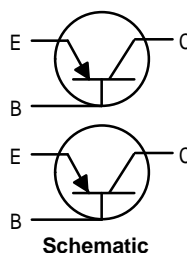


*Preliminary Data Sheet*  
**Plastic Power Transistors**

**SO-8 for Surface Mount Applications**

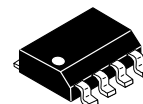
- Collector - Emitter Sustaining Voltage —  $V_{CE(sus)}$   
= 30 Vdc (Min) @  $I_C = 10$  mAdc
- High DC Current Gain —  $h_{FE}$   
= 140 (Min) @  $I_C = 1.2$  Adc  
= 125 (Min) @  $I_C = 3.0$  Adc
- Low Collector - Emitter Saturation Voltage —  $V_{CE(sat)}$   
= 0.24 Vdc (Max) @  $I_C = 1.2$  Adc  
= 0.60 Vdc (Max) @  $I_C = 5.0$  Adc
- Miniature SO-8 Surface Mount Package – Saves Board Space



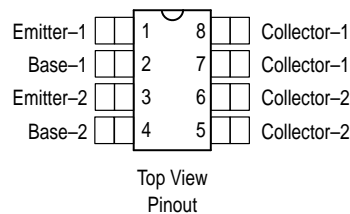
**MMDJ3P03BJT**

Motorola Preferred Device

**DUAL BIPOLAR  
POWER TRANSISTOR  
PNP SILICON  
30 VOLTS  
3 AMPERES**



**CASE 751-05, Style 16  
(SO-8)**



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

Rating	Symbol	Value	Unit
Collector-Base Voltage	$V_{CB}$	45	Vdc
Collector-Emitter Voltage	$V_{CEO}$	30	Vdc
Emitter-Base Voltage	$V_{EB}$	$\pm 8.0$	Vdc
Collector Current — Continuous — Peak	$I_C$	3.0 5.0	Adc
Base Current — Continuous	$I_B$	1.0	Adc
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 Ambient <sup>(1)</sup>	$R_{\theta JC}$	62.5	$^\circ\text{C/W}$
Total Power Dissipation @ $T_A = 25^\circ\text{C}$ <sup>(1)</sup> Derate above $25^\circ\text{C}$	$P_D$	2.0 16	Watts $\text{mW}/^\circ\text{C}$
Maximum Temperature for Soldering	$T_L$	260	$^\circ\text{C}$

(1) Mounted on 2" sq. FR-4 board (1" sq. 2 oz. Cu 0.06" thick single sided) with one die operating, 10 seconds max.

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.

# MMDJ3P03BJT

## ELECTRICAL CHARACTERISTICS (T<sub>C</sub> = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
<b>OFF CHARACTERISTICS</b>					
Collector–Emitter Sustaining Voltage (I <sub>C</sub> = 10 mA <sub>dc</sub> , I <sub>B</sub> = 0 A <sub>dc</sub> )	V <sub>CEO(sus)</sub>	30	—	—	V <sub>dc</sub>
Collector Cutoff Current (V <sub>CE</sub> = 25 V <sub>dc</sub> , R <sub>BE</sub> = 200 Ω)	I <sub>CER</sub>	—	—	20	μA <sub>dc</sub>
Emitter Cutoff Current (V <sub>BE</sub> = 5.0 V <sub>dc</sub> )	I <sub>EBO</sub>	—	—	10	μA <sub>dc</sub>

