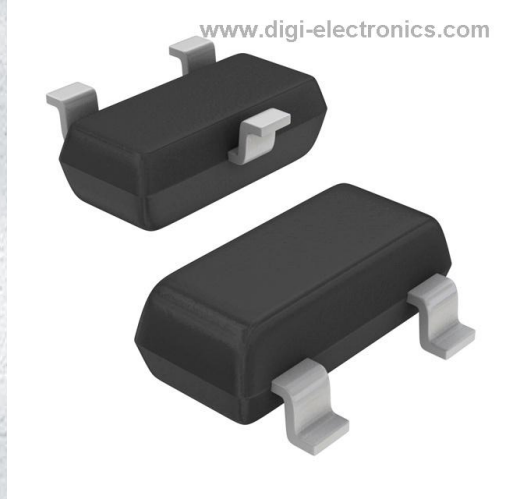
MMBTA92LT1 Datasheet



https://www.DiGi-Electronics.com

DiGi Electronics Part Number	MMBTA92LT1-DG
Manufacturer	onsemi
Manufacturer Product Number	MMBTA92LT1
Description	TRANS PNP 300V 500MA SOT23
Detailed Description	Bipolar (BJT) Transistor PNP 300 V 500 mA 50MHz 2 25 mW Surface Mount SOT-23-3 (TO-236)

Tel: +00 852-30501935

RFQ Email: Info@DiGi-Electronics.com

Purchase and inquiry

Manufacturer Product Number:	Manufacturer:
MMBTA92LT1	onsemi
Series:	Product Status:
-	Obsolete
Transistor Type:	Current - Collector (Ic) (Max):
PNP	500 mA
Voltage - Collector Emitter Breakdown (Max):	Vce Saturation (Max) @ Ib, Ic:
300 V	500mV @ 2mA, 20mA
Current - Collector Cutoff (Max):	DC Current Gain (hFE) (Min) @ Ic, Vce:
250nA	25 @ 1mA, 10V
Power - Max:	Frequency - Transition:
225 mW	50MHz
Operating Temperature:	Mounting Type:
-55°C ~ 150°C (TJ)	Surface Mount
Package / Case:	Supplier Device Package:
TO-236-3, SC-59, SOT-23-3	SOT-23-3 (TO-236)
Base Product Number:	
MMBTA92	

Environmental & Export classification

RoHS Status:	Moisture Sensitivity Level (MSL):
RoHS non-compliant	1 (Unlimited)
REACH Status:	ECCN:
REACH Unaffected	EAR99
HTSUS:	
8541.21.0095	

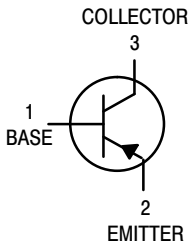
onsemi

DATA SHEET
www.onsemi.com

High Voltage Transistors

PNP Silicon

MMBTA92L, SMMBTA92L, MMBTA93L



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

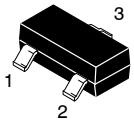
MMBTA92L, SMMBTA92L = 2D; MMBTA93LT1 = 2E

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

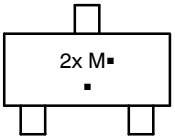
Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

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.

MMBTA92L, SMMBTA92L, MMBTA93L

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) (V_{CB} = −160 Vdc, I_E = 0)	 MMBTA92, SMMBTA92 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) (I_C = −10 mAdc, V_{CE} = −10 Vdc) (I_C = −30 mAdc, V_{CE} = −10 Vdc)	 Both Types Both Types 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

