



DESCRIPTION

The MBT5401DW is available in SC-88 package.

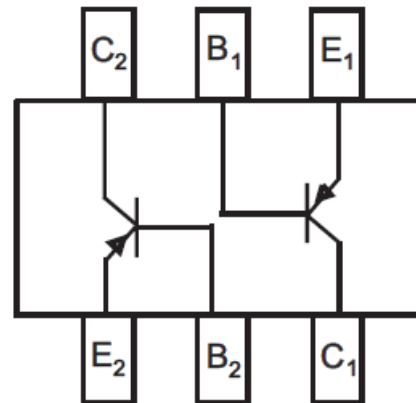
FEATURES

- Available in SC-88 package

ORDERING INFORMATION

Package Type	Part Number
SC-88	MBT5401DW
Package	SPQ: 3,000pcs/Reel
AiT provides all RoHS Compliant Products	

PIN DESCRIPTION





ABSOLUTE MAXIMUM RATINGS

V_{CEO} , Collector-Emitter Voltage	-150Vdc
V_{CBO} , Collector-Base Voltage	-160Vdc
V_{EBO} , Emitter-Base Voltage	-5.0Vdc
I_C , Collector Current - Continuous	-500mAdc

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, ^{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	$^\circ\text{C/W}$
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	$^\circ\text{C/W}$
Junction and Storage Temperature	T_J, T_{STG}	-55 to +150	$^\circ\text{C}$



ELECTRICAL CHARACTERISTICS

T_A = 25°C, unless otherwise noted

Parameter	Symbol	Conditions	Min	Max	Unit
OFF CHARACTERISTICS					
Collector–Emitter Breakdown Voltage ^{NOTE3}	V _{(BR)CEO}	I _C = -1.0mA, I _B = 0	-150	-	Vdc
Collector–Base Breakdown Voltage	V _{(BR)CBO}	I _C = -100μA, I _E = 0	-160	-	Vdc
Emitter–Base Breakdown Voltage	V _{(BR)EBO}	I _E = -10μA, I _C = 0	-5.0	-	Vdc
Collector Cutoff Current	I _{CBO}	V _{CB} = -120Vdc, I _E = 0	-	-50	nAdc
		V _{CB} = -120Vdc, I _E = 0, T _A = 100°C	-	-50	μAdc
ON CHARACTERISTICS^{NOTE2}					
DC Current Gain	h _{FE}	I _C = -1.0mA, V _{CE} = -5.0Vdc	50	-	-
		I _C = -10mA, V _{CE} = -5.0Vdc	60	240	
		I _C = -50mA, V _{CE} = -5.0Vdc	50	-	
Collector–Emitter Saturation Voltage	V _{CE(sat)}	I _C = -10mA, I _B = -1.0mA	-	-0.2	Vdc
		I _C = -50mA, I _B = -5.0mA	-	-0.5	
Base–Emitter Saturation Voltage	V _{BE(sat)}	I _C = -10mA, I _B = -1.0mA	-	-1.0	Vdc
		I _C = -50mA, I _B = -5.0mA	-	-1.0	
SMALL–SIGNAL CHARACTERISTICS					
Current-Gain - Bandwidth Product	f _T	I _C = -10mA, V _{CE} = -10Vdc, f = 100MHz	100	300	MHz
Output Capacitance	C _{obo}	V _{CB} = -10Vdc, I _E = 0, f = 1.0MHz	-	6.0	pF
Small–Signal Current Gain	h _{fe}	I _C = -1.0mA, V _{CE} = -10Vdc, f = 1.0kHz	40	200	-
Noise Figure	NF	I _C = -200μA, V _{CE} = -5.0Vdc, R _S = 10Ω, f = 1.0kHz	-	8.0	dB

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.

