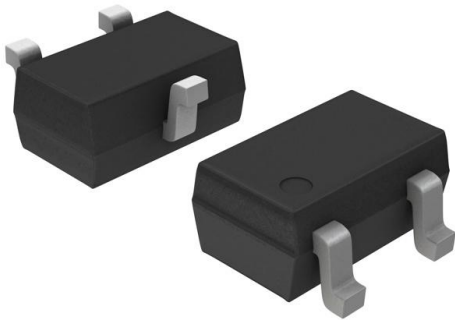


SMMBTA56WT3G Datasheet

www.digi-electronics.com



<https://www.DiGi-Electronics.com>

DiGi Electronics Part Number	SMMBTA56WT3G-DG
Manufacturer	onsemi
Manufacturer Product Number	SMMBTA56WT3G
Description	TRANS PNP 80V 0.5A SC70-3
Detailed Description	Bipolar (BJT) Transistor PNP 80 V 500 mA 50MHz 150 mW Surface Mount SC-70-3 (SOT323)



Tel: +00 852-30501935

RFQ Email: Info@DiGi-Electronics.com

DiGi is a global authorized distributor of electronic components.

Purchase and inquiry

Manufacturer Product Number:

SMMBTA56WT3G

Series:

-

Transistor Type:

PNP

Voltage - Collector Emitter Breakdown (Max):

80 V

Current - Collector Cutoff (Max):

100nA

Power - Max:

150 mW

Operating Temperature:

-55°C ~ 150°C (TJ)

Package / Case:

SC-70, SOT-323

Base Product Number:

SMMBTA56

Manufacturer:

onsemi

Product Status:

Active

Current - Collector (Ic) (Max):

500 mA

Vce Saturation (Max) @ Ib, Ic:

250mV @ 10mA, 100mA

DC Current Gain (hFE) (Min) @ Ic, Vce:

100 @ 100mA, 1V

Frequency - Transition:

50MHz

Mounting Type:

Surface Mount

Supplier Device Package:

SC-70-3 (SOT323)

Environmental & Export classification

RoHS Status:

ROHS3 Compliant

REACH Status:

REACH Unaffected

HTSUS:

8541.21.0095

Moisture Sensitivity Level (MSL):

1 (Unlimited)

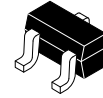
ECCN:

EAR99

Driver Transistor

PNP Silicon

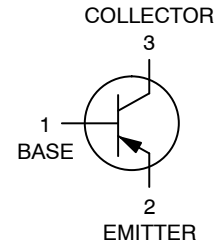
MMBTA56W, SMMBTA56W



SC-70 (SOT-323)
CASE 419
STYLE 3

Features

- Moisture Sensitivity Level: 1
- ESD Rating:
 - Human Body Model – 4 kV
 - Machine Model – 400 V
- 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	Value	Unit
Collector – Emitter Voltage	V_{CEO}	-80	Vdc
Collector – Base Voltage	V_{CBO}	-80	Vdc
Emitter – Base Voltage	V_{EBO}	-4.0	Vdc
Collector Current – Continuous	I_C	-500	mAdc

THERMAL CHARACTERISTICS

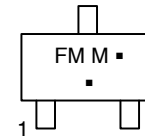
Characteristic	Symbol	Max	Unit
Total Device Dissipation FR-5 Board $T_A = 25^\circ\text{C}$	P_D	460	mW
Thermal Resistance, Junction to Ambient (Note 1)	$R_{\theta JA}$	272	$^\circ\text{C}/\text{W}$
Junction and Storage Temperature Range	T_J, T_{stg}	-55 to +150	$^\circ\text{C}$

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-4 Board, 1 oz. Cu, 100 mm².

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

MARKING DIAGRAM



FM = Device Code
M = Date Code*
▪ = Pb-Free Package

(Note: Microdot may be in either location)

*Date Code orientation may vary depending upon manufacturing location.

ORDERING INFORMATION

Device	Package	Shipping†
MMBTA56WT1G	SC-70 (Pb-Free)	3,000 / Tape & Reel
SMMBTA56WT1G	SC-70 (Pb-Free)	3,000 / Tape & Reel
SMMBTA56WT3G	SC-70 (Pb-Free)	10,000 / 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.

