

FMBT3906TF

List

List.....	1
Package outline.....	2
Features.....	2
Mechanical data.....	2
Maximum ratings	2
Electrical characteristics.....	3
Pinning information.....	4
Marking.....	4
Suggested solder pad layout.....	4
Packing information.....	5
Reel packing.....	6
Suggested thermal profiles for soldering processes.....	6

FMBT3906TF

PNP Epitaxial Silicon Transistor

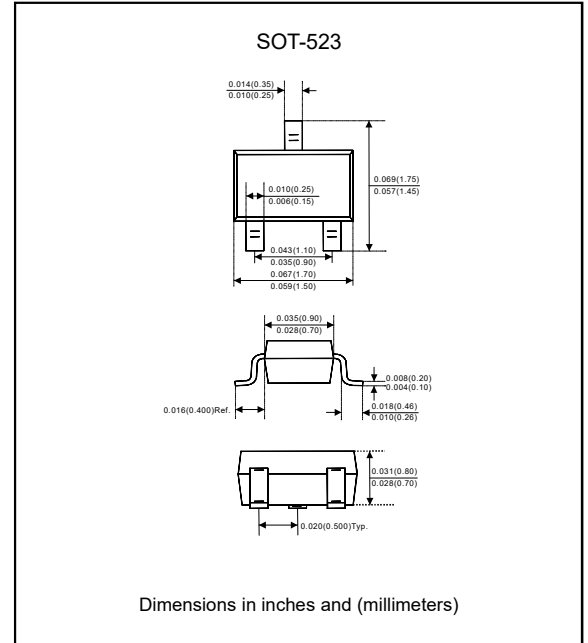
Features

- Epitaxial planar die construction.
- Complementary NPN type available.
- Also available in lead free version.
- Lead-free parts meet RoHS requirements.
- Suffix "-H" indicates Halogen-free part, ex.FMBT3906TF-H.

Mechanical data

- Epoxy:UL94-V0 rated flame retardant
- Case : Molded plastic, SOT-523
- Terminals : Solder plated, solderable per MIL-STD-750, Method 2026
- Mounting Position : Any
- Weight : Approximated 0.003 gram

Package outline



Maximum ratings (At $T_A=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Collector to base voltage	$-V_{CBO}$	40	V
Collector to Emitter Voltage	$-V_{CEO}$	40	V
Emitter to base voltage	$-V_{EBO}$	5	V
Collector current	$-I_C$	200	mA
Total power dissipation	P_C	150	mW
Thermal resistance from junction to ambient	$R_{\theta JA}$	833	$^{\circ}\text{C/W}$
Junction temperature	T_J	+150	$^{\circ}\text{C}$
Storage temperature	T_{STG}	-55 ~ +150	$^{\circ}\text{C}$

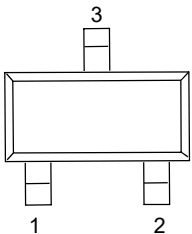
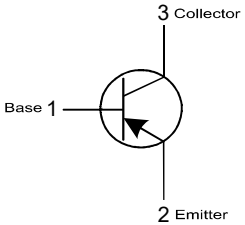
FMBT3906TF

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

Parameter	Conditions	Symbol	Min.	Typ.	Max.	Unit
Collector to base breakdown voltage	$-I_C = 10\mu\text{A}, I_E = 0$	$-BV_{CBO}$	40			V
Collector to emitter breakdown voltage	$-I_C = 1\text{mA}, I_B = 0$	$-BV_{CEO}$	40			V
Emitter to base breakdown voltage	$-I_E = 10\mu\text{A}, I_C = 0$	$-BV_{EBO}$	5			V
Collector-base cut-off current	$-V_{CB} = 30\text{V}, I_E = 0$	$-I_{CBO}$			100	nA
Collector-emitter cut-off current	$-V_{CE} = 30\text{V}, -V_{EB(off)} = 3\text{V}$	$-I_{CEX}$			50	nA
Emitter cut-off current	$-V_{EB} = 5\text{V}, I_C = 0$	$-I_{EBO}$			100	nA
DC current gain	$-V_{CE} = 1\text{V}, -I_C = 0.1\text{mA}$	h_{FE}	60			
	$-V_{CE} = 1\text{V}, -I_C = 1\text{mA}$		80			
	$-V_{CE} = 1\text{V}, -I_C = 10\text{mA}$		100		300	
	$-V_{CE} = 1\text{V}, -I_C = 50\text{mA}$		60			
	$-V_{CE} = 1\text{V}, -I_C = 100\text{mA}$		30			
Collector-emitter saturation voltage	$-I_C = 10\text{mA}, -I_B = 1\text{mA}$	$-V_{CE(SAT)}$			0.25	V
	$-I_C = 50\text{mA}, -I_B = 5\text{mA}$				0.4	
Collector-base saturation voltage	$-I_C = 10\text{mA}, -I_B = 1\text{mA}$	$-V_{BE(SAT)}$	0.65		0.85	V
	$-I_C = 50\text{mA}, -I_B = 5\text{mA}$				0.95	
Current gain bandwidth product	$-V_{CE} = 20\text{V}, -I_C = 10\text{mA}, f = 100\text{MHz}$	f_T	250			MHz
Collector output capacitance	$-V_{CB} = 5\text{V}, I_E = 0, f = 1\text{MHz}$	C_{ob}			4.5	pF
Base input capacitance	$-V_{EB} = 0.5\text{V}, I_C = 0, f = 1\text{MHz}$	C_{ib}			10	pF
Noise figure	$-V_{CE} = 5\text{V}, -I_C = 100\mu\text{A}$	NF			4	dB
Delay time	$-V_{CC} = 3\text{V}, -V_{BE(off)} = 0.5\text{V}, -I_C = 10\text{mA}, -I_{B1} = 1\text{mA}$	t_d			35	ns
Rise time		t_r			35	
Storage time	$-V_{CC} = 3\text{V}, -I_C = 10\text{mA}, -I_{B1} = -I_{B2} = 1\text{mA}$	t_s			225	
Fall time		t_f			75	

