

FMBTA42-Q1**List**

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FMBTA42-Q1

NPN Plastic-Encapsulate Transistor

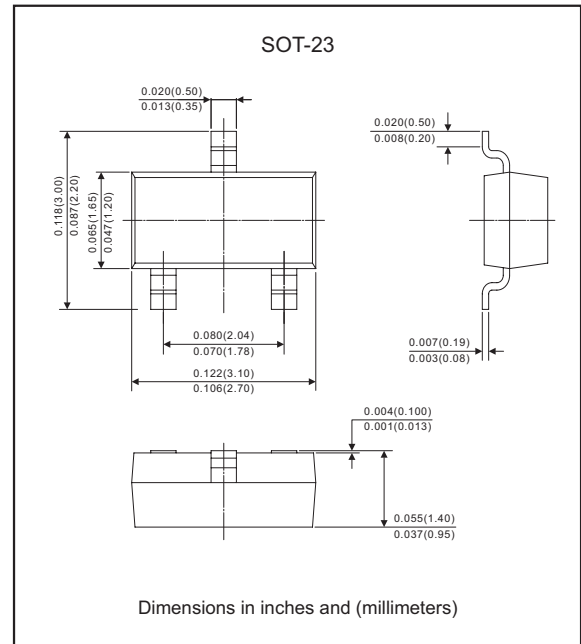
Features

- High breakdown voltage.
- Low collector-emitter saturation voltage.
- Qualified to AEC-Q101 standards for high reliability.
- Complementary to FMBTA92
- Suffix "-H" indicates Halogen-free part, ex. FMBTA42-Q1-H.

Mechanical data

- Epoxy:UL94-V0 rated flame retardant
- Case : Molded plastic, SOT-23
- Terminals : Solder plated, solderable per MIL-STD-750, Method 2026
- Mounting Position : Any
- Weight : Approximated 0.008 gram

Package outline



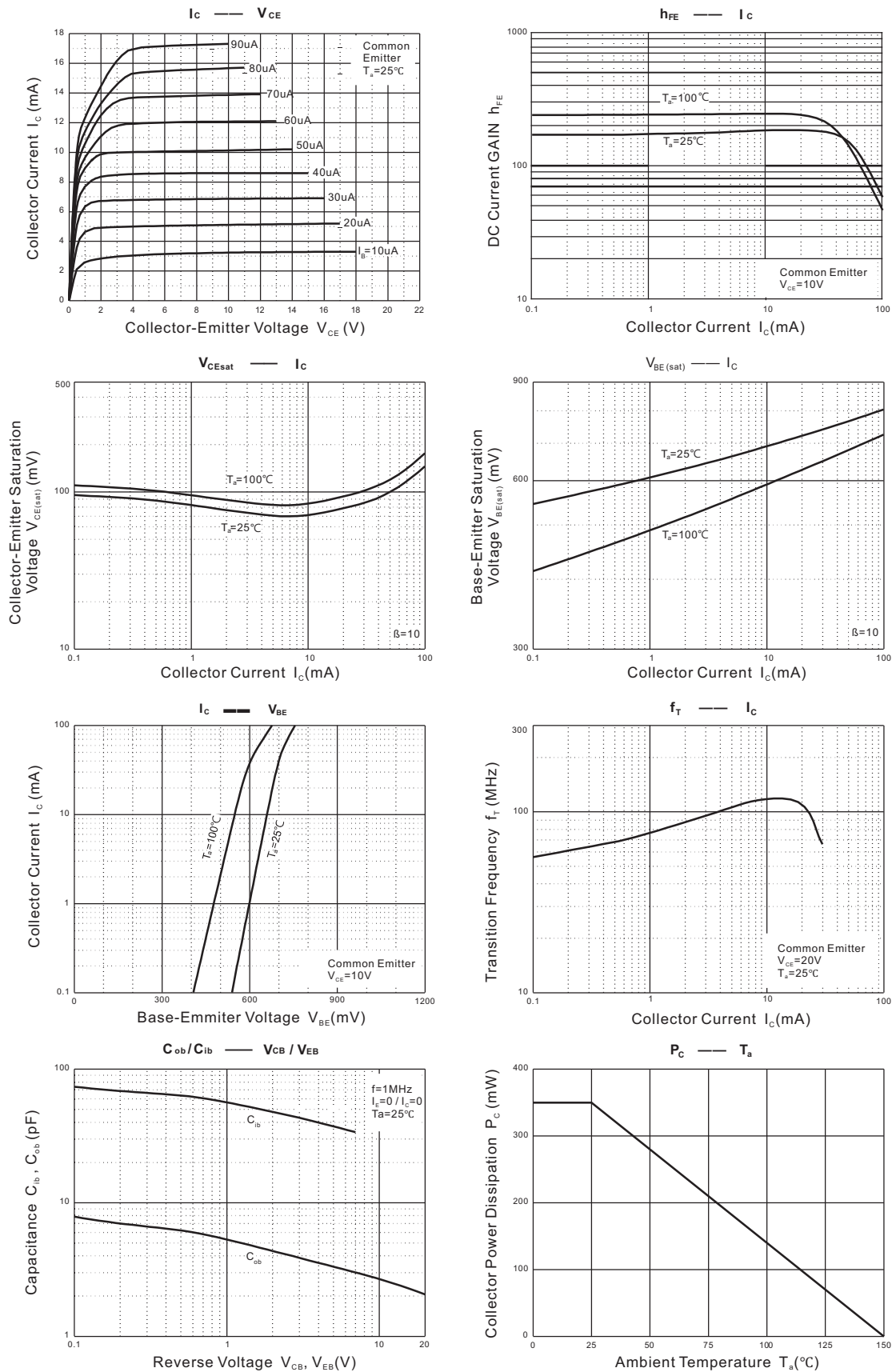
Maximum ratings (AT $T_A=25^{\circ}\text{C}$ unless otherwise noted)

