

2

Power Transistors

2-1. Power Transistors

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2-1. Power Transistors

■ Transistors for Audio Amplifier

● Single emitter

Type No.	P _c (W)	V _{CE0} (V)	I _c (A)	h _{FE} (min)	f _T (MHz)	Package
2SA1725/2SC4511	30	80	6	50	20	FM20 (T0220F)
2SA1726/2SC4512	50					MT-25 (T0220)
2SA1693/2SC4466	60					MT-100 (T03P)
2SA1907/2SC5099						FM100 (T03PF)
2SA1908/2SC5100	75	120	8			MT-100 (T03P)
2SA1694/2SC4467	80					140
2SA1909/2SC5101		85	180			15
2SA1673/2SC4388	100	140	10			
2SA1695/2SC4468	130	180	15			MT200 (2-screw mount)
2SA1492/2SC3856	150	200	17			
2SA1493/2SC3857	200					
2SA1494/2SC3858	200					

● LAPT (Multi-emitter for high-frequency transistor)

Type No.	P _c (W)	V _{CE0} (V)	I _c (A)	h _{FE} (min)	f _T (MHz)	Package
2SA1860/2SC4886	80	150	14	50	50	FM100 (T03PF)
2SA1186/2SC2837	100		10		60	MT-100 (T03P)
2SA1303/2SC3284	125		14		50	
2SA1386/2SC3519	130	160	15		40	
2SA1386A/2SC3519A		180			35	
2SA1294/2SC3263		230			50	
2SA1215/2SC2921	150	160	17		40	MT200 (2-screw mount)
2SA1216/2SC2922	200	180			35	
2SA1295/2SC3264		230				

● Darlington

Type No.	P _c (W)	V _{CE0} (V)	I _c (A)	h _{FE} (min)	f _T (MHz)	Package	
2SB1626/2SD2495	30	110	6	5000	100/60	FM20 (T0220F)	
2SB1659/2SD2589	50					MT-25 (T0220)	
2SB1624/2SD2493	60					MT-100 (T03P)	
2SB1625/2SD2494						FM100 (T03PF)	
2SB1587/2SD2438	75	150	8		65/80	MT-100 (T03P)	
2SB1559/2SD2389	80						10
2SB1588/2SD2439						15	
2SB1649/2SD2562	85					150	10
2SB1560/2SD2390	100	15					
2SB1647/2SD2560			130		45/70		
2SB1570/2SD2401	150	12	50/55		MT-200 (2-screw mount)		
2SB1648/2SD2561	200	17	45/70				

● Temperature compensation/driver

Type No.	P _c (W)	V _{CE0} (V)	I _c (A)	h _{FE} (min)	f _T (MHz)	Package	Remarks
2SC4495	25	50	3	500	40	FM20 (T0220F)	Temperature compensation
2SA1859/2SC4883	20	150	2	60	60/120		Driver
2SA1859A/2SC4883A		180					

■ Transistors for Switch Mode Power Supply

● For AC 80 to 130V input

Specifications			Package				
V _{CB0} (V)	V _{CE0} (V)	I _c (A)	MT-25 (T0220)	FM20 (T0220F)	MT-100 (T03P)	FM100 (T03PF)	
250	200	5		2SC5271			
500	400	5		2SC4073			
				2SC4418			
				2SC4662			
		7	2SC3832	2SC3890			
				2SC4130			
		10			2SC4138	2SC4296	
		12				2SC3833	2SC4297
						2SC5071	
15				2SC4139	2SC4298		
				2SC4434			
600	400	5		2SC5130			
		7		2SC4546			
	500	6	2SC3830	2SC4907			
		10			2SC3831		
	600						
		3			2SC5249		

● For AC 180 to 280V input

Specifications			Package			
V _{CB0} (V)	V _{CE0} (V)	I _c (A)	MT-25 (T0220)	FM20 (T0220F)	MT-100 (T03P)	FM100 (T03PF)
900 (1000)	550	3	2SC5239	2SC4517 (A)		
		5		2SC4518 (A)	2SC5287	
		10			2SC3927	2SC4557
	600	14			2SC4706	
900	800	3	2SC4020	2SC4908		
					2SC3678	2SC4299
		5		2SC4304		2SC4445
						2SC3679
	7			2SC3680	2SC4301	

■ Transistors for Humidifier

Type No.	P _c (W)	V _{CB0} (V)	V _{CE0} (V)	I _c (A)	h _{FE} (min)	f _r (MHz)	Package
2SC4153	30	200	120	7 (14)	70	30	FM20 (T0220F)
2SC3834	50						MT-25 (T0220)
2SC3835	70						MT-100 (T03P)

Note: I_c in parentheses is pulse current.

