2N4918 - 2N4920* Series

Preferred Device

Medium-Power Plastic PNP Silicon Transistors

These medium−power, high−performance plastic devices are designed for driver circuits, switching, and amplifier applications.

Features

- Pb−Free Package is Available**
- Low Saturation Voltage − $V_{CE(sat)}$ = 0.6 Vdc (Max) @ I_C = 1.0 A
- Excellent Power Dissipation Due to Thermopad Construction, P_D = 30 W @ T_C = 25°C
- Excellent Safe Operating Area
- Gain Specified to I_C = 1.0 A
- Complement to NPN 2N4921, 2N4922, 2N4923

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector − Emitter Voltage 2N4918 2N4919 2N4920	V_{CEO}	 40 60 80	Vdc
Collector − Base Voltage 2N4918 2N4919 2N4920	V_{CBO}	 40 60 80	Vdc
Emitter − Base Voltage	V_{EBO}	5.0	Vdc
Collector Current − Continuous (Note 1)	I_C (Note 2)	1.0 3.0	Adc
Base Current	I_B	1.0	Adc
Total Power Dissipation @ T_A = 25°C Derate above 25°C	P_D	30 0.24	W W/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	−65 to +150	°C

Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

1. The 1.0 A max I_C value is based upon JEDEC current gain requirements. The 3.0 A max value is based upon actual current−handling capability of the device (See Figure 5).
2. Indicates JEDEC Registered Data for 2N4918 Series.

THERMAL CHARACTERISTICS (Note 3)

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction−to−Case	θ_{JC}	4.16	°C/W

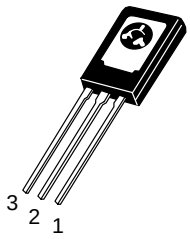
3. Recommend use of thermal compound for lowest thermal resistance.

**For additional information on our Pb−Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

ON Semiconductor®

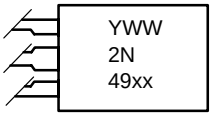
http://onsemi.com

3.0 A, 40−80 V, 30 W GENERAL PURPOSE POWER TRANSISTORS



TO−225
CASE 077
STYLE 1

MARKING DIAGRAM



xx = 18, 19, 20
Y = Year
WW = Work Week

ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 2 of this data sheet.

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

ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted)

Characteristic		Symbol	Min	Max	Unit
OFF CHARACTERISTICS					
Collector−Emitter Sustaining Voltage (Note 4) (I_C = 0.1 Adc, I_B = 0)	2N4918 2N4919 2N4920	$V_{CEO(sus)}$	 40 60 80	 − − −	Vdc
Collector Cutoff Current (V_{CE} = 20 Vdc, I_B = 0) (V_{CE} = 30 Vdc, I_B = 0) (V_{CE} = 40 Vdc, I_B = 0)	 2N4918 2N4919 2N4920	I_{CEO}	 − − −	 0.5 0.5 0.5	mAdc
Collector Cutoff Current (V_{CE} = Rated V_{CEO}, $V_{BE(off)}$ = 1.5 Vdc) (V_{CE} = Rated V_{CEO}, $V_{BE(off)}$ = 1.5 Vdc, T_C = 125°C		I_{CEX}	 − −	 0.1 0.5	mAdc
Collector Cutoff Current (V_{CB} = Rated V_{CB}, I_E = 0)		I_{CBO}	−	0.1	mAdc
Emitter Cutoff Current (V_{BE} = 5.0 Vdc, I_C = 0)		I_{EBO}	−	1.0	mAdc
ON CHARACTERISTICS					
DC Current Gain (Note 4) (I_C = 50 mAdc, V_{CE} = 1.0 Vdc) (I_C = 500 mAdc, V_{CE} = 1.0 Vdc) (I_C = 1.0 Adc, V_{CE} = 1.0 Vdc)		h_{FE}	 40 30 10	 − 150 −	−
Collector−Emitter Saturation Voltage (Note 4) (I_C = 1.0 Adc, I_B = 0.1 Adc)		$V_{CE(sat)}$	−	0.6	Vdc
Base−Emitter Saturation Voltage (Note 4) (I_C = 1.0 Adc, I_B = 0.1 Adc)		$V_{BE(sat)}$	−	1.3	Vdc
Base−Emitter On Voltage (Note 4) (I_C = 1.0 Adc, V_{CE} = 1.0 Vdc)		$V_{BE(on)}$	−	1.3	Vdc
SMALL−SIGNAL CHARACTERISTICS					
Current−Gain − Bandwidth Product (I_C = 250 mAdc, V_{CE} = 10 Vdc, f = 1.0 MHz)		f_T	3.0	−	MHz
Output Capacitance (V_{CB} = 10 Vdc, I_E = 0, f = 100 kHz)		C_{ob}	−	100	pF
Small−Signal Current Gain (I_C = 250 mAdc, V_{CE} = 10 Vdc, f = 1.0 kHz)		h_{fe}	25	−	−

