



## DESCRIPTION

The MBT6427 is available in SOT-23 package

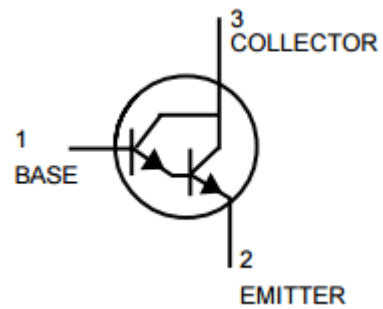
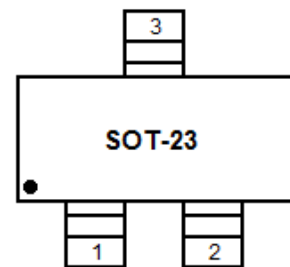
## FEATURES

- Available in SOT-23 package

## ORDERING INFORMATION

Package Type	Part Number
SOT-23	MBT6427
Note	SPQ: 3,000pcs/Reel
AiT provides all RoHS Compliant Products	

## PIN DESCRIPTION





## ABSOLUTE MAXIMUM RATINGS

$T_A = 25^\circ\text{C}$

$V_{CEO}$ , Collector–Emitter Voltage	40V
$V_{CBO}$ , Collector–Base Voltage	40V
$V_{EBO}$ , Emitter–Base Voltage	12V
$I_C$ , Collector Current — Continuous	500mA

Stresses above may cause permanent damage to the device. These are stress ratings only and functional operation of the device at these or any other conditions beyond those indicated in the Electrical Characteristics are not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

## THERMAL CHARACTERISTICS

Parameter	Symbol	Max.	Unit
Total Device Dissipation FR– 5 Board, <sup>NOTE1</sup> $T_A = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	225 1.8	mW mW/ $^\circ\text{C}$
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	556	$^\circ\text{C}/\text{W}$
Total Device Dissipation Alumina Substrate, <sup>NOTE2</sup> $T_A = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	300 2.4	mW 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 ~+150	$^\circ\text{C}$

NOTE1: FR–5 = 1.0 x 0.75 x 0.062 in.

NOTE2: Alumina = 0.4 x 0.3 x 0.024 in. 99.5% alumina.



## ELECTRICAL CHARACTERISTICS

T<sub>A</sub> = 25°C, unless otherwise noted

Parameter	Symbol	Conditions	Min.	Max.	Unit
<b>OFF CHARACTERISTICS</b>					
Collector–Emitter Breakdown Voltage <sup>NOTE3</sup>	V <sub>(BR)CEO</sub>	I <sub>C</sub> =10mA, V <sub>BE</sub> =0	40	-	V
Collector–Base Breakdown Voltage	V <sub>(BR)CBO</sub>	I <sub>C</sub> =100μA, I <sub>E</sub> =0	40	-	V
Emitter–Base Breakdown Voltage	V <sub>(BR)EBO</sub>	I <sub>E</sub> =10μA, I <sub>C</sub> =0	12	-	V
Collector Cutoff Current	I <sub>CES</sub>	V <sub>CE</sub> =25V, I <sub>B</sub> =0		1.0	μA
Collector Cutoff Current	I <sub>CBO</sub>	V <sub>CB</sub> =30V, I <sub>E</sub> =0	-	50	nA
Emitter Cutoff Current	I <sub>EBO</sub>	V <sub>EB</sub> =10V, I <sub>C</sub> =0	-	50	nA
<b>ON CHARACTERISTICS</b>					
DC Current Gain	h <sub>FE</sub>	I <sub>C</sub> =10mA, V <sub>CE</sub> =5.0V	10,000	100,000	-
		I <sub>C</sub> =100mA, V <sub>CE</sub> =5.0V	20,000	200,000	
		I <sub>C</sub> =500mA, V <sub>CE</sub> =5.0V	14,000	140,000	
Collector–Emitter Saturation Voltage	V <sub>CE(sat)</sub>	I <sub>C</sub> =50mA, I <sub>B</sub> =0.5mA I <sub>C</sub> =500mA, I <sub>B</sub> =0.5mA	-	1.2 1.5	V
Base–Emitter Saturation Voltage	V <sub>BE(sat)</sub>	I <sub>C</sub> =500mA, I <sub>B</sub> =0.5mA	-	2.0	V
Base–Emitter On Voltage	V <sub>BE(on)</sub>	I <sub>C</sub> =50mA, V <sub>CE</sub> =5.0V,	-	1.75	V
<b>SMALL–SIGNAL CHARACTERISTICS</b>					
Output Capacitance	C <sub>obo</sub>	V <sub>CB</sub> =10V, I <sub>E</sub> =0, f=1.0MHz	-	7.0	pF
Input Capacitance	C <sub>ibo</sub>	V <sub>EB</sub> =0.5V, I <sub>C</sub> =0, f=1.0MHz	-	15	pF
Current Gain–High Frequency	h <sub>fe</sub>	V <sub>CE</sub> =5.0V, I <sub>C</sub> =10mA, f=100MHz	1.3	-	V
Noise Figure	NF	V <sub>CE</sub> =5.0V, I <sub>C</sub> =1.0mA, R <sub>S</sub> =100kΩ, f=1.0kHz	-	10	dB

