MOSPEC

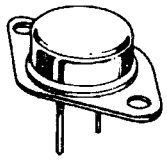
SILICON POWER TRANSISTORS

PNP
MJ15023
MJ15025

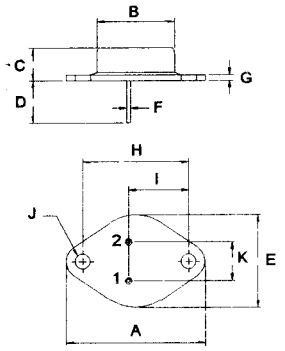
The MJ15023 and MJ15025 are power base power transistors designed for high power audio,disk head positioners and other linear applications.

16 AMPERE
SILICON POWER
TRANSISTORS
200 - 250 VOLTS
250 WATTS

FEATURES
* High Safe Operating Area
* High DC Current Gain-
  h_{FE}= 15(Min)@I_C= 8.0 A V_{CE}=4.0 V



TO-3



PIN 1.BASE
2.EMITTER
COLLECTOR(CASE)

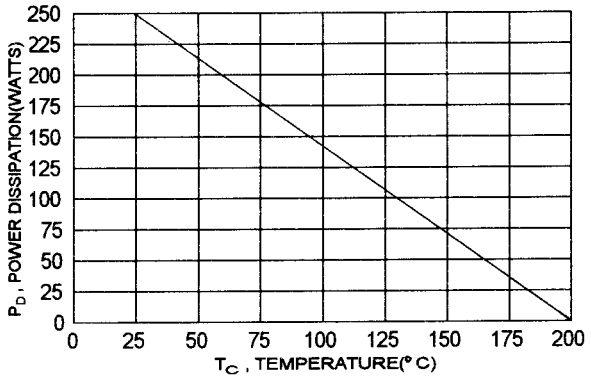
MAXIMUM RATINGS

Characteristic	Symbol	MJ15023	MJ15025	Unit
Collector-Emitter Voltage	V_{CEO}	200	250	V
Collector-Base Voltage	V_{CBO}	350	400	V
Emitter-Base Voltage	V_{EBO}	5.0		V
Collector-Emitter Voltage	V_{CEX}	400		V
Collector Current - Continuous - Peak	I_C I_{CM}	16 30		A
Base Current-Continuous	I_B	5		A
Total Power Dissipation @T_C = 25°C Derate above 25°C	P_D	250 1.43		W W/°C
Operating and Storage Junction Temperature Range	T_J, T_{STG}	-65 to +200		°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	UNIT
Thermal ResistanceJunction to Case	Rθjc	0.7	°C/W

FIGURE -1 POWER DERATING



DIM	MILLIMETERS	
	MIN	MAX
A	38.75	39.96
B	19.28	22.23
C	7.96	9.28
D	11.18	12.19
E	25.20	26.67
F	0.92	1.09
G	1.38	1.62
H	29.90	30.40
I	16.64	17.30
J	3.88	4.36
K	10.67	11.18

ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted)

Characteristic		Symbol	Min	Max	Unit
OFF CHARACTERISTICS					
Collector-Emitter Sustaining Voltage(1) (I_C= 100 mA, I_B= 0)	MJ15023 MJ15025	$V_{CEO(sus)}$	200 250		V
Collector Cutoff Current (V_{CE}= 200 V , $V_{BE(off)}$= 1.5 V) (V_{CE}= 250 V , $V_{BE(off)}$= 1.5 V)	 MJ15023 MJ15025	I_{CEX}		 250 250	uA
Collector Cutoff Current (V_{CE}= 150 V, I_B= 0) (V_{CE}= 200 V, I_B= 0)	 MJ15023 MJ15025	I_{CEO}		 500 500	uA
Emitter Cutoff Current (V_{EB}= 5.0 V, I_B= 0)		I_{EBO}		500	uA
ON CHARACTERISTICS (1)					
DC Current Gain (I_C= 8.0 A, V_{CE}= 4.0 V) (I_C= 16 A, V_{CE}= 4.0 V)		hFE	 15 5.0	60	
Collector-Emitter Saturation Voltage (I_C = 8.0 A, I_B= 0.8 A) (I_C= 16 A, I_B= 3.2 A)		$V_{CE(sat)}$		 1.4 4.0	V
Base-Emitter On Voltage (I_C = 8.0 A, V_{CE}= 4.0 V)		$V_{BE(on)}$		 2.2	V
DYNAMIC CHARACTERISTICS					
Current-Gain-Bandwidth Product (2) (I_C= 1.0 A, V_{CE}= 10 V, f = 1.0 MHz)		f_T	4.0		MHz
Output Capacitance (V_{CB}= 10 V, I_E= 0, f = 1.0 MHz)		C_{ob}		600	pF

