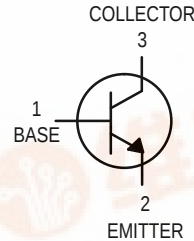
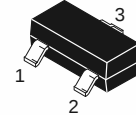


Amplifier Transistors

NPN Silicon



MMBT6428LT1
MMBT6429LT1



CASE 318-08, STYLE 6
SOT-23 (TO-236AB)

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

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Total Device Dissipation FR-5 Board ⁽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	$^\circ\text{C/W}$
Total Device Dissipation Alumina Substrate, ⁽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	$^\circ\text{C/W}$
Junction and Storage Temperature	T_J, T_{stg}	-55 to +150	$^\circ\text{C}$

DEVICE MARKING

MMBT6428LT1 = 1KM; MMBT6429LT1 = 1L

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

Characteristic	Symbol	Min	Max	Unit
----------------	--------	-----	-----	------

OFF CHARACTERISTICS

Collector-Emitter Breakdown Voltage ($I_C = 1.0 \text{ mAdc}$, $I_B = 0$) ($I_C = 1.0 \text{ mAdc}$, $I_B = 0$)	MMBT6428 MMBT6429	$V_{(BR)CEO}$	50 45	— —	Vdc
Collector-Base Breakdown Voltage ($I_C = 0.1 \text{ mAdc}$, $I_E = 0$) ($I_C = 0.1 \text{ mAdc}$, $I_E = 0$)	MMBT6428 MMBT6429	$V_{(BR)CBO}$	60 55	— —	Vdc
Collector Cutoff Current ($V_{CE} = 30 \text{ Vdc}$)		I_{CES}	—	0.1	μAdc
Collector Cutoff Current ($V_{CB} = 30 \text{ Vdc}$, $I_E = 0$)		I_{CBO}	—	0.01	μAdc
Emitter Cutoff Current ($V_{EB} = 5.0 \text{ Vdc}$, $I_C = 0$)		I_{EBO}	—	0.01	μAdc

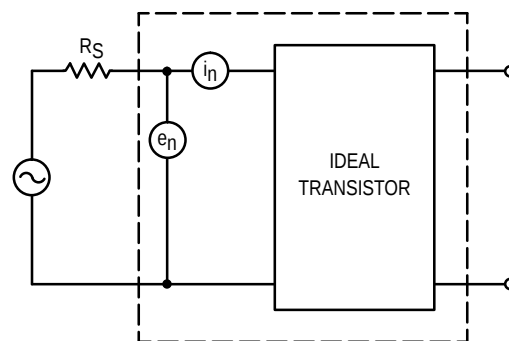
- FR-5 = $1.0 \times 0.75 \times 0.062 \text{ in.}$
- Alumina = $0.4 \times 0.3 \times 0.024 \text{ in.}$ 99.5% alumina.

MMBT6428LT1 MMBT6429LT1**ELECTRICAL CHARACTERISTICS** ($T_A = 25^\circ\text{C}$ unless otherwise noted) (Continued)

Characteristic	Symbol	Min	Max	Unit
ON CHARACTERISTICS				
DC Current Gain ($I_C = 0.01\text{ mAdc}$, $V_{CE} = 5.0\text{ Vdc}$)	h_{FE}	250	—	—
MMBT6428		500	—	—
MMBT6429		—	—	—
($I_C = 0.1\text{ mAdc}$, $V_{CE} = 5.0\text{ Vdc}$)		250	650	—
MMBT6428		500	1250	—
MMBT6429		—	—	—
($I_C = 1.0\text{ mAdc}$, $V_{CE} = 5.0\text{ Vdc}$)		250	—	—
MMBT6428		500	—	—
MMBT6429		—	—	—
($I_C = 10\text{ mAdc}$, $V_{CE} = 5.0\text{ Vdc}$)		250	—	—
MMBT6428		500	—	—
MMBT6429		—	—	—
Collector–Emitter Saturation Voltage ($I_C = 10\text{ mAdc}$, $I_B = 0.5\text{ mAdc}$) ($I_C = 100\text{ mAdc}$, $I_B = 5.0\text{ mAdc}$)	$V_{CE(sat)}$	—	0.2 0.6	Vdc
Base–Emitter On Voltage ($I_C = 1.0\text{ mAdc}$, $V_{CE} = 5.0\text{ mAdc}$)	$V_{BE(on)}$	0.56	0.66	Vdc

