MMBTA92L, SMMBTA92L, MMBTA93L

High Voltage Transistors

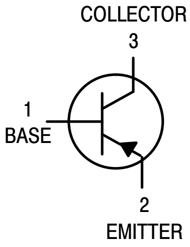
PNP Silicon

ON Semiconductor®

http://onsemi.com

Features

- S Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC−Q101 Qualified and PPAP Capable
- These Devices are Pb−Free, Halogen Free/BFR Free and are RoHS Compliant



MAXIMUM RATINGS

Rating	Symbol	92	93	Unit
Collector−Emitter Voltage	V_{CEO}	−300	−200	Vdc
Collector−Base Voltage	V_{CBO}	−300	−200	Vdc
Emitter−Base Voltage	V_{EBO}	−5.0	−5.0	Vdc
Collector Current — Continuous	I_C	−500		mAdc

DEVICE MARKING

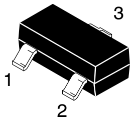
MMBTA92L, SMMBTA92L = 2D; MMBTA93LT1 = 2E

THERMAL CHARACTERISTICS

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

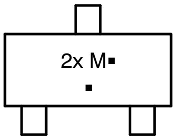
Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

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.



SOT−23 (TO−236AF)
CASE 318
STYLE 6

MARKING DIAGRAM



2x = Specific Device Code
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

Device	Package	Shipping†
MMBTA92LT1G	SOT−23 (Pb−Free)	3000 / Tape & Reel
SMMBTA92LT1G	SOT−23 (Pb−Free)	3000 / Tape & Reel
MMBTA92LT3G	SOT−23 (Pb−Free)	10000 / Tape & Reel
SMMBTA92LT3G	SOT−23 (Pb−Free)	10000 / Tape & Reel
MMBTA93LT1G	SOT−23 (Pb−Free)	3000 / 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.

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 mAdc, I_B = 0) MMBTA92, SMMBTA92 MMBTA93	$V_{(BR)CEO}$	 −300 −200	 – –	Vdc
Collector – Base Breakdown Voltage (I_C = −100 μAdc, I_E = 0) MMBTA92, SMMBTA92 MMBTA93	$V_{(BR)CBO}$	 −300 −200	 – –	Vdc
Emitter – Base Breakdown Voltage (I_E = −100 μAdc, I_C = 0)	$V_{(BR)EBO}$	−5.0	–	Vdc
Collector Cutoff Current (V_{CB} = −200 Vdc, I_E = 0) MMBTA92, SMMBTA92 (V_{CB} = −160 Vdc, I_E = 0) MMBTA93	I_{CBO}	 – –	 −0.25 −0.25	μAdc
Emitter Cutoff Current (V_{EB} = −3.0 Vdc, I_C = 0)	I_{EBO}	–	−0.1	μAdc
ON CHARACTERISTICS (Note 3)				
DC Current Gain (I_C = −1.0 mAdc, V_{CE} = −10 Vdc) Both Types (I_C = −10 mAdc, V_{CE} = −10 Vdc) Both Types (I_C = −30 mAdc, V_{CE} = −10 Vdc) MMBTA92, SMMBTA92 MMBTA93	h_{FE}	 25 40 25 25	 – – – –	–
Collector – Emitter Saturation Voltage (I_C = −20 mAdc, I_B = −2.0 mAdc) MMBTA92, SMMBTA92 MMBTA93	$V_{CE(sat)}$	 – –	 −0.5 −0.5	Vdc
Base–Emitter Saturation Voltage (I_C = −20 mAdc, I_B = −2.0 mAdc)	$V_{BE(sat)}$	–	−0.9	Vdc
SMALL– SIGNAL CHARACTERISTICS				
Current – Gain — Bandwidth Product (I_C = −10 mAdc, 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) MMBTA92, SMMBTA92 MMBTA93	C_{cb}	 – –	 6.0 8.0	pF

