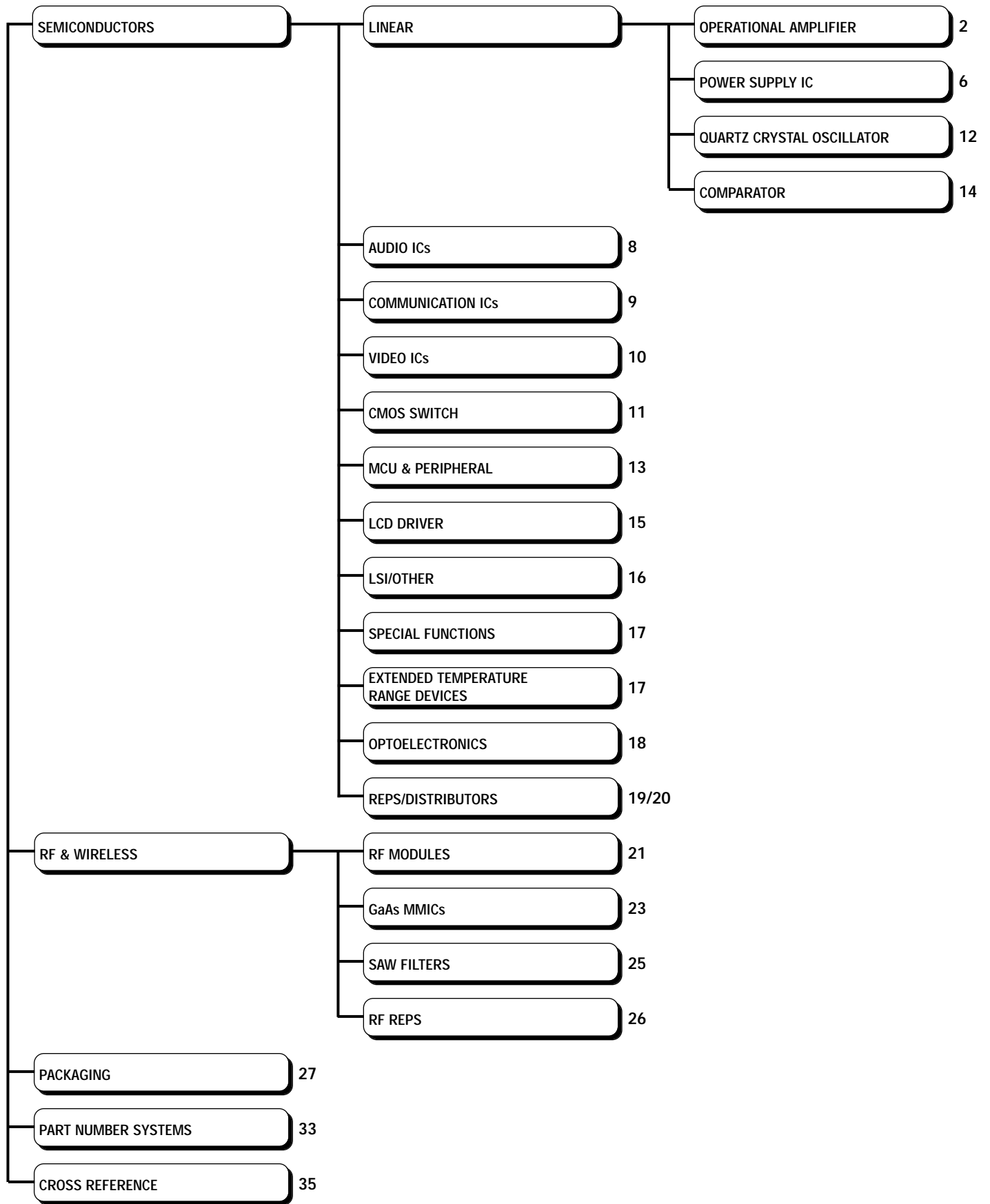




# Product Reference Overview



## BIPOLAR OPERATIONAL AMPLIFIER

| Pwr Supply Inputs                 | Type   | Part Number              | Description                               | V <sub>IO</sub> Typical Offset Voltage (mV) | V <sub>IO</sub> Max Offset Voltage (mV) | I <sub>IO</sub> Typical Offset Current (nA) | I <sub>IO</sub> Max Offset Current (nA) | I <sub>B</sub> Typical Bias Current (nA) | I <sub>B</sub> Max Bias Current (nA) | Typical Unity Gain BW (MHz) | Typical Slew Rate (V/μs) | Package Types                  |
|-----------------------------------|--------|--------------------------|---|---|---|---|---|--|--------------------------------------|-----------------------------|--------------------------|--------------------------------|
| <b>HIGH SPEED &amp; WIDE BAND</b> |        |                          |   |   |   |   |   |  |                                      |                             |                          |                                |
| 2                                 | SINGLE | <a href="#">NJM2136</a>  | High speed wide bandwidth Op Amp          | 1   | 5                                       | 20  | 200                                     | 500                                      | 2000                                 | 200                         | 45                       | DMP-8 / SSOP-8                 |
| 2                                 | DUAL   | <a href="#">NJM2137</a>  | Ultra Wideband High Slew Rate Dual Op Amp | 1   | 5                                       | 20  | 200                                     | 500                                      | 2000                                 | 200                         | 45                       | DMP-8 / SSOP-8                 |
| 2                                 | QUAD   | <a href="#">NJM2138</a>  | High speed wide bandwidth Op Amp          | 1   | 5                                       | 20  | 200                                     | 500                                      | 2000                                 | 200                         | 45                       | DIP-14 / DMP-14 / SSOP-14      |
| 2                                 | HEX    | <a href="#">NJM2116</a>  | High speed, wide bandwidth Op Amp         | 1   | 5                                       | 20  | 200                                     | 500                                      | 2000                                 | 200                         | 45                       | SSOP-20                        |
| <b>HIGH SPEED</b>                 |        |                          |   |   |   |   |   |  |                                      |                             |                          |                                |
| 2                                 | SINGLE | <a href="#">NJM318</a>   | High slew rate Op Amp                     | 4   | 10                                      | 30  | 200                                     | 150                                      | 500                                  | 15                          | 70                       | DIP-8 / DMP-8                  |
| 2                                 | DUAL   | <a href="#">NJM2068</a>  | Low Noise Op Amp                          | 0.3   | 3                                       | 5   | 200                                     | 150                                      | 1000                                 | 5.5                         | 6                        | DIP-8 / DMP-8 / SSOP-8 / SIP-8 |
| 2                                 |        | <a href="#">NJM4560</a>  | Wide bandwidth Op Amp                     | 0.5   | 6                                       | 5   | 200                                     | 40                                       | 500                                  | 10                          | 4                        | DIP-8 / DMP-8 / SIP-8          |
| 2                                 |        | <a href="#">NJM4565</a>  | Wide bandwidth Op Amp                     | 0.5   | 3                                       | 2   | 50                                      | 50                                       | 200                                  | 10                          | 4                        | DIP-8 / DMP-8 / SSOP-8 / SIP-8 |
| 2                                 |        | <a href="#">NJM5532</a>  | Low Noise Op Amp                          | 0.5   | 4                                       | 10  | 150                                     | 200                                      | 800                                  | 10                          | 8                        | DIP-8 / DMP-8 / SIP-8          |
| <b>PRECISION</b>                  |        |                          |   |   |   |   |   |  |                                      |                             |                          |                                |
| 1                                 | DUAL   | <a href="#">NJM2119</a>  | Single supply low drift Op Amp            | 0.09  | 0.45                                    | 0.3   | 7                                       | 18                                       | 50                                   | 1                           | 0.3                      | DIP-8 / DMP-8                  |
| 2                                 | SINGLE | <a href="#">NJMOP-07</a> | Instrumentation grade Op Amp              | 0.06  | 0.15                                    | 0.8   | 6                                       | 2.7                                      | 5                                    | -                           | 0.17                     | DIP-8 / DMP-8                  |
| <b>HIGH OUTPUT</b>                |        |                          |   |   |   |   |   |  |                                      |                             |                          |                                |
| 1                                 | DUAL   | <a href="#">NJM3414A</a> | High output current Op Amp                | 2   | 5                                       | 5   | 100                                     | 100                                      | 500                                  | 1.3                         | 1                        | DIP-8 / DMP-8 / SSOP-8 / SIP-8 |
| 2                                 |        | <a href="#">NJM4556A</a> | High output current Op Amp                | 0.5   | 6                                       | 5   | 60                                      | 50                                       | 500                                  | 8                           | 3                        | DIP-8 / DMP-8 / SIP-8 / SSOP-8 |
| <b>LOW SATURATION</b>             |        |                          |   |   |   |   |   |  |                                      |                             |                          |                                |
| 2                                 | SINGLE | <a href="#">NJM2107F</a> | MTP-5 package Op Amp                      | 1   | 6                                       | 5   | 200                                     | 100                                      | 500                                  | -                           | 3                        | MTP-5                          |
| 2                                 | DUAL   | <a href="#">NJM2100</a>  | High output voltage Op Amp                | 1   | 6                                       | -   | -                                       | 100                                      | 300                                  | 12                          | 4                        | DIP-8 / DMP-8 / SSOP-8 / SIP-8 |
| 2                                 |        | <a href="#">NJM2115</a>  | Low operating voltage Op Amp              | 1   | 6                                       | -   | -                                       | 100                                      | 300                                  | 12                          | 4                        | DIP-8 / DMP-8 / SSOP-8 / SIP-8 |
|                                   |        | <a href="#">NJM2140</a>  | VSP8 package Op Amp                       | 1   | 6                                       | 10  | 200                                     | 100                                      | 300                                  | 12                          | 4                        | VSP-8                          |
| 2                                 | QUAD   | <a href="#">NJM2112</a>  | Low operating voltage Op Amp              | 1   | 6                                       | -   | -                                       | 100                                      | 300                                  | 9                           | 3.2                      | DIP-14 / DMP-14 / SSOP-14      |
| <b>LOW NOISE</b>                  |        |                          |   |   |   |   |   |  |                                      |                             |                          |                                |
| 2                                 | SINGLE | <a href="#">NJM5534</a>  | Low Noise Op Amp                          | 0.5   | 4                                       | 20  | 300                                     | 500                                      | 1500                                 | 10                          | 13                       | DIP-8 / DMP-8                  |
| 2                                 | DUAL   | <a href="#">NJM2041</a>  | Low Noise Op Amp                          | 0.3   | 3                                       | 10  | 200                                     | 200                                      | 500                                  | 7                           | 3                        | DIP-8 / DMP-8 / SIP-8          |
| 2                                 |        | <a href="#">NJM2043</a>  | Low Noise PreAmp.                         | 0.3   | 3                                       | 10  | 200                                     | 400                                      | 1000                                 | 14                          | 6                        | DIP-8 / DMP-8 / SIP-8          |
| 2                                 |        | <a href="#">NJM2068</a>  | Low Noise Op Amp                          | 0.3   | 3                                       | 5   | 200                                     | 150                                      | 1000                                 | 5.5                         | 6                        | DIP-8 / DMP-8 / SSOP-8 / SIP-8 |
| 2                                 |        | <a href="#">NJM2122</a>  | Ultra low noise dual Op Amp               | 1   | 6                                       | 450   | 1500                                    | 3600                                     | 8000                                 | 12                          | 2.4                      | DIP-8 / DMP-8                  |
| 2                                 |        | <a href="#">NJM4560</a>  | Wide bandwidth Op Amp                     | 0.5   | 6                                       | 5   | 200                                     | 40                                       | 500                                  | 10                          | 4                        | DIP-8 / DMP-8 / SIP-8          |
| 2                                 |        | <a href="#">NJM4562</a>  | Decompensated wide bandwidth Op Amp       | 0.5   | 6                                       | 5   | 200                                     | 100                                      | 500                                  | -                           | -                        | DIP-8 / DMP-8 / SIP-8          |
| 2                                 |        | <a href="#">NJM4565</a>  | Wide bandwidth Op Amp                     | 0.5   | 3                                       | 2   | 50                                      | 50                                       | 200                                  | 10                          | 4                        | DIP-8 / DMP-8 / SSOP-8 / SIP-8 |
| 2                                 |        | <a href="#">NJM5532</a>  | Low Noise Op Amp                          | 0.5   | 4                                       | 10  | 150                                     | 200                                      | 800                                  | 10                          | 8                        | DIP-8 / DMP-8 / SIP-8          |
| 2                                 | QUAD   | <a href="#">NJM2060</a>  | Op Amp ( 4560 x 2)                        | 0.5   | 6                                       | 5   | 200                                     | 40                                       | 500                                  | 10                          | 4                        | DIP-14 / DMP-14 / SSOP-14      |

## BIPOLAR OPERATIONAL AMPLIFIER (cont.)

| Pwr Supply Inputs     | Type   | Part Number              | Description                         | V <sub>IO</sub> Typical Offset Voltage (mV) | V <sub>IO</sub> Max Offset Voltage (mV) | I <sub>IO</sub> Typical Offset Current (nA) | I <sub>IO</sub> Max Offset Current (nA) | I <sub>B</sub> Typical Bias Current (nA) | I <sub>B</sub> Max Bias Current (nA) | Typical Unity Gain BW (MHz) | Typical Slew Rate (V/μs) | Package Types                  |
|-----------------------|--------|--------------------------|-------------------------------------|---|---|---|---|--|--------------------------------------|-----------------------------|--------------------------|--------------------------------|
| <b>LOW POWER</b>      |        |                          |                                     |   |   |   |   |  |                                      |                             |                          |                                |
| 2                     | DUAL   | <a href="#">NJM2132</a>  | Low power dual Op Amp               | 2.5   | 5                                       | 5   | 20                                      | 20                                       | 100                                  | 1.8                         | 2.1                      | DIP-8 / DMP-8 / SSOP-8 / SIP-8 |
| 2                     | SINGLE | <a href="#">NJM4250</a>  | μ-Power Programmable Op Amp         | -   | 6                                       | -   | 20                                      | -  | 75                                   | -                           | -                        | DIP-8 / DMP-8 / SSOP-8         |
| 2                     |        | <a href="#">NJM2130F</a> | Low power Op Amp                    | 1   | 5                                       | 1   | 80                                      | 15                                       | 250                                  | -                           | 0.5                      | MTP-5                          |
| 2                     | DUAL   | <a href="#">NJM022</a>   | Low power Op Amp                    | 1   | 5                                       | 1   | 80                                      | 15                                       | 250                                  | -                           | 0.5                      | DIP-8 / DMP-8 / SSOP-8 / SIP-8 |
| 2                     |        | <a href="#">NJM022B</a>  | Low power Op Amp                    | 1   | 5                                       | 1   | 80                                      | 20                                       | 250                                  | -                           | 1                        | DIP-8 / DMP-8 / SSOP-8 / SIP-8 |
| <b>LOW DISTORTION</b> |        |                          |                                     |   |   |   |   |  |                                      |                             |                          |                                |
| 1                     | DUAL   | <a href="#">NJM3404A</a> | Single supply low distortion Op Amp | 2   | 5                                       | 5   | 50                                      | 70                                       | 200                                  | 1.2                         | 1.2                      | DIP-8 / DMP-8 / SSOP-8 / SIP-8 |
| 1                     | QUAD   | <a href="#">NJM3403A</a> | Single supply low distortion Op Amp | 2   | 5                                       | 5   | 50                                      | 70                                       | 200                                  | 1.2                         | 1.2                      | DIP-14 / DMP-14 / SSOP-14      |
| <b>GENERAL</b>        |        |                          |                                     |   |   |   |   |  |                                      |                             |                          |                                |
| 1                     | DUAL   | <a href="#">NJM2143</a>  | Single supply low power Op Amp      | -   | 7                                       | -   | 50                                      | -  | 250                                  | 0.6                         | 0.5                      | VSP-8                          |
| 1                     |        | <a href="#">NJM2904</a>  | Single supply low power Op Amp      | 2   | 7                                       | 5   | 50                                      | 25                                       | 250                                  | 0.2                         | 0.5                      | DIP-8 / DMP-8 / SSOP-8 / SIP-8 |
| 1                     | QUAD   | <a href="#">NJM324</a>   | Single supply low power Op Amp      | 2   | 7                                       | 5   | 50                                      | 20                                       | 250                                  | -                           | -                        | DIP-14 / DMP-14 / SSOP-14      |
| 1                     |        | <a href="#">NJM2902</a>  | Single supply low power Op Amp      | 2   | 10                                      | 5   | 50                                      | 20                                       | 500                                  | 0.5                         | 0.5                      | DIP-14 / DMP-14 / SSOP-14      |
| 2                     | SINGLE | <a href="#">NJM741</a>   | General purpose Op Amp              | 2   | 6                                       | 5   | 200                                     | 30                                       | 500                                  | -                           | 0.5                      | DIP-8 / DMP-8 / SSOP-8         |
| 2                     | DUAL   | <a href="#">NJM1458</a>  | Dual Op Amp ( 741 x 2)              | -   | 6                                       | -   | 200                                     | -  | 500                                  | -                           | 0.5                      | VSP-8                          |
|                       |        | <a href="#">NJM2141</a>  | Dual Op Amp ( 741 x 2)              | 2   | 6                                       | 5   | 200                                     | 30                                       | 500                                  | 8                           | 3                        | DIP-8 / DMP-8                  |
| 2                     |        | <a href="#">NJM4558</a>  | High gain Op Amp                    | 0.5   | 6                                       | 5   | 200                                     | 25                                       | 500                                  | 3                           | 1                        | DIP-8 / DMP-8 / SIP-8 / SSOP-8 |
| 2                     |        | <a href="#">NJM4559</a>  | High performance Op Amp             | 0.5   | 6                                       | 5   | 200                                     | 25                                       | 500                                  | 6                           | 2                        | DIP-8 / DMP-8 / SIP-8 / SSOP-8 |
| 2                     | QUAD   | <a href="#">NJM2058</a>  | Op Amp ( 4558 x 2)                  | 0.5   | 6                                       | 5   | 200                                     | 20                                       | 500                                  | 3                           | 1                        | DIP-14 / DMP-14 / SSOP-14      |
| 2                     |        | <a href="#">NJM2059</a>  | Op Amp ( 4559 x 2)                  | 0.5   | 6                                       | 5   | 200                                     | 20                                       | 500                                  | 6                           | 2                        | DIP-14 / DMP-14 / SSOP-14      |
| 2                     |        | <a href="#">NJM4741</a>  | General purpose Op Amp ( 741 x 4)   | 1   | 5                                       | 30  | 50                                      | 100                                      | 300                                  | -                           | 1.6                      | DIP-14 / DMP-14 / SSOP-14      |
| 2                     | HEX    | <a href="#">NJM2097</a>  | Hex Op Amp                          | 0.5   | 6                                       | 20  | 200                                     | 120                                      | 600                                  | 10                          | 5                        | DMP-24                         |
| <b>FET INPUT</b>      |        |                          |                                     |   |   |   |   |  |                                      |                             |                          |                                |
| 2                     | DUAL   | <a href="#">NJM062</a>   | Low power JFET input Op Amp         | 3   | 15                                      | 1pA   | 200pA                                   | 2pA                                      | 400pA                                | 1                           | 3.5                      | DIP-8 / DMP-8 / SSOP-8 / SIP-8 |
| 2                     |        | <a href="#">NJM072</a>   | J-FET input Op Amp                  | 3   | 10                                      | 5   | 50                                      | 30                                       | 200                                  | 3.0 /ft                     | 20                       | DIP-8 / DMP-8 / SIP-8          |
| 2                     |        | <a href="#">NJM072B</a>  | J-FET input Op Amp                  | 3   | 10                                      | 5 pA  | 50pA                                    | 30pA                                     | 200pA                                | 3.0 /ft                     | 13                       | DIP-8 / DMP-8 / SIP-8 / SSOP-8 |
| 2                     |        | <a href="#">NJM082</a>   | J-FET input Op Amp                  | 3   | 15                                      | 5   | 200                                     | 30                                       | 400                                  | 3.0 /ft                     | 20                       | DIP-8 / DMP-8 / SIP-8          |
| 2                     |        | <a href="#">NJM082B</a>  | J-FET input Op Amp                  | 5   | 15                                      | 5 pA  | 200pA                                   | 30pA                                     | 400pA                                | 5.0 /ft                     | 13                       | DIP-8 / DMP-8 / SSOP-8 / SIP-8 |
| 2                     |        | <a href="#">NJM353</a>   | Wide bandwidth J-FET input Op Amp   | 5   | 10                                      | 25pA  | 100pA                                   | 50pA                                     | 200pA                                | 4                           | 13                       | DIP-8 / DMP-8                  |
| 2                     |        | <a href="#">NJM2082</a>  | High slew rate J-FET input Op Amp   | 2   | 10                                      | 5   | 200                                     | 30                                       | 400                                  | 5                           | 20                       | DIP-8 / DMP-8 / SSOP-8 / SIP-8 |

