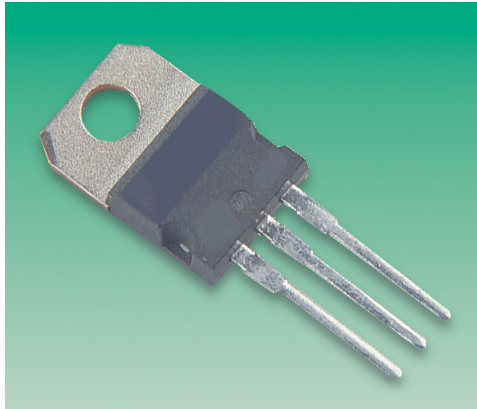


# MJE15030, 15031

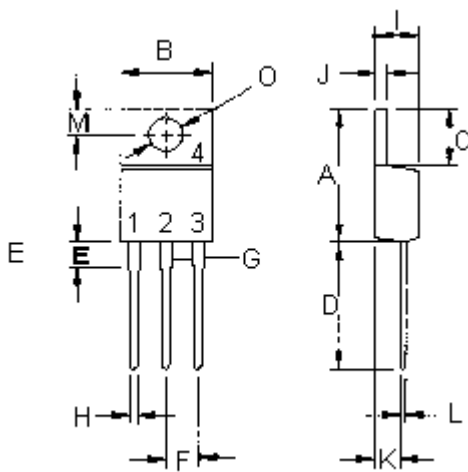
## Complementary Power Transistors



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.



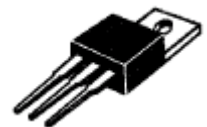
- Pin 1. Base  
2. Collector  
3. Emitter  
4. Collector(Case).

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 MJE15030	PNP MJE15031
-----------------	-----------------

8.0 Ampere  
Complementary Silicon  
Power Transistors  
150 Volts  
50 Watts



TO-220

# MJE15030,15031

## Complementary Power Transistors



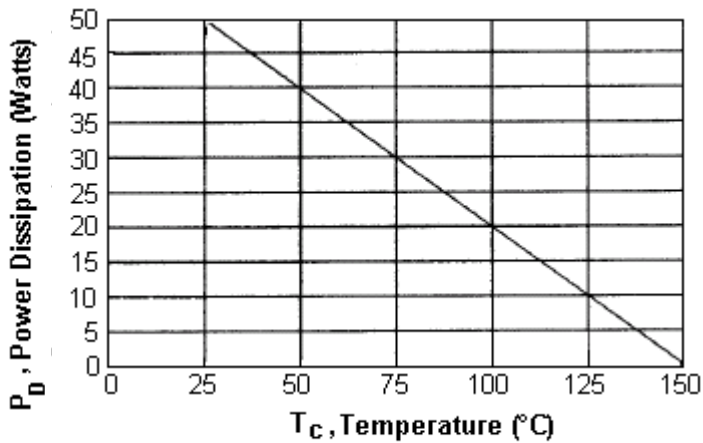
### Maximum Ratings

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 $T_C = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	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 Characteristic

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

Figure - 1 Power Derating



### Electrical Characteristics ( $T_C = 25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Minimum	Maximum	Unit
<b>Off Characteristics</b>				
Collector-Emitter Sustaining Voltage (1) ( $I_C = 10\text{mA}$ , $I_B = 0$ )	$V_{CEO(sus)}$	150	-	V
Collector Cut off Current ( $V_{CE} = 150\text{V}$ , $I_B = 0$ )	$I_{CEO}$	-	0.1	mA
Collector Cut off Current ( $V_{CB} = 150\text{V}$ , $I_E = 0$ )	$I_{CBO}$	-	10	$\mu\text{A}$
Emitter Cut off Current ( $V_{EB} = 5.0\text{V}$ , $I_C = 0$ )	$I_{EBO}$	-		

### 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	
<b>Dynamic Characteristics</b>				
Current Gain-Bandwidth Product (2) ( $I_C = 0.5\text{A}$ , $V_{CE} = 10\text{V}$ , $f = 1.0\text{MHz}$ )	$f_T$	30	-	MHz

(1) Pulse Test: Pulse Width =  $300\mu\text{s}$ , Duty Cycle  $\leq 2.0\%$ .

