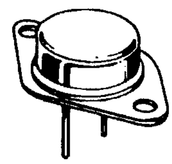
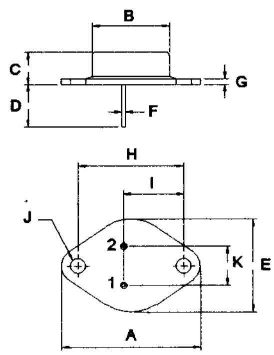
MOSPEC

NPN
MJ16006
MJ16008

8 AMPERE
SILICON POWER
TRANSISTORS
450 VOLTS
150 WATTS



TO-3



PIN 1.BASE
2.EMITTER
COLLECTOR(CASE)

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

SWITCHMODE SERIES
NPN SILICON POWER TRANSISTORS

These transistors are designed for high-voltage,high-speed, power switching in inductive circuits where fall time is cirtical. They are particularly suited for line-operated switchmode applications.The MJ16008 is a selected hihg-gain version of the MJ16006 for applications where drive current is limited

Typical Applications:
* Switching Regulators
* Inverters
* Solenoid and Relay Drives
* Motor Controls
* Deflection Circuits

Features:
* Fast Turn-Off Times
* Operating Temperature Range - 65 to+200°C
* 100°C Performance Specified for:
  Reverse-Biased SOA With Inductive Loads
  Switching Times With Inductive Loads
  Saturation Voltages
  Leakage Currents

MAXIMUM RATINGS

Characteristic	Symbol	MJ16006	MJ16008	Unit
Collector-Emitter Voltage	V_{CEO}	450	450	V
Collector-Emitter Voltage	V_{CEV}	850	850	V
Emitter-Base Voltage	V_{EBO}	6		V
Collector Current - Continuous - Peak	I_C I_{CM}	8 16		A
Base Current-Continuous -Peak	I_B I_{BM}	6 12		A
Total Power Dissipation @T_c=25°C @T_c=100°C Derate above 25°C	P_D	150 85.5 0.86		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	1.17	°C/W

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)		$V_{CEO (sus)}$	450		V
Collector Cutoff Current (V_{CE}= 850 V , $V_{BE(off)}$= 1.5 V) (V_{CE}= 850 V , $V_{BE(off)}$= 1.5 V,T_C= 100°C)		I_{CEV}		0.25 1.5	mA
Collector Cutoff Current (V_{CE}= 850 V, R_{BE}= 50 Ω ,T_C= 100°C)		I_{CER}		2.5	mA
Emitter Cutoff Current (V_{EB}= 6.0 V, I_C= 0)		I_{EBO}		1.0	mA
ON CHARACTERISTICS (1)					
DC Current Gain (I_C= 8.0 A,V_{CE}= 5.0 V)	MJ16006 MJ16008	hFE	5.0 7.0		
Collector-Emitter Saturation Voltage (I_C= 3.0 A, I_B= 0.4 A) (I_C= 5.0 A, I_B= 0.66 A) (I_C= 3.0 A,I_B= 0.3 A) (I_C= 5.0 A, I_B= 0.5 A)	MJ16006 MJ16006 MJ16008 MJ16008	$V_{CE(sat)}$		2.5 3.0 2.5 3.0	V
Base-Emitter Saturation Voltage (I_C= 5.0 A, I_B= 0.66 A) (I_C= 5.0 A, I_B= 0.5 A)	MJ16006 MJ16008	$V_{BE(sat)}$		1.5 1.5	V
DYNAMIC CHARACTERISTICS					
Output Capacitance (V_{CB}= 10 V, I_E= 0, f = 1.0 KHz)		C_{ob}		350	pF

SWITCHING CHARACTERISTICS

Delay Time	V_{CC}=250V, I_C=5A	I_{B1}=-I_{B2}= 0.66A	t_d		100	ns
Rise Time	R_{BE}=4 Ω	MJ16006	t_r		250	ns
Storage Time	P_W=30 us	I_{B1}=-I_{B2}= 0.50A	t_s		2500	ns
Fall Time	Duty Cycle ≦ 2%	MJ16008	t_f		300	ns

