FMBT5401W

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FMBT5401W

-600mA -160V PNP Silicon Transistors

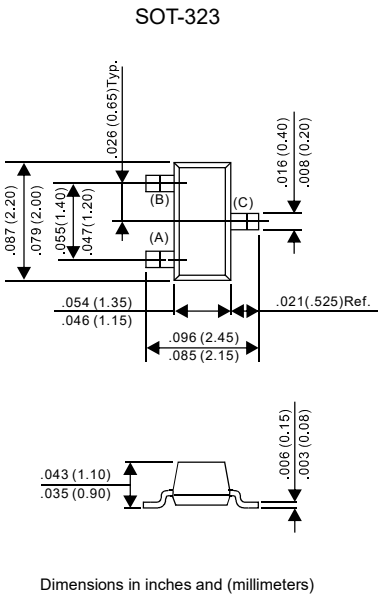
Features

- Small surface mount package.
- Ideal for medium power amplificationand switching.
- Lead-free parts meet RoHS requirements.
- Suffix "-H" indicates Halogen-free part, ex.FMBT5401W-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.

Package outline



Dimensions in inches and (millimeters)

Maximum ratings (At T_A=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Collector to base voltage	$-V_{CBO}$	-160	V
Collector to Emitter Voltage	$-V_{CEO}$	-150	V
Emitter to base voltage	$-V_{EBO}$	-5	V
Collector current - continuous	$-I_C$	-600	mA
Total power dissipation	P_D	200	mW
Thermal resistance, Junction to ambient	$R_{\theta JA}$	625	°C/W
Junction temperature	T_j	+150	°C
Storage temperature range	T_{STG}	-55 ~ +150	°C

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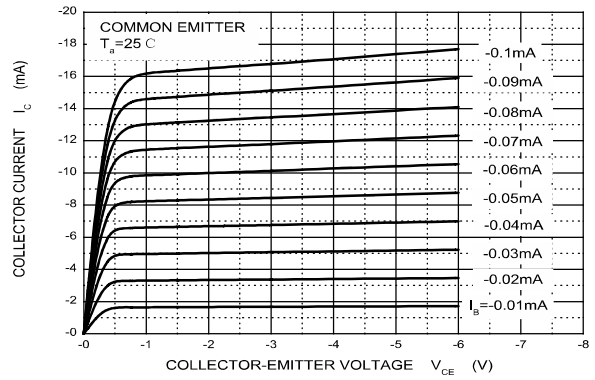
Electrical characteristics (At T_A=25°C unless otherwise noted)

Parameter	Conditions	Symbol	Min.	Typ.	Max.	Unit
Collector base breakdown voltage	$-I_C$= -100μA, I_E = 0	$-V_{(BR)CBO}$	160			V
Collector emitter breakdown voltage	$-I_C$ =-1mA, I_B = 0	$-V_{(BR)CEO}$	150			V
Emitter base breakdown voltage	$-I_E$ =-10μA, I_C = 0	$-V_{(BR)EBO}$	5			V
Collector cut off current	$-V_{CB}$ = 120V, I_E = 0	$-I_{CBO}$			50	nA
Emitter cut-off current	$-V_{EB}$ = 3V, I_C = 0	$-I_{EBO}$			50	nA
DC current gain	$-V_{CE}$ = 5V, $-I_C$ = 1mA	h_{FE}	50			
	$-V_{CE}$ = -5V, $-I_C$ = 10mA		60		300	
	$-V_{CE}$ = -5V, $-I_C$ = 50mA		50			
Collector-emitter saturation voltage	$-I_C$ = 50mA, $-I_B$ = 5mA	$-V_{CE(SAT)}$			0.5	V
	$-I_C$ = 10mA, $-I_B$ = 1mA				0.2	
Base-emitter saturation voltage	$-I_C$ = 50mA, $-I_B$ = 5mA	$-V_{BE(SAT)}$			1	V
	$-I_C$ = 10mA, $-I_B$ = 1mA				1	
Transition Frequency	$-V_{CE}$ = 10V, $-I_C$ = 10mA, f = 100MHz	f_T	100			MHz
Collector output capacitance	$-V_{CB}$ = 10V, I_E=0 , f=1MHz	C_{ob}			6	pF

