

MMBT5087LT1

Low Noise Transistor

PNP Silicon

Features

- Pb-Free Packages are Available

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector–Emitter Voltage	V_{CEO}	–50	Vdc
Collector–Base Voltage	V_{CBO}	–50	Vdc
Emitter–Base Voltage	V_{EBO}	–3.0	Vdc
Collector Current – Continuous	I_C	–50	mAdc

THERMAL CHARACTERISTICS

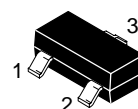
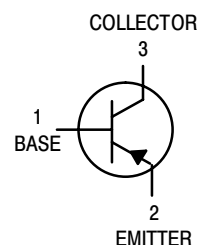
Characteristic	Symbol	Max	Unit
Total Device Dissipation FR–5 Board, (Note 1) $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	225 1.8	mW mW/ $^\circ\text{C}$
Thermal Resistance, Junction–to–Ambient	$R_{\theta JA}$	556	$^\circ\text{C}/\text{W}$
Total Device Dissipation Alumina Substrate, (Note 2) $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	300 2.4	mW mW/ $^\circ\text{C}$
Thermal Resistance, Junction–to–Ambient	$R_{\theta JA}$	417	$^\circ\text{C}/\text{W}$
Junction and Storage Temperature	T_J, T_{stg}	–55 to +150	$^\circ\text{C}$

Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

- FR–5 = 1.0 x 0.75 x 0.062 in.
- Alumina = 0.4 x 0.3 x 0.024 in. 99.5% alumina.

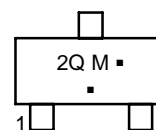


ON Semiconductor®



SOT–23 (TO–236)
CASE 318
STYLE 6

MARKING DIAGRAM



2Q = Device Code
M = Date Code*
▪ = Pb-Free Package

(Note: Microdot may be in either location)

*Date Code orientation and/or overbar may vary depending upon manufacturing location.

ORDERING INFORMATION

Device	Package	Shipping†
MMBT5087LT1	SOT–23	3,000 / Tape & Reel
MMBT5087LT1G	SOT–23 (Pb–Free)	3,000 / Tape & Reel
MMBT5087LT3	SOT–23	10,000/Tape & Reel
MMBT5087LT3G	SOT–23 (Pb–Free)	10,000/Tape & Reel

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

MMBT5087LT1

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector–Emitter Breakdown Voltage ($I_C = -1.0\text{ mA}$, $I_B = 0$)	$V_{(BR)CEO}$	-50	-	Vdc
Collector–Base Breakdown Voltage ($I_C = -100\text{ }\mu\text{A}$, $I_E = 0$)	$V_{(BR)CBO}$	-50	-	Vdc
Collector Cutoff Current ($V_{CB} = -10\text{ Vdc}$, $I_E = 0$) ($V_{CB} = -35\text{ Vdc}$, $I_E = 0$)	I_{CBO}	-	-10 -50	nAdc
ON CHARACTERISTICS				
DC Current Gain ($I_C = -100\text{ }\mu\text{A}$, $V_{CE} = -5.0\text{ Vdc}$) ($I_C = -1.0\text{ mA}$, $V_{CE} = -5.0\text{ Vdc}$) ($I_C = -10\text{ mA}$, $V_{CE} = -5.0\text{ Vdc}$)	h_{FE}	250 250 250	800 - -	-
Collector–Emitter Saturation Voltage ($I_C = -10\text{ mA}$, $I_B = -1.0\text{ mA}$)	$V_{CE(sat)}$	-	-0.3	Vdc
Base–Emitter Saturation Voltage ($I_C = -10\text{ mA}$, $I_B = -1.0\text{ mA}$)	$V_{BE(sat)}$	-	0.85	Vdc
SMALL-SIGNAL CHARACTERISTICS				
Current–Gain — Bandwidth Product ($I_C = -500\text{ }\mu\text{A}$, $V_{CE} = -5.0\text{ Vdc}$, $f = 20\text{ MHz}$)	f_T	40	-	MHz
Output Capacitance ($V_{CB} = -5.0\text{ Vdc}$, $I_E = 0$, $f = 1.0\text{ MHz}$)	C_{obo}	-	4.0	pF
Small–Signal Current Gain ($I_C = -1.0\text{ mA}$, $V_{CE} = -5.0\text{ Vdc}$, $f = 1.0\text{ kHz}$)	h_{fe}	250	900	-
Noise Figure ($I_C = -20\text{ mA}$, $V_{CE} = -5.0\text{ Vdc}$, $R_S = 10\text{ k}\Omega$, $f = 1.0\text{ kHz}$) ($I_C = -100\text{ }\mu\text{A}$, $V_{CE} = -5.0\text{ Vdc}$, $R_S = 3.0\text{ k}\Omega$, $f = 1.0\text{ kHz}$)	NF	-	2.0 2.0	dB

TYPICAL NOISE CHARACTERISTICS

($V_{CE} = -5.0\text{ Vdc}$, $T_A = 25^\circ\text{C}$)

