



DESCRIPTION

The MBT6517 is available in SOT-23 package

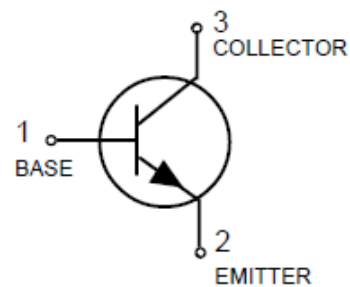
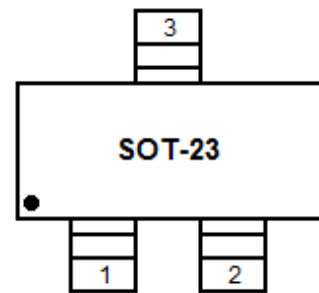
FEATURES

- Available in SOT-23 package

ORDERING INFORMATION

Package Type	Part Number
SOT-23	MBT6517
Note	SPQ: 3,000pcs/Reel
AiT provides all RoHS Compliant Products	

PIN DESCRIPTION



1. BASE
2. EMITTER
3. COLLECTOR



ABSOLUTE MAXIMUM RATINGS

V_{CEO} , Collector–Emitter Voltage	350Vdc
V_{CBO} , Collector–Base Voltage	350Vdc
V_{EBO} , Emitter–Base Voltage	5.0Vdc
I_B , Base Current	250mA _{dc}
I_C , Collector Current — Continuous	500mA _{dc}

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	Min.	Max.	Unit
Total Device Dissipation FR– 5 Board, ^{NOTE1} $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D		225 1.8	mW mW/ $^\circ\text{C}$
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$		556	$^\circ\text{C}/\text{W}$
Total Device Dissipation Alumina Substrate, ^{NOTE2} $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D		300 2.4	mW mW/ $^\circ\text{C}$
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$		417	$^\circ\text{C}/\text{W}$
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_A = 25°C, unless otherwise noted.

Parameter	Symbol	Conditions	Min.	Max.	Unit
OFF CHARACTERISTICS					
Collector–Emitter Breakdown Voltage	V _{(BR)CEO}	I _C = 1.0mA _{dc}	350	-	V _{dc}
Collector–Base Breakdown Voltage	V _{(BR)CBO}	I _C = 100μA _{dc}	350	-	V _{dc}
Emitter–Base Breakdown Voltage	V _{(BR)EBO}	I _E = 10mA _{dc}	6.0	-	V _{dc}
Collector Cutoff Current	I _{CBO}	V _{CB} = 250V _{dc}	-	50	nA _{dc}
Emitter Cutoff Current	I _{EBO}	V _{EB} = 5.0V _{dc}	-	50	nA _{dc}
ON CHARACTERISTICS					
DC Current Gain	h _{FE}	I _C = 1.0mA _{dc} , V _{CE} = 10V _{dc}	20	-	-
		I _C = 10mA _{dc} , V _{CE} = 10V _{dc}	30	-	
		I _C = 30mA _{dc} , V _{CE} = 10V _{dc}	30	200	
		I _C = 50mA _{dc} , V _{CE} = 10V _{dc}	20	200	
		I _C = 100mA _{dc} , V _{CE} = 10V _{dc}	15	-	
Collector–Emitter Saturation Voltage NOTE3	V _{CE(sat)}	I _C = 10mA _{dc} , I _B = 1.0mA _{dc}	-	0.30	V _{dc}
		I _C = 20mA _{dc} , I _B = 2.0mA _{dc}	-	0.35	
		I _C = 30mA _{dc} , I _B = 3.0mA _{dc}	-	0.50	
		I _C = 50mA _{dc} , I _B = 5.0mA _{dc}	-	1.0	
Base – Emitter Saturation Voltage	V _{BE(sat)}	I _C = 10mA _{dc} , I _B = 1.0mA _{dc}	-	0.75	V _{dc}
		I _C = 20mA _{dc} , I _B = 2.0mA _{dc}	-	0.85	
		I _C = 30mA _{dc} , I _B = 3.0mA _{dc}	-	0.90	
Base–Emitter On Voltage	V _{BE(on)}	I _C = 100mA _{dc} , V _{CE} = 10V _{dc}	-	2.0	V _{dc}
SMALL–SIGNAL CHARACTERISTICS					
Current Gain–Bandwidth Product	f _T	V _{CE} = 20V _{dc} , I _C = 10mA _{dc} , f = 20 MHz	40	200	MHz
Collector –Base Capacitance	C _{cb}	V _{CB} = 20V _{dc} , f = 1.0 MHz	-	6.0	pF
Emitter –Base Capacitance	C _{eb}	V _{EB} =0.5V _{dc} , f = 1.0 MHz	-	80	pF

