SOT-23 Plastic-Encapsulate Transistors

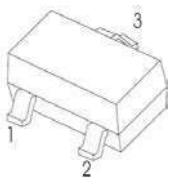
TRANSISTOR(NPN)

MMBT6428
MMBT6429

MAXIMUM RATINGS

Rating	Symbol	Value 6428	Value 6429	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

SOT-23



1. BASE
2. EMITTER
3. COLLECTOR

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

MMBT6428 = 1KM, MMBT6429= 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}			µAdc
(V_{EB} = 5.0Vdc, I_C = 0)			—	0.01	

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.

Typical Characteristics

MMBT6428 MMBT6429

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

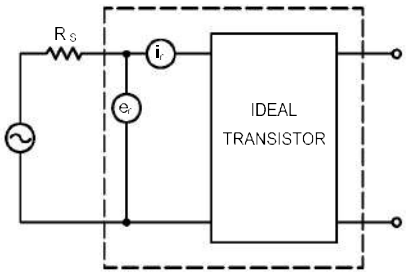
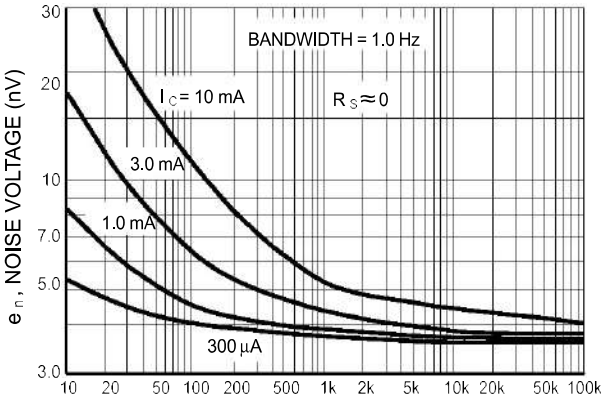


Figure 1. Transistor Noise Model

NOISE CHARACTERISTICS

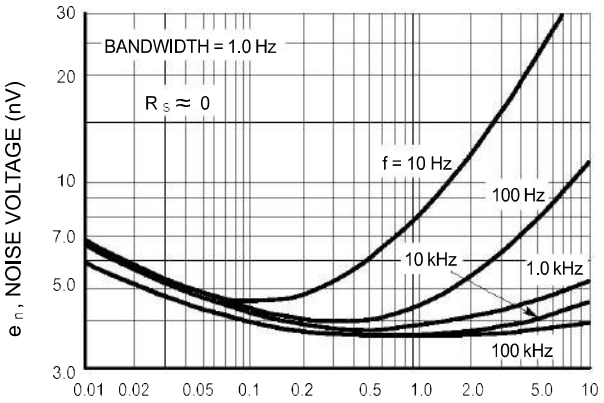
(V_{CE} = 5.0 Vdc, T_A = 25°C)

NOISE VOLTAGE



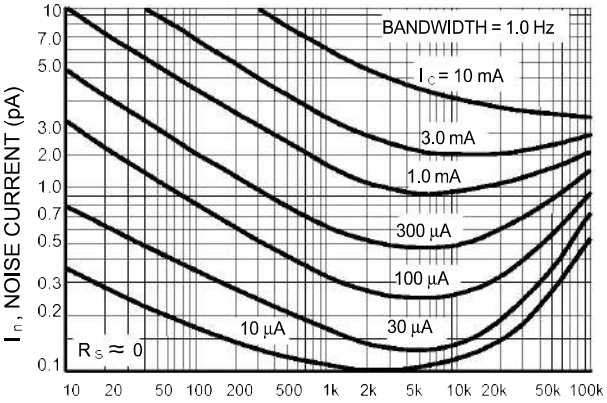
f, FREQUENCY (Hz)

Figure 2. Effects of Frequency



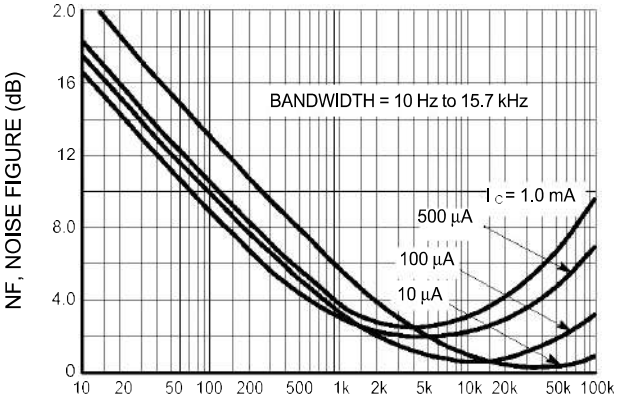
I C, COLLECTOR CURRENT (mA)