MMBTA56W, SMMBTA56W**ELECTRICAL CHARACTERISTICS** ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector - Emitter Breakdown Voltage (Note 1) ($I_C = -1.0\text{ mAdc}$, $I_B = 0$)	$V_{(BR)CEO}$	-80	-	Vdc
Emitter - Base Breakdown Voltage ($I_E = -100\text{ }\mu\text{Adc}$, $I_C = 0$)	$V_{(BR)EBO}$	-4.0	-	Vdc
Collector Cutoff Current ($V_{CE} = -60\text{ Vdc}$, $I_B = 0$)	I_{CES}	-	-0.1	μAdc
Collector Cutoff Current ($V_{CB} = -60\text{ Vdc}$, $I_E = 0$) ($V_{CB} = -80\text{ Vdc}$, $I_E = 0$)	I_{CBO}	-	-0.1	μAdc

ON CHARACTERISTICS

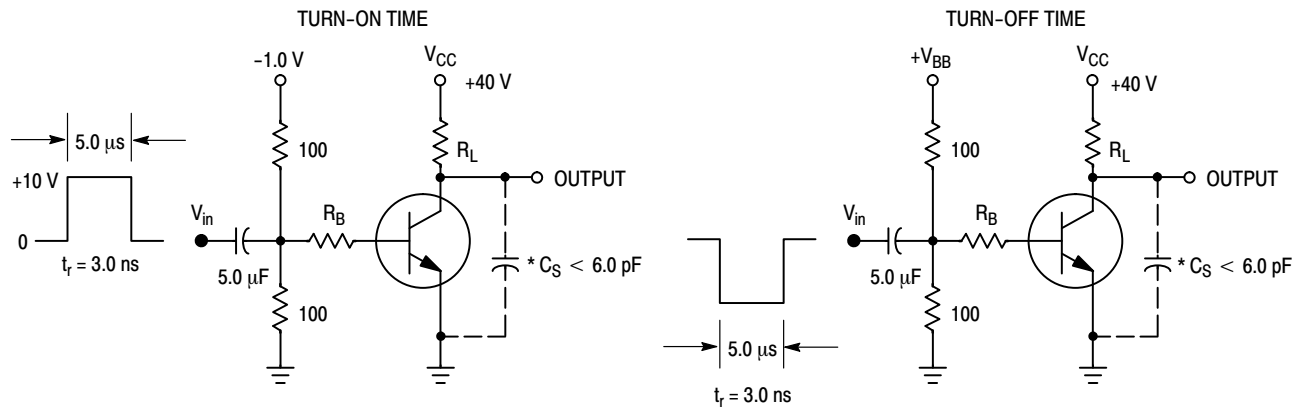
DC Current Gain ($I_C = -10\text{ mAdc}$, $V_{CE} = -1.0\text{ Vdc}$) ($I_C = -100\text{ mAdc}$, $V_{CE} = -1.0\text{ Vdc}$)	h_{FE}	100 100	- -	-
Collector - Emitter Saturation Voltage ($I_C = -100\text{ mAdc}$, $I_B = -10\text{ mAdc}$)	$V_{CE(sat)}$	-	-0.25	Vdc
Base - Emitter On Voltage ($I_C = -100\text{ mAdc}$, $V_{CE} = -1.0\text{ Vdc}$)	$V_{BE(on)}$	-	-1.2	Vdc

SMALL-SIGNAL CHARACTERISTICS

Current - Gain - Bandwidth Product (Note 2) ($I_C = -100\text{ mAdc}$, $V_{CE} = -1.0\text{ Vdc}$, $f = 100\text{ MHz}$)	f_T	50	-	MHz
---	-------	----	---	-----

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.

1. Pulse Test: Pulse Width $\leq 300\text{ }\mu\text{s}$, Duty Cycle $\leq 2.0\%$.
2. f_T is defined as the frequency at which $|h_{fe}|$ extrapolates to unity.