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



TYPICAL CHARACTERISTICS

Figure 1. DC Current Gain

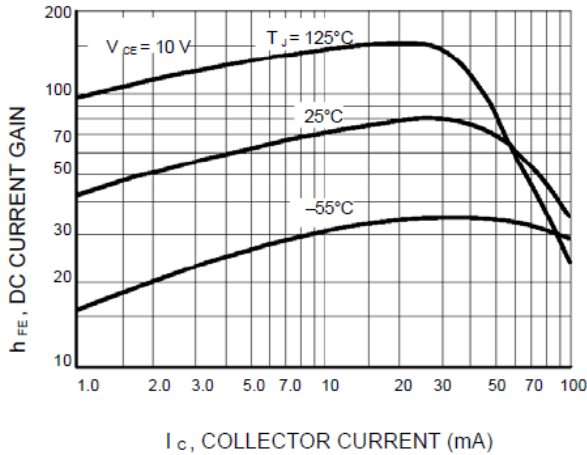


Figure 2. Current-Gain — Bandwidth Product

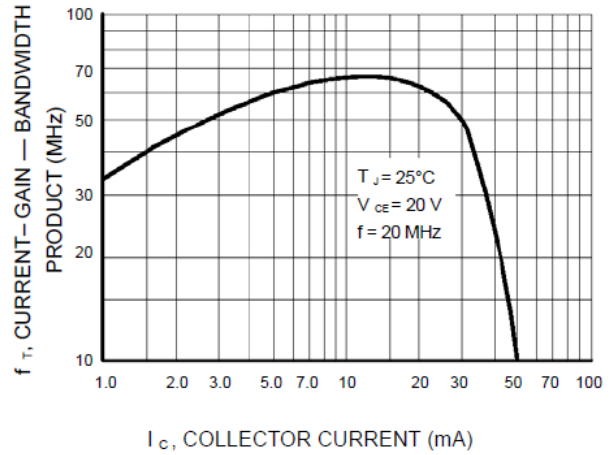


Figure 3. "On" Voltages

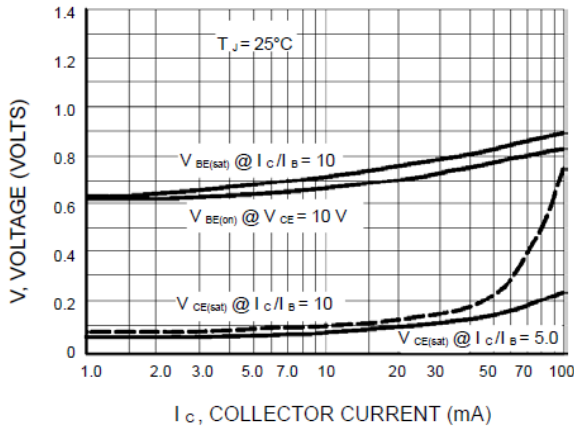


Figure 4. Temperature Coefficients

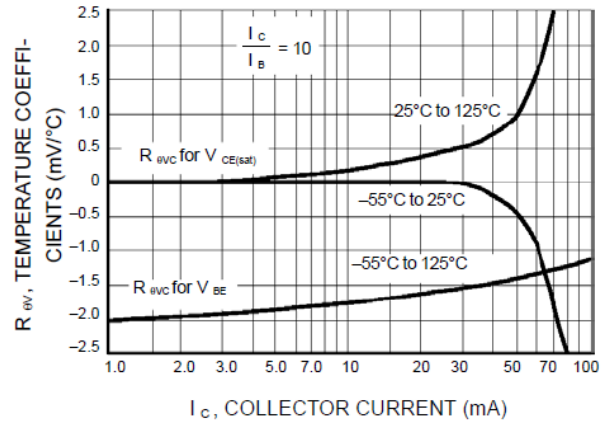


