

MJF31C* (NPN), MJF32C* (PNP)

*Preferred Devices

Complementary Silicon Plastic Power Transistors for Isolated Package Applications

Designed for use in general purpose amplifier and switching applications.

- Collector-Emitter Saturation Voltage –
 $V_{CE(sat)} = 1.2 \text{ Vdc (Max) @ } I_C = 3.0 \text{ Adc}$
- Collector-Emitter Sustaining Voltage –
 $V_{CEO(sus)} = 100 \text{ Vdc (Min)}$
- High Current Gain – Bandwidth Product
 $f_T = 3.0 \text{ MHz (Min) @ } I_C = 500 \text{ mAdc}$
- UL Recognized, File #E69369, to 3500 V_{RMS} Isolation

MAXIMUM RATINGS

Rating	Symbol	MJF31C MJF32C	Unit
Collector-Emitter Voltage	V_{CEO}	100	Vdc
Collector-Base Voltage	V_{CB}	100	Vdc
Emitter-Base Voltage	V_{EB}	5.0	Vdc
Collector Current Continuous Peak	I_C	3.0 5.0	Adc
Base Current	I_B	1.0	Adc
Total Power Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	28 0.22	Watts W/ $^\circ\text{C}$
Total Power Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	2.0 0.016	Watts W/ $^\circ\text{C}$
Unclamped Inductive Load Energy (Note 1)	E	32	mJ
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-65 to +150	$^\circ\text{C}$

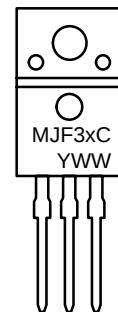
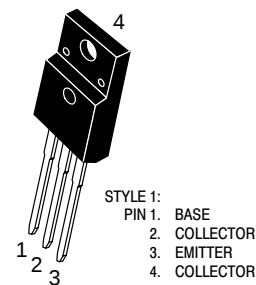
1. $I_C = 1.8 \text{ A}$, $L = 20 \text{ mH}$, $P.R.F. = 10 \text{ Hz}$, $V_{CC} = 10 \text{ V}$, $R_{BE} = 100 \Omega$.



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**3.0 AMPERE
POWER TRANSISTORS
COMPLEMENTARY
SILICON
100 VOLTS
28 WATTS**



**TO-220 FULLPAK
CASE 221D-02**

MJF3xC = Specific Device Code

x = 1 or 2

Y = Year

WW = Work Week

ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 6 of this data sheet.

Preferred devices are recommended choices for future use and best overall value.

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THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	62.5	$^{\circ}\text{C/W}$
Thermal Resistance, Junction to Case	$R_{\theta JC}$	4.46	$^{\circ}\text{C/W}$

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 (Note 2) ($I_C = 30\text{ mAdc}$, $I_B = 0$)	$V_{CEO(sus)}$	100	–	Vdc
Collector Cutoff Current ($I_C = 3.0\text{ Adc}$, $V_{CE} = 4.0\text{ Vdc}$)	I_{CEO}	–	0.3	mAdc
Collector Cutoff Current	I_{CES}	–	200	μAdc
Emitter Cutoff Current ($V_{BE} = 5.0\text{ Vdc}$, $I_C = 0$)	I_{EBO}	–	1.0	mAdc

ON CHARACTERISTICS (Note 2)

DC Current Gain ($I_C = 1.0\text{ Adc}$, $V_{CE} = 4.0\text{ Vdc}$) ($I_C = 3.0\text{ Adc}$, $V_{CE} = 4.0\text{ Vdc}$)	h_{FE}	25 10	– 50	–
Collector–Emitter Saturation Voltage ($I_C = 3.0\text{ Adc}$, $I_B = 375\text{ mAdc}$)	$V_{CE(sat)}$	–	1.2	Vdc
Base–Emitter On Voltage ($I_C = 3.0\text{ Adc}$, $V_{CE} = 4.0\text{ Vdc}$)	$V_{BE(on)}$	–	1.8	Vdc

DYNAMIC CHARACTERISTICS

Current–Gain – Bandwidth Product ($I_C = 500\text{ mAdc}$, $V_{CE} = 10\text{ Vdc}$, $f_{test} = 1.0\text{ MHz}$)	f_T	3.0	–	MHz
Small–Signal Current Gain ($I_C = 0.5\text{ Adc}$, $V_{CE} = 10\text{ Vdc}$, $f = 1.0\text{ kHz}$)	h_{fe}	20	–	–

