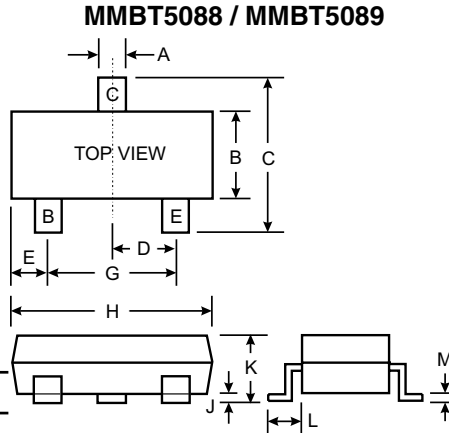


Features

- Low Noise High Gain
- Epitaxial Planar Die Construction
- Available in both Through-Hole and Surface Mount Packages
- General Purpose, Low Noise Amplifier

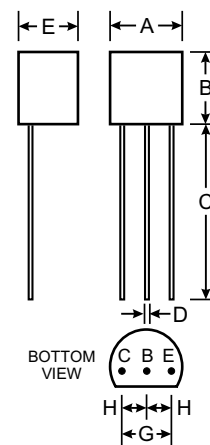


SOT-23		
Dim	Min	Max
A	0.37	0.51
B	1.19	1.40
C	2.10	2.50
D	0.89	1.05
E	0.45	0.61
G	1.78	2.05
H	2.65	3.05
J	0.013	0.15
K	0.89	1.10
L	0.45	0.61
M	0.076	0.178
All Dimensions in mm		

Mechanical Data

- Case: TO-92/SOT-23, Plastic
- Leads/Terminals: Solderable per MIL-STD-202, Method 208
- Terminal Connections: See Diagram
- Marking: TO-92 Type Number
SOT-23 MMBT5088 1Q
MMBT5089 1R
- Approx Weight: TO-92 0.18 grams
SOT-23 0.008 grams

2N5088 / 2N5089



TO-92		
Dim	Min	Max
A	4.32	4.83
B	4.32	4.78
C	12.50	15.62
D	0.36	0.56
E	3.15	3.94
G	2.29	2.79
H	1.14	1.40
All Dimensions in mm		

Maximum Ratings @ T_A = 25°C unless otherwise specified

Characteristic	Symbol	2N/MMBT5088	2N/MMBT5089	Unit
Collector-Emitter Voltage	V _{CEO}	30	25	V
Collector- Base Voltage	V _{CBO}	35	30	V
Emitter- Base Voltage	V _{EBO}	4.5		V
Collector Current	I _C	100		mA
Total Device Dissipation TO-92 (Note 1) SOT-23 (Note 2)	P _d	625 350		mW
Thermal Resistance, Junction to Ambient TO-92 (Note 1) SOT-23 (Note 2)	R _{θJA}	200 357		K/W
Thermal Resistance, Junction to Collector	R _{θJC}	83.3		K/W
Operating and Storage Temperature	T _j , T _{STG}	-55 to +150		°C

- Notes:
1. Valid provided that leads at a distance of 2.0mm from body are kept at specified ambient (TO-92).
 2. Device mounted on FR-4 PCB 40 x 40 x 1.5mm..
 3. Pulse test: Pulse width | 300µs, duty cycle | 2%.

Electrical Characteristics @ $T_A = 25^\circ\text{C}$ unless otherwise specified

Characteristic	Symbol	Min 5088	Max 5088	Min 5089	Max 5089	Unit	Test Condition
Collector to Emitter Breakdown Voltage (Note 3)	$V_{(BR)CEO}$	30	—	25	—	V	$I_C = 1.0\text{mA}, I_B = 0$
Collector to Base Breakdown Voltage	$V_{(BR)CBO}$	35	—	30	—	V	$I_C = 100\mu\text{A}, I_E = 0$
Emitter Cutoff Current	I_{EBO}	—	50 100	—	50 100	nA	$V_{EB(OFF)} = 3.0\text{V}, I_C = 0$ $V_{EB(OFF)} = 4.5\text{V}, I_C = 0$
Collector Cutoff Current	I_{CEX}	—	50 —	—	— 50	nA	$V_{CB} = 20\text{V}, I_E = 0$ $V_{CB} = 15\text{V}, I_E = 0$
DC Current Gain (Note 3)	h_{FE}	300 350 300	900 — —	400 450 400	1200 — —	—	$I_C = 100\mu\text{A}, V_{CE} = 5.0\text{V}$ $I_C = 1.0\text{mA}, V_{CE} = 5.0\text{V}$ $I_C = 10\text{mA}, V_{CE} = 5.0\text{V}$
Collector-Emitter Saturation Voltage (Note 3)	$V_{CE(SAT)}$	—	0.5	—	0.5	V	$I_C = 10\text{mA}, I_B = 1.0\text{mA}$
Base-Emitter "ON" Voltage (Note 3)	$V_{BE(ON)}$	—	0.8	—	0.8	V	$I_C = 10\text{mA}, V_{CE} = 5.0\text{V}$
Collector to Base Capacitance	C_{cb}	—	4.0	—	4.0	pF	$V_{CB} = 5.0\text{V}, I_E = 0$ $f = 100\text{kHz}$
Emitter to Base Capacitance	C_{eb}	—	10	—	10	pF	$V_{BE} = 0.5\text{V}, I_C = 0$ $f = 100\text{kHz}$
Small Signal Current Gain	h_{fe}	350	1400	450	1800	—	$I_C = 1.0\text{mA}, V_{CE} = 5.0\text{V},$ $f = 1.0\text{kHz}$
Current Gain Bandwidth Product	f_T	50	—	50	—	MHz	$I_C = 500\mu\text{A}, V_{CE} = 5.0\text{V},$ $R_S = 10\text{k}\Omega$ $f = 20\text{MHz}$
Noise Figure	NF	—	3.0	—	2.0	dB	$I_C = 100\mu\text{A}, V_{CE} = 5.0\text{V},$ $R_S = 10\text{k}\Omega,$ $f = 10\text{Hz} - 15.7\text{kHz}$

- Notes:
1. Valid provided that leads at a distance of 2.0mm from body are kept at specified ambient (TO-92).
 2. Device mounted on FR-4 PCB 40 x 40 x 1.5mm..
 3. Pulse test: Pulse width | 300 μs , duty cycle | 2%.