

MMBTA42LT1G, MMBTA43LT1G

High Voltage Transistors

NPN Silicon

Features

- These Devices are Pb-Free, Halogen Free/BFR Free and are RoHS Compliant

MAXIMUM RATINGS

Characteristic	Symbol	Value	Unit
Collector - Emitter Voltage MMBTA42 MMBTA43	V_{CEO}	300 200	Vdc
Collector - Base Voltage MMBTA42 MMBTA43	V_{CBO}	300 200	Vdc
Emitter - Base Voltage MMBTA42 MMBTA43	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 1.8	mW 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 2.4	mW 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	$^\circ\text{C}$

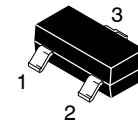
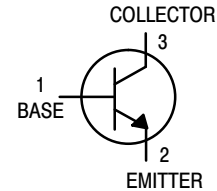
Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

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.



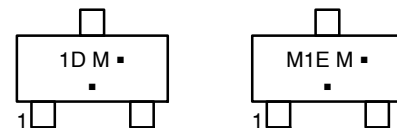
ON Semiconductor®

<http://onsemi.com>



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

MARKING DIAGRAMS



1D = MMBTA42LT
M1E = MMBTA43LT
M = Date Code*
▪ = Pb-Free Package

(Note: Microdot may be in either location)
*Date Code orientation and/or overbar may vary depending upon manufacturing location.

ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 4 of this data sheet.

MMBTA42LT1G, MMBTA43LT1G

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Min	Max	Unit	
OFF CHARACTERISTICS					
Collector - Emitter Breakdown Voltage (Note 3) ($I_C = 1.0\text{ mA}$, $I_B = 0$)	MMBTA42 MMBTA43	$V_{(BR)CEO}$	300 200	- -	Vdc
Collector - Base Breakdown Voltage ($I_C = 100\text{ }\mu\text{A}$, $I_E = 0$)	MMBTA42 MMBTA43	$V_{(BR)CBO}$	300 200	- -	Vdc
Emitter - Base Breakdown Voltage ($I_E = 100\text{ }\mu\text{A}$, $I_C = 0$)		$V_{(BR)EBO}$	6.0	-	Vdc
Collector Cutoff Current ($V_{CB} = 200\text{ Vdc}$, $I_E = 0$) ($V_{CB} = 160\text{ Vdc}$, $I_E = 0$)	MMBTA42 MMBTA43	I_{CBO}	- -	0.1 0.1	μA
Emitter Cutoff Current ($V_{EB} = 6.0\text{ Vdc}$, $I_C = 0$) ($V_{EB} = 4.0\text{ Vdc}$, $I_C = 0$)	MMBTA42 MMBTA43	I_{EBO}	- -	0.1 0.1	μA

ON CHARACTERISTICS (Note 3)

DC Current Gain ($I_C = 1.0\text{ mA}$, $V_{CE} = 10\text{ Vdc}$) ($I_C = 10\text{ mA}$, $V_{CE} = 10\text{ Vdc}$) ($I_C = 30\text{ mA}$, $V_{CE} = 10\text{ Vdc}$)	Both Types Both Types MMBTA42 MMBTA43	h_{FE}	25 40 40 40	- - - -	-
Collector - Emitter Saturation Voltage ($I_C = 20\text{ mA}$, $I_B = 2.0\text{ mA}$)	MMBTA42 MMBTA43	$V_{CE(sat)}$	- -	0.5 0.5	Vdc
Base - Emitter Saturation Voltage ($I_C = 20\text{ mA}$, $I_B = 2.0\text{ mA}$)		$V_{BE(sat)}$	-	0.9	Vdc

SMALL-SIGNAL CHARACTERISTICS

Current - Gain - Bandwidth Product ($I_C = 10\text{ mA}$, $V_{CE} = 20\text{ Vdc}$, $f = 100\text{ MHz}$)		f_T	50	-	MHz
Collector - Base Capacitance ($V_{CB} = 20\text{ Vdc}$, $I_E = 0$, $f = 1.0\text{ MHz}$)	MMBTA42 MMBTA43	C_{cb}	- -	3.0 4.0	pF

