

Medium-Power Plastic PNP Silicon Transistors

... designed for driver circuits, switching, and amplifier applications. These high-performance plastic devices feature:

- Low Saturation Voltage — $V_{CE(sat)} = 0.6 \text{ Vdc (Max) @ } I_C = 1.0 \text{ Amp}$
- Excellent Power Dissipation Due to Thermopad Construction —
 $P_D = 30 \text{ W @ } T_C = 25^\circ\text{C}$
- Excellent Safe Operating Area
- Gain Specified to $I_C = 1.0 \text{ Amp}$
- Complement to NPN 2N4921, 2N4922, 2N4923

*MAXIMUM RATINGS

Ratings	Symbol	2N4918	2N4919	2N4920	Unit
Collector-Emitter Voltage	V_{CEO}	40	60	80	Vdc
Collector-Base Voltage	V_{CB}	40	60	80	Vdc
Emitter-Base Voltage	V_{EB}	5.0			Vdc
Collector Current — Continuous (1)	I_C^*	1.0 3.0			Adc
Base Current	I_B	1.0			Adc
Total Power Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	30 0.24			Watts W/ $^\circ\text{C}$
Operating & Storage Junction Temperature Range	T_J, T_{stg}	-65 to +150			$^\circ\text{C}$

THERMAL CHARACTERISTICS (2)

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	θ_{JC}	4.16	$^\circ\text{C/W}$

* Indicates JEDEC Registered Data for 2N4918 Series.

- (1) The 1.0 Amp maximum I_C value is based upon JEDEC current gain requirements.
The 3.0 Amp maximum value is based upon actual current-handling capability of the device (See Figure 5).
- (2) Recommend use of thermal compound for lowest thermal resistance.

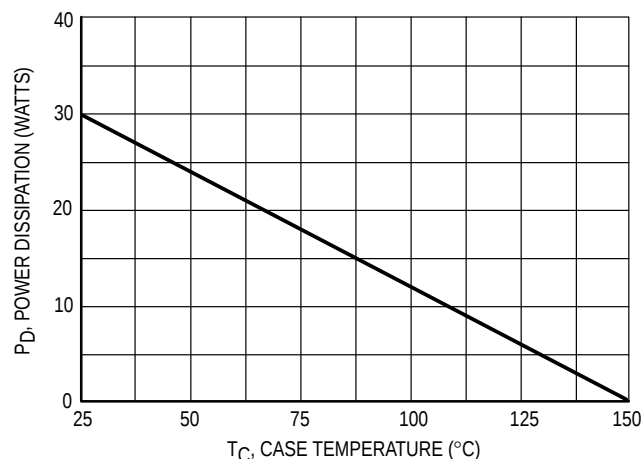


Figure 1. Power Derating

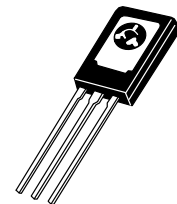
Preferred devices are Motorola recommended choices for future use and best overall value.

REV 7

**2N4918
thru
2N4920***

*Motorola Preferred Device

**3 AMPERE
GENERAL-PURPOSE
POWER TRANSISTORS
40-80 VOLTS
30 WATTS**



**CASE 77-08
TO-225AA TYPE**



MOTOROLA

2N4918 thru 2N4920

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

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector–Emitter Sustaining Voltage (1) ($I_C = 0.1\text{ A dc}$, $I_B = 0$)	$V_{CEO(sus)}$	40 60 80	— — —	Vdc
Collector Cutoff Current ($V_{CE} = 20\text{ Vdc}$, $I_B = 0$) ($V_{CE} = 30\text{ Vdc}$, $I_B = 0$) ($V_{CE} = 40\text{ Vdc}$, $I_B = 0$)	I_{CEO}	— — —	0.5 0.5 0.5	mAdc
Collector Cutoff Current ($V_{CE} = \text{Rated } V_{CEO}$, $V_{BE(off)} = 1.5\text{ Vdc}$) ($V_{CE} = \text{Rated } V_{CEO}$, $V_{BE(off)} = 1.5\text{ Vdc}$, $T_C = 125^\circ\text{C}$)	I_{CEX}	— —	0.1 0.5	mAdc
Collector Cutoff Current ($V_{CB} = \text{Rated } V_{CB}$, $I_E = 0$)	I_{CBO}	—	0.1	mAdc
Emitter Cutoff Current ($V_{BE} = 5.0\text{ Vdc}$, $I_C = 0$)	I_{EBO}	—	1.0	mAdc

