

FMBT2222AW**List**

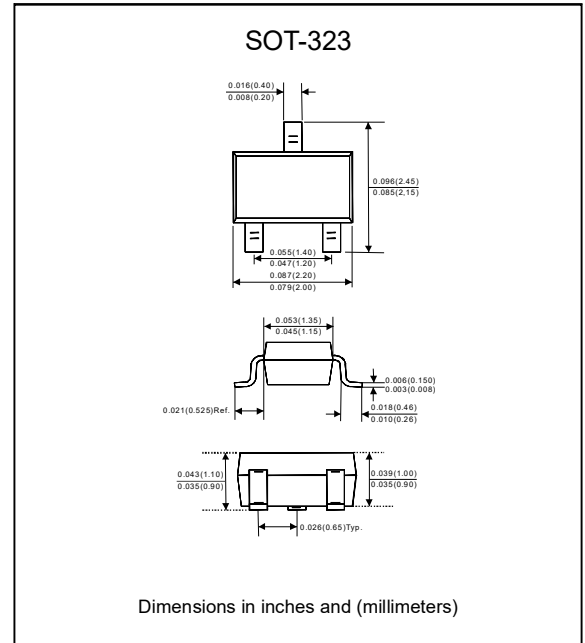
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FMBT2222AW**40V, 600mA Silicon NPN Epitaxial Planar Transistor****Features**

- High collector-emitter breakdown voltage.
($BV_{CEO} = 40V @ I_C = 10mA$)
- Small load switch transistor with high gain and low saturation voltage, is designed for general purpose amplifier and switching applications at collector current.
- Capable of 150mW power dissipation.
- Lead-free parts for green partner, exceeds environmental standards of MIL-STD-19500 /228
- Suffix "-H" indicates Halogen-free part, ex.FMBT2222AW-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

