DESCRIPTION

The MBT2907AL is available in SOT-23 Package.

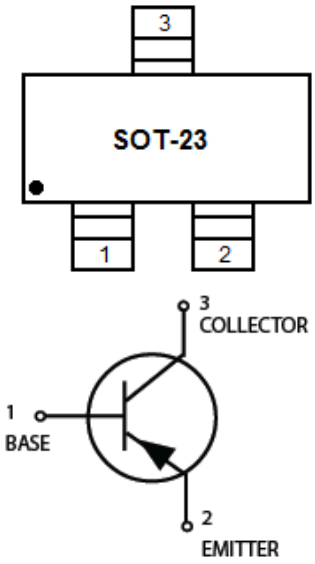
FEATURES

- RoHS compliance
- Available in SOT-23 Package

ORDERING INFORMATION

Package Type	Part Number
SOT-23	MBT2907AL
Note	SPQ: 3,000pcs / Reel
AiT provides all RoHS Compliant Products	

PIN DESCRIPTION



ABSOLUTE MAXIMUM RATINGS

T_A = 25°C

V_{CEO}, Collector-Emitter Voltage	-40Vdc ~ -60Vdc
V_{CBO}, Collector-Base Voltage	-60Vdc
V_{EBO}, Emitter-Base Voltage	-5.0Vdc
I_C , Collector Current-Continuous	-600mAdc

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°C Derate above 25°C	P_D	 225 1.8	 mW mW/°C
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	556	°C/W
Total Device Dissipation Alumina Substrate NOTE2 T_A = 25°C Derate above 25°C	P_D	 300 2.4	 mW 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

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
OFFCHARACTERISTICS					
Collector–Emitter Breakdown Voltage NOTE3	$V_{(BR)CEO}$	I_C = -10mAdc, I_B = 0	-60	-	Vdc
Collector-Emitter Breakdown Voltage	$V_{(BR)CBO}$	I_C = -10μAdc, I_E = 0	-60	-	Vdc
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	I_E = -10μAdc, I_C = 0	-5.0	-	Vdc
Collector Cutoff Current	I_{CEX}	V_{CB} = -30Vdc, $V_{BE(OFF)}$ = -0.5Vdc	-	-50	nAdc
Collector Cutoff Current	I_{CBO}	V_{CB} = -50Vdc, I_E = 0	-	-0.010	μAdc
		V_{CB} = -50Vdc, I_E = 0, T_A = 125°C	-	-10	
Base Current	I_B	V_{CE} = -30Vdc, $V_{EB(OFF)}$ = -0.5Vdc	-	-50	nAdc
ON CHARACTERISTICS					
DC Current Gain	h_{FE}	I_C = -0.1mAdc, V_{CE} = -10Vdc	75	-	-
		I_C = -10mAdc, V_{CE} = -10Vdc	100	-	
		I_C = -1.0mAdc, V_{CE} = -10Vdc	100	-	
		I_C = -150mAdc, V_{CE} = -10Vdc NOTE3	100	300	
		I_C = -500mAdc, V_{CE} = -10Vdc NOTE3	50	-	
Collector-Emitter Saturation Voltage NOTE3	$V_{CE(sat)}$	I_C = -150mAdc, I_B = -15mAdc	-	-0.4	Vdc
		I_C = -500mAdc, I_B = -50mAdc	-	-1.6	
Base-Emitter Saturation Voltage NOTE3	$V_{BE(sat)}$	I_C = -150mAdc, I_B = -15mAdc	-	-1.3	Vdc
		I_C = -500mAdc, I_B = -50mAdc	-	-2.6	
SMALL-SIGNAL CHARACTERISTICS					
Current-Gain-Bandwidth Product NOTE3+NOTE4	f_T	I_C = -50mAdc, V_{CE} = -20Vdc, f = 100MHz	200	-	MHz
Output Capacitance	C_{obo}	V_{CB} = -10Vdc, I_E = 0, f = 1.0MHz	-	8.0	pF
Input Capacitance	C_{ibo}	V_{EB} = -2.0Vdc, I_C = 0, f = 1.0MHz	-	30	pF
Turn–On Time	t_{on}	V_{CC} = -30Vdc, I_C = -150mAdc, I_{B1} = -15mAdc	-	45	ns
Delay Time	t_d		-	10	
Rise Time	t_r		-	40	
Fall Time	t_f	V_{CC} = -6.0Vdc, I_C = -150mAdc, I_{B1} = I_{B2} = 15mAdc	-	30	ns
Storage Time	t_s		-	80	
Turn–Off Time	t_{off}		-	100	

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

NOTE4: f_T is defined as the frequency at which |h f e | extrapolates to unity.