NOTE3: Pulse Tent: Pulse Width = 300μs, Duty Cycle = 2.0%



## TYPICAL CHARACTERISTICS

$V_{CE} = 5.0V$ ,  $T_A = 25^\circ C$

Figure 1. Noise Voltage

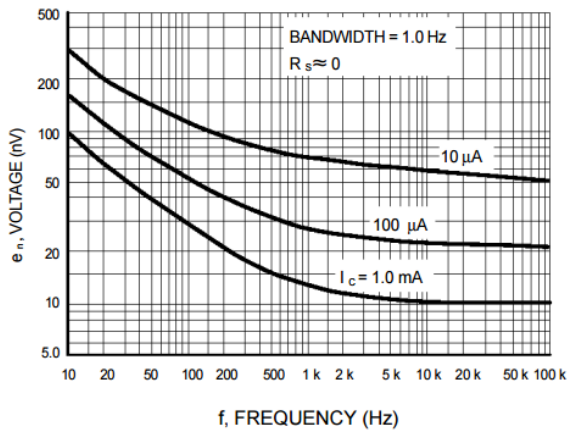


Figure 2. Noise Current

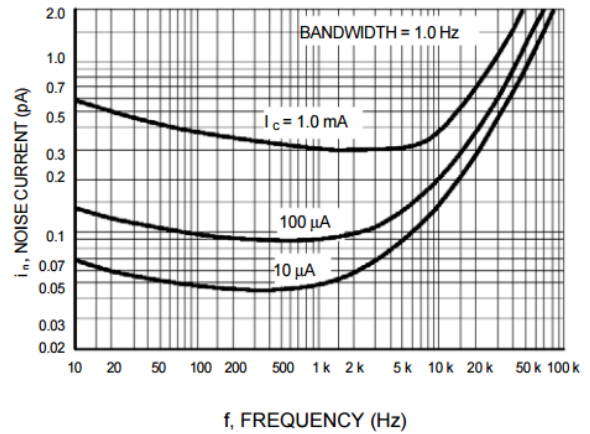


Figure 3. Total Wideband Noise Voltage

