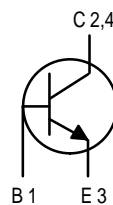


Preliminary Data Sheet
Bipolar Power Transistors
NPN Silicon

- Collector–Emitter Sustaining Voltage — $V_{CE(sus)}$
= 30 Vdc (Min) @ $I_C = 10$ mAdc
- High DC Current Gain — h_{FE}
= 85 (Min) @ $I_C = 1.0$ Adc
= 60 (Min) @ $I_C = 3.0$ Adc
- Low Collector–Emitter Saturation Voltage — $V_{CE(sat)}$
= 0.2 Vdc (Max) @ $I_C = 1.2$ Adc
= 0.55 Vdc (Max) @ $I_C = 5.0$ Adc
- SOT–223 Surface Mount Packaging

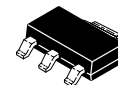


Schematic

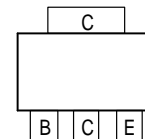
MMJT9410

Motorola Preferred Device

POWER BJT
 $I_C = 3.0$ AMPERES
 $V_{CE0} = 30$ VOLTS
 $V_{CE(sat)} = 0.2$ VOLTS



CASE 318E–04, Style 1



Top View
Pinout

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

Rating	Symbol	Value	Unit
Collector–Emitter Voltage	V_{CEO}	30	Vdc
Collector–Base Voltage	V_{CB}	45	Vdc
Emitter–Base Voltage	V_{EB}	± 8.0	Vdc
Base Current — Continuous	I_B	1.0	Adc
Collector Current — Continuous — Peak	I_C	3.0 5.0	Adc
Total Power Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	3.0 0.025	Watts mW/ $^\circ\text{C}$
Total P_D @ $T_A = 25^\circ\text{C}$ mounted on 1" sq. (645 sq. mm) Drain pad on FR–4 bd material		2.0	Watts
Total P_D @ $T_A = 25^\circ\text{C}$ mounted on 0.92" sq. (590 sq. mm) Drain pad on FR–4 bd material		1.5	
Total P_D @ $T_A = 25^\circ\text{C}$ mounted on 0.012" sq. (7.6 sq. mm) Drain pad on FR–4 bd material		0.8	
Operating and Storage Junction Temperature Range	T_J, T_{stg}	–55 to +150	$^\circ\text{C}$

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance – Junction to Case	$R_{\theta JC}$	40	$^\circ\text{C/W}$
– Junction to Ambient on 1" sq. (645 sq. mm) Drain pad on FR–4 bd material	$R_{\theta JA}$	60	
– Junction to Ambient on 0.92" sq. (590 sq. mm) Drain pad on FR–4 bd material	$R_{\theta JA}$	85	
– Junction to Ambient on 0.012" sq. (7.6 sq. mm) Drain pad on FR–4 bd material	$R_{\theta JA}$	156	
Maximum Lead Temperature for Soldering Purposes, 1/8" from case for 5 seconds	T_L	260	$^\circ\text{C}$

This document contains information on a new product. Specifications and information are subject to change without notice.

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

MMJT9410

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

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector–Emitter Sustaining Voltage (I _C = 10 mAdc, I _B = 0 Adc)	V _{CEO(sus)}	30	—	—	Vdc
Collector Cutoff Current (V _{CE} = 30 Vdc, R _{BE} = 200 Ω)	I _{CER}	—	—	20	μAdc
Emitter Cutoff Current (V _{BE} = 5.0 Vdc)	I _{EBO}	—	—	10	μAdc

ON CHARACTERISTICS(1)

Collector–Emitter Saturation Voltage (I _C = 0.8 Adc, I _B = 20 mAdc) (I _C = 1.2 Adc, I _B = 20 mAdc) (I _C = 5.0 Adc, I _B = 1.0 Adc)	V _{CE(sat)}	— — —	0.110 0.140 —	0.150 0.200 0.550	Vdc
Base–Emitter Saturation Voltage (I _C = 5.0 Adc, I _B = 1.0 Adc)	V _{BE(sat)}	—	—	1.45	Vdc
Base–Emitter On Voltage (I _C = 1.2 Adc, V _{CE} = 4.0 Vdc)	V _{BE(on)}	—	—	1.10	Vdc
DC Current Gain (I _C = 1.0 Adc, V _{CE} = 1.0 Vdc) (I _C = 1.2 Adc, V _{CE} = 1.0 Vdc) (I _C = 3.0 Adc, V _{CE} = 1.0 Vdc)	h _{FE}	85 80 60	170 — —	— — —	—