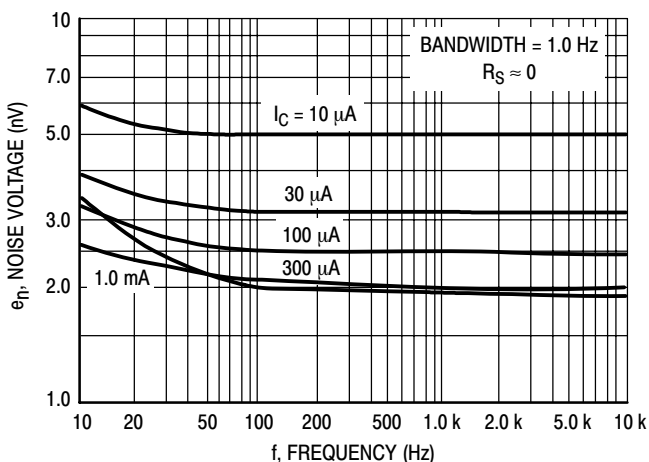


Figure 1. Noise Voltage

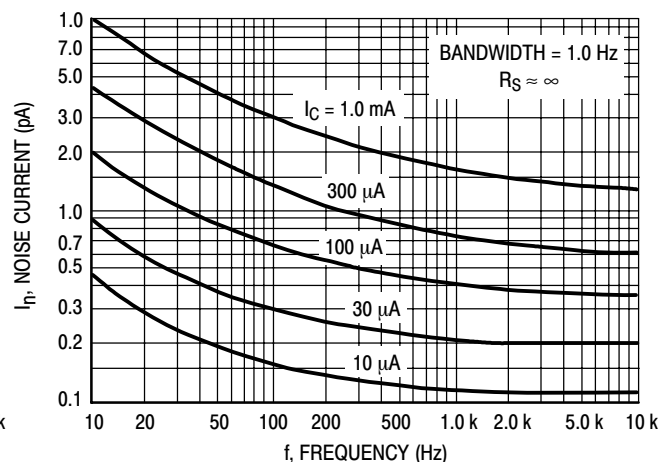
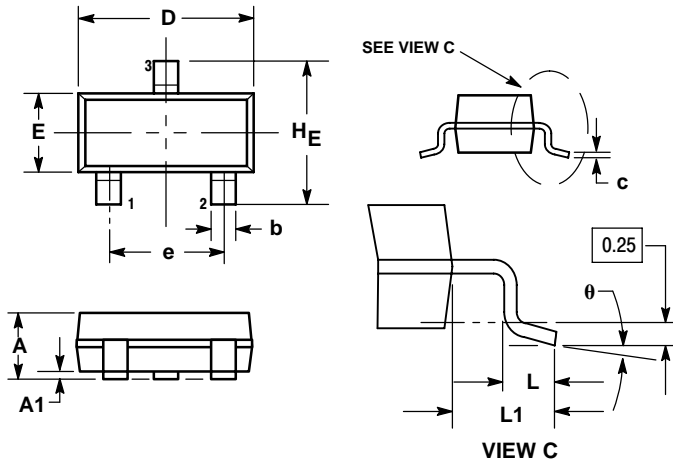


Figure 2. Noise Current

MMBT5087LT1

PACKAGE DIMENSIONS

SOT-23 (TO-236)
CASE 318-08
ISSUE AN



NOTES:

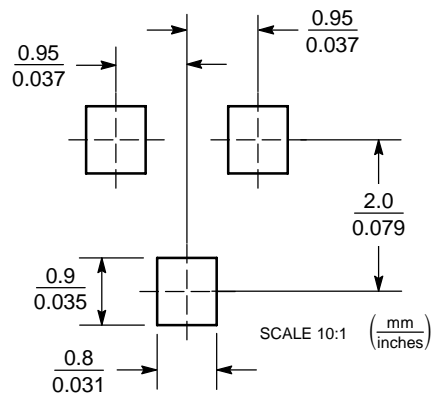
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH THICKNESS. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.
4. 318-01 THRU -07 AND -09 OBSOLETE, NEW STANDARD 318-08.

DIM	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.89	1.00	1.11	0.035	0.040	0.044
A1	0.01	0.06	0.10	0.001	0.002	0.004
b	0.37	0.44	0.50	0.015	0.018	0.020
c	0.09	0.13	0.18	0.003	0.005	0.007
D	2.80	2.90	3.04	0.110	0.114	0.120
E	1.20	1.30	1.40	0.047	0.051	0.055
e	1.78	1.90	2.04	0.070	0.075	0.081
L	0.10	0.20	0.30	0.004	0.008	0.012
L1	0.35	0.54	0.69	0.014	0.021	0.029
HE	2.10	2.40	2.64	0.083	0.094	0.104

STYLE 6:

1. BASE
2. EMITTER
3. COLLECTOR

SOLDERING FOOTPRINT*



*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.