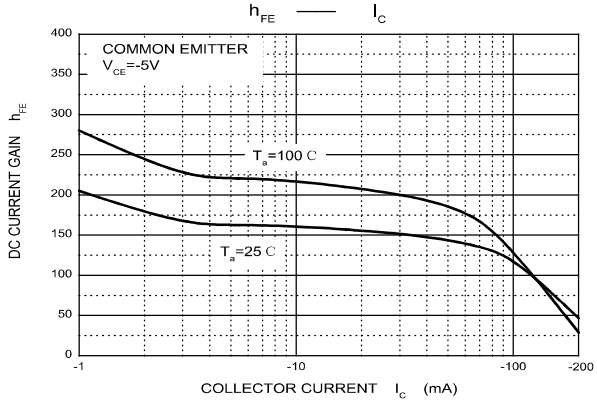
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Rating and characteristic curves

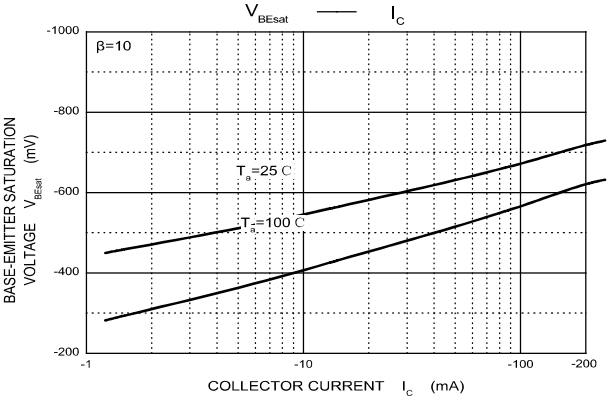
Static Characteristic



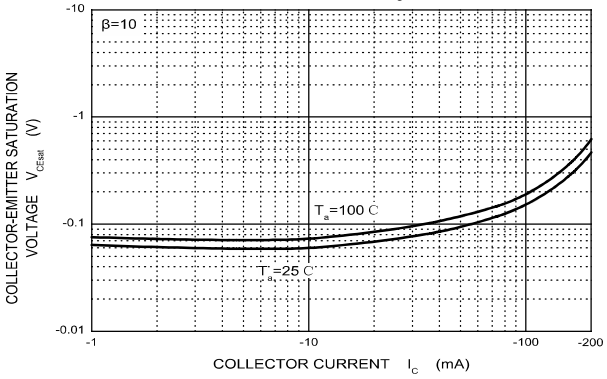
hFE —— IC



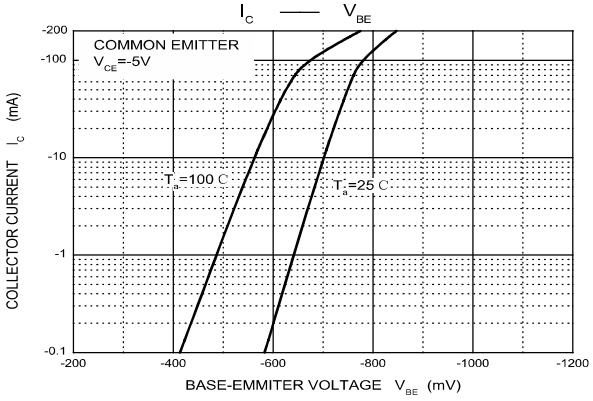
VBEsat —— IC



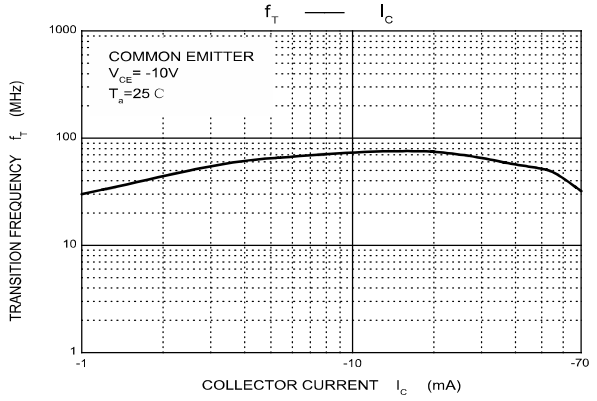
VCEsat —— IC



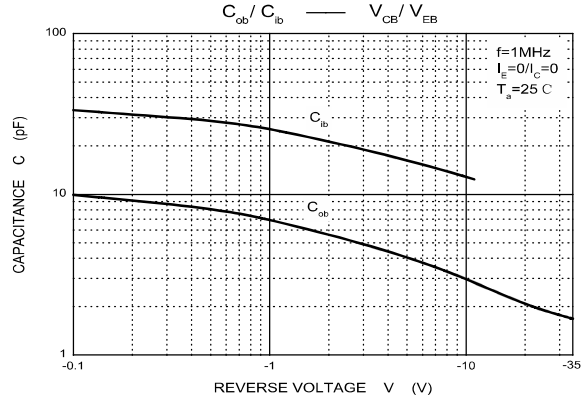
