

# Complementary Silicon Plastic Power Transistors

Specifically designed for power audio output, or high power drivers in audio amplifiers.

- DC Current Gain Specified up to 8.0 Amperes at Temperature
- All On Characteristics at Temperature
- High SOA: 20 A, 18 V, 100 ms
- TO-247AE Package

## MAXIMUM RATINGS

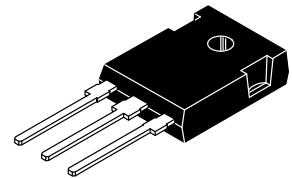
Rating	Symbol	MJW21191 MJW21192	Unit
Collector-Emitter Voltage	$V_{CE0}$	150	Vdc
Collector-Base Voltage	$V_{CB}$	150	Vdc
Emitter-Base Voltage	$V_{EB}$	5.0	Vdc
Collector Current — Continuous — Peak	$I_C$	8.0 16	Adc
Base Current	$I_B$	2.0	Adc
Total Power Dissipation @ $T_C = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	100 0.65	Watts $\text{W}/^\circ\text{C}$
Operating and Storage Junction Temperature Range	$T_J, T_{stg}$	-65 to +150	$^\circ\text{C}$

## THERMAL CHARACTERISTICS

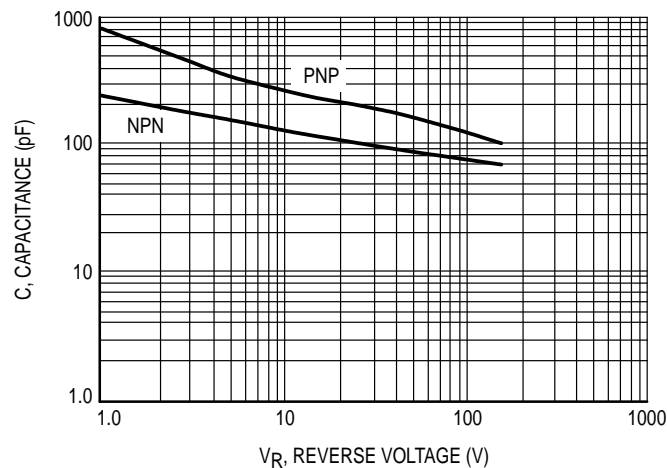
Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	0.65	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	50	$^\circ\text{C}/\text{W}$

**NPN**  
**MJW21192**  
**PNP**  
**MJW21191**

**8.0 AMPERES**  
**POWER TRANSISTORS**  
**COMPLEMENTARY**  
**SILICON**  
**150 VOLTS**  
**100 WATTS**



**CASE 340K-01**  
**TO-247AE**



**Figure 1. Typical Capacitance @  $25^\circ\text{C}$**

# MJW21192 MJW21191

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

Characteristic	Symbol	Min	Max	Unit
<b>OFF CHARACTERISTICS</b>				
Collector–Emitter Sustaining Voltage (1) ( $I_C = 10\text{ mAdc}$ , $I_B = 0$ )	$V_{CE(sus)}$	150	—	Vdc
Collector Cutoff Current ( $V_{CB} = 250\text{ Vdc}$ , $I_E = 0$ )	$I_{CES}$	—	10	$\mu\text{Adc}$
Emitter Cutoff Current ( $V_{BE} = 5.0\text{ Vdc}$ , $I_C = 0$ )	$I_{EBO}$	—	10	$\mu\text{Adc}$
<b>ON CHARACTERISTICS (1)</b>				
DC Current Gain ( $I_C = 4.0\text{ Adc}$ , $V_{CE} = 2.0\text{ Vdc}$ ) ( $I_C = 8.0\text{ Adc}$ , $V_{CE} = 2.0\text{ Vdc}$ )	$h_{FE}$	15 5.0	— —	— 100
Collector–Emitter Saturation Voltage ( $I_C = 4.0\text{ Adc}$ , $I_B = 0.4\text{ Adc}$ ) ( $I_C = 8.0\text{ Adc}$ , $I_B = 1.6\text{ Adc}$ )	$V_{CE(sat)}$	— —	1.0 2.0	Vdc
Base–Emitter On Voltage ( $I_C = 4.0\text{ Adc}$ , $V_{CE} = 2.0\text{ Vdc}$ )	$V_{BE(on)}$	—	2.0	Vdc
<b>DYNAMIC CHARACTERISTICS</b>				
Current Gain — Bandwidth Product (2) ( $I_C = 1.0\text{ Adc}$ , $V_{CE} = 10\text{ Vdc}$ , $f_{test} = 1.0\text{ MHz}$ )	$f_T$	4.0	—	MHz