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	I_C	300	mA
Collector current-peak	I_{CM}	500	mA
Total power dissipation	P_C	350	mW
Junction temperature	T_j	+150	$^{\circ}\text{C}$
Storage temperature	T_{STG}	-55 ~ +150	$^{\circ}\text{C}$
Thermal resistance form junction to ambient	$R_{\theta JA}$	357	$^{\circ}\text{C/W}$

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

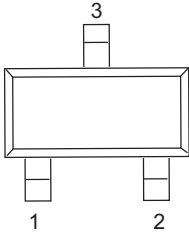
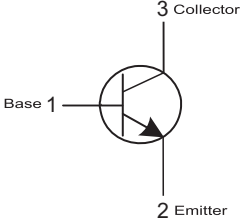
Parameter	Conditions	Symbol	Min.	Typ.	Max.	Unit
Collector to base breakdown voltage	$I_C=100\mu\text{A}$, $I_E=0$	BV_{CBO}	300			V
Collector to emitter breakdown voltage	$I_C=1\text{mA}$, $I_E=0$	BV_{CEO}	300			V
Emitter to base breakdown voltage	$I_E=100\mu\text{A}$, $I_C=0\text{V}$	BV_{EBO}	5			V
Collector 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	$V_{CE}=10\text{V}$, $I_C=1\text{mA}$	$h_{FE(1)}$	60			
	$V_{CE}=10\text{V}$, $I_C=10\text{mA}$	$h_{FE(2)}$	100	200		
	$V_{CE}=10\text{V}$, $I_C=30\text{mA}$	$h_{FE(3)}$	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
Current gain bandwidth product	$V_{CE}=20\text{V}$, $I_C=10\text{mA}$, $f=30\text{MHz}$	f_T	20			MHZ

Rating and characteristic curves (FMBTA42-Q1)



FMBTA42-Q1

Pinning information

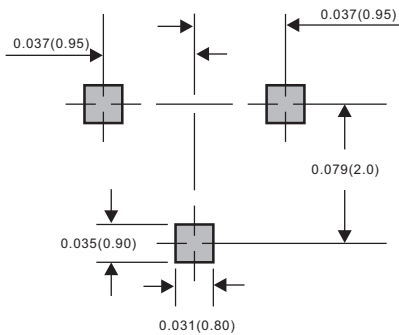
Pin	Simplified outline	Symbol
Pin1 BASE Pin2 EMITTER Pin3 COLLECTOR		