ON CHARACTERISTICS

DC Current Gain (1) ($I_C = 50\text{ mAdc}$, $V_{CE} = 1.0\text{ Vdc}$) ($I_C = 500\text{ mAdc}$, $V_{CE} = 1.0\text{ Vdc}$) ($I_C = 1.0\text{ A dc}$, $V_{CE} = 1.0\text{ Vdc}$)	h_{FE}	40 30 10	— 150 —	—
Collector–Emitter Saturation Voltage (1) ($I_C = 1.0\text{ A dc}$, $I_B = 0.1\text{ A dc}$)	$V_{CE(sat)}$	—	0.6	Vdc
Base–Emitter Saturation Voltage (1) ($I_C = 1.0\text{ A dc}$, $I_B = 0.1\text{ A dc}$)	$V_{BE(sat)}$	—	1.3	Vdc
Base–Emitter On Voltage (1) ($I_C = 1.0\text{ A dc}$, $V_{CE} = 1.0\text{ Vdc}$)	$V_{BE(on)}$	—	1.3	Vdc

SMALL-SIGNAL CHARACTERISTICS

Current–Gain — Bandwidth Product ($I_C = 250\text{ mAdc}$, $V_{CE} = 10\text{ Vdc}$, $f = 1.0\text{ MHz}$)	f_T	3.0	—	MHz
Output Capacitance ($V_{CB} = 10\text{ Vdc}$, $I_E = 0$, $f = 100\text{ kHz}$)	C_{ob}	—	100	pF
Small–Signal Current Gain ($I_C = 250\text{ mAdc}$, $V_{CE} = 10\text{ Vdc}$, $f = 1.0\text{ kHz}$)	h_{fe}	25	—	—

* Indicates JEDEC Registered Data.

