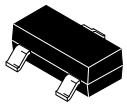
MMBT6427LT1G, SMMBT6427LT1G

Darlington Transistor

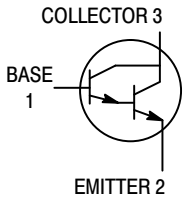
NPN Silicon

ON Semiconductor®

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SOT−23 (TO−236)
CASE 318
STYLE 6



Features

- S Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC−Q101 Qualified and PPAP Capable
- These Devices are Pb−Free, Halogen Free/BFR Free and are RoHS Compliant

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector − Emitter Voltage	V_{CEO}	40	Vdc
Collector − Base Voltage	V_{CBO}	40	Vdc
Emitter − Base Voltage	V_{EBO}	12	Vdc
Collector Current − Continuous	I_C	500	mAdc

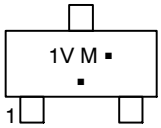
THERMAL CHARACTERISTICS

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

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

1. FR−5 = 1.0 x 0.75 x 0.062 in.
2. Alumina = 0.4 x 0.3 x 0.024 in. 99.5% alumina.

MARKING DIAGRAM



1V = 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†
MMBT6427LT1G	SOT−23 (Pb−Free)	3,000 Tape & Reel
SMMBT6427LT1G	SOT−23 (Pb−Free)	3,000 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.

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

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector – Emitter Breakdown Voltage (I_C = 10 mAdc, V_{BE} = 0)	$V_{(BR)CEO}$	40	–	Vdc
Collector – Base Breakdown Voltage (I_C = 100 μAdc, I_E = 0)	$V_{(BR)CBO}$	40	–	Vdc
Emitter – Base Breakdown Voltage (I_C = 10 μAdc, I_C = 0)	$V_{(BR)EBO}$	12	–	Vdc
Collector Cutoff Current (V_{CE} = 25 Vdc, I_B = 0)	I_{CES}	–	1.0	μAdc
Collector Cutoff Current (V_{CB} = 30 Vdc, I_E = 0)	I_{CBO}	–	50	nAdc
Emitter Cutoff Current (V_{EB} = 10 Vdc, I_C = 0)	I_{EBO}	–	50	nAdc
ON CHARACTERISTICS				
DC Current Gain (I_C = 10 mAdc, V_{CE} = 5.0 Vdc) (I_C = 100 mAdc, V_{CE} = 5.0 Vdc) (I_C = 500 mAdc, V_{CE} = 5.0 Vdc)	h_{FE}	 10,000 20,000 14,000	 100,000 200,000 140,000	–
Collector – Emitter Saturation Voltage (I_C = 50 mAdc, I_B = 0.5 mAdc) (I_C = 500 mAdc, I_B = 0.5 mAdc)	$V_{CE(sat)}$ (3)	 – –	 1.2 1.5	Vdc
Base – Emitter Saturation Voltage (I_C = 500 mAdc, I_B = 0.5 mAdc)	$V_{BE(sat)}$	–	2.0	Vdc
Base – Emitter On Voltage (I_C = 50 mAdc, V_{CE} = 5.0 Vdc)	$V_{BE(on)}$	–	1.75	Vdc
SMALL– SIGNAL CHARACTERISTICS				
Output Capacitance (V_{CB} = 10 Vdc, I_E = 0, f = 1.0 MHz)	C_{obo}	–	7.0	pF
Input Capacitance (V_{EB} = 0.5 Vdc, I_C = 0, f = 1.0 MHz)	C_{ibo}	–	15	pF
Current Gain – High Frequency (I_C = 10 mAdc, V_{CE} = 5.0 Vdc, f = 100 MHz)	$\|h_{fe}\|$	1.3	–	Vdc
Noise Figure (I_C = 1.0 mAdc, V_{CE} = 5.0 Vdc, R_S = 100 kΩ, f = 1.0 kHz)	NF	–	10	dB

