BC856BDW1T1G, SBC856BDW1T1G Series, BC857BDW1T1G, SBC857BDW1T1G Series, BC858CDW1T1G Series

Preferred Devices

Dual General Purpose Transistors

PNP Duals

These transistors are designed for general purpose amplifier applications. They are housed in the SOT−363/SC−88 which is designed for low power surface mount applications.

Features

- AEC−Q101 Qualified and PPAP Capable
- S Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements
- These Devices are Pb−Free, Halogen Free/BFR Free and are RoHS Compliant*

MAXIMUM RATINGS

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

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Total Device Dissipation Per Device FR−5 Board (Note 1) T_A = 25°C Derate Above 25°C	P_D	 380 250 3.0	 mW mW/°C mW/°C
Thermal Resistance, Junction−to−Ambient	$R_{\theta JA}$	 328	°C/W
Junction and Storage Temperature Range	T_J, T_{stg}	−55 to +150	°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.

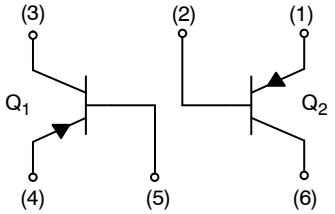
1. FR−5 = 1.0 x 0.75 x 0.062 in

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

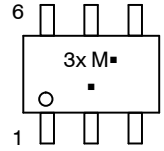
ON Semiconductor®

http://onsemi.com

SOT−363/SC−88
CASE 419B
STYLE 1



MARKING DIAGRAM



3x = Specific Device Code
x = B, F, G, or L
(See Ordering Information)
M = Date Code
▪ = Pb−Free Package

(Note: Microdot may be in either location)

ORDERING INFORMATION

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

Preferred devices are recommended choices for future use and best overall value.

© Semiconductor Components Industries, LLC, 2011

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

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector – Emitter Breakdown Voltage (I_C = −10 mA)	$V_{(BR)CEO}$				V
BC856, SBC856 Series		−65	–	–	
BC857, SBC857 Series		−45	–	–	
BC858 Series		−30	–	–	
Collector – Emitter Breakdown Voltage (I_C = −10 μA, V_{EB} = 0)	$V_{(BR)CES}$				V
BC856, SBC856 Series		−80	–	–	
BC857B, SBC857B Only		−50	–	–	
BC858 Series		−30	–	–	
Collector – Base Breakdown Voltage (I_C = −10 μA)	$V_{(BR)CBO}$				V
BC856, SBC856 Series		−80	–	–	
BC857, SBC857 Series		−50	–	–	
BC858 Series		−30	–	–	
Emitter – Base Breakdown Voltage (I_E = −1.0 μA)	$V_{(BR)EBO}$				V
BC856, SBC856 Series		−5.0	–	–	
BC857, SBC857 Series		−5.0	–	–	
BC858 Series		−5.0	–	–	
Collector Cutoff Current	I_{CBO}				
(V_{CB} = −30 V)		–	–	−15	nA
(V_{CB} = −30 V, T_A = 150°C)		–	–	−4.0	μA
ON CHARACTERISTICS					
DC Current Gain	h_{FE}				–
(I_C = −10 μA, V_{CE} = −5.0 V)					
BC856B, SBC856B, BC857B, SBC857B		–	150	–	
BC857C, SBC857C, BC858C		–	270	–	
(I_C = −2.0 mA, V_{CE} = −5.0 V)					
BC856B, SBC856B, BC857B, SBC857B		220	290	475	
BC857C, SBC857C, BC858C		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	–	–	10	dB

