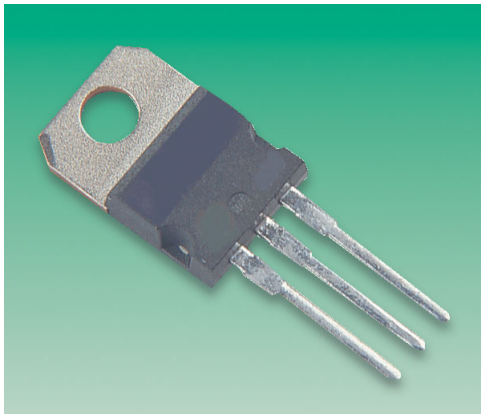
MJE15030, 15031

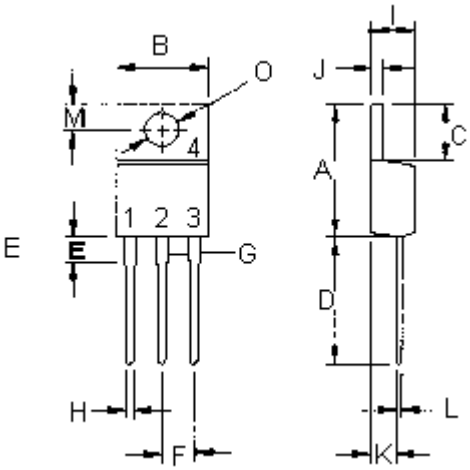
Complementary Power Transistors



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

Features:

- Collector-Emitter sustaining voltage-
  $V_{CEO(sus)}$ = 150V (Minimum) - MJE15030, MJE15031.
- DC current gain specified to 8.0 Amperes
  h_{FE} = 20 (Minimum) at I_C = 4.0A.
- TO-220AB compact package.



Pin 1. Base
2. Collector
3. Emitter
4. Collector(Case).

Dimensions	Minimum	Maximum
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

Dimensions : Millimetres

NPN	PNP
MJE15030	MJE15031

8.0 Ampere
Complementary Silicon
Power Transistors
150 Volts
50 Watts

TO-220

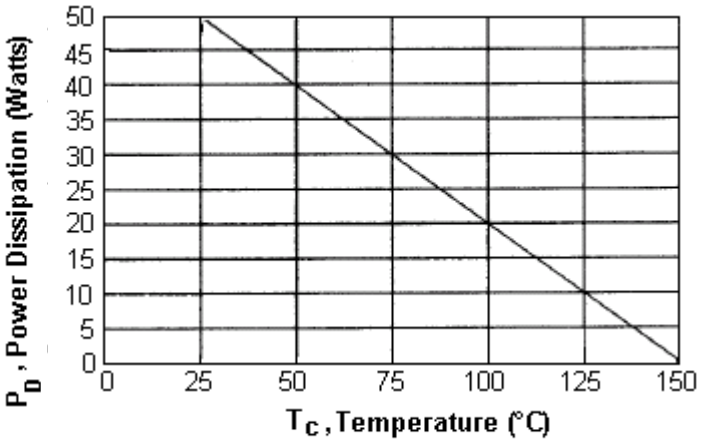
Maximum Ratings

Parameter	Symbol	Rating	Unit
Collector-Emitter Voltage	V_{CEO}	150	V
Collector-Base Voltage	V_{CBO}		
Emitter-Base Voltage	V_{EBO}	5.0	
Collector Current-Continuous -Peak	I_C	8.0 16	A
Base Current	I_B	2.0	
Total Power Dissipation at T_C = 25°C Derate above 25°C	P_D	50 0.4	W W/°C
Operating and Storage Junction Temperature Range	T_J, T_{STG}	-65 to +150	°C

Thermal Characteristic

Characteristic	Symbol	Maximum	Unit
Thermal Resistance Junction to Case	Rθjc	2.50	°C/W

Figure - 1 Power Derating



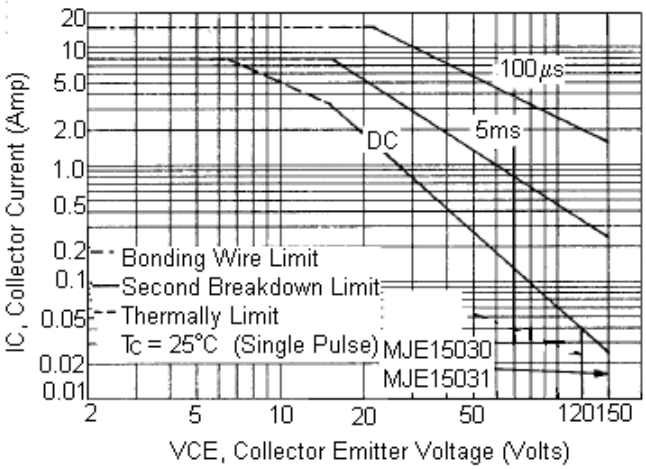
Electrical Characteristics (T_C = 25°C unless otherwise noted)