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

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

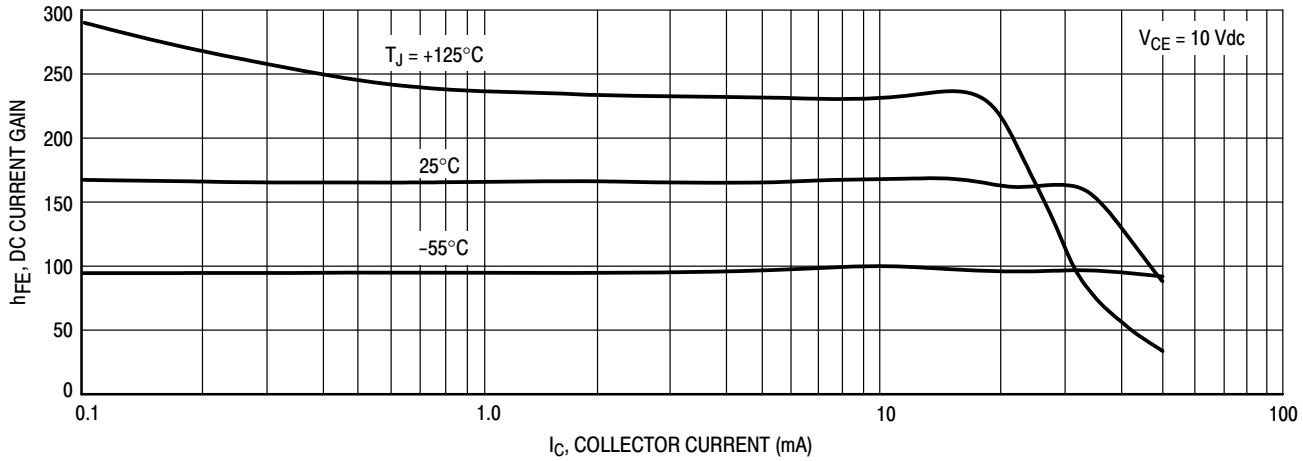


Figure 1. DC Current Gain

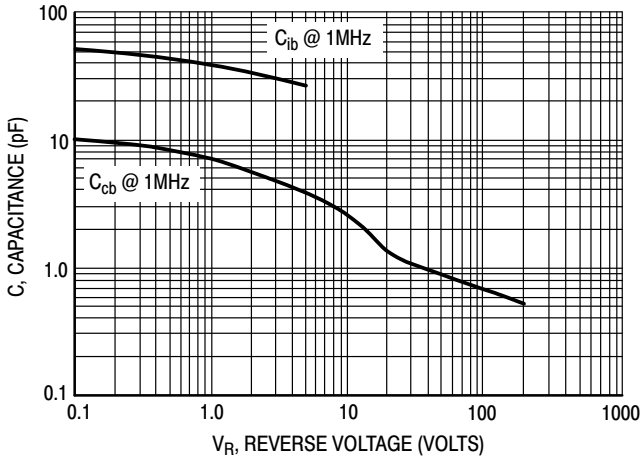


Figure 2. Capacitance

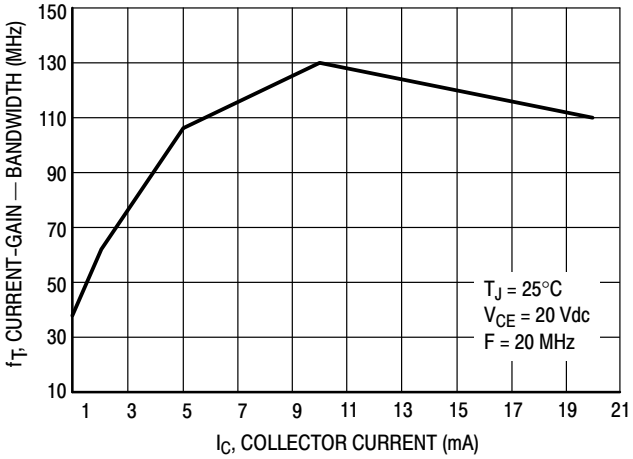


Figure 3. Current−Gain − Bandwidth

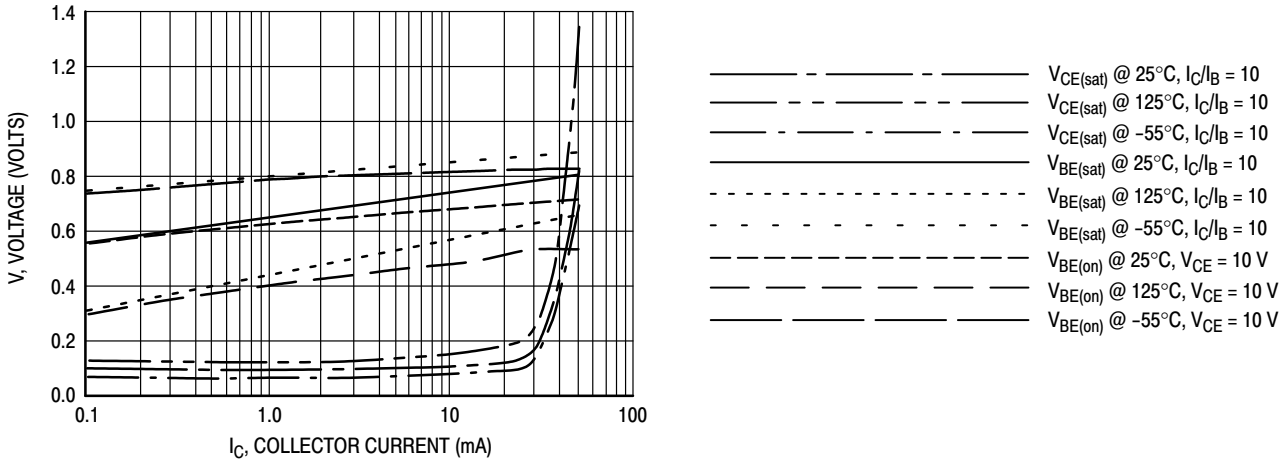


Figure 4. “ON” Voltages

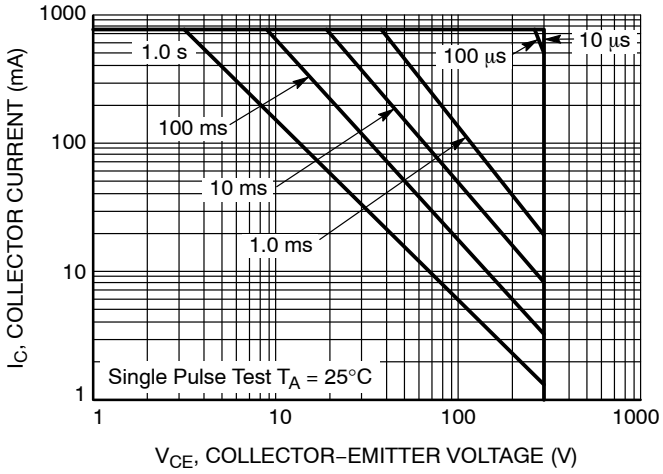
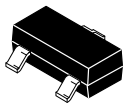


Figure 5. Safe Operating Area

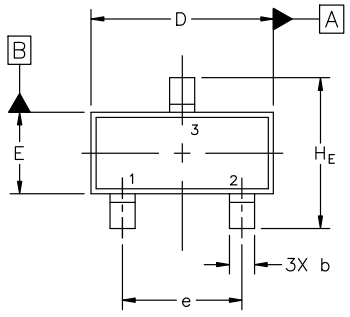
MECHANICAL CASE OUTLINE
PACKAGE DIMENSIONS



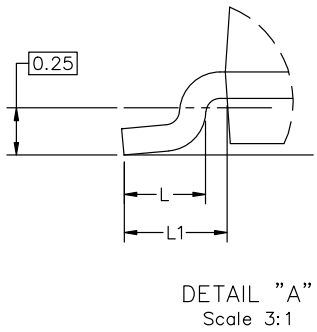
SCALE 4:1

SOT−23 (TO−236) 2.90x1.30x1.00 1.90P
CASE 318
ISSUE AU

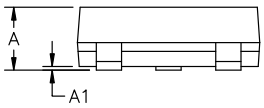
DATE 14 AUG 2024



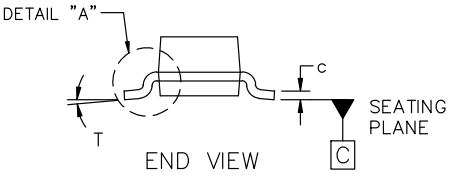
TOP VIEW



DETAIL "A"
Scale 3:1



SIDE VIEW