Marking

Type number	Marking code
FMBTA42-Q1	1D

Suggested solder pad layout

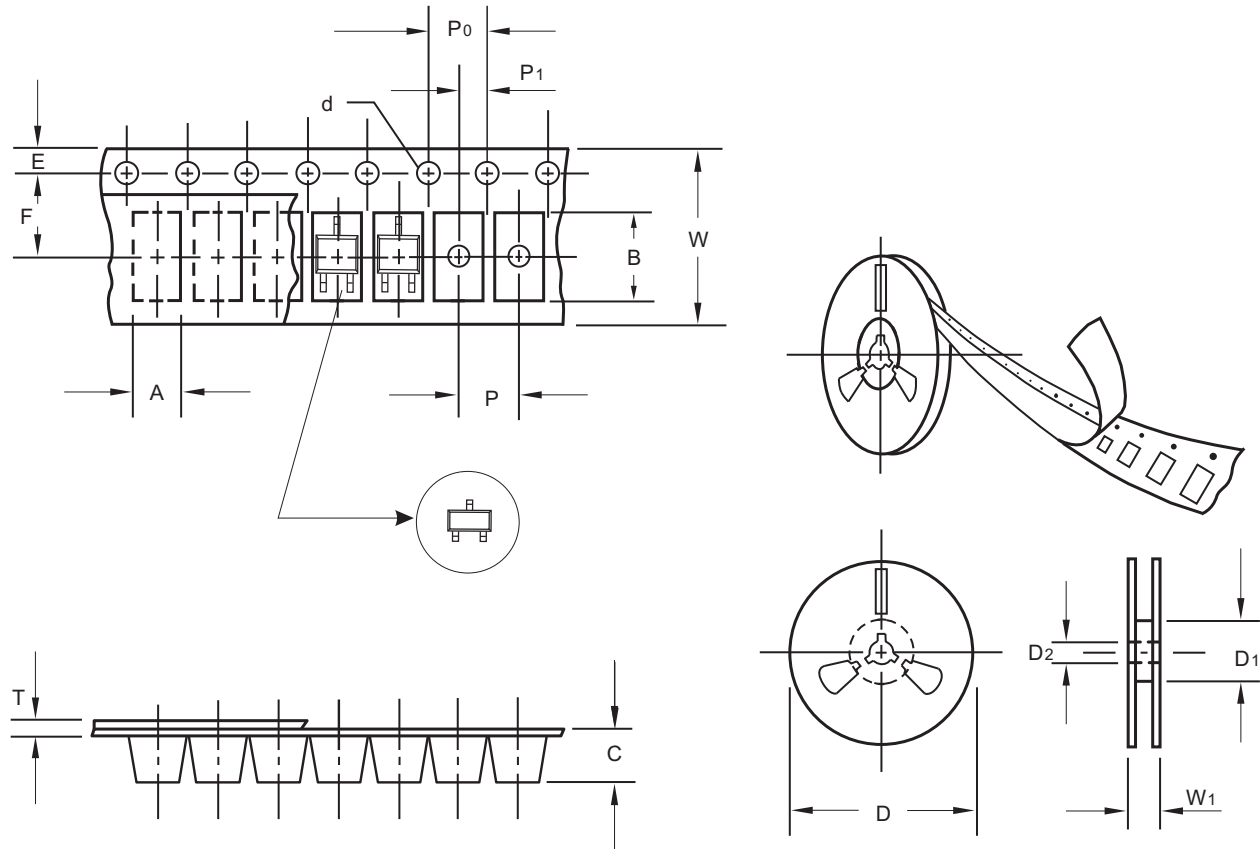
SOT-23



Dimensions in inches and (millimeters)

FMBTA42-Q1

Packing information



unit:mm

Item	Symbol	Tolerance	SOT-23
Carrier width	A	0.1	3.15
Carrier length	B	0.1	2.77
Carrier depth	C	0.1	1.22
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	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	11.40

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

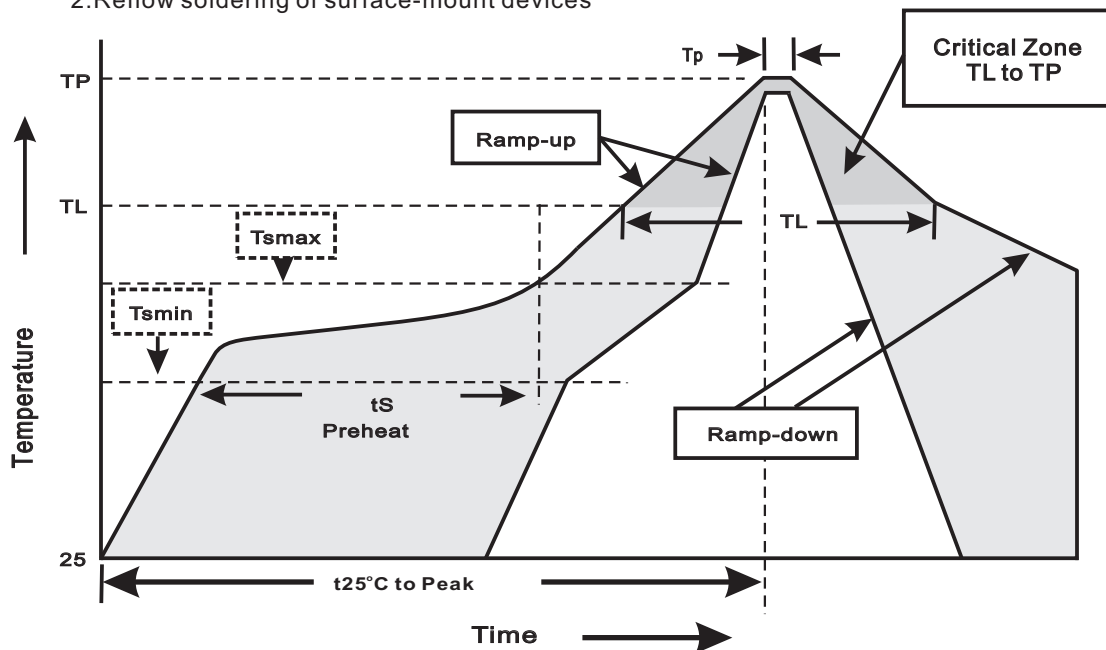
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Reel packing

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-23	7"	3,000	4.0	30,000	183*123*183	178	382*257*387	240,000	11.6

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