FMBT3906TF

Pinning information

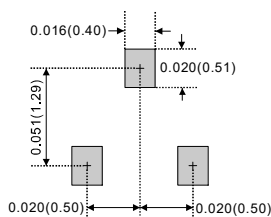
Pin	Simplified outline	Symbol
Pin1 BASE Pin2 EMITTER Pin3 COLLECTOR		

Marking and resistor values

Type number	Marking code
FMBT3906TF	3N

Suggested solder pad layout

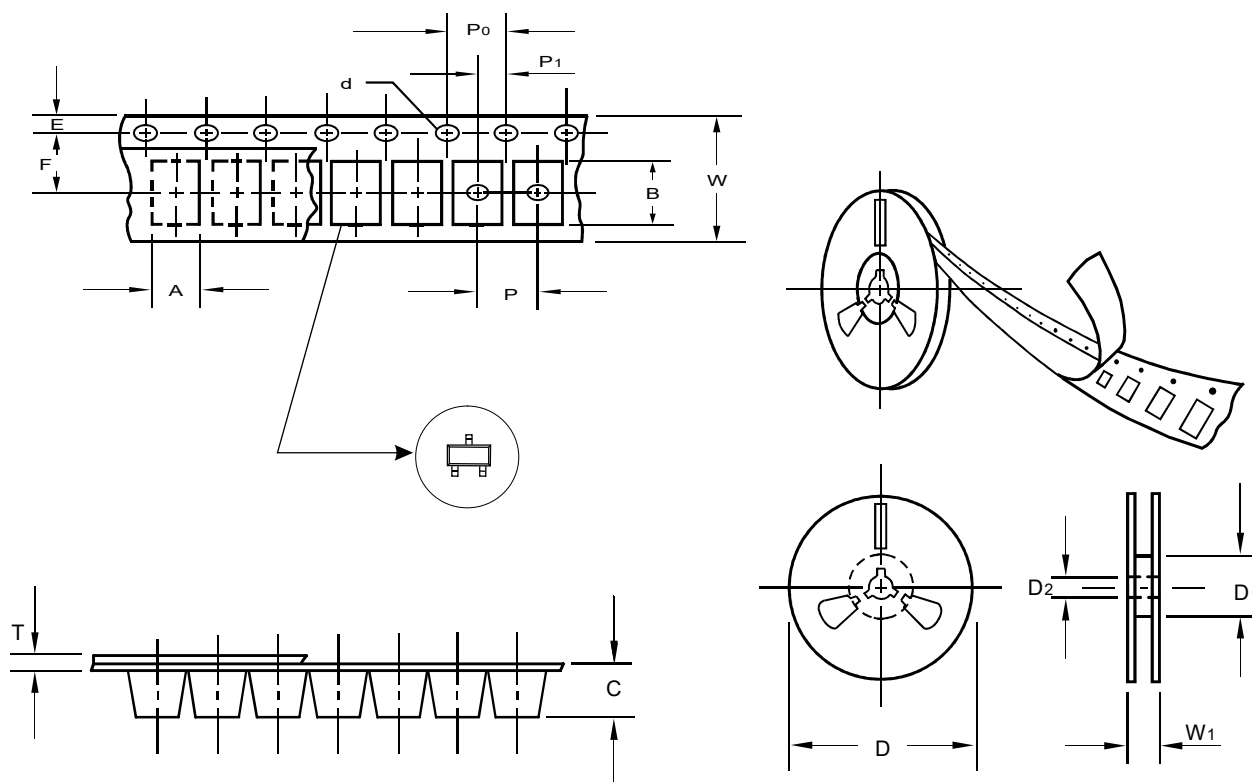
SOT-523



Dimensions in inches and (millimeters)

