MOSPEC

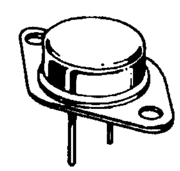
COMPLEMENTARY SILICON POWER DARLINGTON TRANSISTORS

..designed for use as output devices in complementary general purpose amplifier applications.

FEATURES:
* High Gain Darlington Performance
* High DC Current Gain: hFE = 1000(Min) @ I_C = 25 A
  hFE = 400(Min) @ I_C = 50 A
* Monolithic Construction with Built-in Base-Emitter Shunt Resistor

NPN	PNP
MJ11028	MJ11029
MJ11030	MJ11031
MJ11032	MJ11033

50 AMPERE
COMPLEMENTARY
SILICON POWER
DARLINGTON TRANSISTOR
60-120 VOLTS
300 WATTS



TO-3

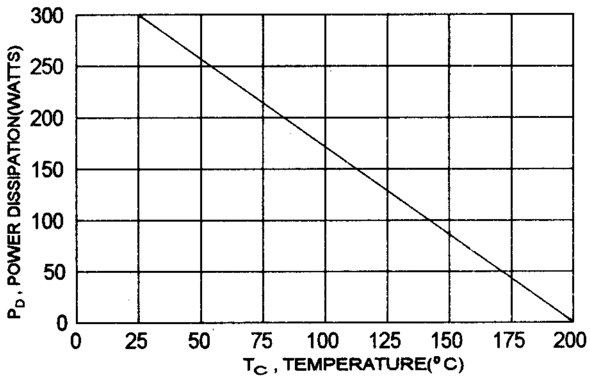
MAXIMUM RATINGS

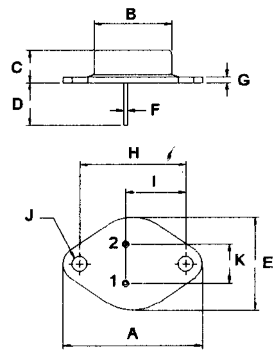
Characteristic	Symbol	MJ11028 MJ11029	MJ11030 MJ11031	MJ11032 MJ11033	Unit
Collector-Emitter Voltage	V_{CEO}	60	90	120	V
COllector-Base Voltage	V_{CBO}	60	90	120	V
Emitter-Base Voltage	V_{EBO}	5.0			V
Collector Current-Continuous -Peak	I_C I_{CM}	50 100			A
Base Current	I_B	2.0			A
Total Power Dissipation @T_C= 25°C Derate above 25°C	P_D	300 1.71			W W/°C
Operating and Storage Junction Temperature Range	T_J ,T_{STG}	- 65 to +200			°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance Junction to Case	Rθjc	0.584	°C/W

FIGURE -1 POWER DERATING





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

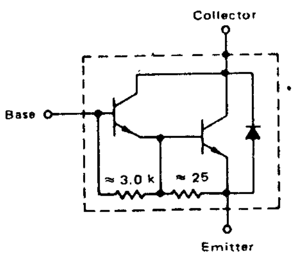
ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector - Emitter Sustaining Voltage (1) (I_C = 100 mA, I_B = 0) MJ11028,MJ11029 MJ11030,MJ11031 MJ11032,MJ11033	$V_{CEO(sus)}$	 60 90 120		V
Collector Cutoff Current (V_{CE} = 50 V, I_B = 0)	I_{CEO}		2.0	mA
Collector-Emitter Leakage Current (V_{CE} = 60 V,R_{BE}= 1 k ohm) MJ11028,MJ11029 (V_{CE} = 90 V,R_{BE}= 1 k ohm) MJ11030,MJ11031 (V_{CE} = 120 V,R_{BE}= 1 k ohm) MJ11032,MJ11033 (V_{CE} = 60 V,R_{BE} = 1 k ohm ,T_C = 125°C) MJ11028,MJ11029 (V_{CE} = 90 V,R_{BE} = 1 k ohm ,T_C = 125°C) MJ11030,MJ11031 (V_{CE} = 120 V,R_{BE} = 1 k ohm, T_C = 125°C) MJ11032,MJ11033	I_{CER}		 2.0 2.0 2.0 10 10 10	mA
Emitter Cutoff Current (V_{EB} = 5.0 V, I_C= 0)	I_{EBO}		5.0	mA
ON CHARACTERISTICS (1)				
DC Current Gain (I_C = 25 A, V_{CE} = 5.0 V) (I_C = 50 A, V_{CE} = 5.0 V)	hFE	 1000 400	 18000	
Collector-Emitter Saturation Voltage (I_C = 25 A, I_B = 250 mA) (I_C = 50 A, I_B = 500 mA)	$V_{CE(sat)}$		 2.5 3.5	V
Base-Emitter Saturation Voltage (I_C = 25 A, I_B = 200 mA) (I_C = 50 A, I_B = 300 mA)	$V_{BE(sat)}$		 3.0 4.5	V
DYNAMIC CHARACTERISTICS				
Small-Signal Current Gain (I_C = 10 A, V_{CE} = 3.0 V, f = 1.0 MHz)	$\|h_{fe}\|$	4.0		

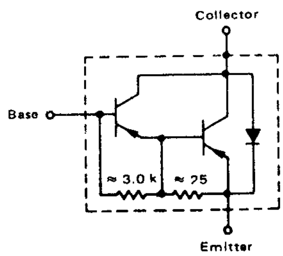
(1) Pulse Test: Pulse width = 300 us , Duty Cycle ≦ 2.0%
(2) $f_T = |h_{fe}| \circ f_{test}$