## BIPOLAR OPERATIONAL AMPLIFIER (cont.)

| Pwr Supply Inputs                        | Type   | Part Number              | Description                                   | V <sub>IO</sub> Typical Offset Voltage (mV) | V <sub>IO</sub> Max Offset Voltage (mV) | I <sub>IO</sub> Typical Offset Current (nA) | I <sub>IO</sub> Max Offset Current (nA) | I <sub>B</sub> Typical Bias Current (nA) | I <sub>B</sub> Max Bias Current (nA) | Typical Unity Gain BW (MHz) | Typical Slew Rate (V/μs) | Package Types                          |
|--|--------|--------------------------|---|---|---|---|---|--|--------------------------------------|-----------------------------|--------------------------|--|
| <b>FET INPUT (cont.)</b>                 |        |                          |   |   |   |   |   |  |                                      |                             |                          |  |
| 2  | DUAL   | <a href="#">NJM2162</a>  | J-FET input Op Amp                            | 5   | 15                                      | 1pA   | 200pA                                   | 2pA                                      | 400pA                                | 3                           | 10                       | DIP / DMP / SIP / SSOP                 |
| 2  | QUAD   | <a href="#">NJM064</a>   | Low power JFET input Op Amp                   | 3   | 15                                      | 1pA   | 200pA                                   | 2pA                                      | 400pA                                | 1                           | 3.5                      | DIP-14 / DMP-14 / SSOP-14              |
| 2  |        | <a href="#">NJM074</a>   | J-FET input Op Amp                            | 3   | 10                                      | 5pA   | 50pA                                    | 30pA                                     | 200pA                                | 3                           | 13                       | DIP-14 / DMP-14 / SSOP-14              |
| 2  |        | <a href="#">NJM084</a>   | J-FET input Op Amp                            | 5   | 15                                      | 5pA   | 200pA                                   | 30pA                                     | 400pA                                | 3                           | 13                       | DIP-14 / DMP-14 / SSOP-14              |
| 2  |        | <a href="#">NJM2164</a>  | Low power JFET input Op Amp                   | 5   | 15                                      | 1pA   | 200pA                                   | 2pA                                      | 400pA                                | 3                           | 10                       | DIP-14 / DMP-14 / SSOP-14              |
| <b>SMALL PACKAGE</b>                     |        |                          |   |   |   |   |   |  |                                      |                             |                          |  |
| 1  | SINGLE | <a href="#">NJM2125F</a> | Single Supply                                 | 2   | 7                                       | 5   | 50                                      | 25                                       | 250                                  | 1.2                         | 1.2                      | MTP5                                   |
| <b>SWITCH FUNCTION (2-IN, 1-OUT X 1)</b> |        |                          |   |   |   |   |   |  |                                      |                             |                          |  |
| 2  | SINGLE | <a href="#">NJM2120</a>  | Switching Op Amp ( 2-input, 1-output )        | 0.8   | 6                                       | -   | -                                       | 80                                       | 500                                  | 7                           | 2.2                      | DIP-8 / DMP-8 / SIP-8                  |
| 2  |        | <a href="#">NJM2121</a>  | High speed switching Op Amp                   | 0.8   | 6                                       | -   | -                                       | 200                                      | 1000                                 | 14                          | 4                        | DIP-8 / DMP-8 / SIP-8                  |
| 1  | DUAL   | <a href="#">NJM2123</a>  | Dual Op Amp with Switch                       | 1   | 6                                       | 10  | 200                                     | 100                                      | 300                                  | 10                          | 3                        | DIP-8 / DMP-8 / SSOP-16                |
| <b>HIGH PERFORMANCE</b>                  |        |                          |   |   |   |   |   |  |                                      |                             |                          |  |
| 2  | DUAL   | <a href="#">NJM2114</a>  | High performance low noise Op Amp             | 0.2   | 3                                       | 10  | 300                                     | 500                                      | 1800                                 | 13                          | 15                       | DIP-8 / DMP-8 / SIP-8                  |
| 2  |        | <a href="#">NJM4580</a>  | High performance Op Amp                       | 0.5   | 3                                       | 5   | 200                                     | 100                                      | 500                                  | 15                          | 5                        | DIP-8 / DMP-8 / SSOP-8 / EMP-8 / SIP-8 |
| <b>HIGH VOLTAGE</b>                      |        |                          |   |   |   |   |   |  |                                      |                             |                          |  |
| 2  | DUAL   | <a href="#">NJM2147</a>  | Dual High Voltage High Power Op Amp           | 1   | 5                                       | 1   | 80                                      | 15                                       | 250                                  | -                           | 0.5                      | DMP / DMP-8                            |
| <b>TRANS CONDUCTANCE</b>                 |        |                          |   |   |   |   |   |  |                                      |                             |                          |  |
| 2  | DUAL   | <a href="#">NJM13600</a> | Transconductance Op Amp with diodes & buffers | 0.4   | 5                                       | -   | -                                       | 0.4                                      | 5                                    | 2                           | 50                       | DIP-14 / DMP-14 / SSOP-14              |
| 2  |        | <a href="#">NJM13700</a> | Transconductance Op Amp                       | 0.4   | 4                                       | -   | -                                       | 0.4                                      | 5                                    | 2                           | 50                       | DIP-14 / DMP-14                        |

## CMOS OPERATIONAL AMPLIFIER

| Pwr Supply Inputs                         | Type    | Part Number                        | Description                      | V <sub>IO</sub> Typical Offset Voltage (mV) | V <sub>IO</sub> Max Offset Voltage (mV) | I <sub>IO</sub> Typical Offset Current (pA) | I <sub>IO</sub> Max Offset Current (pA) | I <sub>B</sub> Typical Bias Current (pA) | I <sub>B</sub> Max Bias Current (pA) | Typical Unity Gain BW (MHz) | Typical Slew Rate (V/μs)    | Package Types                                    |
|---|---------|------------------------------------|----------------------------------|---|---|---|---|--|--------------------------------------|-----------------------------|-----------------------------|--|
| <b>LOW VOLTAGE OPERATING (C-MOS TYPE)</b> |         |                                    |                                  |   |   |   |   |  |                                      |                             |                             |  |
| 1   | SINGLE  | NJU7001                            | Low Power Op Amp                 |   | 10                                      | 1   | -                                       | 1  | -                                    | 0.1                         | 0.05                        | DIP-8 / DMP-8 / SSOP-8<br>DIP-8 / DMP-8 / SSOP-8 |
| 1   |         | NJU7021                            | Low Power Op Amp                 |   | 10                                      | 1   | -                                       | 1  | -                                    | 0.4                         | 0.4                         | DIP-8 / DMP-8 / SSOP-8                           |
| 1   |         | NJU7031                            | Low Power Op Amp                 |   | 10                                      | 1   | -                                       | 1  | -                                    | 1.5                         | 3.5                         | DIP-8 / DMP-8 / SSOP-8                           |
| 1   |         | NJU7051                            | Low Power & Low Offset           |   | 2                                       | 1   | -                                       | 1  | -                                    | 0.1                         | 0.05                        | DIP-8 / DMP-8 / SSOP-8                           |
| 1   |         | NJU7061                            | Low Power & Low Offset           |   | 2                                       | 1   | -                                       | -1                                       | -                                    | 0.4                         | 0.4                         | DIP-8 / DMP-8 / SSOP-8                           |
| 1   |         | NJU7071                            | Low Voltage Op Amp               |   | 2                                       | 1   | -                                       | 1  | -                                    | 1                           | 0.5                         | DIP-8 / DMP-8 / SSOP-8                           |
| 1   |         | NJU7011                            | Low Voltage Tiny Op Amp          |   | 10                                      | 1   | -                                       | 1  | -                                    | 0.2                         | 0.1                         | MTP5   |
| 1   |         | NJU7012                            | Low Voltage Tiny Op Amp          |   | 10                                      | 1   | -                                       | 1  | -                                    | 1                           | 1                           | MTP5   |
| 1   |         | NJU7013                            | Low Voltage Tiny Op Amp          |   | 10                                      | 1   | -                                       | 1  | -                                    | 1                           | 2.4                         | MTP5   |
| 1   |         | NJU7091                            | Low Power Low Offset Tiny Op Amp |   | 2                                       | 1   | -                                       | 1  | -                                    | 0.2                         | 0.1                         | MTP-5  |
| 1   |         | NJU7092                            | Low Power Low Offset Tiny Op Amp |   | 2                                       | 1   | -                                       | 1  | -                                    | 1                           | 1                           | MTP-5  |
| 1   |         | NJU7093                            | Low Power Low Offset Tiny Op Amp |   | 2                                       | 1   | -                                       | 1  | -                                    | 1                           | 2.4                         | MTP-5  |
| 1   |         | DUAL                               | NJU7002                          | Low Power Op Amp                            |   | 10  | 1                                       | -  | 1                                    | -                           | 0.1                         | 0.05   |
| 1   | NJU7022 |                                    | Low Power Op Amp                 |   | 10                                      | 1   | -                                       | 1  | -                                    | 0.4                         | 0.4                         | DIP-8 / DMP-8                                    |
| 1   | NJU7032 |                                    | Low Power Op Amp                 |   | 10                                      | 1   | -                                       | 1  | -                                    | 1.5                         | 3.5                         | DIP-8 / DMP-8                                    |
| 1   | NJU7052 |                                    | Low Power & Low Offset           |   | 2                                       | 1   | -                                       | 1  | -                                    | 0.1                         | 0.05                        | DIP-8 / DMP-8                                    |
| 1   | NJU7062 |                                    | Low Power & Low Offset           |   | 2                                       | 1   | -                                       | 1  | -                                    | 0.4                         | 0.4                         | DIP-8 / DMP-8                                    |
| 1   | NJU7072 |                                    | Low Voltage Op Amp               |   | 2                                       | 1   | -                                       | 1  | -                                    | 1                           | 1.6                         | DIP-8 / DMP-8                                    |
| 1   | NJU7014 |                                    | Low Voltage Op Amp               |   | 10                                      | 1   | -                                       | 1  | -                                    | 0.2                         | 0.1                         | DIP-8 / DMP-8 / SSOP-8 / VSP-8                   |
| 1   | NJU7015 |                                    | Low Voltage Op Amp               |   | 10                                      | 1   | -                                       | 1  | -                                    | 1                           | 1                           | DIP-8 / DMP-8 / SSOP-8 / VSP-8                   |
| 1   | NJU7016 |                                    | Low Voltage Op Amp               |   | 10                                      | 1   | -                                       | 1  | -                                    | 1                           | 2.4                         | DIP-8 / DMP-8 / SSOP-8 / VSP-8                   |
| 1   | NJU7094 |                                    | Low Power Low Offset Dual Op Amp |   | 2                                       | 1   | -                                       | 1  | -                                    | 0.2                         | 0.1                         | DIP-8 / DMP-8 SSOP-8 / VSP8                      |
| 1   | NJU7095 | Low Power & Low Offset Dual Op Amp |                                  | 2   | 2                                       | -   | 2                                       | -  | 1                                    | 1                           | DIP-8 / DMP-8 SSOP-8 / VSP8 |  |
| 1   | NJU7096 | Low Power & Low Offset Dual Op Amp |                                  | 2   | 1                                       | -   | 1                                       | -  | 1                                    | 2.4                         | DIP-8 / DMP-8 SSOP-8 / VSP8 |  |
| 1   | QUAD    | NJU7004                            | Low Power Op Amp                 |   | 10                                      | 1   | -                                       | 1  | -                                    | 0.1                         | 0.05                        | DIP-14 / DMP-14 / SSOP-14                        |
| 1   |         | NJU7024                            | Low Power Op Amp                 |   | 10                                      | 1   | -                                       | 1  | -                                    | 0.4                         | 0.4                         | DIP-14 / DMP-14 / SSOP-14                        |
| 1   |         | NJU7034                            | Low Power Op Amp                 |   | 10                                      | 1   | -                                       | 1  | -                                    | 1.5                         | 3.5                         | DIP-14 / DMP-14 / SSOP-14                        |
| 1   |         | NJU7054                            | Low Power & Low Offset           |   | 2                                       | 1   | -                                       | 1  | -                                    | 0.1                         | 0.05                        | DIP-14 / DMP-14 SSOP-14                          |
| 1   |         | NJU7064                            | Low Power & Low Offset           |   | 2                                       | 1   | -                                       | 1  | -                                    | 0.4                         | 0.4                         | DIP-14 / DMP-14 / SSOP-14                        |
| 1   |         | NJU7074                            | Low Voltage Op Amp               |   | 2                                       | 1   | -                                       | 1  | -                                    | 1                           | 1.6                         | DIP-8 / DMP-8 / SSOP-8                           |

## POWER SUPPLY ICs

| SERIES REGULATOR                        |  |     |     |     |     |     |     |     |     |     |   |     |     |     |   |     |     |   |     |     |                  |   |     |   |    |    |    |    |    |                  |
|---|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|---|-----|-----|-----|---|-----|-----|---|-----|-----|------------------|---|-----|---|----|----|----|----|----|------------------|
| POSITIVE VOLTAGE REGULATOR (3 TERMINAL) |  |     |     |     |     |     |     |     |     |     |   |     |     |     |   |     |     |   |     |     |                  |   |     |   |    |    |    |    |    |                  |
| Output Voltage [V]                      | 1.0  | 1.1 | 1.2 | 1.5 | 2.0 | 2.1 | 2.5 | 2.6 | 2.7 | 2.9 | 3 | 3.2 | 3.3 | 3.5 | 4 | 4.5 | 4.8 | 5 | 5.2 | 5.5 | 6                | 8 | 8.5 | 9 | 12 | 15 | 18 | 20 | 24 | Max Load Current |
| Type                                    |  |     |     |     |     |     |     |     |     |     |   |     |     |     |   |     |     |   |     |     |                  |   |     |   |    |    |    |    |    |                  |
| NJM78L Series                           |  |     |     |     |     |     |     | ○   |     |     |   |     |     |     |   |     |     | ○ |     |     | ○                | ○ |     | ○ | ○  | ○  | ○  | ○  | ○  | 100mA            |
| NJM78M Series                           |  |     |     |     |     |     |     |     |     |     |   |     |     |     |   |     |     | ○ |     |     | ○                | ○ |     | ○ | ○  | ○  | ○  | ○  | ○  | 500mA            |
| NJM78 Series                            |  |     |     |     |     |     |     |     |     |     |   |     |     |     |   |     |     | ○ |     |     | ○                | ○ |     | ○ | ○  | ○  | ○  | ○  | ○  | 1.5A             |
| NJM2930 Series                          |  |     |     |     |     |     |     |     |     |     |   |     |     |     |   |     |     | ○ |     |     |                  | ○ | ○   |   |    |    |    |    |    | 100mA or 150mA   |
| NJU7200 Series                          | ○  | ○   | ○   | ○   |     | ○   | ○   | ○   | ○   | ○   | ○ | ○   | ○   | ○   | ○ |     | ○   | ○ |     | ○   |                  |   |     |   |    |    |    |    |    | 40mA             |
| NJU7201 Series                          |  |     | ○   | ○   |     |     | ○   |     | ○   |     | ○ | ○   |     | ○   | ○ | ○   |     | ○ | ○   | ○   |                  |   |     |   |    |    |    |    |    | 40mA             |
| NJU7202 Series                          |  |     |     |     |     |     |     |     |     |     | ○ |     | ○   | ○   |   |     |     | ○ |     |     |                  |   |     |   |    |    |    |    |    | 100mA            |
| NJU7221 Series                          |  |     | ○   | ○   | ○   |     | ○   |     | ○   |     | ○ | ○   |     | ○   | ○ | ○   |     | ○ |     | ○   |                  |   |     |   |    |    |    |    |    | 40mA             |
| NJU7222 Series                          |  |     |     |     |     |     |     |     |     |     | ○ |     | ○   |     |   |     |     | ○ |     |     |                  |   |     |   |    |    |    |    |    | 100mA            |
| POSITIVE VOLTAGE REGULATOR (3 TERMINAL) |  |     |     |     |     |     |     |     |     |     |   |     |     |     |   |     |     |   |     |     |                  |   |     |   |    |    |    |    |    |                  |
| Output Voltage [V]                      |  |     |     |     |     |     |     |     |     |     |   |     |     |     |   |     |     |   |     |     | Max Load Current |   |     |   |    |    |    |    |    |                  |
| Type                                    | -24  | -18 | -12 | -9  | -8  | -5  | -4  | -3  | -2  |     |   |     |     |     |   |     |     |   |     |     |                  |   |     |   |    |    |    |    |    |                  |
| NJM79L Series                           | ○  | ○   | ○   | ○   | ○   | ○   |     |     | ○   |     |   |     |     |     |   |     |     |   |     |     |                  |   |     |   |    |    |    |    |    | 100mA            |
| NJM79M Series                           | ○  | ○   | ○   | ○   | ○   | ○   |     |     |     |     |   |     |     |     |   |     |     |   |     |     |                  |   |     |   |    |    |    |    |    | 500mA            |
| NJM79 Series                            | ○  | ○   | ○   | ○   | ○   | ○   |     |     |     |     |   |     |     |     |   |     |     |   |     |     |                  |   |     |   |    |    |    |    |    | 1.5A             |
| NJM7211 Series                          |  |     |     |     |     |     |     |     |     | ○   | ○ | ○   | ○   |     |   |     |     |   |     |     |                  |   |     |   |    |    |    |    |    | 40mA             |
| Type                                    | Description  |     |     |     |     |     |     |     |     |     |   |     |     |     |   |     |     |   |     |     |                  |   |     |   |    |    |    |    |    |                  |
| SERIES REGULATOR (OTHERS)               |  |     |     |     |     |     |     |     |     |     |   |     |     |     |   |     |     |   |     |     |                  |   |     |   |    |    |    |    |    |                  |
| NJM317F                                 | Adjustable 3-Terminal positive Voltage Regulator (Io = 1.5A MAX)                         |     |     |     |     |     |     |     |     |     |   |     |     |     |   |     |     |   |     |     |                  |   |     |   |    |    |    |    |    |                  |
| NJM78LR05                               | Positive Voltage Regulator with Reset Function   |     |     |     |     |     |     |     |     |     |   |     |     |     |   |     |     |   |     |     |                  |   |     |   |    |    |    |    |    |                  |
| NJM2370                                 | Low Dropout Voltage Regulator with ON/OFF Function                                       |     |     |     |     |     |     |     |     |     |   |     |     |     |   |     |     |   |     |     |                  |   |     |   |    |    |    |    |    |                  |
| NJM2930                                 | Low Dropout Voltage Regulator  |     |     |     |     |     |     |     |     |     |   |     |     |     |   |     |     |   |     |     |                  |   |     |   |    |    |    |    |    |                  |
| NJU7204 Series                          | 2-Output Positive Voltage Regulator, Low Dropout Voltage (Io = 40mA/circuit)             |     |     |     |     |     |     |     |     |     |   |     |     |     |   |     |     |   |     |     |                  |   |     |   |    |    |    |    |    |                  |
| NJM7224 Series                          | 2-Output Positive Voltage Regulator, Low Dropout Voltage (Io = 40mA/circuit, Vout = ±2%) |     |     |     |     |     |     |     |     |     |   |     |     |     |   |     |     |   |     |     |                  |   |     |   |    |    |    |    |    |                  |

## POWER SUPPLY ICs (cont.)

| Type                              | Description   |
|-----------------------------------|---|
| <b>DC/DC CONVERTER</b>            |   |
| <a href="#">NJM2352</a>           | Low Power Switching Regulator                             |
| <a href="#">NJM2355</a>           | 2-Output Switching Regulator Control                      |
| <a href="#">NJM2360</a>           | DC/DC Converter   |
| <a href="#">NJM2360A</a>          | DC/DC Converter (High Precision Type)                     |
| <a href="#">NJU7261/62 Series</a> | Switching Regulator, Internal/External Clock Operation    |
| <b>SWITCHING REGULATOR</b>        |   |
| <a href="#">NJM2362</a>           | Current Mode Flyback PWM Switching Regulator              |
| <a href="#">NJM2368/69</a>        | Switching Regulator Control IC for Flyback Type           |
| <a href="#">NJM2375/A</a>         | Power Factor Controller                                   |
| <a href="#">NJM2378/79</a>        | Flyback Type Switching Regulator with Sync. Input         |
| <a href="#">NJM3524</a>           | Switching Regulator Control                               |
| <b>VOLTAGE CONVERTER</b>          |   |
| <a href="#">NJU7660 Series</a>    | Voltage Converter, $V^* < 10.5V$ (Doubler)                |
| <a href="#">NJ U7662Series</a>    | Voltage Converter, $V^* < 22V$ (Doubler)                  |
| <a href="#">NJU7670</a>           | Voltage Converter, $ V_{IN} - V_{OUT}  < 20V$ (Tripler)   |
| <b>POWER SUPPLY (OTHERS)</b>      |   |
| <a href="#">NJM431</a>            | Adjustable Precision Shunt Regulator ( $I_o = 100mA$ MAX) |
| <a href="#">NJM723</a>            | Precision Variable Voltage Regulator ( $I_o = 150mA$ MAX) |
| <a href="#">NJM2146B</a>          | Voltage and Current Control IC                            |
| <a href="#">NJM2366</a>           | Voltage Divider IC for Large LCD Panel                    |
| <a href="#">NJ M2380/A</a>        | Adjustable Precision Shunt Regulator                      |
| <a href="#">NJU7284 Series</a>    | Battery Back-up Switcher                                  |
| <a href="#">NJU7664</a>           | Voltage Inverter for Biasing of Gate of GaAs FET          |

