MMBT489LT1

High Current Surface Mount NPN Silicon Switching Transistor for Load Management in Portable Applications

ON Semiconductor®

http://onsemi.com

30 VOLTS
2.0 AMPS
NPN TRANSISTOR

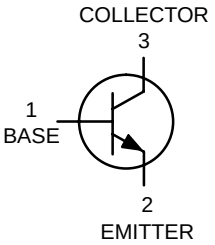
MAXIMUM RATINGS (T_A = 25°C)

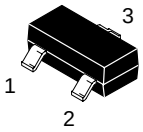
Rating	Symbol	Max	Unit
Collector-Emitter Voltage	V_{CEO}	30	Vdc
Collector-Base Voltage	V_{CBO}	50	Vdc
Emitter-Base Voltage	V_{EBO}	5.0	Vdc
Collector Current − Continuous	I_C	1.0	A
Collector Current − Peak	I_{CM}	2.0	A

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Total Device Dissipation T_A = 25°C Derate above 25°C	P_D (Note 1)	310 2.5	mW mW/°C
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$ (Note 1)	403	°C/W
Total Device Dissipation T_A = 25°C Derate above 25°C	P_D (Note 2)	710 5.7	mW mW/°C
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$ (Note 2)	176	°C/W
Total Device Dissipation (Single Pulse < 10 sec.)	$P_{Dsingle}$	575	mW
Junction and Storage Temperature Range	T_J, T_{stg}	−55 to +150	°C

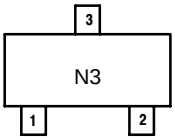
1. FR−4 @ Minimum Pad
2. FR−4 @ 1.0 X 1.0 inch Pad





SOT−23 (TO−236)
CASE 318−08
STYLE 6

DEVICE MARKING



N3 = Specific Device Code

ORDERING INFORMATION

Device	Package	Shipping
MMBT489LT1	SOT−23	3000/Tape & Reel

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

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector−Emitter Breakdown Voltage (I_C = 10 mAdc, I_B = 0)	$V_{(BR)CEO}$	30	−	Vdc
Collector−Base Breakdown Voltage (I_C = 0.1 mAdc, I_E = 0)	$V_{(BR)CBO}$	50	−	Vdc
Emitter−Base Breakdown Voltage (I_E = 0.1 mAdc, I_C = 0)	$V_{(BR)EBO}$	5.0	−	Vdc
Collector Cutoff Current (V_{CB} = 30 Vdc, I_E = 0)	I_{CBO}	−	0.1	μAdc
Collector−Emitter Cutoff Current (V_{CES} = 30 Vdc)	I_{CES}	−	0.1	μAdc
Emitter Cutoff Current (V_{EB} = 4.0 Vdc)	I_{EBO}	−	0.1	μAdc
ON CHARACTERISTICS				
DC Current Gain (Note 1) (I_C = 50 mA, V_{CE} = 5.0 V) (I_C = 0.5 A, V_{CE} = 5.0 V) (I_C = 1.0 A, V_{CE} = 5.0 V)	h_{FE}	 300 300 200	 − 900 −	
Collector−Emitter Saturation Voltage (Note 1) (I_C = 1.0 A, I_B = 100 mA) (I_C = 0.5 A, I_B = 50 mA) (I_C = 0.1 A, I_B = 1.0 mA)	$V_{CE(sat)}$	 − − −	 0.200 0.125 0.075	V
Base−Emitter Saturation Voltage (Note 1) (I_C = 1.0 A, I_B = 0.1 A)	$V_{BE(sat)}$	−	1.1	V
Base−Emitter Turn−on Voltage (Note 1) (I_C = 1.0 mA, V_{CE} = 2.0 V)	$V_{BE(on)}$	−	1.1	V
Cutoff Frequency (I_C = 100 mA, V_{CE} = 5.0 V, f = 100 MHz	f_T	100	−	MHz
Output Capacitance (f = 1.0 MHz)	C_{obo}	−	15	pF

