Darlington Transistors

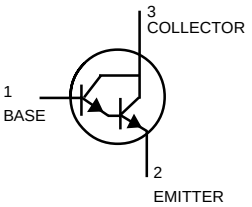
NPN Silicon

- We declare that the material of product compliance with RoHS requirements.

Ordering Information

Device	Marking	Shipping
MMBT6427	1V	3000/Tape&Reel

SOT–23



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, (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

MMBT6427 = 1V

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

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector–Emitter Breakdown Voltage(3) (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_E = 10 µAdc, I_C = 0)	$V_{(BR)EBO}$	12	—	Vdc
Collector Cutoff Current (V_{CE} = 25Vdc, I_B = 0)	I_{CES}	—	1.0	µAdc
Collector Cutoff Current (V_{CB} = 30Vdc, I_E = 0)	I_{CBO}	—	50	nAdc
Emitter Cutoff Current (V_{EB} = 10Vdc, I_C= 0)	I_{EBO}	—	50	nAdc

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 = 10 mAdc, V_{CE} = 5.0 Vdc)		10,000	100,000	
(I_C = 100 mAdc, V_{CE} = 5.0Vdc)		20,000	200,000	
(I_C = 500 mAdc, V_{CE} = 5.0Vdc)		14,000	140,000	
Collector–Emitter Saturation Voltage	$V_{CE(sat)}$(3)			Vdc
(I_C = 50 mAdc, I_B = 0.5 mAdc)		—	1.2	
(I_C = 500 mAdc, I_B = 0.5 mAdc)		—	1.5	
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} = 5.0Vdc)	$V_{BE(on)}$	—	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 (V_{CE} = 5.0 Vdc, I_C = 10mAdc, f = 100 MHz)	$\|h_{fe}\|$	1.3	—	Vdc
Noise Finure (V_{CE}=5.0 Vdc, I_C = 1.0 mAdc , R_S =100 kΩ, f = 1.0 kHz)	NF	—	10	dB

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

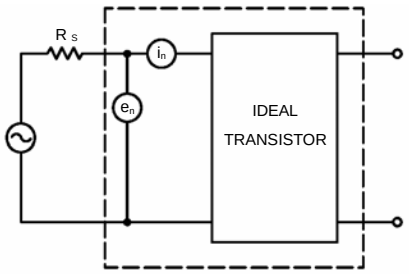
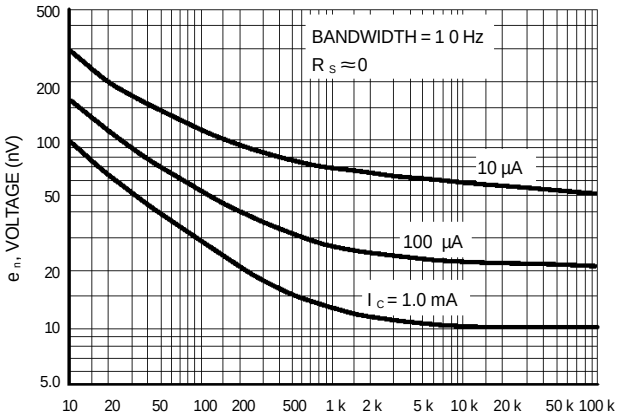


Figure 1. Transistor Noise Model

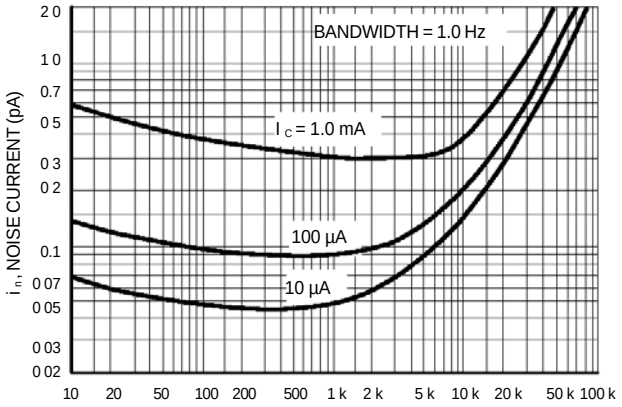
NOISE CHARACTERISTICS

(V_{CE} = 5.0 Vdc, T_A = 25°C)



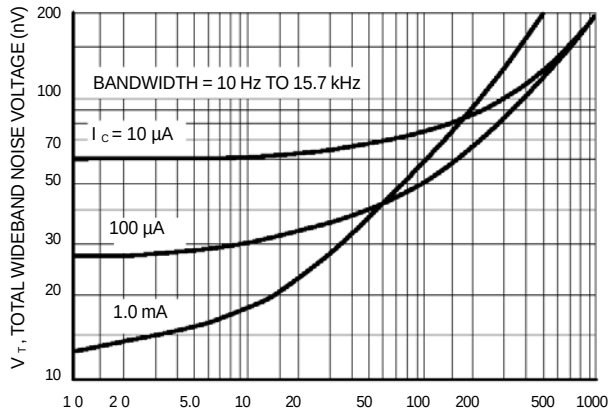
f, FREQUENCY (Hz)