■ Transistors for Display Horizontal Deflection Output

Type No.	V _{CB0} (V)	V _{CE0} (V)	I _c (A)	P _c (W)	Package	Remarks
2SC5002	1500	800	7 (14)	80	FM100 (T03PF)	
2SC5003						Built-in damper diode.
2SC5124						
			10 (20)	100		

Note: I_c in parentheses is pulse current.

Darlington Transistors

Type No.	V _{CB0} (V)	V _{CE0} (V)	I _c (A)	P _c (W)	Complementary	Package	Remarks
2SB1257	-60	-60	-4 (-6)	25	2SD2014	FM20 (T0220F)	Surge voltage absorption
2SB1258	-100	-100	-6 (-10)	30	2SD1785		
2SB1259	-120	-120	-10 (-15)		2SD2081		
2SB1351	-60	-60	-12 (-20)	60		FM100 (T03PF)	
2SB1352							
2SB1382	-120	-120	-16 (-26)	75	2SD2082	MT-100 (T03P)	
2SB1420			-25 (-40)	80			
2SB1383			120	2SD2083			
2SD1796	60±10	60±10	4	25		FM20 (T0220F)	
2SD2014	120	80					
2SD2015	150	120					
2SD2016	200	200	3	30			
2SD1785	120	120	6 (10)				2SB1258
2SD2081			10 (15)				2SB1259
2SD2017	300	250	6	35			
2SD2141	380±50	380±50					
2SD1769	120	120	6 (10)	50		MT-25 (T0220)	
2SD2045						FM100 (T03PF)	
2SD2557	200	200	5	70		MT-100(T03P)	
2SD2558						FM-100 (T03PF)	
2SD2082	120	120	16 (26)	75	2SB1382	MT-100 (T03P)	
2SD2083			25 (40)	120	2SB1383		

Note: I_c in parentheses is pulse current.

Low V_{CE} (sat) - High h_{FE} Transistors

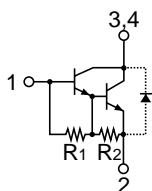
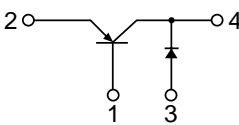
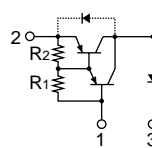
Type No.	V _{CE} (Sat) max (V)	h _{FE} min	V _{CE0} (V)	I _c (A)	P _c (W)	Complementary	Package	Remarks
2SA1567	-0.35	50	-50	-12	35	2SC4064	FM20 (T0220F)	Built-in diode at C-E
2SA1568			-60	±12		2SC4065		
2SA1746	-0.50		-50	-12 (-20)	60		FM100 (T03PF)	
2SC3852	0.50	500	60	3	25		FM20 (T0220F)	High h _{FE}
2SC3852A			80					High h _{FE}
2SC4495			50					High h _{FE}
2SC5370	0.30	70	40	12	30			
2SC4024	0.50	300	50	10	35		FM20 (T0220F)	High h _{FE}
2SC4064	0.35	50		12				2SA1567
2SC4065			60	±12	2SA1568	Built-in diode at C-E		
2SC4131	0.50	60	50	10 (25)	60		FM100 (T03PF)	

Note: I_c in parentheses is pulse current.