## ON CHARACTERISTICS(1)

Collector–Emitter Saturation Voltage (I <sub>C</sub> = 0.8 A <sub>dc</sub> , I <sub>B</sub> = 20 mA <sub>dc</sub> ) (I <sub>C</sub> = 1.2 A <sub>dc</sub> , I <sub>B</sub> = 20 mA <sub>dc</sub> ) (I <sub>C</sub> = 5.0 A <sub>dc</sub> , I <sub>B</sub> = 1.0 A <sub>dc</sub> )	V <sub>CE(sat)</sub>	— — —	0.14 — —	0.20 0.24 0.60	V <sub>dc</sub>
Base–Emitter Saturation Voltage (I <sub>C</sub> = 5.0 A <sub>dc</sub> , I <sub>B</sub> = 1.0 A <sub>dc</sub> )	V <sub>BE(sat)</sub>	—	—	1.40	V <sub>dc</sub>
Base–Emitter On Voltage (I <sub>C</sub> = 3.0 A <sub>dc</sub> , V <sub>CE</sub> = 4.0 V <sub>dc</sub> )	V <sub>BE(on)</sub>	—	—	1.10	V <sub>dc</sub>
DC Current Gain (I <sub>C</sub> = 1.2 A <sub>dc</sub> , V <sub>CE</sub> = 4.0 V <sub>dc</sub> ) (I <sub>C</sub> = 3.0 A <sub>dc</sub> , V <sub>CE</sub> = 4.0 V <sub>dc</sub> )	h <sub>FE</sub>	140 125	— 180	— —	—

## DYNAMIC CHARACTERISTICS

Output Capacitance (V <sub>CB</sub> = 10 V <sub>dc</sub> , I <sub>E</sub> = 0 A <sub>dc</sub> , f = 1.0 MHz)	C <sub>ob</sub>	—	100	—	pF
Input Capacitance (V <sub>EB</sub> = 8.0 V <sub>dc</sub> )	C <sub>ib</sub>	—	135	—	pF
Current–Gain — Bandwidth Product(2) (I <sub>C</sub> = 500 mA, V <sub>CE</sub> = 10 V, F <sub>test</sub> = 1.0 MHz)	f <sub>T</sub>	—	105	—	MHz

