2N4918 thru 2N4920 (SILICON)
MJE4918 thru MJE4920

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 Vdc (Max) @ I_C = 1.0 Amp
- Excellent Power Dissipation Due to Thermopad Construction – P_D = 30 and 40 W @ T_C = 25°C
- Excellent Safe Operating Area
- Gain Specified to I_C = 1.0 Amp
- Complement to NPN 2N4921, 2N4922, 2N4923 and MJE4921, MJE4922, MJE4923
- Choice of Packages – 2N4918 thru 2N4920, 30 Watts, Case 77 MJE4918 thru MJE4920, 40 Watts, Case 199

3 AMPERE GENERAL-PURPOSE POWER TRANSISTORS

40-80 VOLTS
30 and 40 WATTS

*MAXIMUM RATINGS

Ratings	Symbol	2N4918 MJE4918	2N4919 MJE4919	2N4920 MJE4920	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 →			Adc
		← 3.0 →			
Base Current	I_B	← 1.0 →			Adc
		2N4918 series		MJE4918 series	
Total Device Dissipation @ T_C = 25°C Derate above 25°C	P_D	30 0.24		40 0.32	Watts W/°C
Operating & Storage Junction Temperature Range	T_J, T_{stg}	← -65 to +150 →			°C

THERMAL CHARACTERISTICS (2)

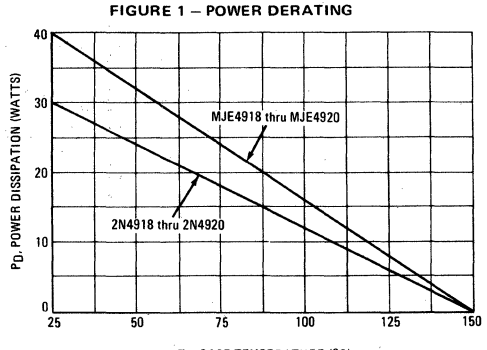
Characteristic	Symbol	2N4918/20	MJE4918/20	Unit
Thermal Resistance, Junction to Case	θ_{JC}	4.16	3.125	°C/W

*Indicates JEDEC Registered Data for 2N4918 Series

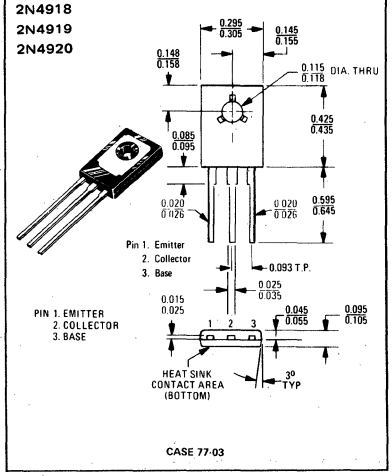
(1) The 1.0 Amp maximum I_C value is based upon JEDEC current gain requirements. The 3.0 Amp maximum value is based upon actual current-handling capability of the device (See Figure 5).

(2) Recommend use of thermal compound for lowest thermal resistance.

FIGURE 1 – POWER DERATING

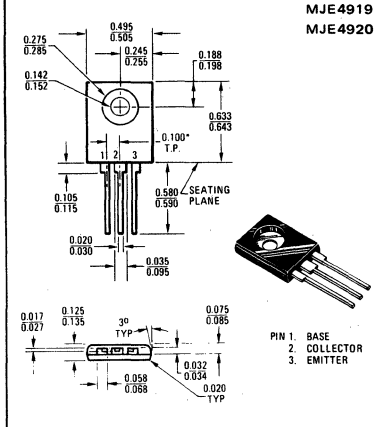


2N4918
2N4919
2N4920



CASE 77-03

MJE4918
MJE4919
MJE4920



*Dimension is to centerline of leads

CASE 199-04

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

Characteristic	Fig. No.	Symbol	Min	Max	Unit
OFF CHARACTERISTICS					
Collector-Emitter Sustaining Voltage (1) (I_C = 0.1 Adc, I_B = 0) 2N4918,MJE4918	–	$V_{CEO(sus)}$	40	–	Vdc
2N4919,MJE4919			60	–	
2N4920,MJE4920			80	–	
Collector Cutoff Current	–	I_{CEO}			mAdc
(V_{CE} = 20 Vdc, I_B = 0) 2N4918,MJE4918			–	0.5	
(V_{CE} = 30 Vdc, I_B = 0) 2N4919,MJE4919			–	0.5	
(V_{CE} = 40 Vdc, I_B = 0) 2N4920,MJE4920			–	0.5	
Collector Cutoff Current	13	I_{CEX}			mAdc
(V_{CE} = Rated V_{CEO}, $V_{BE(off)}$ = 1.5 Vdc)			–	0.1	
(V_{CE} = Rated V_{CEO}, $V_{BE(off)}$ = 1.5 Vdc, T_C = 125°C)			–	0.5	
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 (1)	9	h_{FE}			–
(I_C = 50 mAdc, V_{CE} = 1.0 Vdc)			40	–	
(I_C = 500 mAdc, V_{CE} = 1.0 Vdc)			20	100	
(I_C = 1.0 Adc, V_{CE} = 1.0 Vdc)			10	–	
Collector-Emitter Saturation Voltage (1)	10	$V_{CE(sat)}$			Vdc
(I_C = 1.0 Adc, I_B = 0.1 Adc)	12		–	0.6	
	14				
Base-Emitter Saturation Voltage (1)	12	$V_{BE(sat)}$			Vdc
(I_C = 1.0 Adc, I_B = 0.1 Adc)	14		–	1.3	
Base-Emitter On Voltage (1)	12	$V_{BE(on)}$			Vdc
(I_C = 1.0 Adc, V_{CE} = 1.0 Vdc)	14		–	1.3	
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	–	–

*Indicates JEDEC Registered Data for 2N4918 Series.