Parameter	Symbol	Minimum	Maximum	Unit
Off Characteristics				
Collector-Emitter Sustaining Voltage (1) (I_C = 10mA, I_B = 0)	$V_{CEO(sus)}$	150	-	V
Collector Cut off Current (V_{CE} = 150V, I_B = 0)	I_{CEO}	-	0.1	mA
Collector Cut off Current (V_{CB} = 150V, I_E = 0)	I_{CBO}	-	10	µA
Emitter Cut off Current (V_{EB} = 5.0V, I_C = 0)	I_{EBO}	-		
On Characteristics (1)				
DC Current Gain (I_C = 0.1A, V_{CE} = 2.0V) (I_C = 2.0A, V_{CE} = 2.0V) (I_C = 3.0A, V_{CE} = 2.0V) (I_C = 4.0A, V_{CE} = 2.0V)	h_{FE}	40 40 40 20	-	-
Collector-Emitter Saturation Voltage (I_C = 1.0A, I_B = 0.1A)	$V_{CE(sat)}$	-	0.5	V
Base-Emitter On Voltage (I_C = 1.0A, V_{CE} = 2.0V)	$V_{BE(on)}$	-	1.0	
Dynamic Characteristics				
Current Gain-Bandwidth Product (2) (I_C = 0.5A, V_{CE} = 10V, f = 1.0MHz)	f_T	30	-	MHz

(1) Pulse Test: Pulse Width = 300µs, Duty Cycle ≤2.0%.

(2) $f_T = |h_{FE}| \bullet f_{test.}$

Figure - 2 Active Region Safe Operating Area



There are two limitations 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 the curves indicate.
The data of Figure - 2 and Figure - 3 is based on $T_{J(PK)}$ = 150°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°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.