General Purpose Transistors

Type No.	V _{CB0} (V)	V _{CE0} (V)	I _c (A)	P _c (W)	Complementary	Package
2SA1667	-150	-150	-2	25	2SC4381	FM20 (T0220F)
2SA1668	-200	-200			2SC4382	
2SA1488	-60	-60	2SC3851			
2SA1488A	-80	-80	2SC3851A			
2SA1262	-60	-60	-4	30	2SC3179	MT-25 (T0220)
2SC4381	150	150		25	2	2SA1667
2SC4382	200	200	2SA1668			
2SC3851	80	60	2SA1488			
2SC3851A	100	80	2SA1488A			
2SC3179	80	60	4	30	2SA1262	MT-25 (T0220)
2SC5333	300	300		2	35	FM20 (T0220F)
2SC2023			40		MT-25 (T0220)	

Surface Mount Transistors (SA Series)

Type No.	Equivalent Circuit	Breakdown voltage (V)	Current (A)	h _{FE} and others	V _{CE} (sat) and others (V)	Functions/Applications	Fig. No.
SAC02	 <p>R₁: 4kΩ typ R₂: 200Ω typ</p>	100	1.2 (2.0A pulse)	2000 ~ 12000	1.3max	NPN darlington transistor o Pulse motors o Solenoids o Relays	6
SAH02		Tr: -30 Di: 30	-2.0 (-3.0A pulse) 1.5	1000min trr 15ns typ	-0.3max V _F 0.55max	PNP transistor with built-in schottky barrier diode o Power component for chopper regulator o 5V output component for portable equipment - Video cameras - Word processor - CD radio cassettes - Personal computers	
SAH03	 <p>R₁: 4kΩ typ R₂: 100Ω typ</p>	-60	-1.2	2000 ~ 12000	-1.4max	PNP darlington transistor with built-in fast-recovery diode o Power switching in constant voltage stepper motors - Printers - Plain paper copiers	

Pulse Ratings: t ≤ 1ms, duty ≤ 10%

2-2. Transistor Arrays

■ Sink Drive

● With Built-in avalanche diode at Collector-base

Type No.	Ratings			Equivalent Circuit	Package
	V _{CEO} (V)	I _C (A)	h _{FE} (min)		
STA481A	60 ±10	1	2000	①	STA10Pin
STA471A		2			
STA401A		4	1000		
STA406A		6	2000		
STA435A	65 ±15	4	1000	②	STA8Pin
STA301A	60 ±10	4		③	
STA485A	100 ±15	1	2000	①	STA10Pin
STA475A		2			
STA407A		4			
STA413A	35 ±5	3	500	④	SLA12Pin
STA460C	60 ±10	6	700	⑤	
SLA4010		4	2000	⑥	

● With built-in flywheel diode

Type No.	Ratings			Equivalent Circuit	Package
	V _{CEO} (V)	I _C (A)	h _{FE} (min)		
SMA4033	100	2	2000	⑦	SMA12Pin
SMA4032		3			
SLA4031	120	4			
SLA4061		5	SLA12Pin		
SLA4041		3			1000

● General purpose

Type No.	Ratings			Equivalent Circuit	Package
	V _{CEO} (V)	I _C (A)	h _{FE} (min)		
STA312A	60	3	300	⑧	STA8Pin
STA303A	100	4	1000	⑨	
STA412A	60	3	300	⑩	STA10Pin
STA473A	100	2	2000	⑪	
STA403A		4			
STA404A	200	3	1000	⑫	
SMA4030	100	4			2000
SLA4030		4	SLA12Pin		
SLA4060	120	5			

■ Source Drive

● With built-in flywheel diode

Type No.	Ratings			Equivalent Circuit	Package
	V _{CEO} (V)	I _C (A)	h _{FE} (min)		
SMA4021	-60	-3	2000	⑬	SMA12Pin
SLA4071	-100	-5			SLA12Pin

● General purpose

Type No.	Ratings			Equivalent Circuit	Package
	V _{CEO} (V)	I _C (A)	h _{FE} (min)		
STA302A	-60	-4	1000	⑭	STA8Pin
STA322A	-50		100	⑮	
STA421A	-60		40	⑯	STA10Pin
STA472A		-2	2000	⑰	
STA402A		-4	1000		
STA408A		-100	-4	2000	
SMA4020	-60			⑲	SMA12Pin
SLA4070	-100	-5			SLA12Pin