SMALL–SIGNAL CHARACTERISTICS

Current–Gain — Bandwidth Product ($I_C = 1.0\text{ mAdc}$, $V_{CE} = 5.0\text{ Vdc}$, $f = 100\text{ MHz}$)	f_T	100	700	MHz
Output Capacitance ($V_{CB} = 10\text{ Vdc}$, $I_E = 0$, $f = 1.0\text{ MHz}$)	C_{obo}	—	3.0	pF
Input Capacitance ($V_{EB} = 0.5\text{ Vdc}$, $I_C = 0$, $f = 1.0\text{ MHz}$)	C_{ibo}	—	8.0	pF

**Figure 1. Transistor Noise Model**

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

NOISE VOLTAGE

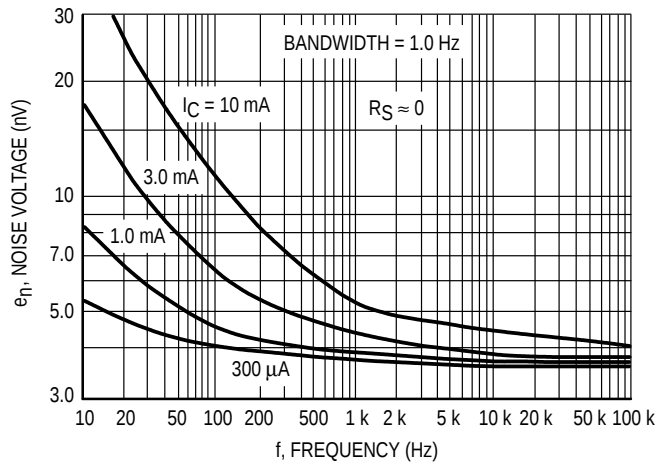


Figure 2. Effects of Frequency

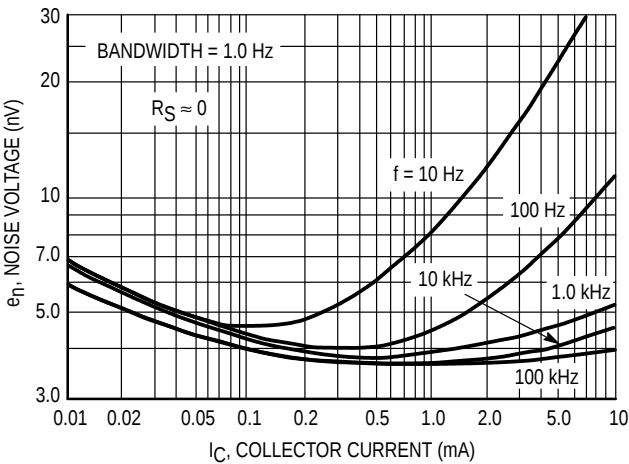


Figure 3. Effects of Collector Current

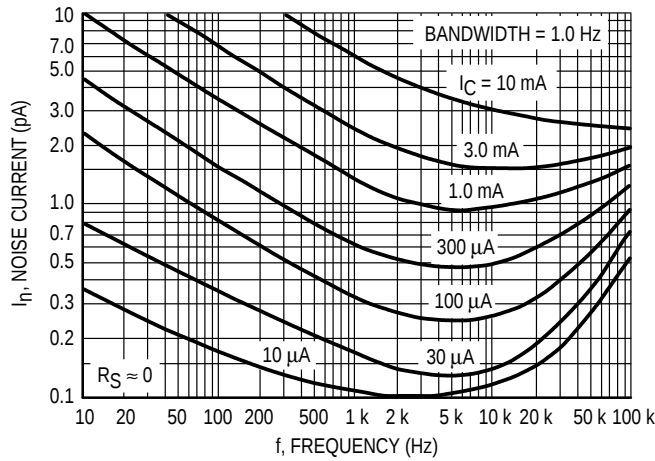


Figure 4. Noise Current

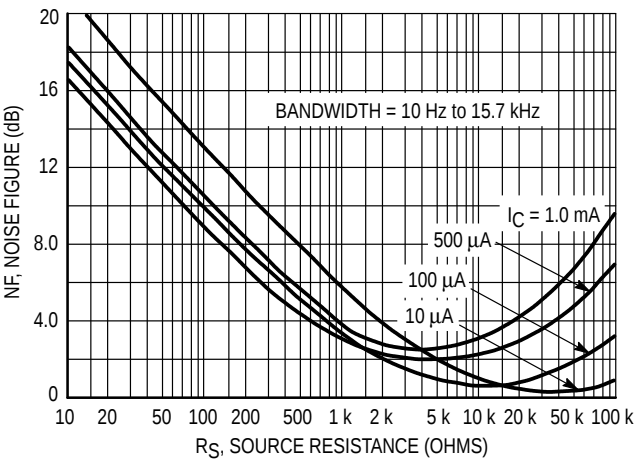


Figure 5. Wideband Noise Figure

100 Hz NOISE DATA

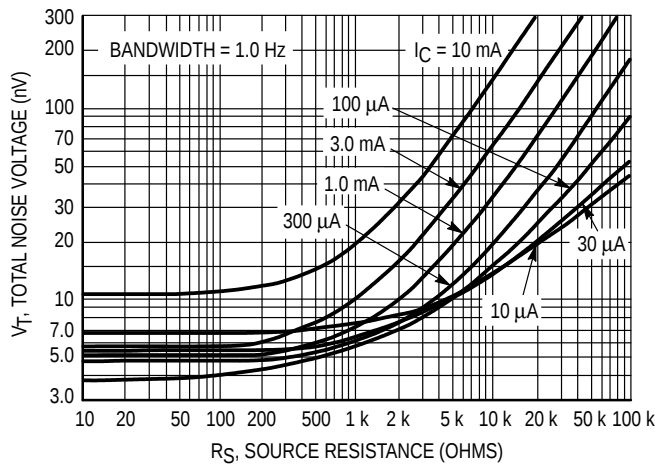


Figure 6. Total Noise Voltage