*Total Shunt Capacitance of Test Jig and Connectors
For PNP Test Circuits, Reverse All Voltage Polarities

Figure 1. Switching Time Test Circuits

MMBTA56W, SMMBTA56W

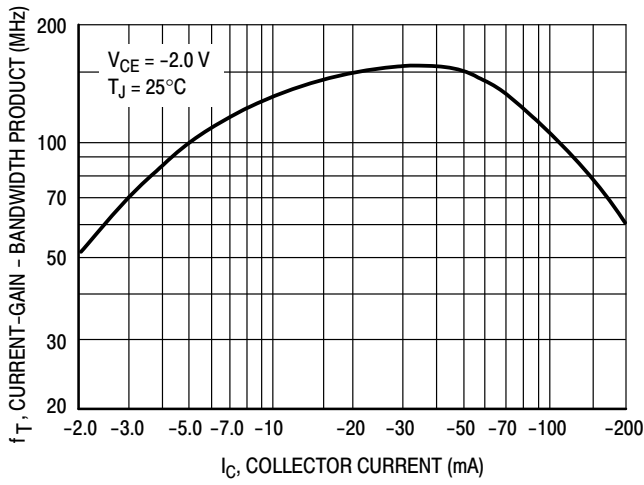


Figure 2. Current-Gain — Bandwidth Product

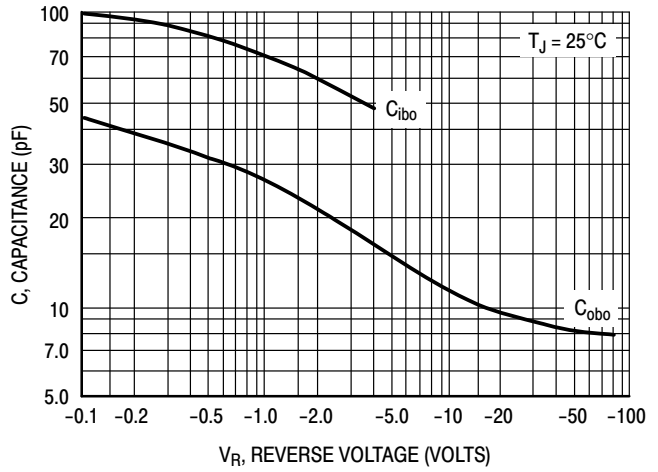


Figure 3. Capacitance

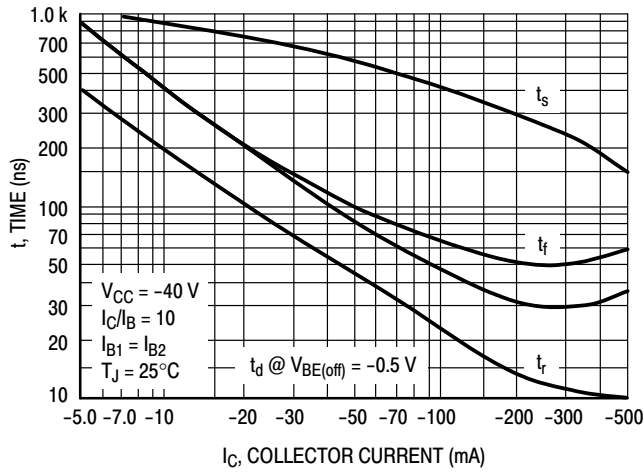


Figure 4. Switching Time