■ H-Bridge

Type No.	Ratings			Equivalent Circuit	Package
	V _{CEO} (V)	I _C (A)	h _{FE} (min)		
STA431A	±60	±3	40	⑳	STA10Pin
STA458C	±30	±5			
STA434A	±60	±4	1000	㉑	
STA457C			2000	㉒	
SLA4310			80	㉓	
SLA4313	±35	±5	50	㉔	SLA12Pin
SLA4340	±60	±4	2000	㉕	
SLA4390	±100	±5		1000	
SLA4391			1000	㉗	
SLA8001	±60	±12	50	㉘	

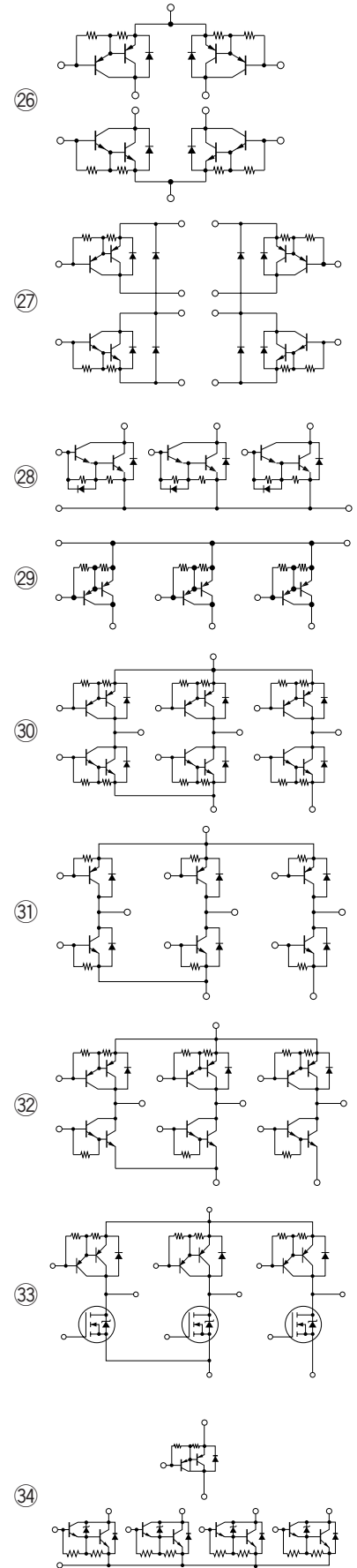
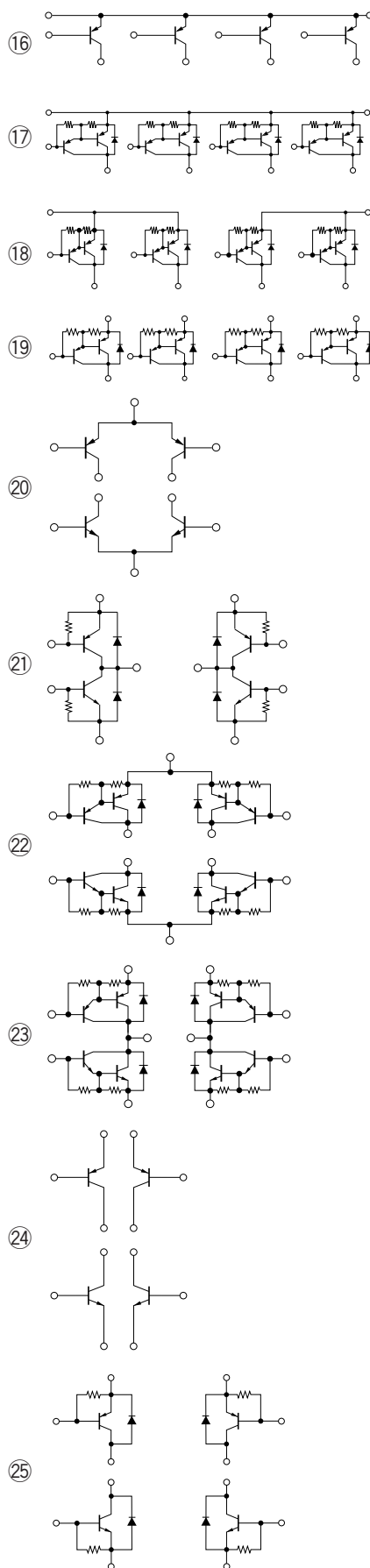
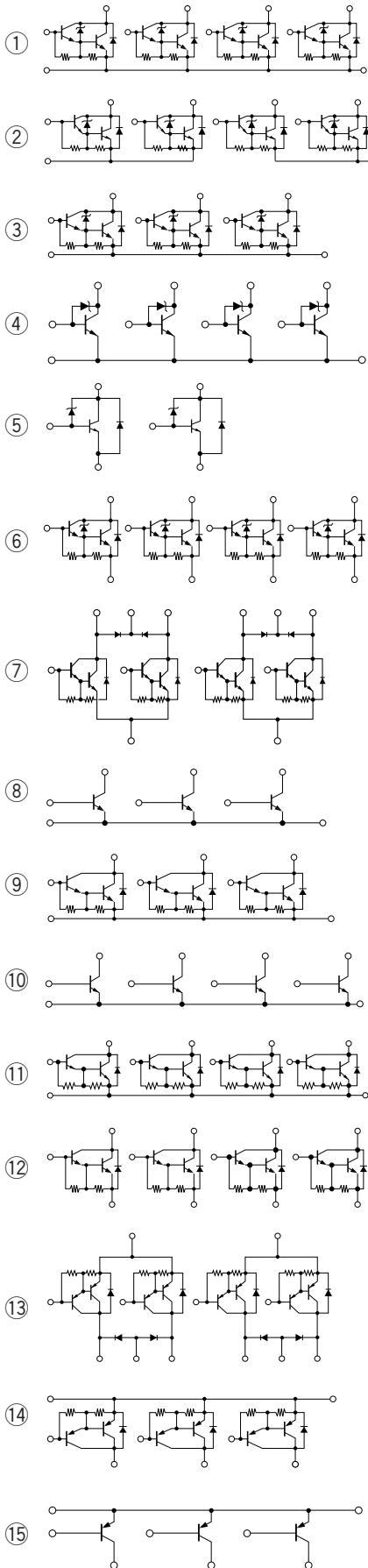
■ 3-Phase Motor Driver