TYPICAL CHARACTERISTICS – BC856/SBC856

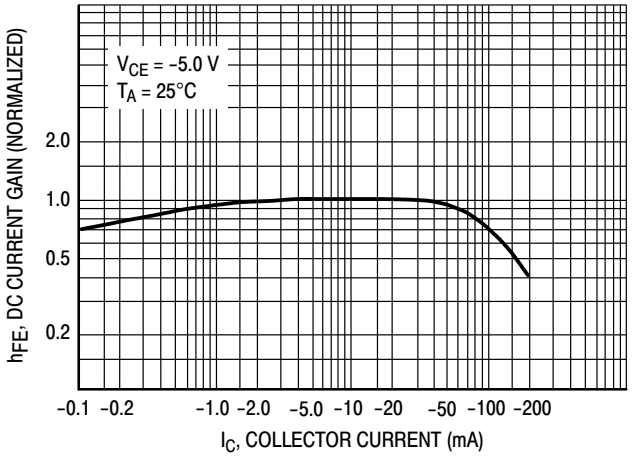


Figure 1. DC Current Gain

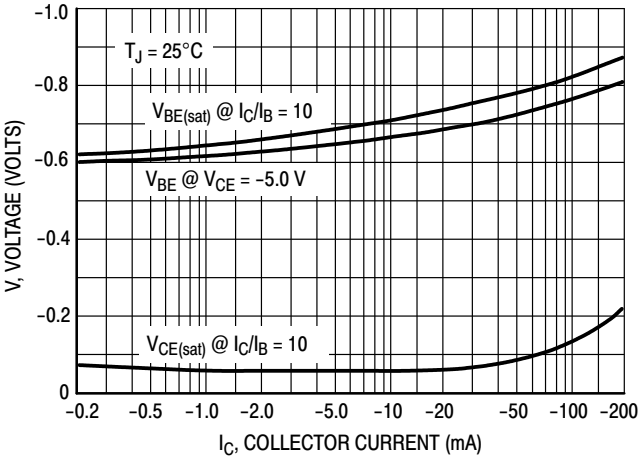


Figure 2. “On” Voltage

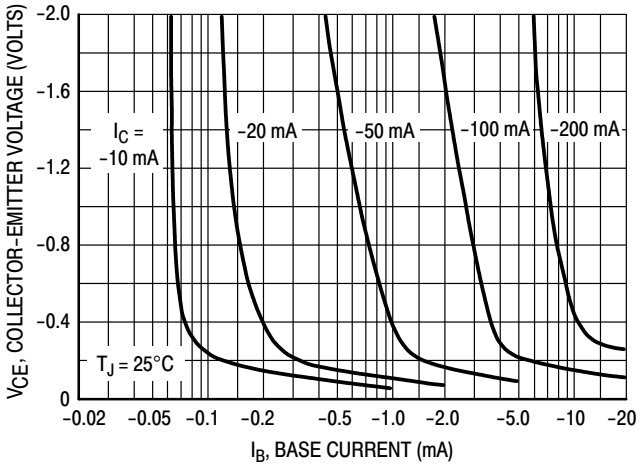


Figure 3. Collector Saturation Region

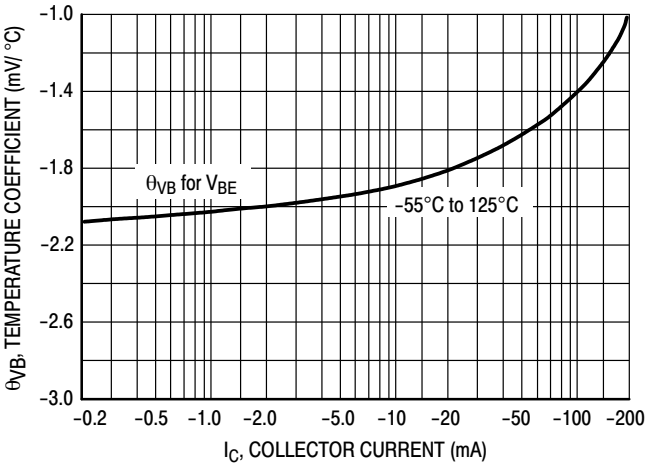


Figure 4. Base−Emitter Temperature Coefficient

