

FMBTA42W-Q1

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FMBTA42W-Q1

300mA, 300V High Voltage NPN Transistor

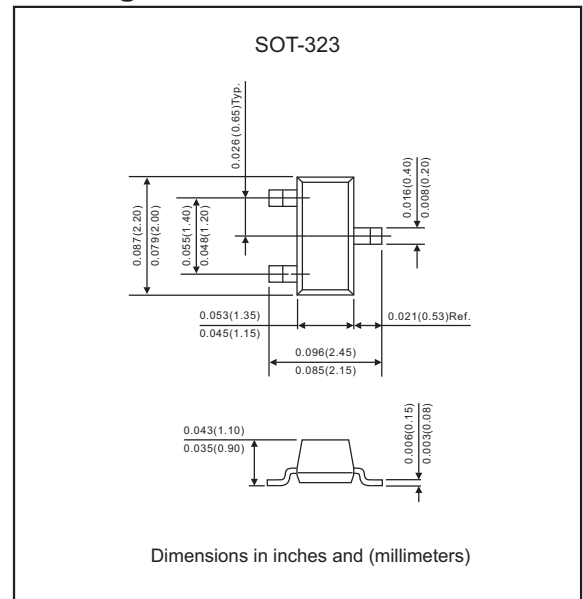
Features

- High breakdown voltage.
- Low collector-emitter saturation voltage.
- Lead-free parts for green partner, exceeds environmental standards of MIL-STD-19500 /228.
- Qualified to AEC-Q101 standards for high reliability.
- Suffix "-H" indicates Halogen-free part, ex.FMBTA42W-Q1-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)

