

FMBT2907AW**List**

List.....	1
Package outline.....	2
Features.....	2
Mechanical data.....	2
Maximum ratings	2
Electrical characteristics.....	3
Rating and characteristic curves.....	4~5
Pinning information.....	6
Marking.....	6
Suggested solder pad layout.....	6
Packing information.....	7
Reel packing.....	8
Suggested thermal profiles for soldering processes.....	8
High reliability test capabilities.....	9

FMBT2907AW

600mA General Purpose Transistor PNP Silicon

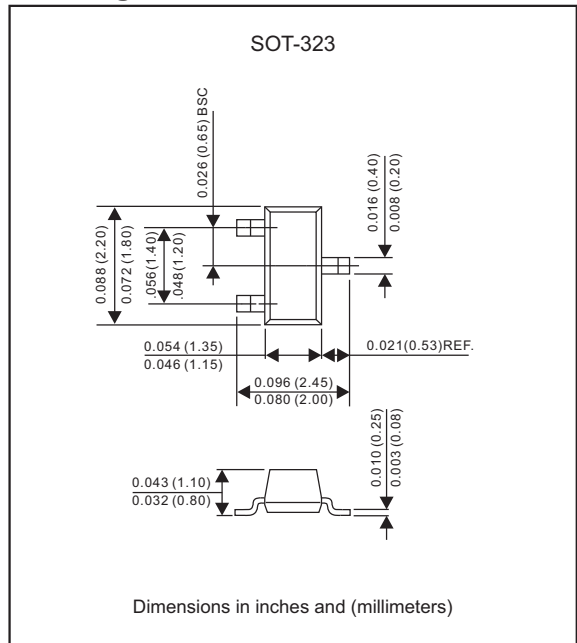
Features

- High collector-emitter breakdown voltage (BVCEO = -60V@Ic=-10mA)
- PNP silicon epitaxial planar transistor, is designed for general purpose and amplifier applications
- Capable of 225mW power dissipation
- Lead-free parts meet RoHS requirements
- Suffix "-H" indicates Halogen-free part, ex.FMBT2907AW-H

Mechanical data

- Epoxy:UL94-V0 rated flame retardant
- Case : Molded plastic, SOT-323
- Terminals : Solder plated, solderable per MIL-STD-750, Method 2026
- Mounting Position : Any
- Weight : Approximated 0.006 gram

Package outline



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

Parameter	Symbol	Limits	Unit
Collector-emitter voltage	V _{CEO}	-60	V
Collector-base voltage	V _{CBO}	-60	V
Emitter-base voltage	V _{EBO}	-5.0	V
Collector current - continuous	I _C	-600	mA
Total device dissipation FR4 board, (1) $T_A=25^{\circ}\text{C}$ Thermal resistance junction to ambient Thermal resistance junction to case	P _D R _{θJA} R _{θJC}	225 556 300	mW °C/W °C/W
Operating junction temperature range	T _J	-55 to +150	°C
Storage temperature range	T _{STG}	-55 to +150	°C

1. 30.0mm×25.0mm×1.6mm(FR4)

FMBT2907AW**Electrical characteristics (AT $T_A=25^{\circ}\text{C}$ unless otherwise noted)****Off characteristics**

Parameter	Conditions	Symbol	Min.	Max.	Unit
Collector-base breakdown voltage	$I_C = -10\mu\text{A}$, $I_E = 0$	$V_{(BR)CBO}$	-60		V
Collector-emitter breakdown voltage	$I_C = -10\text{mA}$, $I_B = 0$	$V_{(BR)CEO}$	-60		V
Emitter-base breakdown voltage	$I_E = -10\mu\text{A}$, $I_C = 0$	$V_{(BR)EBO}$	-5.0		V
Collector cutoff current	$V_{CE} = -30\text{V}$, $V_{EB(off)} = -0.5\text{V}$	I_{CEX}		-50	nA
Base cutoff current	$V_{CE} = -30\text{V}$, $V_{EB(off)} = -0.5\text{V}$	I_{BL}		-50	