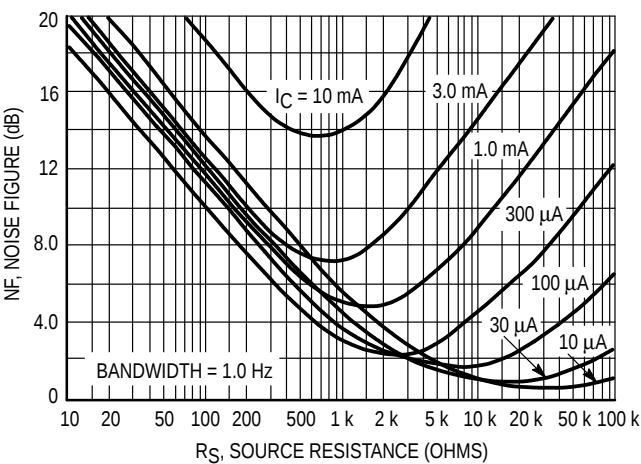


Figure 7. Noise Figure

MMBT6428LT1 MMBT6429LT1

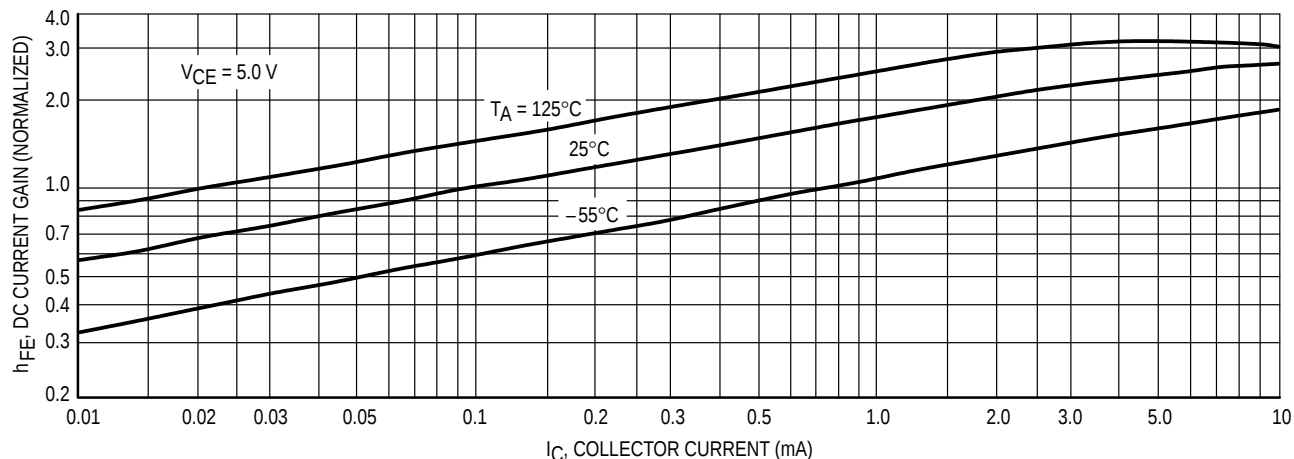


Figure 8. DC Current Gain

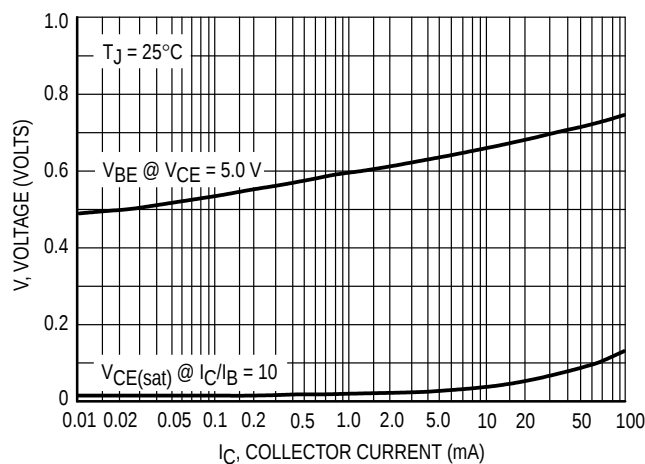


Figure 9. "On" Voltages

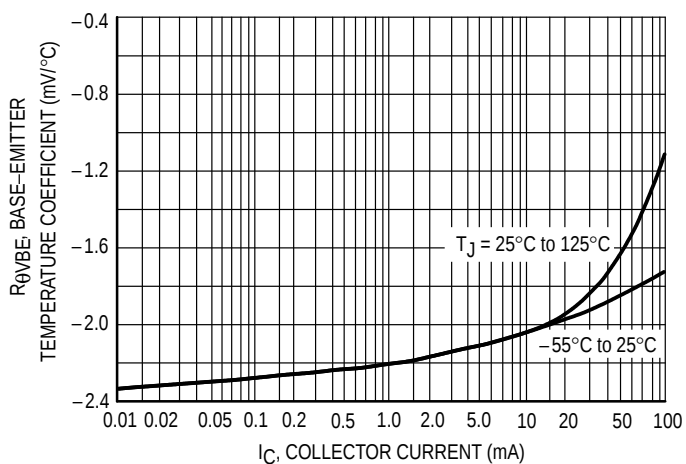


Figure 10. Temperature Coefficients

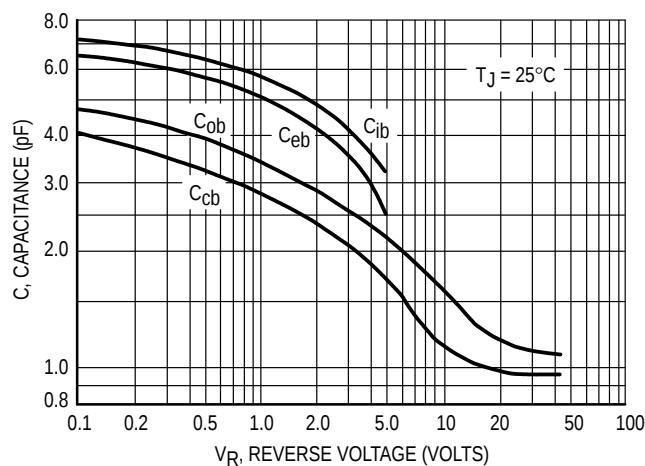


Figure 11. Capacitance

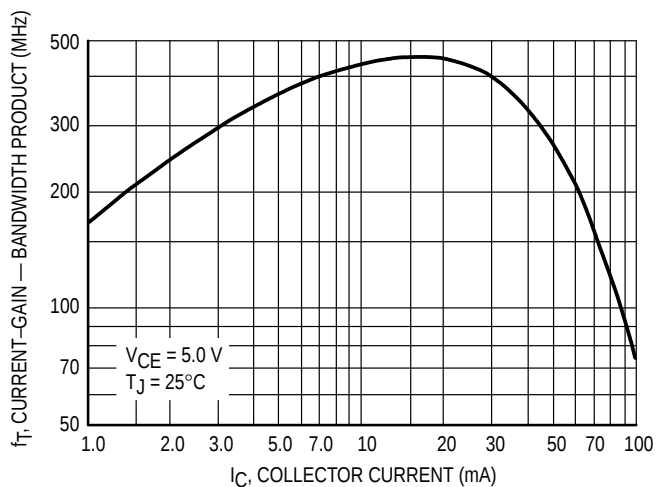
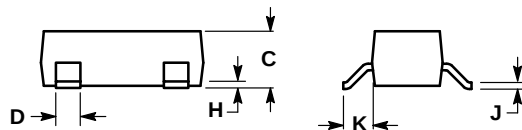
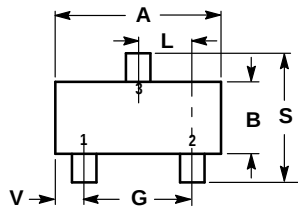


Figure 12. Current-Gain — Bandwidth Product

* Soldering a device without preheating can cause excessive thermal shock and stress which can result in damage to the device.

MMBT6428LT1 MMBT6429LT1

PACKAGE DIMENSIONS



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.

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	0.0180	0.0236	0.45	0.60