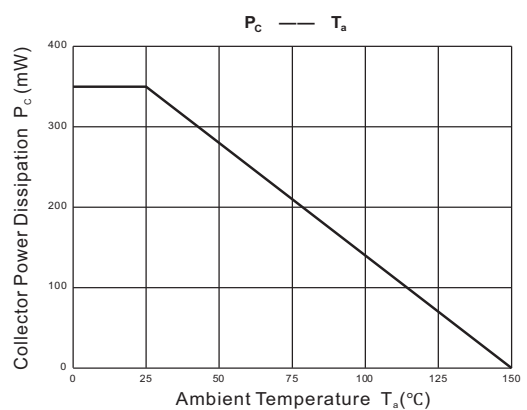
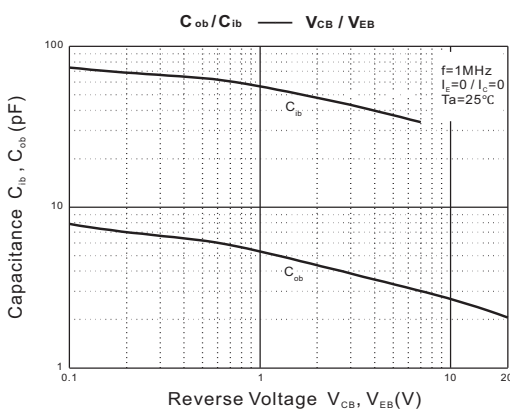
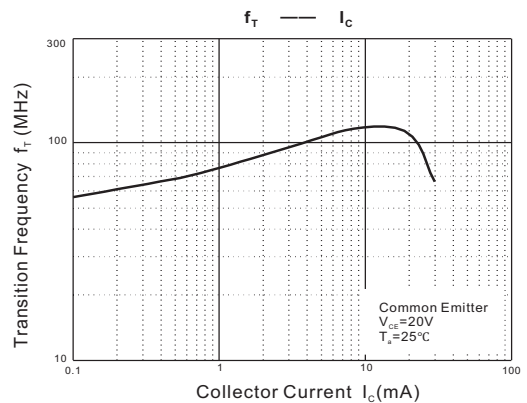
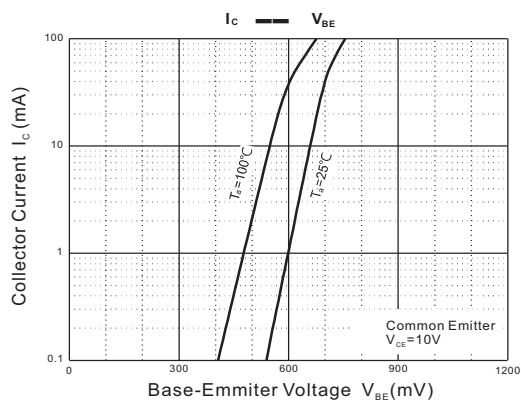
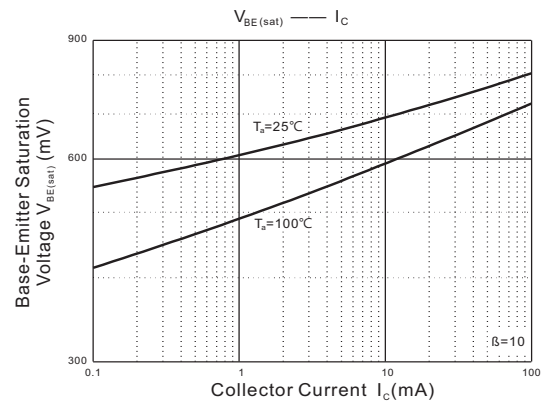
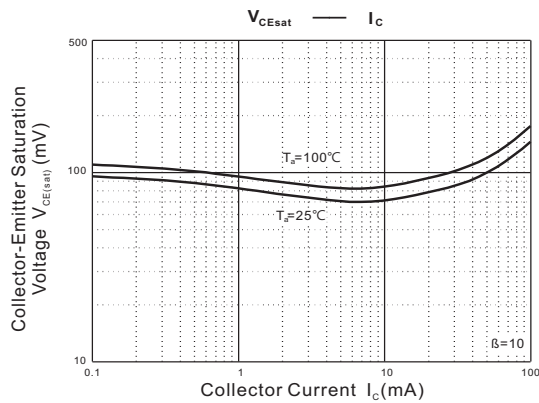
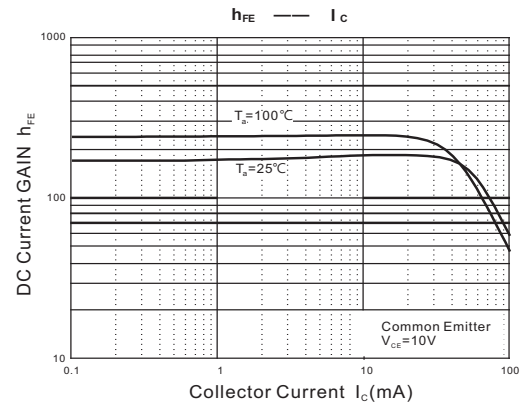
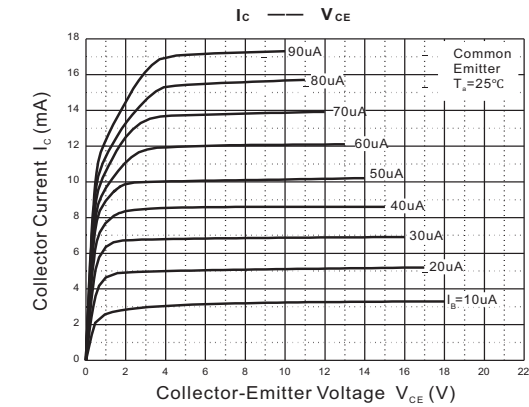
Parameter	Symbol	Value	Unit
Collector to base voltage	V_{CBO}	300	V
Collector to Emitter Voltage	V_{CEO}	300	V
Emitter to base voltage	V_{EBO}	5	V
Collector current - continuous	I_C	300	mA
Collector current - pulsed	I_{CM}	500	mA
Total power dissipation	P_D	350	mW
Junction temperature	T_J	+150	$^\circ\text{C}$
Storage temperature range	T_{STG}	-55 ~ +150	$^\circ\text{C}$
Thermal resistance, Junction to ambient	$R_{\theta JA}$	357	$^\circ\text{C/W}$