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



TYPICAL CHARACTERISTICS

Figure 1. DC Current Gain

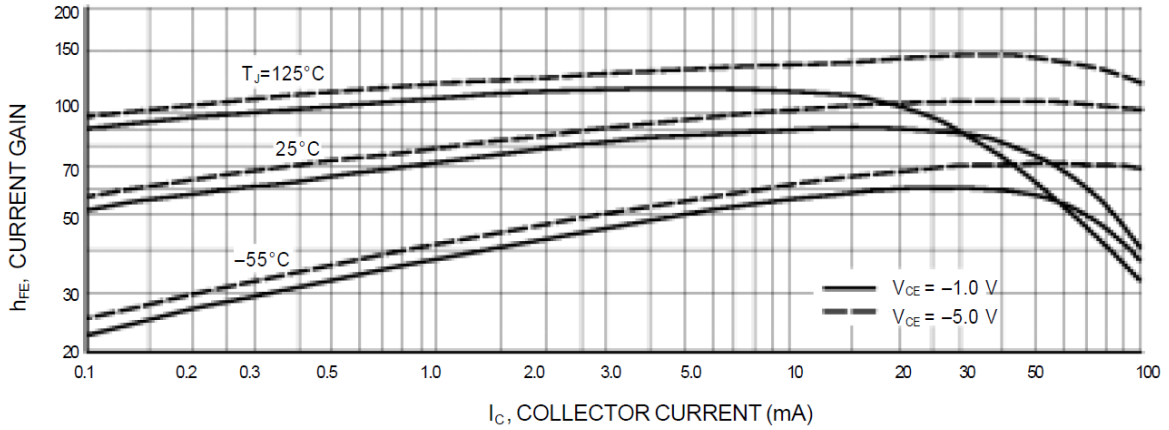


Figure 2. Collector Saturation Region

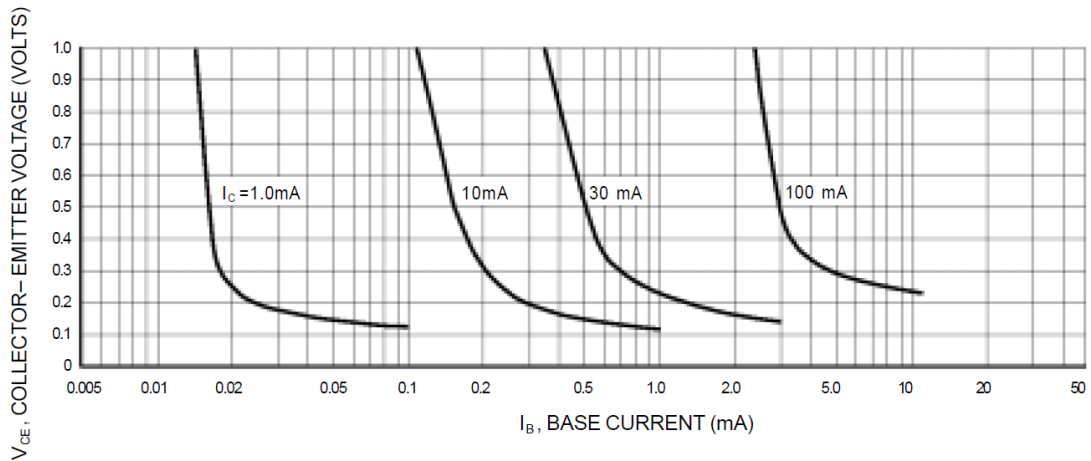


Figure 3. Collector Cut-Off Region

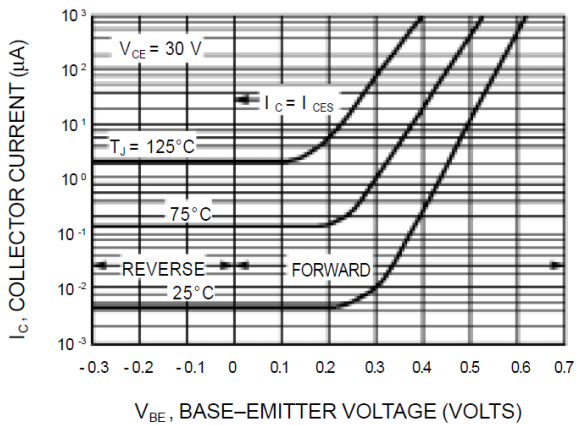