On characteristics (2)

Parameter	Conditions	Symbol	Min.	Max.	Unit
Dc current gain	$I_C = -0.1\text{mA}$, $V_{CE} = -10\text{V}$	h_{FE}	75		
	$I_C = -1.0\text{mA}$, $V_{CE} = -10\text{V}$		100		
	$I_C = -10\text{mA}$, $V_{CE} = -10\text{V}$		100		
	$I_C = -150\text{mA}$, $V_{CE} = -10\text{V}$		100	300	
	$I_C = -500\text{mA}$, $V_{CE} = -10\text{V}$		50		
Collector-emitter saturation voltage	$I_C = -150\text{mA}$, $I_B = -15\text{mA}$	$V_{CE(sat)}$		-0.4	V
	$I_C = -500\text{mA}$, $I_B = -50\text{mA}$			-1.6	
Base-emitter saturation voltage	$I_C = -150\text{mA}$, $I_B = -15\text{mA}$	$V_{BE(sat)}$		-1.3	V
	$I_C = -500\text{mA}$, $I_B = -50\text{mA}$			-2.6	

Small-signal characteristics

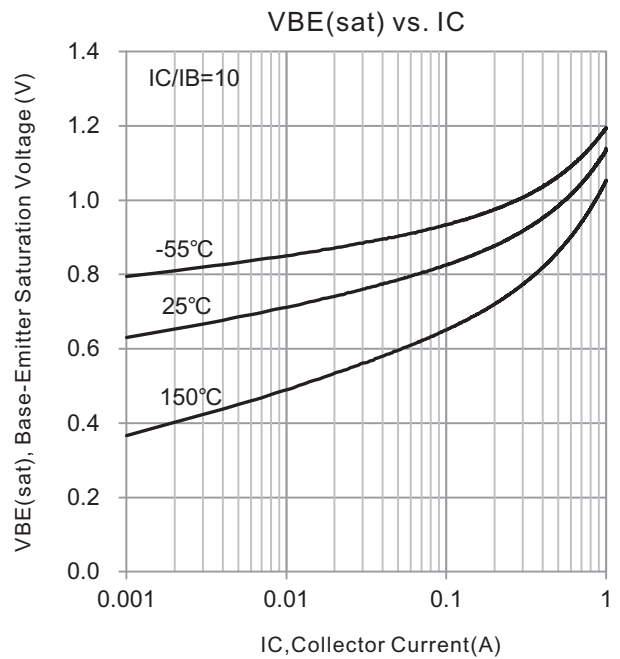
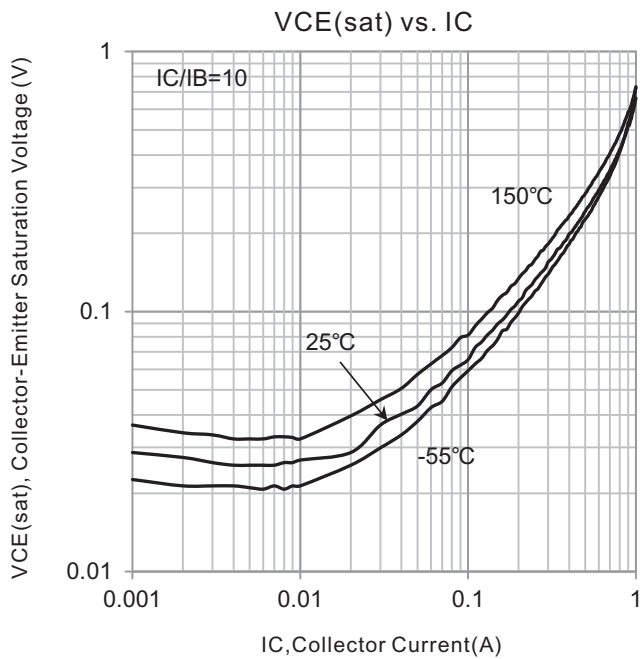
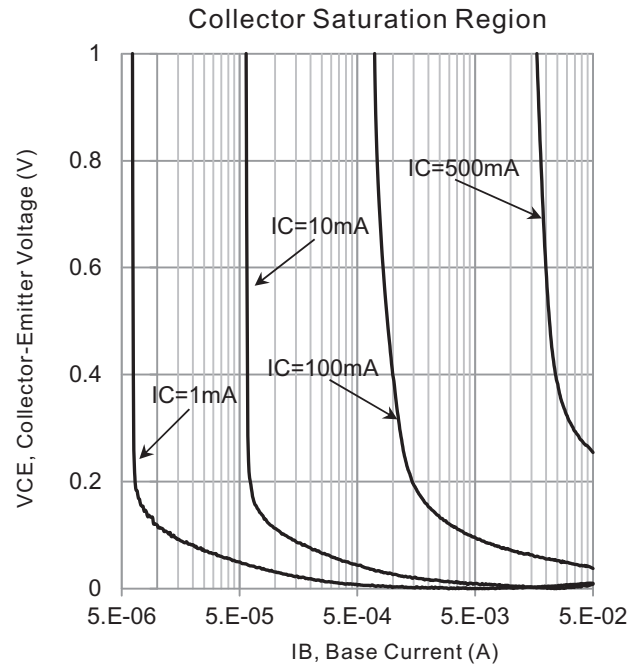
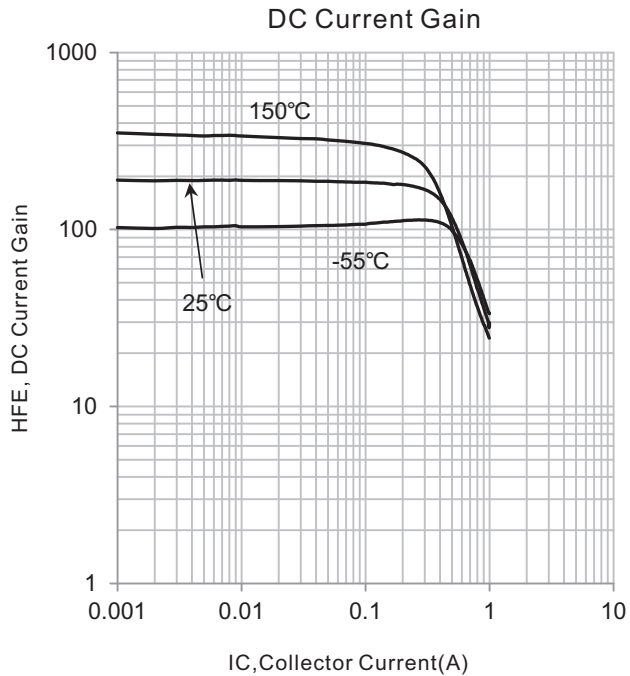
Parameter	Conditions	Symbol	Min.	Max.	Unit
Current-gain-bandwidth product	$I_C = -50\text{mA}$, $V_{CE} = -20\text{V}$, $f = 100\text{MHz}$	f_T	200		MHz
Output capacitance	$V_{CB} = -10\text{V}$, $I_E = 0$, $f = 1.0\text{MHz}$	C_{obo}		8.0	pF
Input capacitance	$V_{EB} = -2\text{V}$, $I_C = 0$, $f = 1.0\text{MHz}$	C_{ibo}		30	pF