IC —— VBE



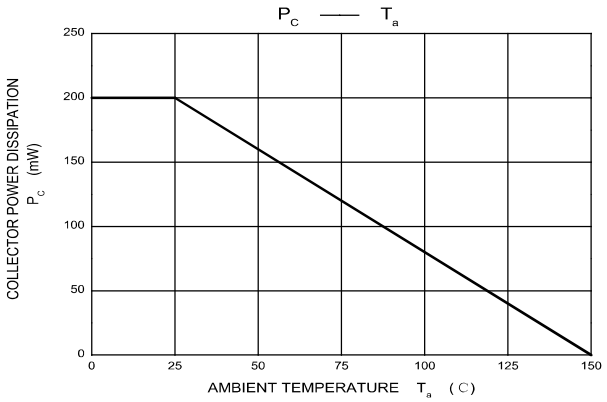
fT —— IC



Cob / Clb —— VCB / VEB

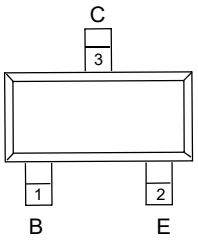
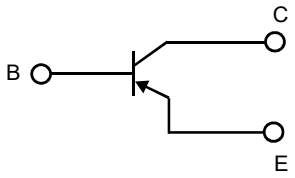


PC —— Ta



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Pinning information

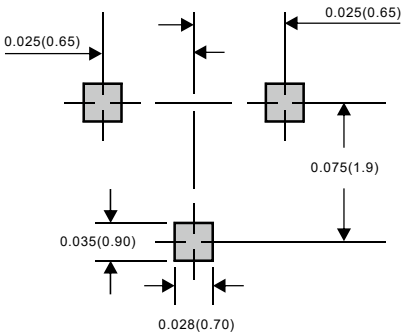
Pin	Simplified outline	Symbol
Pin 1 Base Pin 2 Emitter Pin 3 Collector		