Figure 3. Effects of Collector Current



f, FREQUENCY (Hz)

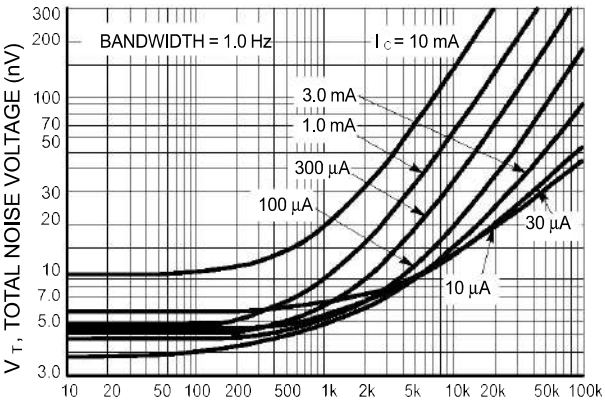
Figure 4. Noise Current



R S, SOURCE RESISTANCE (Ω)

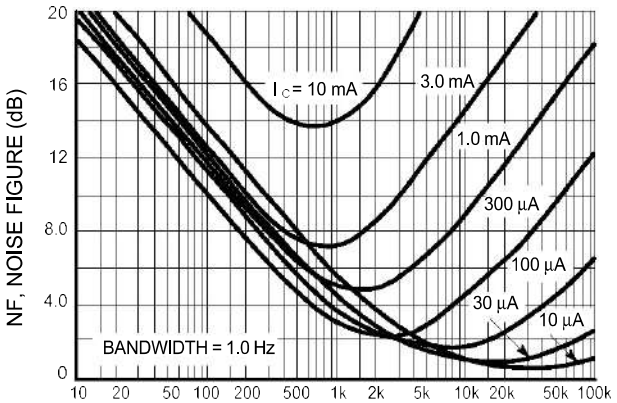
Figure 5. Wideband Noise Figure

100 Hz NOISE DATA



R S, SOURCE RESISTANCE (Ω)

Figure 6. Total Noise Voltage



R S, SOURCE RESISTANCE (Ω)

