

# 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	$V_{CEO}$	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 $25^\circ\text{C}$	$P_D$	125 0.65	Watts 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	$R_{\theta JC}$	1.0	$^\circ\text{C/W}$
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	50	$^\circ\text{C/W}$

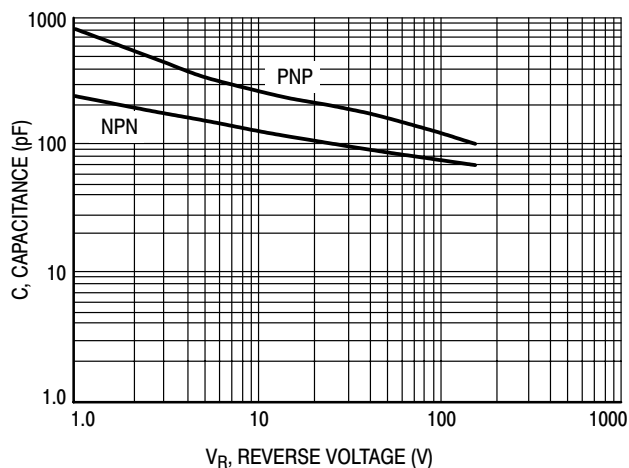


Figure 1. Typical Capacitance @ 25°C

**NPN**  
**MJW21192**

**PNP**  
**MJW21191**

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

**TO-247**  
**CASE 340K**  
**STYLE 3**

**MARKING DIAGRAM**

1 BASE      3 EMITTER  
2 COLLECTOR

MJW2119x = Device Code  
x            = 1 or 2  
LL          = Location Code  
Y            = Year  
WW        = Work Week

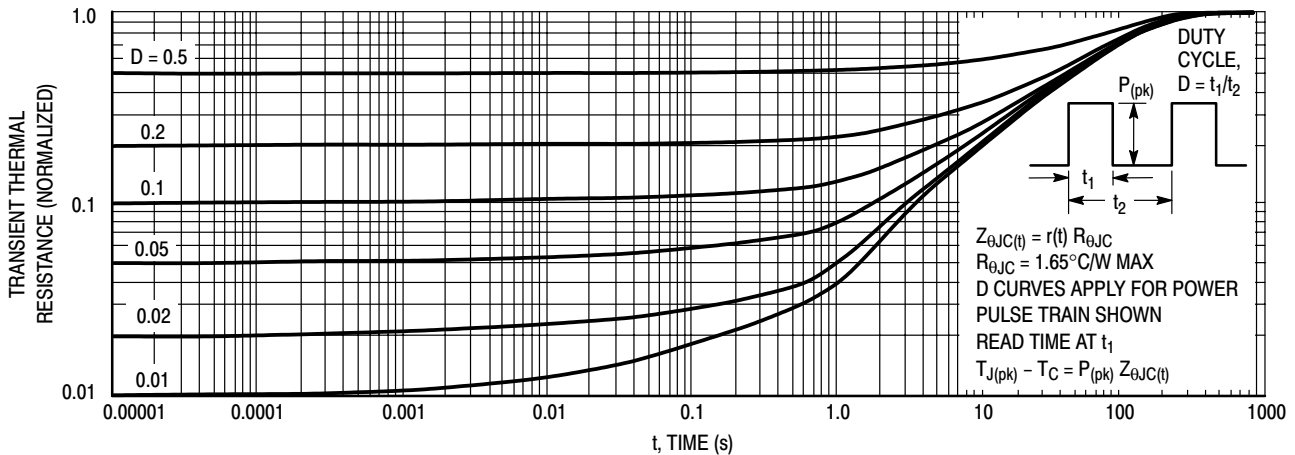
# MJW21192 MJW21191

## 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**

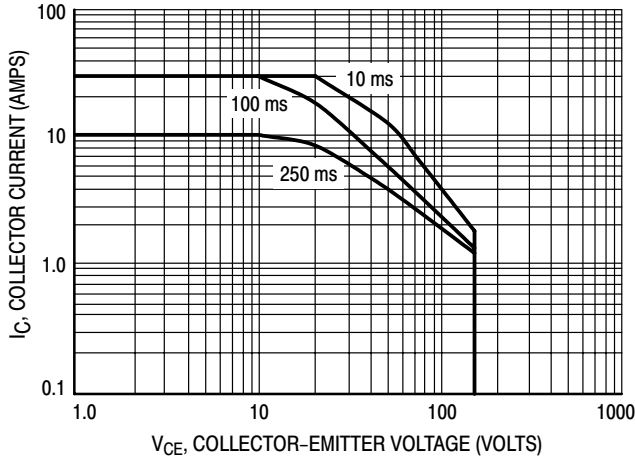
There are two limitations on the power handling ability of a transistor: average junction temperature and second breakdown. Safe operating area curves indicate  $I_C - V_{CE}$  limits of the transistor that must be observed for reliable operation, i.e., the transistor must not be subjected to greater 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.