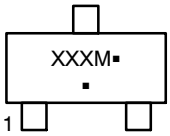


END VIEW

MILLIMETERS			
DIM	MIN	NOM	MAX
A	0.89	1.00	1.11
A1	0.01	0.06	0.10
b	0.37	0.44	0.50
c	0.08	0.14	0.20
D	2.80	2.90	3.04
E	1.20	1.30	1.40
e	1.78	1.90	2.04
L	0.30	0.43	0.55
L1	0.35	0.54	0.69
H_E	2.10	2.40	2.64
T	0°	−−−	10°

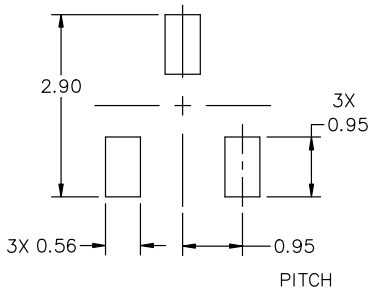
NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 2018.
2. CONTROLLING DIMENSIONS: MILLIMETERS.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF THE BASE MATERIAL.
4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE BURRS.

GENERIC MARKING DIAGRAM*



XXX = Specific Device Code
M = Date Code
▪ = Pb−Free Package

*This information is generic. Please refer to device data sheet for actual part marking. Pb−Free indicator, "G" or microdot "▪", may or may not be present. Some products may not follow the Generic Marking.