Figure 7. Noise Figure

Typical Characteristics

MMBT6428 MMBT6429

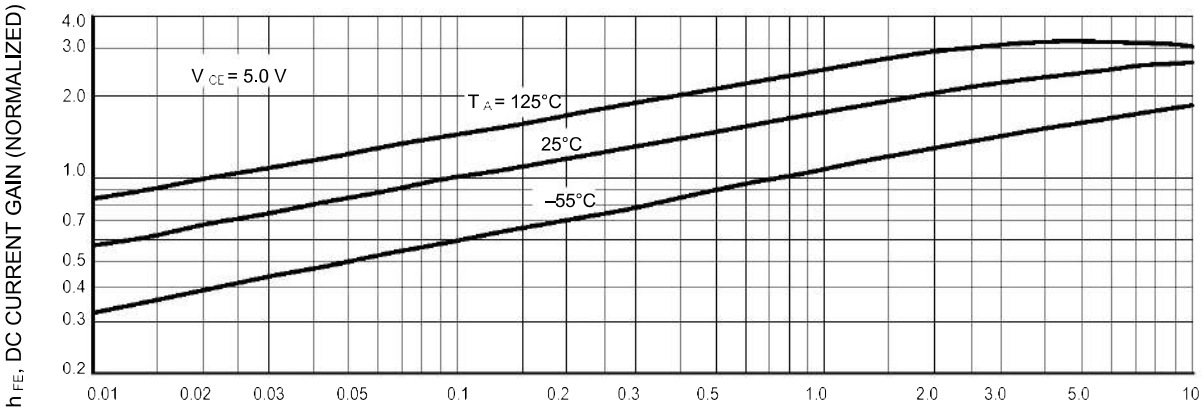


Figure 8. DC Current Gain

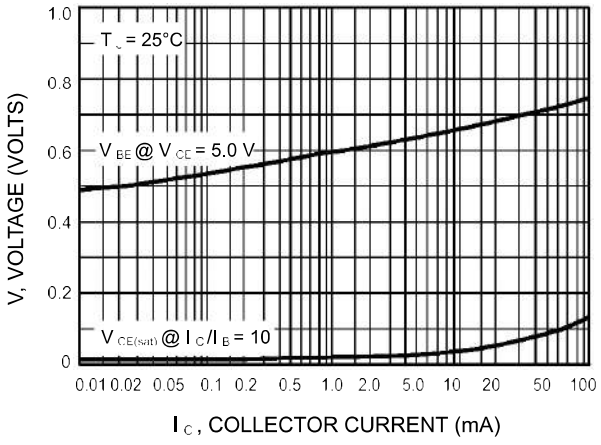


Figure 9. "On" Voltages

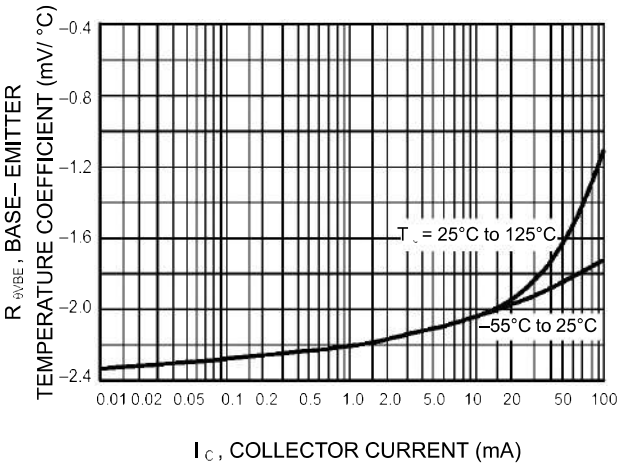


Figure 10. Temperature Coefficients

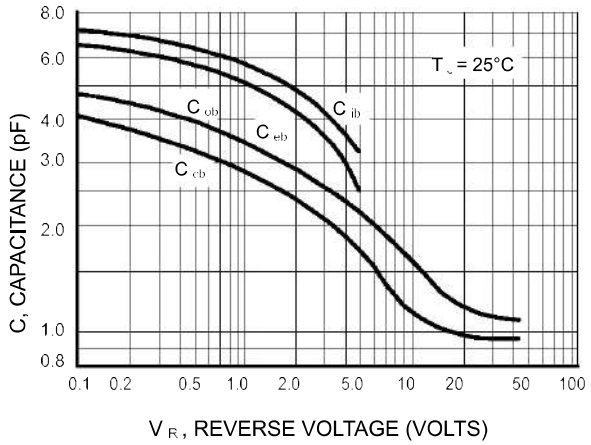


Figure 11. Capacitance

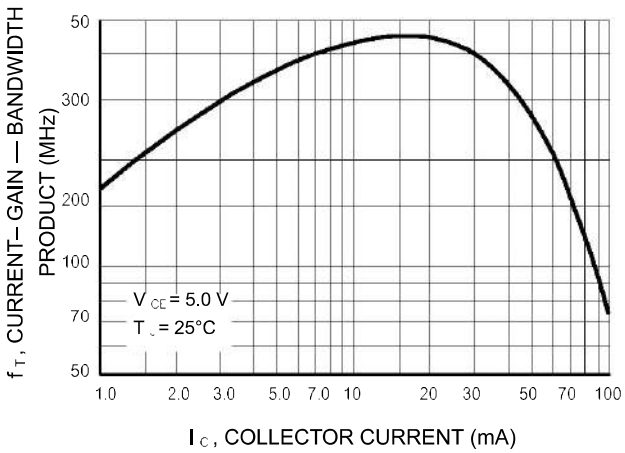
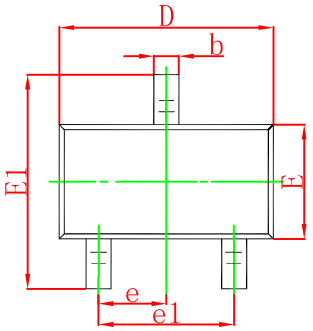
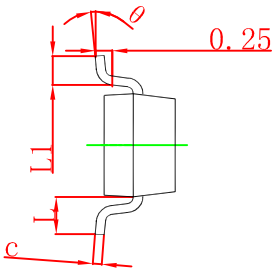
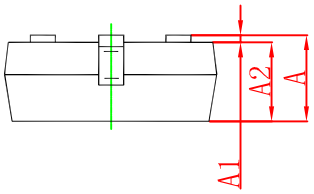


Figure 12. Current–Gain — Bandwidth Product

SOT-23 Package Outline Dimensions

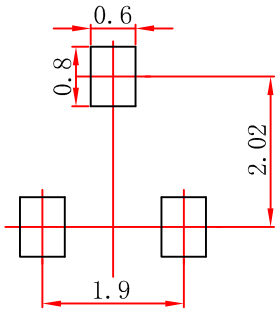






Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP		0.037 TYP	
e1	1.800	2.000	0.071	0.079
L	0.550 REF		0.022 REF	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°