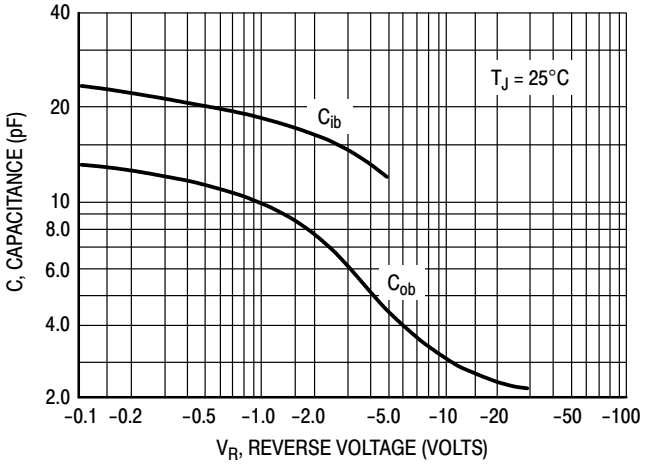


Figure 5. Capacitance

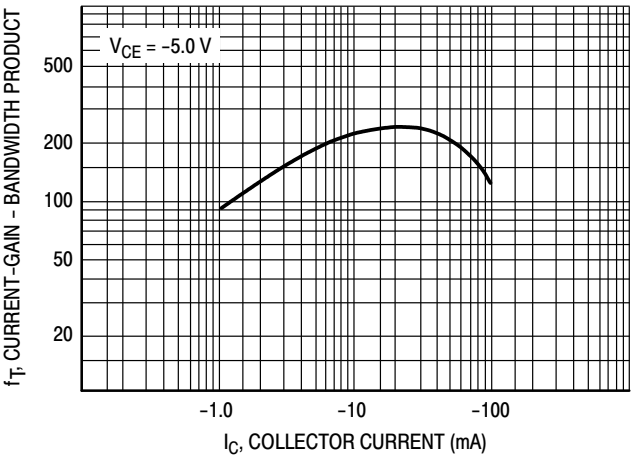


Figure 6. Current−Gain − Bandwidth Product

TYPICAL CHARACTERISTICS – BC857/SBC857/BC858

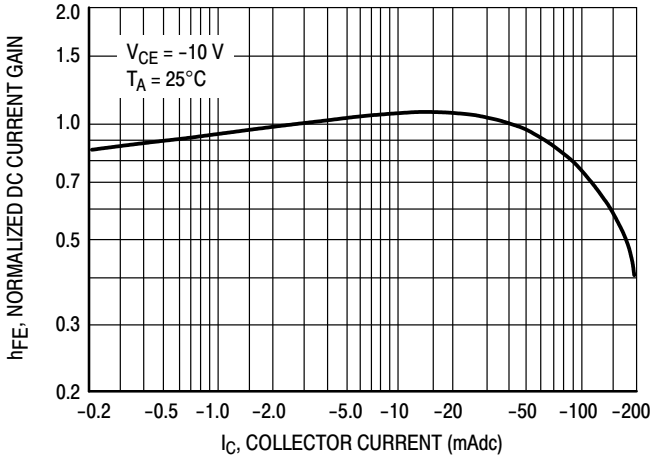


Figure 7. Normalized DC Current Gain

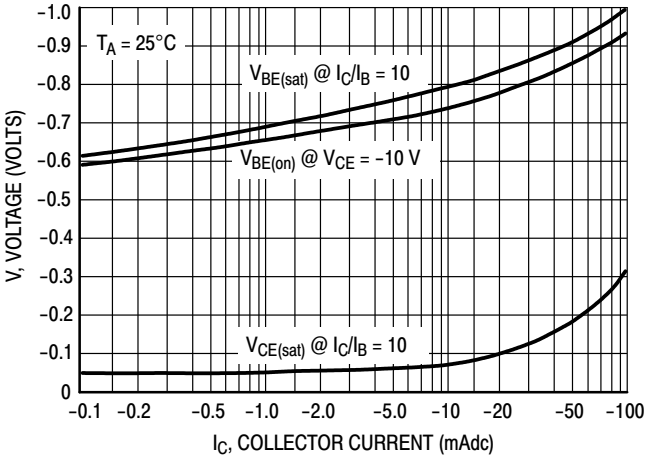


Figure 8. "Saturation" and "On" Voltages