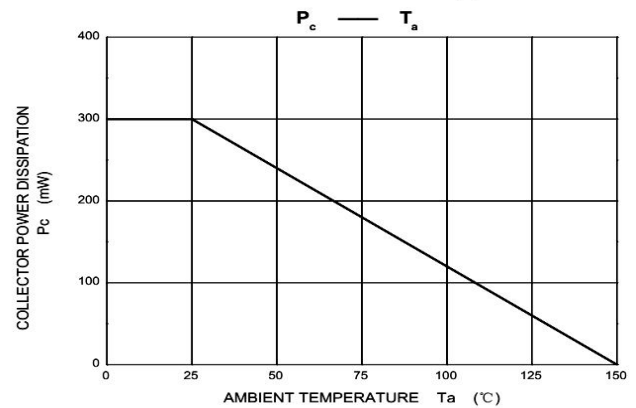
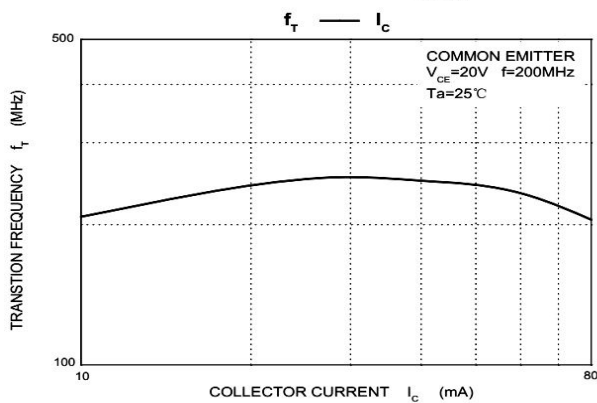
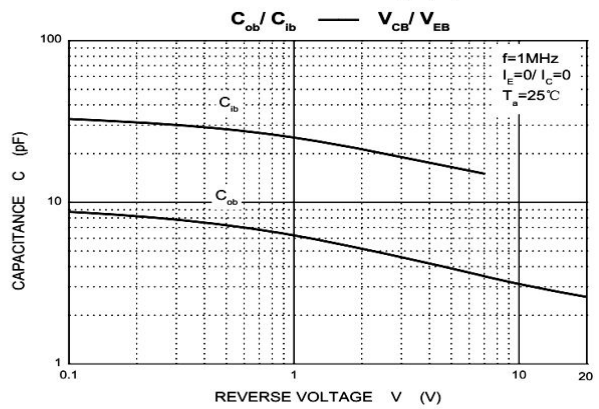
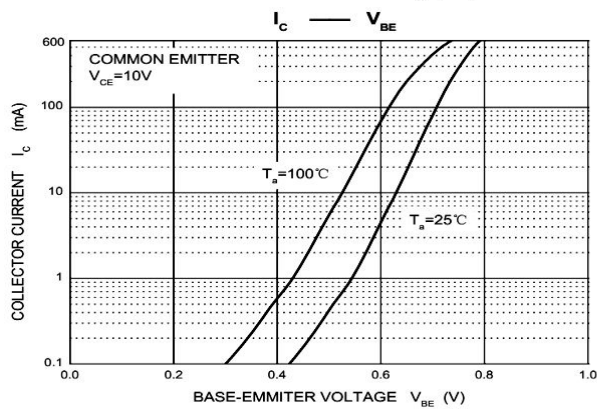
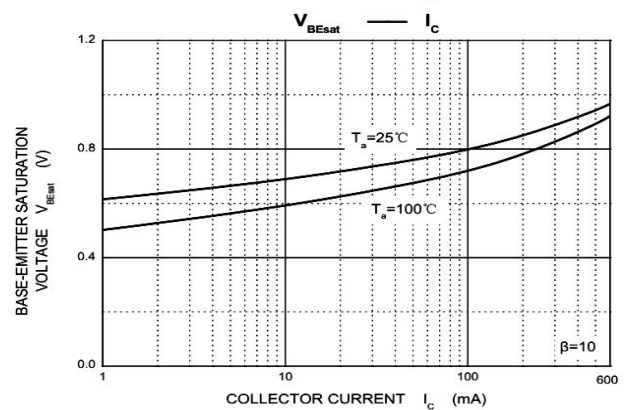
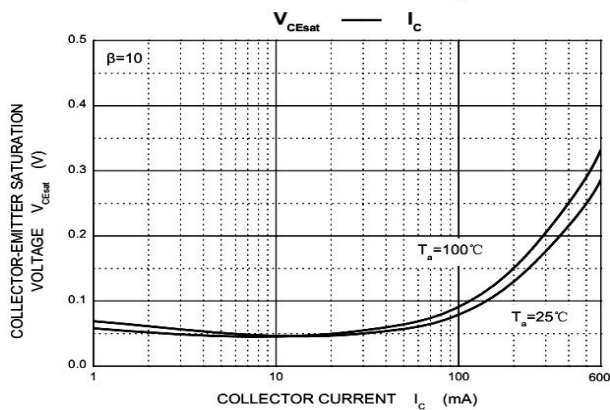
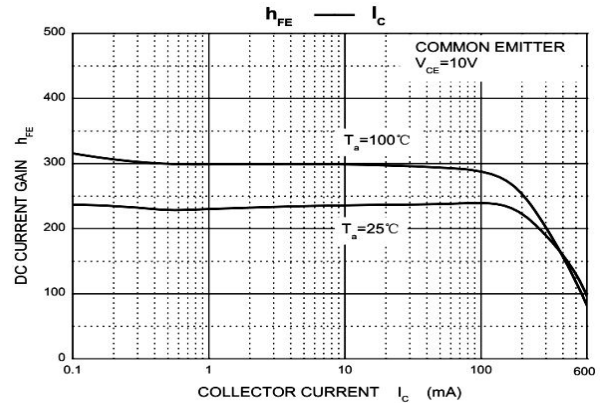
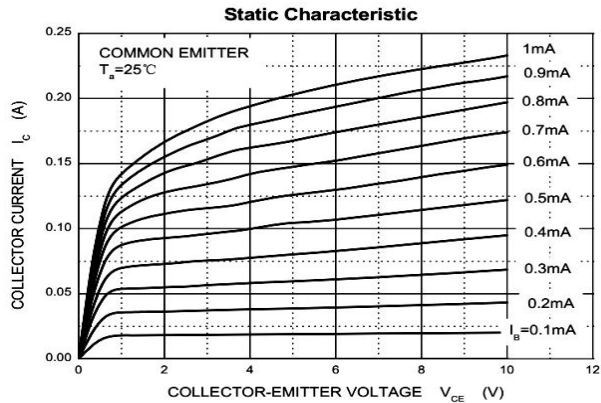
Package outline**Maximum ratings** (At $T_A = 25^\circ C$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Collector to base voltage	V_{CBO}	75	V
Collector to Emitter Voltage	V_{CEO}	40	V
Emitter to base voltage	V_{EBO}	6	V
Collector current	I_C	600	mA
Power dissipation	P_D	0.2	W
Junction temperature	T_J	+150	$^\circ C$
Storage temperature	T_{STG}	-55 ~ +150	$^\circ C$

FMBT2222AW**Electrical characteristics** (At $T_A=25^{\circ}\text{C}$ unless otherwise noted)