Type No.	Ratings			Equivalent Circuit	Package
	V _{CEO} (V)	I _C (A)	h _{FE} (min)		
STA302A	-60	-4	1000	⑭	STA8Pin
STA303A	100	4		⑨	
STA304A	550	1	200	㉘	
STA305A	-550	-1		㉙	
SMA6010	±60	±4	2000	⑳	SMA12Pin
SMA6014		±2	1500/2000	㉑	
SLA6020	±100	±5	2000	㉒	SLA12Pin
SLA6030	±35	±4	70	㉓	
SLA6012	±60				
SLA6022	±80	±5	2000	㉔	
SLA6023	±60	±6		MOS/2000	
SLA5022					

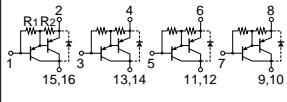
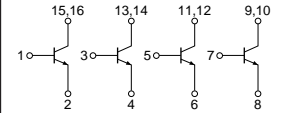
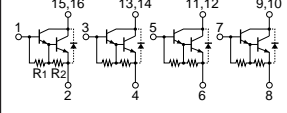
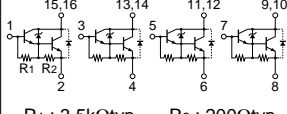
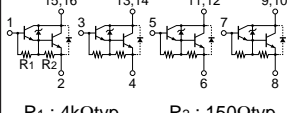
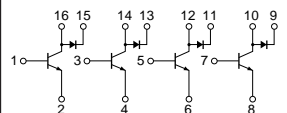
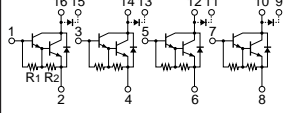
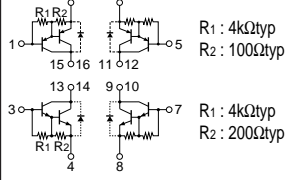
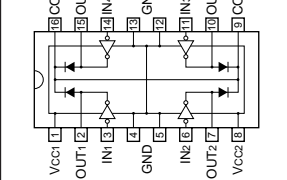
■ Stepper Motor Dual Power Supply Driver

