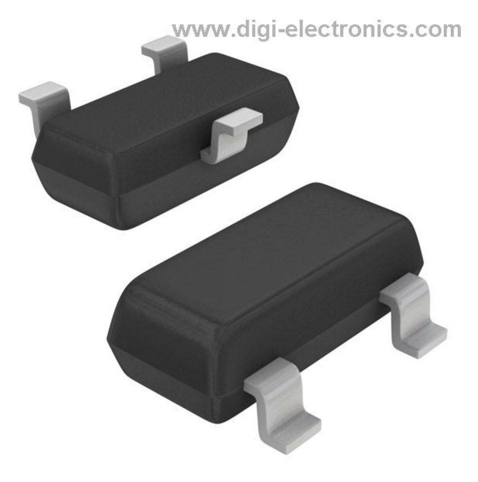
BC857ALT1G Datasheet



https://www.DiGi-Electronics.com

DiGi Electronics Part Number	BC857ALT1G-DG
Manufacturer	onsemi
Manufacturer Product Number	BC857ALT1G
Description	TRANS PNP 45V 0.1A SOT23-3
Detailed Description	Bipolar (BJT) Transistor PNP 45 V 100 mA 100MHz 300 mW Surface Mount SOT-23-3 (TO-236)

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:	Manufacturer:
BC857ALT1G	onsemi
Series:	Product Status:
-	Active
Transistor Type:	Current - Collector (Ic) (Max):
PNP	100 mA
Voltage - Collector Emitter Breakdown (Max):	Vce Saturation (Max) @ Ib, Ic:
45 V	650mV @ 5mA, 100mA
Current - Collector Cutoff (Max):	DC Current Gain (hFE) (Min) @ Ic, Vce:
15nA (ICBO)	125 @ 2mA, 5V
Power - Max:	Frequency - Transition:
300 mW	100MHz
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:	
BC857	

Environmental & Export classification

RoHS Status:	Moisture Sensitivity Level (MSL):
ROHS3 Compliant	1 (Unlimited)
REACH Status:	ECCN:
REACH Unaffected	EAR99
HTSUS:	
8541.21.0075	

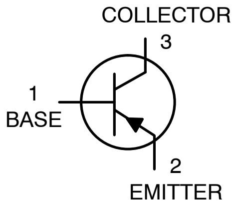
onsemi

DATA SHEET
www.onsemi.com

General Purpose Transistors

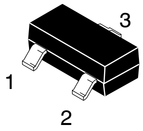
PNP Silicon

BC856ALT1G Series



Features

- S and 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



SOT−23 (TO−236)
CASE 318
STYLE 6

MAXIMUM RATINGS (T_A = 25°C unless otherwise noted)

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}		V
BC856, SBC856		−65	
BC857, SBC857		−45	
BC858, NSVBC858, BC859		−30	
Collector-Base Voltage	V_{CBO}		V
BC856, SBC856		−80	
BC857, SBC857		−50	
BC858, NSVBC858, BC859		−30	
Emitter−Base Voltage	V_{EBO}	−5.0	V
Collector Current − Continuous	I_C	−100	mAdc
Collector Current − Peak	I_C	−200	mAdc

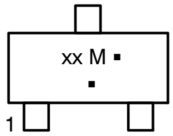
THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Total Device Dissipation FR−5 Board, (Note 1) T_A = 25°C	P_D	225	mW
Derate above 25°C		1.8	mW/°C
Thermal Resistance, Junction−to−Ambient	$R_{\theta JA}$	556	°C/W
Total Device Dissipation Alumina Substrate, (Note 2) T_A = 25°C	P_D	300	mW
Derate above 25°C		2.4	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.

MARKING DIAGRAM



xx = Device Code
xx = (Refer to page 6)
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

See detailed ordering and shipping information in the package dimensions section on page 6 of this data sheet.

