MOSPEC

COMPLEMENTARY SILICON PLASTIC POWER TRANSISTORS

... designed for use in power amplifier and switching circuit applications.

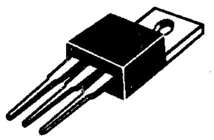
FEATURES:

* Collector-Emitter Sustaining Voltage-
$V_{CEO(SUS)}$ = 30 V (Min) - 2N6111, 2N6288
= 50 V (Min) -2N6109, 2N6290
= 70 V (Min) -2N6107, 2N6292

* DC Current Gain Specified to 7.0 Ampers
hFE = 30-150 @ I_C =3.0 A - 2N6111,2N6292
=2.3(Min) @ I_C=7.0A - All Devices

PNP	NPN
2N6107	2N6288
2N6109	2N6290
2N6111	2N6292

7 AMPERE
COMPLEMENTARY SILICON
POWER TRANSISTORS
30-70 Volts
40 Watts



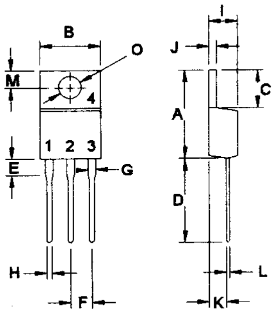
TO-220

MAXIMUM RATINGS

Characteristic	Symbol	2N6111 2N6288	2N6109 2N6290	2N6107 2N6292	Unit
Collector-Emitter Voltage	V_{CEO}	30	50	70	V
Collector-Base Voltage	V_{CBO}	40	60	80	V
Emitter-Base Voltage	V_{EBO}	5.0			V
Collector Current - Continuous - Peak	I_C	7.0 10			A
Base Current	I_B	3.0			A
Total Power Dissipation@T_C = 25°C Derate above 25°C	P_D	40 0.32			W W/°C
Operating and Storage Junction Temperature Range	T_J,T_{STG}	-65 to +150			°C

THERMAL CHARACTERISTICS

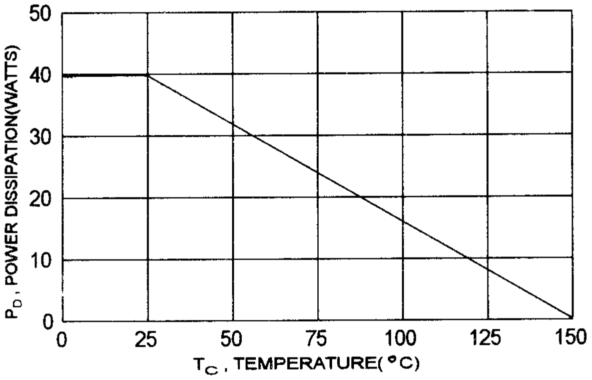
Characteristic	Symbol	Max	Unit
Thermal Resistance Junction to Case	Rθjc	3.125	°C/W



PIN 1.BASE
2.COLLECTOR
3.EMITTER
4.COLLECTOR(CASE)

DIM	MILLIMETERS	
	MIN	MAX
A	14.68	15.31
B	9.78	10.42
C	5.01	6.52
D	13.06	14.62
E	3.57	4.07
F	2.42	3.66
G	1.12	1.36
H	0.72	0.96
I	4.22	4.98
J	1.14	1.38
K	2.20	2.97
L	0.33	0.55
M	2.48	2.98
O	3.70	3.90

