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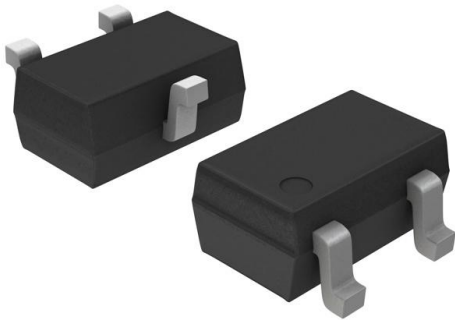
DiGi Electronics Part Number	SMMBTA56WT3G-DG
Manufacturer	onsemi
Manufacturer Product Number	SMMBTA56WT3G
Description	TRANS PNP 80V 0.5A SC70-3
Detailed Description	Bipolar (BJT) Transistor PNP 80 V 500 mA 50MHz 150 mW Surface Mount SC-70-3 (SOT323)

Purchase and inquiry

Manufacturer Product Number:	**Manufacturer:**
SMMBTA56WT3G	onsemi
Series:	**Product Status:**
-	Active
Transistor Type:	**Current - Collector (Ic) (Max):**
PNP	500 mA
Voltage - Collector Emitter Breakdown (Max):	**Vce Saturation (Max) @ Ib, Ic:**
80 V	250mV @ 10mA, 100mA
Current - Collector Cutoff (Max):	**DC Current Gain (hFE) (Min) @ Ic, Vce:**
100nA	100 @ 100mA, 1V
Power - Max:	**Frequency - Transition:**
150 mW	50MHz
Operating Temperature:	**Mounting Type:**
-55°C ~ 150°C (TJ)	Surface Mount
Package / Case:	**Supplier Device Package:**
SC-70, SOT-323	SC-70-3 (SOT323)
Base Product Number:	
SMMBTA56	

Environmental & Export classification

RoHS Status:	**Moisture Sensitivity Level (MSL):**
ROHS3 Compliant	1 (Unlimited)
REACH Status:	**ECCN:**
REACH Unaffected	EAR99
HTSUS:	
8541.21.0095	

onsemi
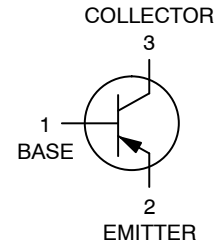
Driver Transistor

PNP Silicon

MMBTA56W, SMMBTA56W
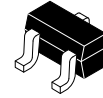
SC−70 (SOT−323)
CASE 419
STYLE 3

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*

COLLECTOR
3

1
BASE

2
EMITTER

MARKING DIAGRAM

FM M ▪

1

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.

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 $T_A = 25°C$	P_D	460	mW
Thermal Resistance, Junction to Ambient (Note 1)	$R_{\theta JA}$	272	°C/W
Junction and Storage Temperature Range	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−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.

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.