L	0.0350	0.0401	0.89	1.02
S	0.0830	0.0984	2.10	2.50
V	0.0177	0.0236	0.45	0.60

STYLE 6:

- PIN 1. BASE
- EMITTER
- COLLECTOR

**CASE 318-08
SOT-23 (TO-236AB)
ISSUE AE**

Motorola reserves the right to make changes without further notice to any products herein. Motorola makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does Motorola assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation consequential or incidental damages. "Typical" parameters can and do vary in different applications. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. Motorola does not convey any license under its patent rights nor the rights of others. Motorola products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the Motorola product could create a situation where personal injury or death may occur. Should Buyer purchase or use Motorola products for any such unintended or unauthorized application, Buyer shall indemnify and hold Motorola and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that Motorola was negligent regarding the design or manufacture of the part. Motorola and  are registered trademarks of Motorola, Inc. Motorola, Inc. is an Equal Opportunity/Affirmative Action Employer.

How to reach us:

USA/EUROPE: Motorola Literature Distribution;
P.O. Box 20912; Phoenix, Arizona 85036. 1-800-441-2447

JAPAN: Nippon Motorola Ltd.; Tatsumi-SPD-JLDC, Toshikatsu Otsuki,
6F Seibu-Butsuryu-Center, 3-14-2 Tatsumi Koto-Ku, Tokyo 135, Japan. 03-3521-8315

MFAX: RMFAX0@email.sps.mot.com - TOUCHTONE (602) 244-6609
INTERNET: <http://Design-NET.com>

HONG KONG: Motorola Semiconductors H.K. Ltd.; 8B Tai Ping Industrial Park,
51 Ting Kok Road, Tai Po, N.T., Hong Kong. 852-26629298