© Semiconductor Components Industries, LLC, 1994

April, 2023 − Rev. 17

Publication Order Number:
BC856ALT1/D

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

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector − Emitter Breakdown Voltage BC856, SBC856 Series	$V_{(BR)CEO}$	−65	–	–	V
(I_C = −10 mA) BC857, SBC857 Series		−45	–	–	
BC858, NSBVC858 BC859 Series		−30	–	–	
Collector − Emitter Breakdown Voltage BC856 S, SBC856eries	$V_{(BR)CES}$	−80	–	–	V
(I_C = −10 μA, V_{EB} = 0) BC857A, SBC857A, BC857B, SBC857B Only		−50	–	–	
BC858, NSVB858, BC859 Series		−30	–	–	
Collector − Base Breakdown Voltage BC856, SBC856 Series	$V_{(BR)CBO}$	−80	–	–	V
(I_C = −10 μA) BC857, SBC857 Series		−50	–	–	
BC858, NSVBC858, BC859 Series		−30	–	–	
Emitter − Base Breakdown Voltage BC856, SBC856 Series	$V_{(BR)EBO}$	−5.0	–	–	V
(I_E = −1.0 μA) BC857, SBC857 Series		−5.0	–	–	
BC858, NSVBC858, BC859 Series		−5.0	–	–	
Collector Cutoff Current (V_{CB} = −30 V)	I_{CBO}	–	–	−15	nA
(V_{CB} = −30 V, T_A = 150°C)		–	–	−4.0	μA
ON CHARACTERISTICS					
DC Current Gain BC856A, SBC856A, BC857A, SBC857A, BC858A	h_{FE}	–	90	–	–
(I_C = −10 μA, V_{CE} = −5.0 V) BC856B, SBC856B, BC857B, SBC857B, BC858B, NSVBC858B		–	150	–	
BC857C, SBC857C BC858C		–	270	–	
(I_C = −2.0 mA, V_{CE} = −5.0 V) BC856A, SBC856A, BC857A, SBC857A, BC858A		125	180	250	
BC856B, SBC856B, BC857B, SBC857B, BC858B, NSVBC858B, BC859B		220	290	475	
BC857C, SBC857C, BC858C, BC859C		420	520	800	
Collector − Emitter Saturation Voltage	$V_{CE(sat)}$				V
(I_C = −10 mA, I_B = −0.5 mA)		–	–	−0.3	
(I_C = −100 mA, I_B = −5.0 mA)		–	–	−0.65	
Base − Emitter Saturation Voltage	$V_{BE(sat)}$				V
(I_C = −10 mA, I_B = −0.5 mA)		–	−0.7	–	
(I_C = −100 mA, I_B = −5.0 mA)		–	−0.9	–	
Base − Emitter On Voltage	$V_{BE(on)}$				V
(I_C = −2.0 mA, V_{CE} = −5.0 V)		−0.6	–	−0.75	
(I_C = −10 mA, V_{CE} = −5.0 V)		–	–	−0.82	
SMALL− SIGNAL CHARACTERISTICS					
Current − Gain − Bandwidth Product (I_C = −10 mA, V_{CE} = −5.0 Vdc, f = 100 MHz)	f_T	100	–	–	MHz
Output Capacitance (V_{CB} = −10 V, f = 1.0 MHz)	C_{ob}	–	–	4.5	pF
Noise Figure (I_C = −0.2 mA, V_{CE} = −5.0 Vdc, R_S = 2.0 kΩ, f = 1.0 kHz, BW = 200 Hz)	NF				dB
BC856, SBC856, BC857, SBC857, BC858, NSVBC858 Series		–	–	10	
BC859 Series		–	–	4.0	
SWITCHING CHARACTERISTICS					
Delay Time (V_{CC} = −3.0 Vdc, I_C = −10 mA, I_E = −1 mA)	t_d	–	35	–	ns
Rise Time (V_{CC} = −3.0 Vdc, I_C = −10 mA, I_E = −1 mA)	t_r	–	25	–	ns
Storage Time (V_{CC} = −3.0 Vdc, I_C = −10 mA, I_E = −1 mA)	t_s	–	310	–	ns
Fall Time (V_{CC} = −3.0 Vdc, I_C = −10 mA, I_E = −1 mA)	t_f	–	40	–	ns

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.