Switching characteristics

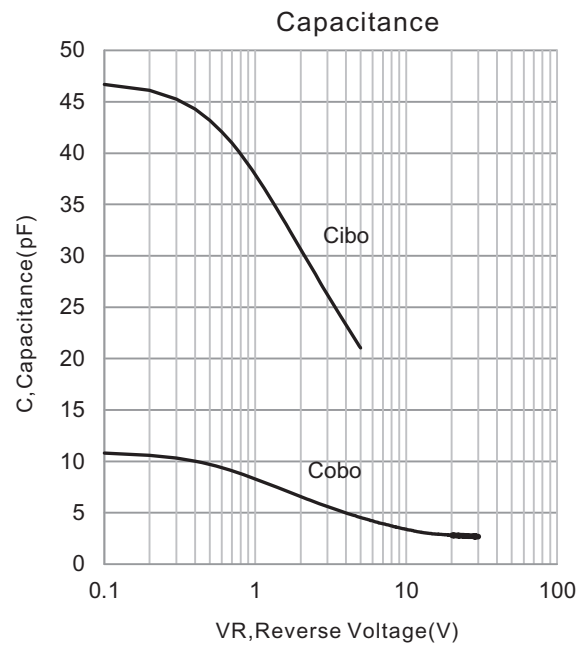
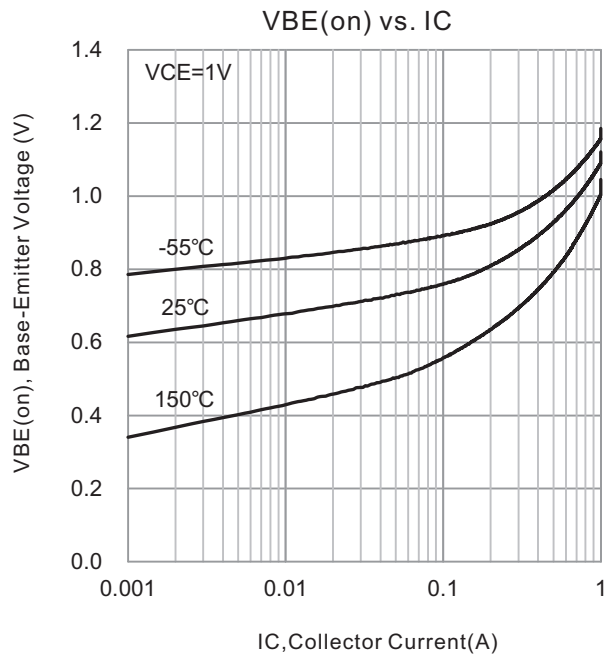
Parameter	Conditions	Symbol	Min.	Max.	Unit
Turn-on time	$V_{CC} = -30\text{V}$, $I_C = -150\text{mA}$, $I_{B1} = -15\text{mA}$	t_{on}		45	ns
Delay time		t_d		10	
Rise time		t_r		40	
Turn-out time	$V_{CC} = -6\text{V}$, $I_C = -150\text{mA}$, $I_{B1} = I_{B2} = -15\text{mA}$	t_{off}		280	
Storage time		t_s		225	
Fall time		t_f		60	

2. Pulse test: pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2.0\%$

Rating and characteristic curves (FMBT2907AW)

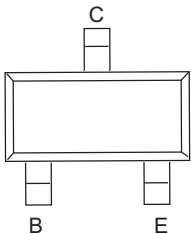
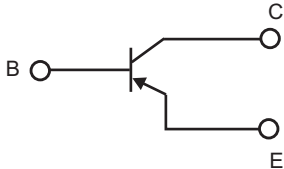


Rating and characteristic curves (FMBT2907AW)



FMBT2907AW

Pinning information

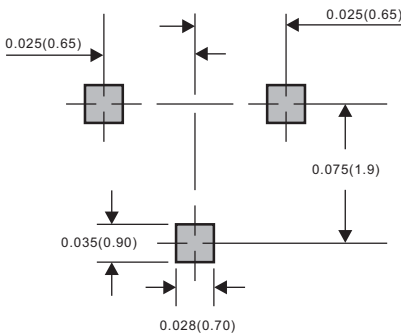
Pin	Simplified outline	Symbol
PinB Base PinC Collector PinE Emitter		

