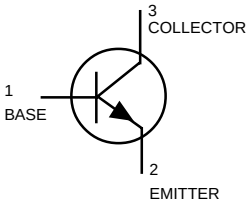
ETL SEMICONDUCTOR

Amplifier Transistors

NPN Silicon

MMBT6428LT1
MMBT6429LT1



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

MAXIMUM RATINGS

Rating	Symbol	Value 6428LT1	Value 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°C	P_D	225	mW
Derate above 25°C		1.8	mW/°C
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	556	°C/W
Total Device Dissipation Alumina Substrate, (2) T_A = 25°C	P_D	300	mW
Derate above 25°C		2.4	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

DEVICE MARKING

MMBT6428LT1 = 1KM, MMBT6429LT1 = 1L

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

Characteristic		Symbol	Min	Max	Unit
OFF CHARACTERISTICS					
Collector–Emitter Breakdown Voltage(3)		$V_{(BR)CEO}$			Vdc
(I_C = 1.0 mAdc, I_B = 0)	MMBT6428		50	—	
(I_C = 1.0 mAdc, I_B = 0)	MMBT6429		45	—	
Collector–Base Breakdown Voltage		$V_{(BR)CBO}$			Vdc
(I_C = 0.1mAdc, I_E = 0)	MMBT6428		60	—	
(I_C = 0.1mAdc, I_E = 0)	MMBT6429		55	—	
Collector Cutoff Current		I_{CBO}			µAdc
(V_{CE} = 30Vdc,)			—	0.1	
Collector Cutoff Current		I_{CBO}			µAdc
(V_{CB} = 30Vdc, I_E = 0)			—	0.01	
Emitter Cutoff Current		I_{EBO}	—	0.01	µAdc
(V_{EB} = 5.0Vdc, I_C = 0)					

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.

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

Characteristic		Symbol	Min	Max	Unit
ON CHARACTERISTICS					
DC Current Gain		h_{FE}			—
(I_C = 0.01 mAdc, V_{CE} = 5.0 Vdc)	MMBT6428		250	—	
	MMBT6429		500	—	
(I_C = 0.1 mAdc, V_{CE} = 5.0Vdc)	MMBT6428		250	650	
	MMBT6429		500	1250	
(I_C = 1.0 mAdc, V_{CE} = 5.0Vdc)	MMBT6428		250	—	
	MMBT6429		500	—	
(I_C = 10 mAdc, V_{CE} = 5.0Vdc)	MMBT6428		250	—	
	MMBT6429		500	—	
Collector–Emitter Saturation Voltage		$V_{CE(sat)}$			Vdc
(I_C = 10 mAdc, I_B = 0.5 mAdc)			—	0.2	
(I_C = 100 mAdc, I_B = 0.5 mAdc)			—	0.6	
Base–Emitter On Voltage (I_C = 1.0 mAdc, V_{CE} = 5.0mAdc)		$V_{BE(on)}$	0.56	0.66	Vdc
SMALL–SIGNAL CHARACTERISTICS					
Current Gain–Bandwidth Product (V_{CE} = 5.0 Vdc, I_C = 1.0mAdc, f = 100 MHz)		f_T	100	700	MHz
Output Capacitance (V_{CB} = 10 Vdc, I_E = 0, f = 1.0 MHz)		C_{obo}	—	3.0	pF
Input Capacitance (V_{EB}= 0.5 Vdc, I_C = 0 , f = 1.0 MHz)		C_{ibo}	—	8.0	pF

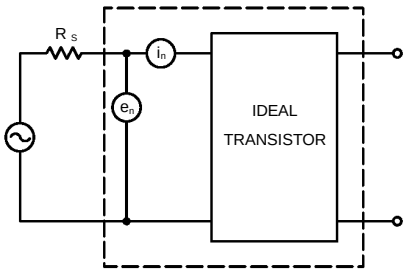
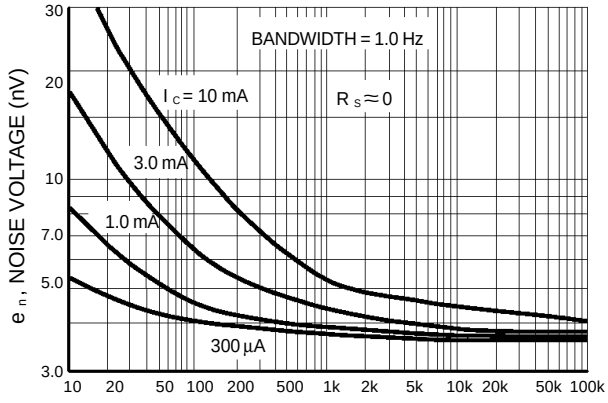