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

3. Pulse Test: Pulse Width = 300 μs, Duty Cycle = 2.0%.

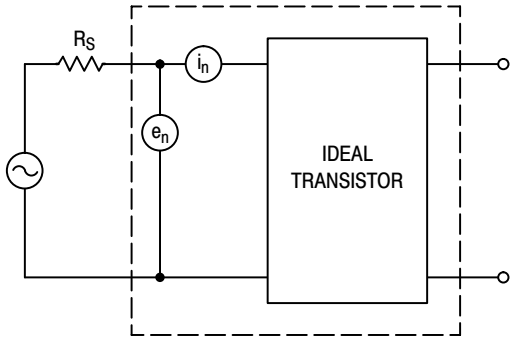


Figure 1. Transistor Noise Model

NOISE CHARACTERISTICS

(V_{CE} = 5.0 Vdc, T_A = 25°C)

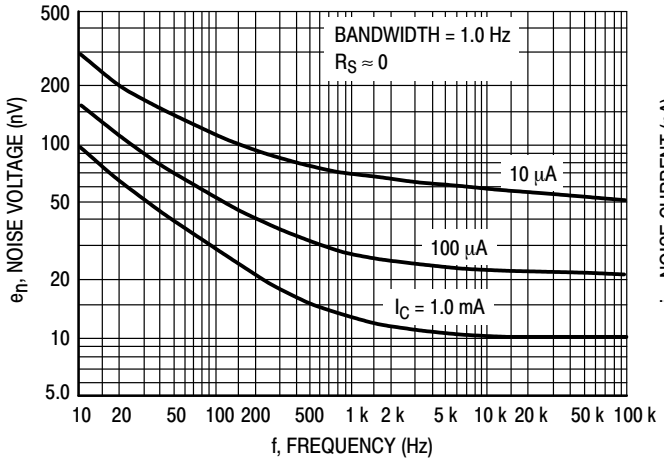


Figure 2. Noise Voltage

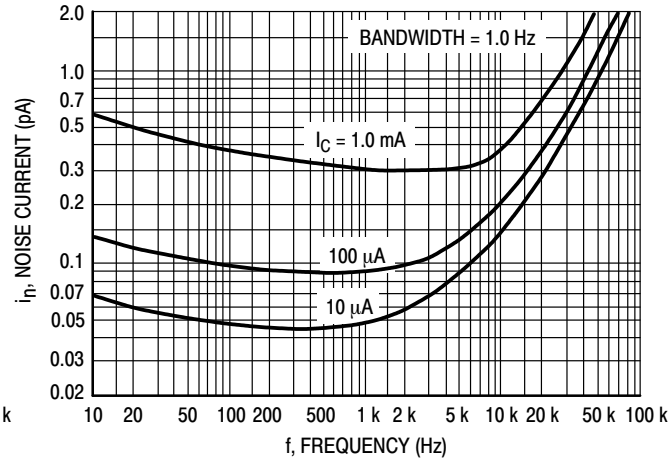


Figure 3. Noise Current

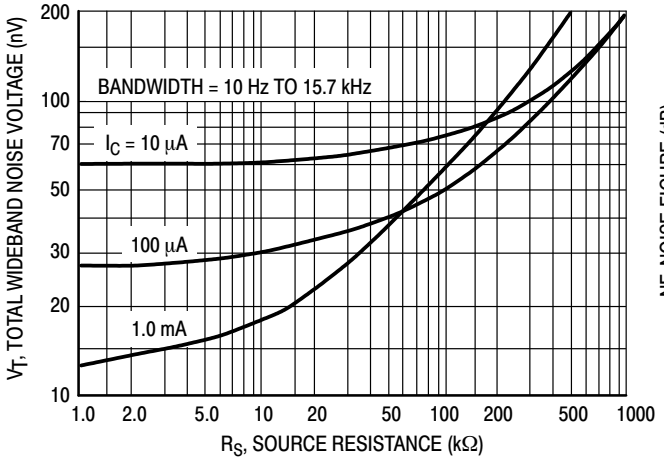


Figure 4. Total Wideband Noise Voltage

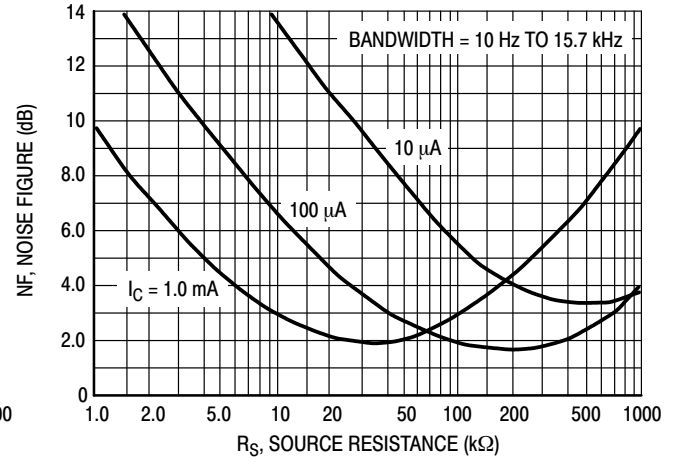