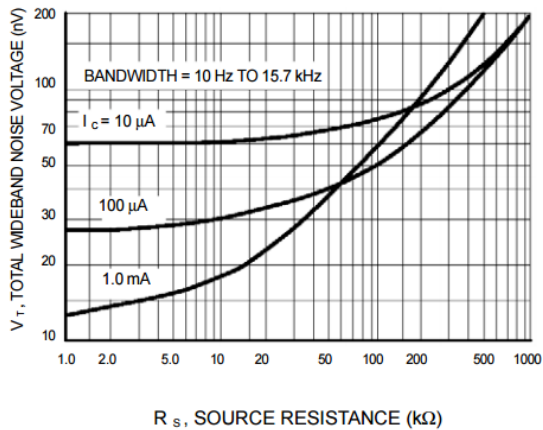


Figure 4. Wideband Noise Figure

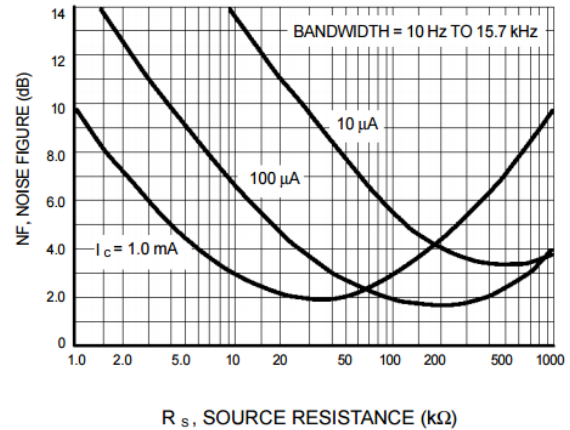


Figure 5. Capacitance

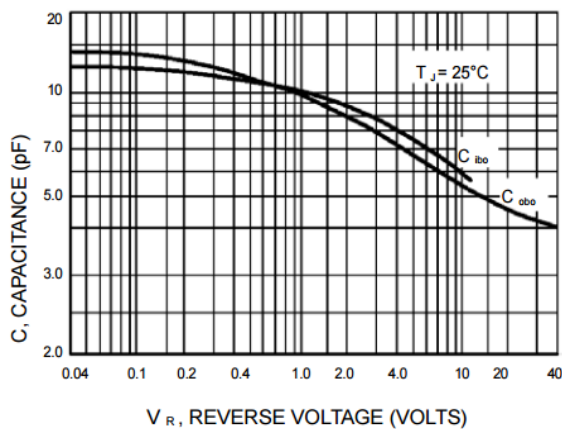


Figure 6. High Frequency Current Gain

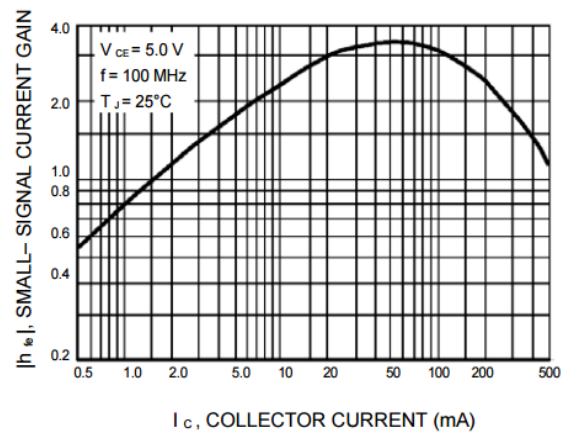




Figure 7. DC Current Gain

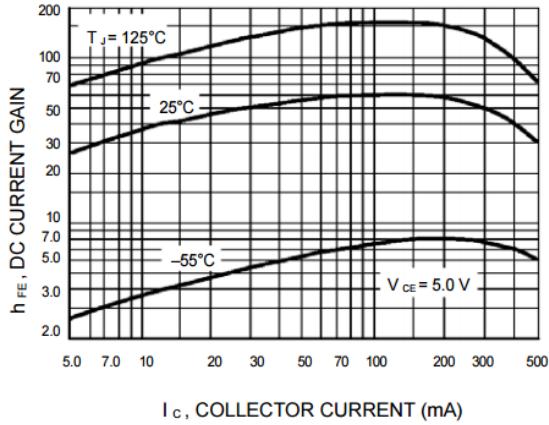