Figure 1. Transistor Noise Model

NOISE CHARACTERISTICS

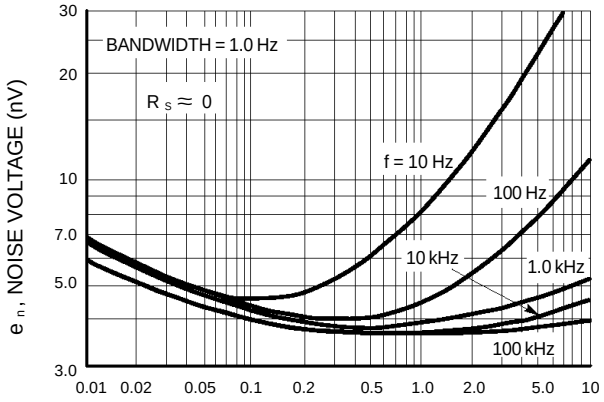
(V_{CE} = 5.0 Vdc, T_A = 25°C)

NOISE VOLTAGE



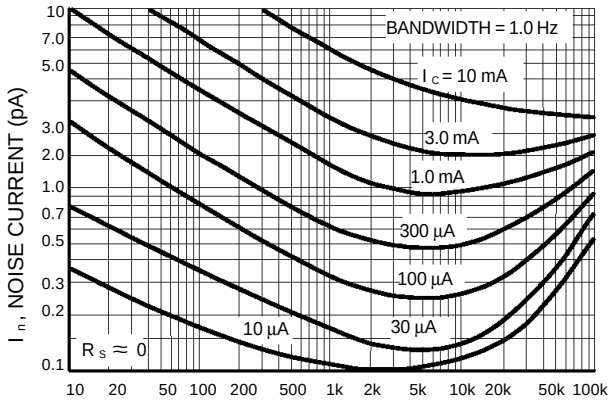
f, FREQUENCY (Hz)

Figure 2. Effects of Frequency



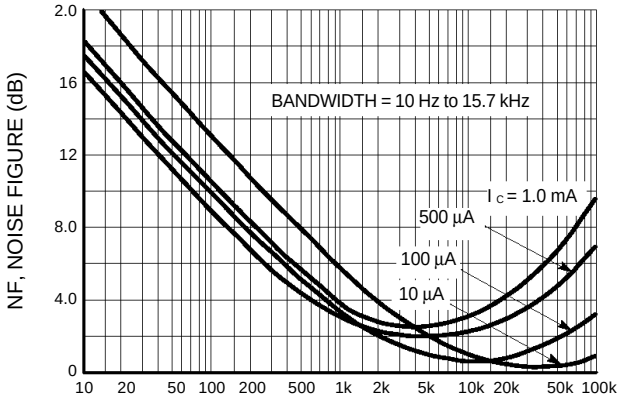
I C, COLLECTOR CURRENT (mA)

Figure 3. Effects of Collector Current



f, FREQUENCY (Hz)

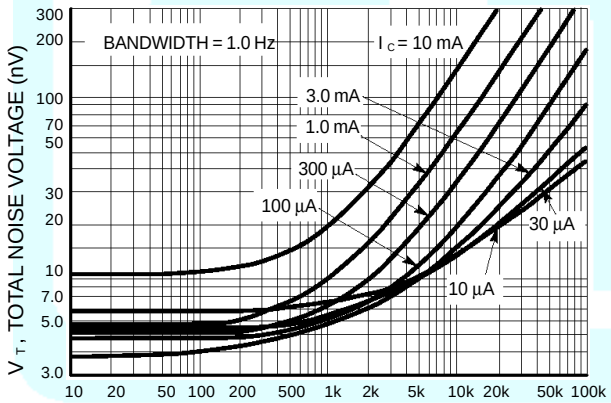
Figure 4. Noise Current



R S, SOURCE RESISTANCE (Ω)

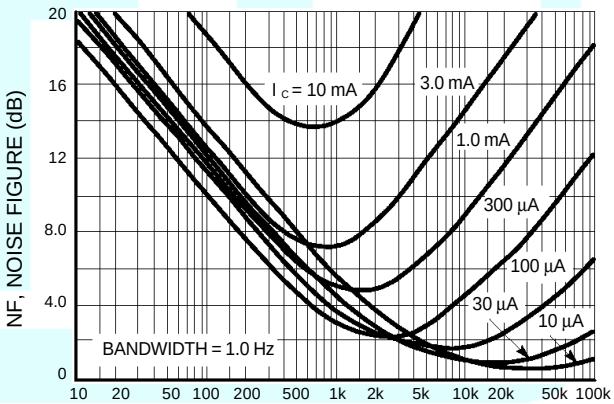
Figure 5. Wideband Noise Figure

100 Hz NOISE DATA



R S, SOURCE RESISTANCE (Ω)

Figure 6. Total Noise Voltage



R S, SOURCE RESISTANCE (Ω)