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

(2) f<sub>T</sub> = |h<sub>FE</sub>| • f<sub>test</sub>

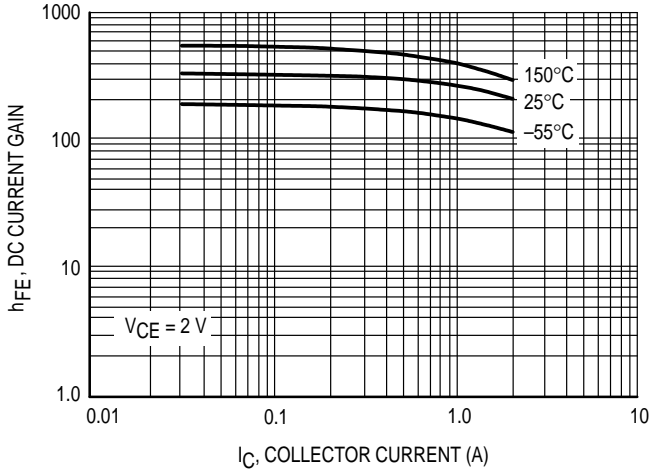


Figure 1. DC Current Gain

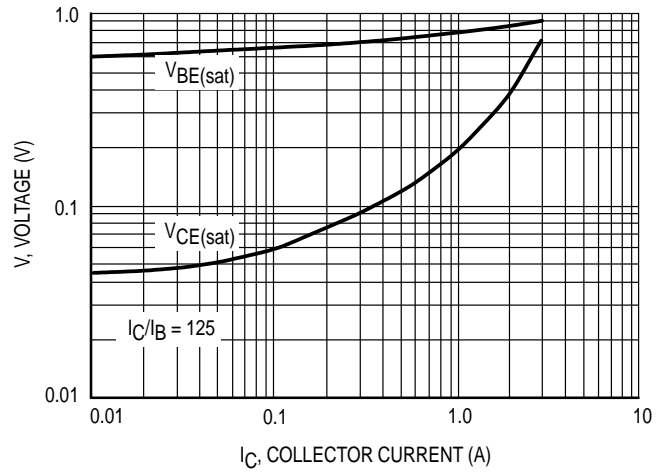


Figure 2. "ON" Voltages

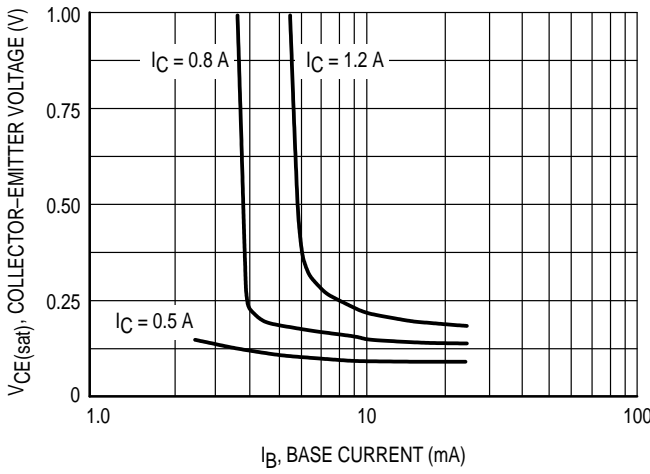


Figure 3. Collector Saturation Region

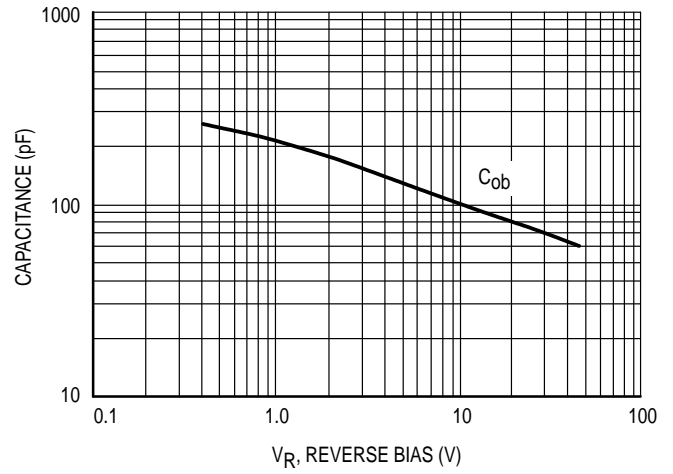


Figure 4. Capacitance

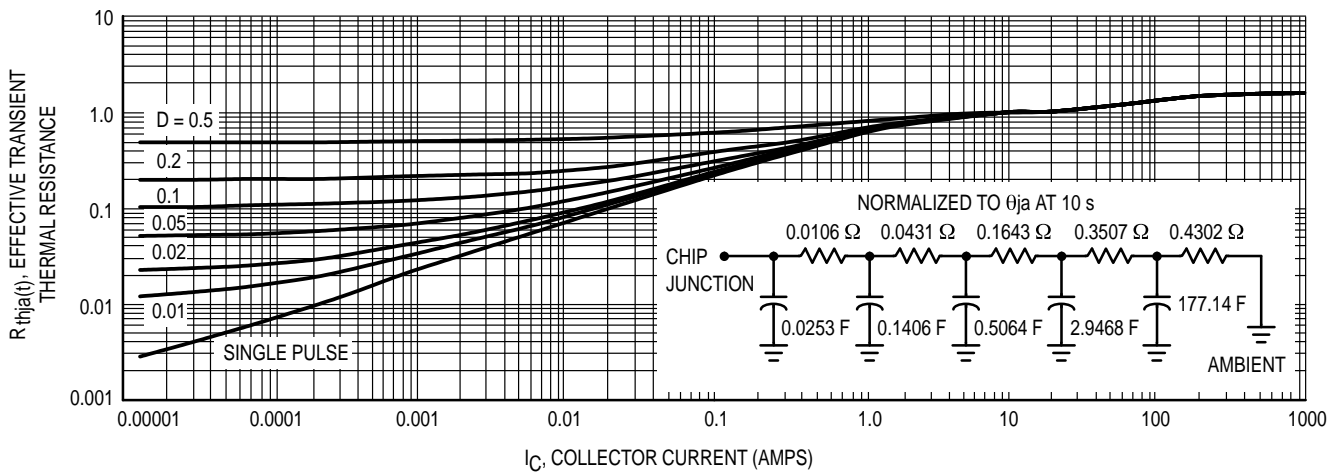
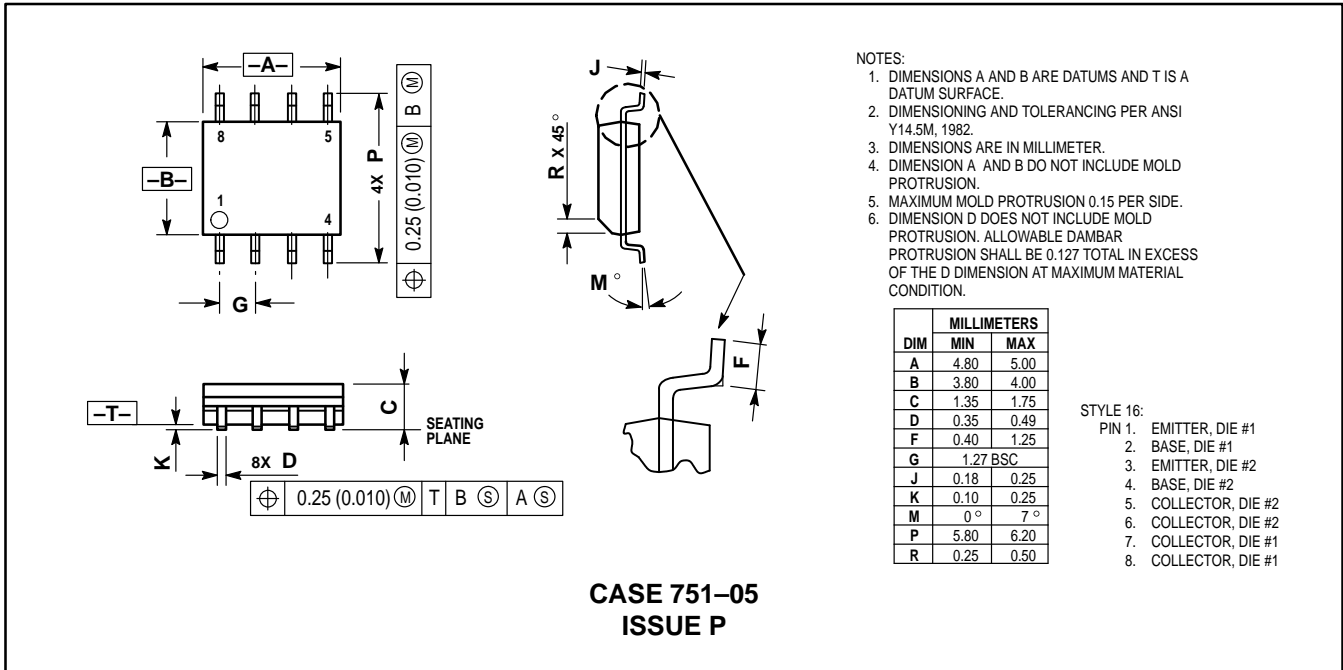


Figure 5. Thermal Response

PACKAGE DIMENSIONS



Motorola reserves the right to make changes without further notice to any products herein. Motorola makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does Motorola assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation consequential or incidental damages. "Typical" parameters which may be provided in Motorola data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. Motorola does not convey any license under its patent rights nor the rights of others. Motorola products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the Motorola