

# MMBT6428LT1, MMBT6429LT1

## Amplifier Transistors

### NPN Silicon



ON Semiconductor®

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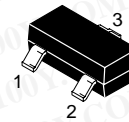
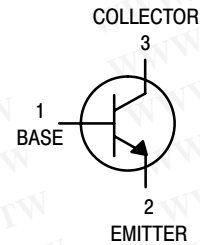
#### Features

- Pb-Free Packages are Available

#### MAXIMUM RATINGS

Rating	Symbol	6428LT1	6429LT1	Unit
Collector-Emitter Voltage	$V_{CEO}$	50	45	Vdc
Collector-Base Voltage	$V_{CBO}$	60	55	Vdc
Emitter-Base Voltage	$V_{EBO}$	6.0		Vdc
Collector Current - Continuous	$I_C$	200		mAdc

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.



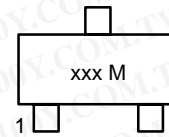
SOT-23 (TO-236)  
CASE 318  
STYLE 6

#### THERMAL CHARACTERISTICS

Rating	Symbol	Value	Unit
Total Device Dissipation FR-5 Board (Note 1) $T_A = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	225	mW
		1.8	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 $25^\circ\text{C}$	$P_D$	300	mW
		2.4	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	$^\circ\text{C}$

1. FR-5 =  $1.0 \times 0.75 \times 0.062$  in.
2. Alumina =  $0.4 \times 0.3 \times 0.024$  in. 99.5% alumina.

#### MARKING DIAGRAM



xxx = Specific Device Code  
 MMBT6428LT1 - 1KM  
 MMBT6429LT1 - 1L  
 M = Date Code

#### ORDERING INFORMATION

Device	Package	Shipping†
MMBT6428LT1	SOT-23	3000 Tape & Reel
MMBT6428LT1G	SOT-23 (Pb-Free)	3000 Tape & Reel
MMBT6429LT1	SOT-23	3000 Tape & Reel
MMBT6429LT1G	SOT-23 (Pb-Free)	3000 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.

# MMBT6428LT1, MMBT6429LT1

勝特力材料 886-3-5753170  
 勝特力电子(上海) 86-21-54151736  
 勝特力电子(深圳) 86-755-83298787  
[Http://www.100y.com.tw](http://www.100y.com.tw)

## ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Max	Unit
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### OFF CHARACTERISTICS

Collector–Emitter Breakdown Voltage (I <sub>C</sub> = 1.0 mAdc, I <sub>B</sub> = 0) (I <sub>C</sub> = 1.0 mAdc, I <sub>B</sub> = 0)	MMBT6428 MMBT6429	V <sub>(BR)CEO</sub>	50 45	– –	Vdc
Collector–Base Breakdown Voltage (I <sub>C</sub> = 0.1 mAdc, I <sub>E</sub> = 0) (I <sub>C</sub> = 0.1 mAdc, I <sub>E</sub> = 0)	MMBT6428 MMBT6429	V <sub>(BR)CBO</sub>	60 55	– –	Vdc
Collector Cutoff Current (V <sub>CE</sub> = 30 Vdc)		I <sub>CES</sub>	–	0.1	μAdc
Collector Cutoff Current (V <sub>CB</sub> = 30 Vdc, I <sub>E</sub> = 0)		I <sub>CBO</sub>	–	0.01	μAdc
Emitter Cutoff Current (V <sub>EB</sub> = 5.0 Vdc, I <sub>C</sub> = 0)		I <sub>EBO</sub>	–	0.01	μAdc