2. Pulse Test: Pulse Width $\leq 300\text{ }\mu\text{s}$, Duty Cycle $\leq 2.0\%$.

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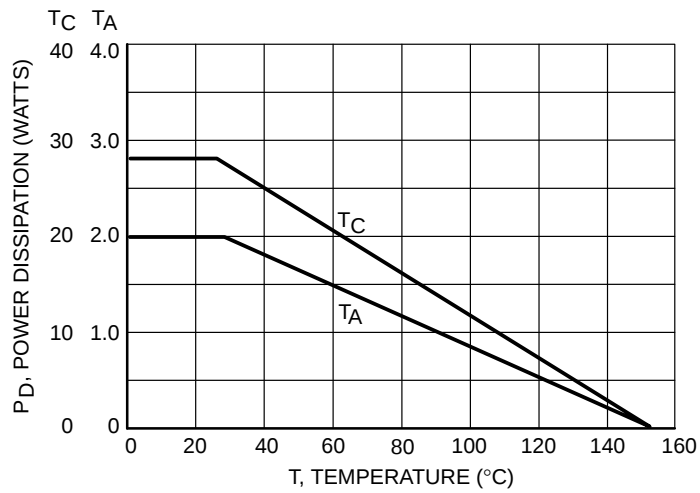


Figure 1. Power Derating

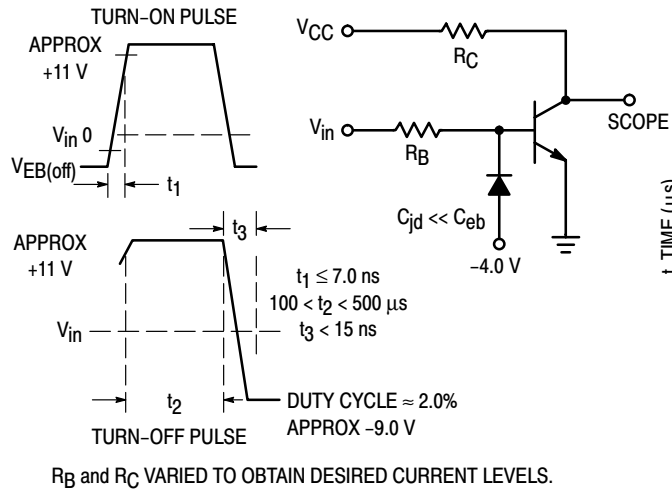


Figure 2. Switching Time Equivalent Circuit

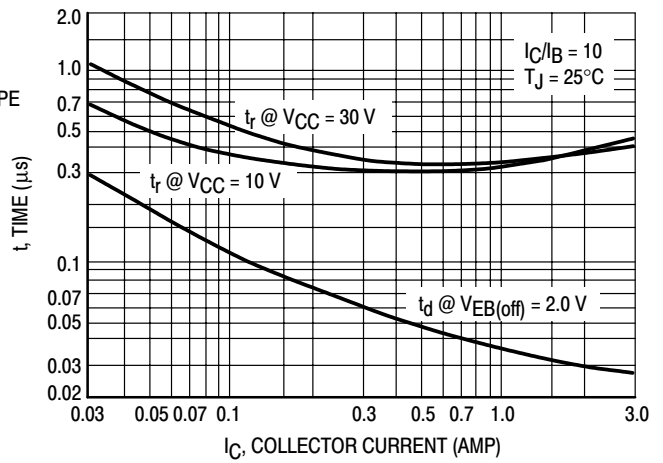


Figure 3. Turn-On Time

MJF31C* (NPN), MJF32C* (PNP)