(1) Pulse Test: $PW \approx 300\text{ }\mu\text{s}$, Duty Cycle $\approx 2.0\%$

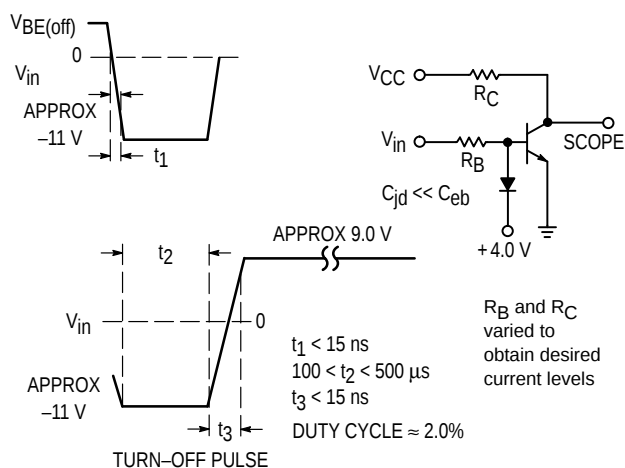


Figure 2. Switching Time Equivalent Test Circuit

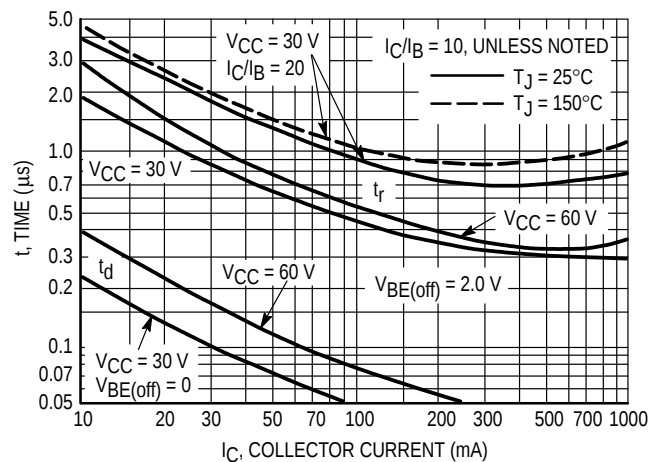


Figure 3. Turn-On Time

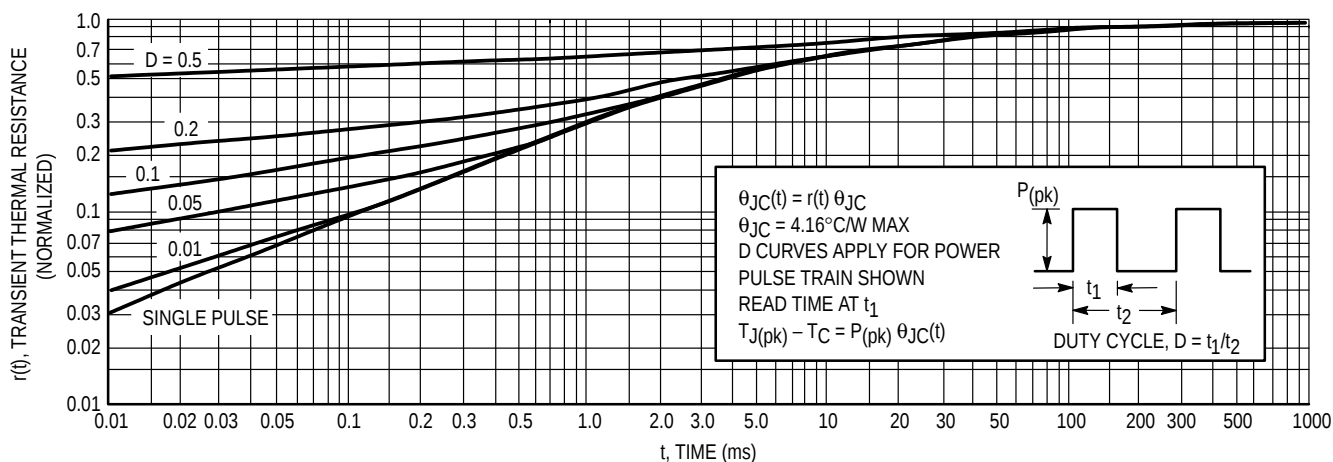


Figure 4. Thermal Response

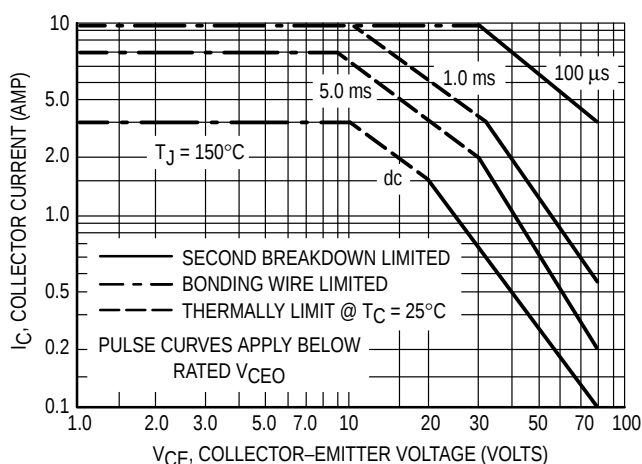


Figure 5. Active-Region Safe Operating Area

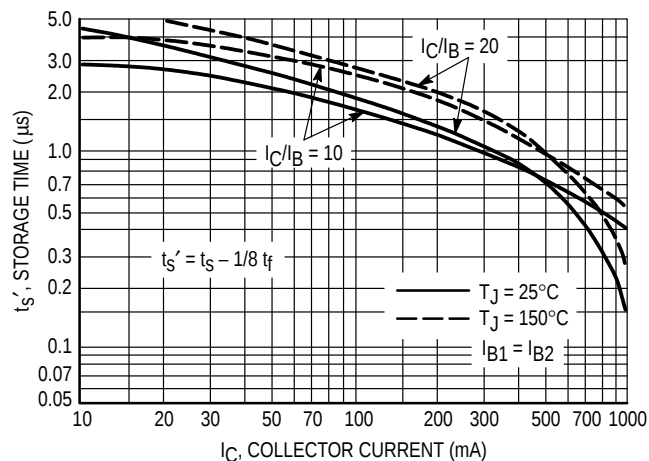


Figure 6. Storage Time

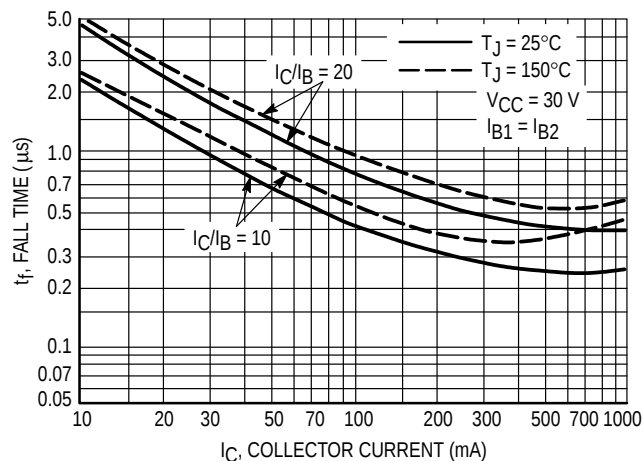


Figure 7. Fall Time

TYPICAL DC CHARACTERISTICS