### ON CHARACTERISTICS

DC Current Gain (I <sub>C</sub> = 0.01 mAdc, V <sub>CE</sub> = 5.0 Vdc)	MMBT6428 MMBT6429	h <sub>FE</sub>	250 500	– –	–
(I <sub>C</sub> = 0.1 mAdc, V <sub>CE</sub> = 5.0 Vdc)	MMBT6428 MMBT6429		250 500	650 1250	
(I <sub>C</sub> = 1.0 mAdc, V <sub>CE</sub> = 5.0 Vdc)	MMBT6428 MMBT6429		250 500	– –	
(I <sub>C</sub> = 10 mAdc, V <sub>CE</sub> = 5.0 Vdc)	MMBT6428 MMBT6429		250 500	– –	
Collector–Emitter Saturation Voltage (I <sub>C</sub> = 10 mAdc, I <sub>B</sub> = 0.5 mAdc) (I <sub>C</sub> = 100 mAdc, I <sub>B</sub> = 5.0 mAdc)		V <sub>CE(sat)</sub>	– –	0.2 0.6	Vdc
Base–Emitter On Voltage (I <sub>C</sub> = 1.0 mAdc, V <sub>CE</sub> = 5.0 mAdc)		V <sub>BE(on)</sub>	0.56	0.66	Vdc

### SMALL–SIGNAL CHARACTERISTICS

Current–Gain – Bandwidth Product (I <sub>C</sub> = 1.0 mAdc, V <sub>CE</sub> = 5.0 Vdc, f = 100 MHz)		f <sub>T</sub>	100	700	MHz
Output Capacitance (V <sub>CB</sub> = 10 Vdc, I <sub>E</sub> = 0, f = 1.0 MHz)		C <sub>obo</sub>	–	3.0	pF
Input Capacitance (V <sub>EB</sub> = 0.5 Vdc, I <sub>C</sub> = 0, f = 1.0 MHz)		C <sub>ibo</sub>	–	8.0	pF

