

MMBTA42LT1, MMBTA43LT1

MMBTA42LT1 is a Preferred Device

High Voltage Transistors NPN Silicon

Features

- Pb-Free Package May be Available. The G-Suffix Denotes a Pb-Free Lead Finish

MAXIMUM RATINGS

Rating	Symbol	MMBTA42	MMBTA43	Unit
Collector-Emitter Voltage	V_{CEO}	300	200	Vdc
Collector-Base Voltage	V_{CBO}	300	200	Vdc
Emitter-Base Voltage	V_{EBO}	6.0	6.0	Vdc
Collector Current-Continuous	I_C	500		mAdc

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Total Device Dissipation FR-5 Board (Note 1) $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	225	mW
		1.8	mW/ $^\circ\text{C}$
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	556	$^\circ\text{C}/\text{W}$
Total Device Dissipation Alumina Substrate (Note 2) $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	300	mW
		2.4	mW/ $^\circ\text{C}$
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	417	$^\circ\text{C}/\text{W}$
Junction and Storage Temperature	T_J, T_{stg}	-55 to +150	$^\circ\text{C}$

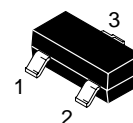
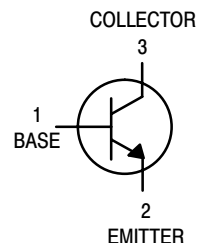
1. FR-5 = 1.0 x 0.75 x 0.062 in.

2. Alumina = 0.4 x 0.3 x 0.024 in. 99.5% alumina.



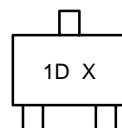
ON Semiconductor®

<http://onsemi.com>

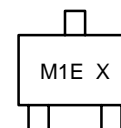


SOT-23 (TO-236)
CASE 318
STYLE 6

MARKING DIAGRAMS



MMBTA42LT1



MMBTA43LT1

1D, M1E = Specific Device Code
X = Date Code

ORDERING INFORMATION

Device	Package	Shipping†
MMBTA42LT1	SOT-23	3000/Tape & Reel
MMBTA42LT1G	SOT-23	3000/Tape & Reel
MMBTA43LT1	SOT-23	3000/Tape & Reel
MMBTA43LT3	SOT-23	10000/Tape & Reel

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

Preferred devices are recommended choices for future use and best overall value.

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ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

Characteristic		Symbol	Min	Max	Unit
OFF CHARACTERISTICS					
Collector–Emitter Breakdown Voltage (Note 3) (I _C = 1.0 mA, I _B = 0)	MMBTA42 MMBTA43	V _{(BR)CEO}	300 200	– –	Vdc
Collector–Base Breakdown Voltage (I _C = 100 μA, I _E = 0)	MMBTA42 MMBTA43	V _{(BR)CBO}	300 200	– –	Vdc
Emitter–Base Breakdown Voltage (I _E = 100 μA, I _C = 0)		V _{(BR)EBO}	6.0	–	Vdc
Collector Cutoff Current (V _{CB} = 200 Vdc, I _E = 0) (V _{CB} = 160 Vdc, I _E = 0)	MMBTA42 MMBTA43	I _{CBO}	– –	0.1 0.1	μA
Emitter Cutoff Current (V _{EB} = 6.0 Vdc, I _C = 0) (V _{EB} = 4.0 Vdc, I _C = 0)	MMBTA42 MMBTA43	I _{EBO}	– –	0.1 0.1	μA
ON CHARACTERISTICS (Note 3)					
DC Current Gain (I _C = 1.0 mA, V _{CE} = 10 Vdc) (I _C = 10 mA, V _{CE} = 10 Vdc) (I _C = 30 mA, V _{CE} = 10 Vdc)	Both Types Both Types MMBTA42 MMBTA43	h _{FE}	25 40 40 40	– – – –	–
Collector–Emitter Saturation Voltage (I _C = 20 mA, I _B = 2.0 mA)	MMBTA42 MMBTA43	V _{CE(sat)}	– –	0.5 0.5	Vdc
Base–Emitter Saturation Voltage (I _C = 20 mA, I _B = 2.0 mA)		V _{BE(sat)}	–	0.9	Vdc
SMALL–SIGNAL CHARACTERISTICS					
Current–Gain – Bandwidth Product (I _C = 10 mA, V _{CE} = 20 Vdc, f = 100 MHz)		f _T	50	–	MHz
Collector–Base Capacitance (V _{CB} = 20 Vdc, I _E = 0, f = 1.0 MHz)	MMBTA42 MMBTA43	C _{cb}	– –	3.0 4.0	pF

3. Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%.