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

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector – Emitter Breakdown Voltage (Note 1) (I_C = −1.0 mAdc, I_B = 0)	$V_{(BR)CEO}$	−80	–	Vdc
Emitter – Base Breakdown Voltage (I_E = −100 μAdc, I_C = 0)	$V_{(BR)EBO}$	−4.0	–	Vdc
Collector Cutoff Current (V_{CE} = −60 Vdc, I_B = 0)	I_{CES}	–	−0.1	μAdc
Collector Cutoff Current (V_{CB} = −60 Vdc, I_E = 0) (V_{CB} = −80 Vdc, I_E = 0)	I_{CBO}	– –	– −0.1	μAdc
ON CHARACTERISTICS				
DC Current Gain (I_C = −10 mAdc, V_{CE} = −1.0 Vdc) (I_C = −100 mAdc, V_{CE} = −1.0 Vdc)	h_{FE}	100 100	– –	–
Collector – Emitter Saturation Voltage (I_C = −100 mAdc, I_B = −10 mAdc)	$V_{CE(sat)}$	–	−0.25	Vdc
Base – Emitter On Voltage (I_C = −100 mAdc, V_{CE} = −1.0 Vdc)	$V_{BE(on)}$	–	−1.2	Vdc
SMALL–SIGNAL CHARACTERISTICS				
Current – Gain – Bandwidth Product (Note 2) (I_C = −100 mAdc, V_{CE} = −1.0 Vdc, f = 100 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 ≤ 300 μs, Duty Cycle ≤ 2.0%.
2. f_T is defined as the frequency at which $|h_{fe}|$ extrapolates to unity.
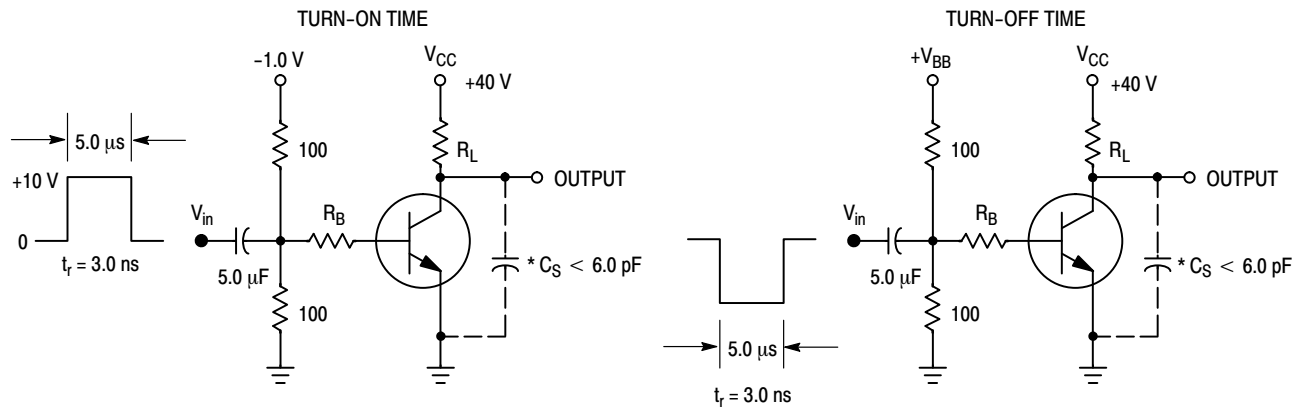
*Total Shunt Capacitance of Test Jig and Connectors
For PNP Test Circuits, Reverse All Voltage Polarities

Figure 1. Switching Time Test Circuits
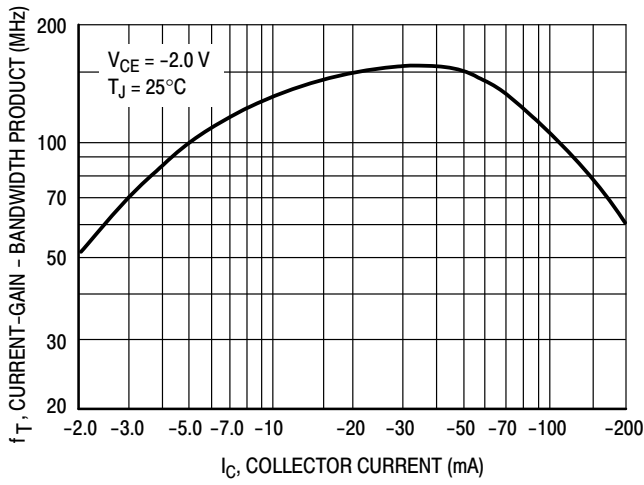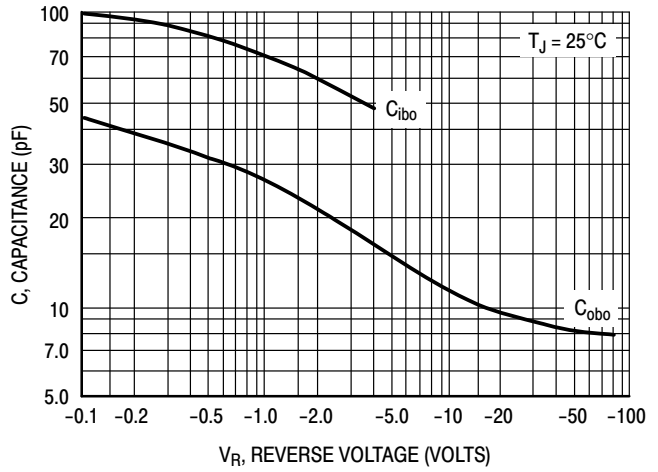
Figure 2. Current–Gain — Bandwidth Product
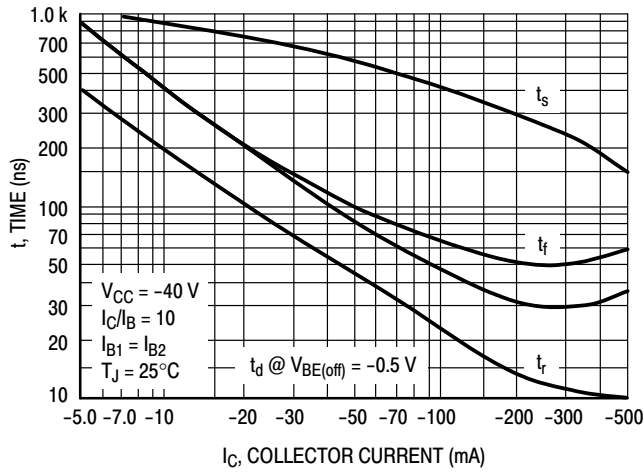