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

Parameter	Conditions	Symbol	Min.	Typ.	Max.	Unit
Collector base breakdown voltage	$I_C = 100\mu\text{A}$, $I_E = 0$	$V_{(BR)CBO}$	300			V
Collector emitter breakdown voltage	$I_C = 1\text{mA}$, $I_B = 0$	$V_{(BR)CEO}$	300			V
Emitter base breakdown voltage	$I_E = 100\mu\text{A}$, $I_C = 0$	$V_{(BR)EBO}$	5			V
Collector cut off current	$V_{CB} = 200\text{V}$, $I_E = 0$	I_{CBO}			0.25	μA
Emitter cut-off current	$V_{EB} = 5\text{V}$, $I_C = 0$	I_{EBO}			0.1	μA
DC current gain	$V_{CE} = 10\text{V}$, $I_C = 1\text{mA}$	h_{FE}	60			
	$V_{CE} = 10\text{V}$, $I_C = 10\text{mA}$		100		200	
	$V_{CE} = 10\text{V}$, $I_C = 30\text{mA}$		60			
Collector-emitter saturation voltage	$I_C = 20\text{mA}$, $I_B = 2\text{mA}$	$V_{CE(SAT)}$			0.2	V
Base-emitter saturation voltage	$I_C = 20\text{mA}$, $I_B = 2\text{mA}$	$V_{BE(SAT)}$			0.9	V
Transition Frequency	$V_{CE} = 20\text{V}$, $I_C = 10\text{mA}$, $f = 30\text{MHz}$	f_T	50			MHz

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Rating and characteristic curves



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Pinning information

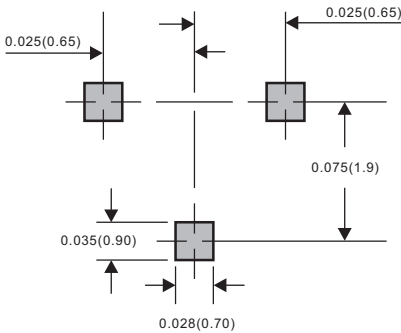
Pin	Simplified outline	Symbol
Pin 1 Base Pin 2 Emitter Pin 3 Collector		