product could create a situation where personal injury or death may occur. Should Buyer purchase or use Motorola products for any such unintended or unauthorized application, Buyer shall indemnify and hold Motorola and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that Motorola was negligent regarding the design or manufacture of the part. Motorola and are registered trademarks of Motorola, Inc. Motorola, Inc. is an Equal Opportunity/Affirmative Action Employer.

Mfax is a trademark of Motorola, Inc.

**How to reach us:**

**USA/EUROPE/Locations Not Listed:** Motorola Literature Distribution; P.O. Box 5405, Denver, Colorado 80217. 303-675-2140 or 1-800-441-2447

**JAPAN:** Nippon Motorola Ltd.; Tatsumi-SPD-JLDC, 6F Seibu-Butsuryu-Center, 3-14-2 Tatsumi Koto-Ku, Tokyo 135, Japan. 81-3-3521-8315

**Mfax™:** RMFAX0@email.sps.mot.com – TOUCHTONE 602-244-6609  
 – US & Canada ONLY 1-800-774-1848

**ASIA/PACIFIC:** Motorola Semiconductors H.K. Ltd.; 8B Tai Ping Industrial Park, 51 Ting Kok Road, Tai Po, N.T., Hong Kong. 852-26629298

**INTERNET:** <http://www.mot.com/SPS/>

