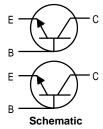
# Preliminary Data Sheet

## **Plastic Power Transistors**

## **SO-8 for Surface Mount Applications**

Designed for general purpose amplifier and low speed switching applications.

- Collector –Emitter Sustaining Voltage V<sub>CEO(sus)</sub>
   = 30 Vdc (Min) @ I<sub>C</sub> = 10 mAdc
- High DC Current Gain hFE
  - = 100 Vdc (Min) @ I<sub>C</sub> = 1.0 Adc
  - = 90 Vdc (Min) @ IC = 3.0 Adc
- Low Collector –Emitter Saturation Voltage VCE(sat)
  - = 0.235 Vdc (Max) @ IC = 1.2 Adc
  - = 0.5 Vdc (Max) @ IC = 5.0 Adc
- Miniature SO-8 Surface Mount Package Saves Board Space



MARKING: 3N3BJT ENG

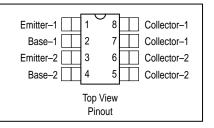
## **MMDJ3N03BJT**

**Motorola Preferred Device** 

DUAL BIPOLAR
POWER TRANSISTOR
NPN SILICON
30 VOLTS
3 AMPERES



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



## **MAXIMUM RATINGS** (T<sub>C</sub> = 25°C unless otherwise noted)

Rating	Symbol	Value	Unit
Collector–Base Voltage	V <sub>CB</sub>	45	Vdc
Collector–Emitter Voltage	VCEO	30	Vdc
Emitter-Base Voltage	V <sub>EB</sub>	± 8.0	Vdc
Collector Current — Continuous — Peak	IC	3.0 5.0	Adc
Base Current — Continuous	IВ	1.0	Adc
Operating and Storage Junction Temperature Range	T <sub>J</sub> , T <sub>Stg</sub>	-55 to +150	°C

### THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance – Junction to Ambient <sup>(1)</sup>	$R_{ heta JA}$	62.5	°C/W
Total Power Dissipation @ T <sub>A</sub> = 25°C <sup>(1)</sup> Derate above 25°C	P <sub>D</sub>	2.0 16	Watts mW/°C
Maximum Temperature for Soldering	TL	260	°C

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

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

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

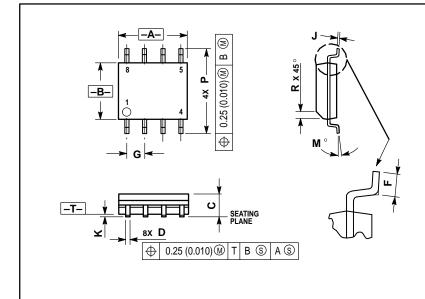
## **MMDJ3N03BJT**

# **ELECTRICAL CHARACTERISTICS** ( $T_C = 25^{\circ}C$ unless otherwise noted)

	Characteristic	Symbol	Min	Тур	Max	Unit
OFF CHARACTERISTIC	cs			•		
Collector–Emitter Susta (I <sub>C</sub> = 10 mAdc, I <sub>B</sub> = 1 Temperature Coeffici	0 Adc)	VCEO(sus)	_ _		30 tbd	Vdc V/°C
Collector Cutoff Curren (V <sub>CE</sub> = 25 Vdc)	t	ICEO	_	_	50	μAdc
Emitter Cutoff Current (VBE = 5.0 Vdc, IC = 0 Adc)		IEBO	_	_	1.0	mAdc
ON CHARACTERISTIC	S(1)					
Collector–Emitter Satu (I <sub>C</sub> = 1.2 Adc, I <sub>B</sub> = 2 (I <sub>C</sub> = 5.0 Adc, I <sub>B</sub> = 1	0 mAdc)	VCE(sat)		0.130 —	0.235 0.500	Vdc
Base–Emitter Saturation (IC = 5.0 Adc, IB = 1	•	V <sub>BE(sat)</sub>	_	_	_	Vdc
Base–Emitter On Volta (I <sub>C</sub> = 2.0 Adc, V <sub>CE</sub> =		V <sub>BE(on)</sub>	_	_	1.0	Vdc
DC Current Gain (I <sub>C</sub> = 1.0 Adc, V <sub>CE</sub> = (I <sub>C</sub> = 3.0 Adc, V <sub>CE</sub> =		hFE	100 90	180 165		_
DYNAMIC CHARACTER	RISTICS			•		
Output Capacitance (V <sub>CB</sub> = 10 Vdc, f = 1	.0 MHz)	C <sub>ob</sub>	_	80	135	pF
Input Capacitance (VEB = 8.0 Vdc, f = 7	1.0 MHz)	C <sub>ibo</sub>	_	200	250	pF
Current-Gain — Bandy	width Product <sup>(2)</sup>	fT	tbd	_	_	MHz
SWITCHING CHARACT	ERISTICS <sup>(1)</sup>					
Delay Time		t <sub>d</sub>	_	215		ns
Rise Time	$(I_C = 2.0 \text{ Adc}, I_{B1} = I_{B2} = 30 \text{ mAdc}, V_{CC} = 10 \text{ Vdc})$	t <sub>r</sub>		100		ns
Storage Time		t <sub>S</sub>	_	530	_	ns
Fall Time		t <sub>f</sub>	_	60	_	ns

<sup>(1)</sup> Pulse Test: Pulse Width  $\leq$  300  $\mu$ s, Duty Cycle  $\leq$  2%. (2) fT = |hFE| • ftest

## **PACKAGE DIMENSIONS**



**CASE 751-05 ISSUE P** 

- NOTES:

  1. DIMENSIONS A AND B ARE DATUMS AND T IS A DATUM SURFACE.

  2. DIMENSIONING AND TOLERANCING PER ANSI

- 2. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
  3. DIMENSIONS ARE IN MILLIMETER.
  4. DIMENSION A AND B DO NOT INCLUDE MOLD PROTRUSION.
  5. MAXIMUM MOLD PROTRUSION 0.15 PER SIDE.
  6. DIMENSION D DOES NOT INCLUDE MOLD PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.127 TOTAL IN EXCESS OF THE D DIMENSION AT MAXIMUM MATERIAL CONDITION CONDITION.

	MILLIMETEDS		
	MILLIMETERS		
DIM	MIN	MAX	
Α	4.80	5.00	
В	3.80	4.00	
С	1.35	1.75	
D	0.35	0.49	
F	0.40	1.25	
G	1.27 BSC		
J	0.18	0.25	
K	0.10	0.25	
M	0 °	7 °	
Р	5.80	6.20	
P	0.25	0.50	

STYLE 16:
PIN 1. EMITTER, DIE #1
2. BASE, DIE #1

- EMITTER, DIE #2
- BASE, DIE #2 COLLECTOR, DIE #2

- COLLECTOR, DIE #2 COLLECTOR, DIE #1 COLLECTOR, DIE #1

#### **MMDJ3N03BJT**

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