(1) Pulse Test: PW ≈ 300 μs, Duty Cycle ≈ 2.0%

FIGURE 2 – SWITCHING TIME EQUIVALENT CIRCUIT

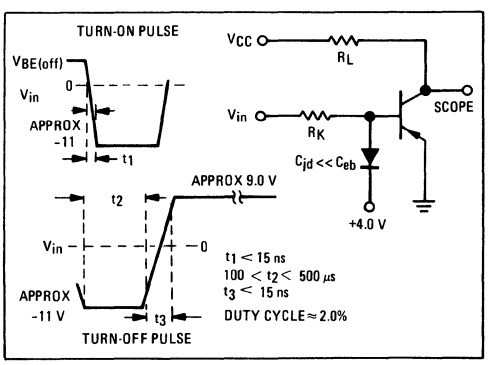


FIGURE 3 – TURN-ON TIME

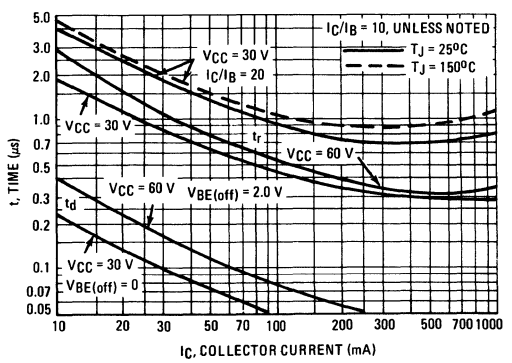
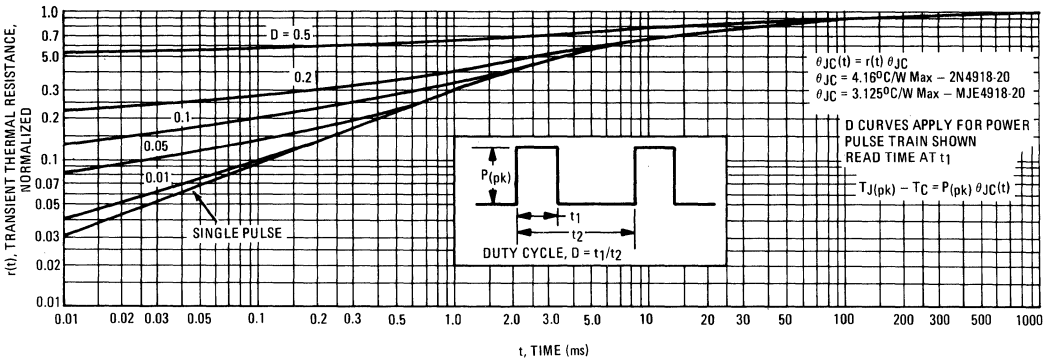
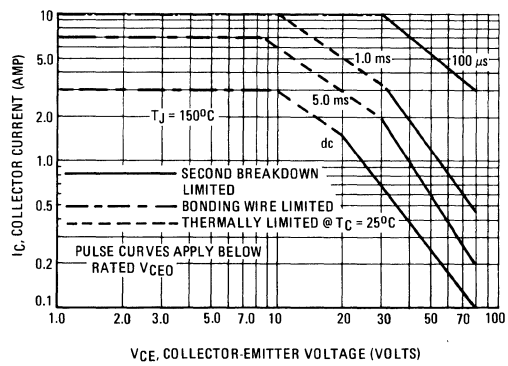


FIGURE 4 – THERMAL RESPONSE



ACTIVE-REGION SAFE OPERATING AREA

FIGURE 5 – 2N4918 thru 2N4920



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 Figures 5 and 6 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. (See AN-415)