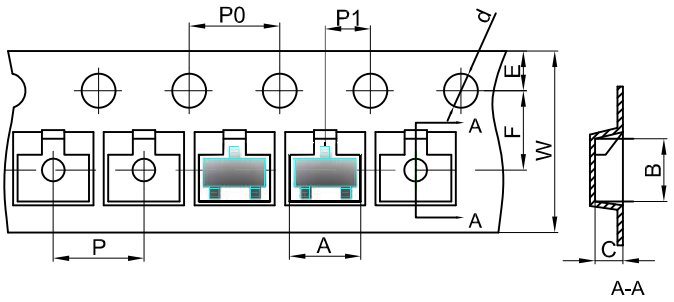
SOT-23 Suggested Pad Layout



Note:
1.Controlling dimension:in millimeters.
2.General tolerance:± 0.05mm.
3.The pad layout is for reference purposes only

SOT-23 Tape and Reel

SOT-23 Embossed Carrier Tape

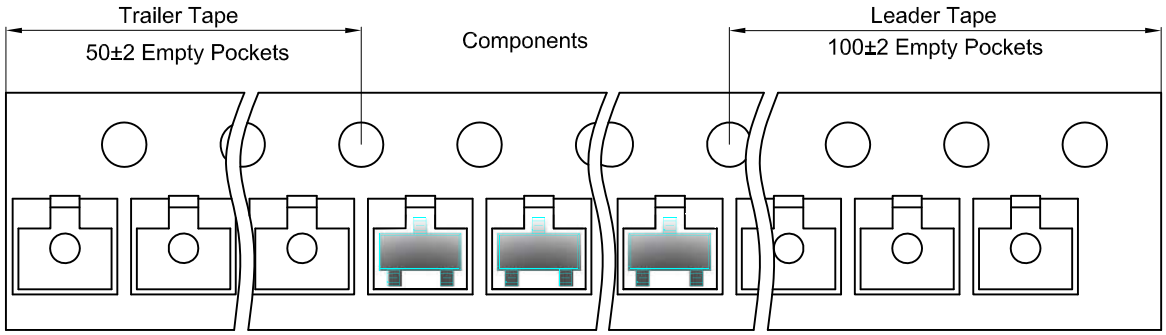


Packaging Description:

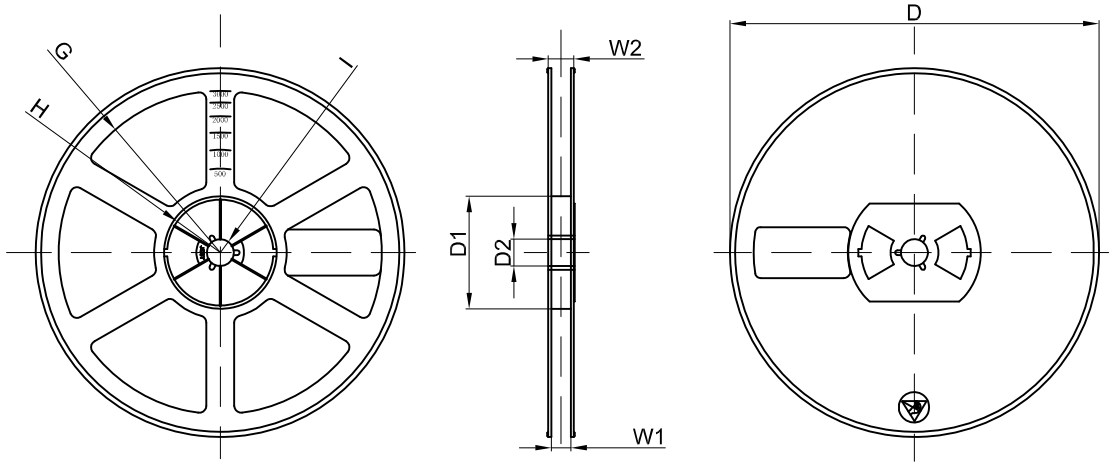
SOT-23 parts are shipped in tape. The carrier tape is made from a dissipative (carbon filled) polycarbonate resin. The cover tape is a multilayer film (Heat Activated Adhesive in nature) primarily composed of polyester film, adhesive layer, sealant, and anti-static sprayed agent. These reeled parts in standard option are shipped with 3,000 units per 7" or 17.8cm diameter reel. The reels are clear in color and is made of polystyrene plastic (anti-static coated).

Dimensions are in millimeter										
Pkg type	A	B	C	d	E	F	P0	P	P1	W
SOT-23	3.15	2.77	1.22	Ø1.50	1.75	3.50	4.00	4.00	2.00	8.00

SOT-23 Tape Leader and Trailer



SOT-23 Reel



Dimensions are in millimeter								
Reel Option	D	D1	D2	G	H	I	W1	W2
7"Dia	Ø178.00	54.40	13.00	R78.00	R25.60	R6.50	9.50	12.30

REEL	Reel Size	Box	Box Size(mm)	Carton	Carton Size(mm)	G.W.(kg)
3000 pcs	7 inch	45,000 pcs	203×203×195	180,000 pcs	438×438×220	