4. Pulse Test: PW ≈ 300 μs, Duty Cycle ≈ 2.0%

ORDERING INFORMATION

Device	Package	Shipping†
2N4918	TO−225	500 Unit / Bulk
2N4919	TO−225	500 Unit / Bulk
2N4920	TO−225	500 Unit / Bulk
2N4920G	TO−225 (Pb−Free)	500 Unit / Bulk

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

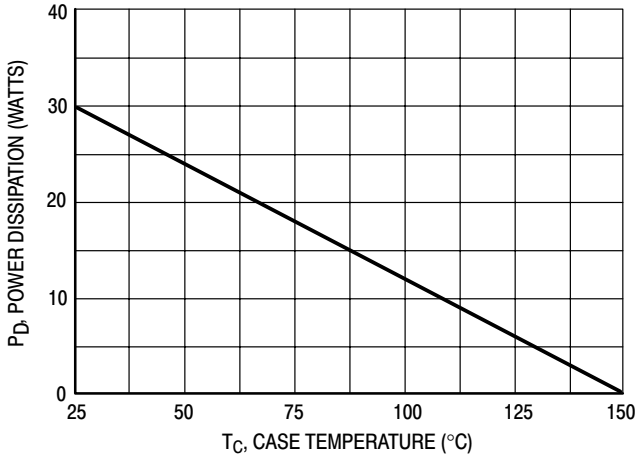


Figure 1. Power Derating

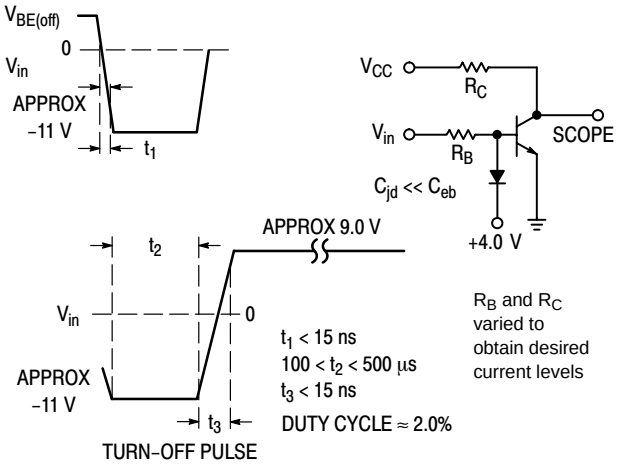


Figure 2. Switching Time Equivalent Test Circuit

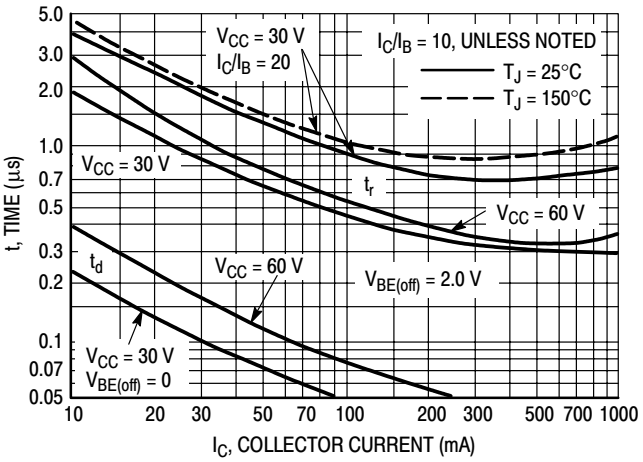


Figure 3. Turn−On Time

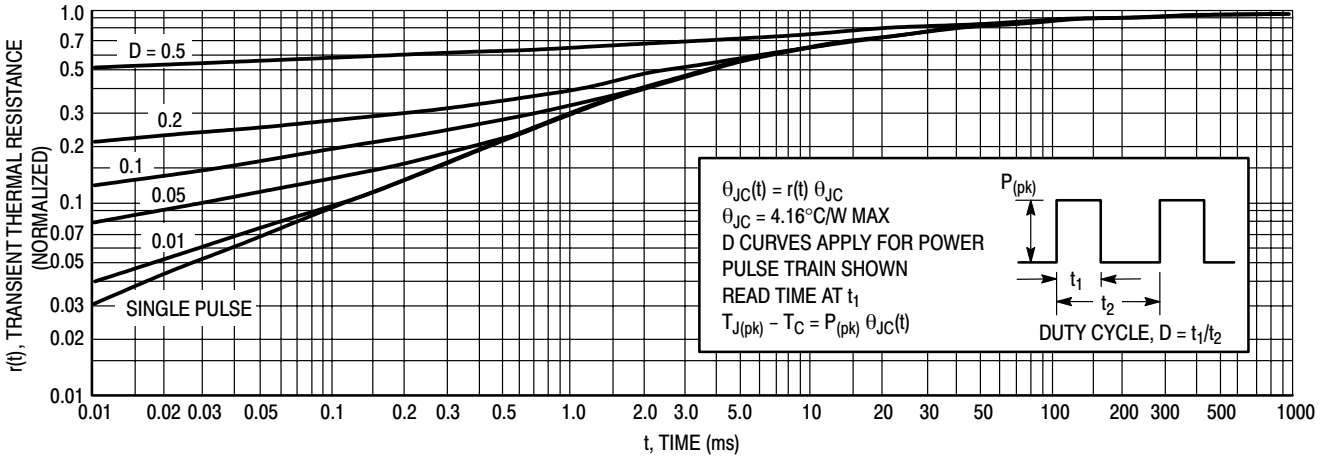


