

COMPLEMENTARY SILICON PLASTIC POWER TRANSISTORS

... designed for use in high-frequency drivers in audio amplifier applications.

FEATURES:

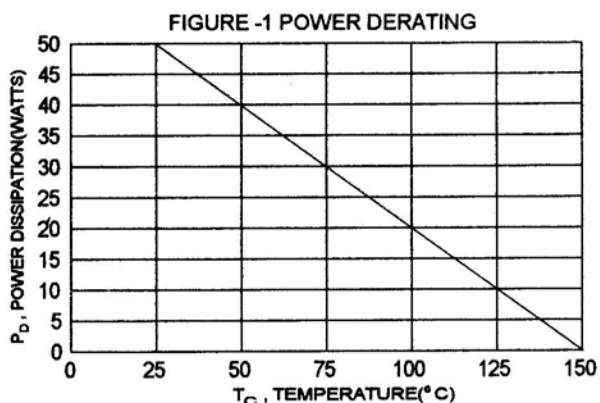
- * Collector-Emitter Sustaining Voltage-
 $V_{CE(SUS)} = 120\text{ V (Min) -MJE15028, MJE15029}$
 $= 150\text{ V (Min) -MJE15030, MJE15031}$
- * DC Current Gain Specified to 8.0 Amperes
 $hFE = 40(\text{Min}) @ I_C = 3.0\text{ A}$
 $= 20(\text{Min}) @ I_C = 4.0\text{ A}$
- * TO-220AB Compact Package

MAXIMUM RATINGS

Characteristic	Symbol	MJE15028 MJE15029	MJE15030 MJE15031	Unit
Collector-Emitter Voltage	V_{CEO}	120	150	V
Collector-Base Voltage	V_{CBO}	120	150	V
Emitter-Base Voltage	V_{EBO}	5.0		V
Collector Current - Continuous - Peak	I_C	8.0 16		A
Base Current	I_B	2.0		A
Total Power Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	50 0.4		W W/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	T_J, T_{STG}	-65 to +150		$^\circ\text{C}$

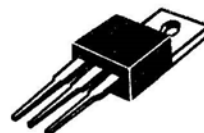
THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance Junction to Case	$R_{\theta jc}$	2.50	$^\circ\text{C/W}$

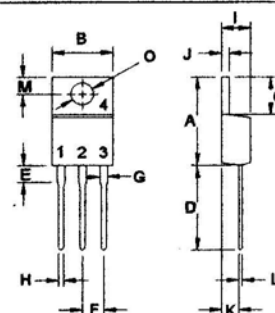


NPN	PNP
MJE15028	MJE15029
MJE15030	MJE15031

8.0 AMPERE
COMPLEMENTARY SILICON
POWER TRANSISTORS
120-150 Volts
50 Watts



TO-220



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

DIM	MILLIMETERS	
	MIN	MAX
A	14.68	16.00
B	9.78	10.42
C	5.02	6.60
D	13.00	14.62
E	3.10	4.19
F	2.41	2.67
G	1.10	1.67
H	0.69	1.01
I	3.21	4.98
J	1.14	1.40
K	2.20	3.30
L	0.28	0.61
M	2.48	3.00
O	3.50	4.00

MJE15028, MJE15030 NPN / MJE15029, MJE15031 PNP

ELECTRICAL CHARACTERISTICS ($T_c = 25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Min	Max	Unit
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OFF CHARACTERISTICS

Collector-Emitter Sustaining Voltage(1) ($I_c = 10\text{ mA}$, $I_B = 0$) MJE15028,MJE15029 MJE15030,MJE15031	$V_{CE(sus)}$	120 150		V
Collector Cutoff Current ($V_{CE} = 120\text{ V}$, $I_B = 0$) ($V_{CE} = 150\text{ V}$, $I_B = 0$) MJE15028,MJE15029 MJE15030,MJE15031	I_{CEO}		0.1 0.1	mA
Collector Cutoff Current ($V_{CB} = 120\text{ V}$, $I_E = 0$) ($V_{CB} = 150\text{ V}$, $I_E = 0$) MJE15028,MJE15029 MJE15030,MJE15031	I_{CBO}		10 10	μA
Emitter Cutoff Current ($V_{EB} = 5.0\text{ V}$, $I_C = 0$)	I_{EBO}		10	μA

