

# BC856BM3, NSVBC856BM3

## General Purpose Transistor

### PNP Silicon

This transistor is designed for general purpose amplifier applications. It is housed in the SOT-723 which is designed for low power surface mount applications.

#### Features

- NSV 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	$V_{CEO}$	-65	V
Collector-Base Voltage	$V_{CBO}$	-80	V
Emitter-Base Voltage	$V_{EBO}$	-5.0	V
Collector Current - Continuous	$I_C$	-100	mA

#### THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Total Device Dissipation FR-5 Board (Note 1) $T_A = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	265	mW
Thermal Resistance, Junction to Ambient (Note 1)	$R_{\theta JA}$	470	$^\circ\text{C}/\text{W}$
Total Device Dissipation Alumina Substrate (Note 2) $T_A = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	640	mW
Thermal Resistance, Junction to Ambient (Note 2)	$R_{\theta JA}$	195	$^\circ\text{C}/\text{W}$
Junction and Storage Temperature Range	$T_J, T_{stg}$	-55 to +150	$^\circ\text{C}$

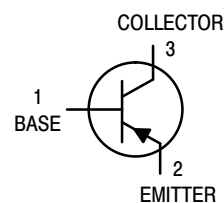
Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

1. FR-5 =  $1.0 \times 0.75 \times 0.062$  in.
2. Alumina =  $0.4 \times 0.3 \times 0.024$  in. 99.5% alumina.

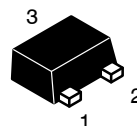


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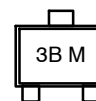
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#### MARKING DIAGRAM



**SOT-723  
CASE 631AA  
STYLE 1**



3B = Specific Device Code  
M = Date Code

#### ORDERING INFORMATION

Device	Package	Shipping†
BC856BM3T5G	SOT-723 (Pb-Free)	8000 / Tape & Reel
NSVBC856BM3T5G	SOT-723 (Pb-Free)	8000 / 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.

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

Characteristic	Symbol	Min	Typ	Max	Unit
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#### OFF CHARACTERISTICS

Collector – Emitter Breakdown Voltage ( $I_C = -10\text{ mA}$ )	$V_{(BR)CEO}$	-65	-	-	V
Collector – Emitter Breakdown Voltage ( $I_C = -10\ \mu\text{A}$ , $V_{EB} = 0$ )	$V_{(BR)CES}$	-80	-	-	V
Collector – Base Breakdown Voltage ( $I_C = -10\ \mu\text{A}$ )	$V_{(BR)CBO}$	-80	-	-	V
Emitter – Base Breakdown Voltage ( $I_E = -1.0\ \mu\text{A}$ )	$V_{(BR)EBO}$	-5.0	-	-	V
Collector Cutoff Current ( $V_{CB} = -30\text{ V}$ ) ( $V_{CB} = -30\text{ V}$ , $T_A = 150^\circ\text{C}$ )	$I_{CBO}$	-	-	-15 -4.0	nA $\mu\text{A}$

#### ON CHARACTERISTICS

DC Current Gain ( $I_C = -10\ \mu\text{A}$ , $V_{CE} = -5.0\text{ V}$ ) ( $I_C = -2.0\text{ mA}$ , $V_{CE} = -5.0\text{ V}$ )	$h_{FE}$	- 220	150 290	- 475	-
Collector – Emitter Saturation Voltage ( $I_C = -10\text{ mA}$ , $I_B = -0.5\text{ mA}$ ) ( $I_C = -100\text{ mA}$ , $I_B = -5.0\text{ mA}$ )	$V_{CE(sat)}$	- -	- -	-0.3 -0.65	V
Base – Emitter Saturation Voltage ( $I_C = -10\text{ mA}$ , $I_B = -0.5\text{ mA}$ ) ( $I_C = -100\text{ mA}$ , $I_B = -5.0\text{ mA}$ )	$V_{BE(sat)}$	- -	-0.7 -0.9	- -	V
Base – Emitter Voltage ( $I_C = -2.0\text{ mA}$ , $V_{CE} = -5.0\text{ V}$ ) ( $I_C = -10\text{ mA}$ , $V_{CE} = -5.0\text{ V}$ )	$V_{BE(on)}$	-0.6 -	- -	-0.75 -0.82	mV

