Preliminary Data Sheet

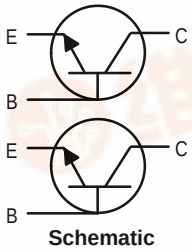
Plastic Power Transistors

SO–8 for Surface Mount Applications

Designed for general purpose amplifier and low speed switching applications.

- Collector –Emitter Sustaining Voltage — $V_{CEO(sus)}$
  = 30 Vdc (Min) @ I_C = 10 mAdc
- High DC Current Gain — h_{FE}
  = 100 Vdc (Min) @ I_C = 1.0 Adc
  = 90 Vdc (Min) @ I_C = 3.0 Adc
- Low Collector –Emitter Saturation Voltage — $V_{CE(sat)}$
  = 0.235 Vdc (Max) @ I_C = 1.2 Adc
  = 0.5 Vdc (Max) @ I_C = 5.0 Adc
- Miniature SO–8 Surface Mount Package – Saves Board Space

MARKING: 3N3BJT ENG

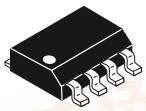


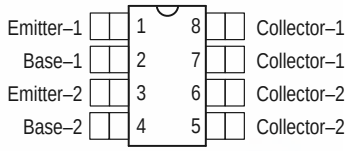
Schematic

MMDJ3N03BJT

Motorola Preferred Device

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


**CASE 751–05, Style 16
(SO–8)**



Top View
Pinout

MAXIMUM RATINGS (T_C = 25°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}	± 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	°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance – Junction to Ambient(1)	$R_{\theta JA}$	62.5	°C/W
Total Power Dissipation @ T_A = 25°C(1) Derate above 25°C	P_D	2.0 16	Watts mW/°C
Maximum Temperature for Soldering	T_L	260	°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.

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

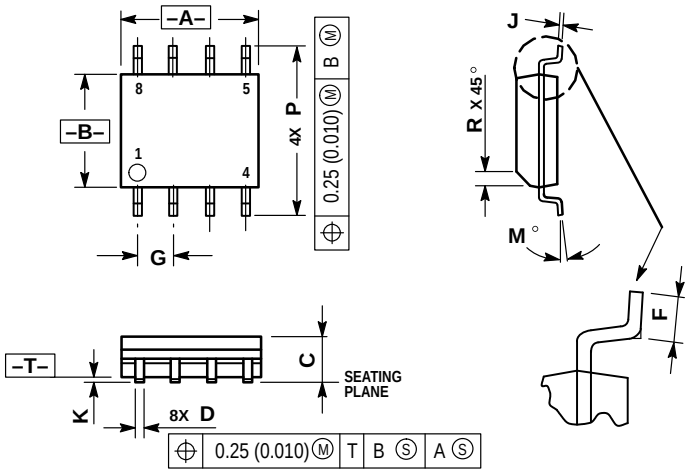
Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector–Emitter Sustaining Voltage (I_C = 10 mAdc, I_B = 0 Adc)	$V_{CEO(sus)}$	—	—	30	Vdc
Temperature Coefficient (Positive)		—	—	tbd	V/°C
Collector Cutoff Current (V_{CE} = 25 Vdc)	I_{CEO}	—	—	50	μAdc
Emitter Cutoff Current (V_{BE} = 5.0 Vdc, I_C = 0 Adc)	I_{EBO}	—	—	1.0	mAdc
ON CHARACTERISTICS(1)					
Collector–Emitter Saturation Voltage (I_C = 1.2 Adc, I_B = 20 mAdc)	$V_{CE(sat)}$	—	0.130	0.235	Vdc
(I_C = 5.0 Adc, I_B = 1.0 Adc)		—	—	0.500	
Base–Emitter Saturation Voltage (I_C = 5.0 Adc, I_B = 1.0 Adc)	$V_{BE(sat)}$	—	—	—	Vdc
Base–Emitter On Voltage (I_C = 2.0 Adc, V_{CE} = 1.0 Vdc)	$V_{BE(on)}$	—	—	1.0	Vdc
DC Current Gain	h_{FE}				—
(I_C = 1.0 Adc, V_{CE} = 4.0 Vdc)		100	180	—	
(I_C = 3.0 Adc, V_{CE} = 4.0 Vdc)		90	165	—	
DYNAMIC CHARACTERISTICS					
Output Capacitance (V_{CB} = 10 Vdc, f = 1.0 MHz)	C_{ob}	—	80	135	pF
Input Capacitance (V_{EB} = 8.0 Vdc, f = 1.0 MHz)	C_{ibo}	—	200	250	pF
Current–Gain — Bandwidth Product(2)	f_T	tbd	—	—	MHz
SWITCHING CHARACTERISTICS(1)					
Resistive Load					
Delay Time	t_d	—	215	—	ns
Rise Time	t_r	—	100	—	ns
Storage Time	t_s	—	530	—	ns
Fall Time	t_f	—	60	—	ns

(I_C = 2.0 Adc, I_{B1} = I_{B2} = 30 mAdc, V_{CC} = 10 Vdc)

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

(2) $f_T = |h_{FE}| \cdot f_{test}$

PACKAGE DIMENSIONS



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

	MILLIMETERS	
DIM	MIN	MAX
A	4.80	5.00
B	3.80	4.00
C	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 °
P	5.80	6.20
R	0.25	0.50

STYLE 16:
PIN 1. EMITTER, DIE #1
2. BASE, DIE #1
3. EMITTER, DIE #2
4. BASE, DIE #2
5. COLLECTOR, DIE #2
6. COLLECTOR, DIE #2
7. COLLECTOR, DIE #1
8. COLLECTOR, DIE #1

CASE 751–05
ISSUE P

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