## AUDIO SIGNAL ICs

| Part Number                  | Description   | Supply Voltage   | Package Type                           |
|------------------------------|---|------------------|--|
| <b>3-D SURROUND</b>          |   |                  |  |
| NJM2177A                     | Dolby Pro-Logic surround decoder                        | 9 ~ 13 Volts     | SDIP-56, QFP-56, QFP-64                |
| NJM2178                      | SRS 3D sound IC ( mono & stereo )                       | 4.7 ~ 13 Volts   | SDMP-30 / SDIP-30                      |
| NJM2179                      | SRS 3D sound IC ( stereo only )                         | 4.7 ~ 13 Volts   | DIP-16 / DMP-16                        |
| NJM2180                      | TruSurround™ 3D Surround Audio Processor                | 4.7 ~ 13 Volts   | SDIP-30 / SDMP-30                      |
| NJM2184                      | SRS A/V Focus speaker elevation audio processor         | 4.7 ~ 13 Volts   | SDIP-28 / SDMP-30, SDIP-30 / SDMP-30   |
| NJM2189                      | SRS A/V Focus speaker elevation audio processor         | 4.7 ~ 13 Volts   | SDIP-30, SDMP-30                       |
| NJM2187                      | Passive Matrix TruSurround™ 3D Surround Audio Processor | 4.7 ~ 13 Volts   | SDIP-30 / SDMP-30                      |
| NJU25005                     | Dolby Pro-Logic Surround Processor                      | 5 Volts          | QFP-80                                 |
| NJU25006                     | Digital Virtual Dolby Pro-Logic Surround Processor      | 5 Volts          | QFP-80                                 |
| NJU25007                     | VMAx 3D Virtual Theater Digital Audio Processor         | 5 Volts          | QFP-80                                 |
| NJU25018                     | TruSurround Digital Audio Processor with BBE            | 5 Volts          | QFP-80                                 |
| NJU25019                     | Spatializer N-2-2 Digital 3D Audio Processor with BBE   | 5 Volts          | QFP-80                                 |
| NJW1102                      | Dolby Pro-Logic Surround Decoder                        | ± 5, 9 ~13 Volts | TFO-64                                 |
| NJW1102A                     | Dolby Pro-Logic Surround Decoder                        | ± 5, 9 ~13 Volts | SDIP-56, TQFP-64                       |
| NJW1103                      | Dolby Pro-Logic Surround Decoder with Digital Delay     | 9, 5 Volts       | QFP-80                                 |
| NJW1104                      | Dolby Pro-Logic Surround Decoder with Digital Delay     |                  | QFP-80 / QFP-100                       |
| <b>SOUND ENHANCEMENT</b>     |   |                  |  |
| NJM2150/A                    | BBE sound enhancement audio processor                   | 4 ~ 12 Volts     | DIP-20, DMP-20, SSOP-20                |
| NJM2152                      | BBE sound enhancement audio processor                   | 4.5~ 13 Volts    | DIP-20, DMP-20, SSOP-20                |
| NJM2153                      | BBE professional sound enhancement audio processor      | ±9 ~ ±18 Volts   | DIP-20, DMP-20                         |
| <b>NOISE REDUCTION</b>       |   |                  |  |
| NJM2063A                     | Dolby B-type noise reduction processor                  | 1.8 ~ 6 Volts    | DIP-16, DMP-16                         |
| NJM2065A                     | Dolby B/C-type noise reduction processor                | 1.8 ~ 6 Volts    | DIP-20, DMP-20                         |
| NJM2085                      | Preamplifier & Dolby B-type noise reduction processor   | 8 ~ 15 Volts     | SDMP-30                                |
| NJM2185A                     | Dolby B-type noise reduction processor                  | 1.8 ~ 3.5 Volts  | DMP-16 / SSOP-14                       |
| <b>AUDIO POWER AMPLIFIER</b> |   |                  |  |
| NJM386                       | Low voltage audio power amplifier                       | 4 ~ 12 Volts     | DIP-8, SIP-8, DMP-8                    |
| NJM386B                      | Low voltage audio power amplifier (1W)                  | 4 ~ 18 Volts     | DIP-8, SIP-8, DMP-8                    |
| NJM2070                      | Low voltage audio power amplifier                       | 1.8 ~ 15 Volts   | DIP-8, DMP-8                           |
| NJM2073                      | Dual low voltage audio power amplifier                  | 1.8 ~ 15 Volts   | DIP-8, DMP-8, SIP-9                    |
| NJM2076                      | Dual low voltage audio power amplifier                  | 1 ~ 3 Volts      | DIP-8, DMP-8, SIP-9                    |
| NJM2096                      | Dual low voltage audio power amplifier                  | 1 ~ 3 Volts      | DIP-8, DMP-8, SIP-9                    |
| NJM2128                      | Pre & power amplifier with ALC                          | 1.8 ~ 7 Volts    | DMP-16                                 |
| NJM2113                      | Low Voltage Audio Power Amp with Power-Down Mode        | 2 ~ 16 Volts     | DMP-8, DMP-8, SIP-8, SSOP-8            |
| NJM2135                      | Low Voltage Audio Power Amp with Power-Down Mode        | 2 ~ 16 Volts     | DIP-8 / DMP-8 / SSOP-8 / VSP-8 / SIP-8 |
| NJM2149                      | Low Voltage Audio Power Amp with Power-Down Mode        | 2 ~ 16 Volts     | DMP-8 / SSOP-8 / VSP-8                 |
| NJM2160                      | Car Audio Boost Amplifier                               |                  | DIP-16 / DMP-16 / SSOP-16              |
| NJU7081                      | CMOS Low Voltage Audio Power Amplifier                  | 2.4 ~ 5.5 Volts  | DMP-8 / SSOP-8 / VSP-8                 |
| NJU7082B                     | CMOS Dual Low Voltage Audio Power Amplifier             | 2.4 ~ 5.5 Volts  | DMP-8 / SSOP-8                         |
| NJW1105                      | Dual Audio Power Amplifier                              | 4 ~ 12 Volts     | DIP-16 / DMP-30                        |
| <b>AUDIO IC (OTHERS)</b>     |   |                  |  |
| NJM2110                      | Monaural mic. Amplifier for video camera                | 2.7 ~ 5.3 Volts  | DMP-8, SSOP-8                          |
| NJM2118                      | Monaural microphone amplifier                           | 2.7 ~ 5.3 Volts  | DMP-8, SSOP-8                          |
| NJM2127                      | Audio Filter Amplifier                                  | 4.5 ~ 5.5 Volts  | DIP-14 / DMP-14 / SSOP-14              |
| NJM2133                      | Audio Filter Amplifier                                  | 4.5 ~ 5.5 Volts  | DIP-14 / DMP-14 / SSOP-14              |
| NJM2520                      | 2-Input, 1-Output audio switch                          | 4.75 ~ 13 Volts  | DIP-8, DMP-8, SIP-8, SSOP-8            |
| NJM2521                      | 3-Input, 1-Output audio switch                          | 4.75 ~ 13 Volts  | DIP-8, DMP-8, SIP-8, SSOP-8            |



## AUDIO SIGNAL ICs (cont.)

| Part Number                    | Description  | Supply Voltage  | Package Type     |
|--------------------------------|--|-----------------|------------------|
| <b>AUDIO IC (OTHERS) cont.</b> |  |                 |                  |
| NJM2106                        | Active bass booster  | 0.9 ~ 2.5 Volts | DMP-16           |
| NJM2117                        | RF amplifier for CD player                                   | ± 5, 5 Volts    | SSOP-20          |
| NJM2035                        | Stereo modulator   | 1.0 ~ 3.6 Volts | DIP-14, DMP-14   |
| NJM2067                        | 33V dual pre-amp. with magnetic-head select                  | 3 Volts         | DIP-16, DMP-16   |
| NJM2072                        | Signal level sensor system IC                                | 0.9 ~ 7 Volts   | DIP-8, DMP-8     |
| NJU25102                       | Digital Karaoke Audio Processor                              | 5 Volts         | QFP-80           |
| NJU25104                       | VCD KARAOKE Processor  | 5 Volts         | QFP-80           |
| NJU3401                        | Graphic Equalizer Controller                                 |                 | QFP-80           |
| NJU3402                        | Graphic Equalizer Controller For NJU7508                     |                 | QFP-80           |
| NJU7305                        | 7 band electrical variable resistance for graphic equalizer  | 7.5 ~ 15 Volts  | SDIP-28          |
| NJU7306                        | 11 band electrical variable resistance for graphic equalizer | 15 ~ 30 Volts   | SDIP-42, SOP-40  |
| NJU7307                        | 11 band electrical variable resistance for graphic equalizer | 15 ~ 30 Volts   | SDIP-42, SOP-40  |
| NJU7505/07                     | Band pass filter ( 5/7ch monaural SCF )                      | 5 Volts         | DIP-8 / DMP-8    |
| NJU7508                        | Band pass filter ( 11ch monaural SCF )                       | ± 5 Volts       | SDIP-14 / DMP-14 |
| NJU7509                        | High speed band pass filter ( 11ch stereo SCF )              | ± 5 Volts       | SDIP-14 / DMP-14 |
| NJU9702                        | Single chip digital delay for surround processors            | 5 Volts         | DIP-24, SOP-24   |

## COMMUNICATIONS & RADIO ICs

| Part Number                   | Description                                      | Note                            | Package Type            |
|-------------------------------|--|---------------------------------|-------------------------|
| <b>FM IF IC</b>               |  |                                 |                         |
| NJM2206                       | Low power narrow band FM IF amplifier            | PLL detection                   | DIP-20, DMP-20          |
| NJM2232A                      | Low power narrow band FM IF amplifier with RSSI  | RSSI dynamic 90db               | DMP-24                  |
| NJM2292                       | Low power narrow band FM IF IC with RSSI         | Op. supply voltage 1.8 ~ 7V     | SSOP-20                 |
| NJM2294                       | FM IF with RSSI output for pager                 | Op. supply voltage 1.1 ~ 4V     | SSOP-16                 |
| NJM2295A                      | FM IF IC for Keyless Entry System                | Op. supply voltage 2.7 ~ 7V     | SSOP-20                 |
| NJM2537                       | Double Conversion FM IF IC for Pager             | Op. supply voltage 1.1 ~ 4V     | SSOP-20                 |
| NJM3357                       | Low power narrow band FM IF amplifier            |                                 | DIP-16, DMP-16          |
| NJM3359                       | Low power narrow band FM IF amplifier            |                                 | DIP-18                  |
| <b>COMMUNICATION (OTHERS)</b> |  |                                 |                         |
| NJM567                        | Tone Decoder                                     | Freq. range 0.01 ~ 500kHz       | DIP-8 / DMP-8           |
| NJM1496                       | Balanced modulator / demodulator                 | Freq. Range 0.01 ~ 500kHz       | DIP-14, DMP-14, SSOP-14 |
| NJM2105                       | Speech network                                   | Carrier supression 65db typ.    | SIP-9                   |
| NJM2203                       | Full balanced mixer                              |                                 | DIP-16                  |
| NJM2204A                      | Log. Amplifier                                   |                                 | DIP-16                  |
| NJM2211                       | FSK demodulator / tone decoder                   | Freq. Range 0.01 ~ 300kHz       | DIP-14, DMP-14          |
| NJM2236/36A                   | FM front-end                                     |                                 | DIP-8, DMP-8, SIP-8     |
| NJM2237                       | AM / FM Radio                                    |                                 | DIP-20                  |
| NJM2241                       | AM / FM Radio with tuning indicator circuit      |                                 | DMP-24                  |
| NJM6104                       | 160MHz Direct in PLL IC for DTS or Communication |                                 | DIP-8                   |
| NJU5601                       | POCSAG DECODER for PAGER                         |                                 | SSOP-16                 |
| NJW2303                       | Base Band Interface IC                           | Op. supply volt. 2.7 ~ 3.3V     | QFP-32                  |
| NJM2145                       | Remote Control Interface IC                      | Op. supply voltage 4.75 ~ 5.25V | DIP-16 / DMP-16         |
| NJM3470/70A                   | FDD read amplifier system                        |                                 | DIP-18                  |

## VIDEO SIGNAL ICs

| Part Number                                | Description  | Supply Voltage            | Package Type                  |
|--|--|---------------------------|-------------------------------|
| <b>VIDEO SWITCH (GENERAL PURPOSE TYPE)</b> |  |                           |                               |
| NJM2233B                                   | 2-input single video switch                            | 4.75 ~ 13 Volts           | DIP-8, DMP-8, SIP-8, SSOP-8   |
| NJM2234                                    | 3-input single video switch                            | 4.75 ~ 13 Volts           | DIP-8, DMP-8, SIP-8, SSOP-8   |
| NJM2235                                    | 3-input single video switch with clamp                 | 4.75 ~ 13 Volts           | DIP-8, DMP-8, SIP-8, SSOP-8   |
| NJM2248                                    | 3-input video superimposer                             | 4.75 ~ 13 Volts           | DIP-8, DMP-8, SIP-8, SSOP-8   |
| NJM2249                                    | 3-input video superimposer                             | 4.75 ~ 13 Volts           | DIP-8, DMP-8, SIP-8, SSOP-8   |
| NJM2273                                    | 3-input video switch with mute                         | 4.75 ~ 13 Volts           | SIP-9                         |
| NJM2293                                    | 4-input 1-mute video switch                            | 4.75 ~ 13 Volts           | DIP-16, DMP-16                |
| NJM2533                                    | 2-input 1-output video switch                          | 4.75 ~ 13 Volts           | DIP-8, DMP-8, SIP-8, SSOP-8   |
| NJM2534                                    | 3-input 1-output video switch                          | 4.75 ~ 13 Volts           | DIP-8, DMP-8, SIP-8, SSOP-8   |
| NJM2535                                    | 3-input 1-output video switch                          | 4.75 ~ 13 Volts           | DIP-8, DMP-8, SIP-8, SSOP-8   |
| NJM2503                                    | 2-input 1-output & 3-input 1-output video switch       | 4.75 ~ 13 Volts           | DIP-16, DMP-16                |
| NJM2506                                    | 2-input 1-output & 3-input 1-output video switch       | 4.75 ~ 13 Volts           | DIP-16, DMP-16, SSOP-16       |
| NJM2508                                    | 2-input 1-output & 3-input 1-output video switch       | 4.75 ~ 13 Volts           | DIP-16, DMP-16, SSOP-16       |
| NJM2513                                    | 2-input 1-output & 3-input 1-output video switch       | 4.75 ~ 13 Volts           | DIP-16, DMP-16                |
| NJM2523                                    | 3-input 1-output & 2-input 1-output video switch       | 4.75 ~ 13 Volts           | DIP-16, DMP-16                |
| NJM2283                                    | 2-input 3ch video switch                               | 4.75 ~ 13 Volts           | DIP-16, DMP-16, SSOP-16       |
| NJM2284                                    | 2-input 3ch video switch                               | 4.75 ~ 13 Volts           | DIP-16, DMP-16, SSOP-16       |
| NJM2285                                    | 2-input 3ch video switch                               | 4.75 ~ 13 Volts           | DIP-16, DMP-16, SSOP-16       |
| NJM2286                                    | 2-input 3ch video switch                               | 4.75 ~ 13 Volts           | DIP-16, DMP-16                |
| NJM2243                                    | 3-input single video switch with 75 Ω driver           | 9 ~ 13 Volts              | DIP-8, DMP-8, SIP-8           |
| NJM2244                                    | 3-input single video switch with 75 Ω driver & clamp   | 4.75 ~ 13 Volts           | DIP-8, DMP-8, SIP-8           |
| NJM2263                                    | 3-input video superimposer with 75 Ω driver            | 4.75 ~ 13 Volts           | DIP-8, DMP-8, SIP-8           |
| NJM2264                                    | 3-input video superimposer with 75 Ω driver            | 4.75 ~ 13 Volts           | DIP-8, DMP-8, SIP-8           |
| NJM2245                                    | 3-input single video switch with 6db amplifier         | 8.5 ~ 13 Volts            | DIP-8, DMP-8, SIP-8           |
| NJM2246                                    | 3-input single video switch with 6db amplifier & clamp | 4.75 ~ 13 Volts           | DIP-8, DMP-8, SIP-8           |
| NJM2265                                    | 3-input video superimposer with 6db amplifier          | 4.75 ~ 13 Volts           | DIP-8, DMP-8, SIP-8           |
| NJM2266                                    | 3-input video superimposer with 6db amplifier          | 4.75 ~ 13 Volts           | DIP-8, DMP-8, SIP-8           |
| <b>VIDEO SWITCH (ASSP TYPE)</b>            |  |                           |                               |
| NJM2223                                    | Quad video signal switch with 8db amplifier            | 12 Volts                  | DMP-16                        |
| NJM2262                                    | 2-input video superimposer                             | 4.7 ~ 5.3 Volts           | DMP-16                        |
| NJM2279                                    | 3-input 2-output video switch for audio                | 9 ~ 12 Volts (±4.5 ~ ±6V) | DIP-14, DMP-14                |
| NJM2296                                    | 5-input, 3-output video switch                         | ±4 ~ ±6.5 Volts           | DIP-16, DMP-16                |
| NJM2509                                    | Video superimposer with Y - C mixer                    | 4.5 ~ 5.1 Volts           | SSOP-8                        |
| <b>VIDEO IC (OTHERS)</b>                   |  |                           |                               |
| NJM592                                     | Video amplifier  | ±3 ~ ±8V                  | DIP-8/14, DMP-8/14, SSOP-8/14 |
| NJM1372A                                   | RF modulator for NTSC color TV ( 3.58MHz )             | 4.75 ~ 5.25 Volts         | DIP-14                        |
| NJM2208                                    | RF modulator with sound signals                        | 4.75 ~ 5.25 Volts         | DIP-16                        |
| NJM2129/45                                 | Interface IC for remote control                        | 4.75 ~ 15 Volts           | DIP-14, DMP-14                |
| NJM2207                                    | Superimposer IC for NTSC color TV ( 3.58MHz )          | 4.75 ~ 13 Volts           | DIP-14, DMP-14, ZIP-16        |
| NJM2209                                    | Video picture enhancer                                 | 4.75 ~ 5.5 Volts          | SIP-9, DMP-14                 |
| NJM2210                                    | Video noise reducer                                    | 4.75 ~ 5.3 Volts          | DIP-8, DMP-8                  |
| NJM2214                                    | Video on-screen display                                | 4.75 ~ 5.3 Volts          | SDIP-22, DMP-22               |
| NJM2217                                    | Video superimposer with AFC circuit                    | 4.75 ~ 5.3 Volts          | DIP-22, SDIP-22               |
| NJM2218                                    | NTSC-M/PAL converter                                   | 4.75 ~ 5.5 Volts          | DIP-18                        |
| NJM2220/30                                 | Video sync. signal detector                            | 4.75 ~ 10 Volts           | DMP-8, SIP-9                  |
| NJM2224                                    | Video noise reducer                                    | 4.75 ~ 5.25 Volts         | DMP-8, SIP-9                  |
| NJM2225                                    | Video camera auto-iris driver                          | 5 ~ 9 Volts               | DMP-16, ZIP-16, SSOP-16       |
| NJM2228                                    | Video subcarrier signal doubler / tripler              | 5 Volts                   | DIP-8, DMP-8, SIP-8           |

## VIDEO SIGNAL ICs (cont.)

| Part Number                      | Description                                  | Supply Voltage                   | Package Type         |
|----------------------------------|--|----------------------------------|----------------------|
| <b>VIDEO IC (OTHERS) (cont.)</b> |  |                                  |                      |
| NJM2229                          | Video sync. signal detector with AFC circuit | 4.7 ~ 5.3 Volts                  | DIP-16, ZIP-16       |
| NJM2238                          | Video subcarrier signal tripler              | 5 Volts                          | DIP-8, DMP-8, SIP-8  |
| NJM2240                          | Video subcarrier signal quadrupler           | 5 Volts                          | DIP-8, DMP-8, SIP-9  |
| NJM2247A/47B                     | Video color superimposer                     | 5 ~ 13 Volts                     | DMP-20               |
| NJM2252                          | On screen display mixer IC                   | 8.6 ~ 9.4 Volts                  | SDIP-20              |
| NJM2255                          | Chroma signal hue tint controller            | 4.7 ~ 5.3 Volts                  | DIP-8                |
| NJM2256                          | Video color superimposer                     | 5 Volts                          | DMP-20               |
| NJM2257                          | Video sync. signal detector with AFC circuit | 4.7 ~ 5.3 Volts                  | DIP-16, DMP-16       |
| NJM2258                          | Video equalizer                              | 5 Volts                          | SDIP-22              |
| NJM2267                          | Dual video amp with 6db amp & 75 Ω driver    | 5 Volts                          | DIP-8, DMP-8, SSOP-8 |
| NJM2268                          | Dual video amp with 6db amp & 75 Ω driver    | 5 Volts                          | DIP-8, DMP-8, SSOP-8 |
| NJM2298                          | AV Switch Amplifier                          | 4.5 ~ 5.5V                       | DMP-24               |
| NJM2538                          | Video amplifier with 75 Ω driver             | V+1=4.5 ~ 5.3V<br>V+2=2.7 ~ 5.3V | SSOP-20              |
| NJW1103                          | Signal Processor For Color TFT               | 4.5 ~ 5.5V                       |                      |

## CMOS ANALOG SWITCH

| Part Number          | Description   | Supply Voltage              | Package Type            |
|----------------------|---|-----------------------------|-------------------------|
| <b>ANALOG SWITCH</b> |   |                             |                         |
| NJU201A              | Quad SPST analog switch                               | 44V                         | DIP-16, DMP-16          |
| NJU211               | Quad SPST analog switch                               | 40V                         | DIP-16, DMP-16          |
| NJU7301              | Quad SPST analog switch                               | 44V                         | DIP-16, DMP-16          |
| NJU7304              | Analog multiplexer with 8-channel sample & hold       | 20V                         | DIP-16                  |
| NJU7311A             | X2 Hex, X1 Dual channel multiplexer                   | 34V                         | SDIP-28, DMP-30         |
| NJU7312A             | X3 Quad, X2 Dual channel multiplexer                  | 34V                         | SDIP-28, DMP-30         |
| NJU7313A             | X2 Quad, X4 Dual channel multiplexer                  | 34V                         | SDIP-28, DMP-30         |
| NJU7314              | X2 Hex, X1 Dual channel multiplexer                   | 34V                         |                         |
| NJU7315              | X3 Quad, X2 Dual channel multiplexer                  | 34V                         |                         |
| NJU7316              | X2 Quad, X4 Dual channel multiplexer                  | 34V                         |                         |
| NJU4051B             | 8-channel analog multiplexer / demultiplexer          | 20V                         | DIP-16, DMP-16, SSOP-16 |
| NJU4052B             | Differential 4-ch. Analog multiplexer / demultiplexer | 20V                         | DIP-16, DMP-16, SSOP-16 |
| NJU4053B             | Differential 2-ch. Analog multiplexer / demultiplexer | 20V                         | DIP-16, DMP-16, SSOP-16 |
| NJU4066B             | Quad bilateral switch                                 | 20V                         | DIP-14, DMP-14, SSOP-14 |
| NJU7370              | 3 x 32 analog cross point switch                      | 6V (Logic),<br>11V (switch) | QFP-64                  |