Figure 3. Capacitance
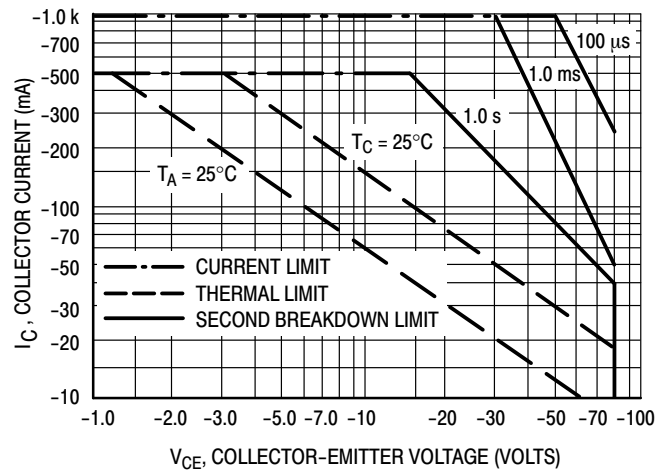

Figure 4. Switching Time

Figure 5. Active–Region Safe Operating Area
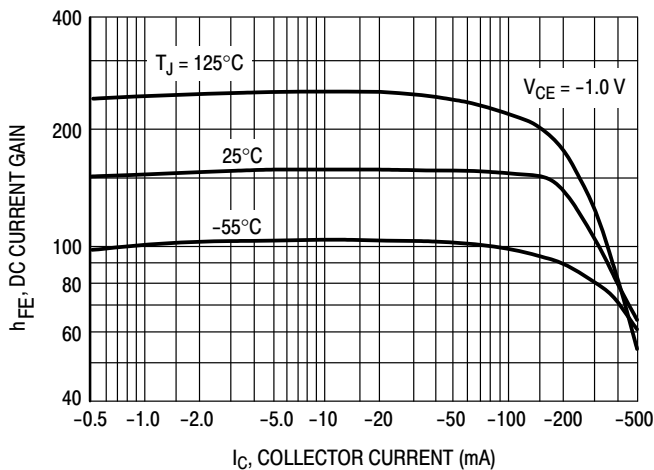