BC857/BC858/BC859/SBC857/NSVBC858

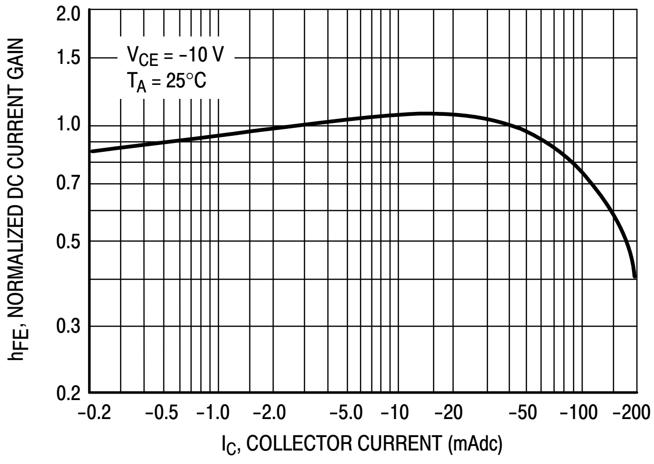


Figure 1. Normalized DC Current Gain

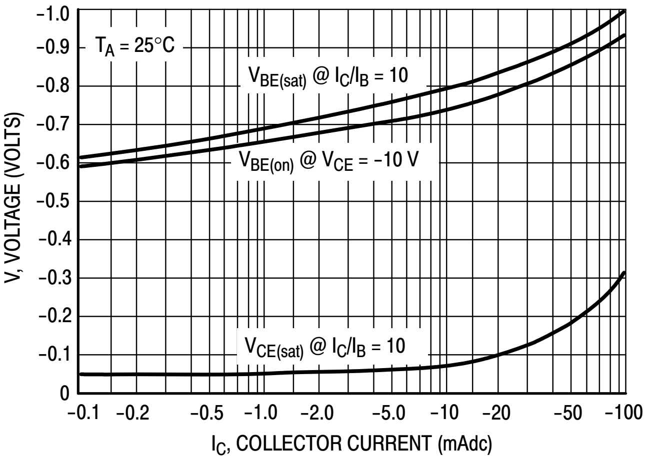


Figure 2. “Saturation” and “On” Voltages

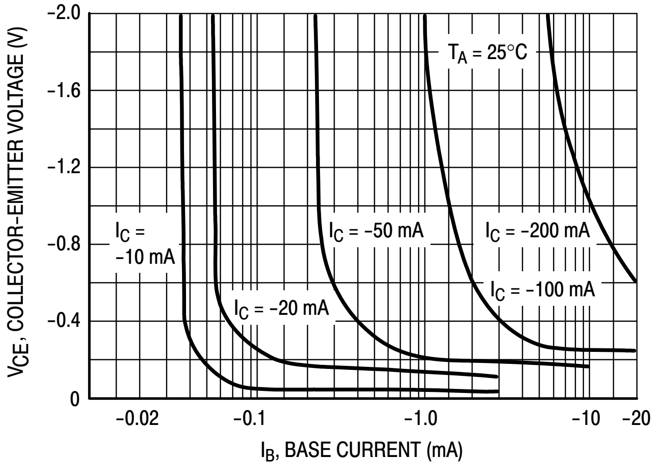


Figure 3. Collector Saturation Region

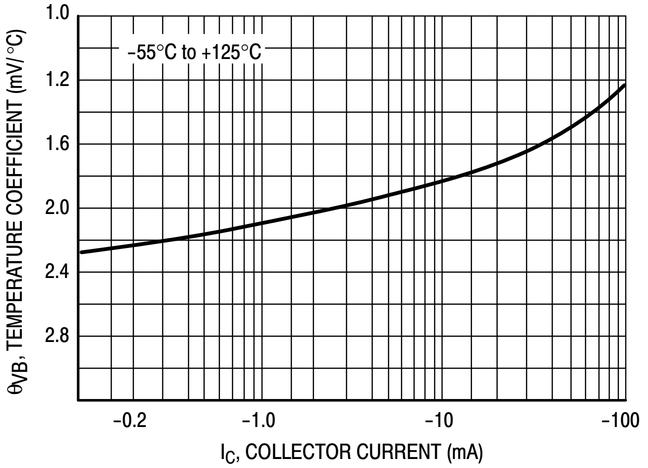