FIGURE -1 POWER DERATING



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

Characteristic	Symbol	Min	Max	Unit

OFF CHARACTERISTICS

Characteristic	Symbol	Min	Max	Unit
Collector - Emitter Sustaining Voltage (1)	$V_{CEO(SUS)}$			V
(I_C = 100 mA, I_B = 0) 2N6111, 2N6288		30		
2N6109, 2N6290		50		
2N6107, 2N6292		70		
Collector Cutoff Current	I_{CEO}			mA
(V_{CE} = 20 V, I_B = 0) 2N6111, 2N6288			1.0	
(V_{CE} = 40 V, I_B = 0) 2N6109, 2N6290			1.0	
(V_{CE} = 60 V, I_B = 0) 2N6107, 2N6292			1.0	
Collector Cutoff Current	I_{CEX}			mA
(V_{CE} = 40 V, $V_{BE(off)}$ = 1.5 V) 2N6111, 2N6288			0.1	
(V_{CE} = 60 V, $V_{BE(off)}$ = 1.5 V) 2N6109, 2N6290			0.1	
(V_{CE} = 80 V, $V_{BE(off)}$ = 1.5 V) 2N6107, 2N6292			0.1	
(V_{CE} = 30 V, $V_{BE(off)}$ = 1.5 V, T_C = 125°C) 2N6111, 2N6288			2.0	
(V_{CE} = 50 V, $V_{BE(off)}$ = 1.5 V, T_C = 125°C) 2N6109, 2N6290			2.0	
(V_{CE} = 70 V, $V_{BE(off)}$ = 1.5 V, T_C = 125°C) 2N6107, 2N6292			2.0	
Emitter Cutoff Current	I_{EBO}			mA
(V_{EB} = 5.0 V , I_C = 0)			1.0	

ON CHARACTERISTICS (1)

Characteristic	Symbol	Min	Max	Unit
DC Current Gain	hFE			
(I_C = 2.0 A, V_{CE} = 4.0 V) 2N6107, 2N6292		30	150	
(I_C = 2.5 A, V_{CE} = 4.0 V) 2N6109, 2N6290		30	150	
(I_C = 3.0 A, V_{CE} = 4.0 V) 2N6111, 2N6288		30	150	
(I_C = 7.0 A, V_{CE} = 4.0 V) All Devices		2.3		
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$			V
(I_C = 7.0 A, I_B = 3.0 A)			3.5	
Base-Emitter On Voltage	$V_{BE(on)}$			V
(I_C = 7.0 A, V_{CE} = 4.0 V)			3.0	

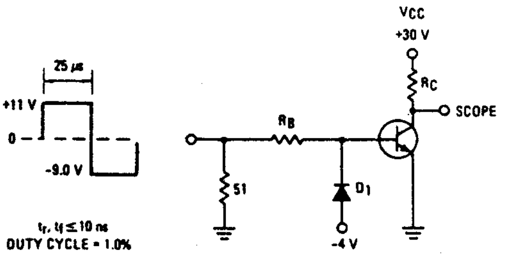
DYNAMIC CHARACTERISTICS

Characteristic	Symbol	Min	Max	Unit
Current-Gain-Bandwidth Product (2)	f_T			MHz
(I_C = 0.5 A, V_{CE} = 4.0 V, f = 1.0 MHz) 2N6288,90,92		2.5		
2N6107,09,11		10		
Small-Signal Current Gain	h_{fe}			
(I_C = 0.5 A, V_{CE} =4.0 V, f = 50 KHz)		20		

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

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

FIGURE 2 – SWITCHING TIME TEST CIRCUIT



R_B and R_C VARIED TO OBTAIN DESIRED CURRENT LEVELS

D_1 MUST BE FAST RECOVERY TYPE, eg:
MBD5300 USED ABOVE $I_B \approx 100$ mA
MSD6100 USED BELOW $I_B \approx 100$ mA