Figure 2. Noise Voltage



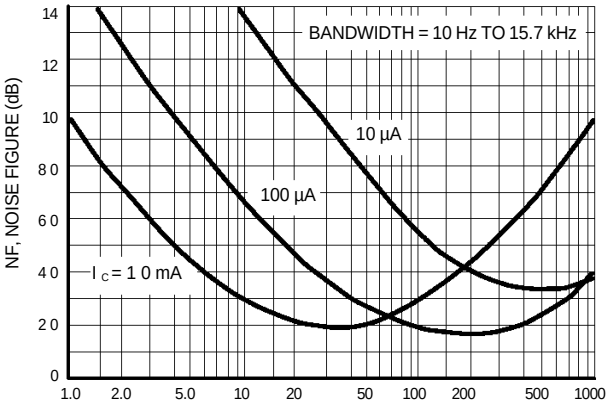
f, FREQUENCY (Hz)

Figure 3. Noise Current



R S, SOURCE RESISTANCE (kΩ)

Figure 4. Total Wideband Noise Voltage



R S, SOURCE RESISTANCE (kΩ)

Figure 5. Wideband Noise Figure

SMALL–SIGNAL CHARACTERISTICS

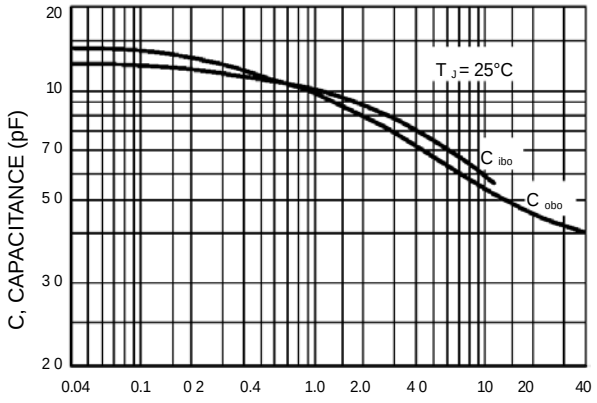


Figure 6. Capacitance

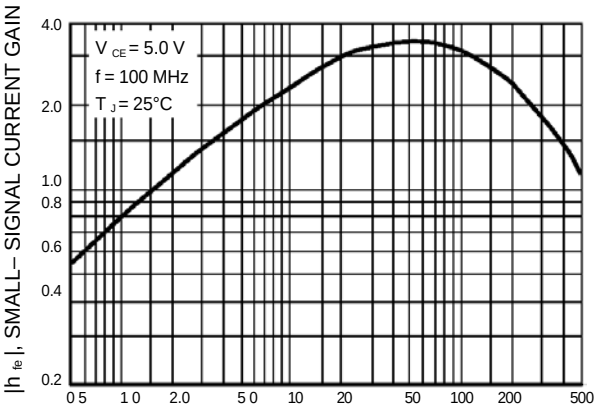


Figure 7. High Frequency Current Gain

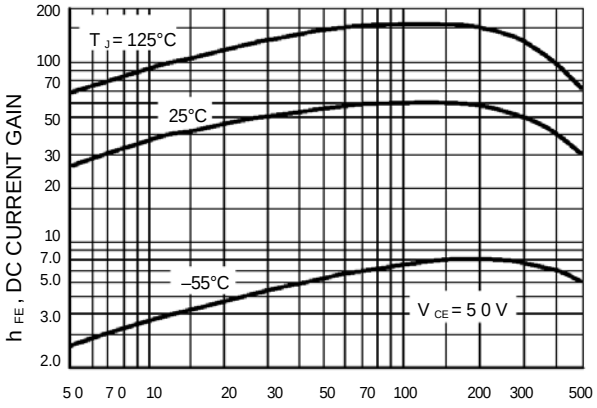


Figure 8. DC Current Gain

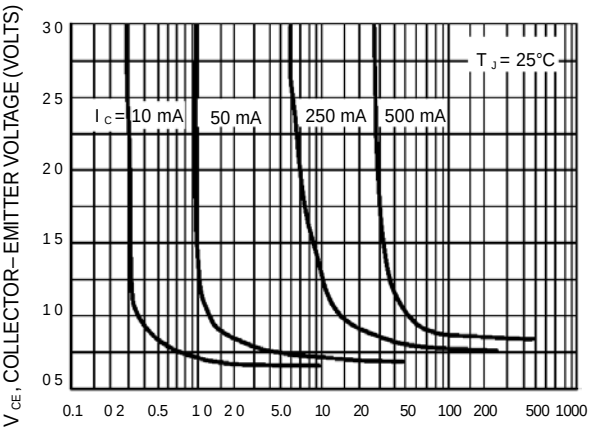