Marking

Type number	Marking code
FMBT2907AW	20, 2F

Suggested solder pad layout

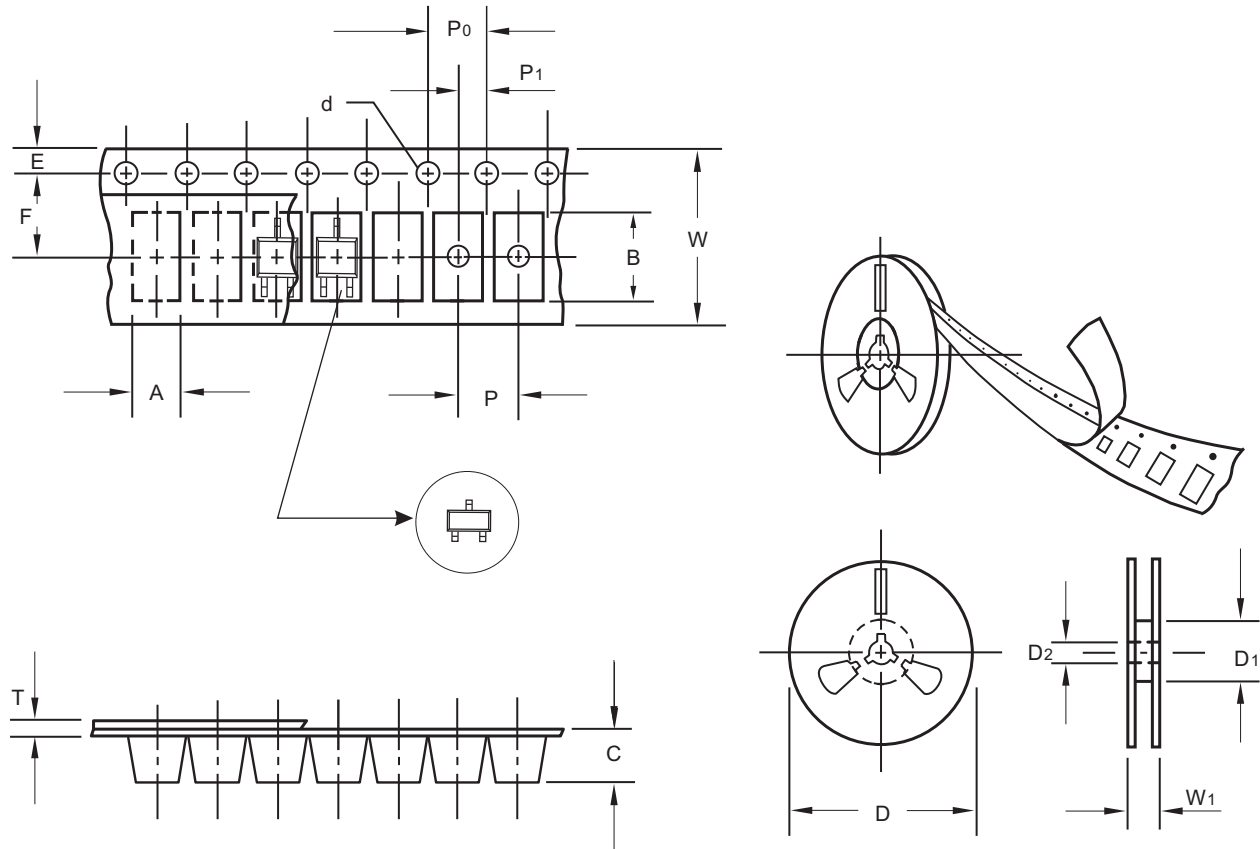
SOT-323



Dimensions in inches and (millimeters)

FMBT2907AW

Packing information



unit:mm

Item	Symbol	Tolerance	SOT-323
Carrier width	A	0.1	2.25
Carrier length	B	0.1	2.55
Carrier depth	C	0.1	1.19
Sprocket hole	d	0.1	1.55
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	54.40
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	12.30