Figure 5. Capacitance

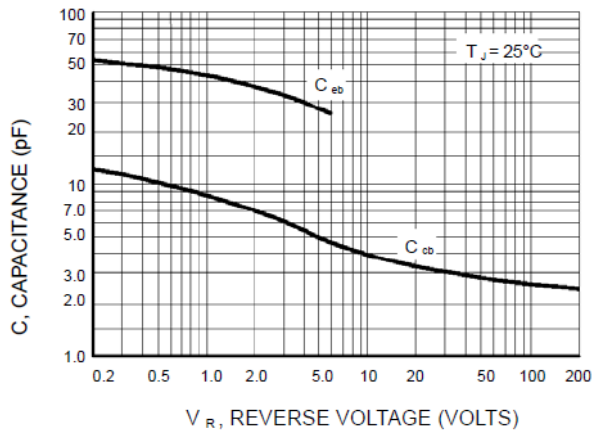




Figure 6. Turn-On Time

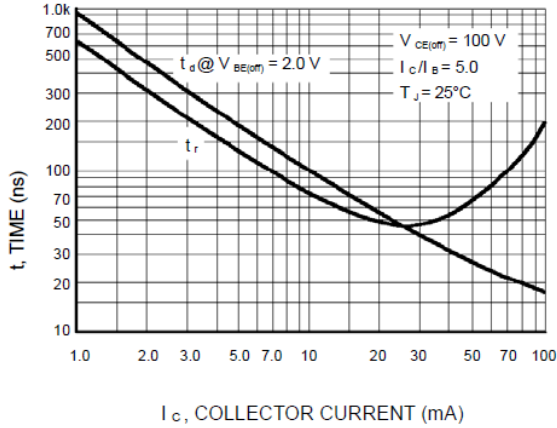


Figure 7. Turn-Off Time

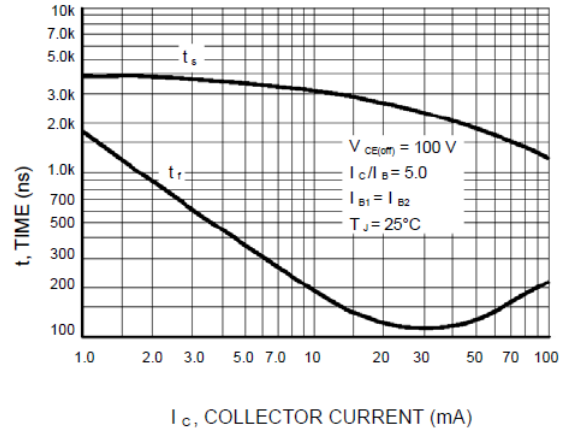


Figure 8. Thermal Response

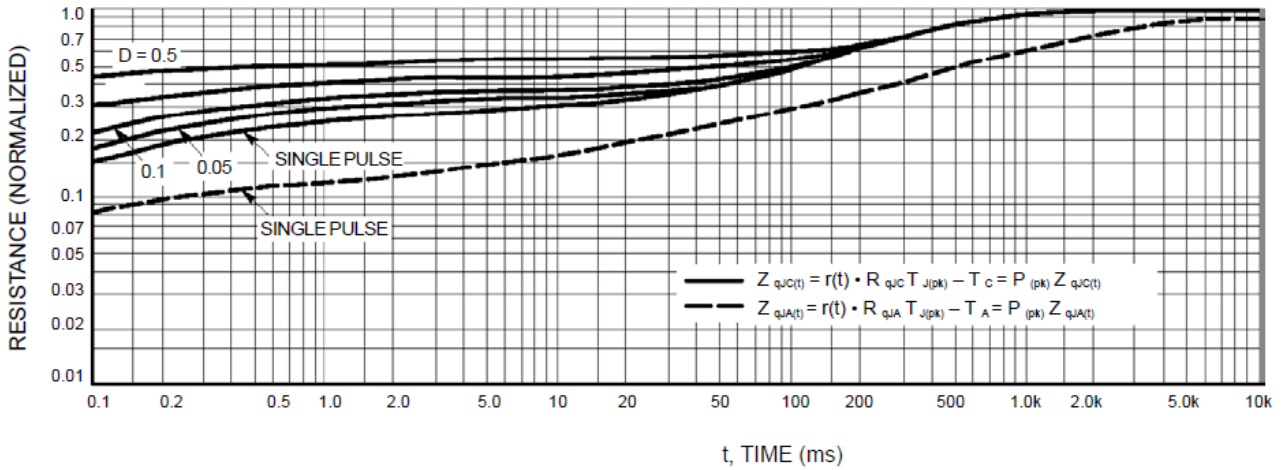
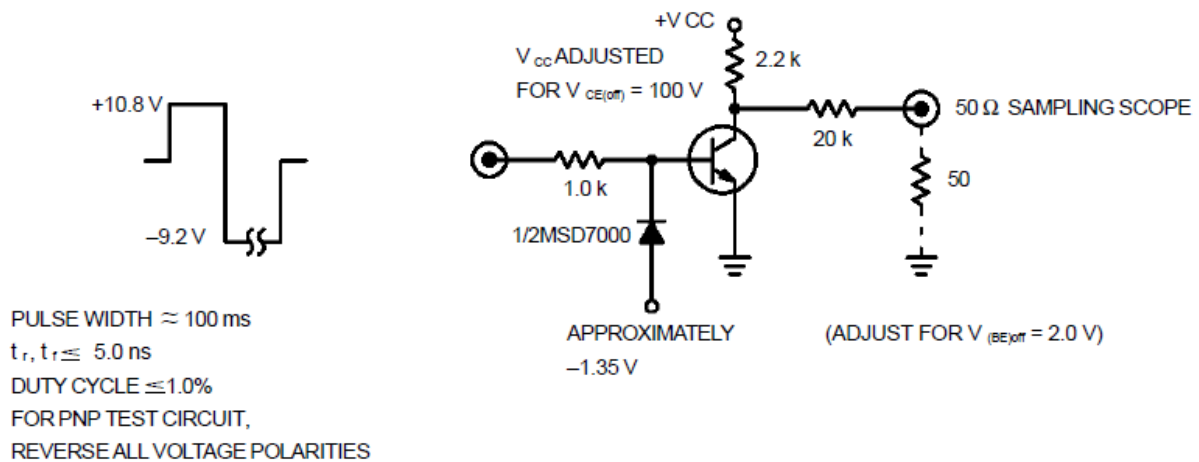
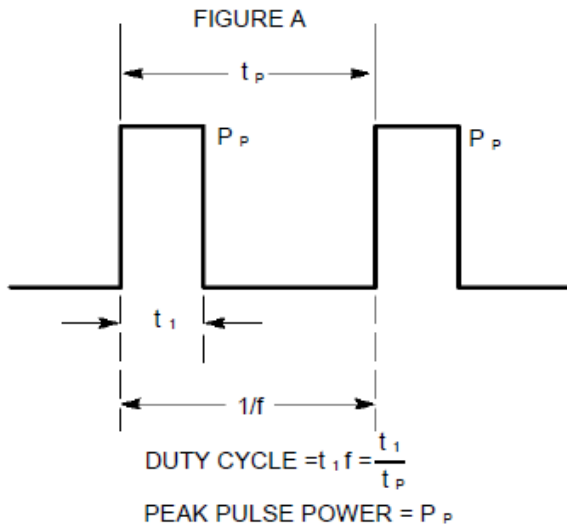