Figure 4. "On" Voltages

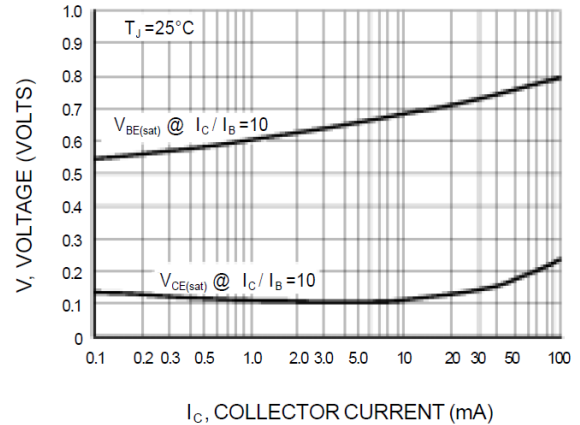




Figure 5. Temperature Coefficients

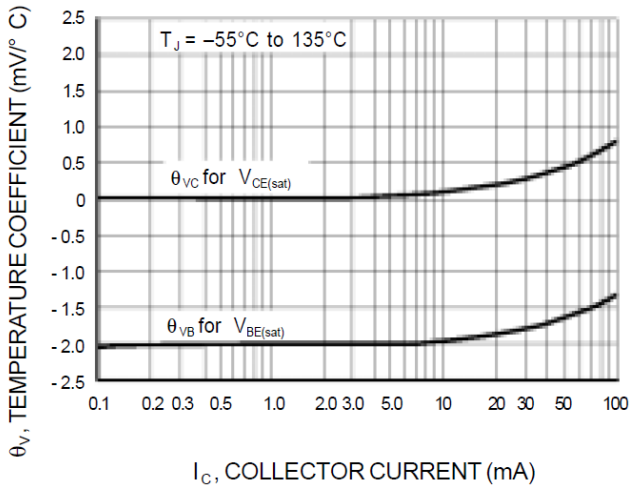


Figure 6. Switching Time Test Circuit

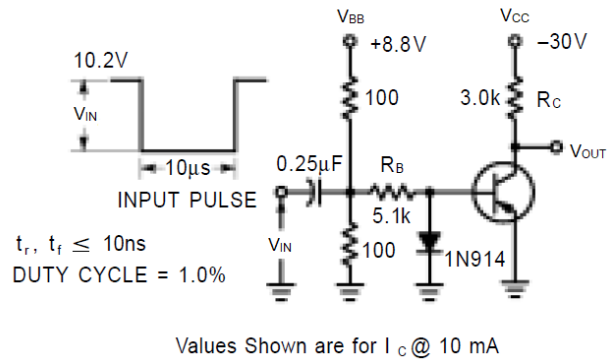


Figure 7. Capacitances

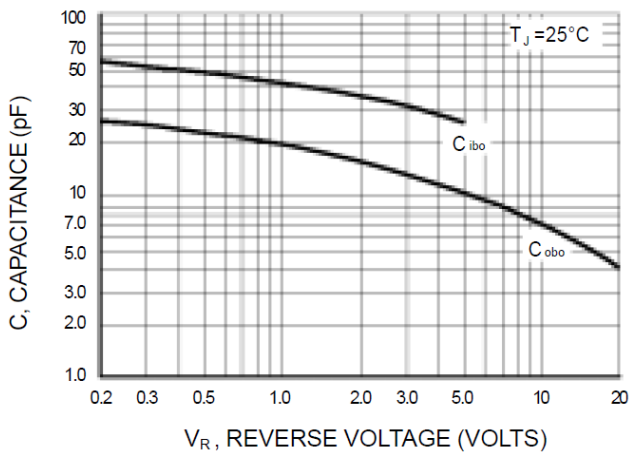