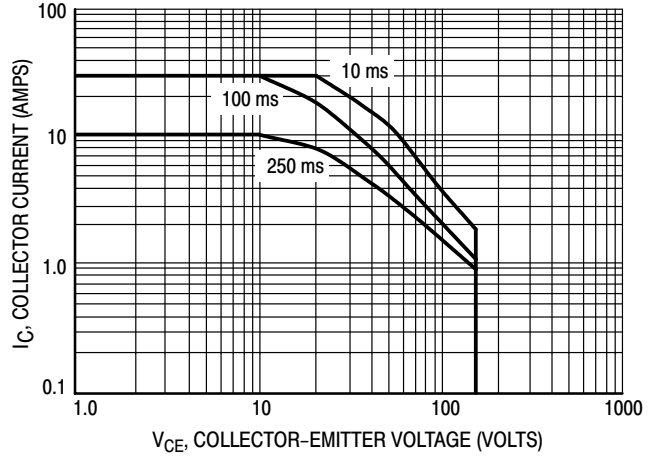
# MJW21192 MJW21191

**NPN — MJW21192**



**Figure 3. NPN — MJW21192  
Safe Operating Area**

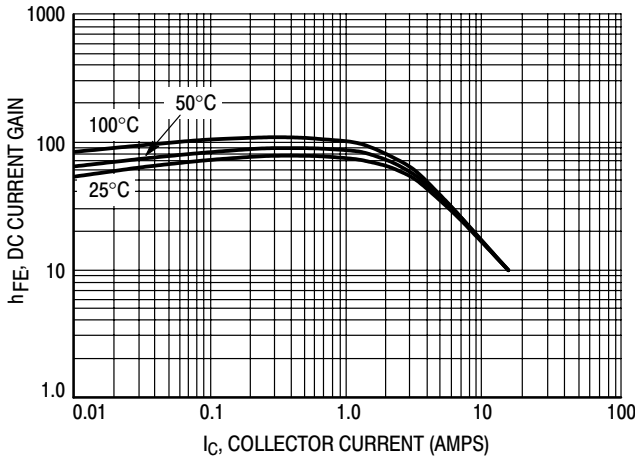
**PNP — MJW21191**



**Figure 4. PNP — MJW21191  
Safe Operating Area**

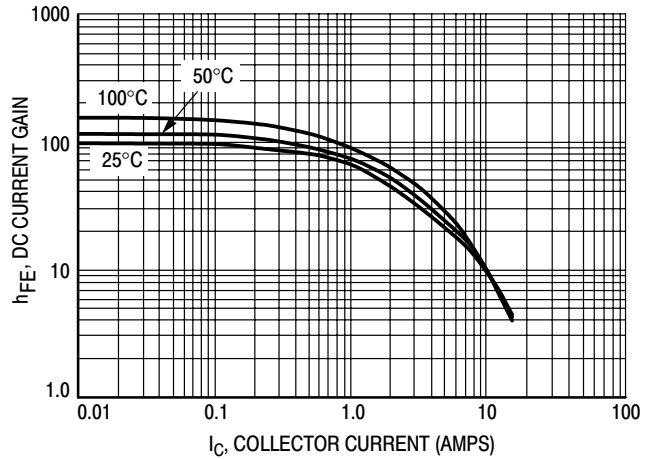
## TYPICAL CHARACTERISTICS

**NPN — MJW21192**



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

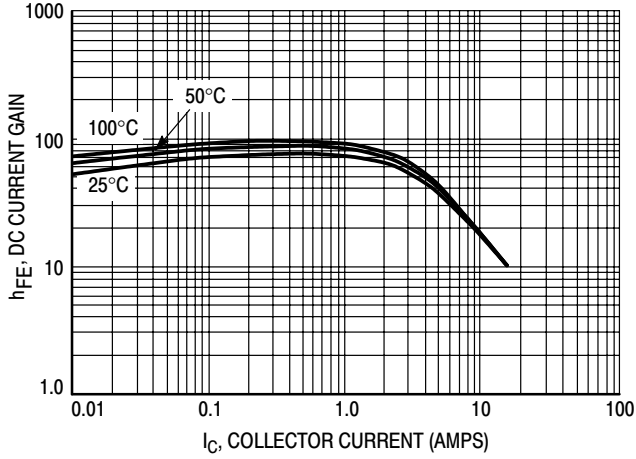