- (1) Pulse Test: Pulse Width  $\leq 300\ \mu\text{s}$ , Duty Cycle  $\leq 2.0\%$ .  
 (2)  $f_T = |h_{fe}| \cdot f_{test}$ .

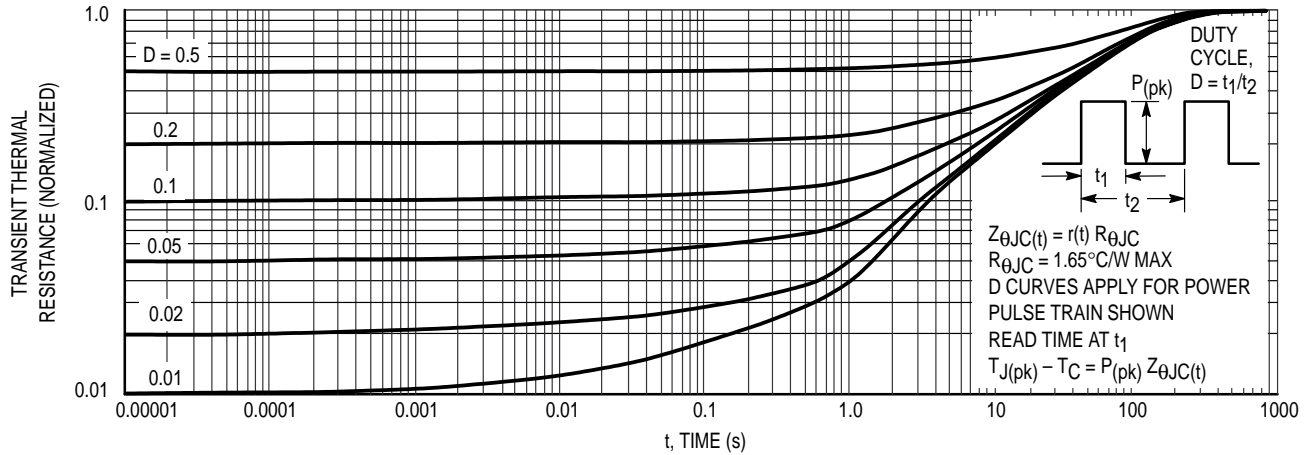


Figure 2. Thermal Response

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 Figures 3 and 4 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  $T_{J(pk)} < 150^\circ\text{C}$ .  $T_{J(pk)}$  may be calculated from the data in Figure 2. At high case temperatures, thermal limitations will reduce the power that can be handled to values less than the limitations imposed by second breakdown.