Figure 8. Collector Saturation Region

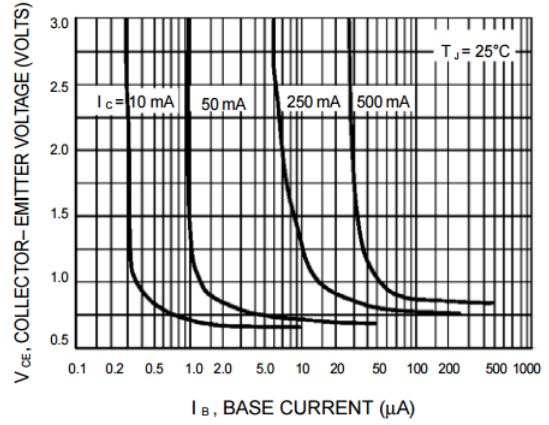


Figure 9. "On" Voltages

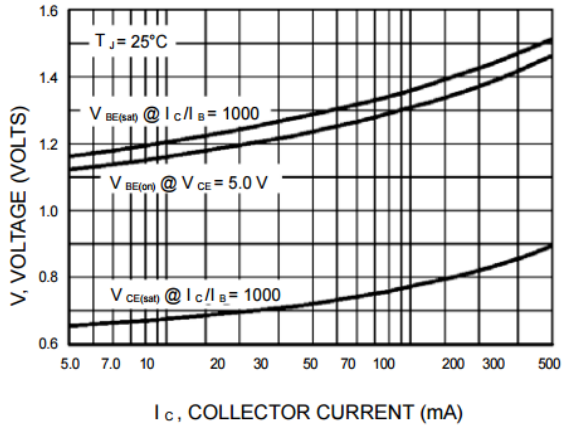


Figure 10. Temperature Coefficients

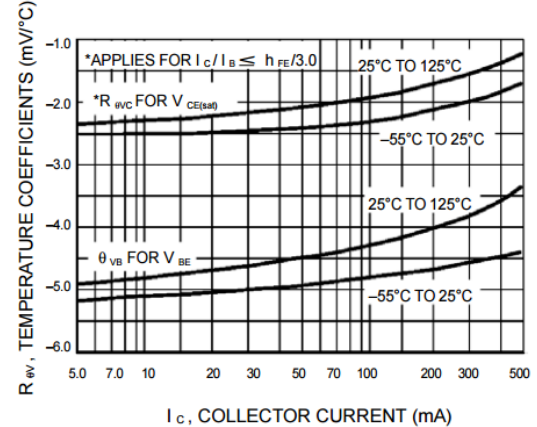
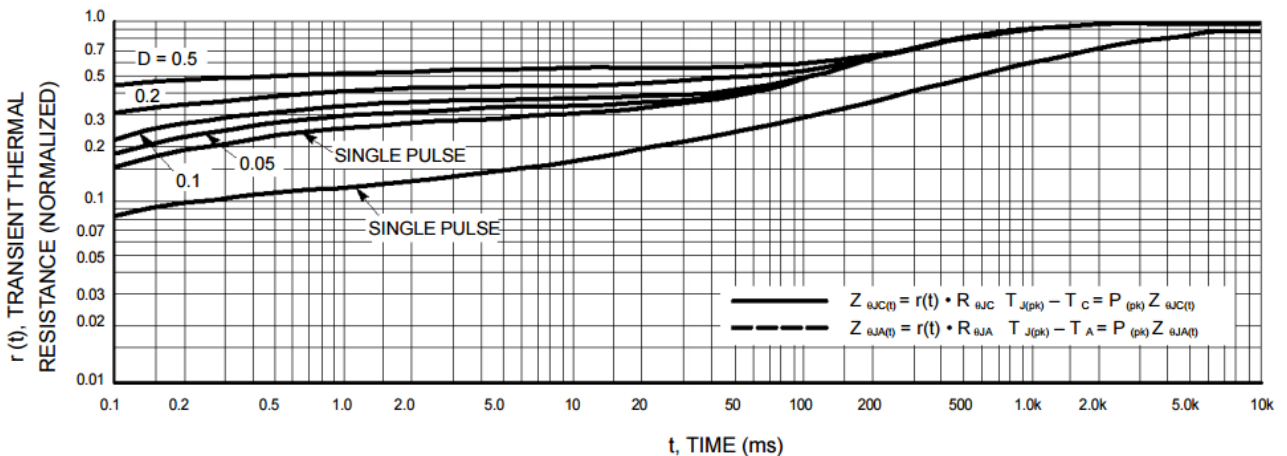
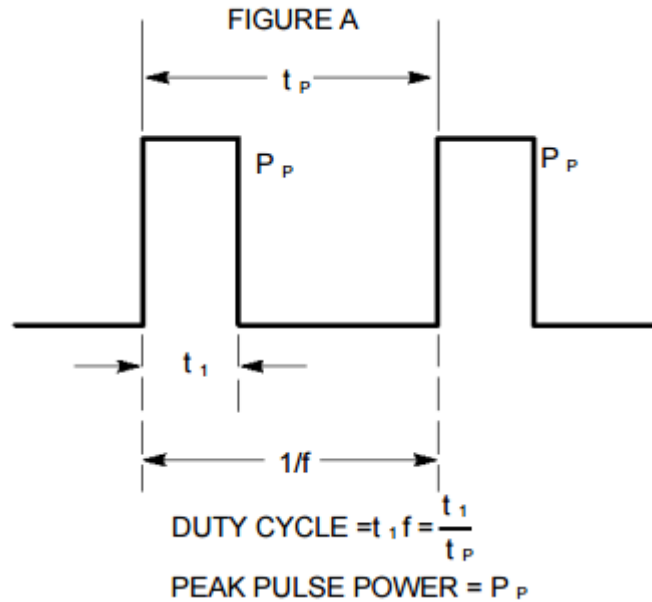