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

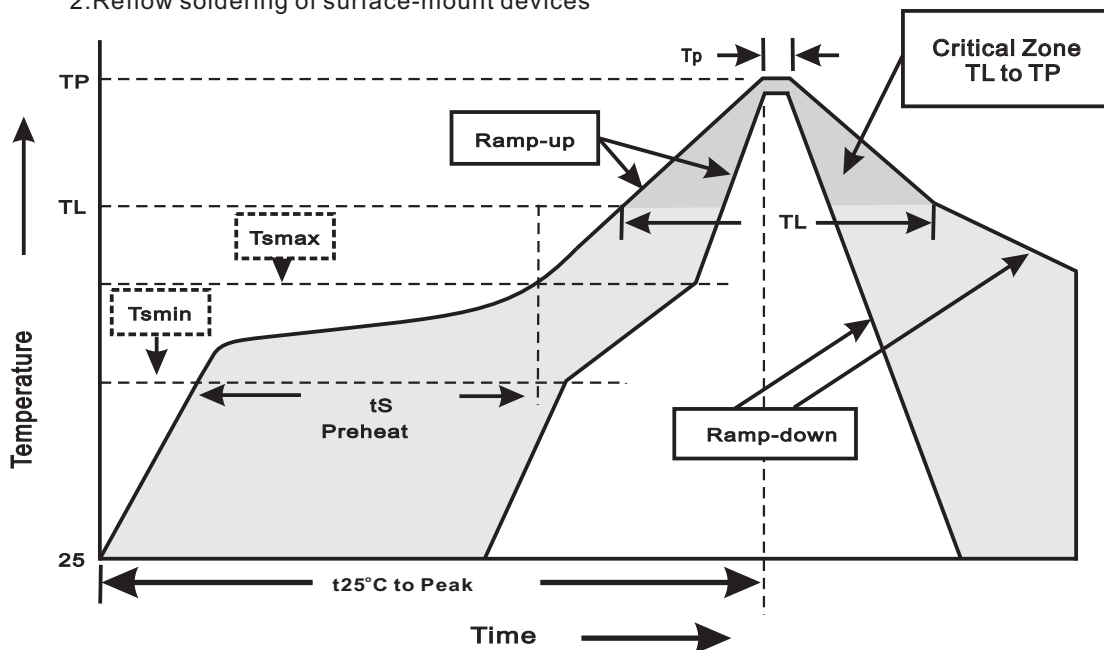
FMBT2907AW

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-323	7"	3,000	4.0	30,000	183*123*183	178	382*257*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(T _L to T _P)	<3°C/sec
Preheat -Temperature Min(T _{smmin}) -Temperature Max(T _{smmax}) -Time(min to max)(t _s)	150°C 200°C 60~120sec
T _{smmax} to T _L -Ramp-upRate	<3°C/sec
Time maintained above: -Temperature(T _L) -Time(t _L)	217°C 60~260sec
Peak Temperature(T _P)	255°C-0/+5°C
Time within 5°C of actual Peak Temperature(t _P)	10~30sec
Ramp-down Rate	<6°C/sec
Time 25°C to Peak Temperature	<6minutes

FMBT2907AW

High reliability test capabilities

Item Test	Conditions
1. Steady State Operating Life	$P_D=225\text{mW}$ Test Duration:1000hrs
2. High Temperature Reverse Bias	$T_J=150^\circ\text{C}$, $V_{CE}=80\%$ related volage, 1000hrs
3. Temperature Cycle	$-55^\circ\text{C}(15\text{min})$ to $150^\circ\text{C}(15\text{min})$ Air to Air Transition Time<20sec Test Cycles: 1000cycle
4. Autoclave	$P=2\text{atm}$ $T_a=121^\circ\text{C}$ $RH=100\%$ Test Duration: 96hrs
5. High Temperature Storage Life	$T_a=150^\circ\text{C}$ Test Duration: 1000hrs
6. Solderability	245°C , 5sec
7. High Temperature High Humidity Reverse Bias	$T_a=85^\circ\text{C}$, 85%RH, $V_{CE}=80\%$ related volage, 1000hrs
8. Resistance to Soldering Heat	260°C , 10sec