New Jersey Semi-Conductor Products, Inc.

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U.S.A.

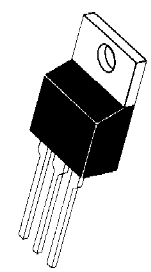
MJE1123

Bipolar Power PNP Low Dropout Regulator Transistor

PNP LOW DROPOUT TRANSISTOR
4.0 AMPERES
40 VOLTS

The MJE1123 is an applications specific device designed to provide low–dropout linear regulation for switching–regulator post regulators, battery powered systems and other applications. The MJE1123 is fully specified in the saturation region and exhibits the following main features:

- High Gain Limits Base–Drive Losses to only 1–2% of Circuit Output Current
- Gain is 100 Minimum at I_C = 1.0 Amp, V_{CE} = 7.0 Volts
- Excellent Saturation Voltage Characteristic, 0.2 Volts Maximum at 1.0 Amp



TO–220AB

MAXIMUM RATINGS (T_C = 25°C Unless Otherwise Noted.)

Rating	Symbol	Value	Unit
Collector–Emitter Sustaining Voltage	V_{CEO}	40	Vdc
Collector–Base Voltage	V_{CB}	50	Vdc
Emitter–Base Voltage	V_{EB}	5.0	Vdc
Collector Current — Continuous — Peak	I_C I_{CM}	4.0 8.0	Adc
Base Current — Continuous	I_B	4.0	Adc
Total Power Dissipation @ T_C = 25°C Derate above 25°C	P_D	75 0.6	Watts W/°C
Operating and Storage Temperature	T_J, T_{stg}	– 65 to +150	°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Value	Unit
Thermal Resistance — Junction to Case — Junction to Ambient	$R_{\theta JC}$ $R_{\theta JA}$	1.67 70	°C/W
Maximum Lead Temperature for Soldering Purposes: 1/8″ from Case for 5 seconds	T_L	275	°C

ELECTRICAL CHARACTERISTICS (T_C = 25°C Unless Otherwise Noted)

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS*					
Collector–Emitter Sustaining Voltage (I_C = 1.0 mA, I = 0)	$V_{CEO(sus)}$	40	65	—	Vdc
Emitter–Base Voltage (I_E = 100 μA)	V_{EBO}	7.0	11	—	Vdc
Collector Cutoff Current (V_{CE} = 7.0 Vdc, I_B = 0) (V_{CE} = 20 Vdc, I_B = 0)	I_{CEO}	 — —	 — —	 100 250	μAdc
ON CHARACTERISTICS*					
Collector–Emitter Saturation Voltage (I_C = 1.0 Adc, I_B = 20 mAdc) (I_C = 1.0 Adc, I_B = 50 mAdc) (I_C = 1.0 Adc, I_B = 120 mAdc) (I_C = 2.0 Adc, I_B = 50 mAdc) (I_C = 2.0 Adc, I_B = 120 mAdc) (I_C = 4.0 Adc, I_B = 120 mAdc)	$V_{CE(sat)}$	 — — — — — —	 0.16 0.13 0.10 0.25 0.20 0.45	 0.30 0.25 0.20 0.40 0.35 0.75	Vdc

* Indicates Pulse Test: Pulse Width = 300 μs max, Duty Cycle = 2%.

ELECTRICAL CHARACTERISTICS — continued (T_C = 25°C Unless Otherwise Noted)

Characteristic	Symbol	Min	Typ	Max	Unit
ON CHARACTERISTICS* (continued)					
Base–Emitter Saturation Voltage	$V_{BE(sat)}$				Vdc
(I_C = 1.0 Adc, I_B = 20 mAdc)		—	0.77	0.95	
(I_C = 2.0 Adc, I_B = 50 mAdc)		—	0.87	1.20	
(I_C = 4.0 Adc, I_B = 120 mAdc)		—	1.00	1.40	
DC Current Gain	h_{FE}				—
(I_C = 1.0 Adc, V_{CE} = 7.0 Vdc)		100	170	225	
(I_C = 1.0 Adc, V_{CE} = 10 Vdc)		100	180	225	
(I_C = 2.0 Adc, V_{CE} = 7.0 Vdc)		75	120	170	
(I_C = 2.0 Adc, V_{CE} = 10 Vdc)		80	140	180	
(I_C = 4.0 Adc, V_{CE} = 7.0 Vdc)		45	75	100	
(I_C = 4.0 Adc, V_{CE} = 10 Vdc)		45	79	100	
Base–Emitter On Voltage	$V_{BE(on)}$				Vdc
(I_C = 1.0 Adc, V_{CE} = 1.0 Vdc)		—	0.75	0.90	
(I_C = 2.0 Adc, V_{CE} = 1.0 Vdc)		—	0.84	1.00	
(I_C = 4.0 Adc, V_{CE} = 1.0 Vdc)		—	0.90	1.20	
DYNAMIC CHARACTERISTICS					
Current–Gain — Bandwidth Product (I_C = 1.0 Adc, V_{CE} = 4.0 Vdc, f = 1.0 MHz)	f_T	5.0	11.5	—	MHz

* Indicates Pulse Test: Pulse Width = 300 μs max, Duty Cycle = 2%.

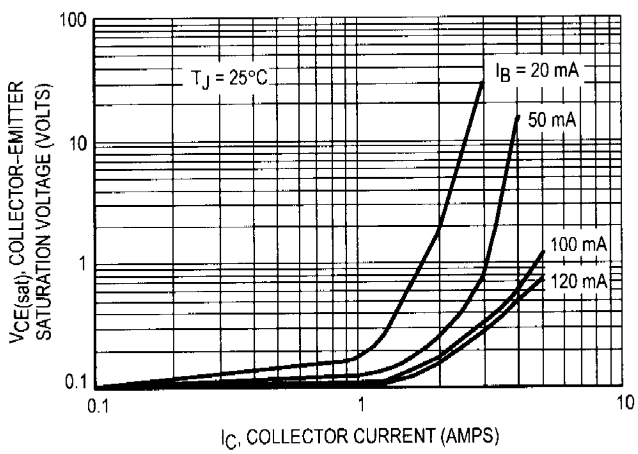


Figure 1. Saturation Voltage versus Collector Current as a Function of Base Drive

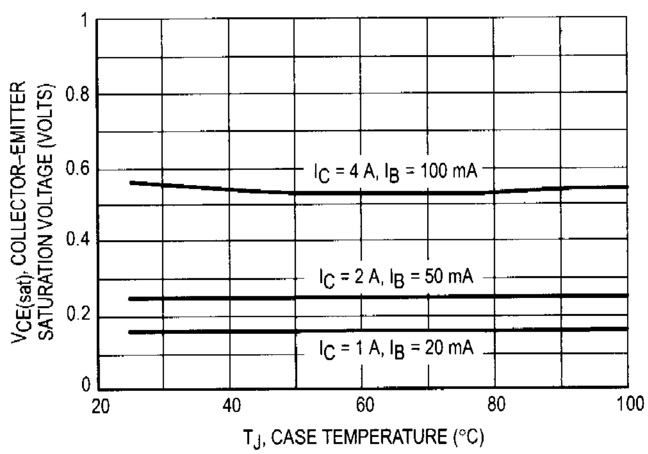


Figure 2. Saturation Voltage versus Temperature