ON CHARACTERISTICS (1)

DC Current Gain ($I_c = 0.1\text{ A}$, $V_{CE} = 2.0\text{ V}$) ($I_c = 2.0\text{ A}$, $V_{CE} = 2.0\text{ V}$) ($I_c = 3.0\text{ A}$, $V_{CE} = 2.0\text{ V}$) ($I_c = 4.0\text{ A}$, $V_{CE} = 2.0\text{ V}$)	h_{FE}	40 40 40 20		
Collector-Emitter Saturation Voltage ($I_c = 1.0\text{ A}$, $I_B = 0.1\text{ A}$)	$V_{CE(sat)}$		0.5	V
Base-Emitter On Voltage ($I_c = 1.0\text{ A}$, $V_{CE} = 2.0\text{ V}$)	$V_{BE(on)}$		1.0	V

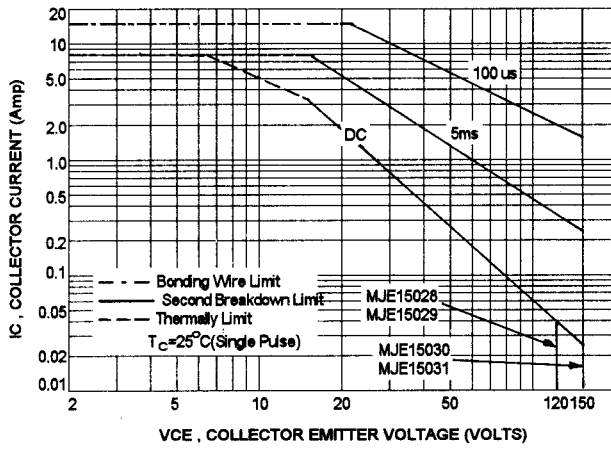
DYNAMIC CHARACTERISTICS

Current-Gain-Bandwidth Product (2) ($I_c = 0.5\text{ A}$, $V_{CE} = 10\text{ V}$, $f = 10\text{ MHz}$)	f_T	30		MHz
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(1) Pulse Test: Pulse width = $300\text{ }\mu\text{s}$, Duty Cycle $\leq 2.0\%$

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

FIG-2 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-2 and Fig-3 is base on $T_{J(PK)} = 150^\circ\text{C}$; T_C is variable depending on conditions. second breakdown pulse limits are valid for duty cycles to 10% provided $T_{J(PK)} \leq 150^\circ\text{C}$. 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-3 REVERSE BIASE SAFE OPERATING AREA