Figure 11. Thermal Response

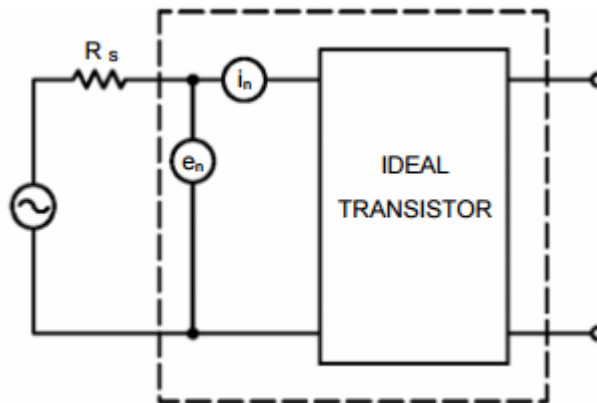




Design Note: Use of Transient Thermal Resistance Data



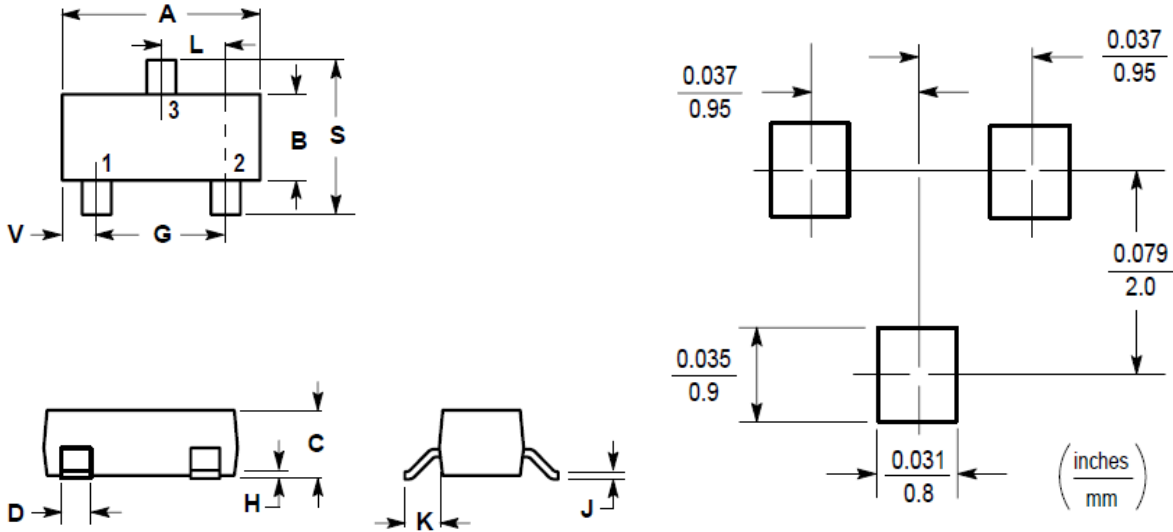
Transistor Noise Model





**PACKAGE INFORMATION**

Dimension in SOT-23 Package (Unit: mm)



DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	2.80	3.04	0.1102	0.1197
B	1.20	1.40	0.0472	0.0551
C	0.89	1.11	0.0350	0.0440
D	0.37	0.50	0.0150	0.0200
G	1.78	2.04	0.0701	0.0807
H	0.013	0.100	0.0005	0.0040
J	0.085	0.177	0.0034	0.0070
K	0.35	0.69	0.0140	0.0285
L	0.89	1.02	0.0350	0.0401
S	2.10	2.64	0.0830	0.1039
V	0.45	0.60	0.0177	0.0236



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