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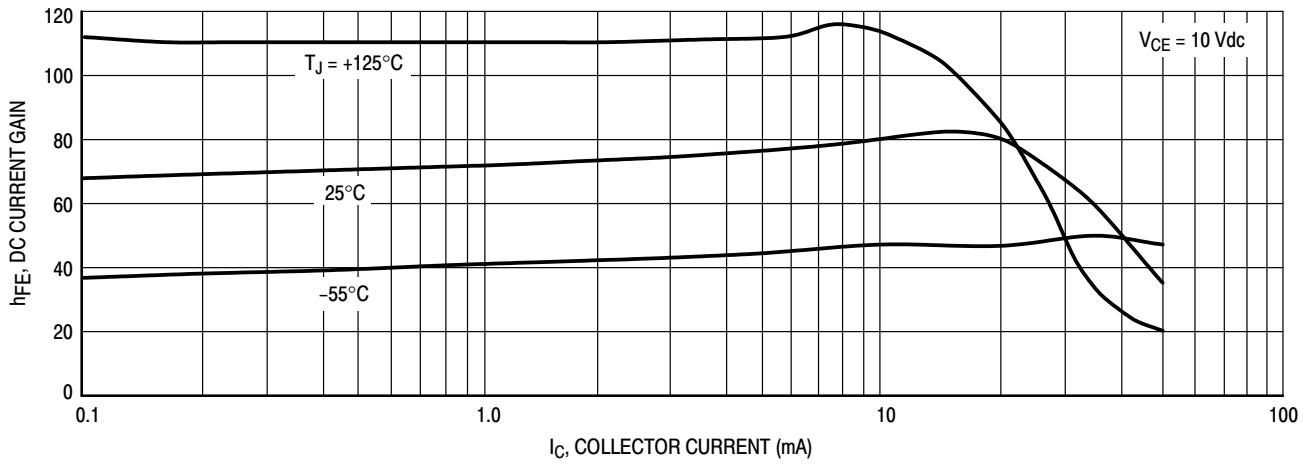