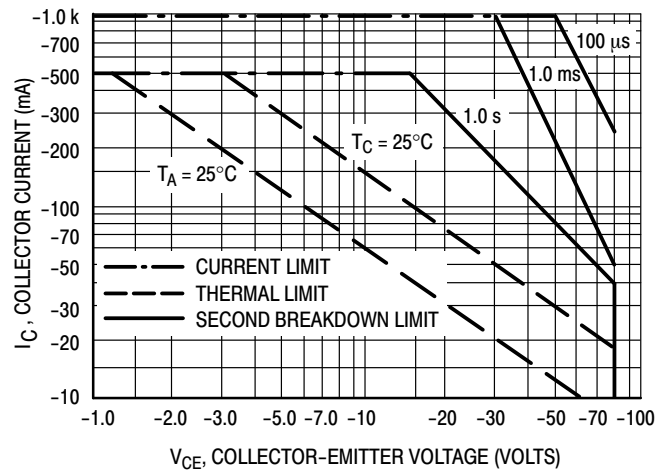


Figure 5. Active-Region Safe Operating Area

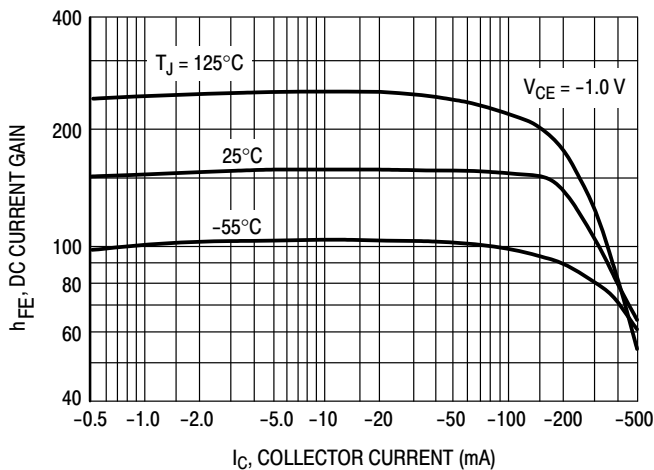


Figure 6. DC Current Gain

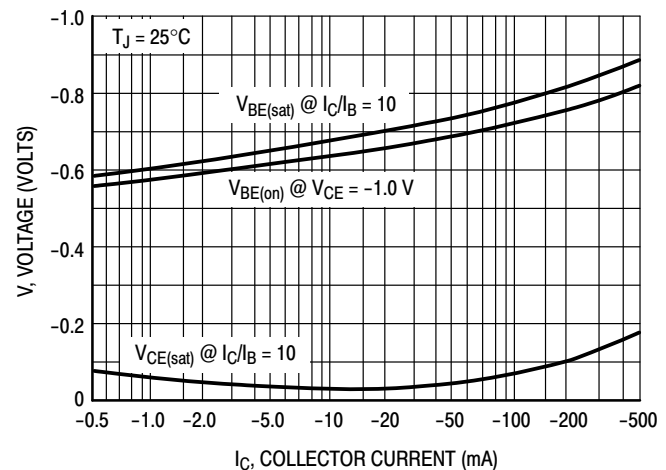


Figure 7. "ON" Voltages

MMBTA56W, SMMBTA56W

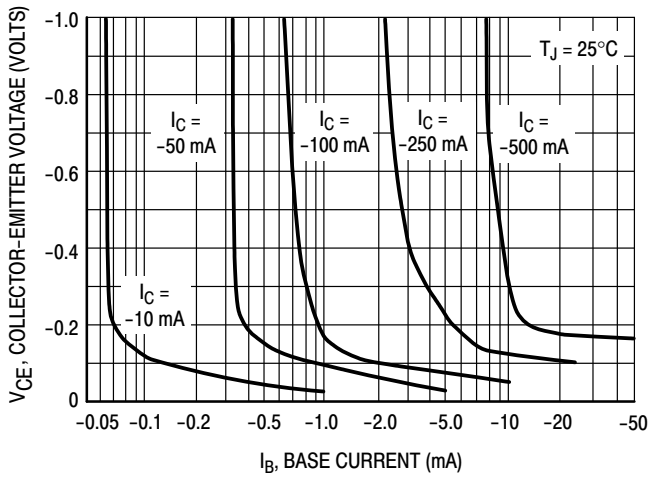


Figure 8. Collector Saturation Region

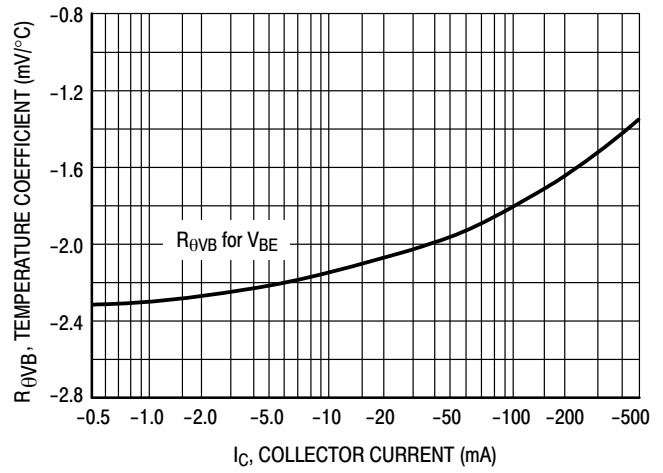
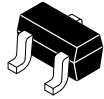