Figure 4. Base−Emitter Temperature Coefficient

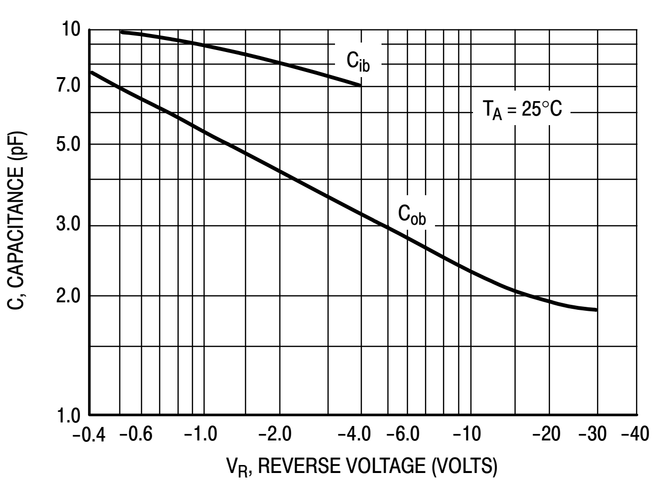


Figure 5. Capacitances

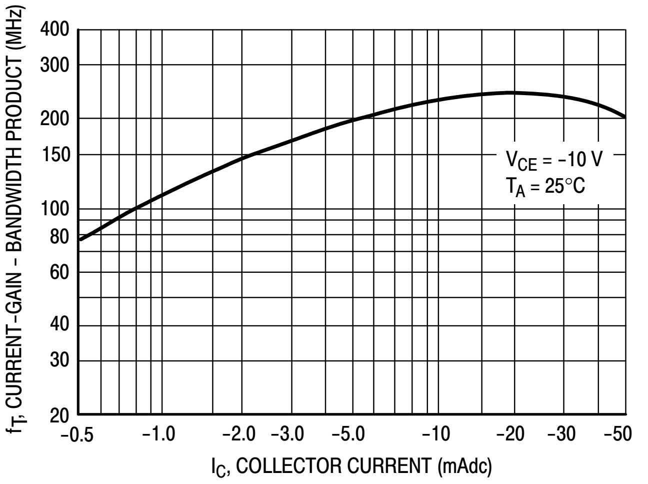


Figure 6. Current−Gain − Bandwidth Product

BC856/SBC856

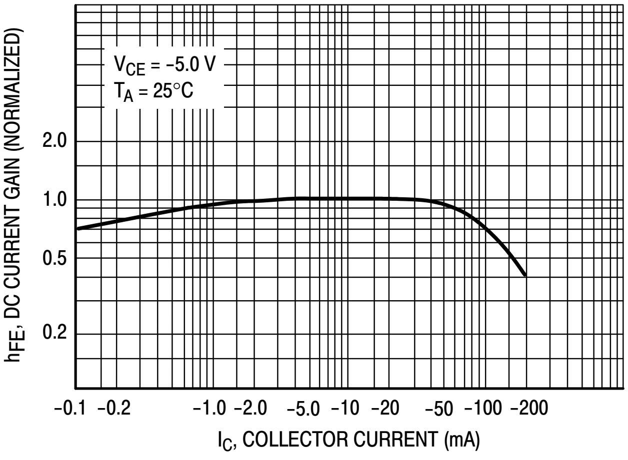


Figure 7. DC Current Gain

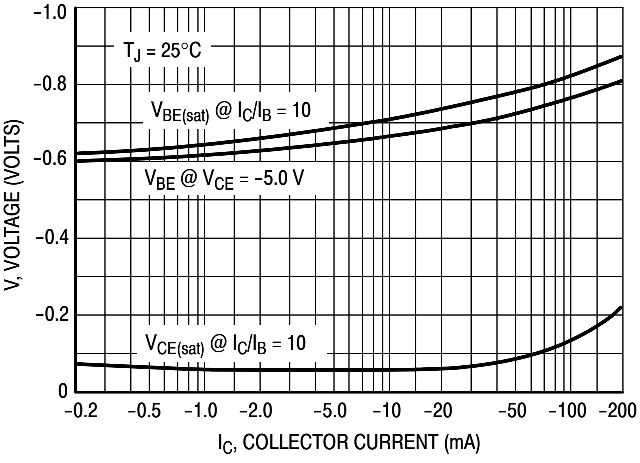


Figure 8. “On” Voltage