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

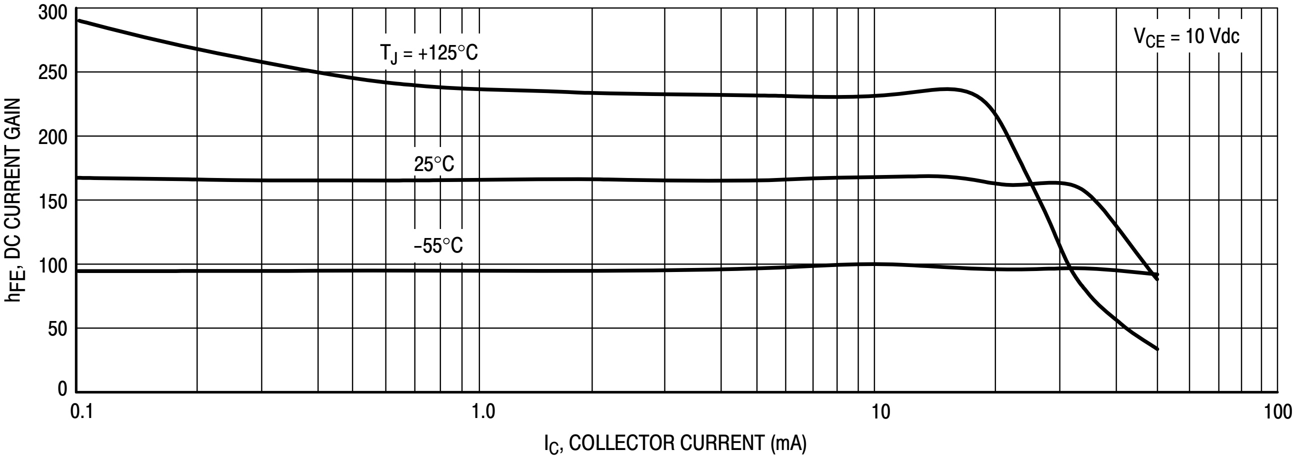


Figure 1. DC Current Gain

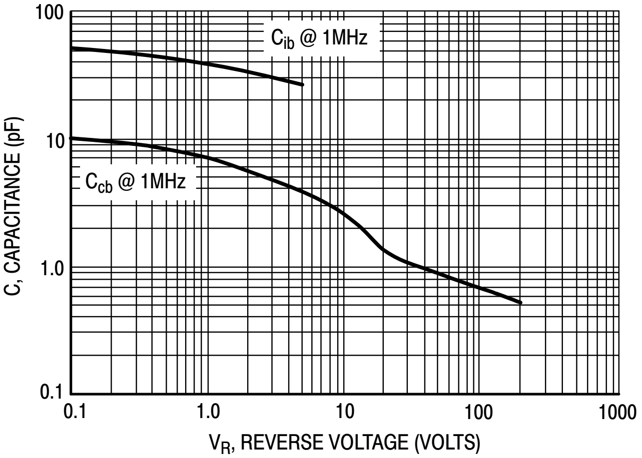


Figure 2. Capacitance

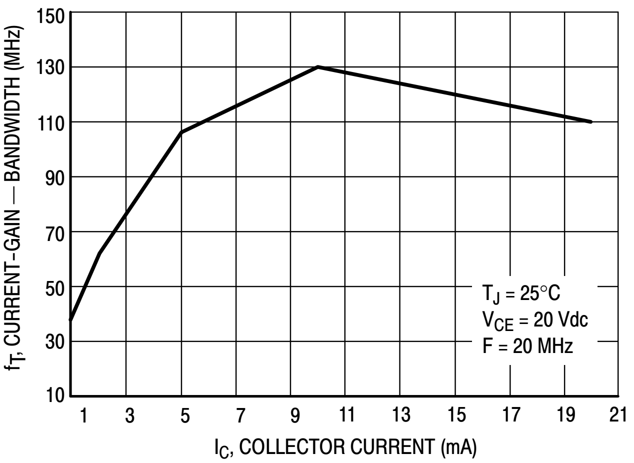


Figure 3. Current−Gain − Bandwidth

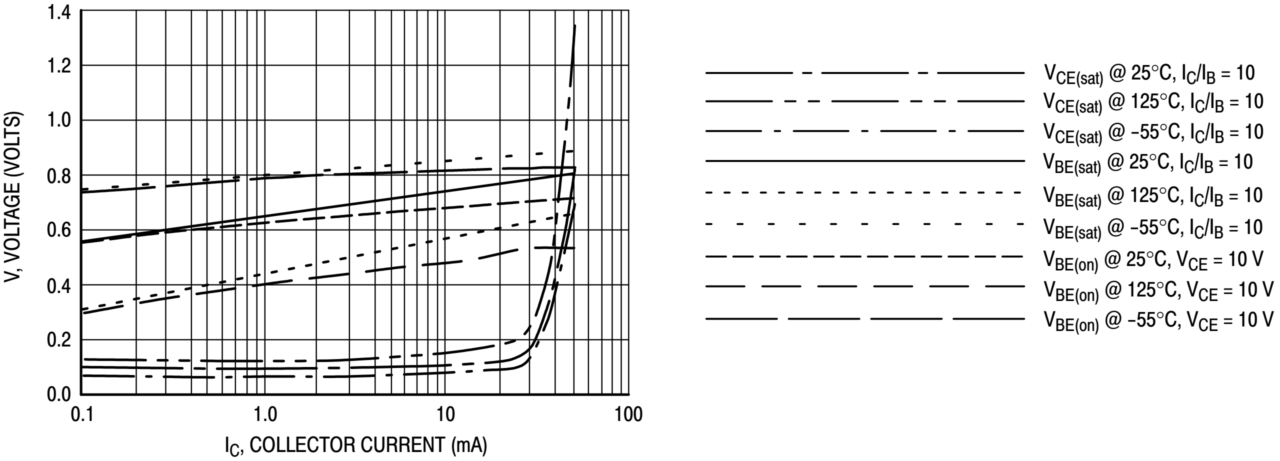


Figure 4. “ON” Voltages

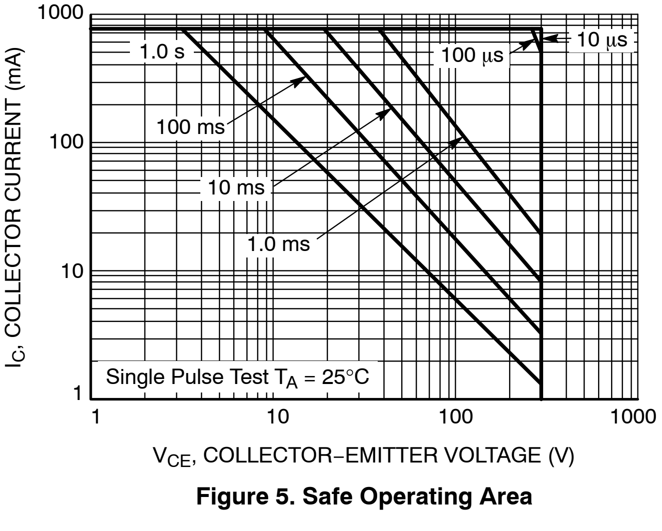
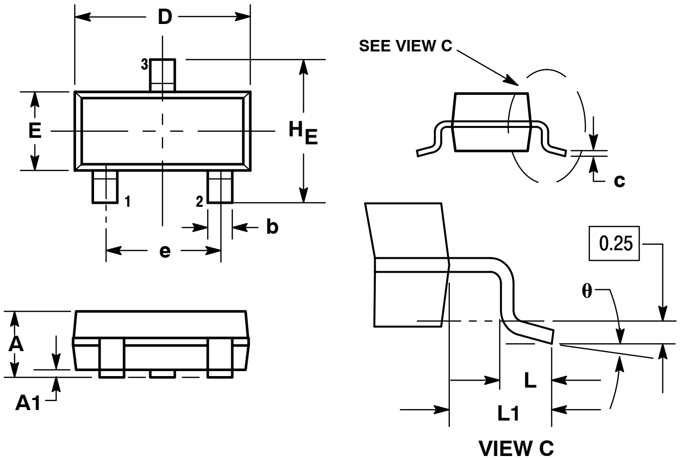


Figure 5. Safe Operating Area

PACKAGE DIMENSIONS

SOT−23 (TO−236)
CASE 318−08
ISSUE AP



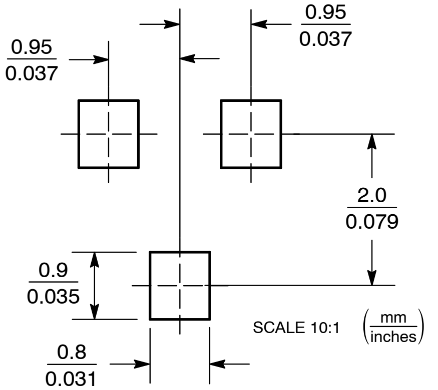
VIEW C

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.

	MILLIMETERS			INCHES		
DIM	**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
H_E	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



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