**PNP — MJW21191**



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

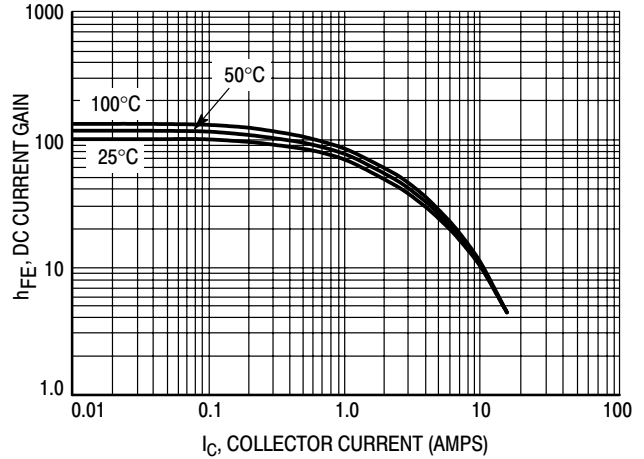
# MJW21192 MJW21191

**NPN — MJW21192**

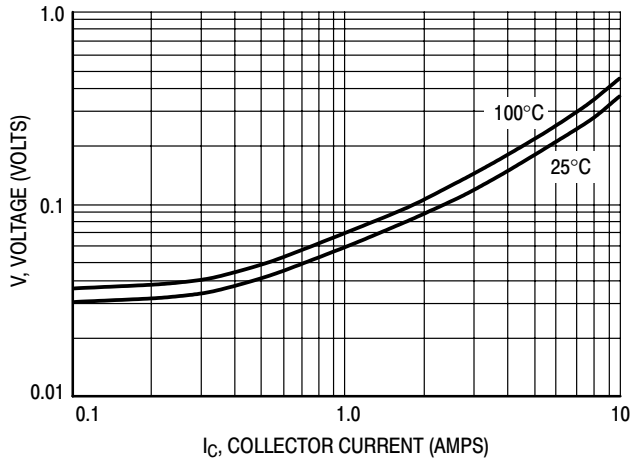


**Figure 7. NPN — MJW21192**  
 **$V_{CE} = 5.0$  V DC Current Gain**

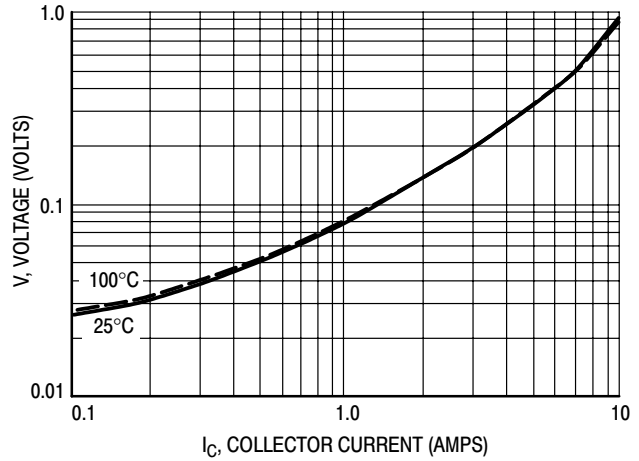
**PNP — MJW21191**



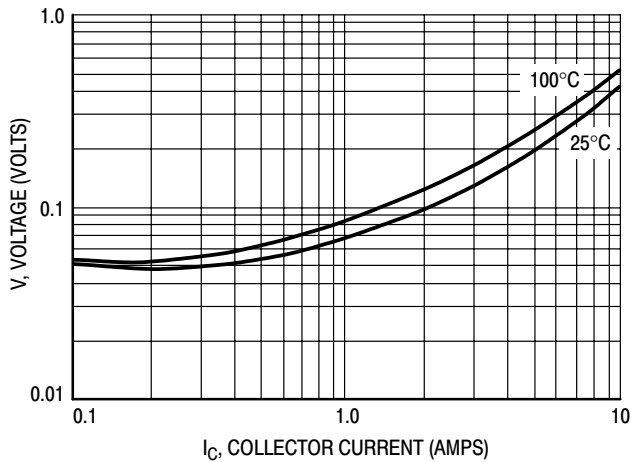
**Figure 8. PNP — MJW21191**  
 **$V_{CE} = 5.0$  V DC Current Gain**