Figure 4. Thermal Response

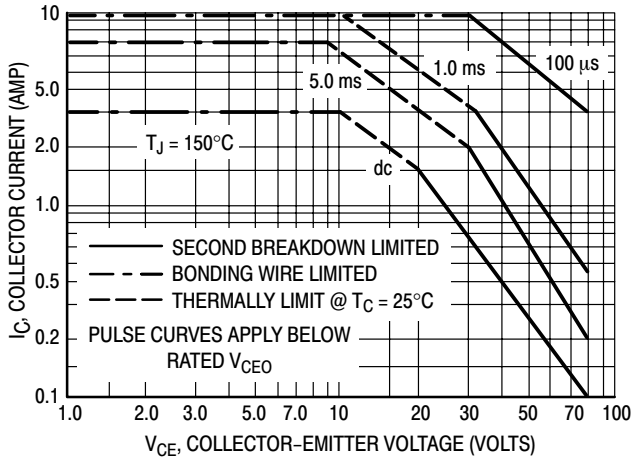


Figure 5. Active−Region Safe Operating Area

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

The data of Figure 5 is based on $T_{J(pk)} = 150°C$; T_C is variable depending on conditions. Second breakdown pulse limits are valid for duty cycles to 10% provided $T_{J(pk)} \leq 150°C$. At high case temperatures, thermal limitations will reduce the power that can be handled to values less than the limitations imposed by second breakdown.