#### SMALL-SIGNAL CHARACTERISTICS

Current – Gain – Bandwidth Product ( $I_C = -10\text{ mA}$ , $V_{CE} = -5.0\text{ Vdc}$ , $f = 100\text{ MHz}$ )	$f_T$	100	-	-	MHz
Output Capacitance ( $V_{CB} = -10\text{ V}$ , $f = 1.0\text{ MHz}$ )	$C_{obo}$	-	-	4.5	pF
Noise Figure ( $I_C = -0.2\text{ mA}$ , $V_{CE} = -5.0\text{ Vdc}$ , $R_S = 2.0\text{ k}\Omega$ , $f = 1.0\text{ kHz}$ , $BW = 200\text{ Hz}$ )	NF	-	-	10	dB

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## TYPICAL CHARACTERISTICS



Figure 1. DC Current Gain



Figure 2. "On" Voltage



Figure 3. Collector Saturation Region



Figure 4. Base-Emitter Temperature Coefficient



Figure 5. Capacitance

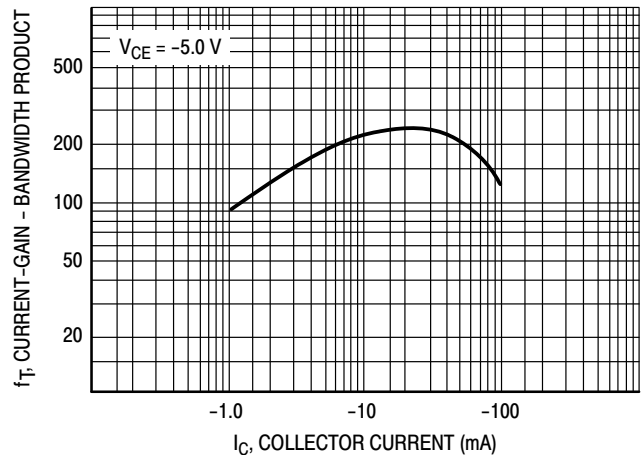


Figure 6. Current-Gain - Bandwidth Product

# MECHANICAL CASE OUTLINE

## PACKAGE DIMENSIONS

ON Semiconductor®



SCALE 4:1

**SOT-723**  
CASE 631AA-01  
ISSUE D

DATE 10 AUG 2009

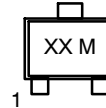


**NOTES:**

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH. 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			
DIM	MIN	NOM	MAX
A	0.45	0.50	0.55
b	0.15	0.21	0.27
b1	0.25	0.31	0.37
C	0.07	0.12	0.17
D	1.15	1.20	1.25
E	0.75	0.80	0.85
e	0.40 BSC		
H E	1.15	1.20	1.25
L	0.29 REF		
L2	0.15	0.20	0.25

**GENERIC MARKING DIAGRAM\***



XX = Specific Device Code  
M = Date Code

- |                                                       |                                                  |                                                    |                                                      |                                                  |
|-------------------------------------------------------|--------------------------------------------------|----------------------------------------------------|------------------------------------------------------|--------------------------------------------------|
| STYLE 1:<br>PIN 1. BASE<br>2. EMITTER<br>3. COLLECTOR | STYLE 2:<br>PIN 1. ANODE<br>2. N/C<br>3. CATHODE | STYLE 3:<br>PIN 1. ANODE<br>2. ANODE<br>3. CATHODE | STYLE 4:<br>PIN 1. CATHODE<br>2. CATHODE<br>3. ANODE | STYLE 5:<br>PIN 1. GATE<br>2. SOURCE<br>3. DRAIN |
|-------------------------------------------------------|--------------------------------------------------|----------------------------------------------------|------------------------------------------------------|--------------------------------------------------|

**RECOMMENDED SOLDERING FOOTPRINT\***



\*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G", may or not be present.

\*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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