Figure - 3 Reverse Bias Safe Operating Area

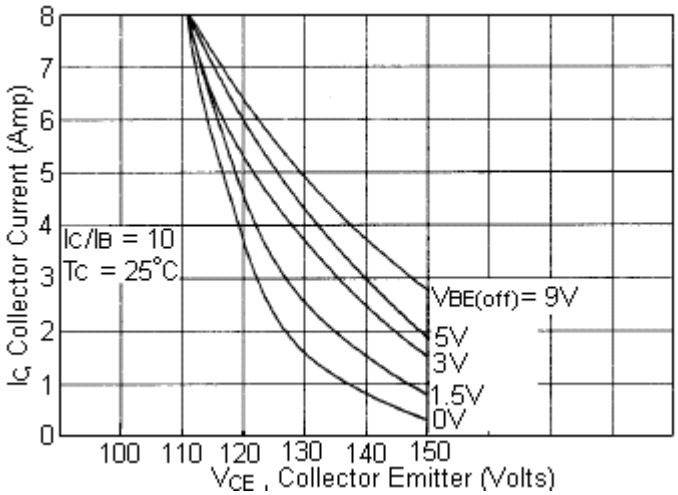


Figure - 4 Capacitances

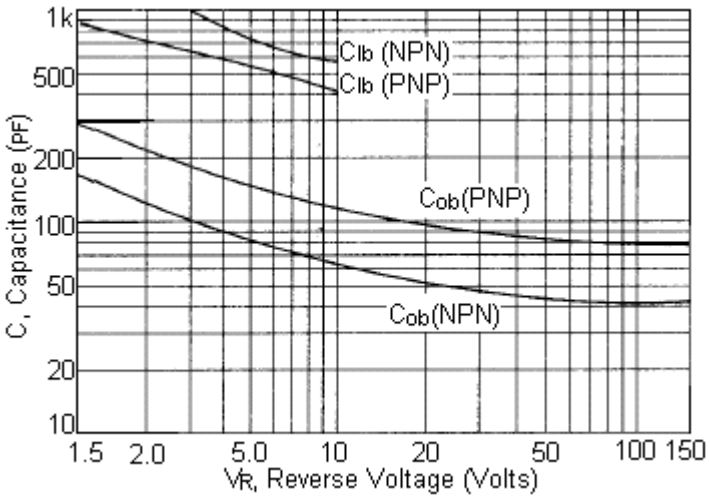


Figure - 5 Small Signal Current Gain

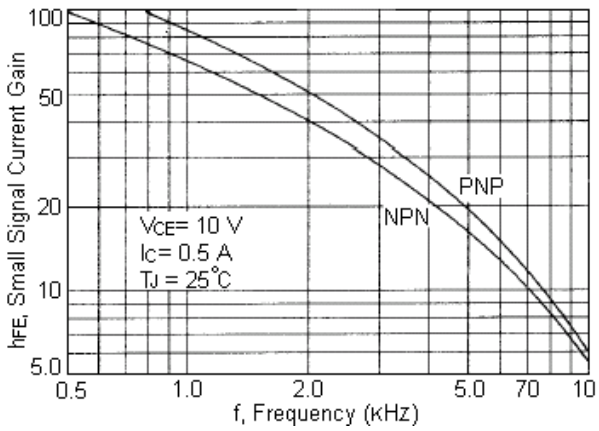


Figure - 6 Current Gain-Bandwidth Product

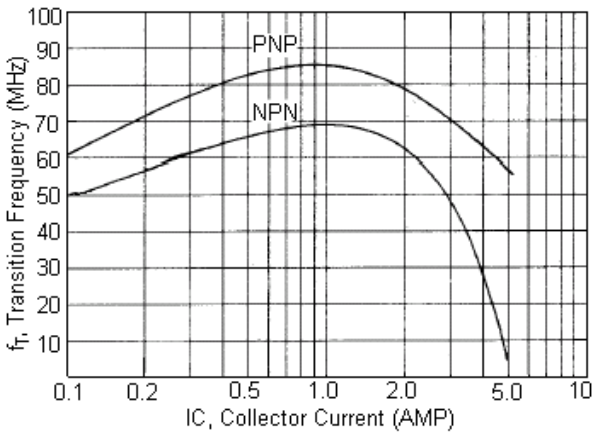
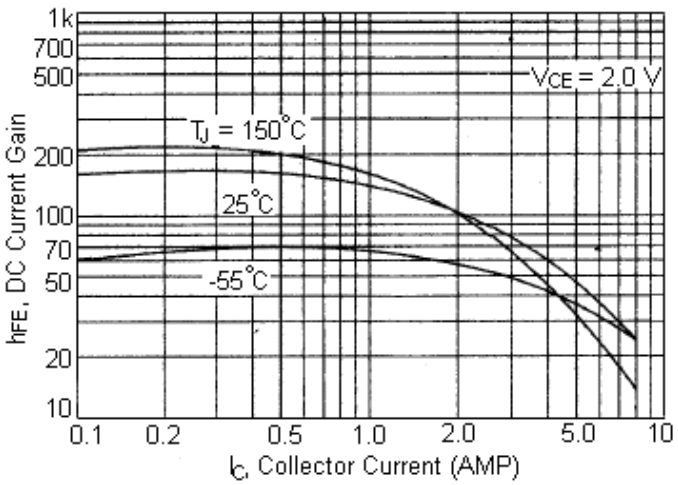


Figure - 7 DC Current Gain

NPN MJE15030



PNP MJE15031

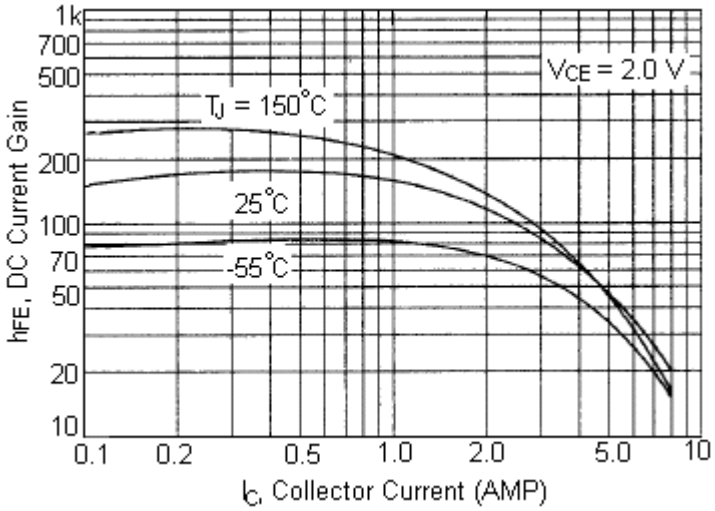
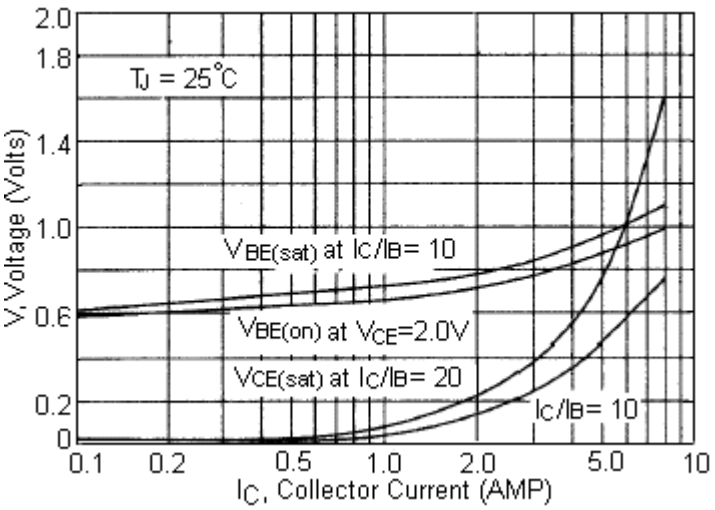