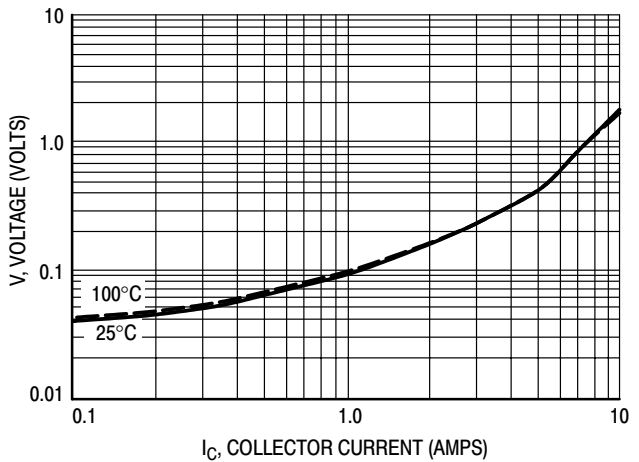
**Figure 9. NPN — MJW21192**  
 **$V_{CE(sat)}$   $I_C/I_B = 5.0$**



**Figure 10. PNP — MJW21191**  
 **$V_{CE(sat)}$   $I_C/I_B = 5.0$**



**Figure 11. NPN — MJW21192**  
 **$V_{CE(sat)}$   $I_C/I_B = 10$**



**Figure 12. PNP — MJW21191**  
 **$V_{CE(sat)}$   $I_C/I_B = 10$**

# MJW21192 MJW21191

NPN — MJW21192

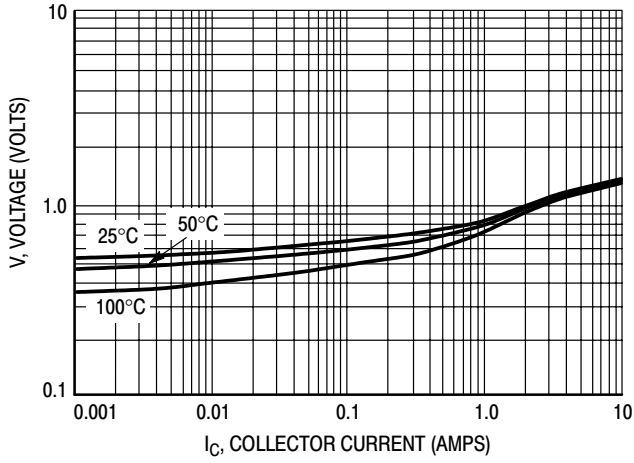


Figure 13. NPN — MJW21192  
 $V_{CE} = 2.0 \text{ V } V_{BE(on)}$  Curve

PNP — MJW21191

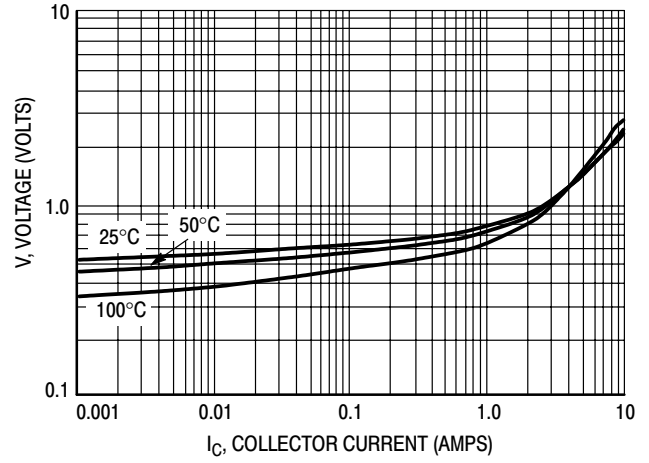



Figure 14. PNP — MJW21191  
 $V_{CE} = 2.0 \text{ V } V_{BE(on)}$  Curve

# Notes

# Notes

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