Type No.	Ratings			Equivalent Circuit	Package
	V _{CEO} (V)	I _C (A)	h _{FE} (min)		
SMA6511	60 ±10	1.5	2000	㉖	SMA12Pin
SMA6512	100 ±15				

● Equivalent Circuit



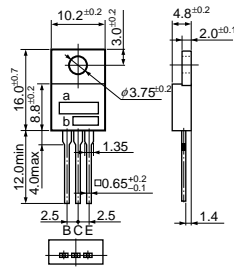
Surface Mount Transistor Arrays (SD Series)

Type No.	Equivalent Circuit	Breakdown Voltage (V)	Current (A)	hFE and other	V _{CE(sat)} and other (V)	Functions/Applications	Fig. No.
SDA01	 <p>R₁ : 4kΩtyp R₂ : 100Ωtyp</p>	-60	-1.5 (-2.5A pulse)	2000 to 12000	-1.4 max	PNP darlington transistor array (Surface mount type of STA472A) o Pulse motors o Relays o Solenoids	11
SDC01		50	2.0 (3.0A pulse)	500 to 2000	0.4 max	NPN high hFE transistor array (Surface mount type of STA412A) o Solenoids o Relays o Lamps o Switches	
SDC02	 <p>R₁ : 4kΩtyp R₂ : 200Ωtyp</p>	100	1.5 (2.5A pulse)	2000 to 12000	1.3 max	NPN darlington transistor array (Surface mount type of STA473A) o Pulse motors o Solenoids o Relays	
SDC03	 <p>R₁ : 3.5kΩtyp R₂ : 200Ωtyp</p>	60 ±10	1.5 (2.5A pulse)	2000 to 12000	1.4 max	NPN darlington transistor array with built-in surge absorption feature (Surface mount type of STA471A) o Pulse motors o Solenoids o Relays	
SDC04	 <p>R₁ : 4kΩtyp R₂ : 150Ωtyp</p>	100 ±15	1.5 (2.5A pulse)	2000 to 12000	1.3 max	NPN darlington transistor array with built-in surge absorption feature (Surface mount type of STA475A) o Pulse motors o Solenoids o Relays	
SDH01		Tr: 50 Di: 120	2.0 (3.0A pulse) 1.5	500 to 2000 trr 100ns typ	0.4 max V _F 1.6 max	NPN high hFE transistor array o Pulse motors o Solenoids o Relays o Lamps o Switches	
SDH02	 <p>R₁ : 2.5kΩtyp R₂ : 200Ωtyp</p>	Tr: 100 Di: 120	-1.5 (-2.5A pulse) 1.5	2000 to 12000 trr 100ns typ	1.3 max V _F 1.6 max	NPN darlington transistor array o Pulse motors o Solenoids o Relays	
SDH03	 <p>R₁ : 4kΩtyp R₂ : 100Ωtyp R₁ : 4kΩtyp R₂ : 200Ωtyp</p>	PNP: -60 NPN: 100	-1.5 (-2.5A pulse) 1.5 (2.5A pulse)	2000 to 12000 2000 to 12000	-1.4 max 1.3 max	H-bridge transistor array (Surface mount type of STA434A) o DC motors o Pulse motors	
SDI01		80	1.2	Active Low V _{IL} < 1.4V	1.6 max	Four circuit array with buffers (Surface mount type of SIB1044D) o Pulse motors o Solenoids o Relays	

Pulse Ratings: t ≤ 1ms, duty ≤ 10%

● External Dimensions (Unit: mm) a. Type No. b. Lot No.

Fig. 1 MT-25 (TO-220)



a. Type No.
b. Lot No.

Fig. 2 MT-100 (TO-3P)

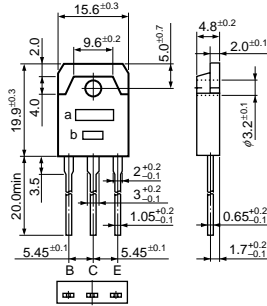


Fig. 3 MT-200

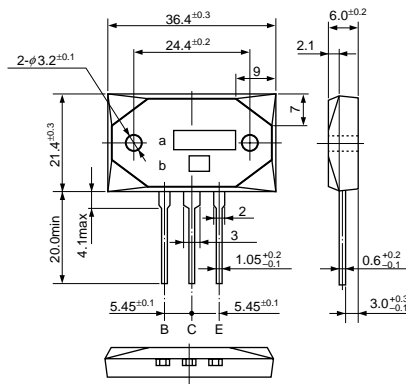


Fig. 4 Full-Mold FM20 (TO-220F)