Figure 1. DC Current Gain

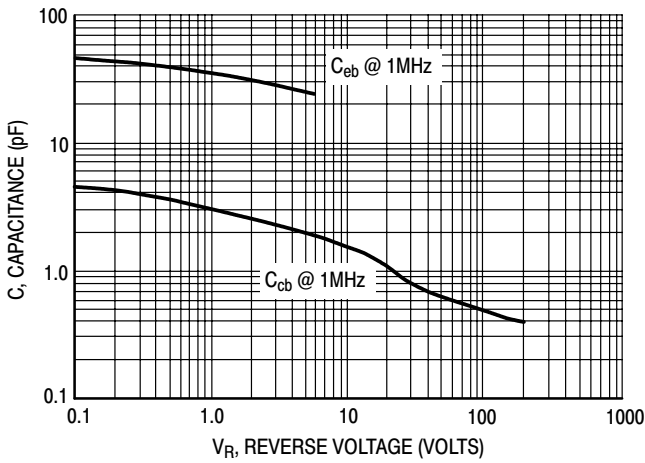


Figure 2. Capacitance

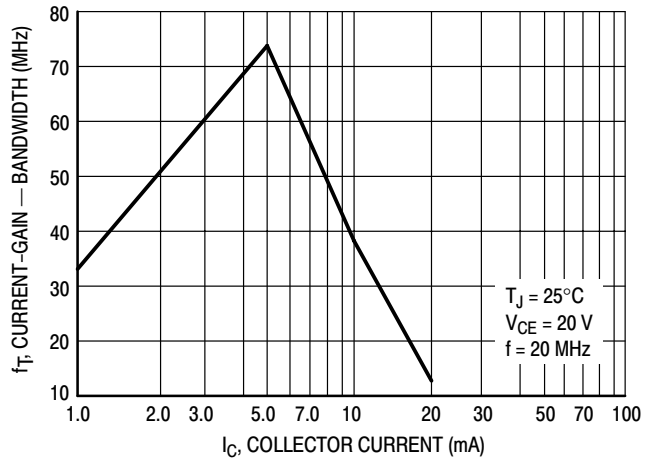


Figure 3. Current-Gain - Bandwidth

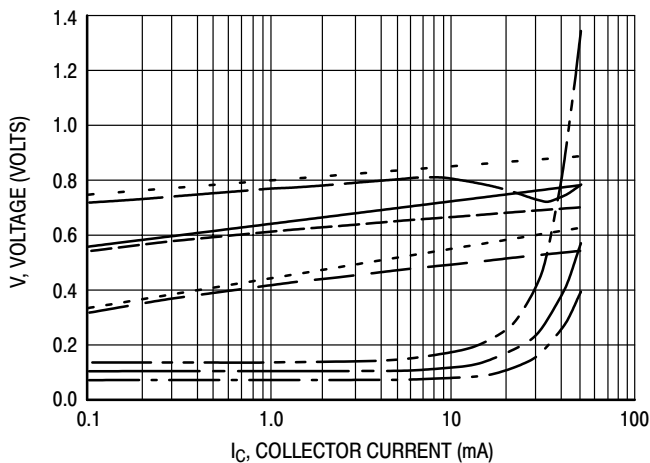


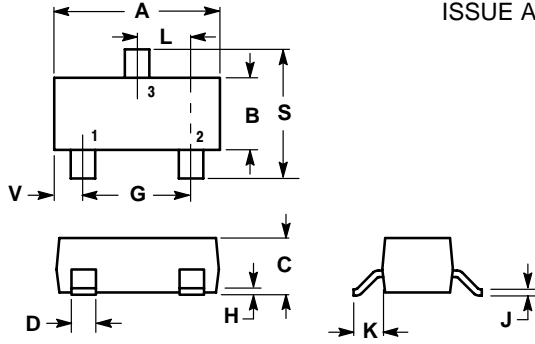
Figure 4. "ON" Voltages

- $V_{CE(sat)}$ @ 25°C, $I_C/I_B = 10$
- $V_{CE(sat)}$ @ 125°C, $I_C/I_B = 10$
- $V_{CE(sat)}$ @ -55°C, $I_C/I_B = 10$
- $V_{BE(sat)}$ @ 25°C, $I_C/I_B = 10$
- $V_{BE(sat)}$ @ 125°C, $I_C/I_B = 10$
- $V_{BE(sat)}$ @ -55°C, $I_C/I_B = 10$
- $V_{BE(on)}$ @ 25°C, $V_{CE} = 10$ V
- $V_{BE(on)}$ @ 125°C, $V_{CE} = 10$ V
- $V_{BE(on)}$ @ -55°C, $V_{CE} = 10$ V

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PACKAGE DIMENSIONS

SOT-23 (TO-236) CASE 318-08 ISSUE AH



- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
 2. CONTROLLING DIMENSION: INCH.
 3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH THICKNESS. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.
 4. 318-03 AND -07 OBSOLETE, NEW STANDARD 318-08.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.1102	0.1197	2.80	3.04
B	0.0472	0.0551	1.20	1.40
C	0.0350	0.0440	0.89	1.11
D	0.0150	0.0200	0.37	0.50
G	0.0701	0.0807	1.78	2.04
H	0.0005	0.0040	0.013	0.100
J	0.0034	0.0070	0.085	0.177
K	0.0140	0.0285	0.35	0.69
L	0.0350	0.0401	0.89	1.02
S	0.0830	0.1039	2.10	2.64
V	0.0177	0.0236	0.45	0.60

- STYLE 6:
1. BASE
 2. EMITTER
 3. COLLECTOR

SOLDERING FOOTPRINT*

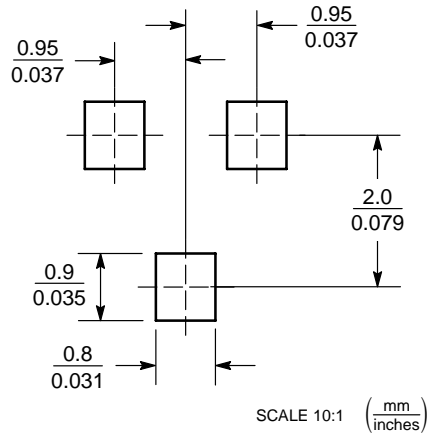



Figure 5. SOT-23

*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

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