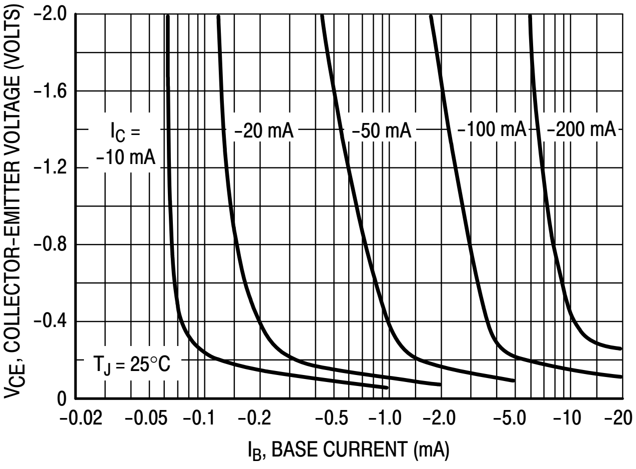


Figure 9. Collector Saturation Region

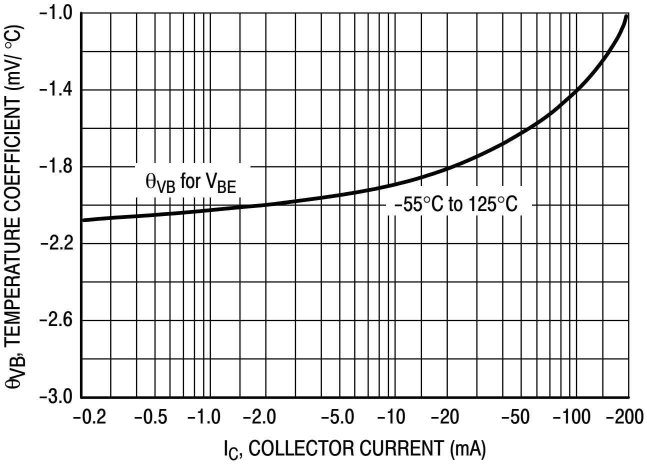


Figure 10. Base−Emitter Temperature Coefficient

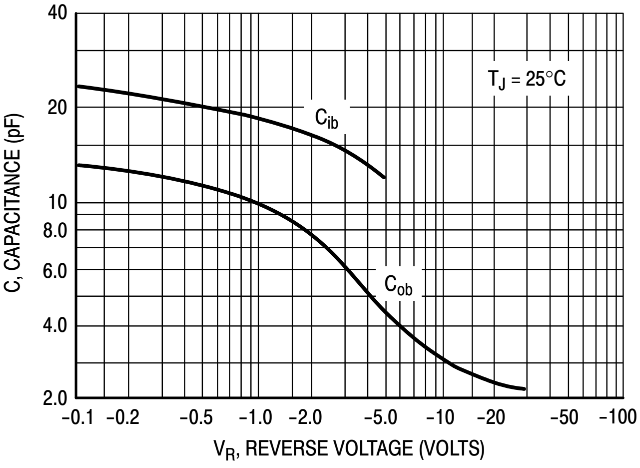


Figure 11. Capacitance

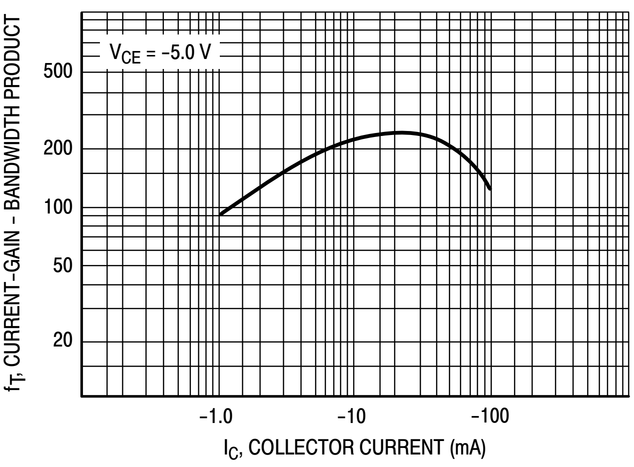


Figure 12. Current−Gain − Bandwidth Product

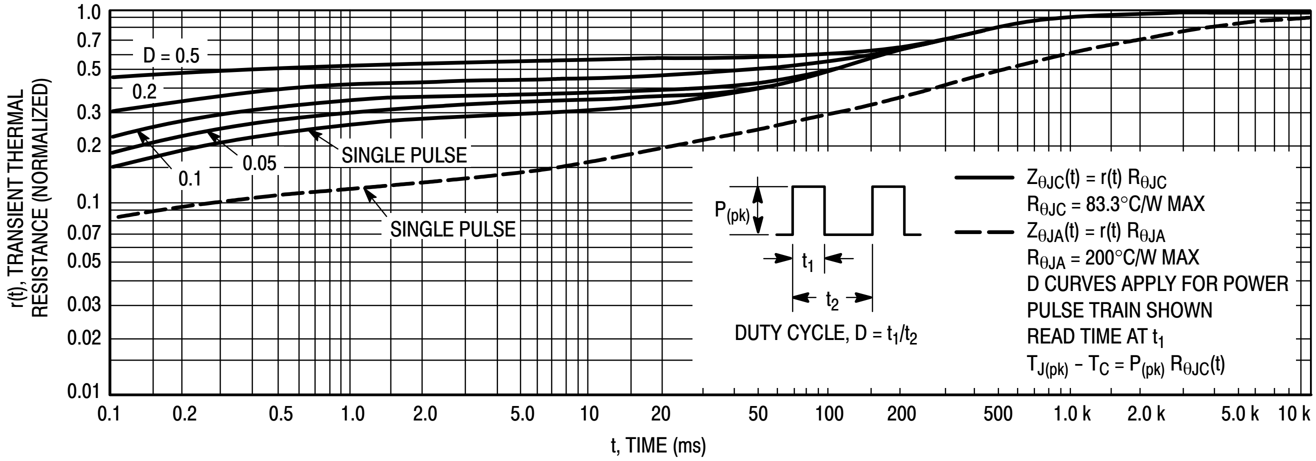