NPN — MJW21192

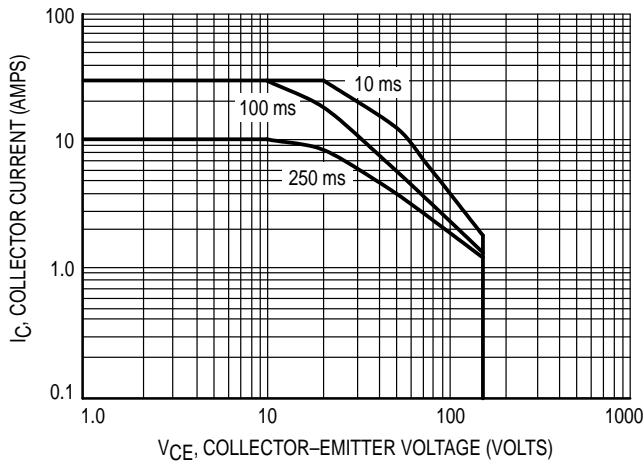


Figure 3. NPN — MJW21192  
Safe Operating Area

PNP — MJW21191

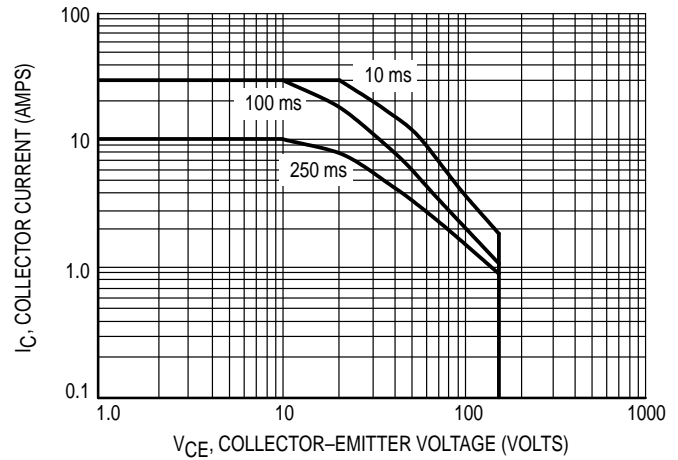


Figure 4. PNP — MJW21191  
Safe Operating Area

TYPICAL CHARACTERISTICS

NPN — MJW21192

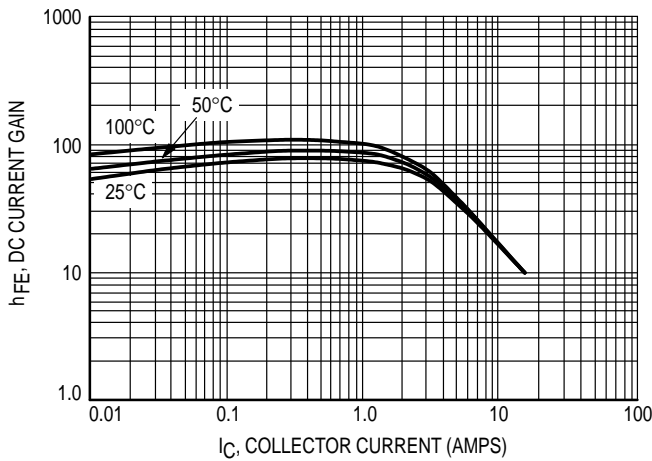


Figure 5. NPN — MJW21192  
 $V_{CE} = 2.0\text{ V}$  DC Current Gain

PNP — MJW21191

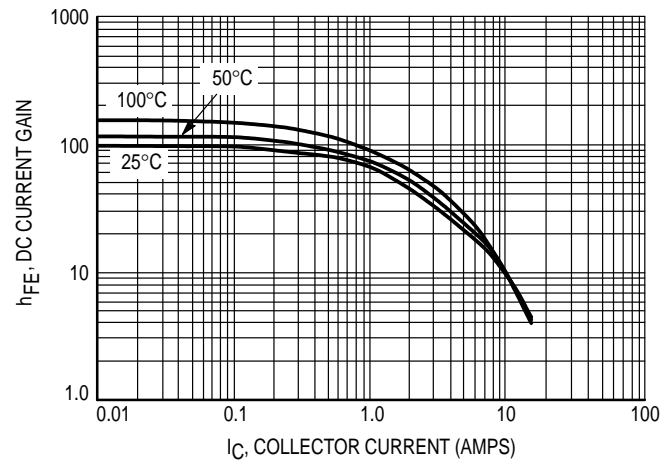


Figure 6. PNP — MJW21191  
 $V_{CE} = 2.0\text{ V}$  DC Current Gain

NPN — MJW21192

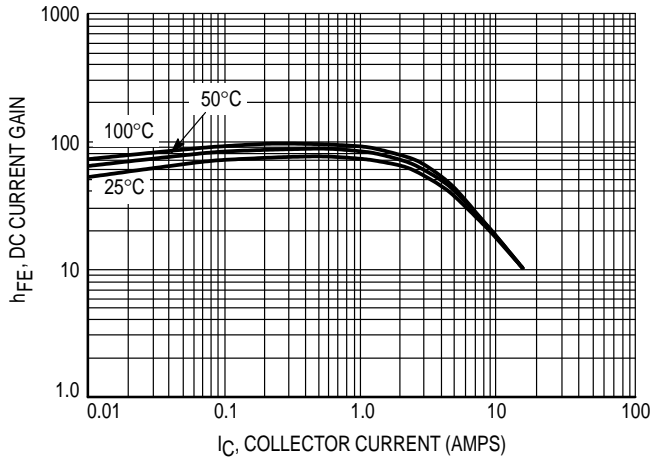


Figure 7. NPN — MJW21192  
VCE = 5.0 V DC Current Gain

PNP — MJW21191

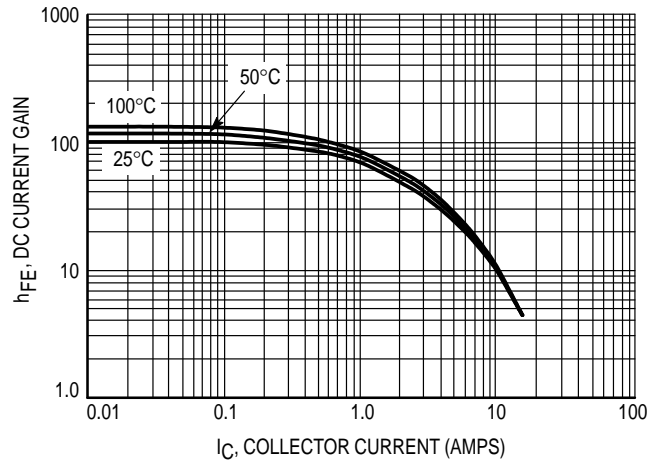