Figure 9. Switching Time Test Circuit





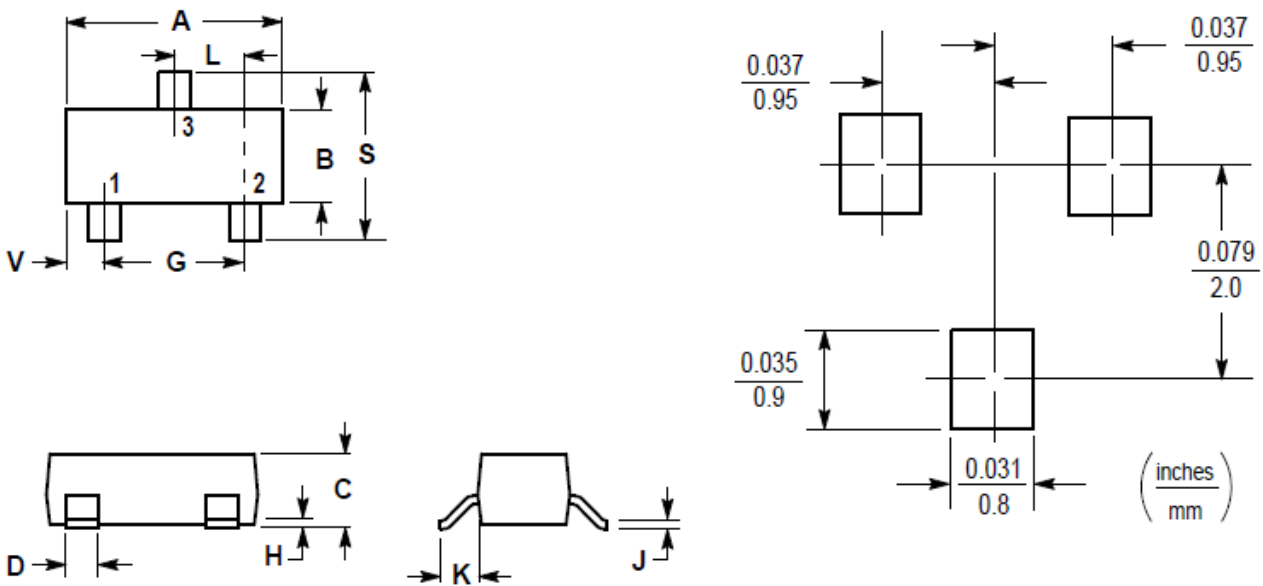
Design Note: Use of Transient Thermal Resistance Data





PACKAGE INFORMATION

Dimension in SOT-23 (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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