TYPICAL CHARACTERISTICS

Figure 1. Delay and Rise Time Test Circuit

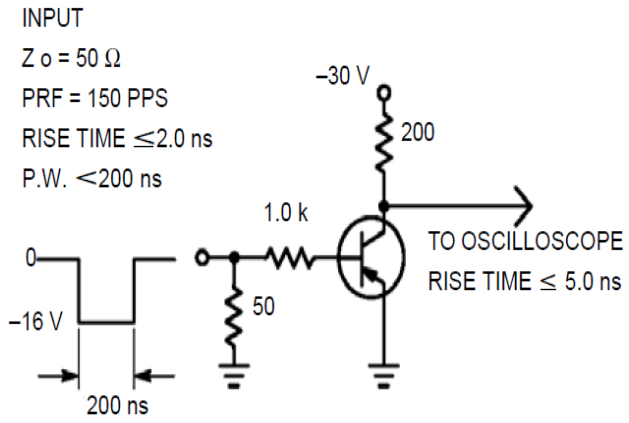


Figure 2. Storage and Fall Time Test Circuit

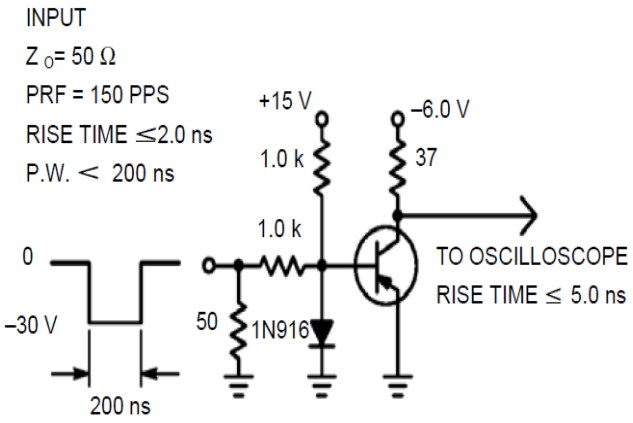


Figure 3. DC Current Gain

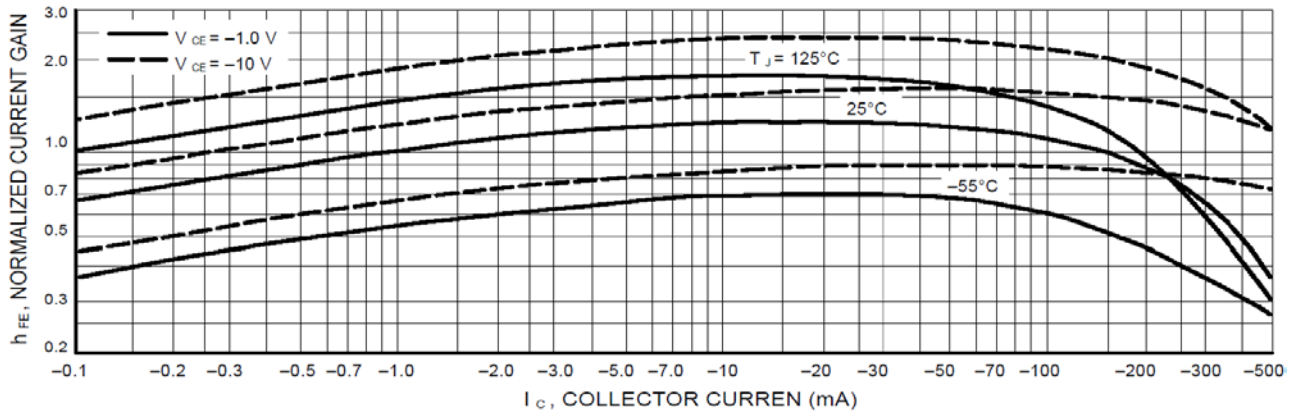