## QUARTZ CRYSTAL OSCILLATION ICs

| Part Number                    | Description   | Package Type         |
|--------------------------------|---|----------------------|
| <b>FUNDAMENTAL</b>             |   |                      |
| NJU6328 Series                 | $f_{\max}$ <24MHz, IOL <1mA, Tri-state buffer               | CHIP / EMP-8 / vsp-8 |
| <a href="#">NJU6321 Series</a> | $f_{\max}$ <50MHz, IOL <4mA, Tri-state buffer               | CHIP , EMP-8         |
| <a href="#">NJU6323 Series</a> | $f_{\max}$ <50MHz, IOL <4mA, Tri-state buffer               | CHIP , EMP-8         |
| <a href="#">NJU6324 Series</a> | $f_{\max}$ <50MHz, IOL <4mA, Tri-state buffer               | CHIP , EMP-8         |
| <a href="#">NJU6361A</a>       | $f_{\max}$ <50MHz, IOL <4mA, Inverter output                | CHIP , EMP-8         |
| <a href="#">NJU6318 Series</a> | $f_{\max}$ <50MHz, IOL <16mA, Tri-state buffer              | CHIP , EMP-8         |
| <a href="#">NJU6319 Series</a> | $f_{\max}$ <50MHz, IOL <16mA, Tri-state buffer              | CHIP , EMP-8         |
| <a href="#">NJU6322 Series</a> | $f_{\max}$ <50MHz, IOL <16mA, Tri-state buffer              | CHIP , EMP-8         |
| <a href="#">NJU6329 Series</a> | $f_{\max}$ <50MHz, IOL <16mA, Tri-state buffer              | CHIP , EMP-8         |
| <b>3RD OVER TONE</b>           |   |                      |
| <a href="#">NJU6339 Series</a> | $f_{\max}$ <75MHz, IOL <4mA, Tri-state buffer               | CHIP , EMP-8         |
| <a href="#">NJU6374 Series</a> | $f_{\max}$ <75MHz, IOL <4mA, Tri-state buffer               | CHIP , EMP-8         |
| <a href="#">NJU6391 Series</a> | $f_{\max}$ <75MHz, IOL <8mA, Tri-state buffer, 3V operation | CHIP , EMP-8         |
| <a href="#">NJU6392 Series</a> | $f_{\max}$ <75MHz, IOL <8mA, Tri-state buffer, 3V operation | CHIP / EMP-8         |
| <a href="#">NJU6330 Series</a> | $f_{\max}$ <75MHz, IOL <16mA, Tri-state buffer              | CHIP , EMP-8         |
| <a href="#">NJU6338 Series</a> | $f_{\max}$ <75MHz, IOL <16mA, Tri-state buffer              | CHIP , EMP-8         |
| <a href="#">NJU6373 Series</a> | $f_{\max}$ <75MHz, IOL <16mA, Tri-state buffer              | CHIP , EMP-8         |
| <a href="#">NJU6375 Series</a> | $f_{\max}$ <50MHz, IOL <24mA / 16mA, Tri-state buffer       | CHIP , EMP-8         |
| <a href="#">NJU6333 Series</a> | $f_{\max}$ <75MHz, IOL <24mA, Tri-state buffer              | CHIP , EMP-8         |
| <b>OTHERS</b>                  |   |                      |
| <a href="#">NJU6342 Series</a> | $f_{\max}$ <120MHz, IOL <4mA or <24mA, Tri-state buffer     | CHIP , EMP-8         |

## MCU & MICROPROCESSOR PERIPHERALS

| Part Number             | Description                       | ROM Size    | RAM Size   | Package Types   |
|-------------------------|-----------------------------------|-------------|------------|-----------------|
| <b>MICRO CONTROLLER</b> |                                   |             |            |                 |
| <a href="#">NJU3101</a> | 4Bit Single Chip Tiny Controller  | 512 x 8bit  | 16 x 4bit  | DIP16 / DMP16   |
| <a href="#">NJU3102</a> | 4Bit Single Chip Tiny Controller  | 1024 x 8bit | 32 x 4bit  | SDIP22 / SOP22  |
| <a href="#">NJU3501</a> | 4Bit Single Chip Micro Controller | 512 x 8bit  | 64 x 4bit  | DIP20 / SOP20   |
| <a href="#">NJU3502</a> | 4Bit Single Chip Micro Controller | 1024 x 8bit | 64 x 4bit  | SDIP24 / DMP24  |
| <a href="#">NJU3503</a> | 4Bit Single Chip Micro Controller | 2048 x 8bit | 128 x 4bit | SDIP28 / SDMP30 |
| <a href="#">NJU3504</a> | 4Bit Single Chip Micro Controller | 4096 x 8bit | 256 x 4bit | SDIP42 / QFP44  |
| <a href="#">NJU3505</a> | 4Bit Single Chip Micro Controller | 8912 x 8bit | 256 x 4bit | SDIP42 / QFP44  |

| Part Number                    | Description   | Package Type                     |
|--------------------------------|---|----------------------------------|
| <b>PERIPHERAL ICs</b>          |   |                                  |
| <a href="#">NJU6401B</a>       | RS232C Line driver receiver X3 driver, X5 receiver          | DIP-20 / DMP-20                  |
| <a href="#">NJU6402B</a>       | RS232C Line driver receiver X3 driver, X3 receiver          | DIP-16 / DMP-16                  |
| <a href="#">NJU6413</a>        | RS232C Line Driver Receiver X2 Driver, X2 Receiver          | DIP-16 / SDMP-30                 |
| <a href="#">NJU6350</a>        | Serial Interface Real Time Clock                            | VSP-8                            |
| <a href="#">NJU6355 Series</a> | Serial interface real time clock for 4-bit CPU              | DIP-8 / DMP-8                    |
| <a href="#">NJU6356 Series</a> | Serial interface real time clock for 4-bit CPU              | DIP-8 / DMP-8                    |
| <a href="#">NJU6358 Series</a> | Serial interface real time clock for 4-bit CPU with Wake-Up | DIP-14 / DMP-14 / SSOP-14 / CHIP |
| <a href="#">NJU6359</a>        | Serial Interface Real Time Clock with Wake-Up Output        | SSOP-8                           |
| <a href="#">NJU3711</a>        | 8-bit Serial In Parallel Out                                | DIP-14 / DMP-14                  |
| <a href="#">NJU3712</a>        | 8-bit Serial In Parallel Out with Cascade function          | DIP-16 / DMP-16                  |
| <a href="#">NJU3713</a>        | 12-bit Serial In Parallel Out                               | DIP-18 / SOP-18                  |
| <a href="#">NJU3714</a>        | 12-bit Serial In Parallel Out with Cascade function         | DIP-20 / SOP-20                  |
| <a href="#">NJU3715</a>        | 16-bit Serial In Parallel Out                               | SDIP-22 / SOP-22                 |
| <a href="#">NJU3716</a>        | 16-bit Serial In Parallel Out with Cascade function         | SDIP-24 / DMP-24                 |
| <a href="#">NJU3718</a>        | 24-bit Serial In Parallel Out with Cascade function         | SDIP-28 / SOP-28                 |
| <a href="#">NJU3719</a>        | 24-bit Serial In Parallel Out                               | SDIP-30                          |

| Part Number             | Description                       | Note                     | Package Types         |
|-------------------------|-----------------------------------|--------------------------|-----------------------|
| <b>RESET ICs</b>        |                                   |                          |                       |
| <a href="#">NJM2078</a> | Voltage detector                  | Supply Voltage 2.5 ~ 40V | DIP-8 / DMP-8         |
| <a href="#">NJM2102</a> | System reset with watch dog timer | Supply Voltage 5 ~ 15V   | DIP-8 / DMP-8 / SIP-8 |
| <a href="#">NJM2103</a> | System Reset                      | Supply Voltage 5 ~ 15V   | DIP-8 / DMP-8 / SIP-8 |
| <a href="#">NJM2405</a> | Voltage detector                  | Supply Voltage 2.5 ~ 40V | DMP-8                 |

## COMPARATOR

| Pwr Supply Inputs            | Type   | Part Number              | Description  | V <sub>IO</sub> Typical Offset Voltage (mV) | V <sub>IO</sub> Max Offset Voltage (mV) | I <sub>IO</sub> Typical Offset Current (nA) | I <sub>IO</sub> Max Offset Current (nA) | I <sub>B</sub> Typical Bias Current (nA) | I <sub>B</sub> Max Bias Current (nA) | Typical Response Time (ns) | Voltage Gain (db) | Package Types       |
|------------------------------|--------|--------------------------|--|---|---|---|---|--|--------------------------------------|----------------------------|-------------------|---------------------|
| <b>HIGH SPEED</b>            |        |                          |  |   |   |   |   |  |                                      |                            |                   |                     |
| 2                            | Dual   | <a href="#">NJM319</a>   | High speed dual comparator                         | 2   | 8                                       | 80  | 200                                     | 250                                      | 1000                                 | 80                         | 92                | DIP / DMP /         |
| 2                            | Single | <a href="#">NJM360</a>   | High speed voltage comparator                      | 2   | 5                                       | 500   | 3000                                    | 5000                                     | 20000                                | 13                         | -                 | DIP / DMP-8         |
| <b>PRECISION</b>             |        |                          |  |   |   |   |   |  |                                      |                            |                   |                     |
| 2                            | Single | <a href="#">NJM311</a>   | Precision voltage comparator                       | 2   | 7.5                                     | 6   | 50                                      | 100                                      | 250                                  | 200                        | 106               | DIP / DMP-8         |
| <b>LOW POWER CONSUMPTION</b> |        |                          |  |   |   |   |   |  |                                      |                            |                   |                     |
| 1                            | Quad   | <a href="#">NJM2901</a>  | Single supply low power quad voltage comparator    | 2   | 7                                       | 5   | 50                                      | 25                                       | 250                                  | 1300                       | 106               | DIP / DMP / SSOP-14 |
| 1                            | Dual   | <a href="#">NJM2903</a>  | Single supply low power dual voltage comparator    | -   | 7                                       | -   | 50                                      | 30                                       | 250                                  | 1500                       | 106               | DIP / DMP / SIP-8   |
| 1                            | Dual   | <a href="#">NJU7102A</a> | Low power comparator with CMOS output - dual       | 1.2   | 12                                      | 1   | -                                       | 1  | -                                    | -                          | -                 | DIP / DMP-8         |
| 1                            | Quad   | <a href="#">NJU7104A</a> | Low power comparator with CMOS output - quad       | 1.2   | 12                                      | 1   | -                                       | 1  | -                                    | -                          | -                 | DIP / DMP-14        |
| 1                            | Dual   | <a href="#">NJU7112A</a> | Low power comparator with open drain output - dual | 1.4   | 12                                      | 1   | -                                       | 1  | -                                    | -                          | -                 | DIP / DMP-8         |
| 1                            | Quad   | <a href="#">NJU7114A</a> | Low power comparator with open drain output - quad | 1.4   | 12                                      | 1   | -                                       | 1  | -                                    | -                          | -                 | DIP / DMP-14        |
|                              | Single | <a href="#">NJU7141</a>  | Low Power Comparator with Open Drain Output        | -   | 10                                      | 1   | -                                       | 1  | -                                    | -                          | -                 | MTP-5-              |
| <b>OTHERS</b>                |        |                          |  |   |   |   |   |  |                                      |                            |                   |                     |
| 2                            | Dual   | <a href="#">NJM2403</a>  | High output current dual voltage comparator        | -   | 10                                      | -   | 100                                     | 40                                       | 500                                  | 1500                       | 106               | DIP / DMP / SIP-8   |
| 2                            | Single | <a href="#">NJM2406F</a> | MTP-5 package comparator                           | 1   | 7                                       | 1   | 50                                      | 20                                       | 250                                  | 1500                       | 106               | MTP-5               |
| 1                            | Dual   | <a href="#">NJM2407R</a> | Dual Miniature Comparator                          | 2   | 7                                       | 5   | 50                                      | 25                                       | 250                                  | 800                        | 106               | VSP-8               |

## LCD CONTROLLER/DRIVER

|   | 4 character   | 8 character                                 | 10 character  | 12 character  | 14 character                              |
|---|---|---|---|---|---|
| <b>CHARACTER TYPE LCD CONTROLLER DRIVER</b> |   |   |   |   |   |
| 1 Line                                      |   | NJU6408B<br>NJU6468                         |   | NJU6467<br>NJU6428/29<br>NJU6469                              | NJU6520                                   |
| 2Line                                       | NJU6408B<br>NJU6468                                     | NJU6408B<br>NJU6468                         | NJU6424<br>NJU6425<br>NJU6427<br>NJU6428/29                                 | NJU6428/29<br>NJU6469<br>NJU6461<br>NJU6462                   | NJU6520                                   |
| 3Line                                       |   | NJU6424<br>NJU6425<br>NJU6427               | NJU6424<br>NJU6425<br>NJU6427   | NJU6406B<br>NJU6466   |   |
| 4Line                                       |   | NJU6420B<br>NJU6426                         | NJU6423B  | NJU6406B<br>NJU6466<br>NJU6465<br>NJU6475<br>NJU6426+6407C/CR |   |
|   | 16 character  | 20 character                                | 24 character  | 40 character  | 80 character                              |
| 1 Line                                      | NJU6460A<br>NJ U6408B<br>NJU6468<br>NJU6420B<br>NJU6470 | NJU6423B                                    | NJU6406B<br>NJU6469<br>NJU6461  | NJU6423B  | NJU6408B+6407C/CRx9<br>NJU6468+6407C/CRx9 |
| 2 Line                                      | NJU6420B<br>NJU6426<br>NJU6408B+6407C/CR                | NJU6423B<br>NJU6408B+6417C<br>NJU6468+6417C | NJU6406B<br>NJU6466<br>NJU6465<br>NJU6408B+6407C/CRx2<br>NJU6468+6407C/CRx2 | NJU6426+6417C<br>NJU6408B+6407C/CRx4<br>NJU6468+6407C/CRx4    |   |
| 3Line                                       | NJU6463   |   |   |   |   |
| 4Line                                       | NJU6426+6407C/CR  | NJU6426+6417C                               | NJU6426+6415/16   |   |   |

|  | 61 SEG               | 80 SEG  | 96 SEG  | 122 SEG                          | 128 SEG | 134 SEG   | 141 SEG                          | 288 SEG      |
|--|----------------------|---------|---------|----------------------------------|---------|-----------|----------------------------------|--------------|
| <b>BITMAP TYPE LCD CONTROLLER DRIVER</b> |                      |         |         |                                  |         |           |                                  |              |
| 16 COM                                   | NJU6450A<br>NJU6452A |         |         |                                  |         |           | NJU6450A+6451A<br>NJU6452A+6453A |              |
| 17 COM                                   |                      |         | NJU6580 |                                  |         |           |                                  |              |
| 32 COM                                   |                      |         |         | NJU6450A+6450A<br>NJU6452A+6452A |         |           |                                  |              |
| 33 COM                                   |                      |         | NJU6583 |                                  | NJU6455 | NJU6575/A |                                  | NJU6455+6455 |
| 49 COM                                   |                      | NJU6561 |         |                                  |         |           |                                  |              |
| 53 COM                                   |                      | NJU6577 |         |                                  |         |           |                                  |              |
| 65 COM                                   |                      |         |         |                                  |         | NJU6579   |                                  |              |

|                                | 80 SEG   | 104 SEG  | 120 SEG    | 128 SEG | 160 SEG            | 200 SEG | 240 SEG |
|--------------------------------|----------|----------|------------|---------|--------------------|---------|---------|
| <b>SEGMENT TYPE LCD DRIVER</b> |          |          |            |         |                    |         |         |
| 1/2 Duty                       | NJU6435D | NJU6432B |            |         |                    |         |         |
| 1/3 Duty                       |          |          | NJU6435E/F |         |                    |         |         |
| 1/4 Duty                       |          |          |            | NJU6437 | NJU6438<br>NJU6439 | NJU6433 | NJU6436 |

## IC/LSI (OTHERS)

| Type                     | Description  | Note                               | Package Type                   |
|--------------------------|--|------------------------------------|--------------------------------|
| <b>VFD DRIVER</b>        |  |                                    |                                |
| NJU3421A                 | VFD Driver (9-segment, 15-digit)                         |                                    | SDIP-42 / QFP-44-A1            |
| NJU3422                  | VFD Driver (8-segment,8-digit)                           |                                    | SDIP-24                        |
| NJU3423                  | VFD Driver (11-segment,11-digit)                         | Key Scan Function                  | QFP-44                         |
| <b>DMM</b>               |  |                                    |                                |
| NJU9201B                 | 3-1/2 DIGIT SINGLE CHIP A/D CONVERTER WITH LCD DRIVER    |                                    | DIP-40 / DMP-42                |
| NJU9203B                 | 3-1/2 DIGIT SINGLE CHIP A/D CONVERTER WITH LED DRIVER    | Display HOLD                       | DIP-40 / DMP-42                |
| NJU9202B                 | 3-1/2 DIGIT SINGLE CHIP A/D CONVERTER WITH LCD DRIVER    |                                    | DIP-40 / DMP-42                |
| NJU9204B                 | 3-1/2 DIGIT SINGLE CHIP A/D CONVERTER WITH LED DRIVER    | Display HOLD                       | DIP-40 / DMP-42                |
| NJU9207B                 | 3-1/2 DIGIT SINGLE CHIP DMM LSI                          |                                    | QFP-80                         |
| NJU9208                  | 3-1/2 DIGIT SINGLE CHIP DMM LSI                          |                                    | QFP-80                         |
| NJU9212                  | 3-1/2 DIGIT SINGLE CHIP DMM LSI                          | Pocket type                        | QFP-64 / CHIP                  |
| NJU9210C                 | 3-3/4 DIGIT SINGLE CHIP DMM LSI With 42-Segment Bargraph |                                    | QFP-100                        |
| NJU9252                  | 2-DIGIT SINGLE CHIP A/D CONVERTER                        | LED Drive                          | DIP-18                         |
| <b>D/A CONVERTER</b>     |  |                                    |                                |
| NJMDAC-08C               | Bipolar 8-bit high speed multiplying D/A converter       | Nonlinearity $\pm 0.1\%$ MAX.      |                                |
| <b>TIMER</b>             |  |                                    |                                |
| NJM555                   | Timer  | From $\mu$ sec order to hour order | DIP-8 / DMP-8 / SSOP-8 / SIP-8 |
| NJM556                   | Dual timer   | From $\mu$ sec order to hour order | DIP-14 / DMP-14                |
| <b>V/F,F/V CONVERTER</b> |  |                                    |                                |
| NJM415I                  | V/F,F/V converter  | Linearity 0.05% Typ.               | DIP-8 / DMP-8                  |
| <b>ANALOG MULTIPLIER</b> |  |                                    |                                |
| NJM4200                  | Analog multiplier  | Total error $\pm 0.5\%$            | DIP-8 / DMP-8                  |



## SPECIAL FUNCTIONS

| Part Number | Description                       | Note                          | Package Type            |
|-------------|-----------------------------------|-------------------------------|-------------------------|
| NJM567      | Tone Decoder                      | Freq. Range 0.01 ~ 500kHz     | DIP-8, DMP-8            |
| NJM2078     | Voltage detector                  | Op. Supply voltage 2.5 ~ 40V  | DIP-8, DMP-8            |
| NJM2102     | System reset with watch dog timer | Op. Supply voltage 5 ~ 15V    | DIP-8, DMP-8, SIP-8     |
| NJM2103     | System reset with watch dog timer | Op. Supply voltage 5 ~ 15V    | DIP-8, DMP-8, SIP-8     |
| NJM2211     | FSK demodulator / tone decoder    | Freq. Range 0.01 ~ 300kHz     | DIP-14, DMP-14          |
| NJM2405     | Voltage detector                  | Op. Supply voltage 2.5 ~ 40V  | DMP-8                   |
| NJM2606/06A | Low voltage DC motor controller   | Op. Supply voltage 1.8 ~ 8V   | DIP-8, DMP-8            |
| NJM2611     | Servo motor controller            | Op. Supply voltage 2.5 ~ 7.5V | DIP-16                  |
| NJM2624     | Brushless DC motor pre-driver     | Op. Supply voltage 4.5 ~ 18V  | DIP-16, DMP-16, SSOP-16 |
| NJM3470/70A | Floppy disk read amplifier system | Wide Bandwidth (5MHz@-3dB)    | DIP-18                  |
| NJW4301     | 2 Channel Bridge Driver           | Op. Supply voltage 4~12V      | DIP-16, SDMP-30         |

## Motor Control ICs

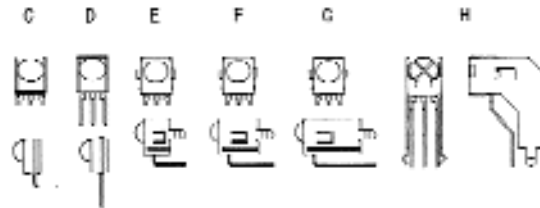
| Type                  | Description              | Note              |
|-----------------------|--------------------------|-------------------|
| <b>DCMOTOR</b>        |                          |                   |
| NJM2606               | DC motor speed control   |                   |
| NJM2611               | Servo motor controller   | Op. volt. 3~10V   |
| <b>3- PHASE MOTOR</b> |                          |                   |
| NJM2624               | 3-Phase motor pre-driver | Op. volt. 4.5~18V |
| <b>ACTUATOR</b>       |                          |                   |
| NJW4301               | 2ch BTL BRIDGE DRIVER    | Op. volt. 4~12V   |

 Extended Operating Temperature Devices  
 ( $T_A = -40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$ )

| Op Amp   |            | Comparator   | Power Supply | Audio              | Crystal Oscillator | Special Function |
|----------|------------|--------------|--------------|--------------------|--------------------|------------------|
| NJMOP-07 | NJM324     | NJM360       | NJM78XX      | NJM386             | NJU6318            | NJM555           |
| NJM022   | NJM353     | NJM2406F     | NJM78LXX     | NJM386B            | NJU6319            | NJM556           |
| NJM022B  | NJM741     | NJM2901      | NJM78MXX     | NJM2070            | NJU6321            | NJM567           |
| NJM062   | NJM1458    | NJM2403      | NJM79XX      | NJM2072            | NJU6361A           | NJM2078          |
| NJM064   | NJM2082    | NJM2903      | NJM79LXX     | NJM2073            | NJU6322            | NJM2102          |
| NJM072   | NJM2100    | <b>Video</b> | NJM79MXX     |                    | NJU6323            | NJM2103          |
| NJM082   | NJM2107    | NJM592       | NJM431       |                    | NJU6324            | NJM2211          |
| NJM072B  | NJM2116    | NJM2244      | NJM2352      | <b>CMOS Switch</b> | NJU6329            | NJM4151          |
| NJM082B  | NJM2902    | NJM2245      | NJM2360      | NJU4051B           | NJU6338            | <b>Telecom</b>   |
| NJM074   | NJM2904    | NJM2246      | NJM2930      | NJU4052B           | NJU6339            | NJM567           |
| NJM084   | NJM3403A   |              | NJU4066B     | NJU4053B           | NJU6373            | NJM221           |
| NJM318   | NJM3404A   |              | NJU7201      |                    | NJU6374            | NJM3357          |
| NJM318   | NJM4556    |              | NJU7221      |                    | NJU6391            |                  |
|          | NJU7031/34 |              |              |                    |                    |                  |