1. Pulsed Condition: Pulse Width = 300 μsec, Duty Cycle ≤ 2%

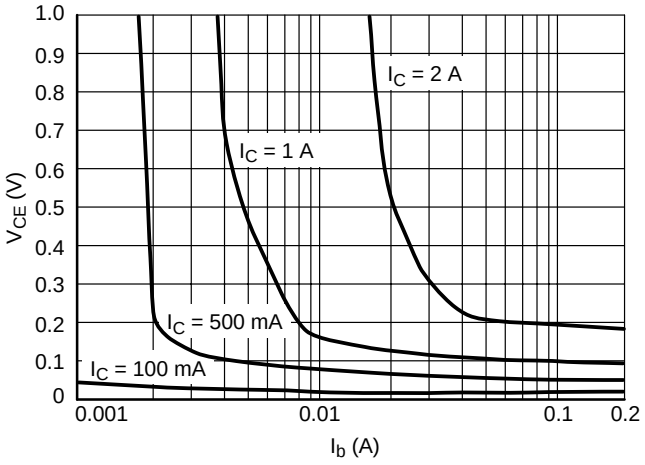


Figure 1. V_{CE} versus I_b

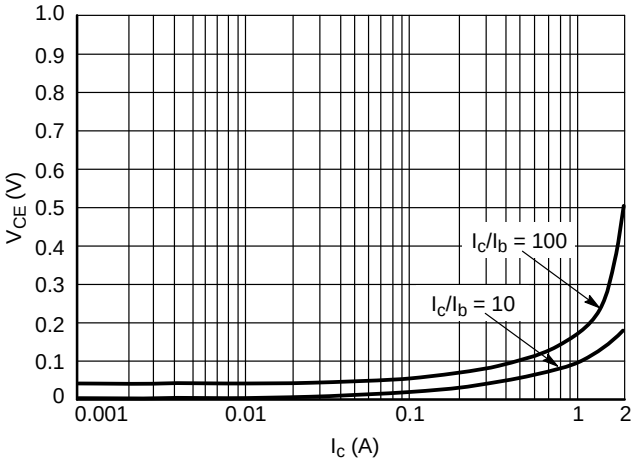


Figure 2. V_{CE} versus I_c

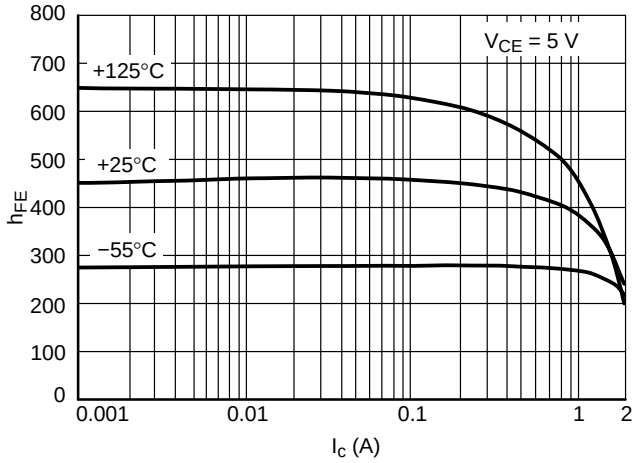


Figure 3. h_{FE} versus I_c

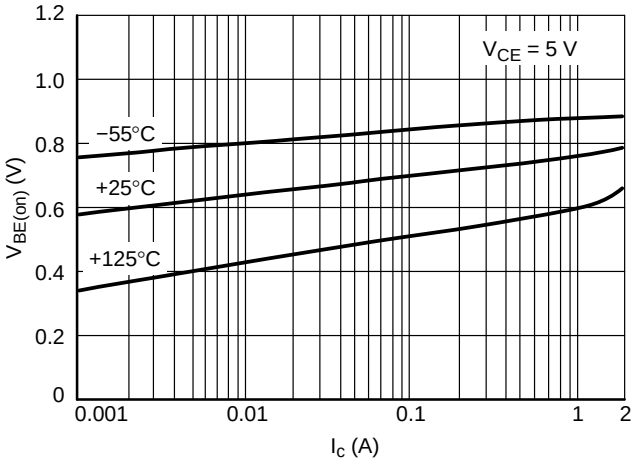


Figure 4. $V_{BE(on)}$ versus I_c

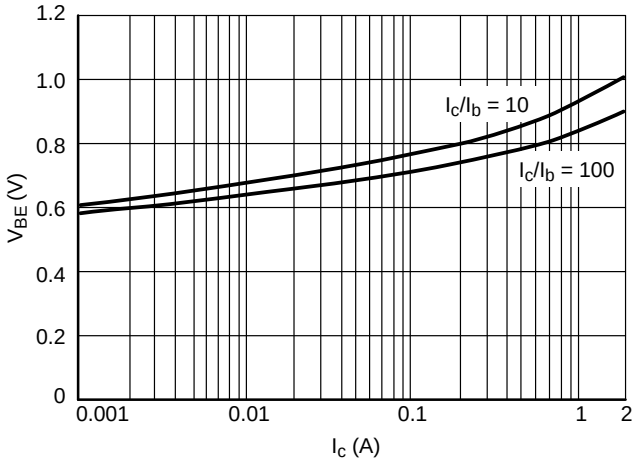


Figure 5. $V_{BE(sat)}$ versus I_c

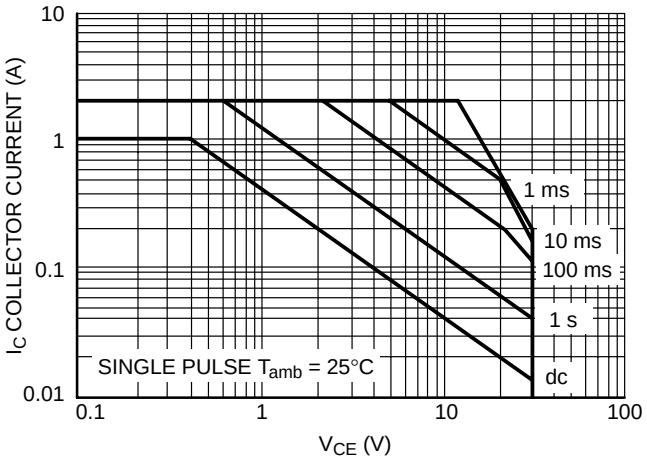


Figure 6. Safe Operating Area

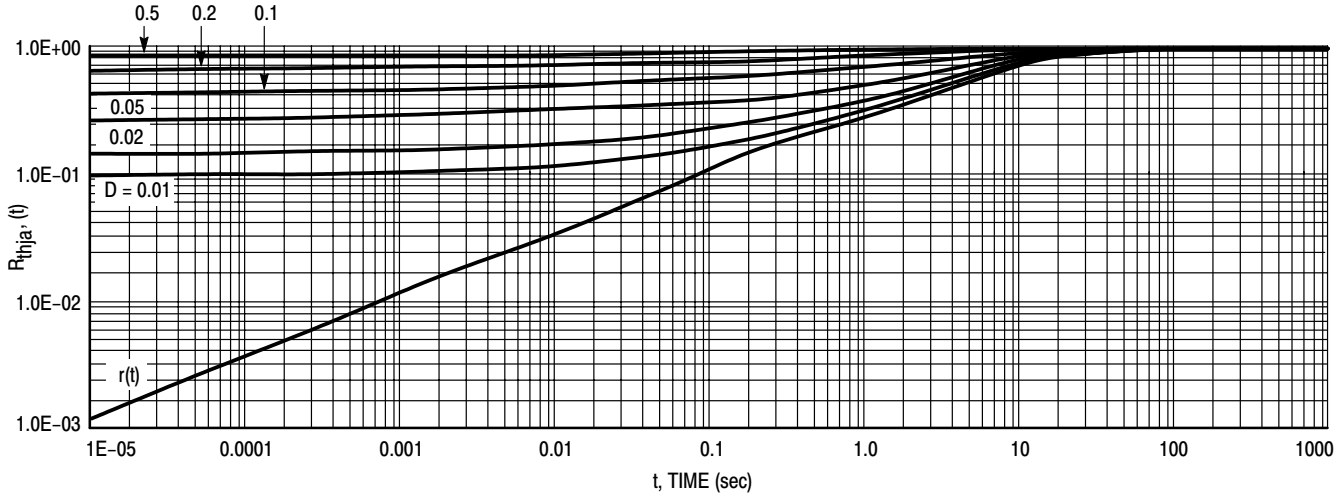
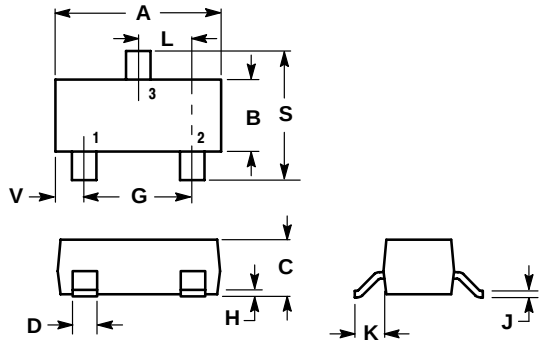


Figure 7. Normalized Thermal Response

PACKAGE DIMENSIONS

SOT−23 (TO−236)
CASE 318−08
ISSUE AH



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. 318−03 AND −07 OBSOLETE, NEW STANDARD 318−08.

	INCHES		MILLIMETERS	
DIM	MIN	MAX	MIN	MAX
A	0.1102	0.1197	2.80	3.04
B	0.0472	0.0551	1.20	1.40
C	0.0350	0.0440	0.89	1.11
D	0.0150	0.0200	0.37	0.50
G	0.0701	0.0807	1.78	2.04
H	0.0005	0.0040	0.013	0.100
J	0.0034	0.0070	0.085	0.177
K	0.0140	0.0285	0.35	0.69
L	0.0350	0.0401	0.89	1.02
S	0.0830	0.1039	2.10	2.64
V	0.0177	0.0236	0.45	0.60

STYLE 6:
PIN 1. BASE
2. EMITTER
3. COLLECTOR

PUBLICATION ORDERING INFORMATION

Literature Fulfillment:
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