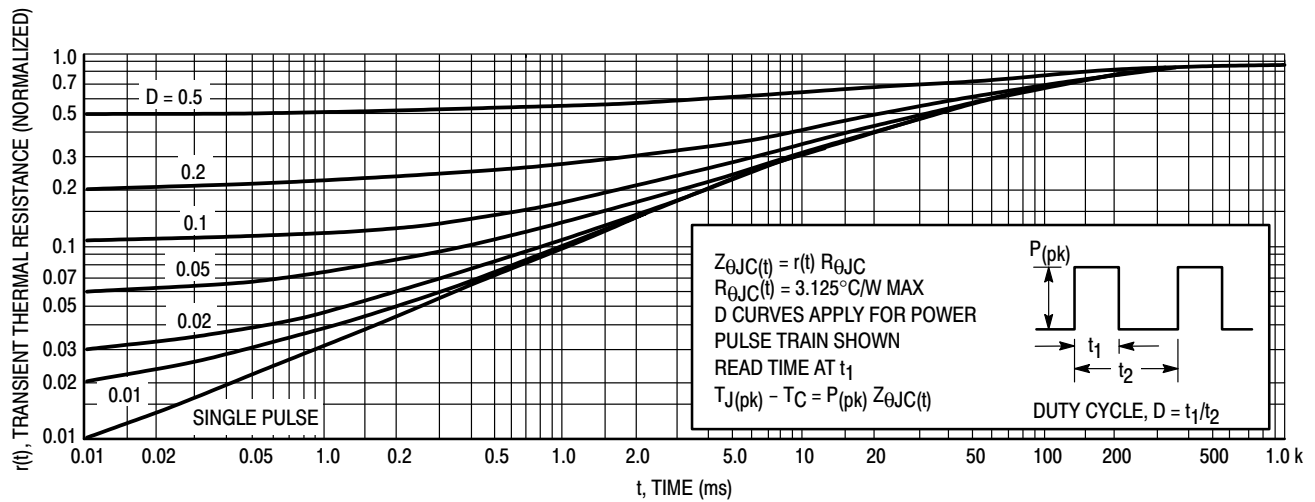


Figure 4. Thermal Response

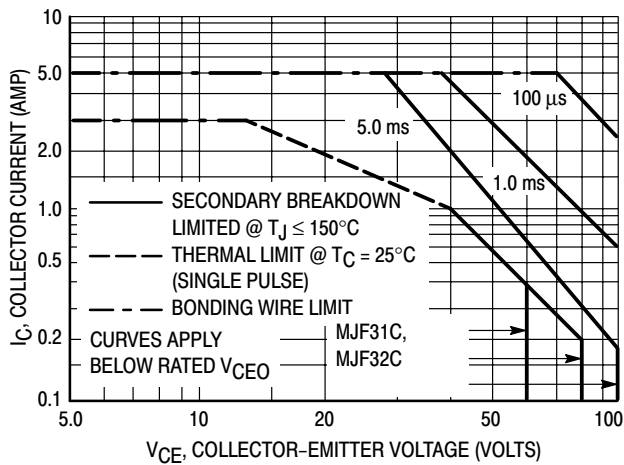


Figure 5. Active Region Safe Operating Area

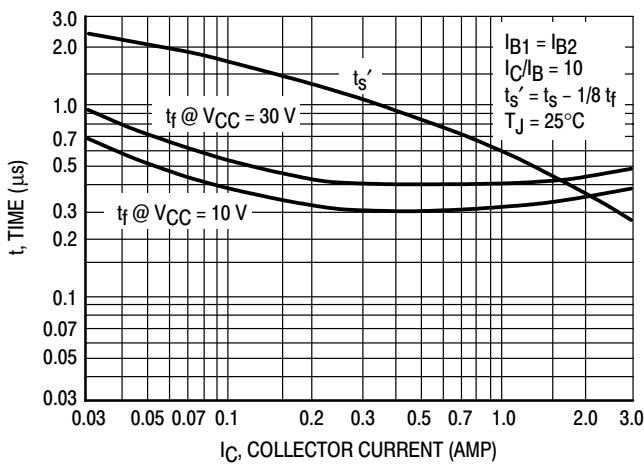


Figure 6. Turn-Off Time

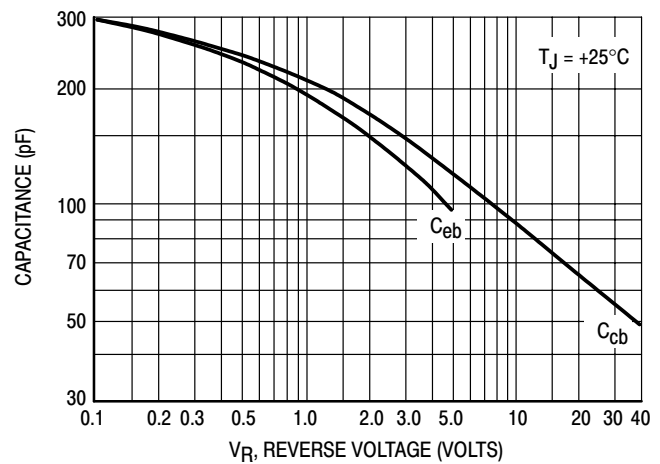


Figure 7. Capacitance

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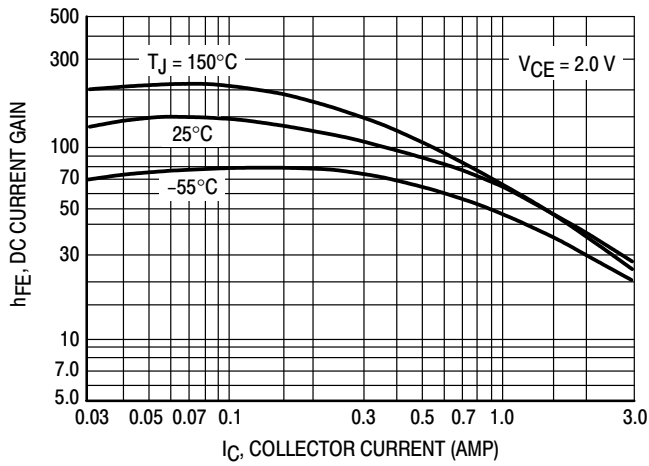