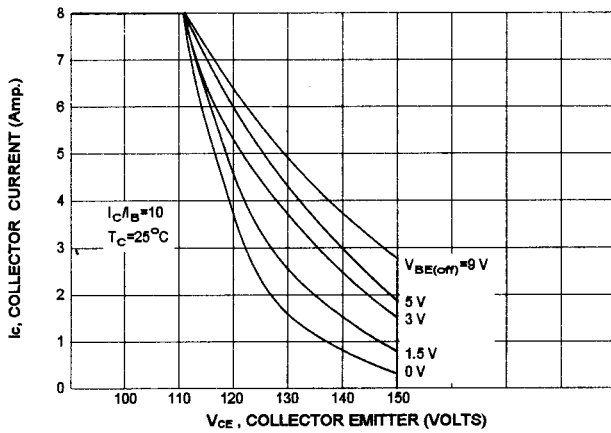


FIG-4 CAPACITANCES

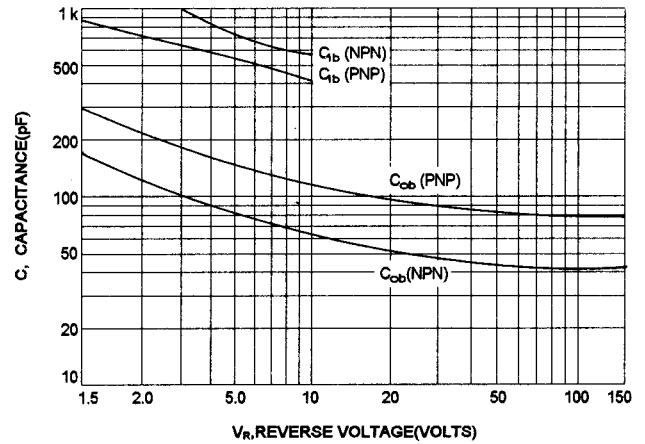


FIG-5 SMALL-SIGNAL CURRENT GAIN

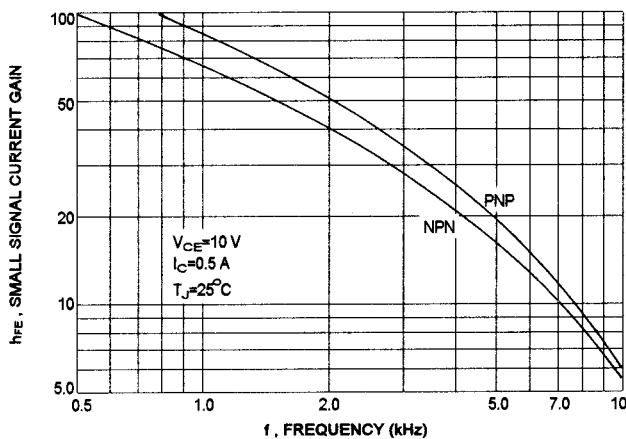


FIG-6 CURRENT GAIN- BANDWIDTH PRODUCT

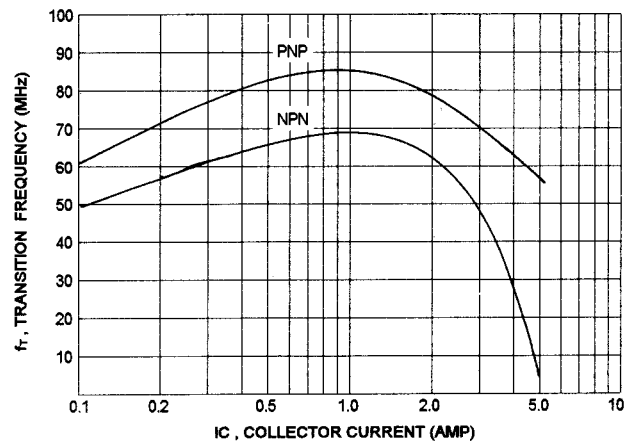


FIG-7 DC CURRENT GAIN

NPN- MJE15028, MJE15030

PNP- MJE15029, MJE15031

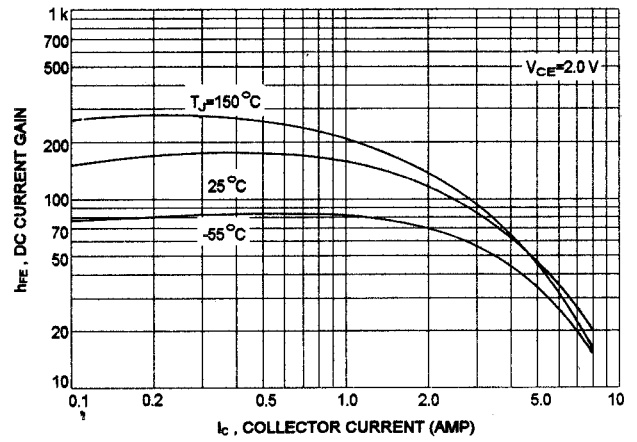
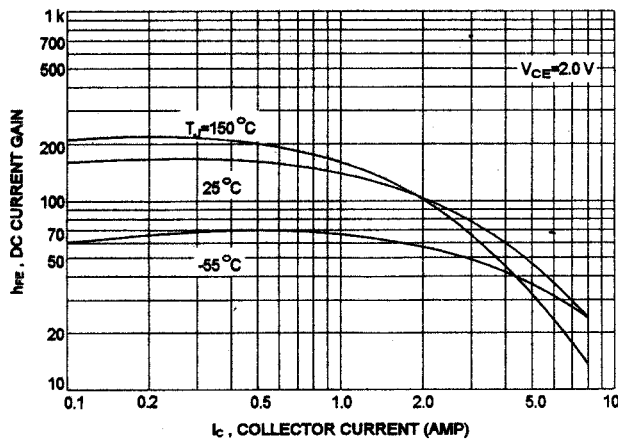