## OPTOELECTRONIC DEVICES

| Part Number                             | Description               | Maximum Rating<br>$V_{CC}$ (V) | Electro-Optical Characteristic |          |          | Body Size |        |        | Note | Package Types |
|---|---------------------------|--------------------------------|--------------------------------|----------|----------|-----------|--------|--------|------|---------------|
|   |                           |                                | $V_{CC}$ (V)                   | Lc       |          | L (mm)    | W (mm) | H (mm) |      |               |
|   |                           |                                |                                | Min. (m) | Typ. (m) |           |        |        |      |               |
| <b>INFRARED REMOTE CONTROL RECEIVER</b> |                           |                                |                                |          |          |           |        |        |      |               |
| <b>High Sensitivity Type</b>            |                           |                                |                                |          |          |           |        |        |      |               |
| <a href="#">NJL51Hxxx</a>               | Mold Type, Top View       | 6.3                            | 4.5~5.5                        | 8        | 16       | 7.3       | 6.2    | 5.4    |      | C             |
| <a href="#">NJL51Vxxx</a>               | Mold Type, Side View      |                                |                                |          |          | 7.3       | 6.2    | 5.4    |      | D             |
| <a href="#">NJL55Hxxx</a>               | Metal Case Type, Top View |                                |                                |          |          | 10.2      | 8.2    | 11.0   |      | F             |
| <a href="#">NJL56Hxxx</a>               | Metal Case Type, Top View |                                |                                |          |          | 10.2      | 8.2    | 15.0   |      | G             |
| <a href="#">NJL57Hxxx</a>               | Metal Case Type, Top View |                                |                                |          |          | 10.2      | 8.2    | 8.0    |      | E             |
| <b>Standard Type</b>                    |                           |                                |                                |          |          |           |        |        |      |               |
| <a href="#">NJL61Hxxx</a>               | Mold Type, Top View       | 6.3                            | 4.5~5.5                        | 8        | 16       | 7.3       | 6.2    | 5.4    |      | C             |
| <a href="#">NJL61Vxxx</a>               | Mold Type, Side View      |                                |                                |          |          | 7.3       | 6.2    | 5.4    |      | D             |
| <a href="#">NJL62Hxxx</a>               | Metal Case Type, Top View |                                |                                |          |          | 10.2      | 8.2    | 8.0    |      | E             |
| <a href="#">NJL63Hxxx</a>               | Metal Case Type, Top View |                                |                                |          |          | 10.2      | 8.2    | 11.0   |      | F             |
| <a href="#">NJL64Hxxx</a>               | Metal Case Type, Top View |                                |                                |          |          | 10.2      | 8.2    | 15.0   |      | G             |
| <a href="#">NJL65Vxxx</a>               | Metal Case Type, Top View |                                |                                |          |          | 15.0      | 8.2    | 18.5   |      | H             |



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## RF Modules

| Type No.                          | TV System             | Input Level   | Output Channel | Additional Function                          | Antenna System        |
|-----------------------------------|-----------------------|---|----------------|--|-----------------------|
| <b>RF MODULATOR</b>               |                       |   |                |  |                       |
| NJH3031U                          | NTSC-M                | Video 1Vp-p<br>Audio -3.8dBs<br>B+ 5V                     | USA 3/4CH      | Standard<br>(without Control Terminal)       | Off-through<br>Switch |
| NJH3031D                          | PAL-B                 |   | CCIR 3/4CH     |  |                       |
| NJH3031D                          | PAL-D                 |   | China 4/5CH    |  |                       |
| NJH3041U                          | NTSC-M                |   | USA 3/4CH      | with Control Terminal                        |                       |
| NJH3041D                          | PAL-D                 | China 4/5CH   |                |  |                       |
| NJH3032E                          | PAL-BG/DK             | Video 1Vp-p<br>Audio -5dBs<br>B+ 5V                       | CCIR 30-39CH   | Standard (without T.S.G.)                    | Booster Mixer         |
| NJH3032E                          | PAL-I/DK              |   |                |  |                       |
| NJH3032G                          | PAL-BG                |   |                |  |                       |
| NJH3032M                          | PAL-I                 |   |                |  |                       |
| <b>RF MODULATOR VERTICAL TYPE</b> |                       |   |                |  |                       |
| NJH3047U                          | NTSC-M                | Video 1Vp-p<br>Audio -3.8dBs<br>B+ 5V                     | USA 3/4CH      | Standard<br>(without Control Terminal)       | Off-through<br>Switch |
| <b>PLL MODULATOR</b>              |                       |   |                |  |                       |
| NJH3046G                          | PAL-G                 | Power Supply<br>(5V/5V/33V)<br>Video 1Vp-p<br>Audio -5dBs | CCIR 21-69CH   | I <sup>2</sup> C data control<br>with T.S.G. | Booster Mixer         |
| NJH3046M                          | PAL-I                 |   |                |  |                       |
| NJH3046E                          | PAL-G/I               |   |                |  |                       |
|                                   | PAL-G/DK              |   |                |  |                       |
|                                   | PAL-I/DK              |   |                |  |                       |
| <b>RF MODULATOR SMALL SIZE</b>    |                       |   |                |  |                       |
| NJH3048E                          | PAL-G/I/DK<br>/NTSC-M | Power Supply<br>(5V/5V/33V)<br>Video 1Vp-p<br>Audio -5dBs | CCIR 211-69CH  | I <sup>2</sup> C data control<br>with T.S.G. | Booster mixer         |

| Type No.             | TV System | Input Level   | Receiving Channel   | Output Level                          | Output Channel | Antenna System        |
|----------------------|-----------|---|---|---------------------------------------|----------------|-----------------------|
| <b>3 IN 1 MODULE</b> |           |   |   |                                       |                |                       |
| NJH3091Uxxx          | NTSC-M    | Power Supply<br>(5V/5V/33V)<br>Video 1Vp-p<br>Audio -3.8dBs<br>3wire/I <sup>2</sup> C | USA<br>VHF Low 2~B CH<br>VHF High C~W+11 CH<br>UHF W+12~69 CH | Video<br>1.0Vp-p<br>Audio<br>480mVrms | USA 3/4 CH     | Off-through<br>Switch |

| Type No.        | TV System | Input Level   | Receiving Channel   | IF Frequency                 | Note                        |
|-----------------|-----------|---|---|------------------------------|-----------------------------|
| <b>TV TUNER</b> |           |   |   |                              |                             |
| NJH302_Uxxx     | NTSC-M    | Power Supply<br>(5V/5V/33V)<br>3wire/I <sup>2</sup> C | USA<br>VHF Low 2~B CH<br>VHF High C~W+11 CH<br>UHF W+12~69 CH                   | VIF 45.75MHz<br>SIF 41.25MHz | World standardized TV tuner |
| NJH302_Gxxx     | PAL       |   | C.C.I.R. 470MHzCATV<br>VHF Low N1~S6 CH<br>VHF High S7~S36 CH<br>UHF S37~E69 CH | VIF 38.9MHz<br>SIF 33.4MHz   |                             |
| NJH302_Mxxx     | PAL       |   | UK<br>UHF E21~E69 CH  | VIF 39.5MHz<br>SIF 33.5MHz   |                             |
| NJH302_Dxxx     | PAL       |   | China<br>VHF Low C1~C5 CH<br>VHF High C6~C12 CH<br>UHF C13~C57 CH               | VIF 38.0MHz<br>SIF 31.5MHz   |                             |

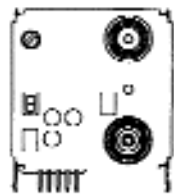
Note: xxx – Semi custom product. Last three digits assigned after approval of specification.

## RF Modules (cont.)

| TV TUNER NUMBERING SYSTEMS        |  |  |   |                       |
|-----------------------------------|--|--|---|-----------------------|
| Example NJH3022U001<br>NJH302xxxx | NJH3022xxxx  |  | NJH3022Uxxx   |                       |
| TV tuner                          | 1: 470MHz CATV,Phono<br>2: 470MHz CATV,F<br>3: 470MHz CATV,DIN<br>4: 300MHz CATV,Phono<br>5: 300MHz CATV,F<br>6: 300MHz CATV,DIN | 7: VHF/UHF,Phono<br>8: VHF/UHF,F<br>9: VHF/UHF,DIN | U: USA<br>J: Japan<br>B: Australia<br>D: China<br>E: Europe Multi<br>D: China | G: Germany<br>M: U.K. |

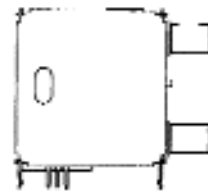
## Dimensions

RF MODULATOR



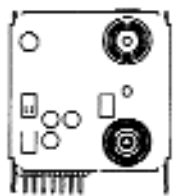
(42) × (44) × (17)

RF MODULATOR VERTICAL TYPE



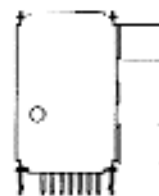
(47) × (44) × (16)

PLL MODULATOR



(44) × (44) × (17)

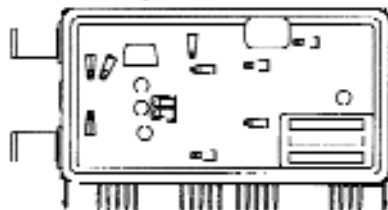
RF MODULATOR Small size



(27) × (41) × (17)

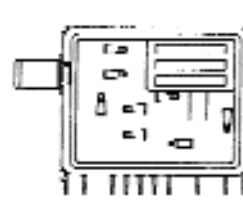
UNIT mm: (W) × (H) × (D)

3in1 MODULE  
Input connector: I



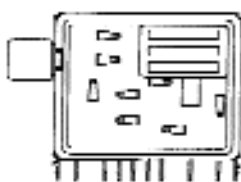
(89) × (44) × (15)

TV TUNER  
Input connector: F



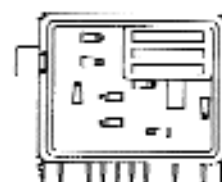
(51) × (42) × (15)

TV TUNER  
Input connector: DIN



(51) × (42) × (15)

TV TUNER  
Input connector: Phono



(51) × (42) × (15)

UNIT mm: (W) × (H) × (D)

## GaAs MMICs

| Type                  | Description                              | Insertion Loss Max [dB] | Isolation Min. [dB] | P-1dB Min. [dBm] | Switching Speed Typ. [ns] | Operating Frequency Range | Package Type |
|-----------------------|--|-------------------------|---------------------|------------------|---------------------------|---------------------------|--------------|
| <b>GaAs SWITCH IC</b> |  |                         |                     |                  |                           |                           |              |
| NJG1505               | L-Band SPDT Switch<br>Positive Bias type | 1.2                     | 33                  | 19               | 8                         | 100MHz ~ 2.5GHz           | VSP8         |
| NJG1506               |  | 0.6 @f=1GHz             | 23                  | 19               | 15                        | 100MHz ~ 2GHz             |              |
| NJG1507               |  | 0.8                     | 25                  | 26               |                           |                           |              |
| NJG1508               |  | 0.6 @f=1GHz             | 20                  | 19               |                           |                           | MTP6         |
| NJG1509               |  | 0.8                     | 20                  | 26               |                           |                           |              |
| NJG1512               |  | 1.2                     | 43                  | 19               | 8                         | 100MHz ~ 2GHz             | SSOP14       |
| NJG1515               | Multifunction Switches for TDMA          | 0.65@TX<br>0.80@TX      | 22@TX<br>30@TX      | 23@RX<br>26@RX   | 120<br>120                | 800MHz<br>1.5GHz          | SSOP20-B2    |

f=1.9GHz

| Type                       | Description                                   | GAIN Min. [dB]               | Pacp Max. @Δ f=600KHz [dBc] | GAIN Variable Range Typ. [dB]  | Maximum Power Dissipation [mW] | Note                       | Package Type    |
|----------------------------|---|------------------------------|-----------------------------|--------------------------------|--------------------------------|----------------------------|-----------------|
| <b>GaAs AMPLIFIER</b>      |   |                              |                             |                                |                                |                            |                 |
| <b>Power Amplifier</b>     |   |                              |                             |                                |                                |                            |                 |
| NJG1301                    | GaAs Power Amp.                               | 20                           | -55 @Pout=21dBm             | —                              | 600<br>1000                    | Suited for PHS Application | SSOP15<br>EMP14 |
| NJG1302                    | GaAs Power Amp (Gain Variable Type)           | 29                           | -55 @Pout=21dBm             | 20                             | 600<br>1000                    |                            | SSOP14<br>EMP14 |
| <b>Driver Amplifier</b>    |   |                              |                             |                                |                                |                            |                 |
| NJG1307                    | GaAs Driver Amp. (Gain Variable Type)         | 29                           | —                           | 40                             | 300                            |                            | VSP8            |
| NJG1308                    | GaAs Driver Amp.                              | 11                           | -60 Typ. @Pout=8dBm         | —                              | 300                            |                            | MTP6            |
| NJG1309                    | GaAs Driver Amp. (Positive Power Supply Type) | 34                           | -55 @Pout=21dBm             | 26                             | 600                            | Suited for PHS Application | SSOP16-B2       |
| <b>AGC Amplifier</b>       |   |                              |                             |                                |                                |                            |                 |
| NJG1101                    | GaAs Wide Band AGC Amp. (Gain Variable Type)  | 15.5                         | -70 Typ. @Pout=10dB         | 40                             | 300                            |                            | MTP6            |
| Type                       | Description                                   | GAIN                         |                             | NF                             | Maximum Power Dissipation [mW] | Note                       | Package Type    |
| <b>Low Noise Amplifier</b> |   |                              |                             |                                |                                |                            |                 |
| NJG1102                    | Low Noise Amp.                                | 15                           |                             | 1.4                            | 150                            |                            | MTP6-1          |
| NJG1103                    | Low Noise Amp.                                | 14 @f=1.5GHz<br>12 @f=1.9GHz |                             | 1.2 @f=1.5GHz<br>1.4 @f=1.9GHz | 150                            |                            | MTP6-1          |

## GaAs MMICs (cont.)

$f_{IF}=130\text{MHz}(*240\text{MHz}), P_{LO}=-10\text{dBm}, P_{RF}=-30\text{dBm}$

| Type                 | Description                                      | I Total Typ. [mA] | GC Typ. [dB]   | IP3 Typ. [dBm]  | NF Typ. [dB]   | Application                 | Package Type |
|----------------------|--|-------------------|--|---|--|-----------------------------|--------------|
| <b>GaAs Mixer IC</b> |  |                   |  |   |  |                             |              |
| NJG1550<br>NJG1551   | GaAs Mixer IC<br>$f_{RF}=800\sim 900\text{MHz}$  | 4.5<br>7.0        | 14.0<br>13.0 @ $f_{RF}=820\text{MHz}$                            | -6.0<br>-1.0 @ $f_{RF}=820\text{MHz}^*$                             | 5.0<br>5.0 @ $f_{RF}=820\text{MHz}$                              | Cellular Phone              | MTP6         |
| NJG1552              | GaAs Mixer IC<br>$f_{RF}=150\sim 1900\text{MHz}$ | 4.5               | 8.0 @ $f_{RF}=1489\text{MHz}$<br>5.0 @ $f_{RF}=1900\text{MHz}^*$ | -5.0 @ $f_{RF}=1489\text{MHz}^*$<br>1.0 @ $f_{RF}=1900\text{MHz}^*$ | 6.0 @ $f_{RF}=1489\text{MHz}$<br>1.0 @ $f_{RF}=1900\text{MHz}^*$ | Cellular and Cordless Phone |              |
| NJG1553              | GaAs Mixer IC<br>$f_{RF}=150\sim 1900\text{MHz}$ | 7.0               | 9.0 @ $f_{RF}=1489\text{MHz}$<br>7.0 @ $f_{RF}=1900\text{MHz}^*$ | -1.0 @ $f_{RF}=1489\text{MHz}$<br>4.0 @ $f_{RF}=1900\text{MHz}^*$   | 6.0 @ $f_{RF}=1489\text{MHz}$<br>6.0 @ $f_{RF}=1900\text{MHz}^*$ |                             |              |

$f=1.9\text{GHz}$

| Type                                  | Description                       | PA-SW                     |                |  | SW-LNA                        |              | Application | Package Type  |
|---------------------------------------|-----------------------------------|---------------------------|----------------|--|-------------------------------|--------------|-------------|---------------|
|                                       |                                   | I <sub>dd</sub> Typ. [mA] | GAIN Min. [dB] | P <sub>acp</sub> Max. @ $\Delta f=600\text{KHz}$ [dBc] | GAIN Variable Range Typ. [dB] | NF Typ. [dB] |             |               |
| <b>GaAs MULTI FUNCTION IC FOR PHS</b> |                                   |                           |                |  |                               |              |             |               |
| NJG1701V                              | GaAs Multifunction IC (PA+SW+LNA) | 160                       | 29             | @P <sub>out</sub> =20dBm                               | 33                            | 2.7          | 2.8         | PHS<br>SSOP20 |



## SAW FILTERS

| Part Number | Application  | Center Frequency (MHz) | Pass Band (MHz) | Pass Band Insertion Loss (dB) | Pass Band Ripple (dB) | Rejection Outside of Passband (dB)        | VSWR | Max Input (dBm) | Operational Temperature Range (°C) |
|-------------|--------------|------------------------|-----------------|-------------------------------|-----------------------|---|------|-----------------|------------------------------------|
| NSVA497     | AMPS TX      | 836.50                 | 25              | 4                             | 2                     | 20 (869 - 894.5MHz)                       | 3    | 20              | - 30 to + 85                       |
| NSVA498     | AMPS RX      | 881.50                 | 25              | 4                             | 2                     | 20 (824 - 849MHz)                         | 3    | 20              | - 30 to + 85                       |
| NSVA210     | ETACS TX     | 888.50                 | 33              | 6                             | 2.5                   | 20 (923 - 950MHz)                         | 3    | 20              | - 30 to + 85                       |
| NSVA211     | ETACS RX     | 933.50                 | 33              | 6                             | 2.5                   | 35 (872 - 894MHz)                         | 3    | 20              | - 30 to + 85                       |
| NSVA260     | NTACS TX     | 911.50                 | 27              | 4.5                           | 2                     | 45 (715 - 815MHz)                         | 3    | 20              | - 30 to + 85                       |
| NSVA261     | NTACS TX     | 856.50                 | 27              | 4.0                           | 2                     | 20 (898 - 925MHz)                         | 3    | 20              | - 30 to + 85                       |
| NSVA272     | GMS TX       | 902.50                 | 25              | 5.5                           | 2.5                   | 30 (935 - 960MHz)                         | 3    | 20              | - 20 to + 70                       |
| NSVA273     | GMS RX       | 947.50                 | 25              | 4.5                           | 2.0                   | 20 (890 - 915MHz)                         | 2    | 20              | - 20 to + 70                       |
| NSVA276     | CT1+         | 886.00                 | 2.4             | 3.5                           | 1.5                   | 45 (806 - 844.4 MHz)                      | 2.5  | 20              | -10 to + 60                        |
| NSVA277     | CT1+         | 931.00                 | 2.4             | 3.5                           | 1.5                   | 45 (851 - 886 MHz)                        | 2.5  | 20              | -10 to + 60                        |
| NSVA300     | CT1+         | 914.50                 | 2.4             | 3.5                           | 1.5                   | 45 (834.5 - 872.9MHz)                     | 2.5  | 20              | -10 to + 60                        |
| NSVA301     | CT1+         | 959.40                 | 2.4             | 3.5                           | 1.5                   | 45 (879.5 - 914.5MHz)                     | 2.5  | 20              | -10 to + 60                        |
| NSVA371     | CT2          | 912.00                 | 4.0             | 3.5                           | 1.0                   | 55 (614 - 812MHz)                         | 3.0  | 20              | -10 to + 60                        |
| NSVA288     | Pager        | 930.00                 | 4               | 6                             | 1.7                   | 40 (630 - 910.7MHz)                       | 2    | 20              | - 10 to + 60                       |
| NSVA325     | Pager        | 458.00                 | 10              | 6                             | 2                     | 50 (-35MHz)<br>40 (-20MHz)<br>50 (+25MHz) | 3    | 20              | - 10 to + 50                       |
| NSVA234     | PDC1.5G TX   | 1441.00                | 24              | 3.7                           | 2                     | 15 (1477 - 1501MHz)                       | 3    | 15              | - 20 to + 70                       |
| NSVA235     | PDC1.5G RX   | 1489.00                | 24              | 3.7                           | 2                     | 25 (1477MHz)<br>10 (1453MHz)              | 3    | 15              | - 20 to + 70                       |
| NSVA352     | GPS          | 1575.42                | 2               | 2.5                           | 1.0                   | 40 (1475.42MHz)                           | 2    | 0               | -40 to 85                          |
| NSVA278     | USA Cordless | 903.00                 | 2.0             | 4.0                           | 1.5                   | 45 (823 - 861MHz)                         | 2.5  | 20              | - 10 to + 60                       |
| NSVA279     | USA Cordless | 927.00                 | 2.0             | 3.5                           | 1.5                   | 45 (847 - 888.5MHz)                       | 2.5  | 20              | - 10 to + 60                       |
| NSVA419     | USA Cordless | 915.00                 | 26              | 4.5                           | 2.0                   | 40 (fc-100MHz)                            | 3    | 20              | - 30 to + 85                       |
| NSVA274     | PHS          | 1907.00                | 24              | 3.5                           | 1.5                   | 20 (+/-100MHz)                            | 3    | 15              | - 20 to + 70                       |