FIGURE 6 – MJE4918 thru MJE4920

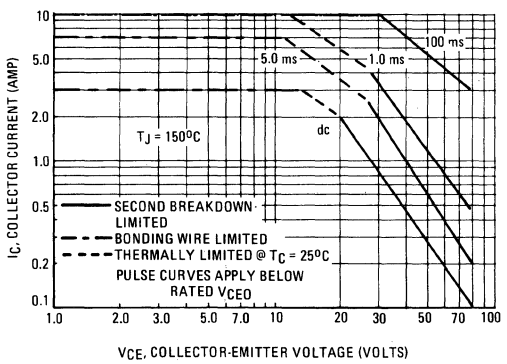


FIGURE 7 – STORAGE TIME

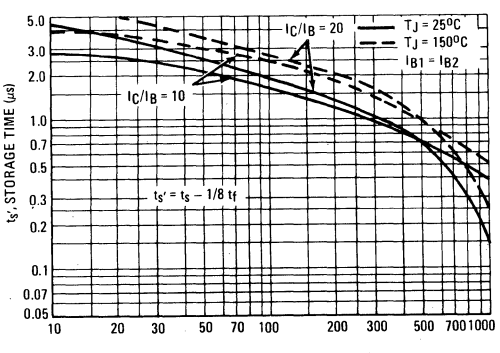
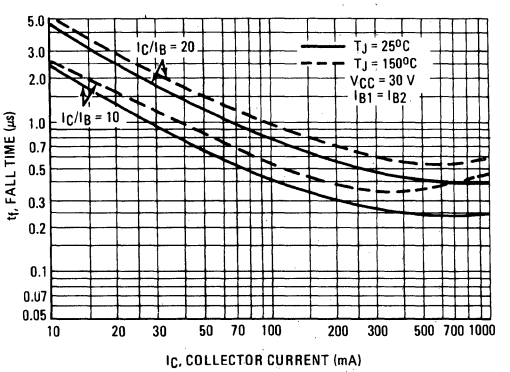


FIGURE 8 – FALL TIME



TYPICAL DC CHARACTERISTICS

FIGURE 9 – CURRENT GAIN

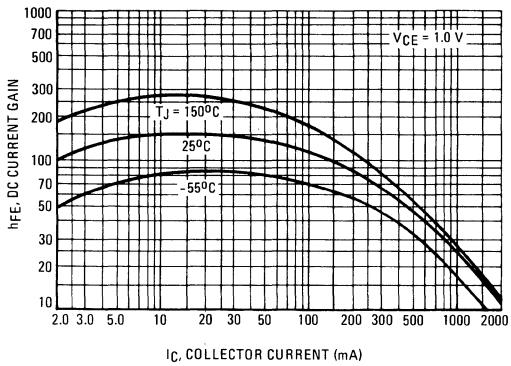


FIGURE 10 – COLLECTOR SATURATION REGION

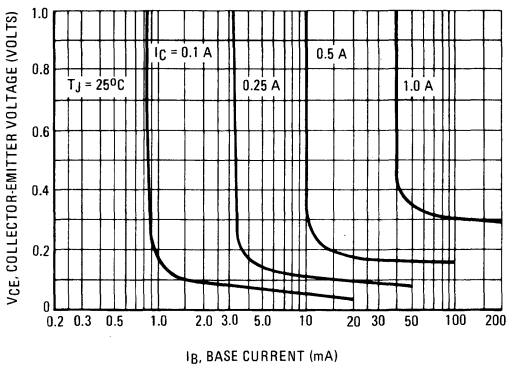


FIGURE 11 – EFFECTS OF BASE-EMITTER RESISTANCE

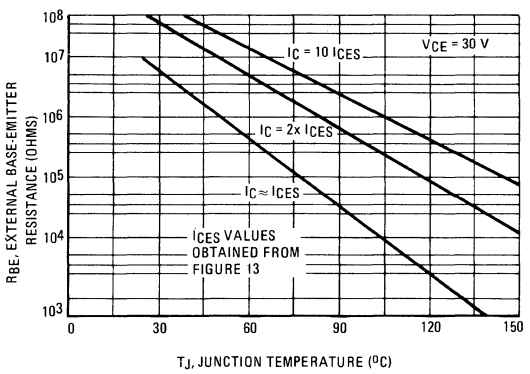


FIGURE 12 – "ON" VOLTAGE

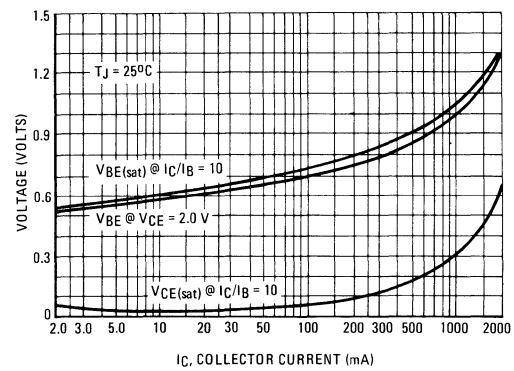


FIGURE 13 – COLLECTOR CUTOFF REGION

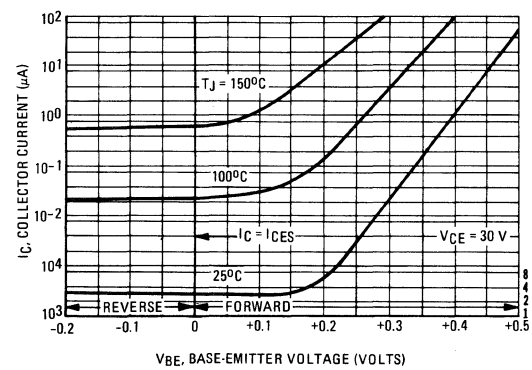


FIGURE 14 – TEMPERATURE COEFFICIENTS