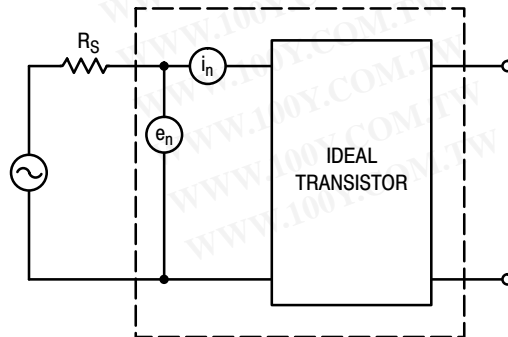


Figure 1. Transistor Noise Model

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NOISE CHARACTERISTICS

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

NOISE VOLTAGE

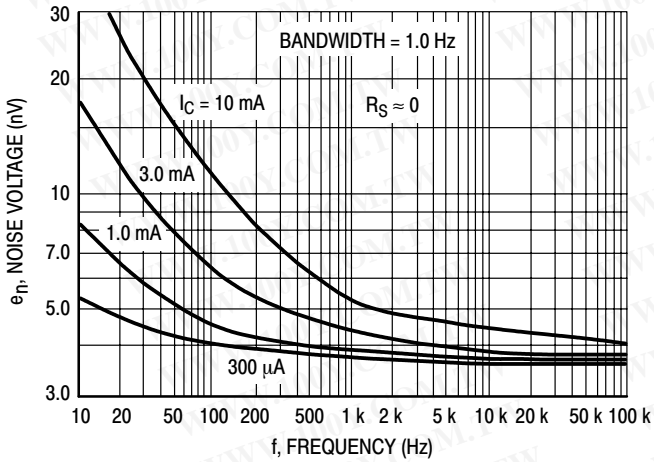


Figure 2. Effects of Frequency

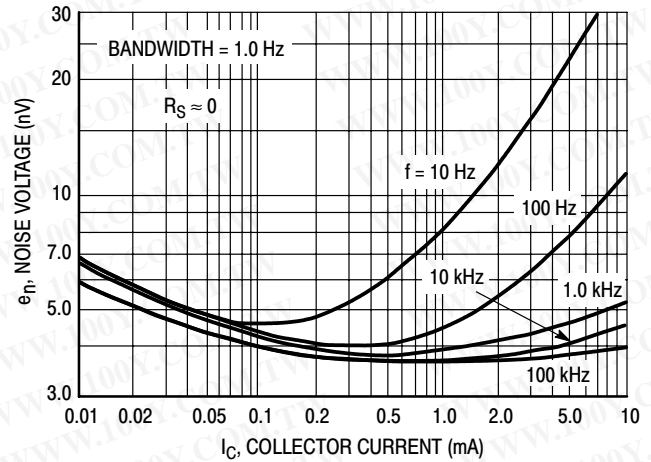


Figure 3. Effects of Collector Current

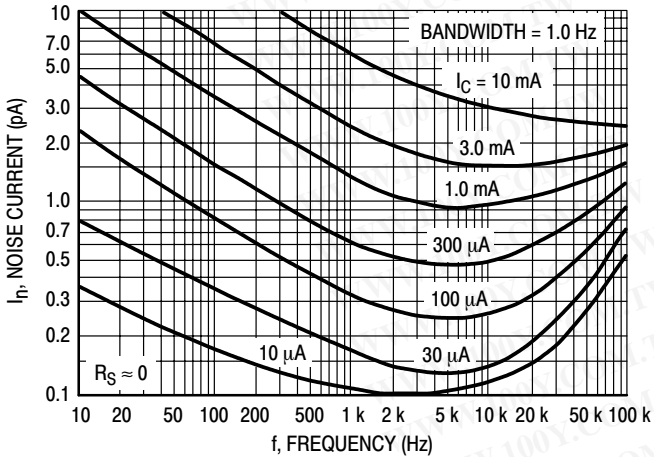


Figure 4. Noise Current