RECOMMENDED
MOUNTING FOOTPRINT

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

STYLES ON PAGE 2

DOCUMENT NUMBER:	**98ASB42226B**	Electronic versions are uncontrolled except when accessed directly from the Document Repository. Printed versions are uncontrolled except when stamped "CONTROLLED COPY" in red.	
DESCRIPTION:	**SOT−23 (TO−236) 2.90x1.30x1.00 1.90P**		**PAGE 1 OF 2**

SOT−23 (TO−236) 2.90x1.30x1.00 1.90P
CASE 318
ISSUE AU

DATE 14 AUG 2024

STYLE 1 THRU 5:
CANCELLED

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

STYLE 7:
PIN 1. EMITTER
2. BASE
3. COLLECTOR

STYLE 8:
PIN 1. ANODE
2. NO CONNECTION
3. CATHODE

STYLE 9:
PIN 1. ANODE
2. ANODE
3. CATHODE

STYLE 10:
PIN 1. DRAIN
2. SOURCE
3. GATE

STYLE 11:
PIN 1. ANODE
2. CATHODE
3. CATHODE−ANODE

STYLE 12:
PIN 1. CATHODE
2. CATHODE
3. ANODE

STYLE 13:
PIN 1. SOURCE
2. DRAIN
3. GATE

STYLE 14:
PIN 1. CATHODE
2. GATE
3. ANODE

STYLE 15:
PIN 1. GATE
2. CATHODE
3. ANODE

STYLE 16:
PIN 1. ANODE
2. CATHODE
3. CATHODE

STYLE 17:
PIN 1. NO CONNECTION
2. ANODE
3. CATHODE

STYLE 18:
PIN 1. NO CONNECTION
2. CATHODE
3. ANODE

STYLE 19:
PIN 1. CATHODE
2. ANODE
3. CATHODE−ANODE

STYLE 20:
PIN 1. CATHODE
2. ANODE
3. GATE

STYLE 21:
PIN 1. GATE
2. SOURCE
3. DRAIN

STYLE 22:
PIN 1. RETURN
2. OUTPUT
3. INPUT

STYLE 23:
PIN 1. ANODE
2. ANODE
3. CATHODE

STYLE 24:
PIN 1. GATE
2. DRAIN
3. SOURCE

STYLE 25:
PIN 1. ANODE
2. CATHODE
3. GATE

STYLE 26:
PIN 1. CATHODE
2. ANODE
3. NO CONNECTION

STYLE 27:
PIN 1. CATHODE
2. CATHODE
3. CATHODE

STYLE 28:
PIN 1. ANODE
2. ANODE
3. ANODE

ADDITIONAL INFORMATION

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OUR CERTIFICATE

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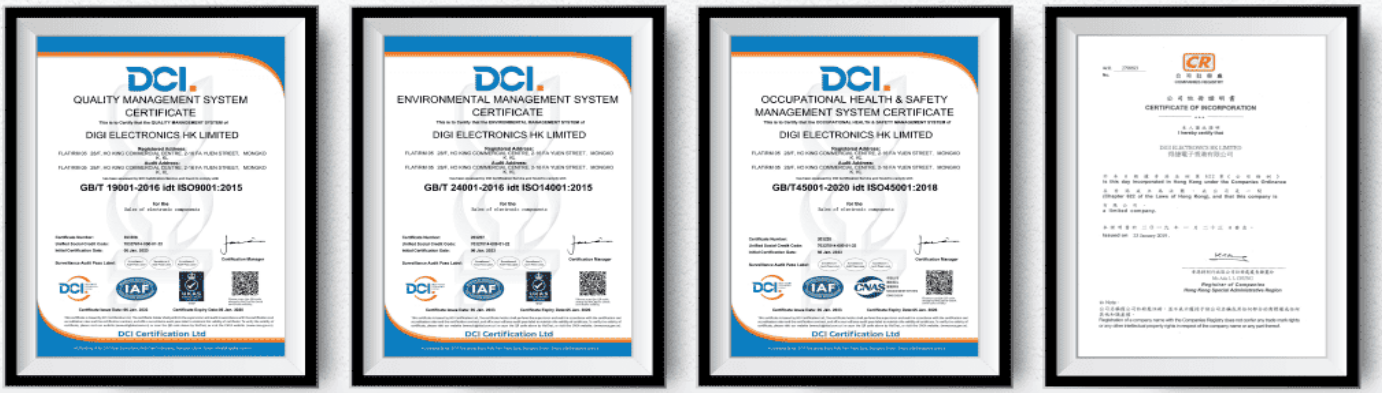

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