Figure 4. Collector Saturation Region

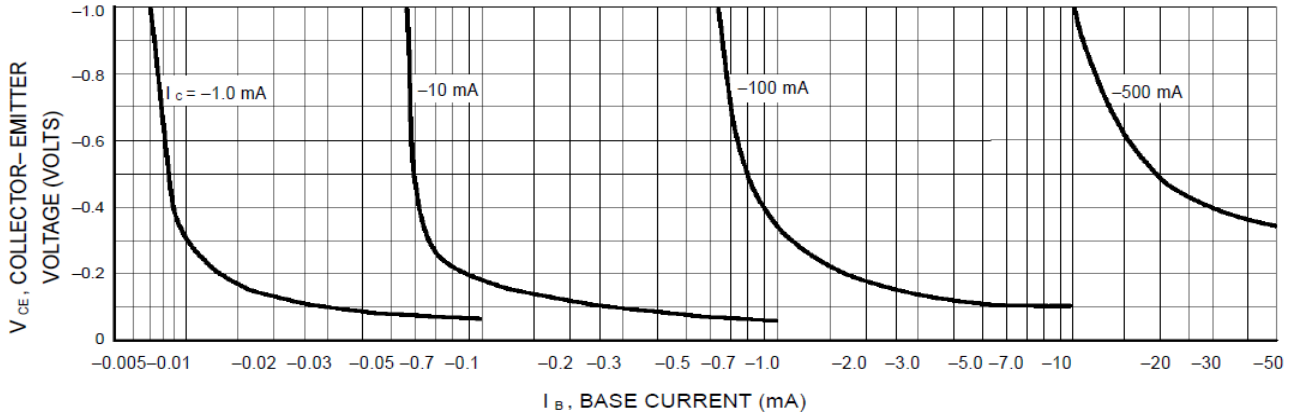


Figure 5. Turn–On Time

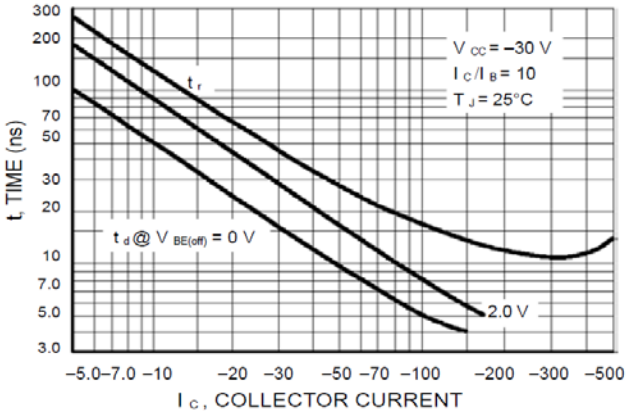
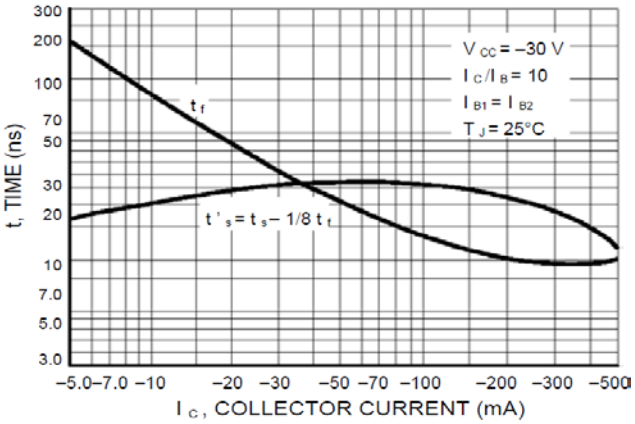


Figure 6. Turn–Off Time



TYPICAL SMALL-SIGNAL CHARACTERISTICS, NOISE FIGURE(V_{CE} = 10Vdc, T_A = 25°C)