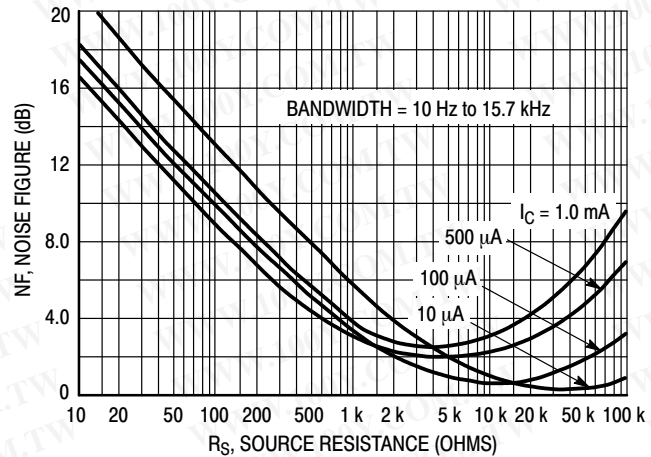


Figure 5. Wideband Noise Figure

100 Hz NOISE DATA

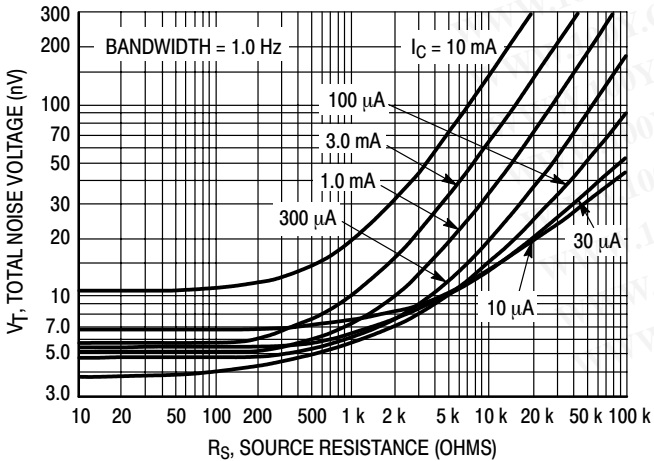


Figure 6. Total Noise Voltage

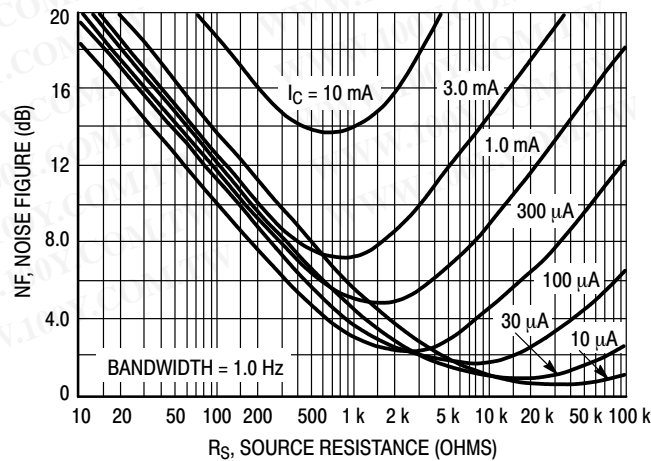


Figure 7. Noise Figure

# MMBT6428LT1, MMBT6429LT1

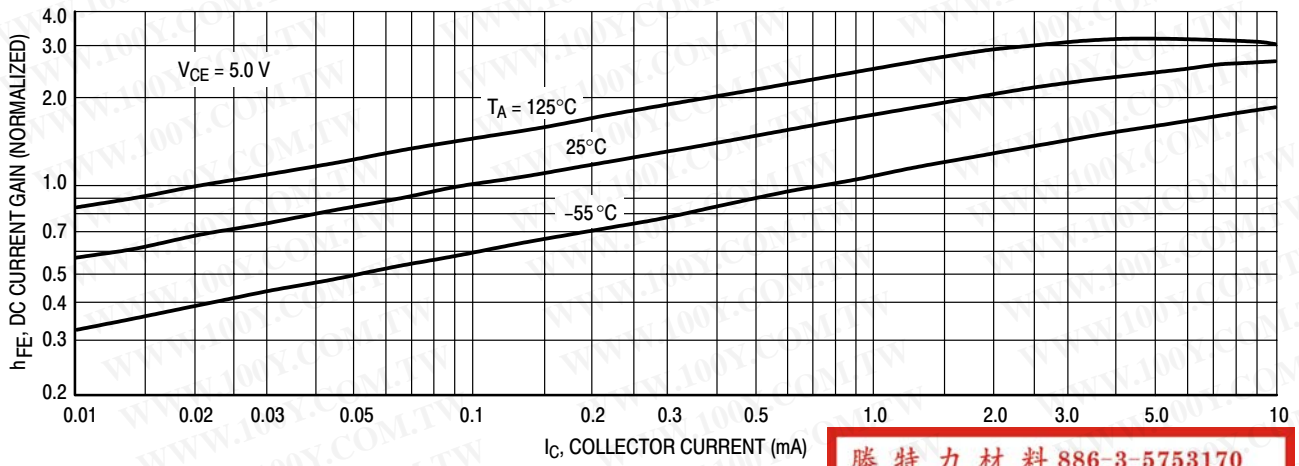


Figure 8. DC Current Gain

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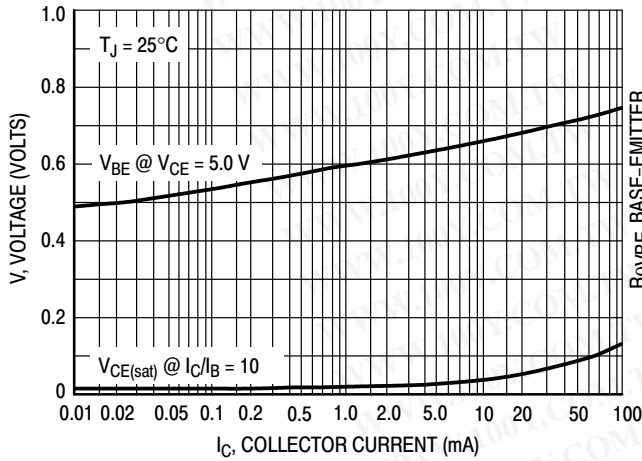