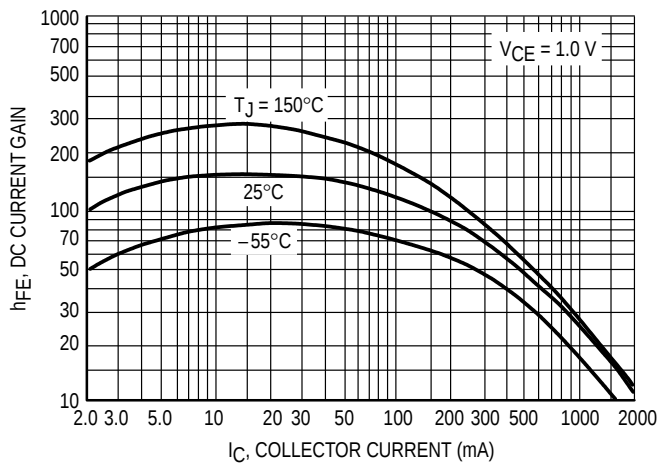


Figure 8. Current Gain

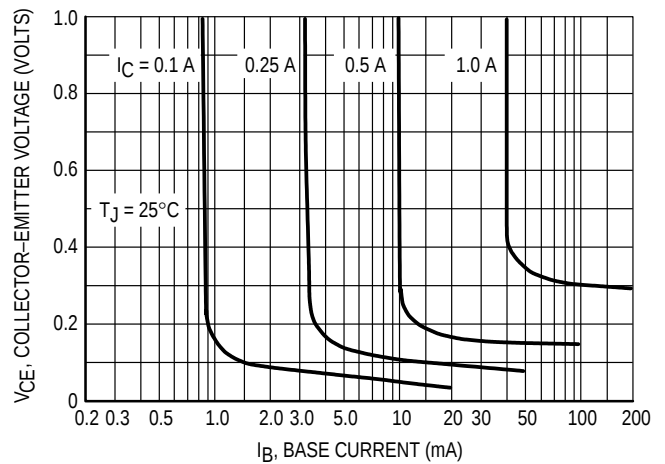


Figure 9. Collector Saturation Region

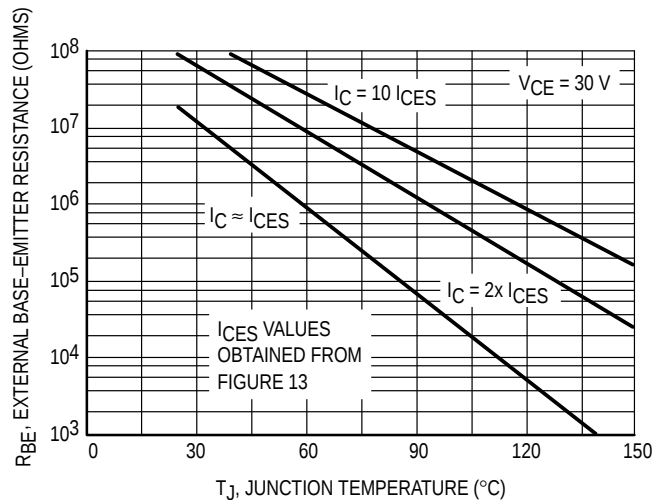


Figure 10. Effects of Base-Emitter Resistance

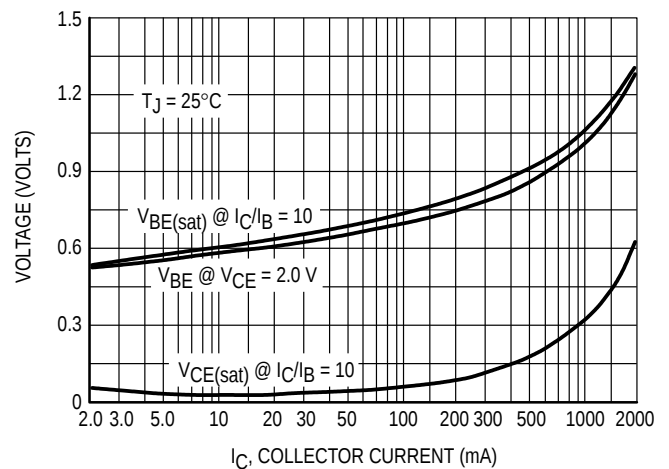


Figure 11. "On" Voltage

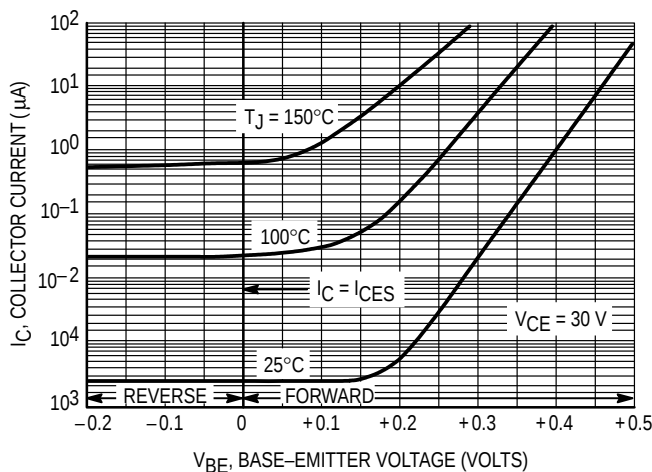


Figure 12. Collector Cut-Off Region

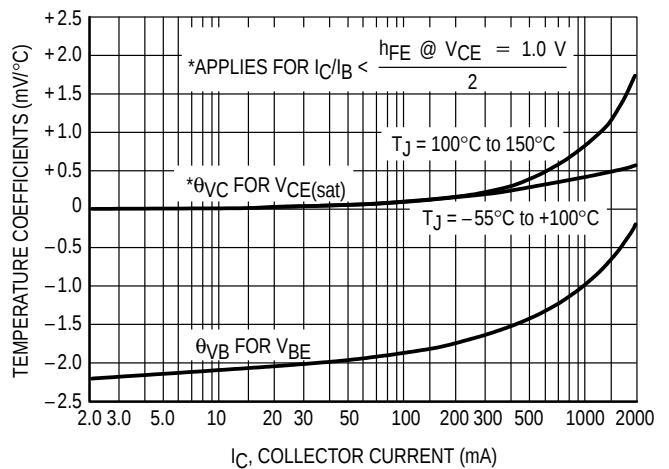
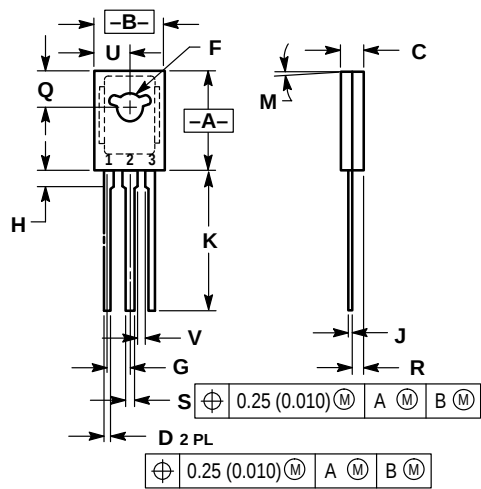


Figure 13. Temperature Coefficients

PACKAGE DIMENSIONS



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

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.425	0.435	10.80	11.04
B	0.295	0.305	7.50	7.74
C	0.095	0.105	2.42	2.66
D	0.020	0.026	0.51	0.66
F	0.115	0.130	2.93	3.30
G	0.094 BSC		2.39 BSC	
H	0.050	0.095	1.27	2.41
J	0.015	0.025	0.39	0.63
K	0.575	0.655	14.61	16.63
M	5° TYP		5° TYP	
Q	0.148	0.158	3.76	4.01
R	0.045	0.055	1.15	1.39
S	0.025	0.035	0.64	0.88
U	0.145	0.155	3.69	3.93
V	0.040	—	1.02	—

- STYLE 1:
1. EMITTER
 2. COLLECTOR
 3. BASE

CASE 77-08
TO-225AA TYPE
ISSUE V

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