Figure 8. DC Current Gain

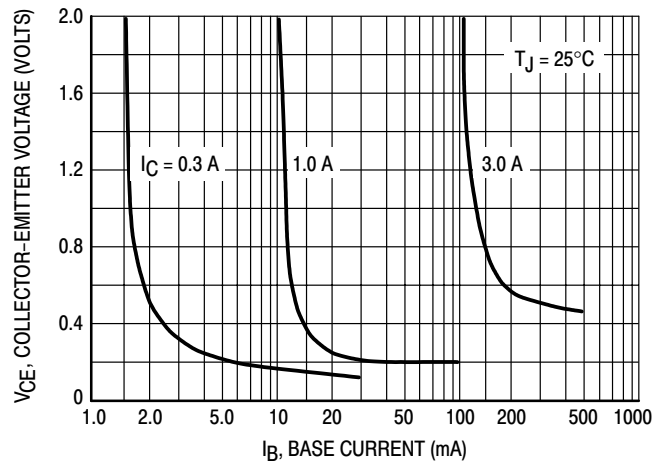


Figure 9. Collector Saturation Region

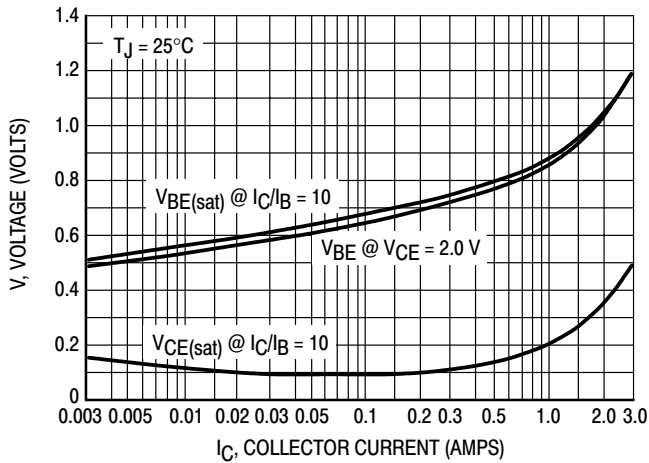


Figure 10. "On" Voltages

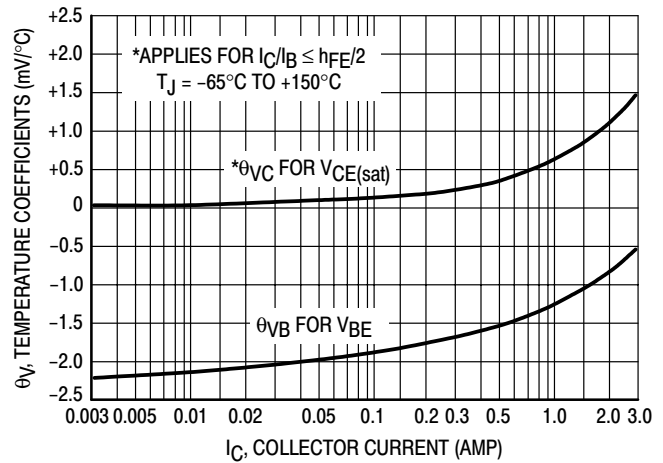


Figure 11. Temperature Coefficients

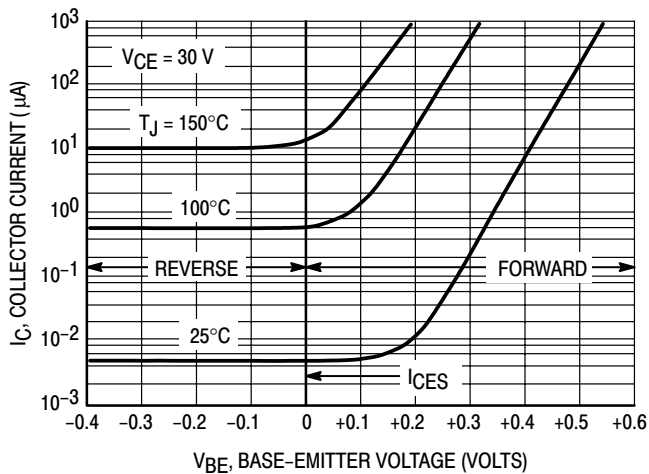


Figure 12. Collector Cut-Off Region

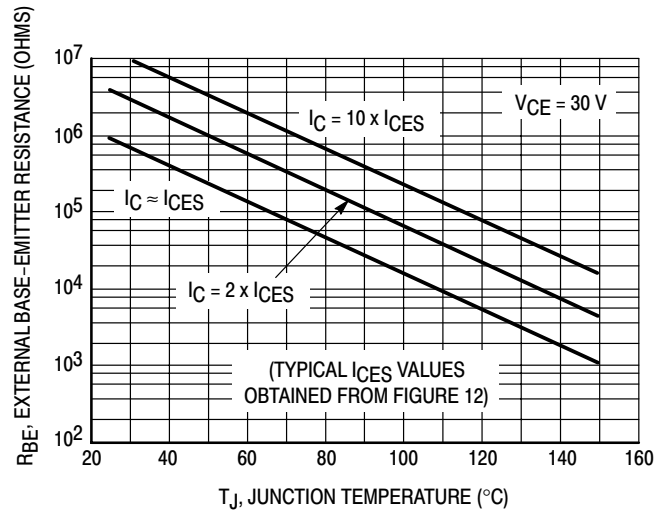


Figure 13. Effects of Base-Emitter Resistance

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ORDERING INFORMATION

Device	Package	Shipping
MJF31C	TO-220 FULLPAK	50 Units/Rail
MJF32C	TO-220 FULLPAK	50 Units/Rail

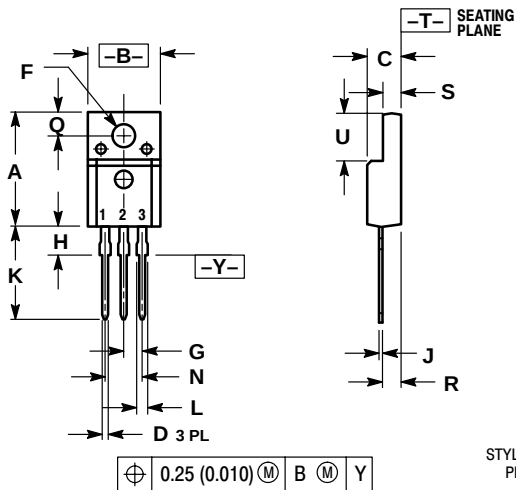
MJF31C* (NPN), MJF32C* (PNP)

PACKAGE DIMENSIONS

TO-220 FULLPAK

CASE 221D-02

ISSUE D



NOTES:

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

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.621	0.629	15.78	15.99
B	0.394	0.402	10.01	10.21
C	0.181	0.189	4.60	4.80
D	0.026	0.034	0.67	0.86
F	0.121	0.129	3.08	3.27
G	0.100 BSC		2.54 BSC	
H	0.123	0.129	3.13	3.27
J	0.018	0.025	0.46	0.64
K	0.500	0.562	12.70	14.27
L	0.045	0.060	1.14	1.52
N	0.200 BSC		5.08 BSC	
Q	0.126	0.134	3.21	3.40
R	0.107	0.111	2.72	2.81
S	0.096	0.104	2.44	2.64
U	0.259	0.267	6.58	6.78

STYLE 1:
PIN 1. BASE
2. COLLECTOR
3. EMITTER
4. COLLECTOR

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