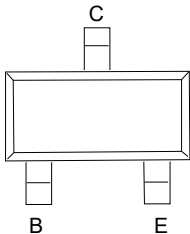
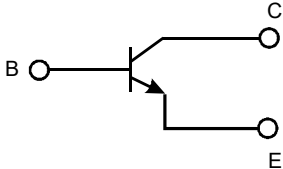
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Off Characteristics						
Collector-base breakdown voltage	$V_{(BR)CBO}$	$I_C=10\mu A, I_E=0$	75			V
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	$I_C=10mA, I_B=0$	40			V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	$I_E=10\mu A, I_C=0$	6			V
Collector-emitter cut off current	I_{CBO}	$V_{CB}=60V, I_E=0$			100	nA
Emitter-base cut off current	I_{EBO}	$V_{EB}=3V, I_C=0$			100	nA
On Characteristics						
DC current gain	h_{FE}	$V_{CE} = 10V, I_C = 0.1mA$	35			
		$V_{CE} = 10V, I_C = 1mA$	50			
		$V_{CE} = 10V, I_C = 10mA$	75			
		$V_{CE} = 1V, I_C = 150mA$	50			
		$V_{CE} = 10V, I_C = 150mA$	100		300	
		$V_{CE} = 10V, I_C = 500mA$	40			
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C=150mA, I_B=15mA$			0.3	V
		$I_C=500mA, I_B=50mA$			1.0	
Base-emitter saturation voltage	$V_{BE(sat)}$	$I_C=150mA, I_B=15mA$			1.2	V
		$I_C=500mA, I_B=50mA$			2.0	
Small Signal Characteristics						
Output capacitance	C_{ob}	$V_{CB}=10V, I_E=0, f=100KHz$			8	pF
Emitter input capacitance	C_{ib}	$V_{EB}=0.5V, I_E=0, f=100KHz$			25	pF
Gain-bandwidth product	f_T	$V_{CE}=20V, I_E=20mA, f=100MHz$	300			MHZ
Delay time	t_d	$V_{CC}=30V, V_{BE(OFF)}=0.5V, I_C=150mA, I_{B1}=15mA$			10	ns
Rise time	t_r	$V_{CC}=30V, V_{BE(OFF)}=0.5V, I_C=150mA, I_{B1}=15mA$			25	
Storage time	t_{stg}	$V_{CC}=30V, I_C=150mA, I_{B1}=I_{B2}=15mA$			225	
Fall time	t_f	$V_{CC}=30V, I_C=150mA, I_{B1}=I_{B2}=15mA$			60	

Rating and characteristic curves (FMBT2222AW)



FMBT2222AW

Pinning information

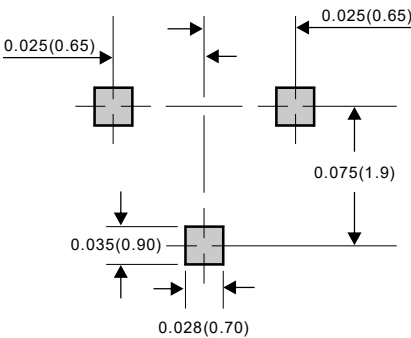
Pin	Simplified outline	Symbol
PinB Base PinC Collector PinE Emitter		