Figure 5. Wideband Noise Figure

SMALL−SIGNAL CHARACTERISTICS

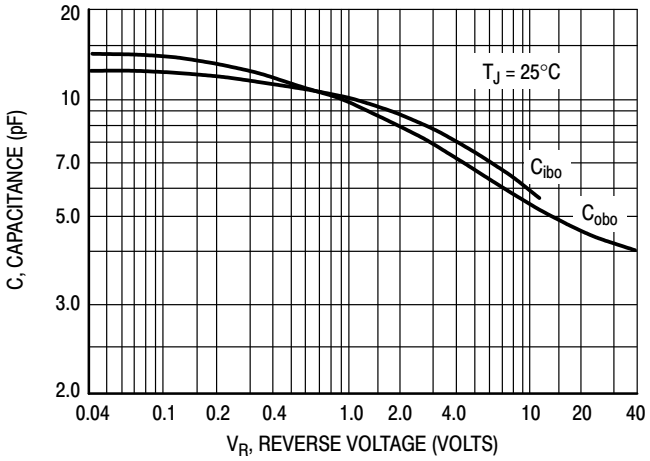


Figure 6. Capacitance

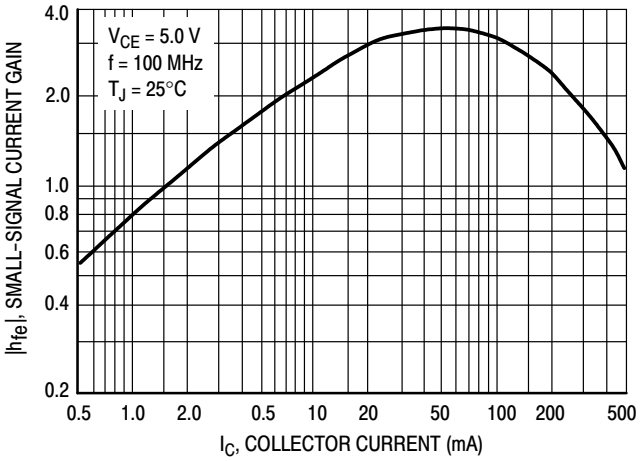


Figure 7. High Frequency Current Gain

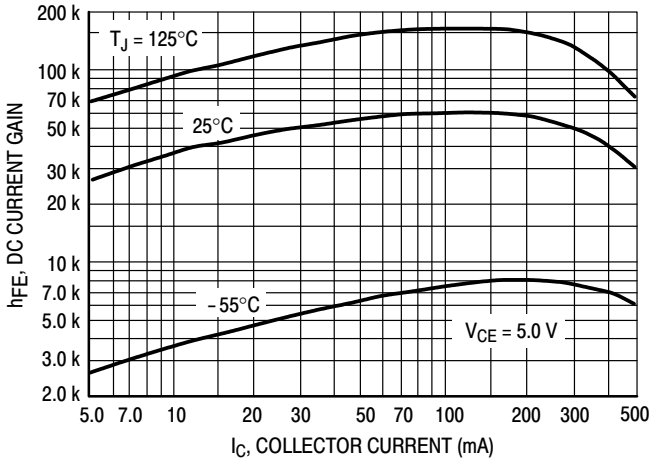


Figure 8. DC Current Gain

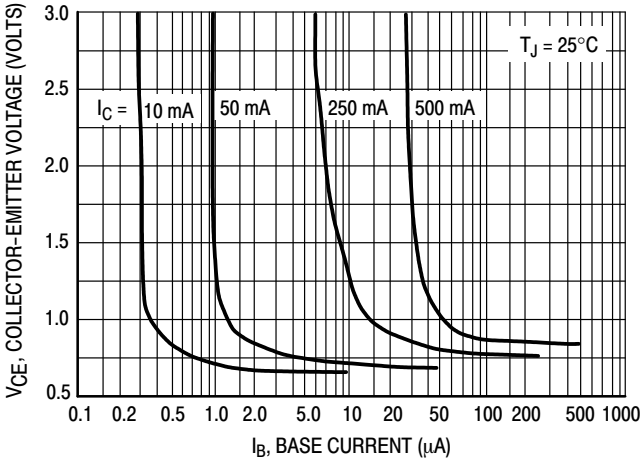


Figure 9. Collector Saturation Region

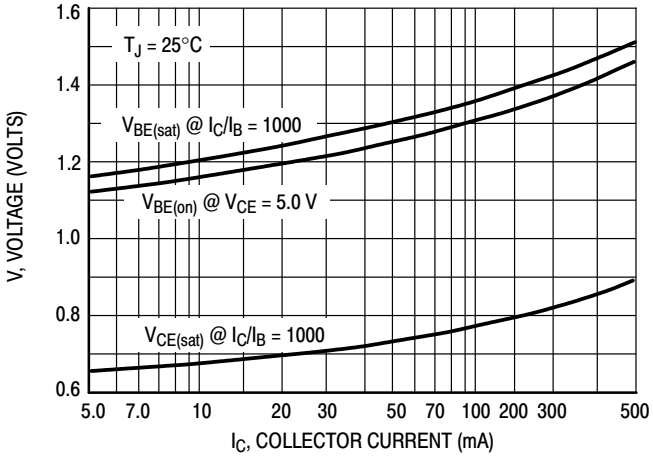


Figure 10. “On” Voltages

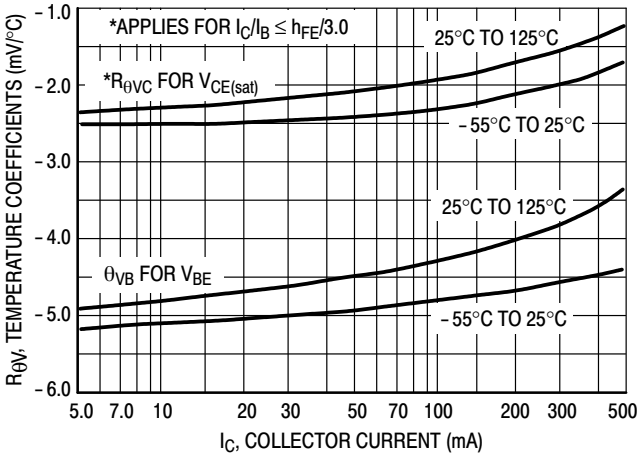


Figure 11. Temperature Coefficients

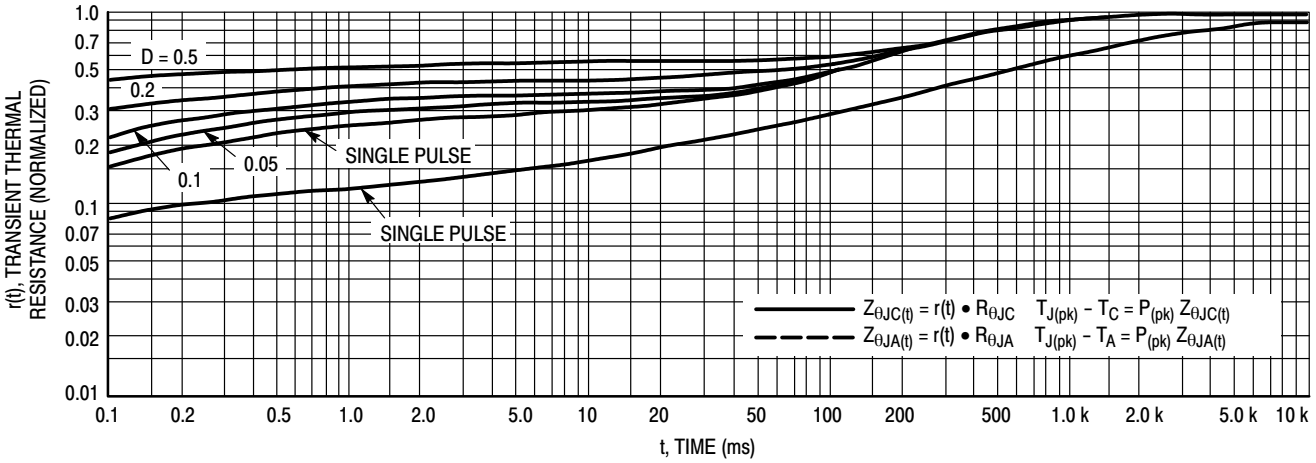