DYNAMIC CHARACTERISTICS

Output Capacitance (V _{CB} = 10 Vdc, I _E = 0 Adc, f = 1.0 MHz)	C _{ob}	—	80	135	pF
Input Capacitance (V _{EB} = 8.0 Vdc)	C _{ib}	—	200	—	pF
Current–Gain — Bandwidth Product(2) (I _C = 500 mA, V _{CE} = 10 Vdc, F _{test} = 1.0 MHz)	f _T	—	100	—	MHz

(1) Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2%.

(2) f_T = |h_{FE}| • f_{test}

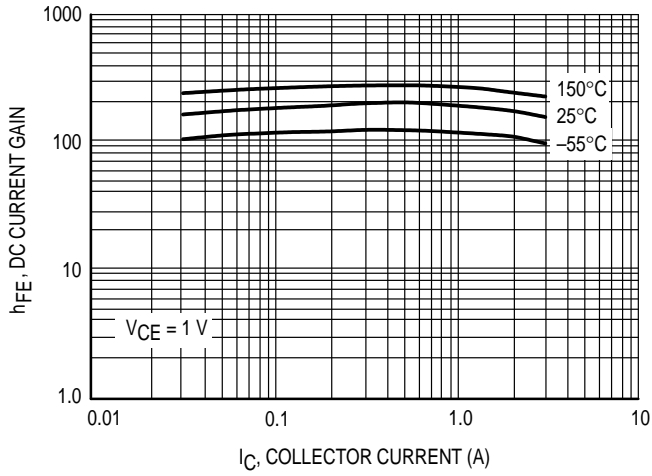


Figure 1. DC Current Gain

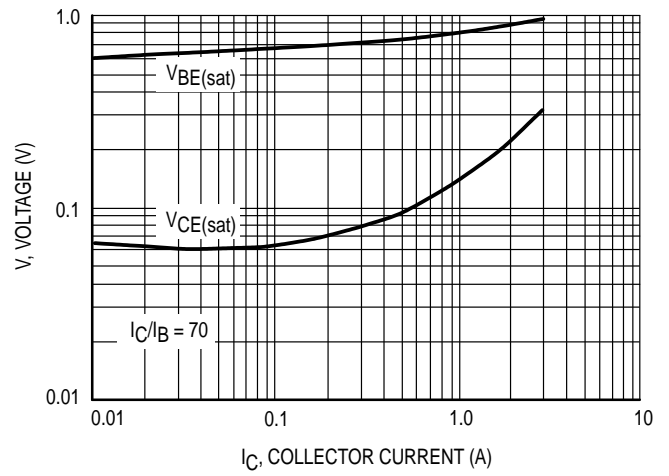


Figure 2. "ON" Voltages

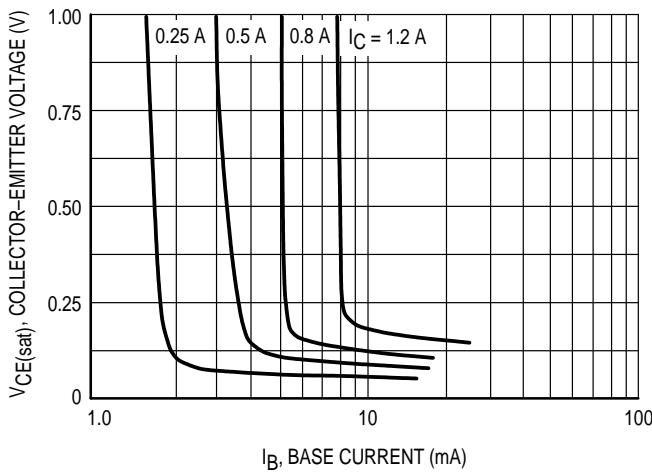


Figure 3. Collector Saturation Region

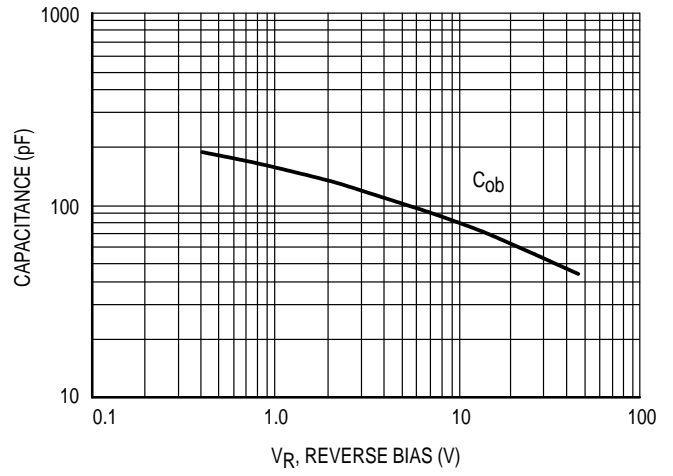
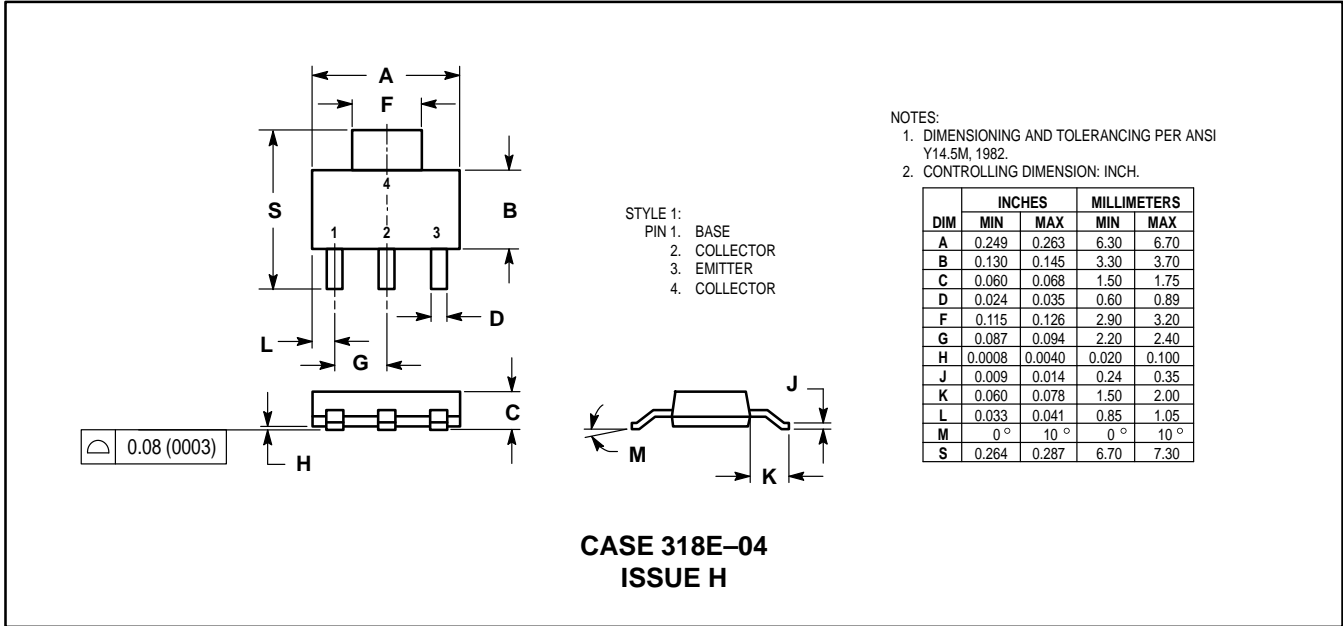


Figure 4. Capacitance

PACKAGE DIMENSIONS



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