Figure 8. Turn-On Time

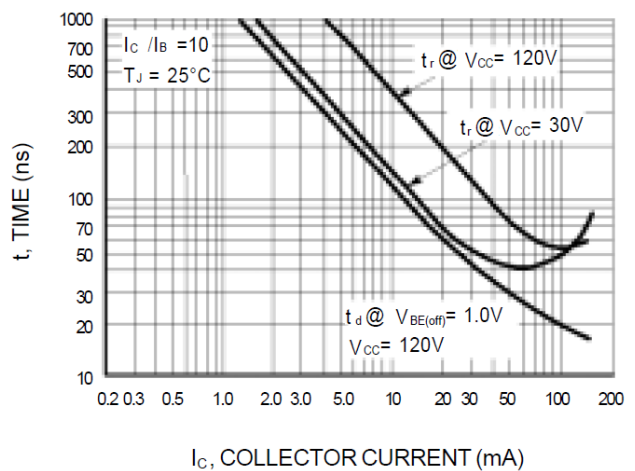
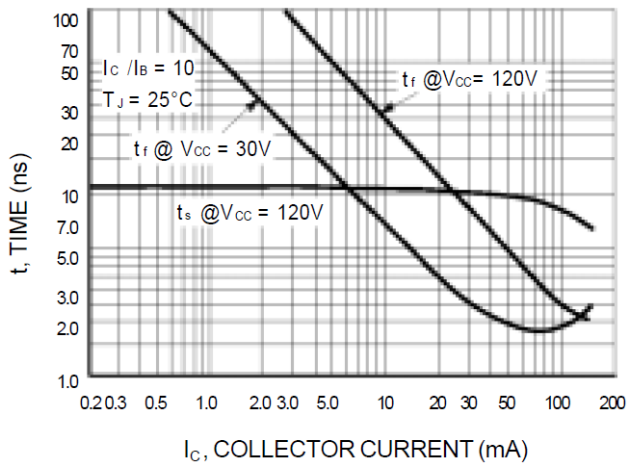


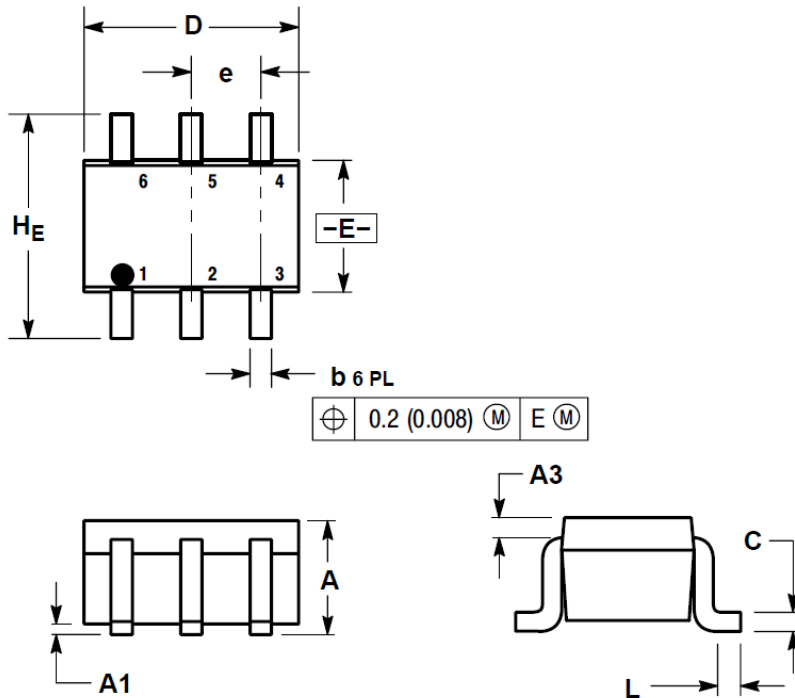
Figure 9. Turn-Off Time





PACKAGE INFORMATION

Dimension in SC-88 Package (Unit: mm)





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