FMBT3906TF

Packing information



unit:mm

Item	Symbol	Tolerance	SOT-523
Carrier width	A	0.1	1.85
Carrier length	B	0.1	1.85
Carrier depth	C	0.1	0.875
Sprocket hole	d	0.1	1.5
13" Reel outside diameter	D	2.0	-
13" Reel inner diameter	D1	min	-
7" Reel outside diameter	D	2.0	178.00
7" Reel inner diameter	D1	min	60.00
Feed hole diameter	D2	0.5	13.00
Sprocket hole position	E	0.1	1.75
Punch hole position	F	0.1	3.50
Punch hole pitch	P	0.1	4.00
Sprocket hole pitch	P0	0.1	4.00
Embossment center	P1	0.1	2.00
Overall tape thickness	T	0.1	0.23
Tape width	W	0.3	8.00
Reel width	W1	1.0	9.50

Note: Devices are packed in accordance with EIA standard RS-481-A and specifications listed above.

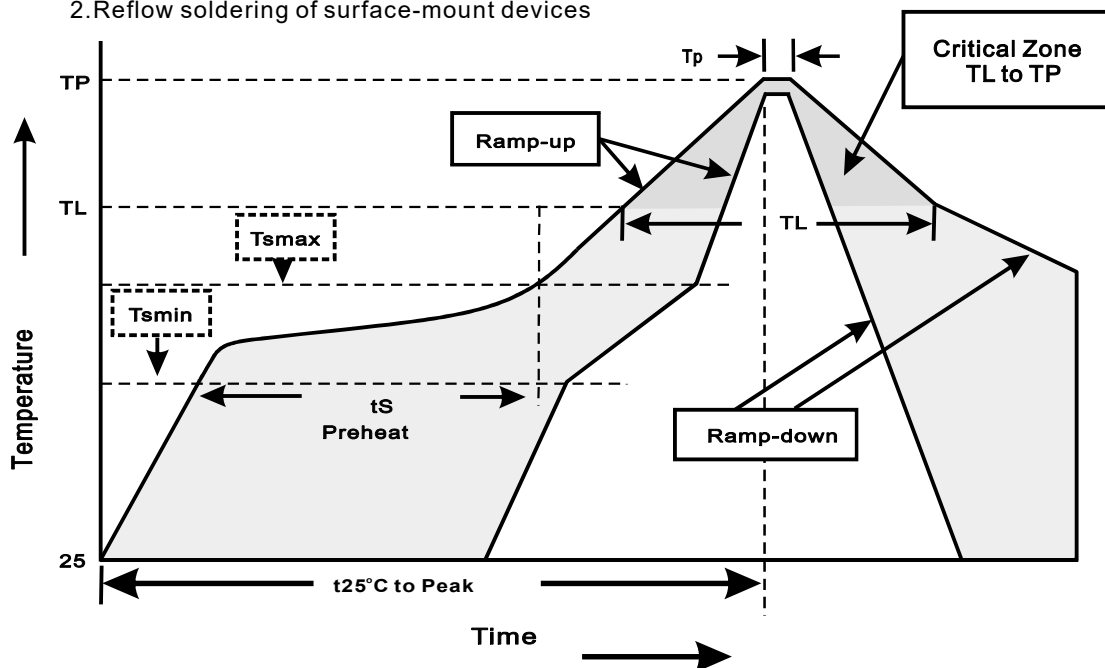
FMBT3906TF

Reel packing

PACKAGE	REEL SIZE	REEL (pcs)	COMPONENT SPACING (m/m)	BOX (pcs)	INNER BOX (m/m)	REEL DIA, (m/m)	CARTON SIZE (m/m)	CARTON (pcs)	APPROX. GROSS WEIGHT (kg)
SOT-523	7"	3,000	4.0	30,000	183*183*123	178	382*262*387	240,000	9.5

Suggested thermal profiles for soldering processes

- 1.Storage environment: Temperature=5°C~40°C Humidity=55%±25%
- 2.Reflow soldering of surface-mount devices



3.Reflow soldering

Profile Feature	Soldering Condition
Average ramp-up rate(TL to TP)	<3°C/sec
Preheat -Temperature Min(Tsmin) -Temperature Max(Tsmax) -Time(min to max)(ts)	150°C 200°C 60~120sec
Tsmax to TL -Ramp-upRate	<3°C/sec
Time maintained above: -Temperature(TL) -Time(tL)	217°C 60~260sec
Peak Temperature(TP)	255°C-0/+5°C
Time within 5°C of actual Peak Temperature(tp)	10~30sec
Ramp-down Rate	<6°C/sec
Time 25°C to Peak Temperature	<6minutes