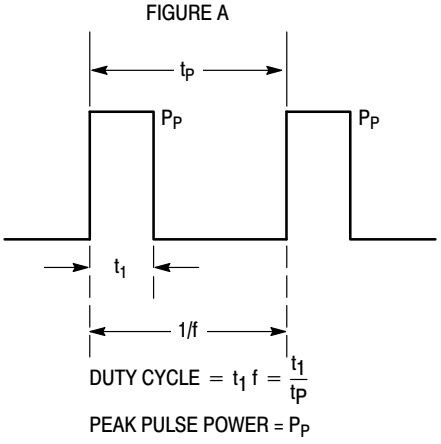


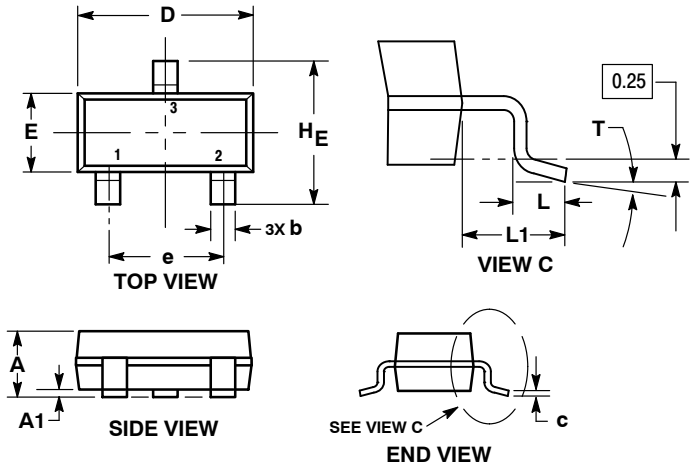
Figure 12. Thermal Response



Design Note: Use of Transient Thermal Resistance Data

PACKAGE DIMENSIONS

SOT−23 (TO−236)
CASE 318−08
ISSUE AR

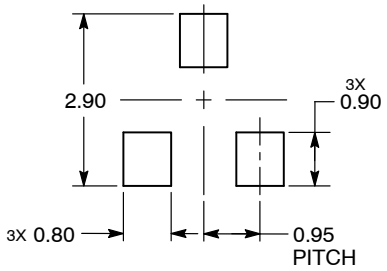


NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF THE BASE MATERIAL.
4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE BURRS.

	MILLIMETERS			INCHES		
DIM	MIN	NOM	MAX	MIN	NOM	MAX
A	0.89	1.00	1.11	0.035	0.039	0.044
A1	0.01	0.06	0.10	0.000	0.002	0.004
b	0.37	0.44	0.50	0.015	0.017	0.020
c	0.08	0.14	0.20	0.003	0.006	0.008
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	0.080
L	0.30	0.43	0.55	0.012	0.017	0.022
L1	0.35	0.54	0.69	0.014	0.021	0.027
H_E	2.10	2.40	2.64	0.083	0.094	0.104
T	0°	−−−	10 °	0 °	−−−	10 °

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

RECOMMENDED SOLDERING FOOTPRINT*



DIMENSIONS: MILLIMETERS

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

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