

Features

- Pb-Free package is available.

Device Marking And Ordering Information

Device	Package	Shipping
FMBT5401LG	SOT-23	3000/Tape&Reel

Maximum Ratings

Rating	Symbol	Value	Unit
Collector–Emitter Voltage	V_{CEO}	-150	Vdc
Collector–Base Voltage	V_{CBO}	-160	Vdc
Emitter–Base Voltage	V_{EBO}	-5.0	Vdc
Collector Current – Continuous	I_C	-500	mAdc

Thermal Characteristics

Characteristic	Symbol	Max	Unit
Total Device Dissipation FR-5 Board (1) $T_A = 25^\circ\text{C}$ Derate Above 25°C	P_D	225	mW
		1.8	mW/ $^\circ\text{C}$
Thermal Resistance, Junction–to–Ambient	$R_{\theta JA}$	556	$^\circ\text{C}/\text{W}$
Total Device Dissipation Alumina Substrate (2) $T_A = 25^\circ\text{C}$ Derate Above 25°C	P_D	300	mW
		2.4	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 to +150	$^\circ\text{C}$

Device Marking

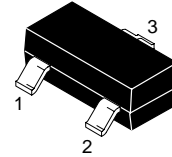
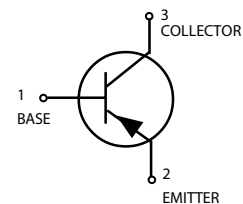
FMBT3906LG = 2L

Electrical Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise noted.)

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector–Emitter Breakdown Voltage ($I_C = -1.0\text{ mAdc}, I_B = 0$)	$V_{(BR)CEO}$	-150	-	Vdc
Collector–Base Breakdown Voltage ($I_C = -100\ \mu\text{Adc}, I_E = 0$)	$V_{(BR)CBO}$	-160	-	Vdc
Emitter–Base Breakdown Voltage ($I_E = -10\ \mu\text{Adc}, I_C = 0$)	$V_{(BR)EBO}$	-5.0	-	Vdc
Collector Cutoff Current ($V_{CB} = -120\text{ Vdc}, I_E = 0$) ($V_{CB} = -120\text{ Vdc}, I_E = 0, T_A = 100^\circ\text{C}$)	I_{CES}	-	-50	nAdc μAdc