Marking

Type number	Marking code
FMBT5401W	K4M

Suggested solder pad layout

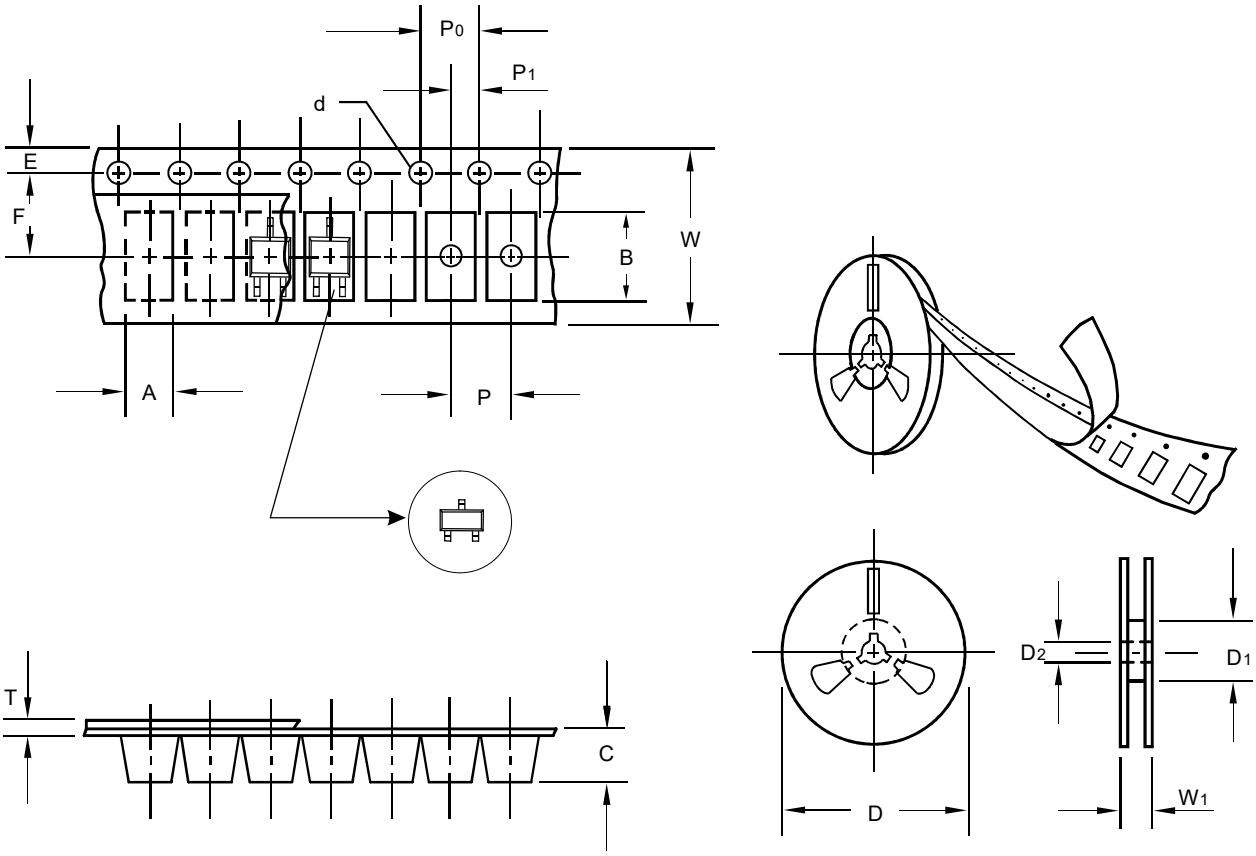
SOT-323



Dimensions in inches and (millimeters)

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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	D_1	min	-
7" Reel outside diameter	D	2.0	178.00
7" Reel inner diameter	D_1	min	54.40
Feed hole diameter	D_2	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	P_0	0.1	4.00
Embossment center	P_1	0.1	2.00
Overall tape thickness	T	0.1	0.23
Tape width	W	0.3	8.00
Reel width	W_1	1.0	12.30

Note:Devices are packed in accor dance with EIA standar RS-481-A and specifications listed above.

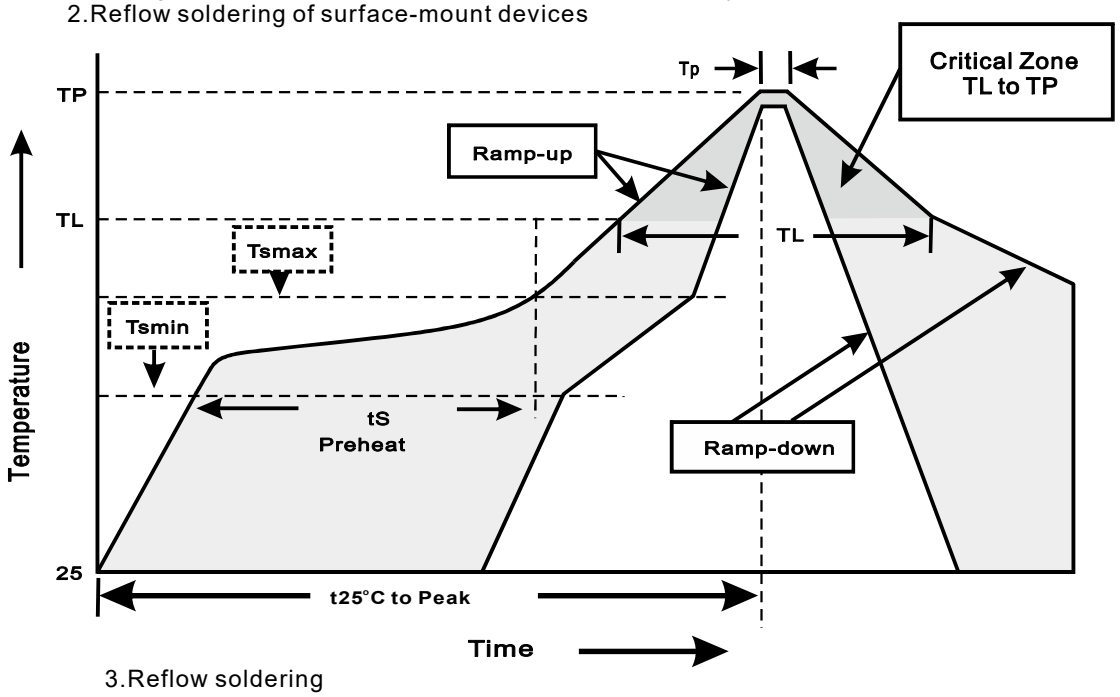
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Reel packing

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(Tsmin) -Temperature Max(Tsmax) -Time(min to max)(t_s)	 150°C 200°C 60~120sec
Tsmax 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