Figure 7. Frequency Effects

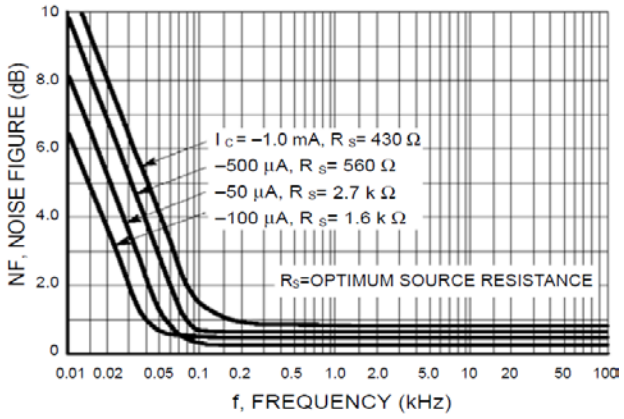


Figure 8. Source Resistance Effects

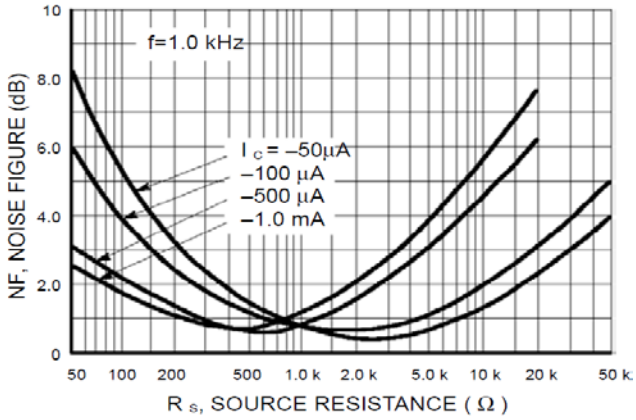


Figure 9. Capacitances

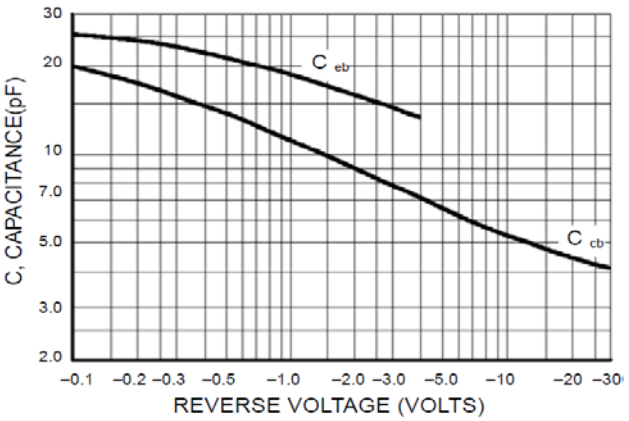


Figure 10. Current–Gain — Bandwidth Product

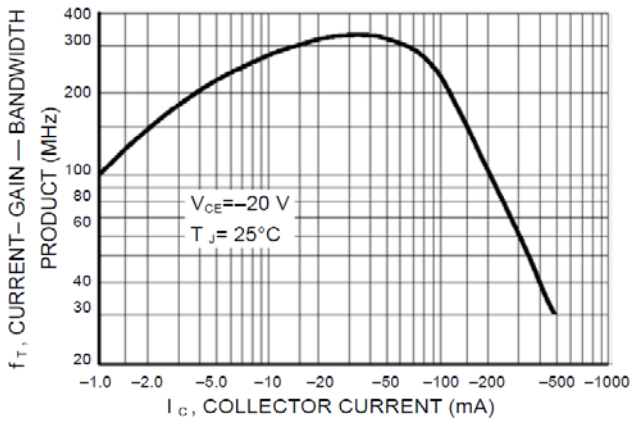


Figure 11. “On” Voltage

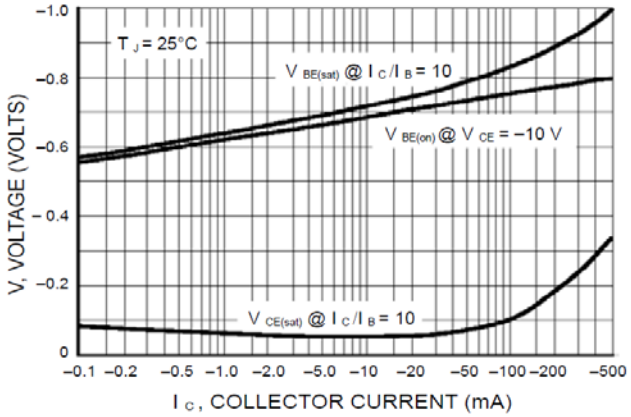
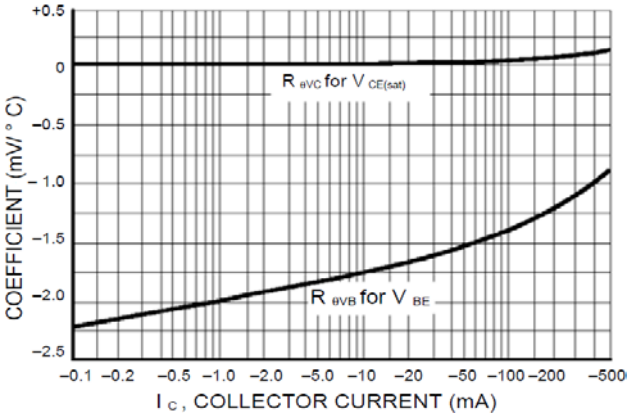
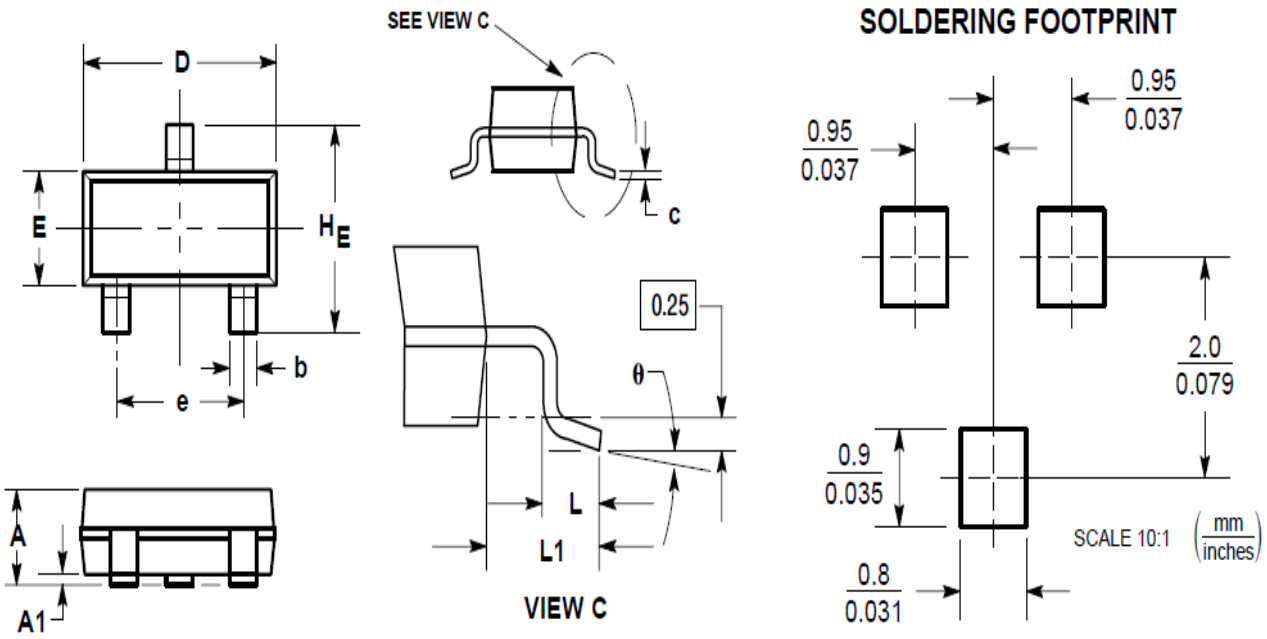


Figure 12. Temperature Coefficients



PACKAGE INFORMATION

Dimension in SOT-23 Package (Unit: mm)



DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.035	0.044	0.89	1.11
A1	0.001	0.004	0.01	0.10
b	0.015	0.020	0.37	0.50
c	0.003	0.007	0.09	0.18
D	0.110	0.120	2.80	3.04
E	0.047	0.055	1.20	1.40
e	0.070	0.081	1.78	2.04
L	0.004	0.012	0.10	0.30
L1	0.014	0.029	0.35	0.69
H_E	0.083	0.104	2.10	2.64

IMPORTANT NOTICE

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