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## ■ PACKAGE OUTLINE TABLE

|         | Suffix | 3Pin | 5Pin | 8Pin | 9Pin | 14Pin | 16Pin | 18Pin | 20Pin | 22Pin |
|---------|--------|------|------|------|------|-------|-------|-------|-------|-------|
| TO-92   | E/F    | ○    | -    | -    | -    | -     | -     | -     | -     | -     |
| TO-220F | F      | ○    | -    | -    | -    | -     | -     | -     | -     | -     |
| SOT-89  | U      | ○    | -    | -    | -    | -     | -     | -     | -     | -     |
| MTP-5   | F      | -    | ○    | -    | -    | -     | -     | -     | -     | -     |
| DMP     | D/N    | -    | -    | ○    | -    | ○     | ○     | ○     | ○     | ○     |
| SDMP    | L      | -    | -    | -    | -    | -     | -     | -     | -     | ○     |
| DMP     | M      | -    | -    | ○    | -    | ○     | ○     | ○     | ○*2   | -     |
|         | G      | -    | -    | ○    | -    | -     | -     | ○     | ○     | ○     |
| EMP     | E      | -    | -    | ○    | -    | ○     | -     | -     | -     | -     |
| SSOP    | V      | -    | -    | ○    | -    | ○     | ○     | -     | ○     | -     |
| SIP     | L      | -    | -    | ○    | -    | -     | -     | -     | -     | -     |
| ZIP     | S      | -    | -    | -    | -    | -     | ○     | -     | -     | -     |
| QFP     | F      | -    | -    | -    | -    | -     | -     | -     | -     | -     |
| VSP     | E      | -    | -    | ○    | -    | -     | -     | -     | -     | -     |

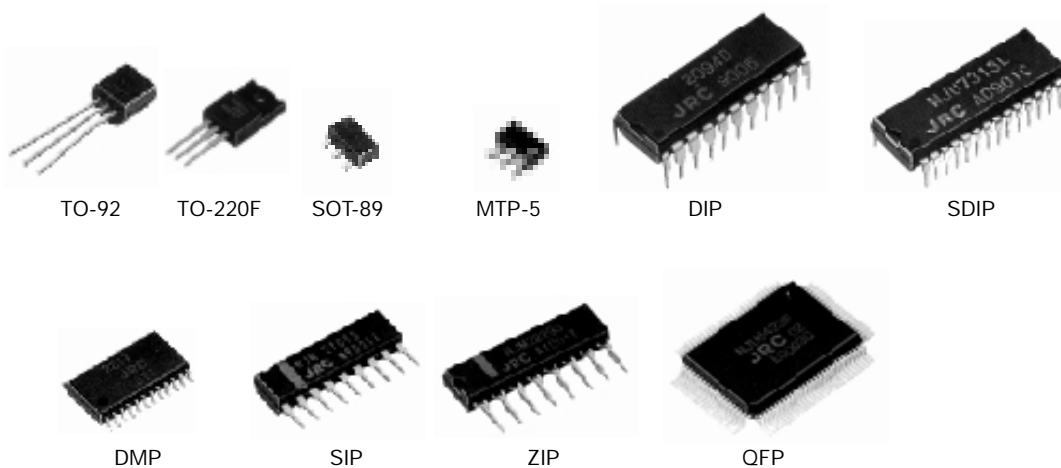
|      | Suffix | 24Pin | 28Pin | 30Pin | 40Pin | 42Pin | 44Pin | 56Pin | 64Pin | 80Pin | 100Pin |
|------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|
| DIP  | D/N    | ○*3   | -     | -     | ○     | -     | -     | -     | -     | -     | -      |
| SDIP | I      | ○     | ○     | ○     | -     | ○     | -     | ○     | -     | -     | -      |
| DMP  | M      | ○     | -     | ○*4   | -     | ○     | -     | -     | -     | -     | -      |
| SOP  | G      | ○*3   | ○     | -     | ○     | -     | -     | -     | -     | -     | -      |
| DMP  | E      | -     | -     | -     | -     | -     | -     | -     | -     | -     | -      |
| SSOP | V      | ○     | -     | -     | -     | -     | -     | -     | -     | -     | -      |
| SIP  | S/L    | -     | -     | -     | -     | -     | -     | -     | -     | -     | -      |
| ZIP  | S      | -     | -     | -     | -     | -     | -     | -     | -     | -     | -      |
| QFP  | F      | -     | -     | -     | -     | -     | ○     | ○     | ○     | ○     | ○      |

\*1) Except NJM78L, NJM79L Series

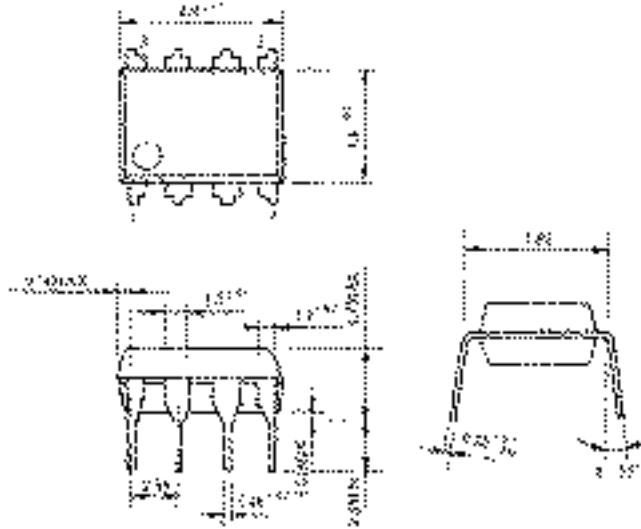
\*2) Lead pitch: 0.95mm

\*3) These two packages are applied to only NJU9702.

\*4) Lead pitch: 1.0mm(SDMP-30)

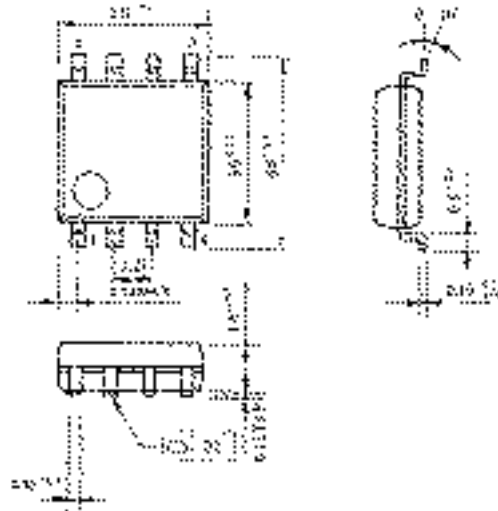


**DIP8** (D/N Designation)



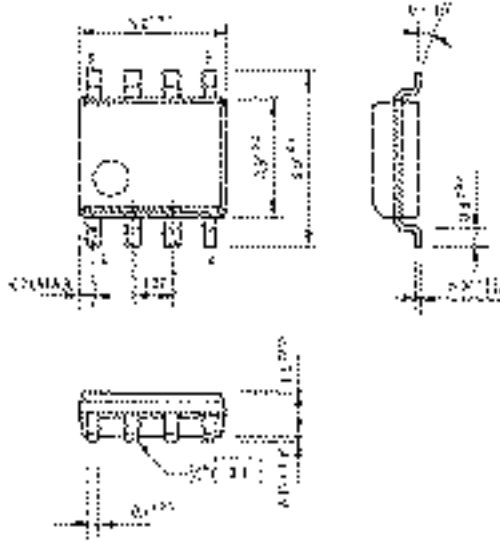
0501200

**DMP8** (M Designation)



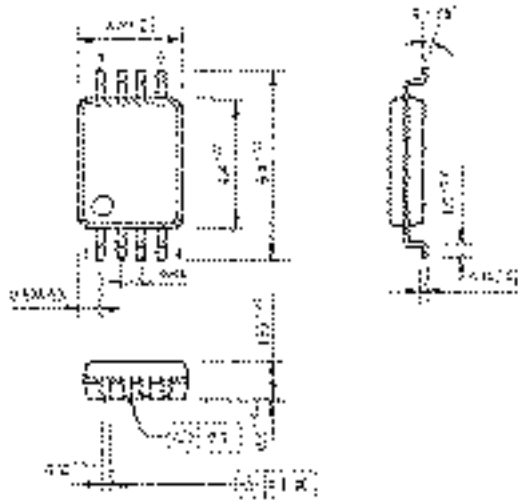
0501200

**ESOP8** (E Designation)



ESOP8

**SSOP8** (V Designation)



SSOP8

7007-566

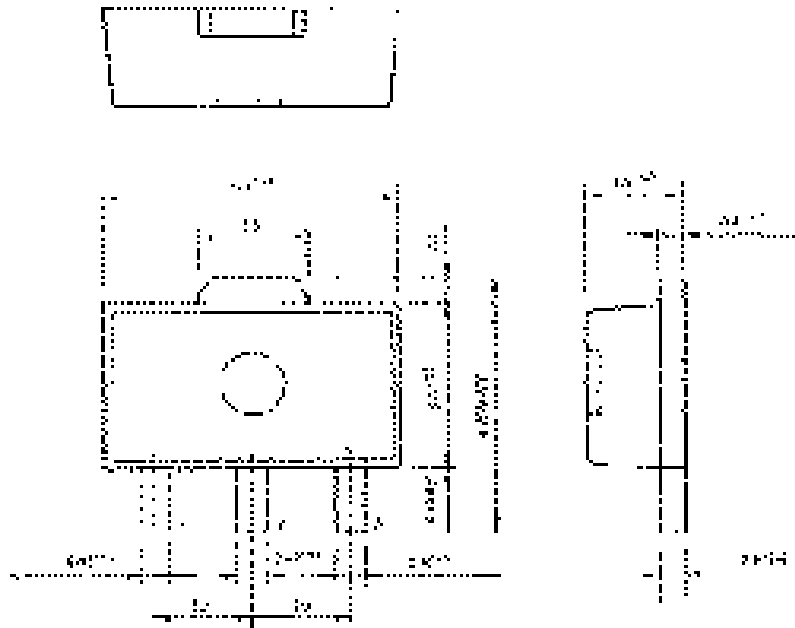


FIG. 100.

7007-567 (F Designation)

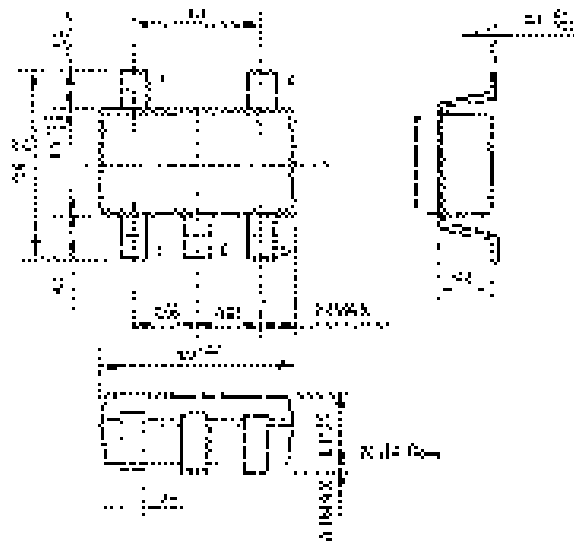
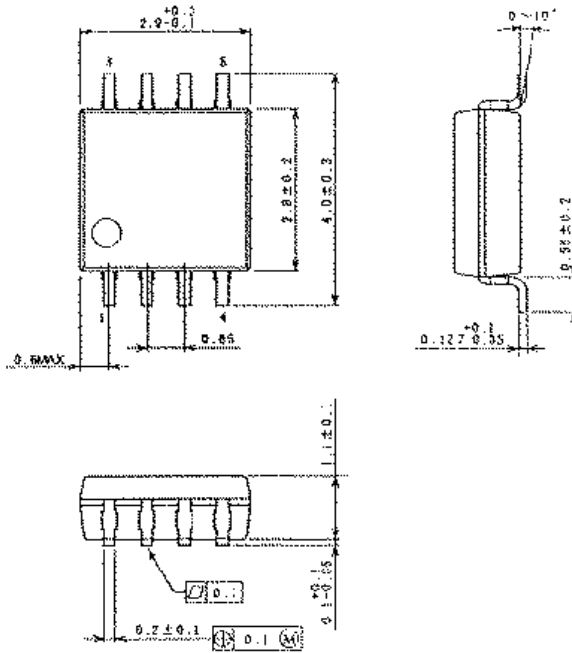


FIG. 101.

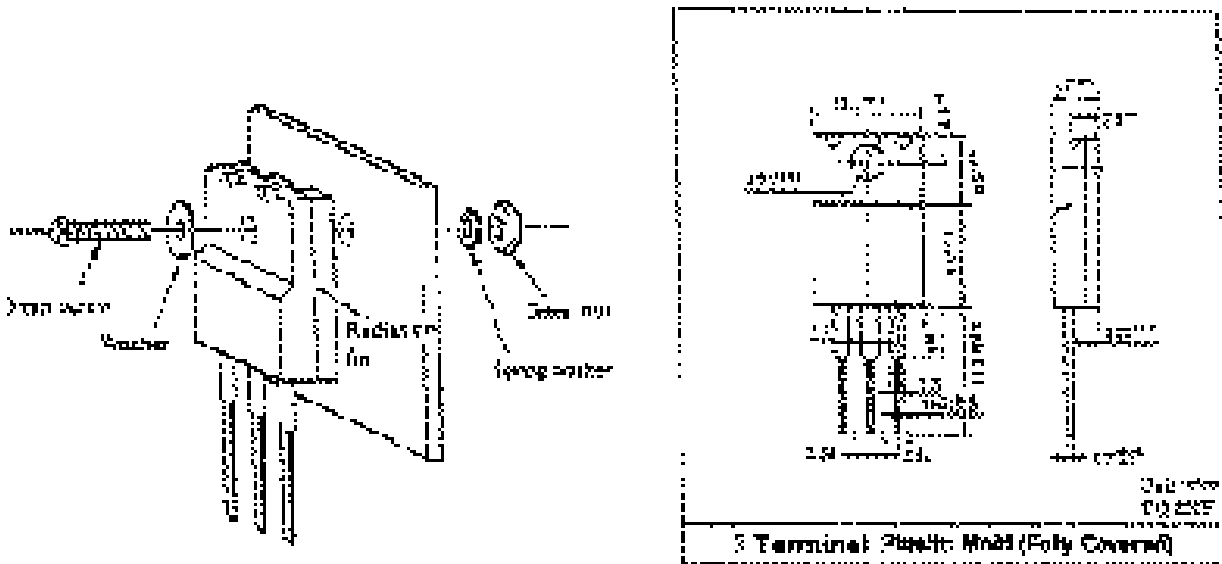
VSP8 (R Designation)



- TO-220F Fully Molded Three Terminal Voltage Regulator

NJR's fully molded package, the TO-220F was developed for medium and high power 3 pin voltage regulators. It is fully interchangeable with conventional TO-220 packages with the exception that the radiation fin is resin encapsulated offering the following features:

1. The radiation fin is fully insulated. No need for Teflon washers.
2. In cases where the fin is not attached the fully molded TO-220F offers better heat dissipation.
3. Higher reliability and moisture resistance.



## THERMAL CHARACTERISTICS (T<sub>J</sub> = 125°C NORMAL AIR DRY)

|                   | Item                                 | TO-220 | TO-220F | Unit |
|-------------------|--------------------------------------|--------|---------|------|
| Without Outer Fin | Thermal Resistance ( $\theta_{ja}$ ) | 70     | 60      | °C/W |
|                   | Power Dissipation ( $P_D$ )          | 1.4    | 1.7     | W    |
| With Outer Fin    | Thermal Resistance ( $\theta_{ja}$ ) | 25     | 25      | °C/W |
|                   | Power Dissipation ( $P_D$ )          | 4.0    | 4.0     | W    |

1. DEVICE USED: 78 SERIES.
2. TYPICAL VALUE.
3. THERMAL RESISTIVITY OF THE RADIATION FIN IS  $\theta_{HS} = 20^\circ\text{C/W}$ .
4. TIGHTENING TORQUE OF THE RADIATION FIN IS 4 KG·CM, NO SILICON GREASE.



## BIPOLAR AND CMOS PRODUCTS

*Example:*  $\frac{\text{NJM } 4558 \text{ D - A (00) (T1)}}{1 \quad 2 \quad 3 \quad 4 \quad 4a \quad 5}$

- Item 1 Item Classification NJM Bipolar  
NJU CMOS
- Item 2 Part Number
- Item 3 Package Type
 

|   |      |   |      |
|---|------|---|------|
| D | DIP  | E | EMP  |
| F | QFP  | G | SOP  |
| L | SDIP | M | DMP  |
| N | SDIP | V | SSOP |
| R | VSP  | C | Chip |
| H | TCP  |   |      |
- Item 4 Selection or Screening Option
- Item 4a ROM Code, Title and Screening Option
- Item 5 Tape & Reel Form T1 or T2 Adhesive  
TE1 to 4 Embossed

## 78 / 79 SERIES REGULATORS

*Example:*  $\frac{\text{NJM } 78\text{M } 00 \text{ FA - B (T1)}}{1 \quad 2 \quad 3 \quad 4 \quad 5 \quad 6}$

- Item 1 Item Classification NJM Bipolar
- Item 2 Part Number
- Item 3 Output Voltage
- Item 4 Package Type
 

|    |         |    |       |
|----|---------|----|-------|
| F  | TO-220F | U  | SOP   |
| DL | TO-252  | No | TO-92 |

(Note) A capital letter after the package shows the output voltage accuracy.
- Item 4a Selection or Screening Option  
Capital letters after a hyphen show products that have selected or screened parameters.
- Item 5 Tape & Reel Form T1 or T2 Adhesive  
TE1 to 4 Embossed

## CMOS REGULATORS

*Example:*  $\frac{\text{NJU } 7201 \text{ L } 00 \text{ (T1)}}{1 \quad 2 \quad 3 \quad 4 \quad 5}$

- Item 1 Item Classification NJU C-MOS
- Item 2 Part Number
- Item 3 Package Type
 

|   |       |   |        |
|---|-------|---|--------|
| L | TO-92 | U | SOT-89 |
| F | MTP-5 |   |        |
- Item 4 Output Voltage
- Item 5 Tape & Reel Form T1 or T2 Adhesive  
TE1 to 4 Embossed

## IR DEVICES

*Example:*  $\frac{\text{NJL } 51 \text{ H } 328}{1 \quad 2 \quad 3 \quad 4}$

- Item 1 **Classification of Items** NJL Opto electronics devices
- Item 2 **Part Number**
- Item 3 **Classification of Package** H Top view V Side view
- Item 4 **Classification of center carrier frequency**  
 Example: 32.75kHz 328  
 36.00kHz 360

## RF MODULES

*Example:*  $\frac{\text{NJH } 30 \text{ 3 } 1 \text{ U } -001}{1 \quad 2 \quad 3 \quad 4 \quad 5 \quad 6}$

- Item 1 **Prefix 1** NJH RF Modules
- Item 2 **Fixed Number** 30
- Item 3 **Functions**
  - 2: TV Tuner
  - 3: RF Modulator
  - 4: RF Modulator with Antenna Switch
  - 5: DBS
  - 9: 3-in-1 Module
- Item 4 **Applications**
  - 1: VHF Output
  - 2: UHF Output
- Item 5 **Destination**
  - U: USA
  - J: Japan
  - D: Southeast Asia
  - E: Europe
  - G: Germany
- Item 6 **Customer Code**  
 Three digit numeric suffix code assigned to each customer at time of order