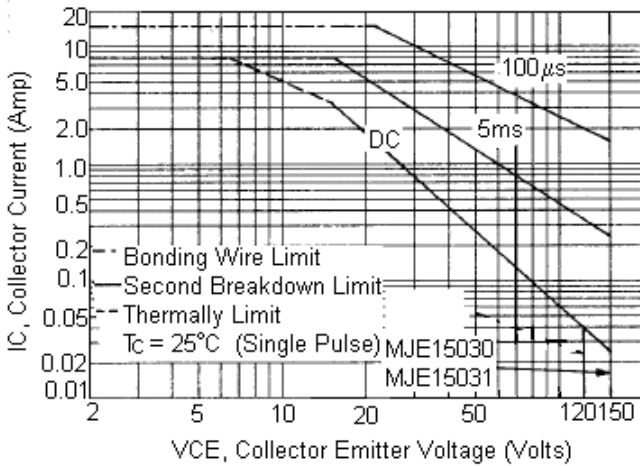
(2)  $f_T = |h_{FE}| \cdot f_{test}$ .

# MJE15030,15031

## Complementary Power Transistors



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  $T_{J(PK)} = 150^\circ\text{C}$ ;  $T_C$  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.

Figure - 3 Reverse Bias Safe Operating Area

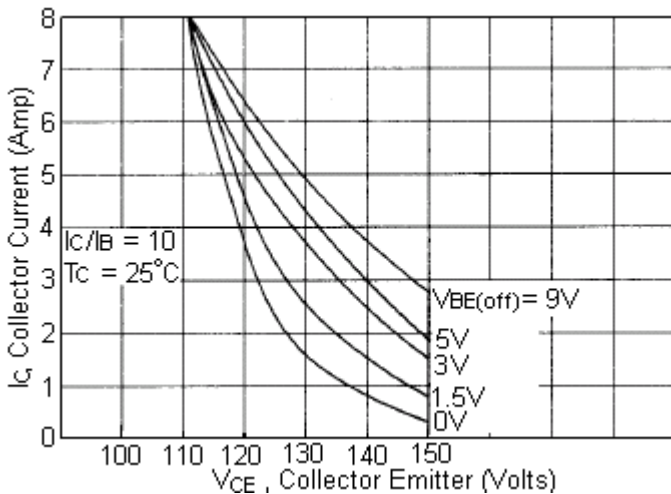


Figure - 4 Capacitances

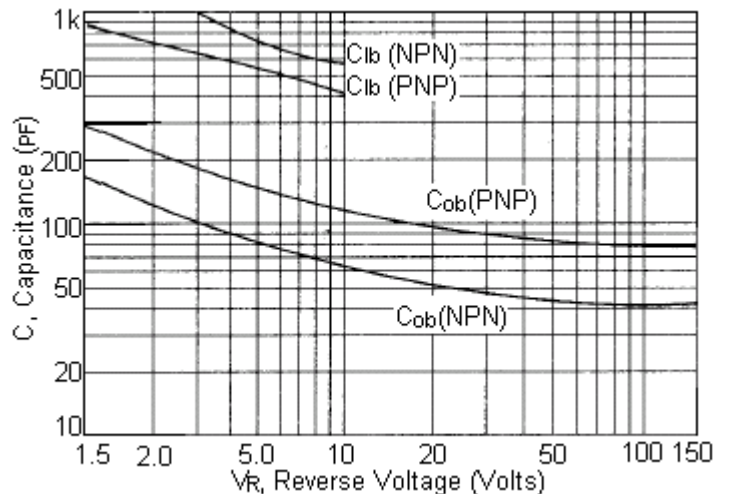


Figure - 5 Small Signal Current Gain

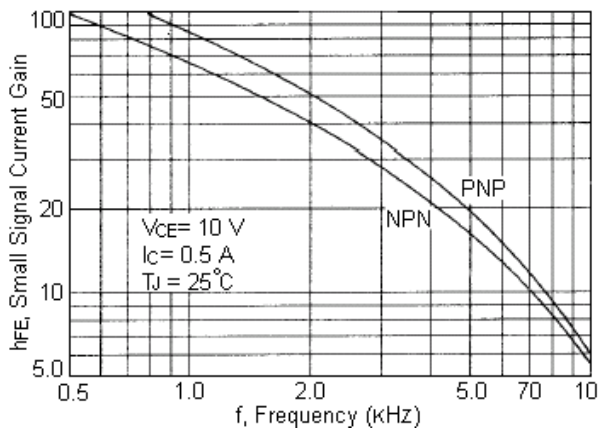
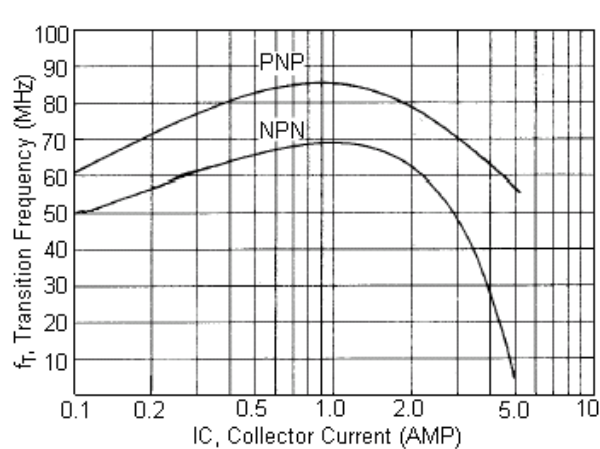