Figure 9. Collector Saturation Region

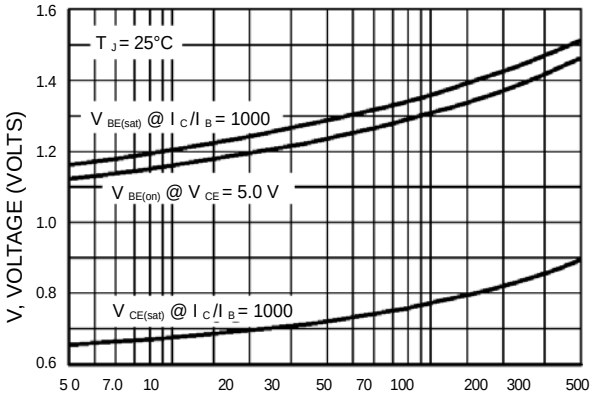


Figure 10. “On” Voltages

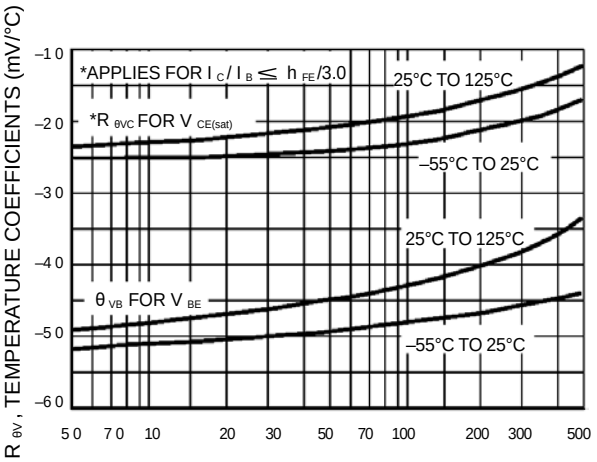


Figure 11. Temperature Coefficients

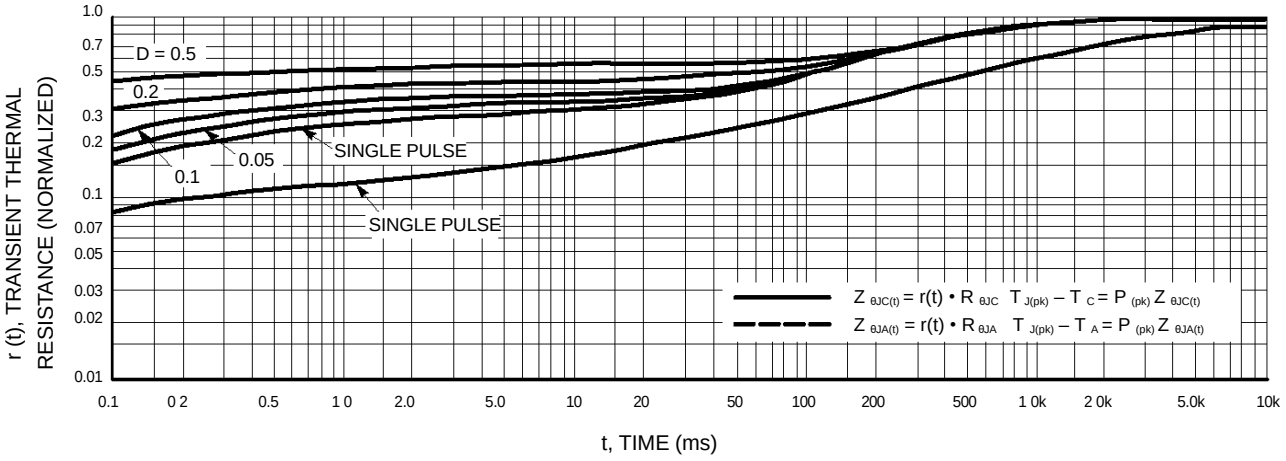
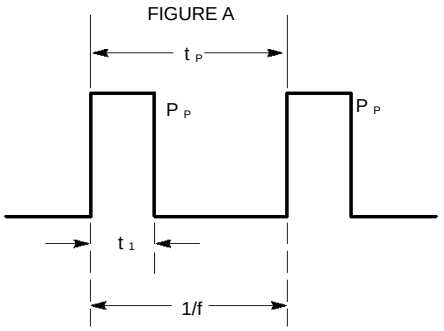
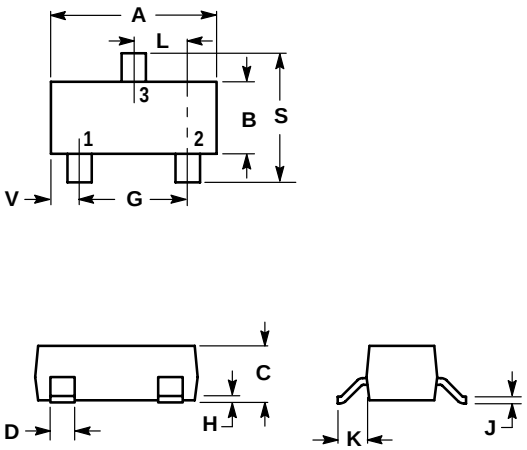


Figure 12. Thermal Response



Design Note: Use of Transient Thermal Resistance Data

SOT−23



NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M,1982
2. CONTROLLING DIMENSION: INCH.

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