Figure - 8 “ON” Voltage

NPN MJE15030



PNP MJE15031

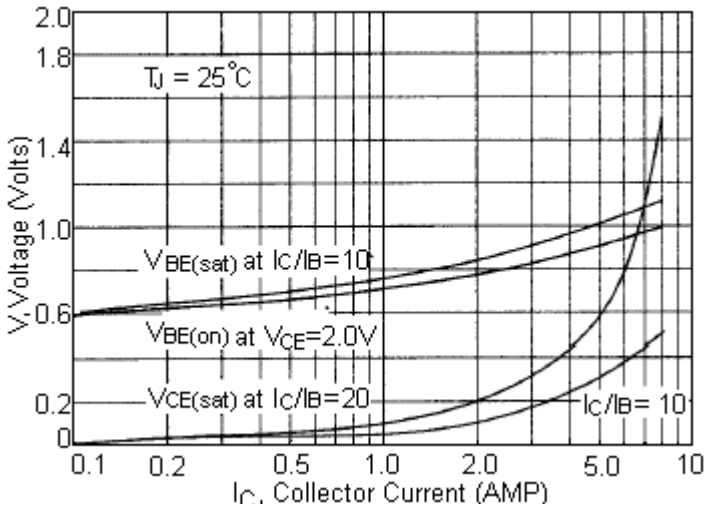


Figure - 9 Turn-On Time

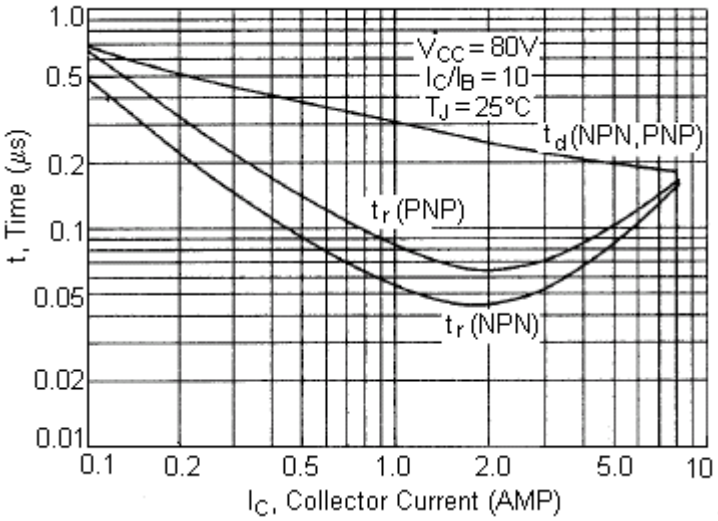
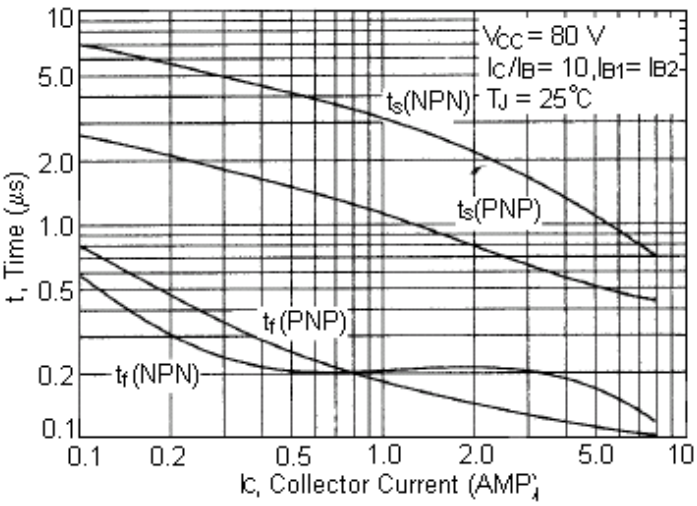


Figure - 10 Turn-Off Time



Specifications

$I_{C(av)}$ maximum (A)	V_{CEO} maximum (V)	h_{FE} minimum at I_C = 4A	P_{tot} at 25°C (W)	Package	Type	Part Number
8	150	20	50	TO-220	NPN	MJE15030
					PNP	MJE15031

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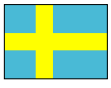

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