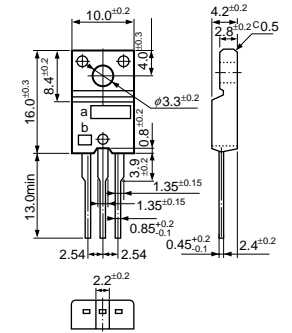


Fig. 5 Full-Mold FM100 (TO-3PF)

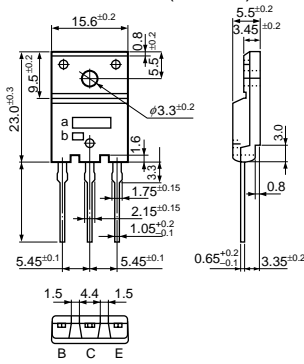


Fig. 6 SA series

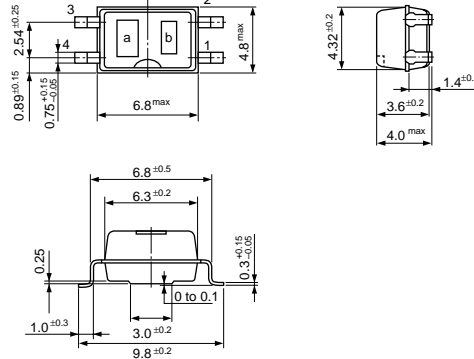


Fig. 7 STA300A series

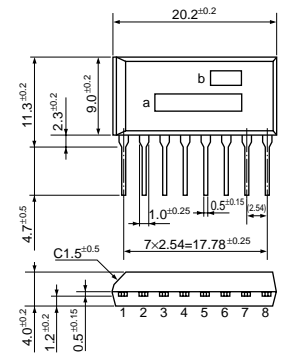


Fig. 8 STA400A series

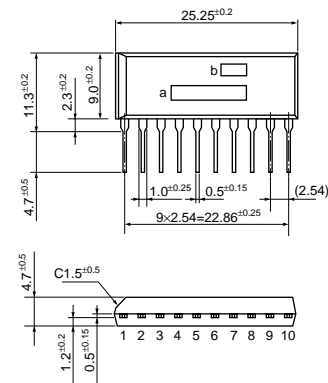


Fig. 9 SMA series

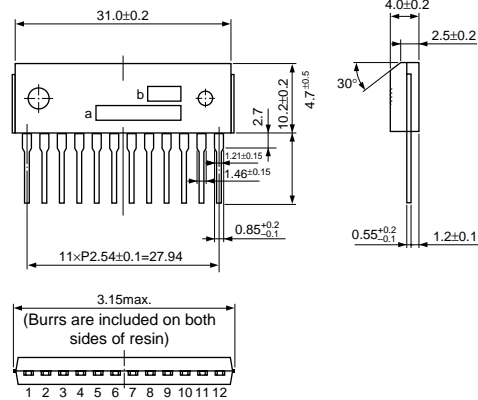


Fig. 10 SLA series

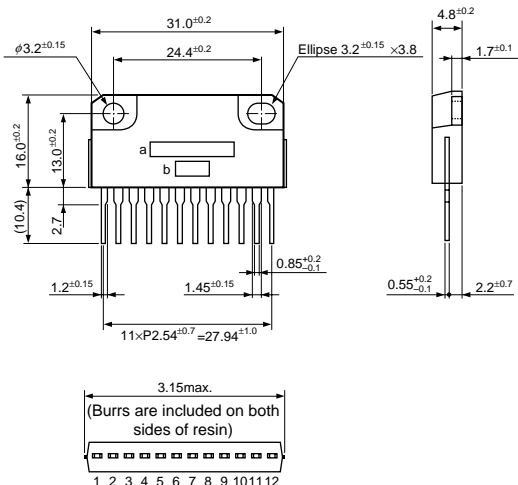


Fig. 11 SD series