Figure 7. Noise Figure

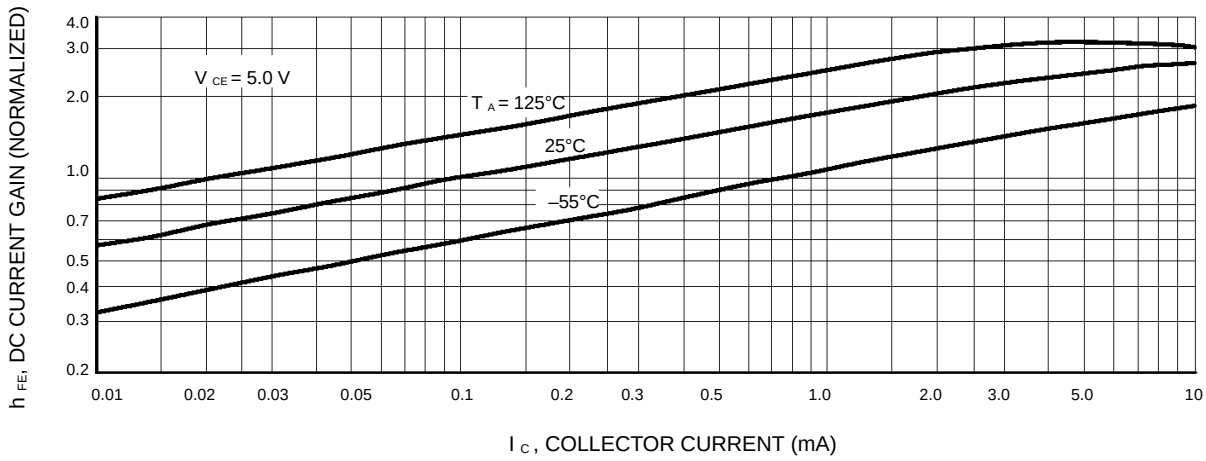


Figure 8. DC Current Gain

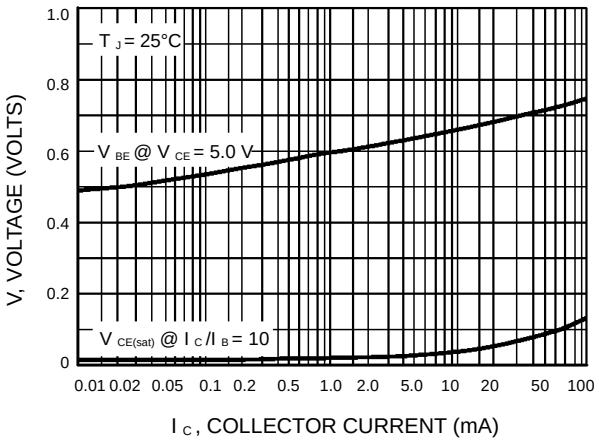


Figure 9. "On" Voltages

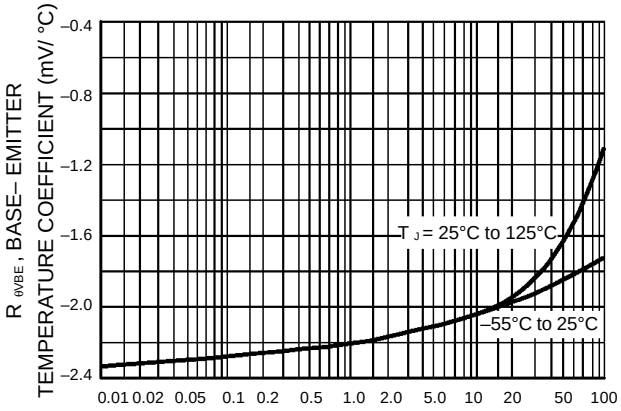


Figure 10. Temperature Coefficients

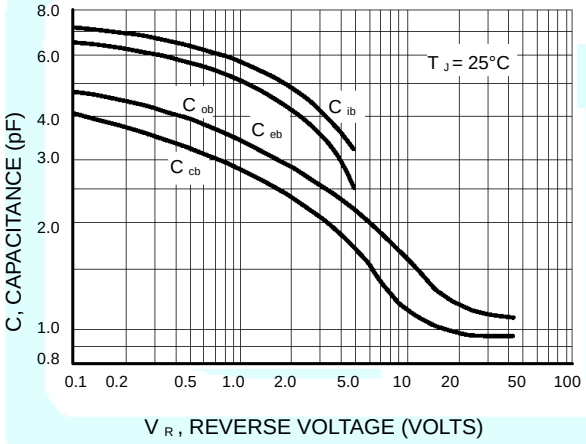


Figure 11. Capacitance

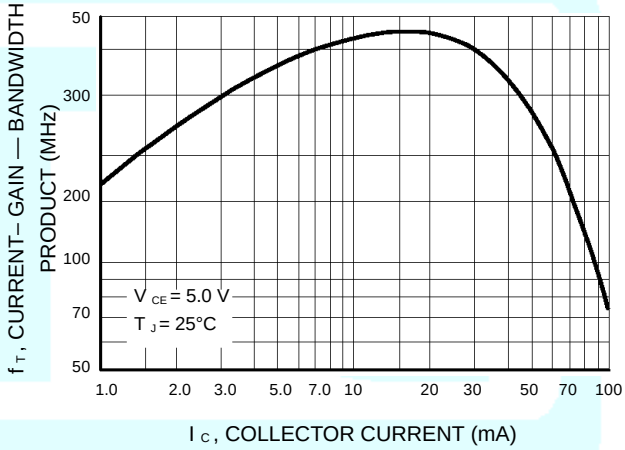


Figure 12. Current–Gain — Bandwidth Product