3. Pulse Test: Pulse Width $\leq 300\text{ }\mu\text{s}$, Duty Cycle $\leq 2.0\%$.

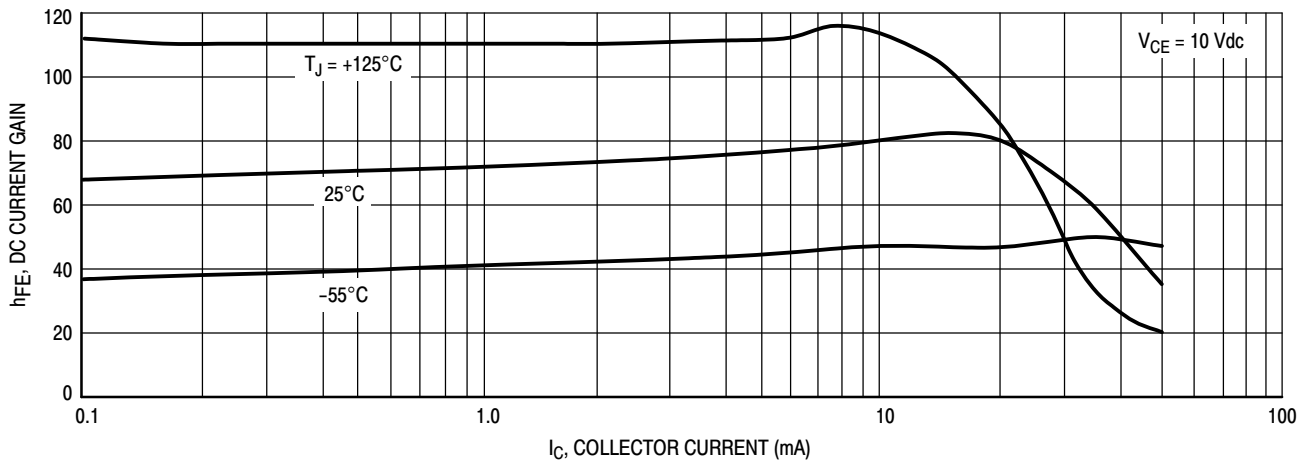


Figure 1. DC Current Gain

MMBTA42LT1G, MMBTA43LT1G

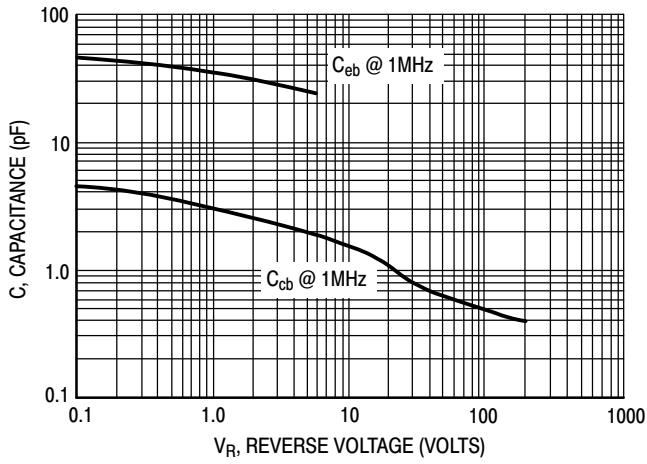


Figure 2. Capacitance

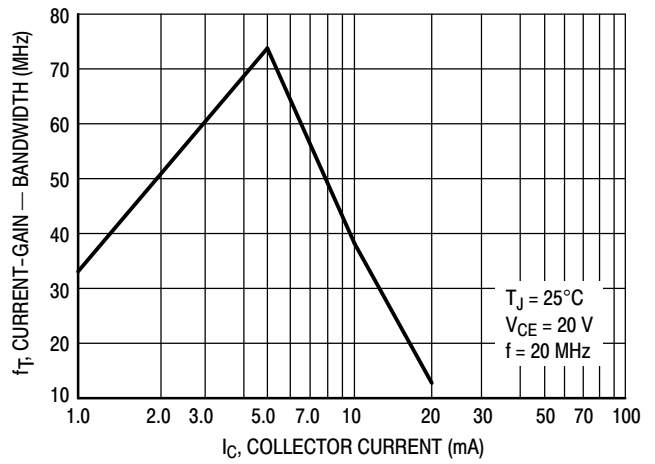


Figure 3. Current-Gain - Bandwidth

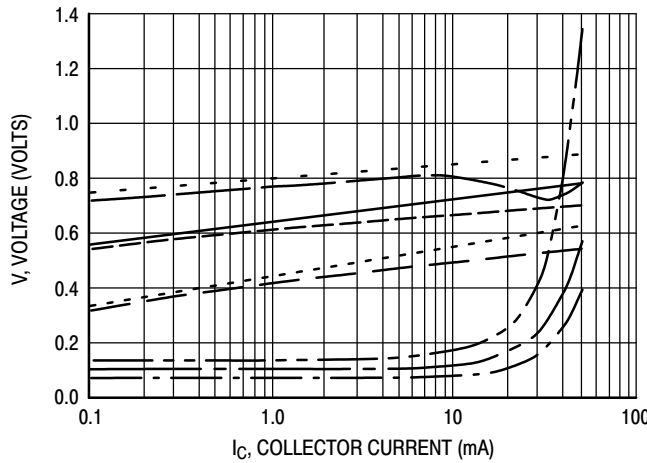


Figure 4. "ON" Voltages

- 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

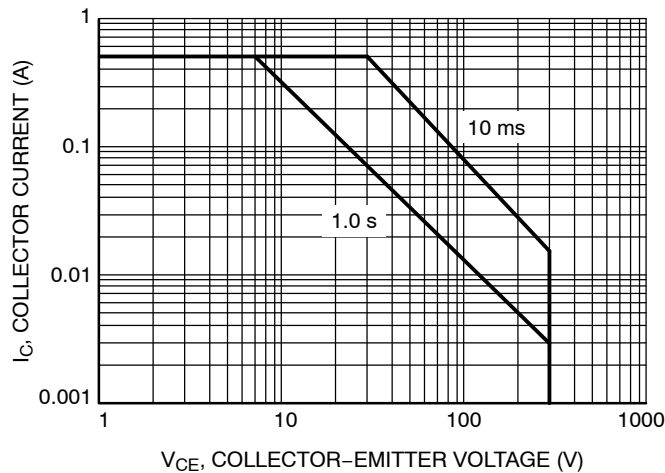


Figure 5. Safe Operating Area

MMBTA42LT1G, MMBTA43LT1G

ORDERING INFORMATION

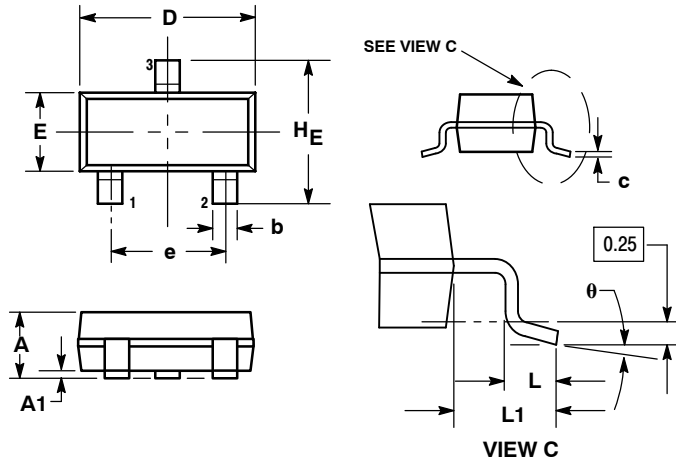
Device Order Number	Package Type	Shipping†
MMBTA42LT1G	SOT-23 (Pb-Free)	3,000 / Tape & Reel
MMBTA42LT3G	SOT-23 (Pb-Free)	10,000 / Tape & Reel
MMBTA43LT1G	SOT-23 (Pb-Free)	3,000 / Tape & Reel

†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.

MMBTA42LT1G, MMBTA43LT1G

PACKAGE DIMENSIONS

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