Figure 13. Thermal Response

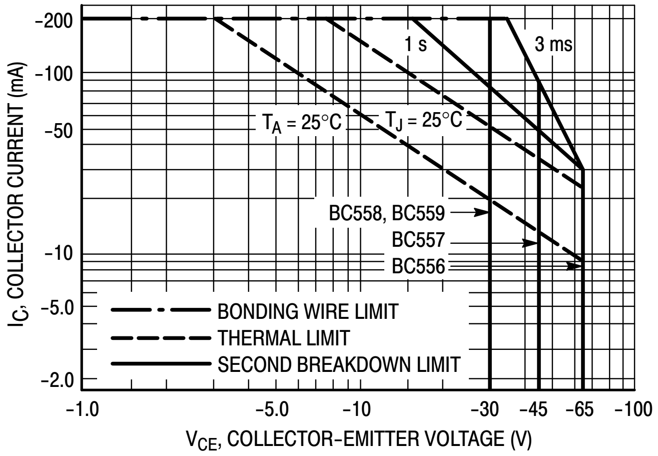


Figure 14. Active Region Safe Operating Area

The safe operating area curves indicate I_C−V_{CE} limits of the transistor that must be observed for reliable operation. Collector load lines for specific circuits must fall below the limits indicated by the applicable curve.