## MOTOROLA

| Motorola Part Number | NJR Part Number | Comments | Motorola Part Number | NJR Part Number | Comments          |
|----------------------|-----------------|----------|----------------------|-----------------|-------------------|
| DAC08CD              | NJMDAC-08MC     | Note 1   | LM393D               | NJM2903M        | Note 1            |
| DAC08CP              | NJMDAC-08DE     |          | LM393D               | NJM2903MG       | Note 1            |
| LF353D               | NJM353M         | Note 1   | LM393D               | NJM2903MG       | Selected-Note 1   |
| LF353N               | NJM353D         |          | MC145403             | NJU6401B        | Note 4            |
| LM2900N              | NJM2900N        |          | MC145406             | NJU6402B        | Note 4            |
| LM2901D              | NJM2901E        |          | MC1455D              | NJM555E         |                   |
| LM2901D              | NJM2901M        | Note 1   | MC1455D              | NJM555M         | Note 1            |
| LM2901D              | NJM339E         |          | MC1455P1             | NJM555D         |                   |
| LM2901N              | NJM2901N        |          | MC14573              | NJU7021         | Note 4 Iset=20uA  |
| LM2901N              | NJM339D         |          | MC14573              | NJU7022         | Note 4 Iset=20uA  |
| LM2902D              | NJM324E         |          | MC14573              | NJU7024         | Note 4 Iset=20uA  |
| LM2902D              | NJM324M         | Note 1   | MC14573              | NJU7031         | Note 4 Iset=200uA |
| LM2902N              | NJM324D         |          | MC14573              | NJU7032         | Note 4 Iset=200uA |
| LM2903D              | NJM2903E        |          | MC14573              | NJU7034         | Note 4 Iset=200uA |
| LM2903D              | NJM2903M        | Note 1   | MC1458D              | NJM1458M        | Note 1            |
| LM2903N              | NJM2903D        |          | MC1458P1             | NJM1458D        |                   |
| LM2904D              | NJM2904E        |          | MC14803A             | NJU7201L30      |                   |
| LM2904D              | NJM2904M        | Note 1   | MC14805.2A           | NJU7201L52      |                   |
| LM2904D              | NJM358E         |          | MC14805A             | NJU7201L50      |                   |
| LM2904N              | NJM2904D        |          | MC1496D              | NJM1496M        | Note 1            |
| LM2904N              | NJM358D         |          | MC1496P              | NJM1496D        |                   |
| LM311D               | NJM311E         |          | MC1723CD             | NJM723M         | Note 1            |
| LM311D               | NJM311M         | Note 1   | MC1723CP             | NJM723D         |                   |
| LM311N               | NJM311D         |          | MC1741CD             | NJM741E         |                   |
| LM317T               | NJM317F         | Note 2   | MC1741CD             | NJM741M         | Note 1            |
| LM324 SSOP           | NJM2902V        | Note 3   | MC1741CP1            | NJM741D         |                   |
| LM324AN              | NJM324DA        |          | MC1776CD             | NJM4250E        |                   |
| LM324D               | NJM2902E        |          | MC1776CD             | NJM4250M        | Note 1            |
| LM324D               | NJM2902M        | Note 1   | MC1776CP1            | NJM4250D        |                   |
| LM324D               | NJM324E         |          | MC33063AD            | NJM2360AM       | Note 1            |
| LM324D               | NJM324M         | Note 1   | MC33063AP1           | NJM2360AD       |                   |
| LM324N               | NJM324D         |          | MC33063D             | NJM2360M        | Note 1            |
| LM324P               | NJM2902N        |          | MC33063P1            | NJM2360D        |                   |
| LM339 SSOP           | NJM2901V        | Note 3   | MC33167              | NJM2367         |                   |
| LM339D               | NJM2901E        |          | MC33172D             | NJM022BE        |                   |
| LM339D               | NJM2901M        | Note 1   | MC33172D             | NJM022BM        | Note 1            |
| LM339D               | NJM339E         |          | MC33172D             | NJM2132M        | Note 1            |
| LM339N               | NJM339D         |          | MC33172P             | NJM022BD        |                   |
| LM339P               | NJM2901N        |          | MC33172P             | NJM2132D        |                   |
| LM340T-12            | NJM7812FA       | Note 2   | MC3357D              | NJM3357M        | Note 1            |
| LM340T-15            | NJM7815FA       | Note 2   | MC3357P              | NJM3357D        |                   |
| LM340T-18            | NJM7818FA       | Note 2   | MC3359P              | NJM3359D        |                   |
| LM340T-24            | NJM7824FA       | Note 2   | MC3362               | NJM2292         | Note 4            |
| LM340T-5.0           | NJM7805FA       | Note 2   | MC3371               | NJM2292         | Note 4            |
| LM340T-6.0           | NJM7806FA       | Note 2   | MC3372               | NJM2292         |                   |
| LM340T-8.0           | NJM7808FA       | Note 2   | MC3403D              | NJM3403AM       | Note 1            |
| LM358D               | NJM358E         |          | MC3403P              | NJM3403AD       |                   |
| LM358N               | NJM358D         |          | MC34063D             | NJM2360M        | Note 1            |
| LM3900N              | NJM3900N        |          | MC34063P1            | NJM2360D        |                   |
| LM393D               | NJM2903E        |          |                      |                 |                   |

# CROSS REFERENCE GUIDE

## MOTOROLA (CONT.)

| Motorola Part Number | NJR Part Number | Comments | Motorola Part Number | NJR Part Number | Comments |
|----------------------|-----------------|----------|----------------------|-----------------|----------|
| LM393LP              | NJM2903L        |          | MC34119              | NJM2135         |          |
| LM393N               | NJM2903DQ       |          | MC34119D             | NJM2113E        |          |
| LM393P               | NJM2903D        |          | MC34119D             | NJM2113M        | Note 1   |
| LM393P               | NJM2903DQ       | Selected | MC34119P             | NJM2113D        |          |
| LM833D               | NJM2068E        |          | MC34167              | NJM2367         |          |
| LM833N               | NJM2068D        |          | MC34182D             | NJM2162M        | Note 1   |
| MC1372               | NJM1372A        |          | MC34182P             | NJM2162D        |          |
| MC14051BD            | NJU4051BM       | Note 1   | MC34184D             | NJM2164M        | Note 1   |
| MC14051BP            | NJU4051BD       |          | MC34184P             | NJM2164D        |          |
| MC14052BD            | NJU4052BM       | Note 1   | MC3456D              | NJM556M         | Note 1   |
| MC14052BP            | NJU4052BD       |          | MC3456P              | NJM556D         |          |
| MC14053BD            | NJU4053BM       | Note 1   | MC4558D              | NJM4558E        |          |
| MC14053BP            | NJU4053BD       |          | MC4558D              | NJM4558M        | Note 1   |
| MC14066BD            | NJU4066BM       | Note 1   | MC4558P1             | NJM4558D        |          |
| MC14066BP            | NJU4066BD       |          | MC4741D              | NJM4741M        | Note 1   |
| MC1411D              | NJD6511M        | Note 1   | MC4741P              | NJM4741D        |          |
| MC7805CT             | NJM7805FA       | Note 2   | MC79L15ACP           | NJM79L15A       |          |
| DAC08CP              | NJM DAC-08DE    |          | MC1412D              | NJD6512M        | Note 1   |
| MC7806CT             | NJM7806FA       | Note 2   | MC79L18ACP           | NJM79L18A       |          |
| MC7808CT             | NJM7808FA       | Note 2   | MC79L24ACP           | NJM79L24A       |          |
| MC7809CT             | NJM7809FA       | Note 2   | MC79M05CDT           | NJM79M05DLA     | Note 5   |
| MC7812CT             | NJM7812FA       | Note 2   | MC79M05CT            | NJM79M05FA      | Note 2   |
| MC7815CT             | NJM7815FA       | Note 2   | MC79M08CDT           | NJM79M08DLA     | Note 5   |
| MC7818CT             | NJM7818FA       | Note 2   | MC79M12CDT           | NJM79M12DLA     | Note 5   |
| MC7824CT             | NJM7824FA       | Note 2   | MC79M12CT            | NJM79M12FA      | Note 2   |
| MC78L05ACP           | NJM78L05A       |          | MC79M15CT            | NJM79M15FA      | Note 2   |
| MC78L08ACP           | NJM78L08A       |          | NE592D               | NJM592M         | Note 1   |
| MC78L12ACP           | NJM78L12A       |          | NE592N               | NJM592D         |          |
| MC78L15ACP           | NJM78L15A       |          | TL062ACD             | NJM062MA        | Note 1   |
| MC78L18ACP           | NJM78L18A       |          | TL062CD              | NJM062E         |          |
| MC78L24ACP           | NJM78L24A       |          | TL062CD              | NJM062M         | Note 1   |
| MC78M05CDT           | NJM78M05DLA     | Note 5   | TL062CP              | NJM062D         |          |
| MC78M05CT            | NJM78M05FA      | Note 2   | TL064CD              | NJM064M         | Note 1   |
| MC78M06CT            | NJM78M06FA      | Note 2   | TL064CP              | NJM064D         |          |
| MC78M08CDT           | NJM78M08DLA     | Note 5   | TL072CD              | NJM072M         | Note 1   |
| MC78M08CT            | NJM78M08FA      | Note 2   | TL072CP              | NJM072D         |          |
| MC78M12CDT           | NJM78M12DLA     | Note 5   | TL074CD              | NJM074M         | Note 1   |
| MC78M12CT            | NJM78M12FA      | Note 2   | TL074CP              | NJM074D         |          |
| MC78M15CT            | NJM78M15FA      | Note 2   | TL082CD              | NJM082E         |          |
| MC78M18CT            | NJM78M18FA      | Note 2   | TL082CD              | NJM082M         | Note 1   |
| MC78M20CT            | NJM78M20FA      | Note 2   | TL082CD              | NJM2082M        | Note 1   |
| MC78M24CT            | NJM78M24FA      | Note 2   | TL082CP              | NJM082D         |          |
| MC7905CT             | NJM7905FA       | Note 2   | TL082CP              | NJM2082D        |          |
| MC7906CT             | NJM7906FA       | Note 2   | TL084CD              | NJM084M         | Note 1   |
| MC7908CT             | NJM7908FA       | Note 2   | TL084CP              | NJM084D         |          |
| MC7912CT             | NJM7912FA       | Note 2   | TL431AD              | NJM431MA        | Note 1   |
| MC7915CT             | NJM7915FA       | Note 2   | TL431CD              | NJM431E         |          |
| MC7918CT             | NJM7918FA       | Note 2   | TL431D               | NJM431M         | Note 1   |
| MC7924CT             | NJM7924FA       | Note 2   | TL431LP              | NJM431L         |          |
| MC79L05ACP           | NJM79L05A       |          | TL431P               | NJM431D         |          |
| MC79L12ACP           | NJM79L12A       |          |                      |                 |          |

## NATIONAL

| NSC Part Number | NJR Part Number | Comments | NSC Part Number | NJR Part Number | Comments        |
|-----------------|-----------------|----------|-----------------|-----------------|-----------------|
| CD4051BC        | NJU4051BD       |          | LM324 SSOP      | NJM2902V        | Note 3          |
| CD4051BM        | NJU4051BM       | Note 1   | LM324AN         | NJM324DA        |                 |
| CD4052BC        | NJU4052BD       |          | LM324D          | NJM2902E        |                 |
| CD4052BM        | NJU4052BM       | Note 1   | LM324D          | NJM2902M        | Note 1          |
| CD4053BC        | NJU4053BD       |          | LM324M          | NJM324E         |                 |
| CD4053BM        | NJU4053BM       | Note 1   | LM324M          | NJM324M         | Note 1          |
| CD4066BC        | NJU4066BD       |          | LM324N          | NJM2902N        |                 |
| CD4066BM        | NJU4066BM       | Note 1   | LM324N          | NJM324D         |                 |
| DAC-0801LCM     | NJMDAC-08MC     | Note 1   | LM336           | NJM431          |                 |
| DAC-0801LCN     | NJMDAC-08DE     |          | LM339 SSOP      | NJM2901V        | Note 3          |
| DS14C232        | NJU6401B        | Note 4   | LM339D          | NJM2901E        |                 |
| DS14C232        | NJU6402B        | Note 4   | LM339D          | NJM2901M        | Note 1          |
| LF11201D        | NJU201AD        |          | LM339M          | NJM339E         |                 |
| LF347M          | NJM074M         | Note 1   | LM339N          | NJM2901N        |                 |
| LF347N          | NJM074D         |          | LM339N          | NJM339D         |                 |
| LF353M          | NJM353M         | Note 1   | LM340T-10       | NJM7810FA       | Note 2          |
| LF353N          | NJM353D         |          | LM340T-12       | NJM7812FA       | Note 2          |
| LM13600M        | NJM13600M       | Note 1   | LM340T-15       | NJM7815FA       | Note 2          |
| LM13600N        | NJM13600D       |          | LM340T-5.0      | NJM7805FA       | Note 2          |
| LM13700M        | NJM13700M       | Note 1   | LM341T-12       | NJM78M12FA      | Note 2          |
| LM13700N        | NJM13700D       |          | LM341T-15       | NJM78M15FA      | Note 2          |
| LM1458M         | NJM1458M        | Note 1   | LM341T-5.0      | NJM78M05FA      | Note 2          |
| LM1458M         | NJM4558E        |          | LM348M          | NJM4741M        | Note 1          |
| LM1458N         | NJM1458D        |          | LM348N          | NJM4741D        |                 |
| LM1458N         | NJM4558D        |          | LM349M          | NJM4741M        | Note 1          |
| LM1496M         | NJM1496M        | Note 1   | LM349N          | NJM4741D        |                 |
| LM1496N         | NJM1496D        |          | LM358M          | NJM358E         |                 |
| LM185           | NJM2373         |          | LM358N          | NJM358D         |                 |
| LM2575          | NJM2367         |          | LM360M          | NJM360E         |                 |
| LM2901D         | NJM339E         |          | LM360M          | NJM360M         | Note 1          |
| LM2901M         | NJM2901E        |          | LM360N          | NJM360D         |                 |
| LM2901M         | NJM2901M        | Note 1   | LM386M-1 (-3)   | NJM386E         |                 |
| LM2901N         | NJM2901N        |          | LM386M-1 (-3)   | NJM386M         | Note 1          |
| LM2901N         | NJM339D         |          | LM386M-1 (-3)   | NJM386M         | Note 1          |
| LM2902D         | NJM324E         |          | LM386M-4        | NJM386BE        |                 |
| LM2902D         | NJM324M         | Note 1   | LM386M-4        | NJM386BM        | Note 1          |
| LM2902M         | NJM2902E        |          | LM386N-1 (-3)   | NJM386D         |                 |
| LM2902M         | NJM2902M        | Note 1   | LM386N-1 (-3)   | NJM387D         | Note 1          |
| LM2902N         | NJM2902N        |          | LM386N-4        | NJM386BD        |                 |
| LM2902N         | NJM324D         |          | LM393ACZ        | NJM2903L        |                 |
| LM2903M         | NJM2903E        |          | LM393D          | NJM2903E        |                 |
| LM2903M         | NJM2903M        | Note 1   | LM393D          | NJM2903M        | Note 1          |
| LM2903N         | NJM2903D        |          | LM393D          | NJM2903MG       | Selected-Note 1 |
| LM2904D         | NJM358E         |          | LM393M          | NJM2903MG       | Note 1          |
| LM2904M         | NJM2904E        |          | LM393N          | NJM2903D        |                 |
| LM2904M         | NJM2904M        | Note 1   | LM393N          | NJM2903DQ       |                 |
| LM2904N         | NJM2904D        |          | LM393N          | NJM2903DQ       | Selected        |
| LM2904N         | NJM358D         |          | LM4250CM        | NJM4250E        |                 |
| LM2930T-5.0     | NJM2930F05      | Note2    | LM4250CM        | NJM4250M        | Note 1          |
| LM2930T-8.0     | NJM2930F08      | Note2    | LM4250CN        | NJM4250D        |                 |
| LM2931Z-5.0     | NJM2930L05      |          | LM431ACM        | NJM431E         |                 |
| LM311D          | NJM311D         |          | LM431ACM        | NJM431M         | Note 1          |
| LM311M          | NJM311E         |          | LM431ACZ        | NJM431L         |                 |
| LM311M          | NJM311M         | Note 1   | LM555CM         | NJM555E         |                 |
| LM317T          | NJM317F         | Note2    |                 |                 |                 |

## NATIONAL (CONT.)

| NSC Part Number | NJR Part Number | Comments       | NSC Part Number | NJR Part Number | Comments               |
|-----------------|-----------------|----------------|-----------------|-----------------|------------------------|
| LM318M          | NJM318E         |                | LM555CM         | NJM555M         | Note 1                 |
| LM318M          | NJM318M         | Note 1         | LM555CN         | NJM555D         |                        |
| LM318N          | NJM318D         |                | LM556CM         | NJM556M         | Note 1                 |
| LM319M          | NJM319E         |                | LM556CN         | NJM556D         |                        |
| LM319M          | NJM319M         | Note 1         | LM567CM         | NJM567M         | Note 1                 |
| LM319N          | NJM319D         |                | LM567CN         | NJM567D         |                        |
| LM320LZ-12      | NJM79L12A       |                | LM592M          | NJM592M         | Note 1                 |
| LM320LZ-15      | NJM79L15A       |                | LM592N          | NJM592D         |                        |
| LM320LZ-5.0     | NJM79L05A       |                | LM723CM         | NJM723M         | Note 1                 |
| LM320T-12       | NJM7912FA       | Note 2         | LM723CN         | NJM723D         |                        |
| LM320T-15       | NJM7915FA       | Note 2         | LM741CM         | NJM741E         |                        |
| LM320T-5.0      | NJM7905FA       | Note 2         | LM741CN         | NJM741M         | Note 1                 |
| LM741CN         | NJM741D         |                | LMC6041AM       | NJU7051M        | Note 1 Top =-40-85C    |
| LM7805CT        | NJM7805FA       | Note 2         | LMC6041AN       | NJU7051D        | Top= -40-85C NSC       |
| LM7806CT        | NJM7806FA       | Note 2         | LMC6041M        | NJU7051M        | Note 1 Top =-40-85C    |
| LM7808CT        | NJM7808FA       | Note 2         | LMC6041N        | NJU7051D        | Top= -40-85C NSC       |
| LM7812CT        | NJM7812FA       | Note 2         | LMC6042AM       | NJU7052M        | Note 1 Top =-40-85C    |
| LM7815CT        | NJM7815FA       | Note 2         | LMC6042AN       | NJU7052D        | Top= -40-85C NSC       |
| LM7818CT        | NJM7818FA       | Note 2         | LMC6042M        | NJU7052M        | Note 1 Top =-40-85C    |
| LM7824CT        | NJM7824FA       | Note 2         | LMC6042N        | NJU7052D        | Top= -40-85C NSC       |
| LM78L05ACZ      | NJM78L05A       |                | LMC6044AM       | NJU7054M        | Note 1 Top =-40-85C    |
| LM78L06ACZ      | NJM78L06A       | Vo=6.2V on NSC | LMC6044AN       | NJU7054D        | Top= -40-85C NSC       |
| LM78L08ACZ      | NJM78L08A       | Vo=8.2V on NSC | LMC6044M        | NJU7054M        | Note 1 Top =-40-85C    |
| LM78L09ACZ      | NJM78L09A       |                | LMC6044N        | NJU7054D        | Top= -40-85C NSC       |
| LM78L12ACZ      | NJM78L12A       |                | LMC660AIM       | NJU7064M        | Note 1                 |
| LM78L15ACZ      | NJM78L15A       |                | LMC660AIM       | NJU7074M        | Note 1                 |
| LM78M05CT       | NJM78M05FA      | Note 2         | LMC660AIN       | NJU7064D        |                        |
| LM78M06CT       | NJM78M06FA      | Note 2         | LMC660AIN       | NJU7074D        |                        |
| LM78M08CT       | NJM78M08FA      | Note 2         | LMC660CM        | NJU7024M        | Note 1                 |
| LM78M12CT       | NJM78M12FA      | Note 2         | LMC660CM        | NJU7034M        | Note 1                 |
| LM78M15CT       | NJM78M15FA      | Note 2         | LMC660CN        | NJU7024D        |                        |
| LM78M24CT       | NJM78M24FA      | Note 2         | LMC660CN        | NJU7034D        |                        |
| LM7905CT        | NJM7905FA       | Note 2         | LMC662AIM       | NJU7062M        | Note 1                 |
| LM7908CT        | NJM7908FA       | Note 2         | LMC662AIM       | NJU7072M        | Note 1                 |
| LM7912CT        | NJM7912FA       | Note 2         | LMC662AIN       | NJU7062D        |                        |
| LM7915CT        | NJM7915FA       | Note 2         | LMC662AIN       | NJU7072D        |                        |
| LM79L05ACZ      | NJM79L05A       |                | LMC662CM        | NJU7022M        | Note 1                 |
| LM79L12ACZ      | NJM79L12A       |                | LMC662CM        | NJU7032M        | Note 1                 |
| LM79L15ACZ      | NJM79L15A       |                | LMC662CN        | NJU7022D        |                        |
| LM79M05CT       | NJM79M05FA      | Note 2         | LMC662CN        | NJU7032D        |                        |
| LM79M08CT       | NJM79M08FA      | Note 2         | LP2980          | NJM2370         |                        |
| LM79M12CT       | NJM79M12FA      | Note 2         | LPC6611M        | NJU7071M        | Note 1, Icc(max)=0.1mA |
| LM79M15CT       | NJM79M15FA      | Note 2         | LPC6611N        | NJU7071D        | Icc(max)=0.1mA NSC     |
| LM833M          | NJM2068E        |                | NS733           | NJM592D         |                        |
| LM833M          | NJM2068M        | Note 1         | OP07CP          | NJMOP-07D       |                        |
| LM833N          | NJM2068D        |                | OP07DP          | NJMOP-07D       |                        |
| LMC6022M        | NJU7022M        | Note 1         | TL072CM         | NJM072M         | Note 1                 |
| LMC6022N        | NJU7022D        |                | TL072CP         | NJM072D         |                        |
| LMC6024M        | NJU7024M        | Note 1         | TL082CM         | NJM082E         |                        |
| LMC6024N        | NJU7024D        |                | TL082CM         | NJM082M         | Note 1                 |
| LMC6032M        | NJU7032M        | Note 1         | TL082CM         | NJM2082M        | Note 1                 |
| LMC6032N        | NJU7032D        |                | TL082CP         | NJM082D         |                        |
| LMC6034M        | NJU7034M        | Note 1         | TL082CP         | NJM2082D        |                        |
| LMC6034N        | NJU7034D        |                |                 |                 |                        |