Figure - 6 Current Gain-Bandwidth Product



# MJE15030,15031

## Complementary Power Transistors



Figure - 7 DC Current Gain

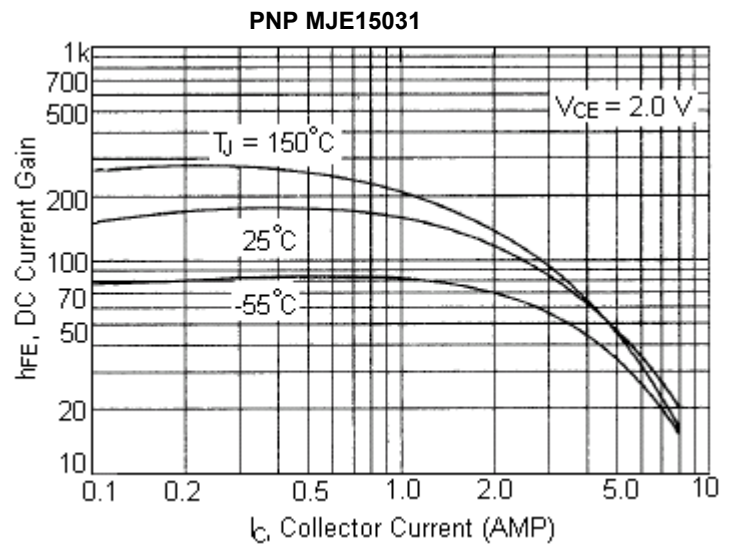
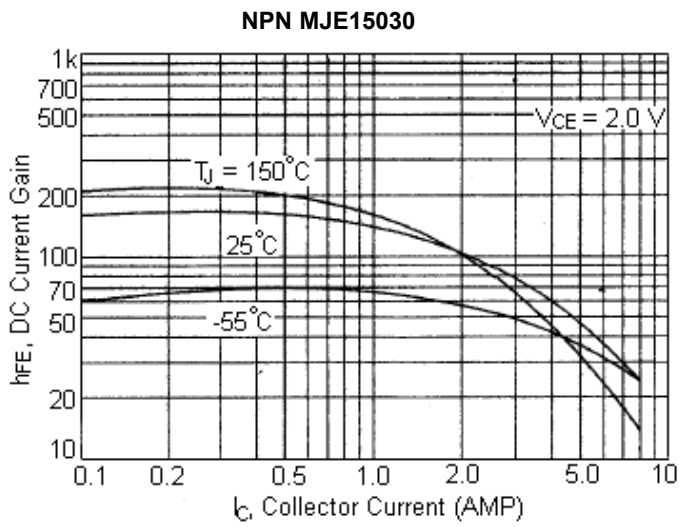