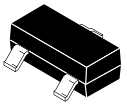
The data of Figure 14 is based upon $T_{J(pk)} = 150°C$; T_C or T_A is variable depending upon conditions. Pulse curves are valid for duty cycles to 10% provided $T_{J(pk)} \leq 150°C$. $T_{J(pk)}$ may be calculated from the data in Figure 13. At high case or ambient temperatures, thermal limitations will reduce the power that can be handled to values less than the limitations imposed by the secondary breakdown.

ORDERING INFORMATION

Device	Marking	Package	Shipping†
BC856ALT1G	3A	SOT−23 (Pb−Free)	3,000 / Tape & Reel
SBC856ALT1G*			
BC856ALT3G			10,000 / Tape & Reel
BC856BLT1G	3B	SOT−23 (Pb−Free)	3,000 / Tape & Reel
SBC856BLT1G*			
BC856BLT3G			10,000 / Tape & Reel
SBC856BLT3G*			
BC857ALT1G	3E	SOT−23 (Pb−Free)	3,000 / Tape & Reel
SBC857ALT1G*			
BC857BLT1G	3F	SOT−23 (Pb−Free)	3,000 / Tape & Reel
SBC857BLT1G*			
BC857BLT3G			10,000 / Tape & Reel
NSVBC857BLT3G*			
BC857CLT1G	3G	SOT−23 (Pb−Free)	3,000 / Tape & Reel
SBC857CLT1G*			
BC857CLT3G			10,000 / Tape & Reel
BC858ALT1G	3J	SOT−23 (Pb−Free)	3,000 / Tape & Reel
BC858BLT1G	3K	SOT−23 (Pb−Free)	
NSVBC858BLT1G*			
BC858BLT3G		SOT−23 (Pb−Free)	10,000 / Tape & Reel
BC858CLT1G	3L	SOT−23 (Pb−Free)	3,000 / Tape & Reel
BC858CLT3G		SOT−23 (Pb−Free)	10,000 / Tape & Reel
BC859BLT1G	4B	SOT−23 (Pb−Free)	3,000 / Tape & Reel
BC859BLT3G		SOT−23 (Pb−Free)	10,000 / Tape & Reel
BC859CLT1G	4C	SOT−23 (Pb−Free)	3,000 / Tape & Reel
BC859CLT3G		SOT−23 (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.

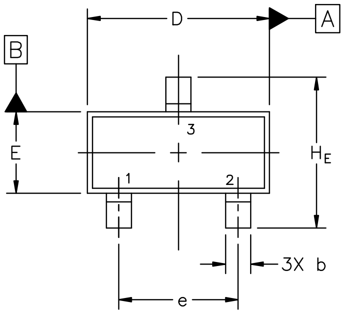
*S and NSV Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC−Q101 Qualified and PPAP Capable.



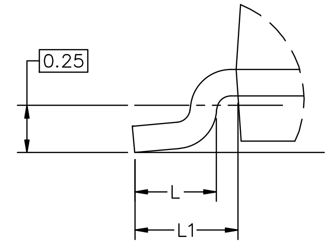
SCALE 4:1

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

DATE 14 AUG 2024

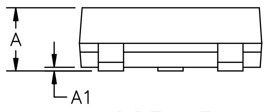


TOP VIEW

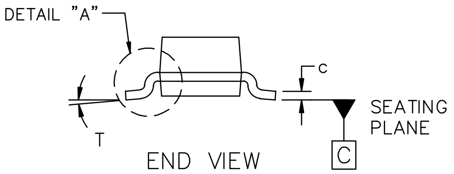


DETAIL "A"
Scale 3:1

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
HE	2.10	2.40	2.64
T	0°	−−−	10°



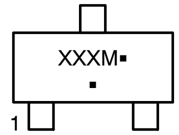
SIDE VIEW



END VIEW

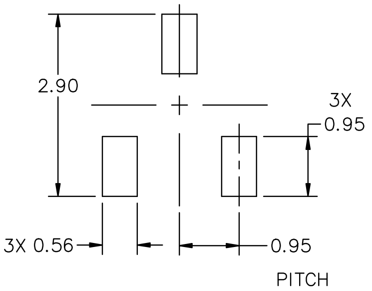
NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 2018.
2. CONTROLLING DIMENSIONS: MILLIMETERS.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF THE BASE MATERIAL.
4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE BURRS.