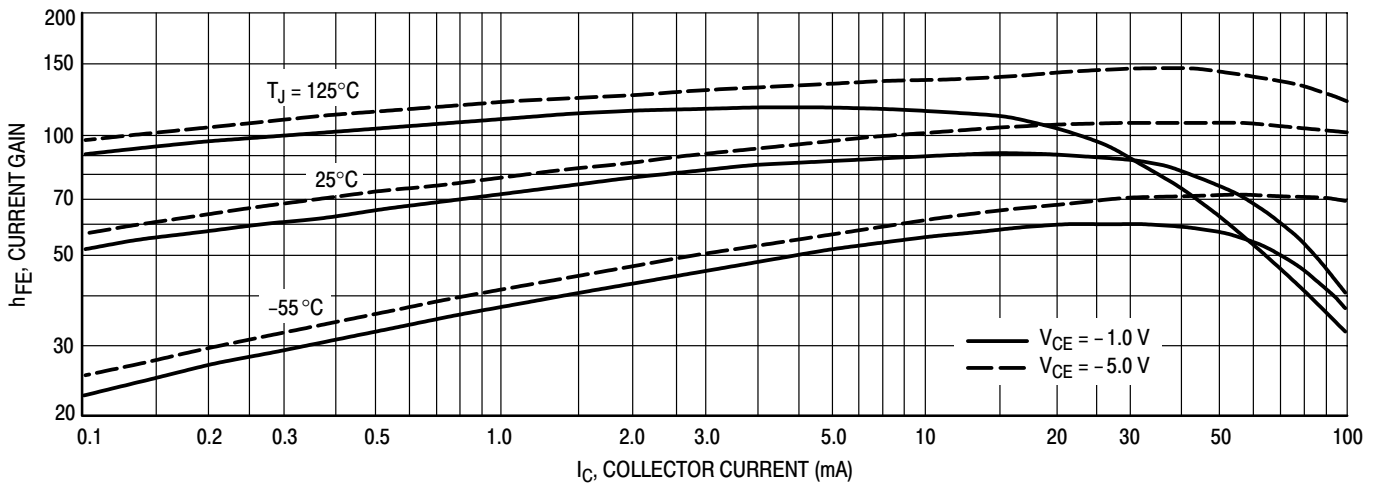
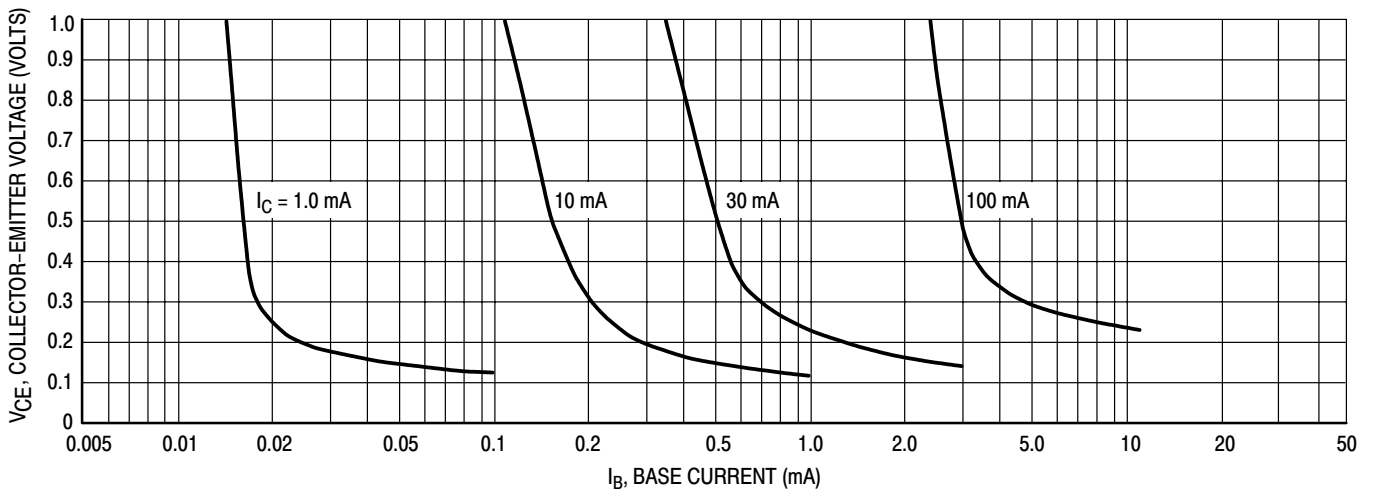
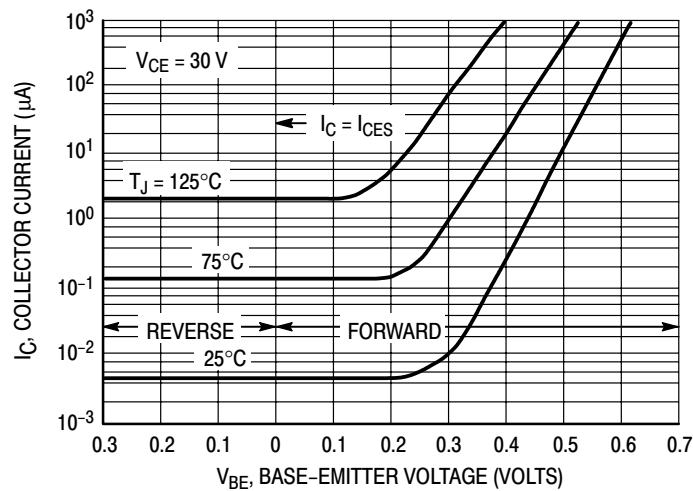
1. FR-5 = 1.0 x 0.75 x 0.062 in.