(1) Pulse Test: Pulse Width ≦ 300 us,Duty Cycle≦ 2%

FIGURE -1 POWER DERATING

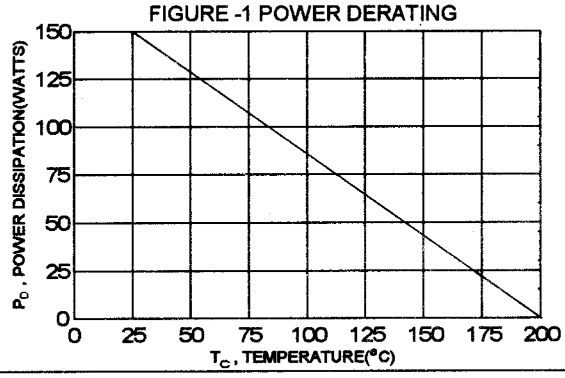


FIG -2 DC CURRENT GAIN

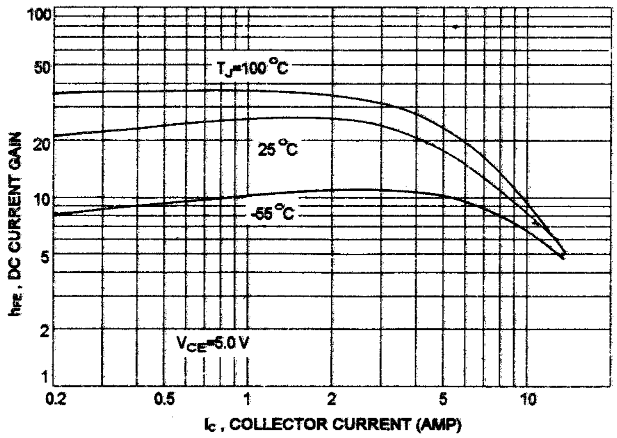


FIG-3 COLLECTOR SATURATION REGION

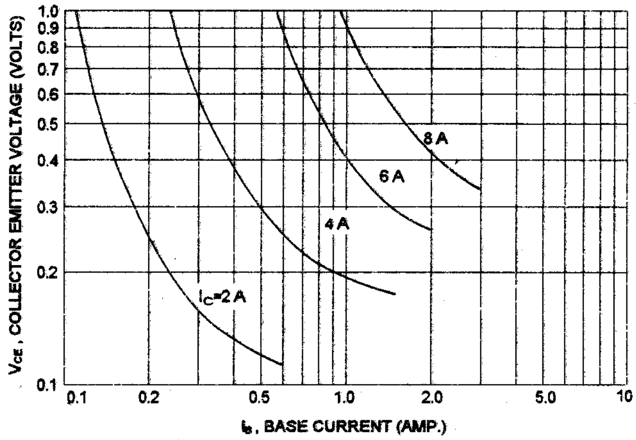


FIG-4COLLECTOR EMITTER SATURATION VOLTAGE

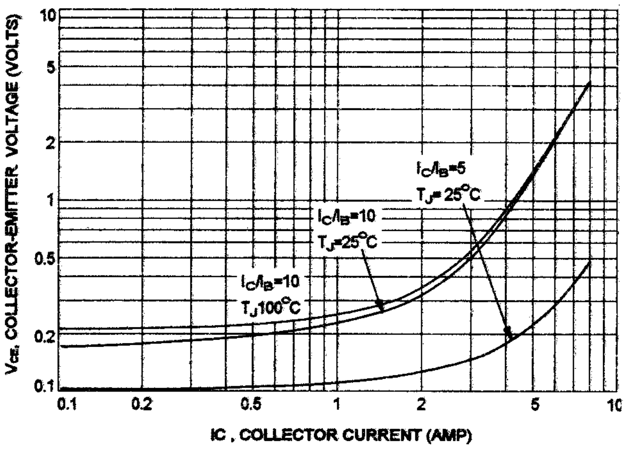


FIG-5 BASE- EMITTER SATURATION VOLTAGE

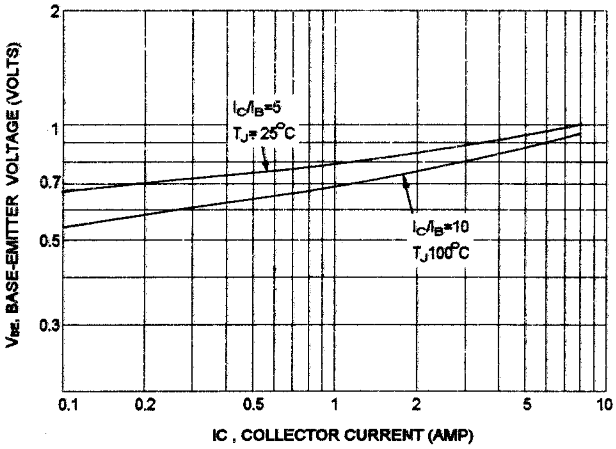


FIG-6 COLLECTOR CUT-OFF REGION

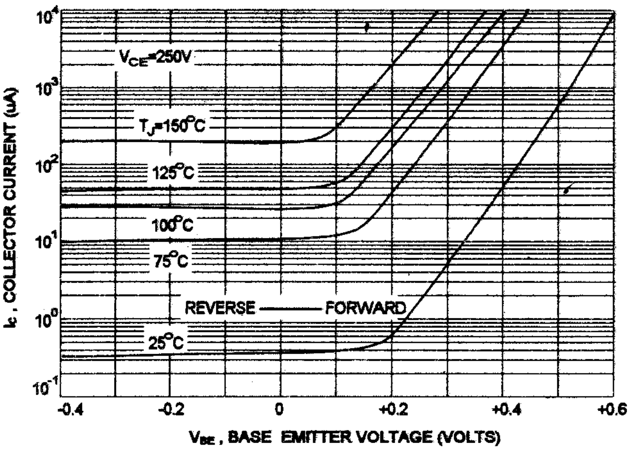


FIG-7 CAPACITANCES

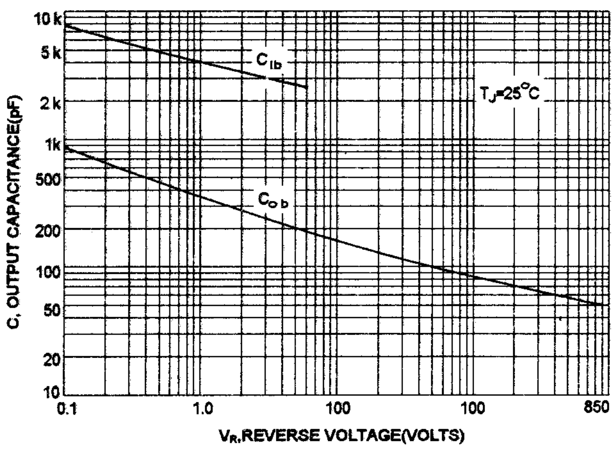
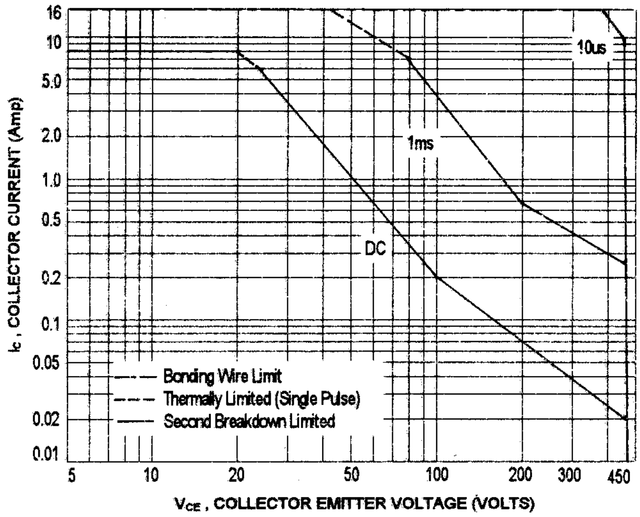


FIG-8 FORWARD BIAS SAFE OPERATING AREA

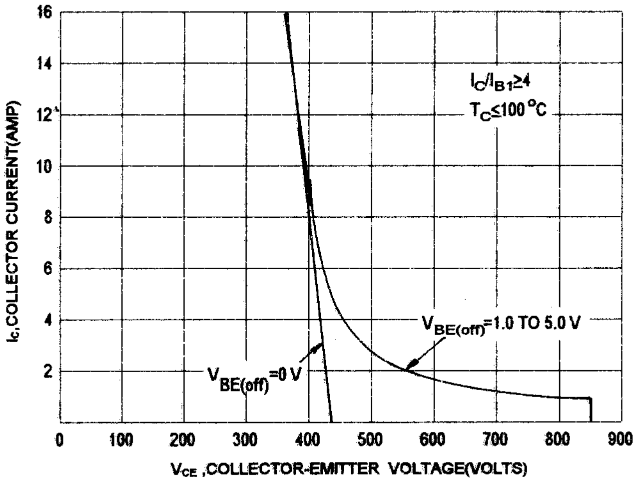


FORWARD BIAS

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-8 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.

FIG-9 REVERSE BIAS SAFE OPERATING AREA



REVERSE BIAS

For inductive loads, high voltage and high current must be sustained simultaneously during turn-off,in most cases, with the base-to-emitter junction reverse biased Under these conditions the collector voltage must be held to a safe level at or below a specfic value of collector current.This can be accomplished by several mean such as active clamping, RC snubbing, load line shaping, etc. the safe level for these devices is specified as Reverse Bias Safe Operating Area and represents the voltage-current condition allowable during reverse biased turn-off. This rating is verified under clamped conditions so that the device is never subjected to an avalanche mode. FIG-9 gives the RBSOA characteristics.