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**

onsemi and onsemi are trademarks of Semiconductor Components Industries, LLC dba **onsemi** or its subsidiaries in the United States and/or other countries. **onsemi** reserves the right to make changes without further notice to any products herein. **onsemi** makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does **onsemi** assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. **onsemi** does not convey any license under its patent rights nor the rights of others.

© Semiconductor Components Industries, LLC, 2019

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

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 2 OF 2**

onsemi and onsemi are trademarks of Semiconductor Components Industries, LLC dba **onsemi** or its subsidiaries in the United States and/or other countries. **onsemi** reserves the right to make changes without further notice to any products herein. **onsemi** makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does **onsemi** assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. **onsemi** does not convey any license under its patent rights nor the rights of others.

© Semiconductor Components Industries, LLC, 2019

onsemi, onsemi, , and other names, marks, and brands are registered and/or common law trademarks of Semiconductor Components Industries, LLC dba “**onsemi**” or its affiliates and/or subsidiaries in the United States and/or other countries. **onsemi** owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of **onsemi**’s product/patent coverage may be accessed at www.onsemi.com/site/pdf/Patent−Marking.pdf. **onsemi** reserves the right to make changes at any time to any products or information herein, without notice. The information herein is provided “as−is” and **onsemi** makes no warranty, representation or guarantee regarding the accuracy of the information, product features, availability, functionality, or suitability of its products for any particular purpose, nor does **onsemi** assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. Buyer is responsible for its products and applications using **onsemi** products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by **onsemi**. “Typical” parameters which may be provided in **onsemi** data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including “Typicals” must be validated for each customer application by customer’s technical experts. **onsemi** does not convey any license under any of its intellectual property rights nor the rights of others. **onsemi** products are not designed, intended, or authorized for use as a critical component in life support systems or any FDA Class 3 medical devices or medical devices with a same or similar classification in a foreign jurisdiction or any devices intended for implantation in the human body. Should Buyer purchase or use **onsemi** products for any such unintended or unauthorized application, Buyer shall indemnify and hold **onsemi** and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that **onsemi** was negligent regarding the design or manufacture of the part. **onsemi** is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

ADDITIONAL INFORMATION

TECHNICAL PUBLICATIONS:
Technical Library: www.onsemi.com/design/resources/technical−documentation
onsemi Website: www.onsemi.com

ONLINE SUPPORT: www.onsemi.com/support
For additional information, please contact your local Sales Representative at www.onsemi.com/support/sales

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

DCI.

QUALITY MANAGEMENT SYSTEM CERTIFICATE

DIGI ELECTRONICS HK LIMITED

GB/T 19001-2016 idt ISO9001:2015

DCI Certification Ltd

DCI.

ENVIRONMENTAL MANAGEMENT SYSTEM CERTIFICATE

DIGI ELECTRONICS HK LIMITED

GB/T 24001-2016 idt ISO14001:2015

DCI Certification Ltd

DCI.

OCCUPATIONAL HEALTH & SAFETY MANAGEMENT SYSTEM CERTIFICATE

DIGI ELECTRONICS HK LIMITED

GB/T45001-2020 idt ISO45001:2018

DCI Certification Ltd

CR

CERTIFICATE OF INCORPORATION

ASA

MEMBERSHIP

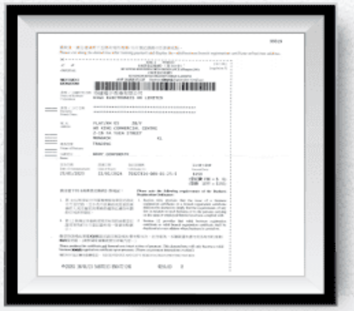
Certificate

DIGI ELECTRONICS HK LIMITED

dun&bradstreet

A Dun & Bradstreet

D-U-N-S® Registered™ Business



Tel: +00 852-30501935

RFQ Email: Info@DiGi-Electronics.com

DiGi is a global authorized distributor of electronic components.