Figure 8. PNP — MJW21191  
VCE = 5.0 V DC Current Gain

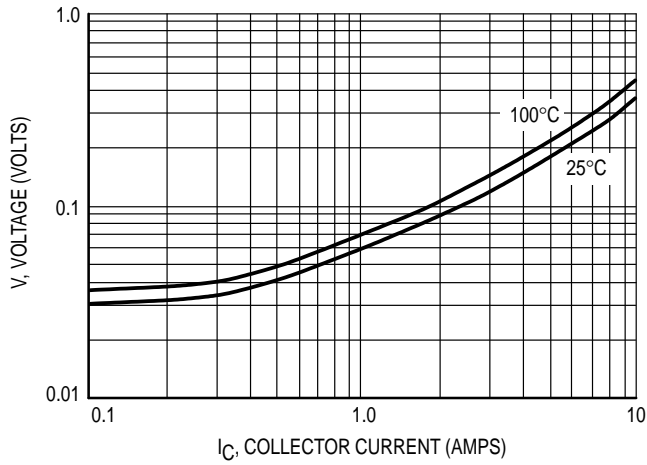


Figure 9. NPN — MJW21192  
VCE(sat) IC/IB = 5.0

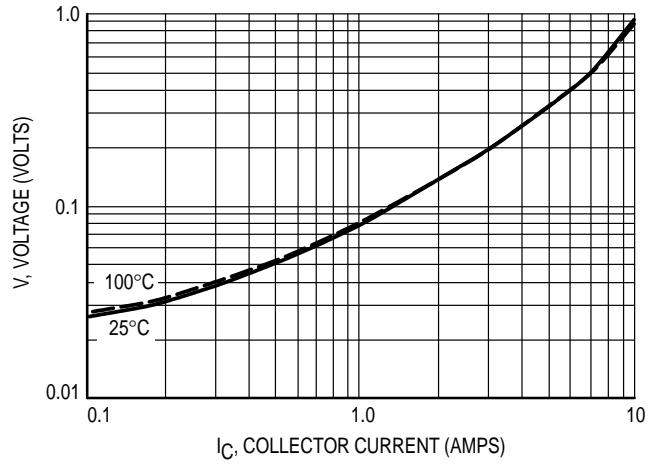


Figure 10. PNP — MJW21191  
VCE(sat) IC/IB = 5.0

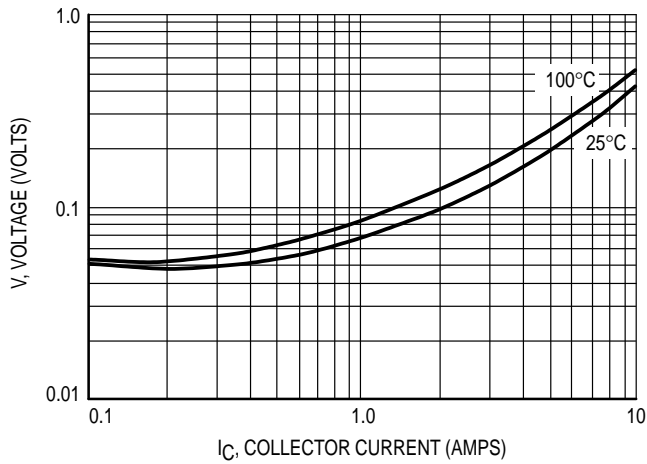


Figure 11. NPN — MJW21192  
VCE(sat) IC/IB = 10

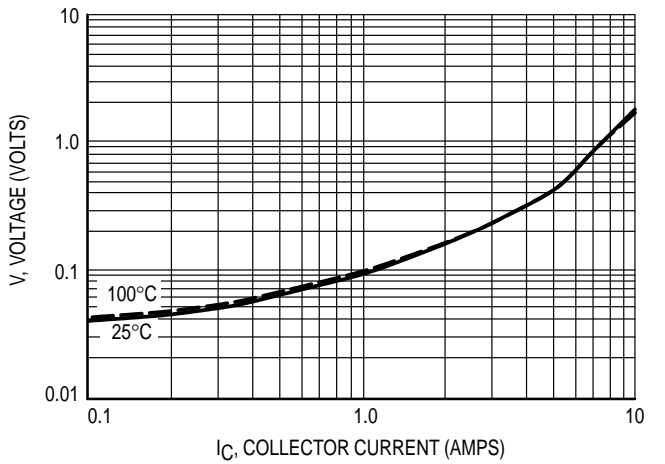


Figure 12. PNP — MJW21191  
VCE(sat) IC/IB = 10

NPN — MJW21192

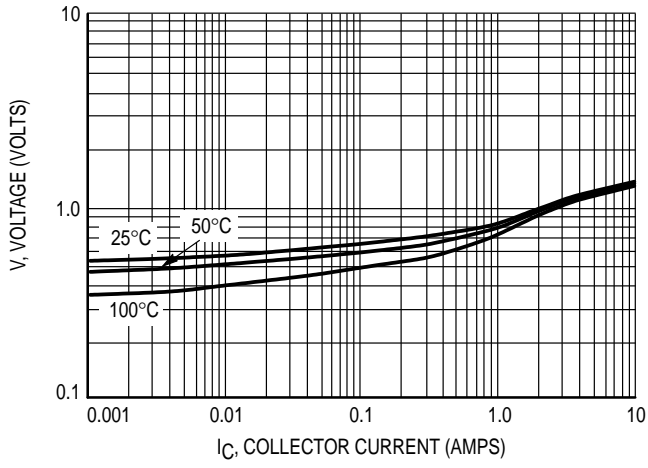


Figure 13. NPN — MJW21192  
 $V_{CE} = 2.0\text{ V } V_{BE(on)}$  Curve

PNP — MJW21191

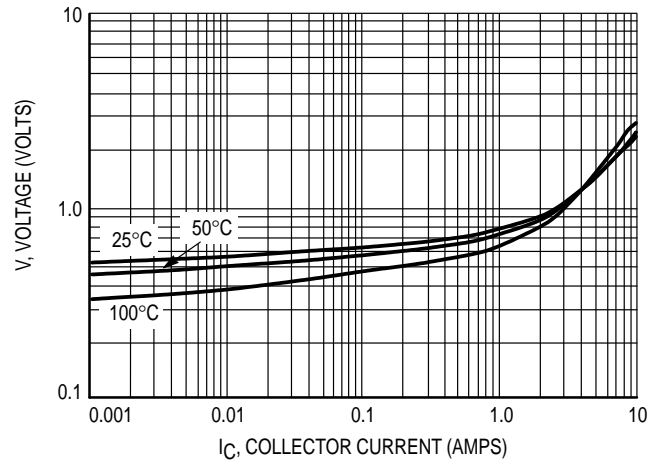
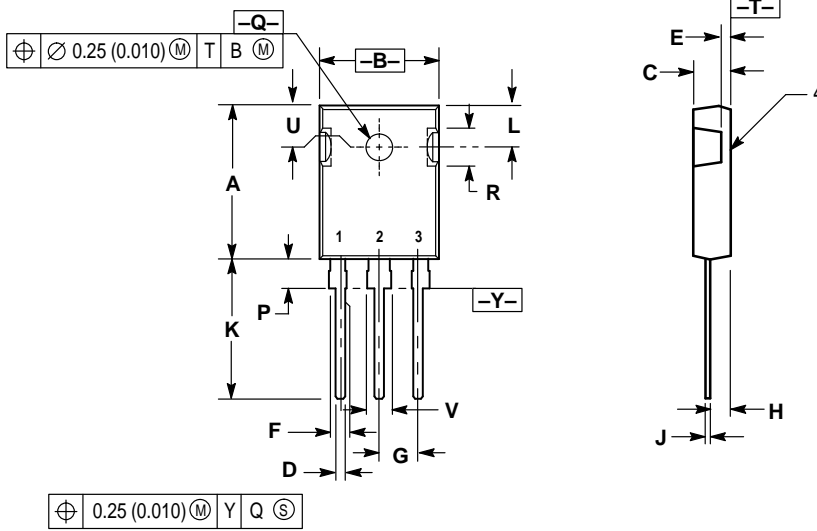