FIG-3 TURN-OFF TIME

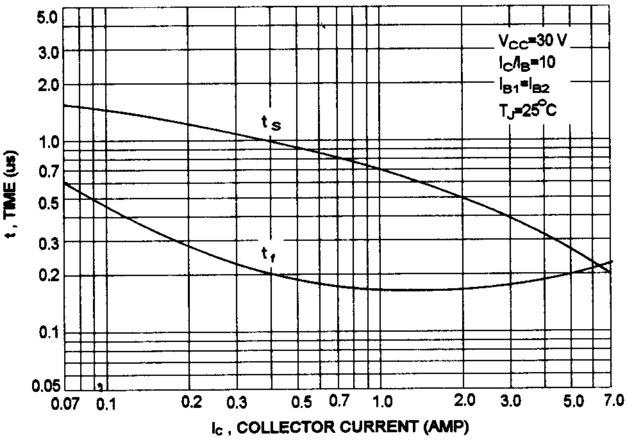


FIG-4 DC CURRENT GAIN

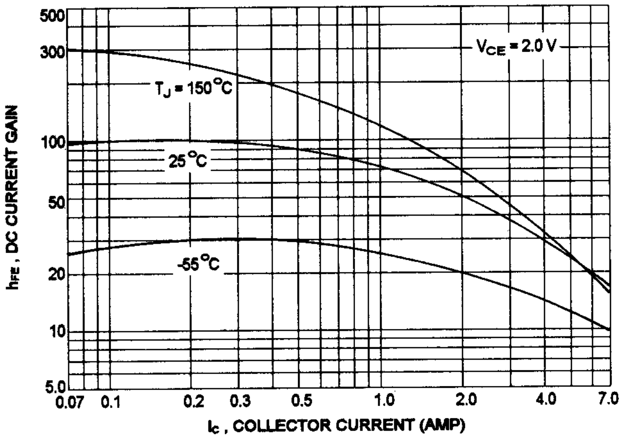


FIG-5 TURN-ON TIME

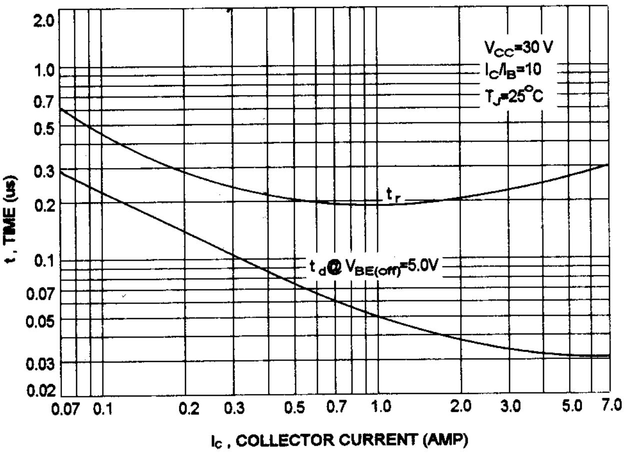
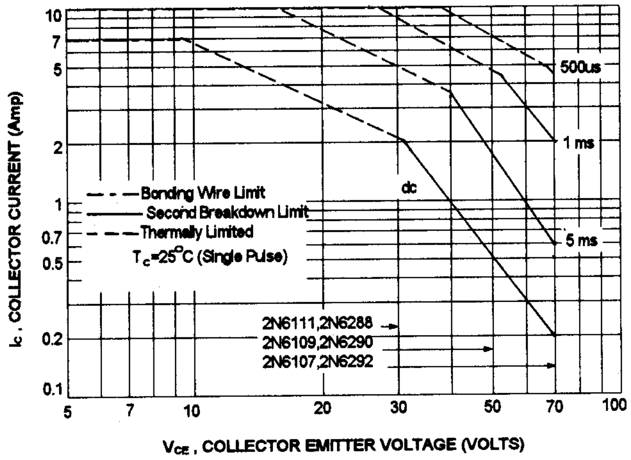


FIG-6 ACTIVE REGION SAFE OPERATING AREA



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 $T_{J(PK)}$=150 °C;T_C is variable depending on power level.second breakdown pulselimits are valid for duty cycles to 10% provided $T_{J(PK)} \leq 150$°C, 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-7 COLLECTOR SATURATION REGION