INTERNAL SCHEMATIC DIAGRAM

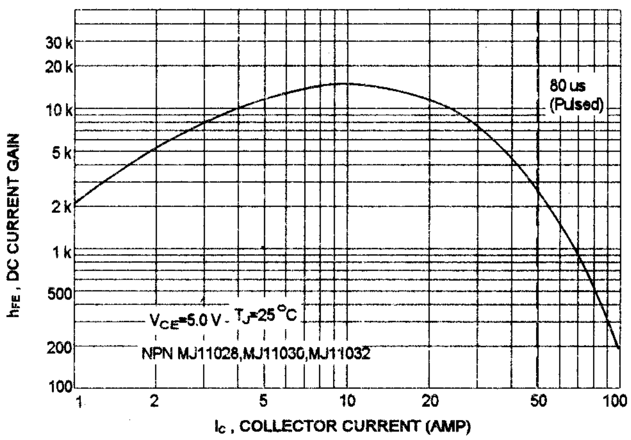
NPN
MJ11028
MJ11030
MJ11032



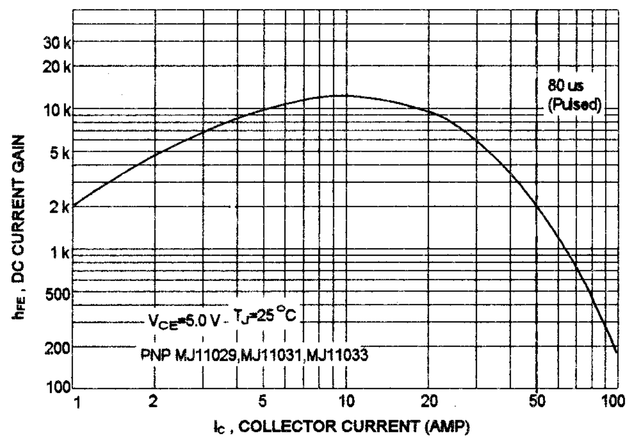
PNP
MJ11029
MJ11031
MJ11033



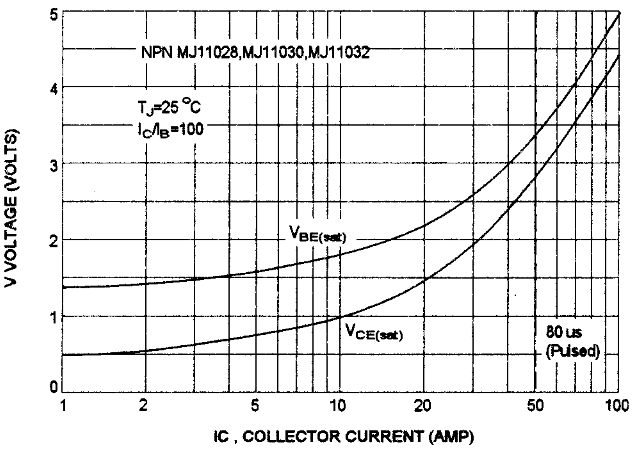
DC CURRENT GAIN



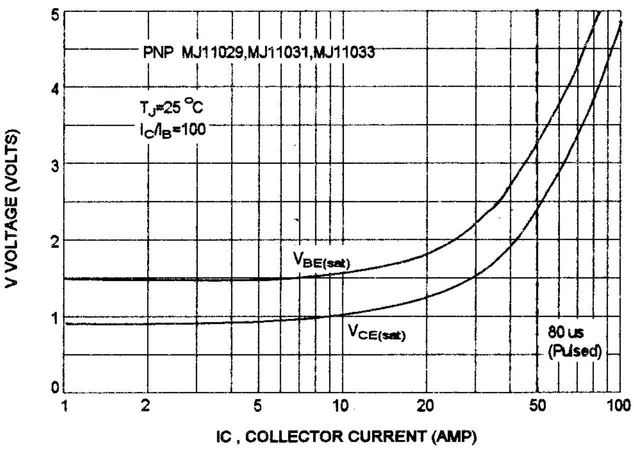
DC CURRENT GAIN



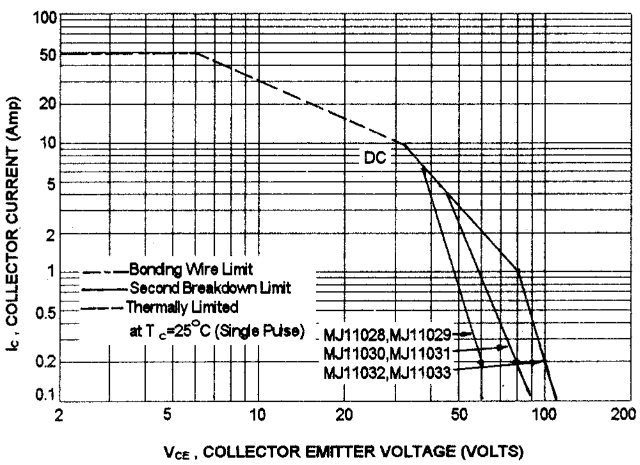
"ON" VOLTAGES



"ON" VOLTAGES



ACTIVE-REGION SAFE OPERATING AREA (SOA)



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 SOA curve is base on $T_{J(PK)}$=200 °C;T_C is variable depending on conditions. second breakdown pulse limits are valid for duty cycles to 10% provided $T_{J(PK)} \leq 200$°C,At high case temperatures, thermal limita - tion will reduce the power that can be handled to values less than the limitations imposed by second breakdown.