## TEXAS INSTRUMENTS

| TI Part Number | NJR Part Number | Comments | TI Part Number | NJR Part Number | Comments |
|----------------|-----------------|----------|----------------|-----------------|----------|
| LM13600N       | NJM13600D       |          | SG3524N        | NJM3524D        |          |
| LM13600NS      | NJM13600M       |          | SG3524NS       | NJM3524M        | Note 1   |
| LM13700N       | NJM13700D       |          | SN75C1406      | NJU6401B        | Note 4   |
| LM13700NS      | NJM13700NS      |          | SN75C1454      | NJU6402B        | Note 4   |
| LM2901D        | NJM2901E        |          | TL022CD        | NJM022BE        |          |
| LM2901D        | NJM2901M        | Note 1   | TL022CD        | NJM022BM        | Note 1   |
| LM2901DBLE     | NJM2901V        | Note 3   | TL022CD        | NJM022E         |          |
| LM2901N        | NJM2901N        |          | TL022CP        | NJM022BD        |          |
| LM2902D        | NJM2902E        |          | TL022CP        | NJM022D         |          |
| LM2902DBLE     | NJM2902V        | Note 3   | TL022CPS       | NJM022M         | Note 1   |
| LM2902N        | NJM2902N        |          | TL062ACD       | NJM062MA        | Note 1   |
| LM2902NS       | NJM2902M        | Note 1   | TL062BCD       | NJM062MB        | Note 1   |
| LM2903D        | NJM2903E        |          | TL062CD        | NJM062E         |          |
| LM2903D        | NJM2903M        | Note 1   | TL062CP        | NJM062D         |          |
| LM2903DB       | NJM3902V        | Note 3   | TL062CPS       | NJM062M         | Note 1   |
| LM2903P        | NJM2903D        |          | TL064CN        | NJM064D         |          |
| LM2904D        | NJM2904E        |          | TL064CNS       | NJM064M         | Note 1   |
| LM2904DB       | NJM2904V        | Note 3   | TL072BCP       | NJM072BMB       | Note 1   |
| LM2904P        | NJM2904D        |          | TL072CP        | NJM072D         |          |
| LM2904PS       | NJM2904M        | Note 1   | TL072CPS       | NJM072M         | Note 1   |
| LM2930KC-5.0   | NJM2930F05      | Note 2   | TL074CN        | NJM074D         |          |
| LM2930KC-8.0   | NJM2930F08      | Note 2   | TL074CNS       | NJM074M         | Note 1   |
| LM2930LP-5.0   | NJM2930L05      |          | TL082CD        | NJM082E         |          |
| LM2930LP-8.0   | NJM2930L08      |          | TL082CD        | NJM2082M        | Note 1   |
| LM311D         | NJM311E         |          | TL082CP        | NJM082D         |          |
| LM311P         | NJM311D         |          | TL082CP        | NJM2082D        |          |
| LM311PS        | NJM311M         | Note 1   | TL082CPS       | NJM082M         | Note 1   |
| LM317AB        | NJM317F         |          | TL084CN        | NJM084D         |          |
| LM318D         | NJM318E         |          | TL084CNS       | NJM084M         | Note 1   |
| LM318P         | NJM318D         |          | TL431ACD       | NJM431MA        | Note 1   |
| LM318PS        | NJM318M         | Note 1   | TL431ACPK      | NJM431UA        |          |
| LM324AN        | NJM324DA        |          | TL431CD        | NJM431E         |          |
| LM324D         | NJM324E         |          | TL431CLP       | NJM431L         |          |
| LM324N         | NJM324D         |          | TL431CP        | NJM431D         |          |
| LM324NS        | NJM324M         | Note 1   | TL431CPK       | NJM431U         |          |
| LM339D         | NJM339E         |          | TL431PS        | NJM431M         | Note 1   |
| LM339N         | NJM339D         |          | TLC2272CD      | NJU7072M        | Note 1   |
| LM358D         | NJM358E         |          | TLC2272CP      | NJU7072D        |          |
| LM358P         | NJM358D         |          | TLC2272CP      | NJU7074D        |          |
| LM393D         | NJM2903MG       | Note 1   | TLC2274CD      | NJU7074M        | Note 1   |
| LM393P         | NJM2903DQ       |          | TLC271BCD      | NJU7051M        | Note 1   |
| MC1458P        | NJM1458D        |          | TLC271BCD      | NJU7061M        | Note 1   |
| MC1458PS       | NJM1458M        | Note 1   | TLC271BCD      | NJU7071M        | Note 1   |
| MC3403N        | NJM3403AD       |          | TLC271BCP      | NJU7051D        |          |
| MC3403NS       | NJM3403AM       | Note 1   | TLC271BCP      | NJU7061D        |          |
| MC79L05CLP     | NJM79L05A       |          | TLC271BCP      | NJU7071D        |          |
| MC79L12CLP     | NJM79L12A       |          | TLC271CD       | NJU7001M        | Note 1   |
| MC79L15CLP     | NJM79L15A       |          | TLC271CD       | NJU7021M        | Note 1   |
| NE5532P        | NJM5532D        |          | TLC271CD       | NJU7031M        | Note 1   |
| NE5532PS       | NJM5532M        | Note 1   | TLC271CP       | NJU7001D        |          |
| NE5534P        | NJM5534D        |          | TLC271CP       | NJU7021D        |          |
| NE5534PS       | NJM5534M        | Note 1   | TLC271CP       | NJU7031D        |          |
| NE555D         | NJM555E         |          | TLC272BCD      | NJU7072M        | Note 1   |

## TEXAS INSTRUMENTS

| TI Part Number | NJR Part Number | Comments   | TI Part Number | NJR Part Number | Comments |
|----------------|-----------------|------------|----------------|-----------------|----------|
| NE555D         | NJM555M         | Note 1     | TLC272BCP      | NJU7072D        |          |
| NE555P         | NJM555D         |            | TLC272CD       | NJU7032M        | Note 1   |
| NE556D         | NJM556M         | Note 1     | TLC272CP       | NJU7032D        |          |
| NE556P         | NJM556D         |            | TLC274BCD      | NJU7074M        | Note 1   |
| NE592D         | NJM592M         | Note 1     | TLC274BCP      | NJU7074D        |          |
| NE592N         | NJM592D         |            | TLC274CD       | NJU7034M        | Note 1   |
| OP07CP         | NJMOP-07D       |            | TLC274CP       | NJU7034D        |          |
| OP07CPS        | NJMOP-07M       | Note 1     | TLC27L2BCD     | NJU7052M        | Note 1   |
| OP07DD         | NJMOP-07M       | Note 1     | TLC27L2BCP     | NJU7052D        |          |
| OP07DP         | NJMOP-07D       |            | TLC27L2CD      | NJU7002M        | Note 1   |
| RC4558D        | NJM4558E        |            | TLC27L2CP      | NJU7002D        |          |
| RC4558DBLE     | NJM4558V        | Note 3     | TLC27L4BCD     | NJU7054M        | Note 1   |
| RC4558P        | NJM4558D        |            | TLC27L4BCP     | NJU7054D        |          |
| RC4558PS       | NJM4558M        | Note 1     | TLC27L4CD      | NJU7004M        | Note 1   |
| TLC27L4CP      | NJU7004D        |            | UA78L09CLP     | NJM78L09A       |          |
| TLC27M2BCD     | NJU7062M        | Note 1     | UA78L10CLP     | NJM78L10UA      |          |
| TLC27M2BCP     | NJU7062D        |            | UA78L12CLP     | NJM78L12A       |          |
| TLC27M2CD      | NJU7022M        | Note 1     | UA78L15CLP     | NJM78L15A       |          |
| TLC27M2CP      | NJU7022D        |            | UA78M05CKC     | NJM78M05FA      | Note 2   |
| TLC27M4BCD     | NJU7064M        | Note 1     | UA78M06CKC     | NJM78M06FA      | Note 2   |
| TLC27M4BCP     | NJU7064D        |            | UA78M08CKC     | NJM78M08FA      | Note 2   |
| TLC27M4CD      | NJU7024M        | Note 1     | UA78M09CKC     | NJM78M09FA      | Note 2   |
| TLC27M4CP      | NJU7024D        |            | UA78M10CKC     | NJM78M10FA      | Note 2   |
| TLC339CD       | NJU7114AM       | Note 1     | UA78M12CKC     | NJM78M12FA      | Note 2   |
| TLC339CP       | NJU7114AD       |            | UA78M15CKC     | NJM78M15FA      | Note 2   |
| TLC3702CD      | NJU7102AM       | Note 1     | UA78M20CKC     | NJM78M20FA      | Note 2   |
| TLC3702CP      | NJU7102AD       |            | UA78M24CKC     | NJM78M24FA      | Note 2   |
| TLC3704CD      | NJU7104AM       | Note 1     | UA7905CKC      | NJM7905FA       | Note 2   |
| TLC3704CP      | NJU7104AD       |            | UA7906CKC      | NJM7906FA       | Note 2   |
| TLC393CD       | NJU7112AM       | Note 1     | UA7908CKC      | NJM7908FA       | Note 2   |
| TLC393CP       | NJU7112AD       |            | UA7912CKC      | NJM7912FA       | Note 2   |
| UA723CD        | NJM723M         | Note 1     | UA7915CKC      | NJM7915FA       | Note 2   |
| UA723CN        | NJM723D         |            | UA7918CKC      | NJM7918FA       | Note 2   |
| UA741CD        | NJM741E         |            | UA7924CKC      | NJM7924FA       | Note 2   |
| UA741CP        | NJM741D         |            | UA79M05CKC     | NJM79M05FA      | Note 2   |
| UA741CPS       | NJM741M         | Note 1     | UA79M06CKC     | NJM79M06FA      | Note 2   |
| UA7805CKC      | NJM7805FA       | Note 2     | UA79M08CKC     | NJM79M08FA      | Note 2   |
| UA7806CKC      | NJM7806FA       | Note 2     | UA79M12CKC     | NJM79M12FA      | Note 2   |
| UA7808CKC      | NJM7808FA       | Note 2     | UA79M15CKC     | NJM79M15FA      | Note 2   |
| UA7810CKC      | NJM7810FA       | Note 2     | UA79M24CKC     | NJM79M24FA      | Note 2   |
| UA7812CKC      | NJM7812FA       | Note 2     |                |                 |          |
| UA7815CKC      | NJM7815FA       | Note 2     |                |                 |          |
| UA7818CKC      | NJM7818FA       | Note 2     |                |                 |          |
| UA7824CKC      | NJM7824FA       | Note 2     |                |                 |          |
| UA78L02CKC     | NJM78L02A       |            |                |                 |          |
| UA78L05CLP     | NJM78L05UA      |            |                |                 |          |
| UA78L06CLP     | NJM78L06A       | Vo=6.2V TI |                |                 |          |
| UA78L08CLP     | NJM78L08A       |            |                |                 |          |



## SGS-THOMSON

| SGS Part Number | NJR Part Number | Comments | SGS Part Number | NJR Part Number | Comments |
|-----------------|-----------------|----------|-----------------|-----------------|----------|
| L7805CV         | NJM7805FA       | Note 2   | TS271CD (low)   | NJU7001M        | Note 1   |
| L7806CV         | NJM7806FA       | Note 2   | TS271CD (med)   | NJU7021M        | Note 1   |
| L7808CV         | NJM7808FA       | Note 2   | TS271CN (high)  | NJU7031D        |          |
| L7809CV         | NJM7809FA       | Note 2   | TS271CN (low)   | NJU7001D        |          |
| L7812CV         | NJM7812FA       | Note 2   | TS271CN (med)   | NJU7021D        |          |
| L7815CV         | NJM7815FA       | Note 2   | TS272BCD        | NJU7072M        | Note 1   |
| L7818CV         | NJM7818FA       | Note 2   | TS272BCN        | NJU7072D        |          |
| L7820CV         | NJM7820FA       | Note 2   | TS272CD         | NJU7032M        | Note 1   |
| L7824CV         | NJM7824FA       | Note 2   | TS272CN         | NJU7032D        |          |
| L78M05CV        | NJM78M05FA      | Note 2   | TS274BCD        | NJU7074M        | Note 1   |
| L78M06CV        | NJM78M05FA      | Note 2   | TS274BCN        | NJU7074D        |          |
| L78M06CV        | NJM78M06FA      | Note 2   | TS274CD         | NJU7034M        | Note 1   |
| L78M08CV        | NJM78M08FA      | Note 2   | TS274CN         | NJU7034D        |          |
| L78M10CV        | NJM78M10FA      | Note 2   | TS27L2BCD       | NJU7052M        | Note 1   |
| L78M12CV        | NJM78M12FA      | Note 2   | TS27L2BCN       | NJU7052D        |          |
| L78M15CV        | NJM78M15FA      | Note 2   | TS27L2CD        | NJU7002M        | Note 1   |
| L78M18CV        | NJM78M18FA      | Note 2   | TS27L2CN        | NJU7002D        |          |
| L78M20CV        | NJM78M20FA      | Note 2   | TS27L4BCD       | NJU7054M        | Note 1   |
| L78M24CV        | NJM78M24FA      | Note 2   | TS27L4BCN       | NJU7054D        |          |
| L7905CV         | NJM7905FA       | Note 2   | TS27L4CD        | NJU7004M        | Note 1   |
| L7906CV         | NJM7906FA       | Note 2   | TS27L4CN        | NJU7004D        |          |
| L7908CV         | NJM7908FA       | Note 2   | TS27M2BCD       | NJU7062M        | Note 1   |
| L7912CV         | NJM7912FA       | Note 2   | TS27M2BCN       | NJU7062D        |          |
| L7915CV         | NJM7915FA       | Note 2   | TS27M2CD        | NJU7022M        | Note 1   |
| L7918CV         | NJM7918FA       | Note 2   | TS27M2CN        | NJU7022D        |          |
| L7924CV         | NJM7924FA       | Note 2   | TS27M4BCD       | NJU7064M        | Note 1   |
| LM317T          | NJM317F         | Note 2   | TS27M4BCN       | NJU7064D        |          |
| LM324AN         | NJM324DA        |          | TS27M4CD        | NJU7024M        | Note 1   |
| LM723 SMT       | NJM723M         | Note 1   | TS27M4CN        | NJU7024D        |          |
| LM723N          | NJM723D         |          | TS339CD         | NJU7114AM       | Note 1   |
| NE555 SMT       | NJM555E         |          | TS339CN         | NJU7114AD       |          |
| NE555 SMT       | NJM555M         | Note 1   | TS3702CD        | NJU7102AM       | Note 1   |
| NE555N          | NJM555D         |          | TS3702CN        | NJU7102AD       |          |
| NE556 SMT       | NJM556M         | Note 1   | TS3704CD        | NJU7104AM       | Note 1   |
| NE556N          | NJM556D         |          | TS3704CN        | NJU7104AD       |          |
| SG3524N         | NJM3524M        | Note 1   | TS393CD         | NJU7112AM       | Note 1   |
| SG3524P         | NJM3524D        |          | TS393CN         | NJU7112AD       |          |
| TDA2822M        | NJM2073D        |          |                 |                 |          |
| TDA7335P        | NJM2085M        | Note 1   |                 |                 |          |
| TS271BCD (high) | NJU7071M        | Note 1   |                 |                 |          |
| TS271BCD (low)  | NJU7051M        | Note 1   |                 |                 |          |
| TS271BCD (med)  | NJU7061M        | Note 1   |                 |                 |          |
| TS271BCN (high) | NJU7071D        |          |                 |                 |          |
| TS271BCN (low)  | NJU7051D        |          |                 |                 |          |
| TS271BCN (med)  | NJU7061D        |          |                 |                 |          |
| TS271CD (high)  | NJU7031M        | Note 1   |                 |                 |          |

Note 1: EIAJ (Electronics Industrial Association of Japan) standard package. The width of the package is slightly wider than the JEDEC std. (US). However, since EIAJ parts have the same lead pitch as JEDEC parts, they can usually be placed on the JEDEC footprint without problems.

Note 2: TO-220F (Full Molded TO-220 package) The mechanical dimensions are different due to the encapsulated fin. Please refer to the attached illustration.

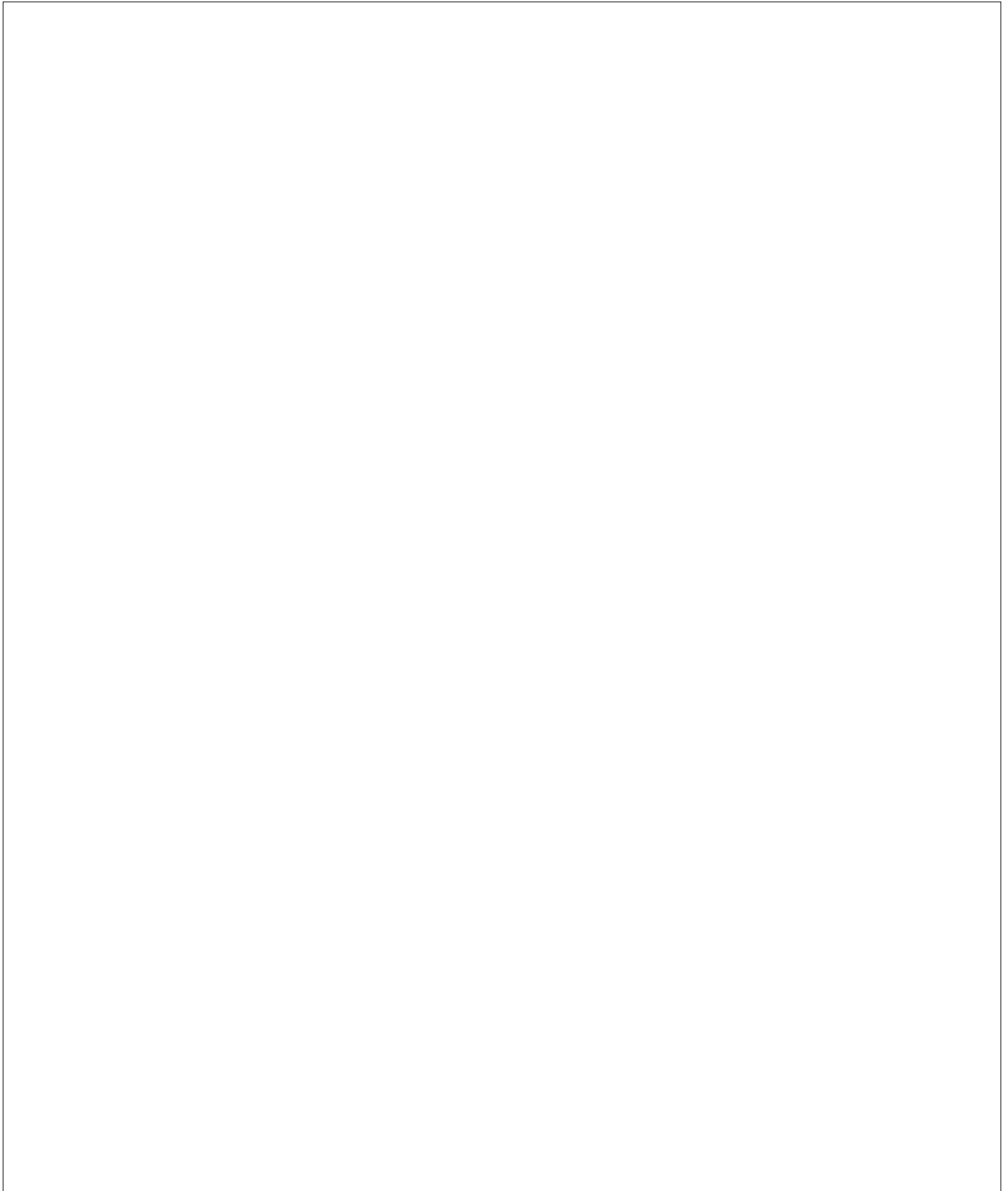
Note 3: SSOP Package (Shrink SOP Package) is available.

Note 4: Devices are functionally equivalent, but NOT pin-to-pin compatible.

Note 5: TO-252 or DPACK Package: designated with suffix "DLA"

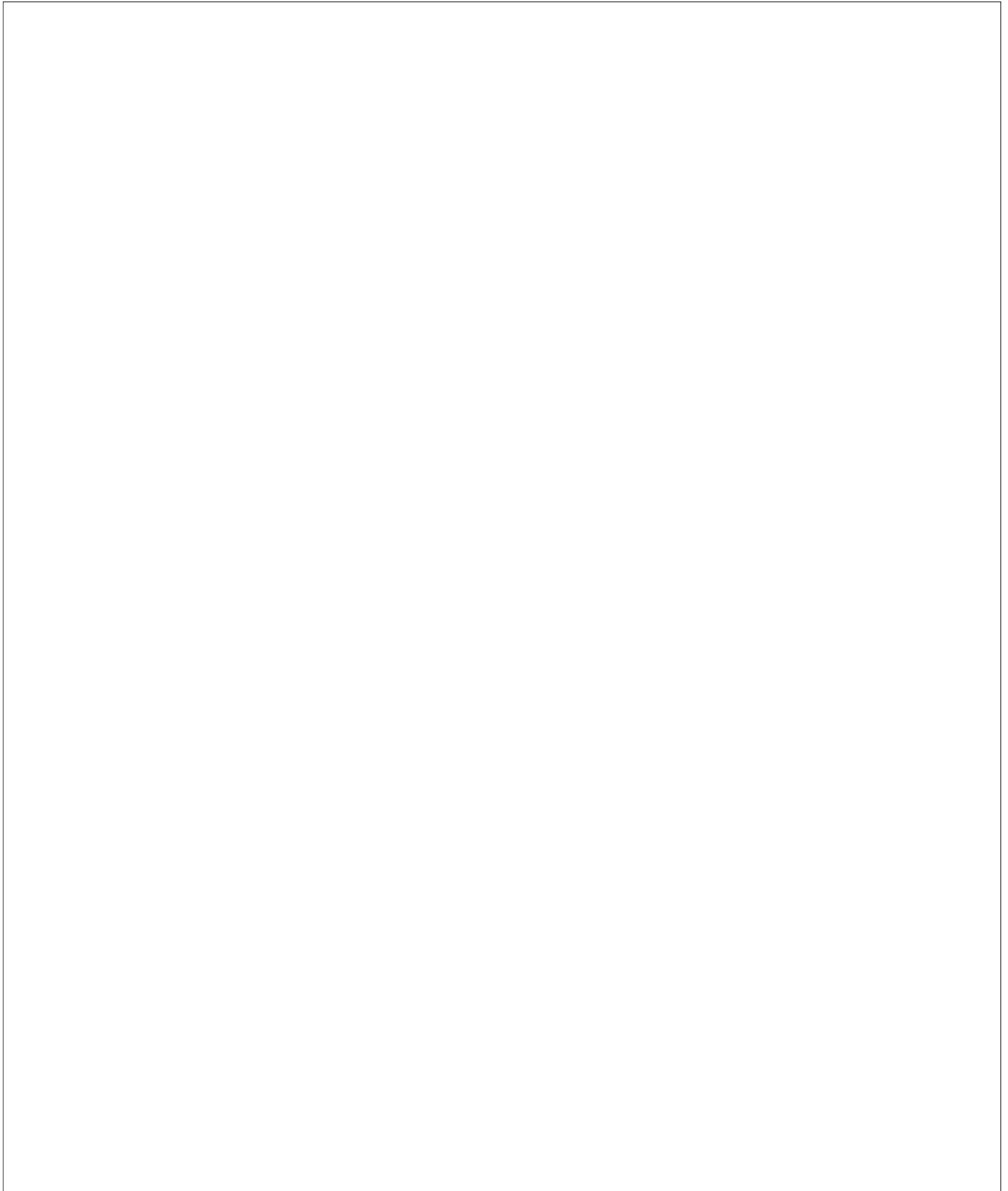
# NOTES

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# NOTES

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# NOTES

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