FIG-8 "ON" VOLTAGE

NPN-MJE15028, MJE15030

PNP-MJE15029, MJE15031

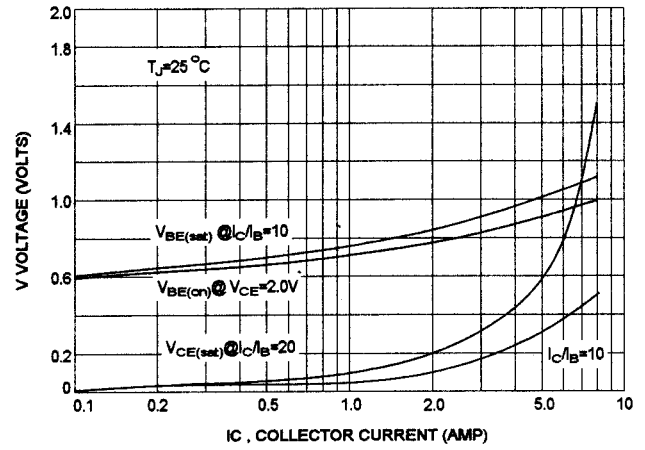
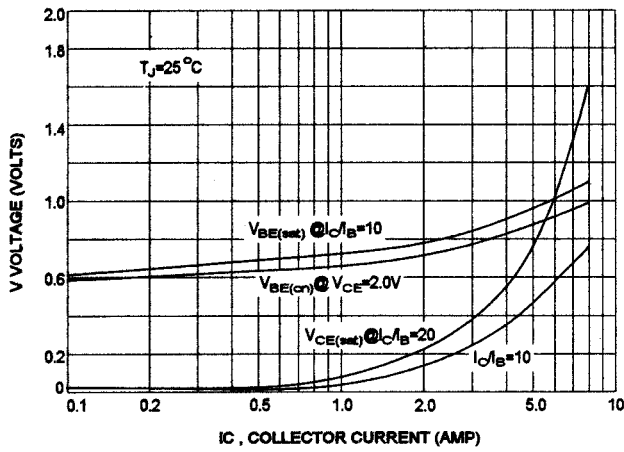


FIG-9 TURN-ON TIME

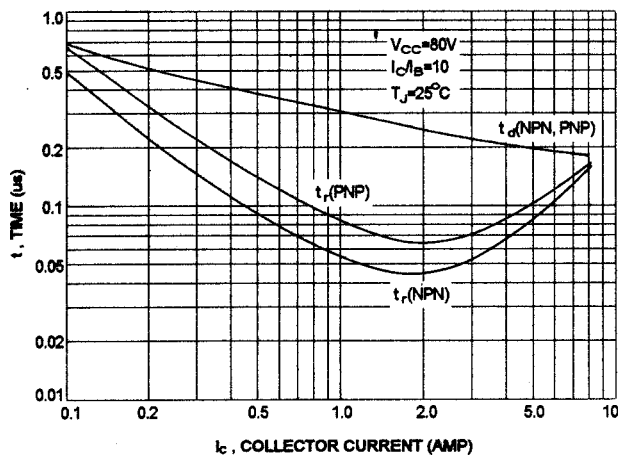
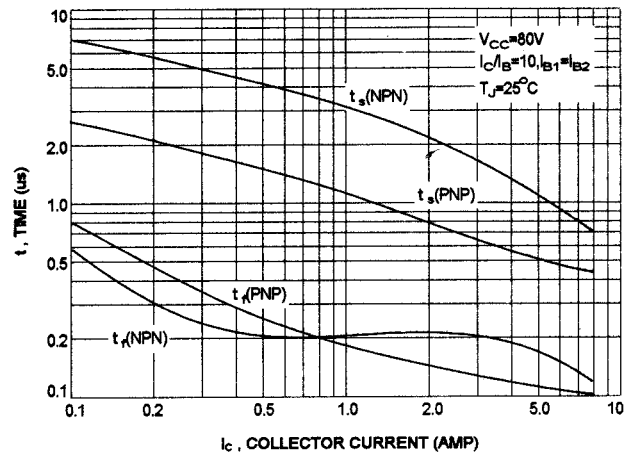


FIG-10 TURN-OFF TIME



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