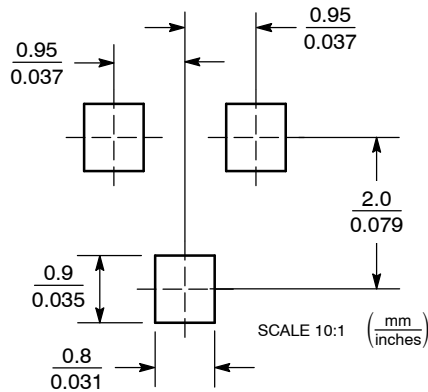


- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
 2. CONTROLLING DIMENSION: INCH.
 3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH THICKNESS. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.
 4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE BURRS.

DIM	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.89	1.00	1.11	0.035	0.040	0.044
A1	0.01	0.06	0.10	0.001	0.002	0.004
b	0.37	0.44	0.50	0.015	0.018	0.020
c	0.09	0.13	0.18	0.003	0.005	0.007
D	2.80	2.90	3.04	0.110	0.114	0.120
E	1.20	1.30	1.40	0.047	0.051	0.055
e	1.78	1.90	2.04	0.070	0.075	0.081
L	0.10	0.20	0.30	0.004	0.008	0.012
L1	0.35	0.54	0.69	0.014	0.021	0.029
HE	2.10	2.40	2.64	0.083	0.094	0.104
θ	0°	---	10°	0°	---	10°

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

SOLDERING FOOTPRINT*



*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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