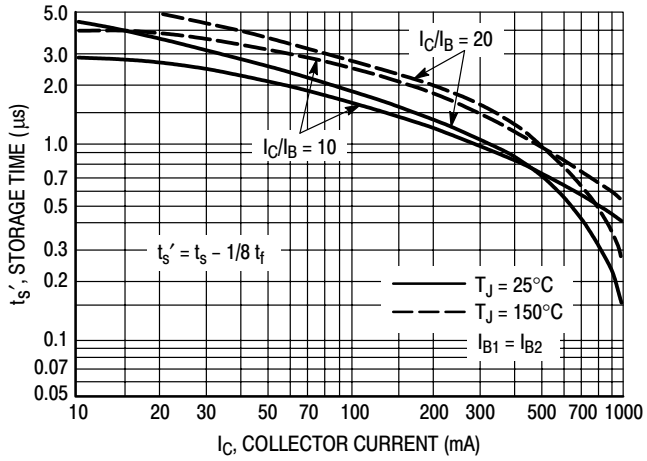


Figure 6. Storage Time

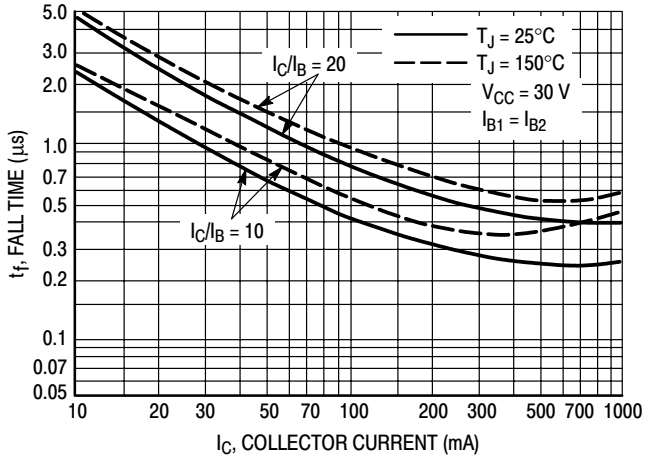


Figure 7. Fall Time

TYPICAL DC CHARACTERISTICS

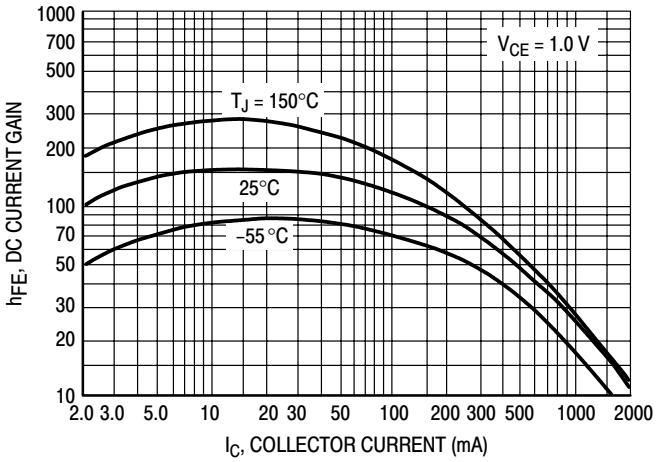


Figure 8. Current Gain

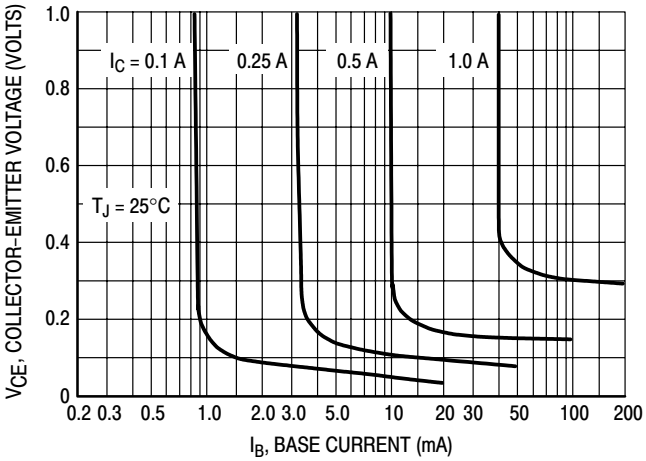


Figure 9. Collector Saturation Region

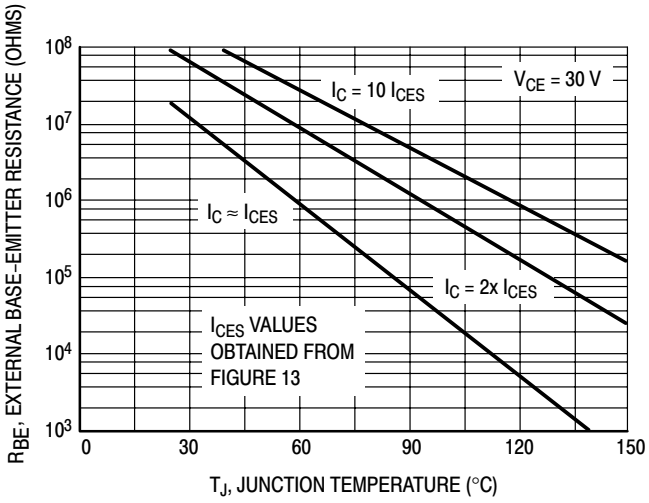


Figure 10. Effects of Base−Emitter Resistance

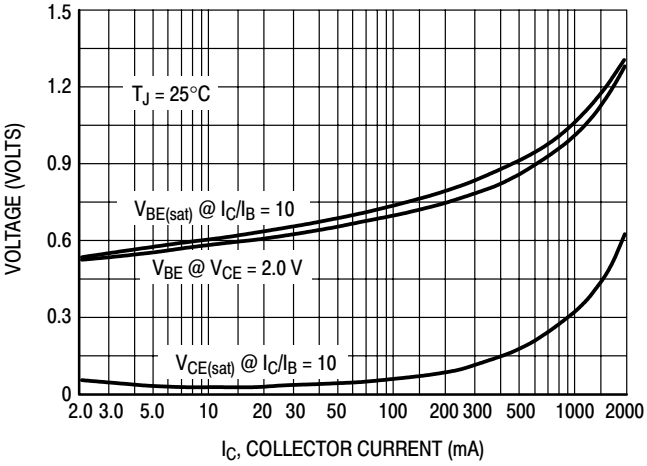


Figure 11. “On” Voltage

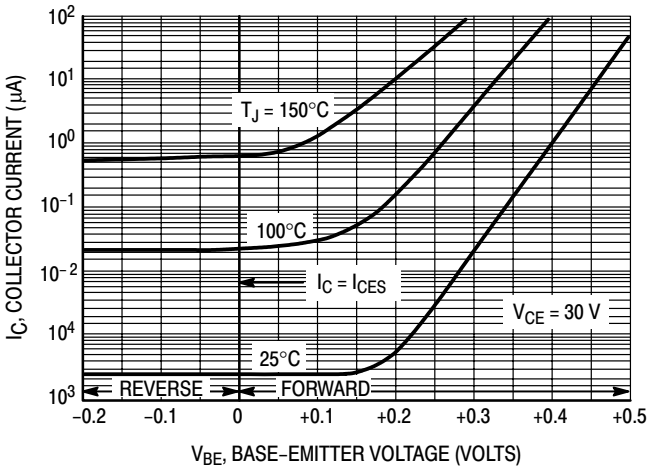


Figure 12. Collector Cut−Off Region

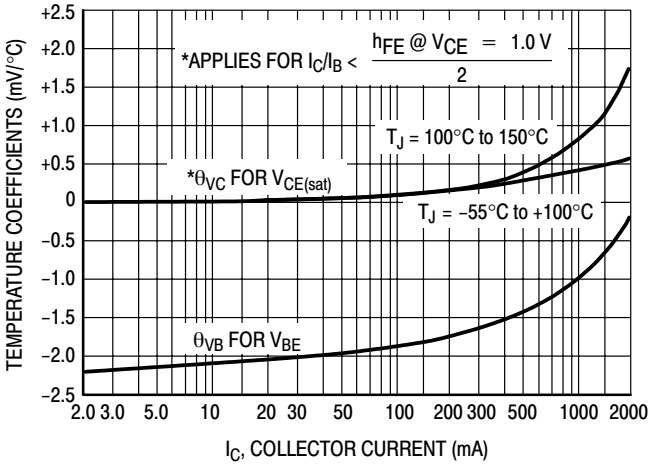
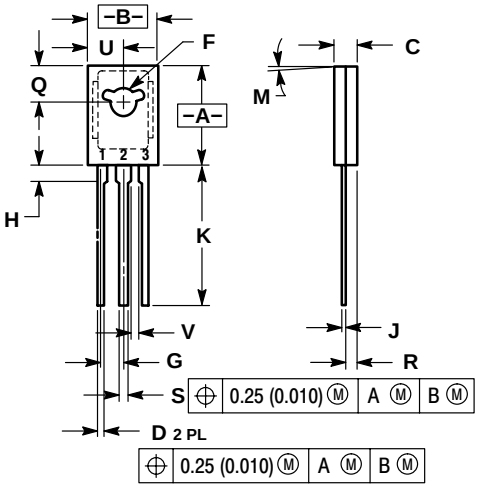


Figure 13. Temperature Coefficients

PACKAGE DIMENSIONS

TO−225
CASE 77−09
ISSUE Z



NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. 077−01 THRU −08 OBSOLETE, NEW STANDARD 077−09.

	INCHES		MILLIMETERS	
DIM	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	0.065	1.15	1.65
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:
PIN 1. EMITTER
2. COLLECTOR
3. BASE

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:
Literature Distribution Center for ON Semiconductor
P.O. Box 61312, Phoenix, Arizona 85082−1312 USA
Phone: 480−829−7710 or 800−344−3860 Toll Free USA/Canada
Fax: 480−829−7709 or 800−344−3867 Toll Free USA/Canada
Email: orderlit@onsemi.com

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