Marking

Type number	Marking code
FMBT2222AW	P1,K3P,1P

Suggested solder pad layout

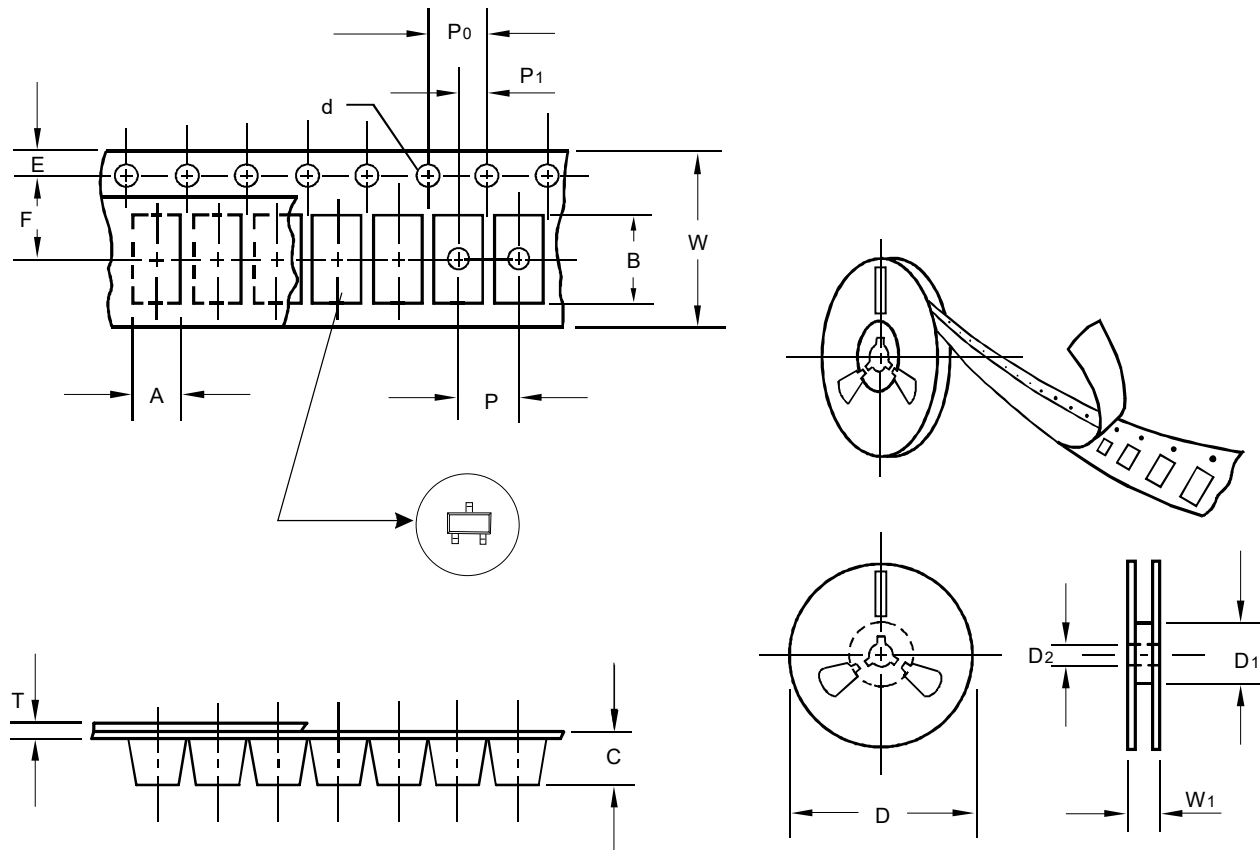
SOT-323



Dimensions in inches and (millimeters)

FMBT2222AW

Packing information



unit:mm

Item	Symbol	Tolerance	SOT-323
Carrier width	A	0.1	2.36
Carrier length	B	0.1	2.40
Carrier depth	C	0.1	1.20
Sprocket hole	d	0.1	1.50
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	62.00
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	11.40

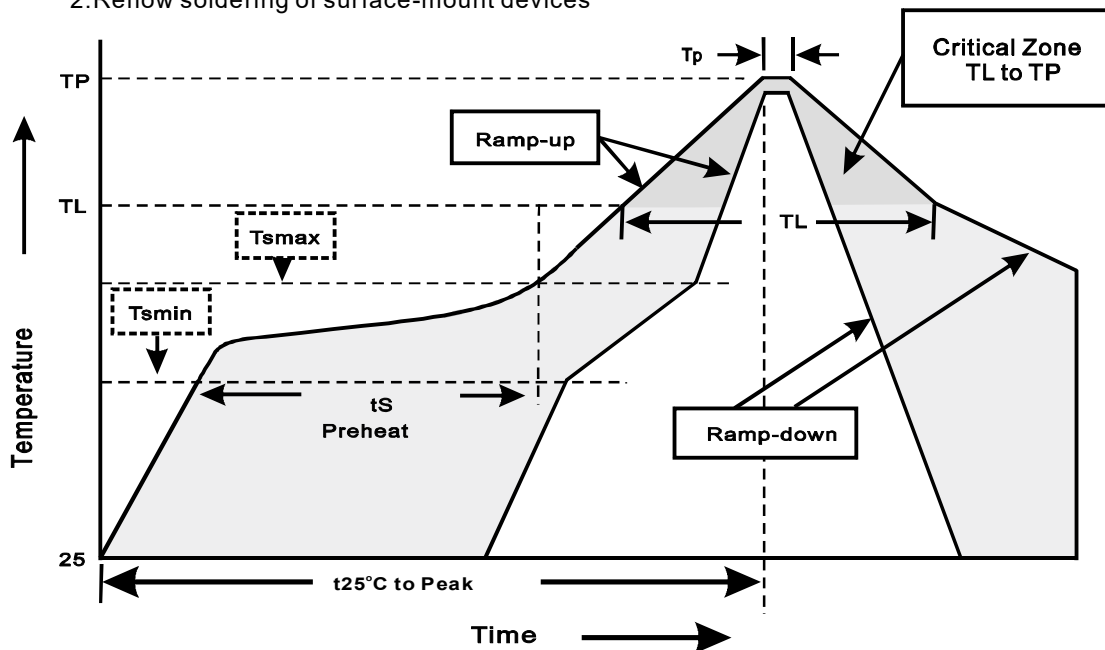
Note: Devices are packed in accordance with EIA standard RS-481-A and specifications listed above.

FMBT2222AW**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*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(T _L to T _P)	<3°C/sec
Preheat - Temperature Min(T _{Smin}) - Temperature Max(T _{Smax}) - Time(min to max)(t _S)	150°C 200°C 60~120sec
T _{Smax} 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