Figure - 8 "ON" Voltage

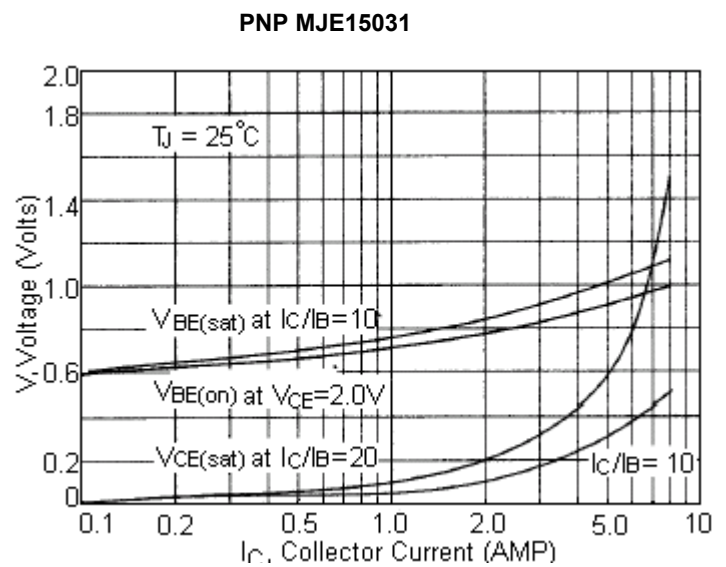
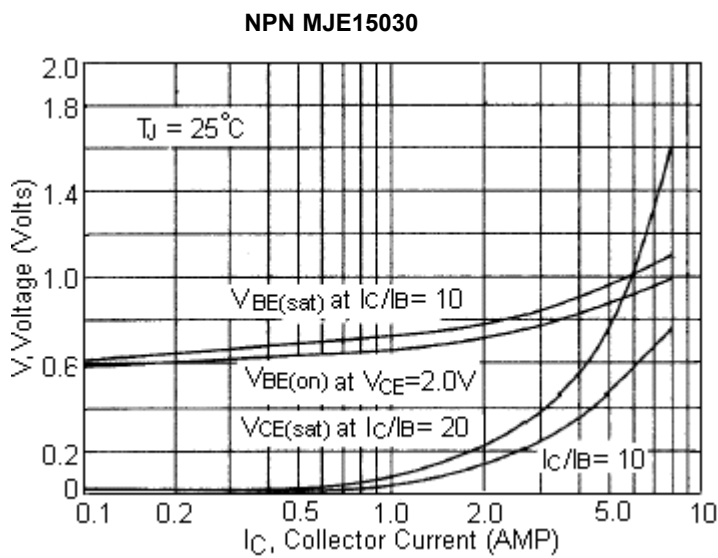


Figure - 9 Turn-On Time

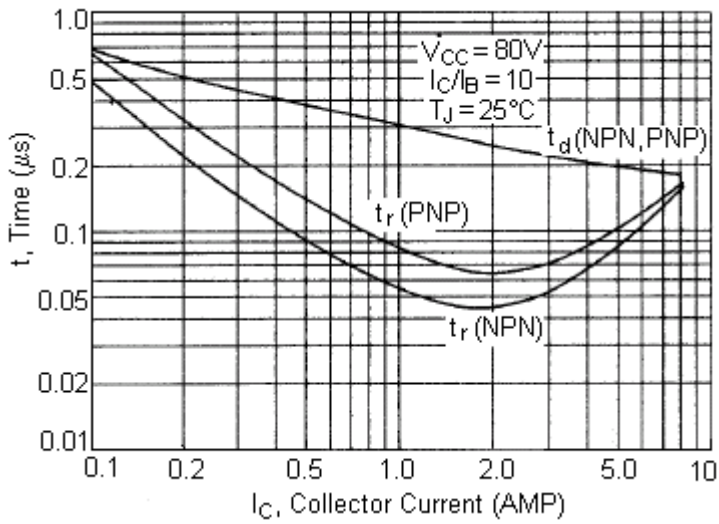
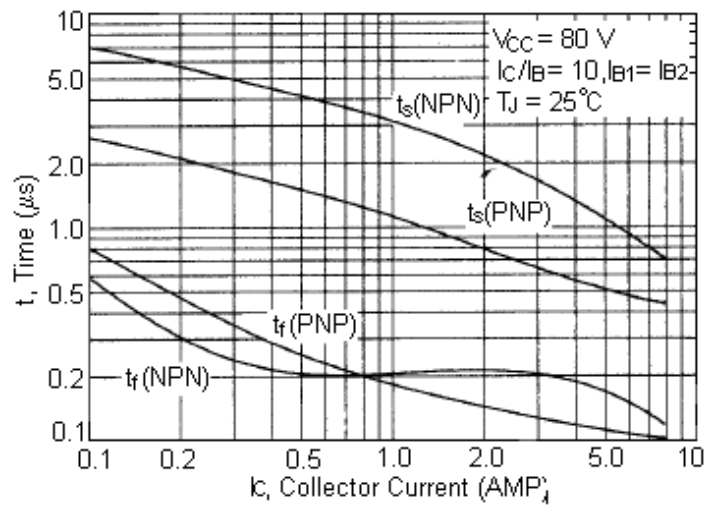


Figure - 10 Turn-Off Time



### Specifications

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

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