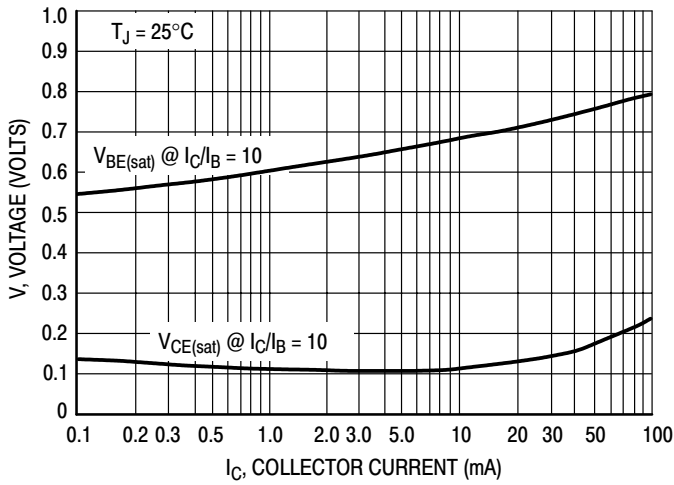
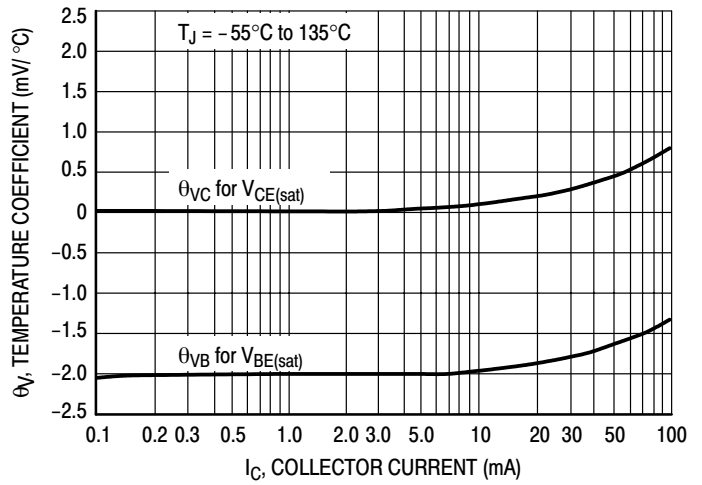
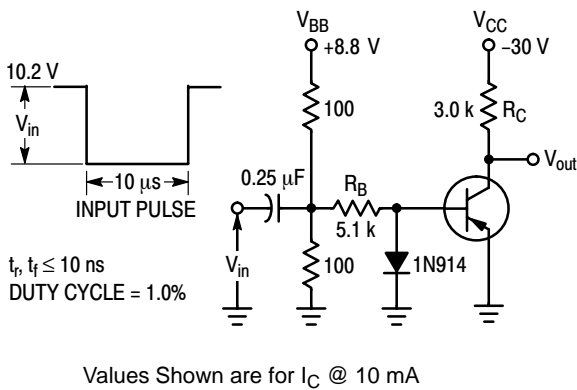
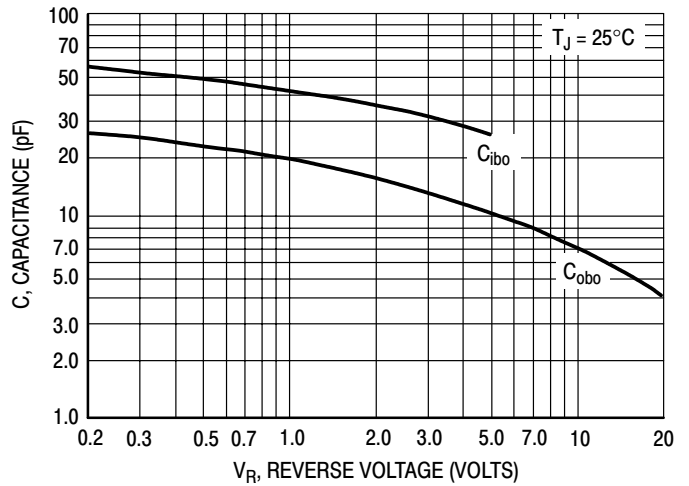
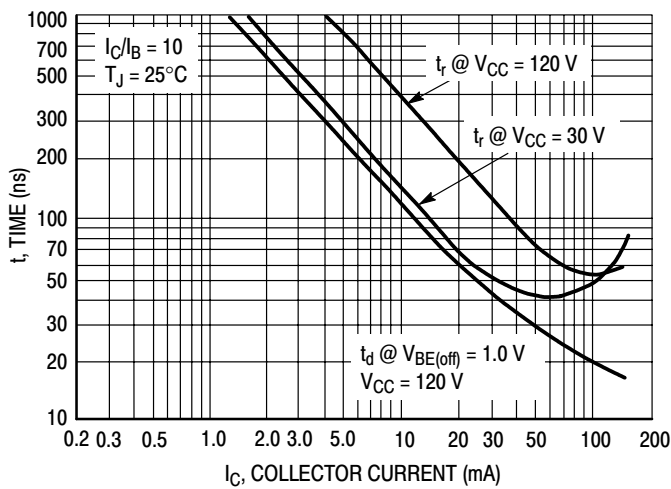
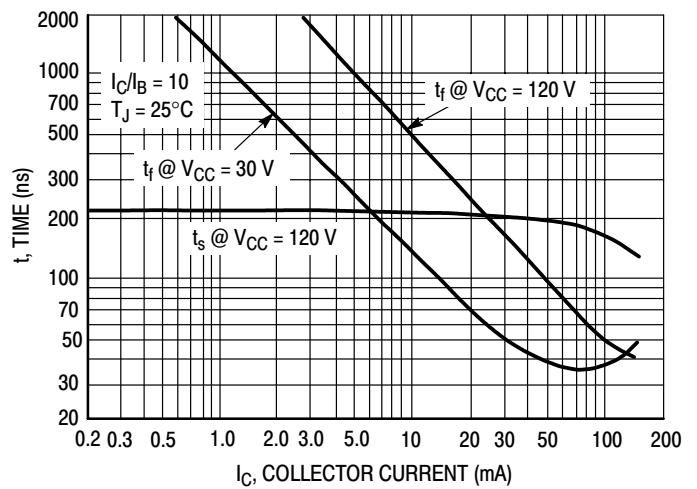
2. Alumina = 0.4 x 0.3 x 0.024 in. 99.5% alumina.