Figure 9. "On" Voltages

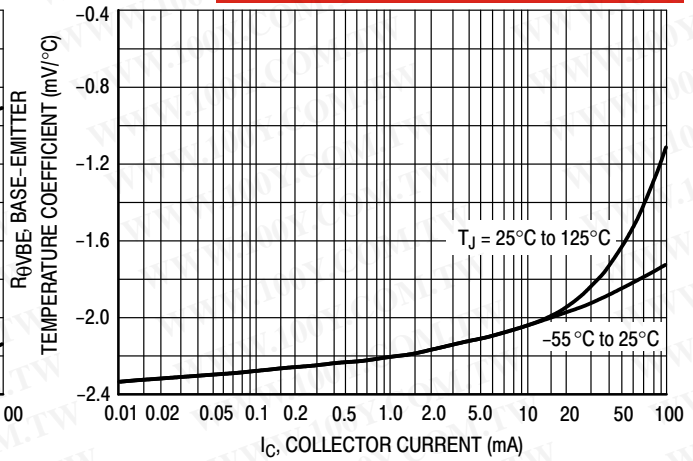


Figure 10. Temperature Coefficients

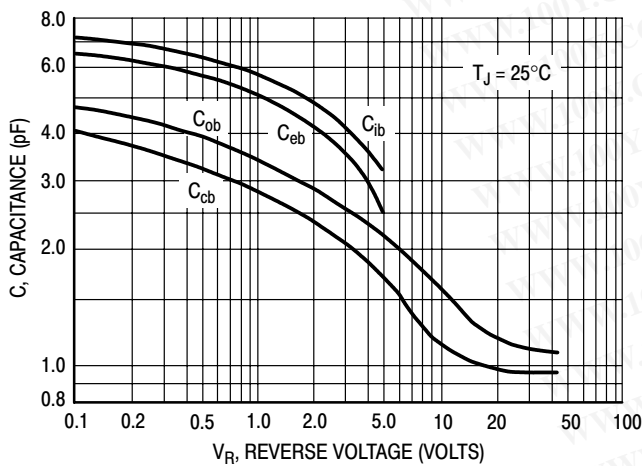


Figure 11. Capacitance

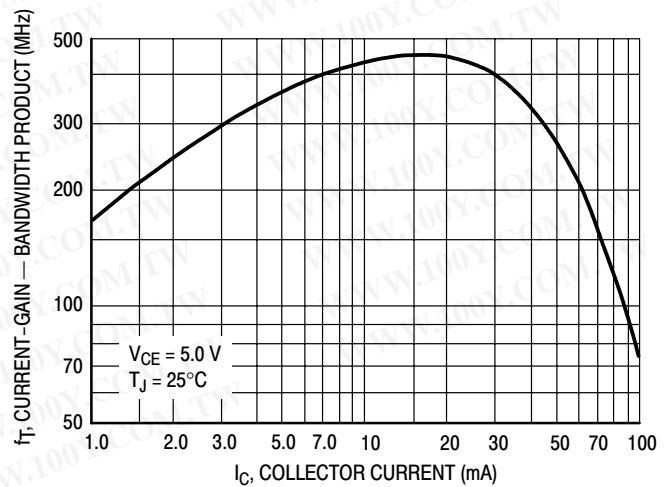


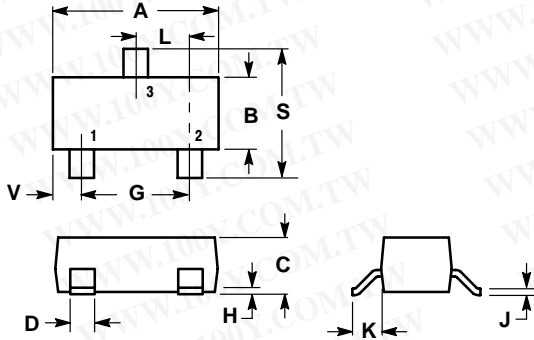
Figure 12. Current-Gain — Bandwidth Product



# MMBT6428LT1, MMBT6429LT1

## PACKAGE DIMENSIONS

SOT-23 (TO236)  
CASE 318-18  
ISSUE AK



NOTES:

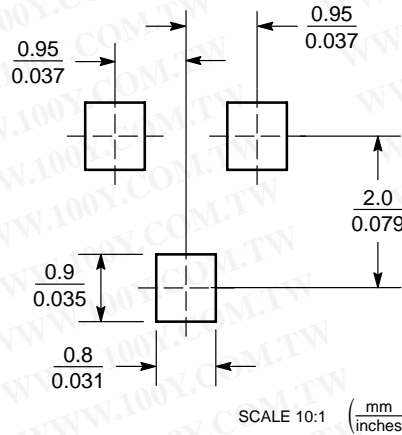
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH THICKNESS. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.
4. 318-01 THRU -07 AND -09 OBSOLETE, NEW STANDARD 318-08.

DIM	INCHES		MILLIMETERS	
	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
- EMITTER
- COLLECTOR

### SOLDERING FOOTPRINT\*




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\*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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