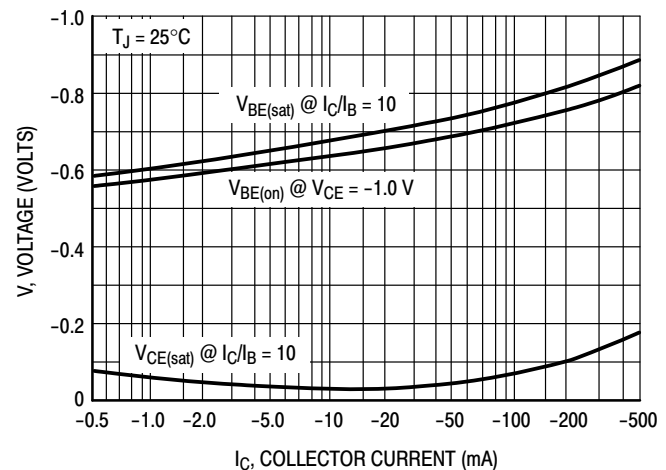**Figure 6. DC Current Gain**

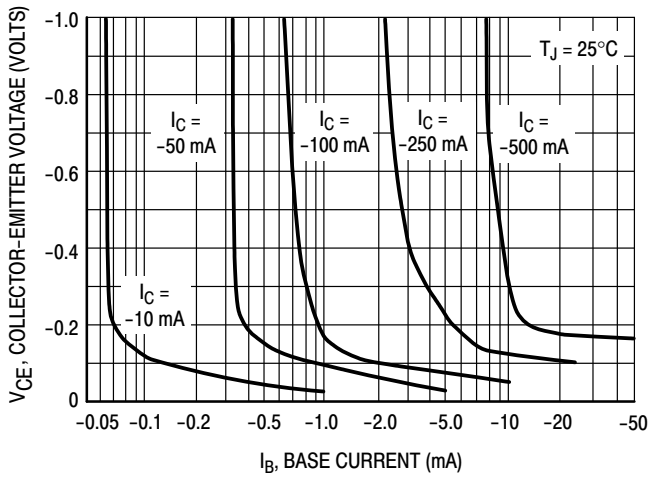**Figure 7. "ON" Voltages**

MMBTA56W, SMMBTA56W

Figure 8. Collector Saturation Region
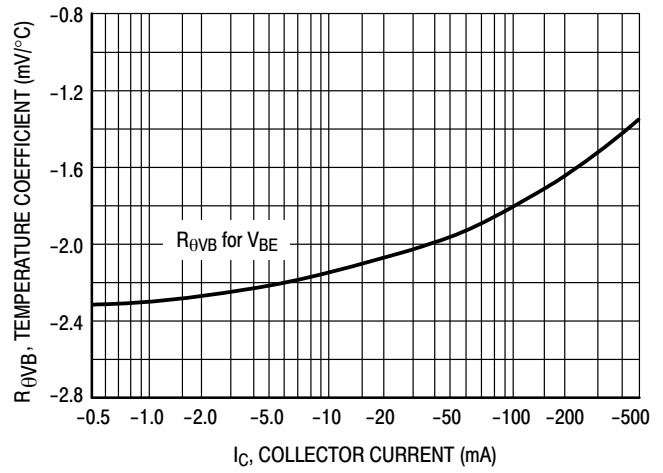
Figure 9. Base−Emitter Temperature Coefficient

onsemi

MECHANICAL CASE OUTLINE
PACKAGE DIMENSIONS
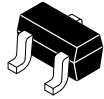
SC−70 (SOT−323)
CASE 419
ISSUE R

DATE 11 OCT 2022

SCALE 4:1

D

H$_E$

3

1   2

E

b

e

TOP VIEW

A

0.05 (0.002)   A1

SIDE VIEW

A2   L

C

END VIEW
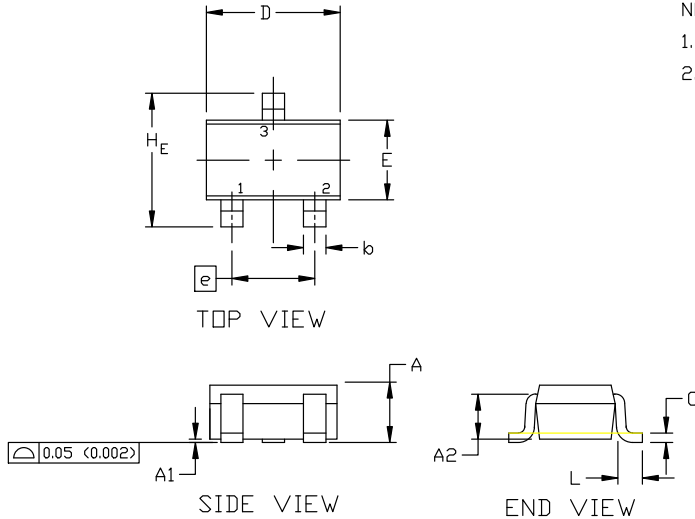
NOTES:

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 M▪
▪

1
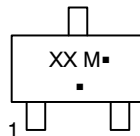
XX   = Specific Device Code
M   = Date Code
▪   = Pb−Free Package

*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.
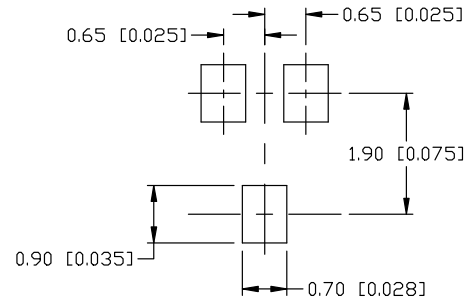
0.65 [0.025]   0.65 [0.025]

1.90 [0.075]

0.90 [0.035]

0.70 [0.028]

* For additional information on our Pb−Free
  strategy and soldering details, please download
  the ON 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

ADDITIONAL INFORMATION

◊

OUR CERTIFICATE

DiGi provide top-quality products and perfect service for customer worldwide through standardization, technological innovation and continuous improvement. DiGi through third-party certification, we striciy control the quality of products and services. Welcome your RFQ to Email: Info@DiGi-Electronics.com