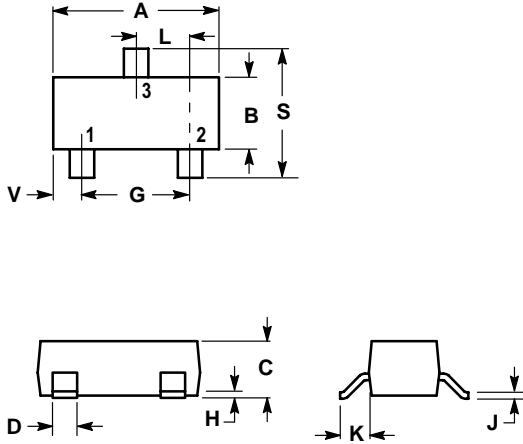
Package outline

SOT-23


Electrical Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise noted.)

Characteristic	Symbol	Min	Max	Unit
ON CHARACTERISTICS				
DC Current Gain ($I_C = -1.0\text{ mAdc}$, $V_{CE} = -5.0\text{ Vdc}$) ($I_C = -10\text{ mAdc}$, $V_{CE} = -5.0\text{ Vdc}$) ($I_C = -50\text{ mAdc}$, $V_{CE} = -5.0\text{ Vdc}$)	h_{FE}	50 60 50	- 240 -	-
Collector–Emitter Saturation Voltage ($I_C = -10\text{ mAdc}$, $I_B = -1.0\text{ mAdc}$) ($I_C = -50\text{ mAdc}$, $I_B = -5.0\text{ mAdc}$)	$V_{CE(sat)}$	- -	-0.2 -0.5	Vdc
Base–Emitter Saturation Voltage ($I_C = -10\text{ mAdc}$, $I_B = -1.0\text{ mAdc}$) ($I_C = -50\text{ mAdc}$, $I_B = -5.0\text{ mAdc}$)	$V_{BE(sat)}$	- -	-1.0 -1.0	Vdc
SMALL–SIGNAL CHARACTERISTICS				
Current–Gain — Bandwidth Product ($I_C = -10\text{ mAdc}$, $V_{CE} = -10\text{ Vdc}$, $f = 100\text{ MHz}$)	f_T	100	300	MHz
Output Capacitance ($V_{CB} = -10\text{ Vdc}$, $I_E = 0$, $f = 1.0\text{ MHz}$)	C_{obo}	-	6.0	pF
Small Signal Current Gain ($I_C = -1.0\text{ mAdc}$, $V_{CE} = -10\text{ Vdc}$, $f = 1.0\text{ kHz}$)	h_{fe}	40	200	-
Noise Figure ($I_C = -200\text{ }\mu\text{A dc}$, $V_{CE} = -5.0\text{ Vdc}$, $R_S = 10\text{ }\Omega$, $f = 1.0\text{ kHz}$)	NF	-	8.0	dB


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 Dimensions
SOT-23

NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.

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

- PIN 1. BASE
 2. EMITTER
 3. COLLECTOR