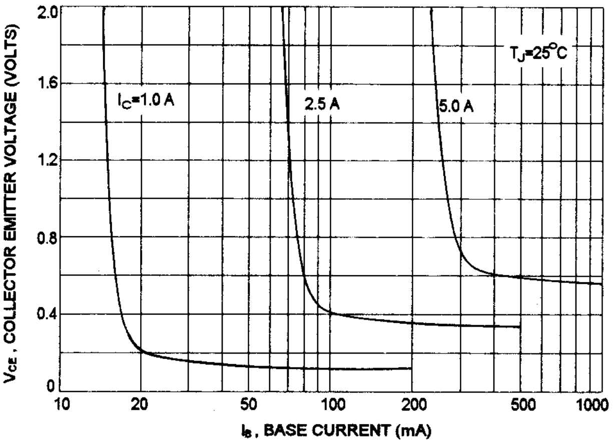


FIG-8 CAPACITANCES

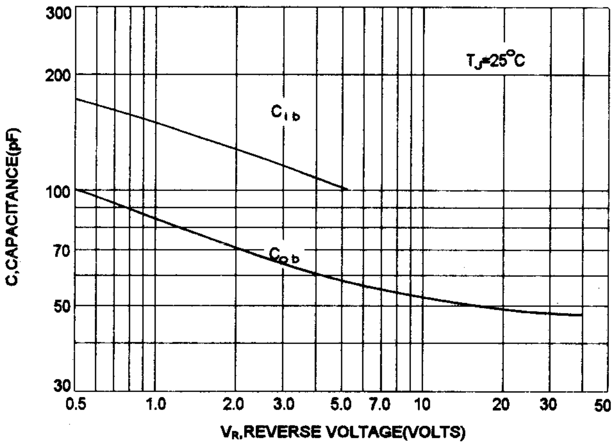


FIG-9 "ON" VOLTAGE

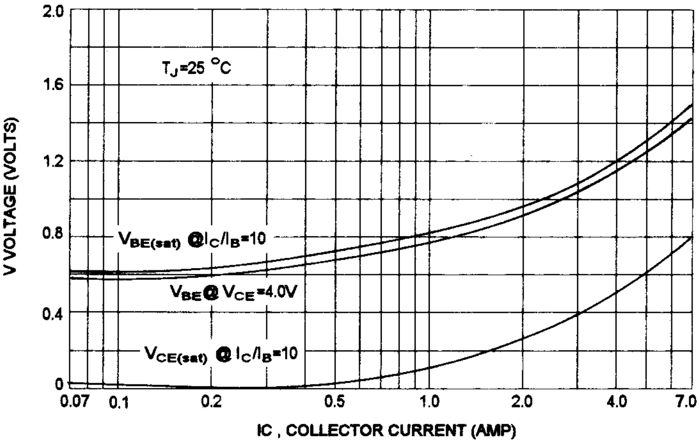
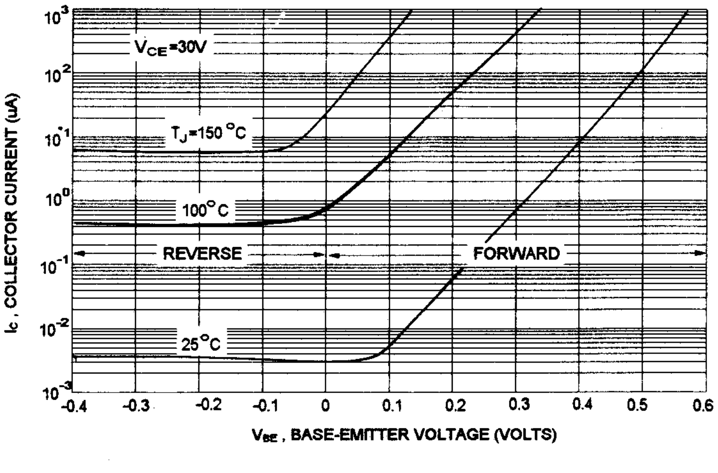


FIG-10 COLLECTOR CUT-OFF REGION



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