Figure 9. Base-Emitter Temperature Coefficient



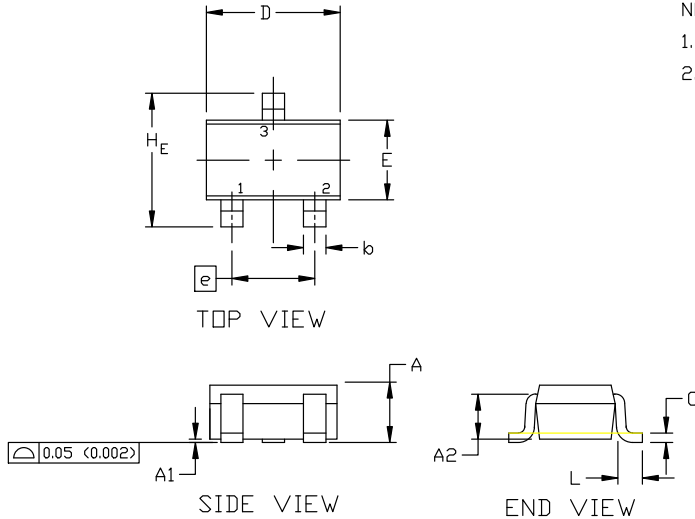
**MECHANICAL CASE OUTLINE
PACKAGE DIMENSIONS**



SCALE 4:1

**SC-70 (SOT-323)
CASE 419
ISSUE R**

DATE 11 OCT 2022

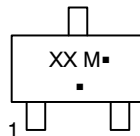


NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH

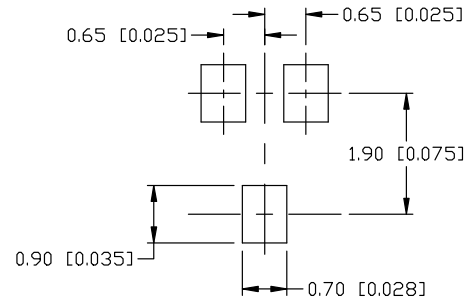
DIM	MILLIMETERS			INCHES		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	0.80	0.90	1.00	0.032	0.035	0.040
A1	0.00	0.05	0.10	0.000	0.002	0.004
A2	0.70 REF			0.028 BSC		
b	0.30	0.35	0.40	0.012	0.014	0.016
c	0.10	0.18	0.25	0.004	0.007	0.010
D	1.80	2.00	2.20	0.071	0.080	0.087
E	1.15	1.24	1.35	0.045	0.049	0.053
e	1.20	1.30	1.40	0.047	0.051	0.055
e1	0.65 BSC			0.026 BSC		
L	0.20	0.38	0.56	0.008	0.015	0.022
H _E	2.00	2.10	2.40	0.079	0.083	0.095

GENERIC MARKING DIAGRAM



- XX = 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.



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

SOLDERING FOOTPRINT

- | | | | | | |
|---|---|---|--|---|---|
| STYLE 1:
CANCELLED | STYLE 2:
PIN 1. ANODE
2. N.C.
3. CATHODE | STYLE 3:
PIN 1. BASE
2. EMITTER
3. COLLECTOR | STYLE 4:
PIN 1. CATHODE
2. CATHODE
3. ANODE | STYLE 5:
PIN 1. ANODE
2. ANODE
3. CATHODE | |
| STYLE 6:
PIN 1. EMITTER
2. BASE
3. COLLECTOR | STYLE 7:
PIN 1. BASE
2. EMITTER
3. COLLECTOR | STYLE 8:
PIN 1. GATE
2. SOURCE
3. DRAIN | STYLE 9:
PIN 1. ANODE
2. CATHODE
3. CATHODE-ANODE | STYLE 10:
PIN 1. CATHODE
2. ANODE
3. ANODE-CATHODE | STYLE 11:
PIN 1. CATHODE
2. CATHODE
3. CATHODE |

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DESCRIPTION:	SC-70 (SOT-323)	PAGE 1 OF 1

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