Figure 14. PNP — MJW21191  
 $V_{CE} = 2.0\text{ V } V_{BE(on)}$  Curve


PACKAGE DIMENSIONS



- NOTES:  
 1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.  
 2. CONTROLLING DIMENSION: MILLIMETER.

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	19.7	20.3	0.776	0.799
B	15.3	15.9	0.602	0.626
C	4.7	5.3	0.185	0.209
D	1.0	1.4	0.039	0.055
E	1.27 REF		0.050 REF	
F	2.0	2.4	0.079	0.094
G	5.5 BSC		0.216 BSC	
H	2.2	2.6	0.087	0.102
J	0.4	0.8	0.016	0.031
K	14.2	14.8	0.559	0.583
L	5.5 NOM		0.217 NOM	
P	3.7	4.3	0.146	0.169
Q	3.55	3.65	0.140	0.144
R	5.0 NOM		0.197 NOM	
U	5.5 BSC		0.217 BSC	
V	3.0	3.4	0.118	0.134

CASE 340K-03  
 (TO-247AE)  
 ISSUE A

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**USA/EUROPE/Locations Not Listed:** Motorola Literature Distribution;  
P.O. Box 5405, Denver, Colorado 80217. 303-675-2140 or 1-800-441-2447

**JAPAN:** Nippon Motorola Ltd.: SPD, Strategic Planning Office, 4-32-1,  
Nishi-Gotanda, Shinagawa-ku, Tokyo 141, Japan. 81-3-5487-8488

**Mfax™:** RMFAX0@email.sps.mot.com – TOUCHTONE 602-244-6609  
– US & Canada ONLY 1-800-774-1848

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51 Ting Kok Road, Tai Po, N.T., Hong Kong. 852-26629298

**INTERNET:** <http://motorola.com/sps>



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