(1) Pulse Test: Pulse width = 300 us , Duty Cycle ≦ 2.0%

(2) $f_T = |h_{fe}| \cdot f_{test}$

FIG-2 DC CURRENT GAIN

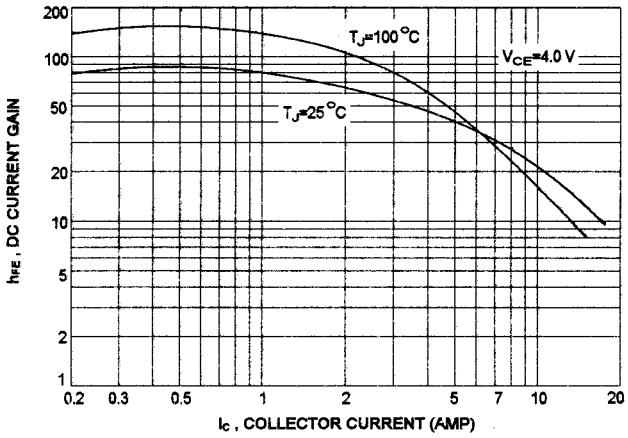


FIG-3 "ON" VOLTAGE

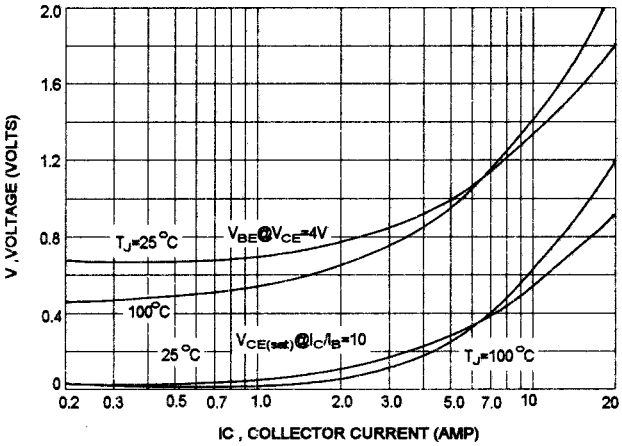


FIG-4 CAPACITANCES

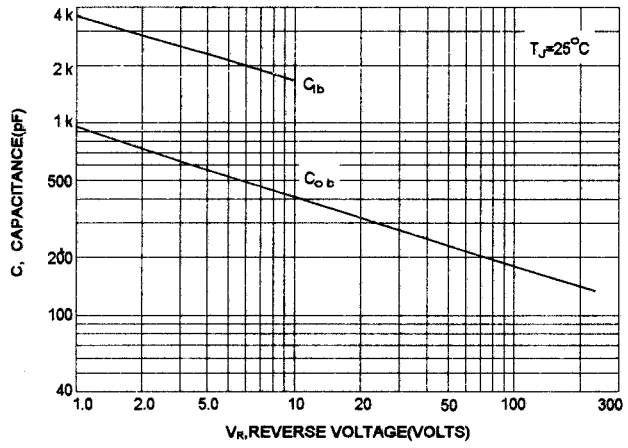


FIG-5 CURRENT GAIN- BANDWIDTH PRODUCT

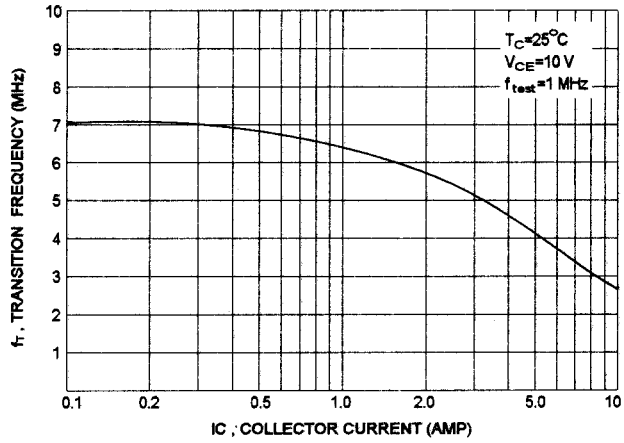
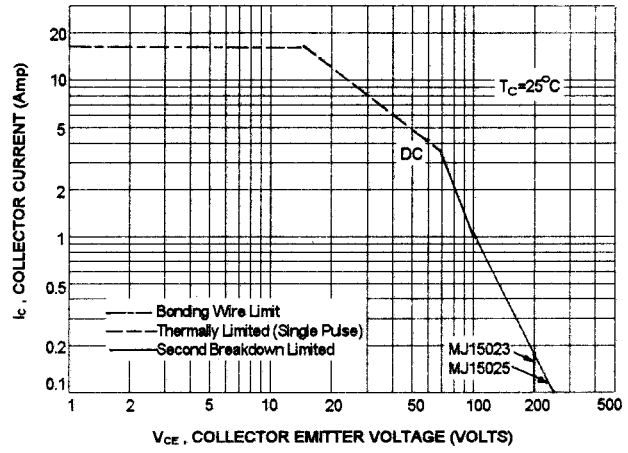


FIG-6 ACTIVE-REGION SAFE OPERATING AREA



There are two limitation on the power handling ability of a transistor:average junction temperature and second breakdown safe operating area curves indicate I_C-V_{CE} limits of the transistor that must be observed for reliable operation i.e., the transistor must not be subjected to greater dissipation than curves indicate.

The data of FIG-6 is base on $T_{J(PK)}$=200 °C;T_C is variable depending on conditions.At high case temperatures , thermal limitation will reduce the power that can be handled to values less than the limitations imposed by second breakdown.