Marking

Type number	Marking code
FMBTA42W-Q1	1D

Suggested solder pad layout

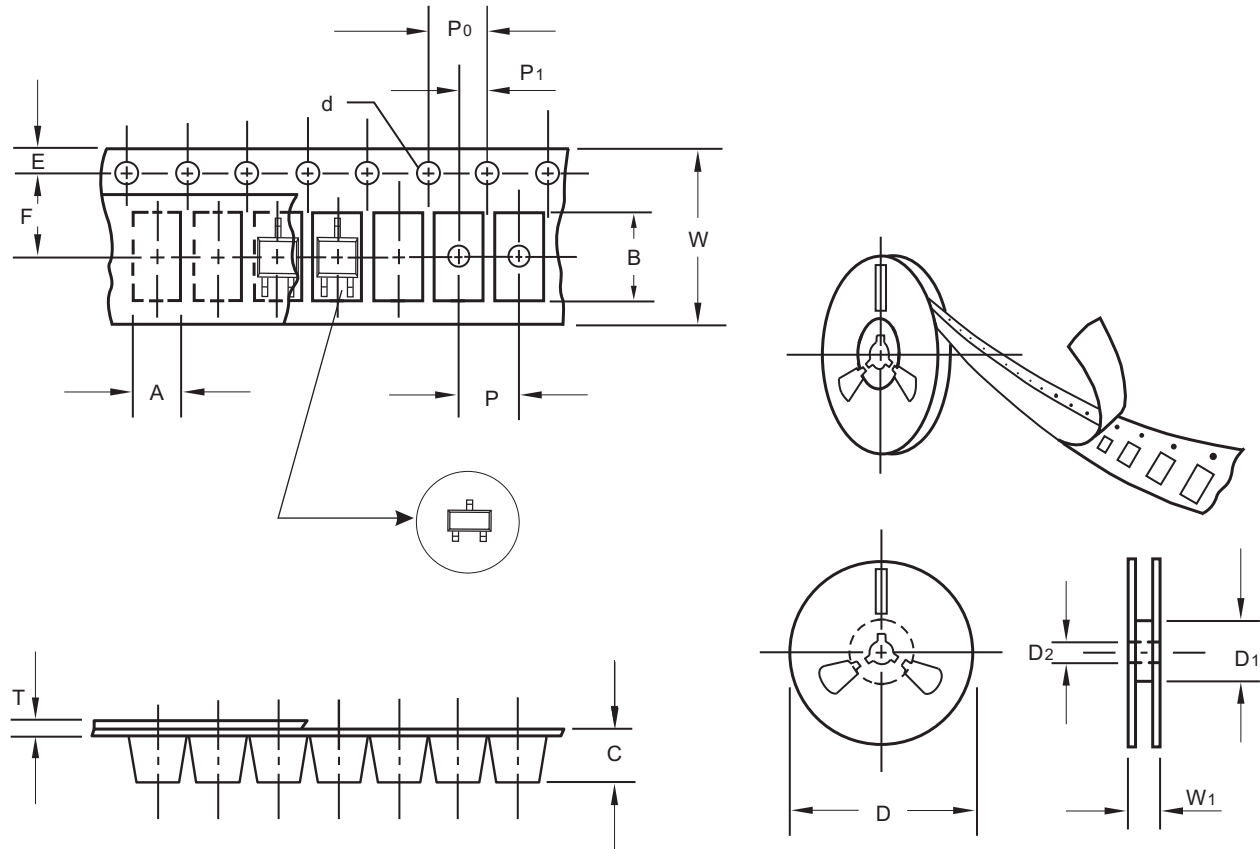
SOT-323



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	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.

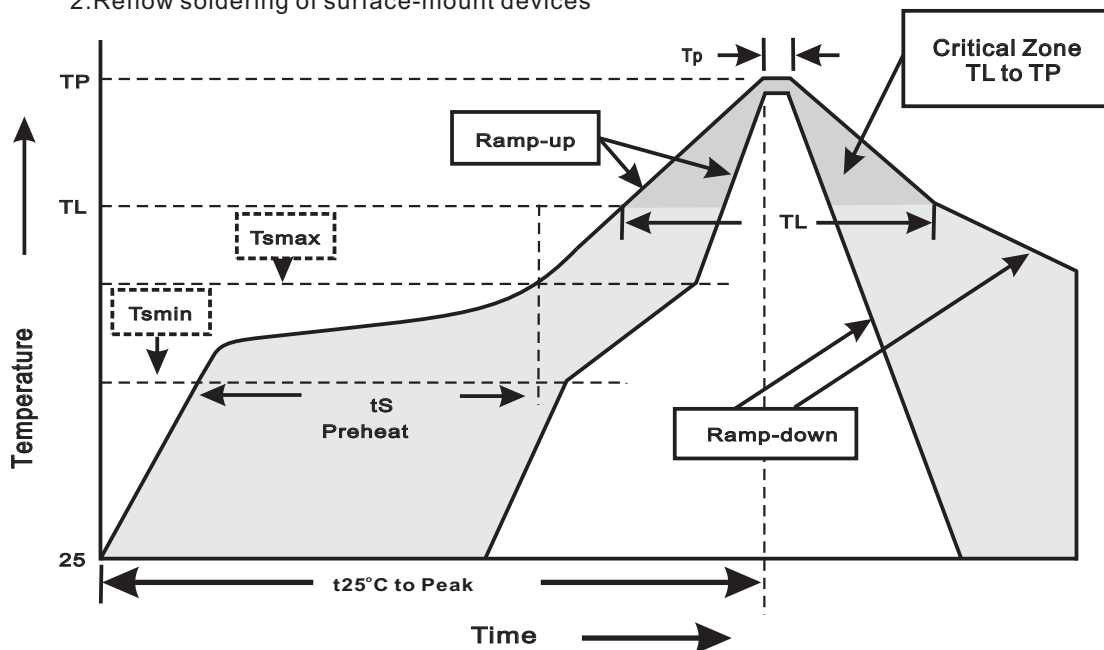
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Reel packing

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(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