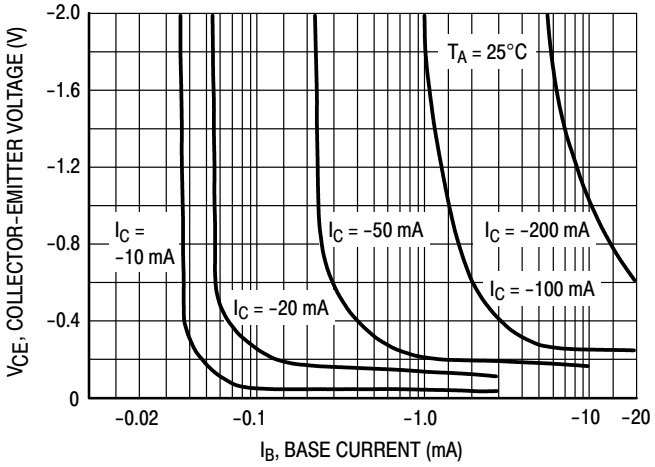


Figure 9. Collector Saturation Region

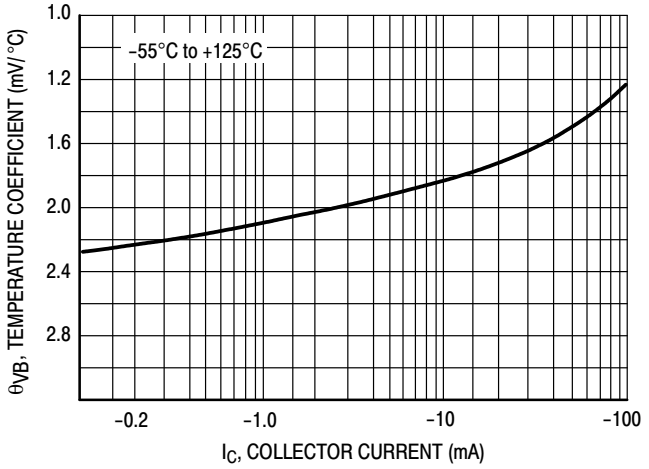


Figure 10. Base−Emitter Temperature Coefficient

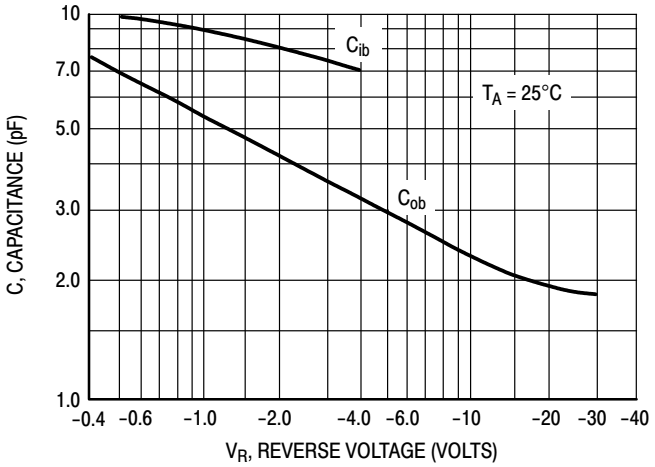


Figure 11. Capacitances

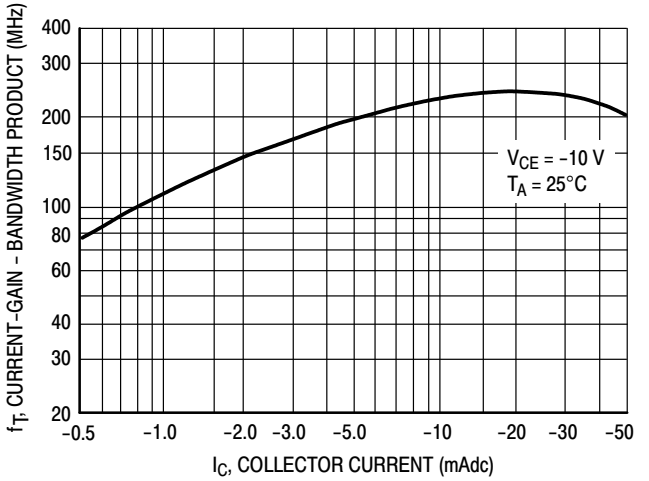


Figure 12. Current−Gain − Bandwidth Product

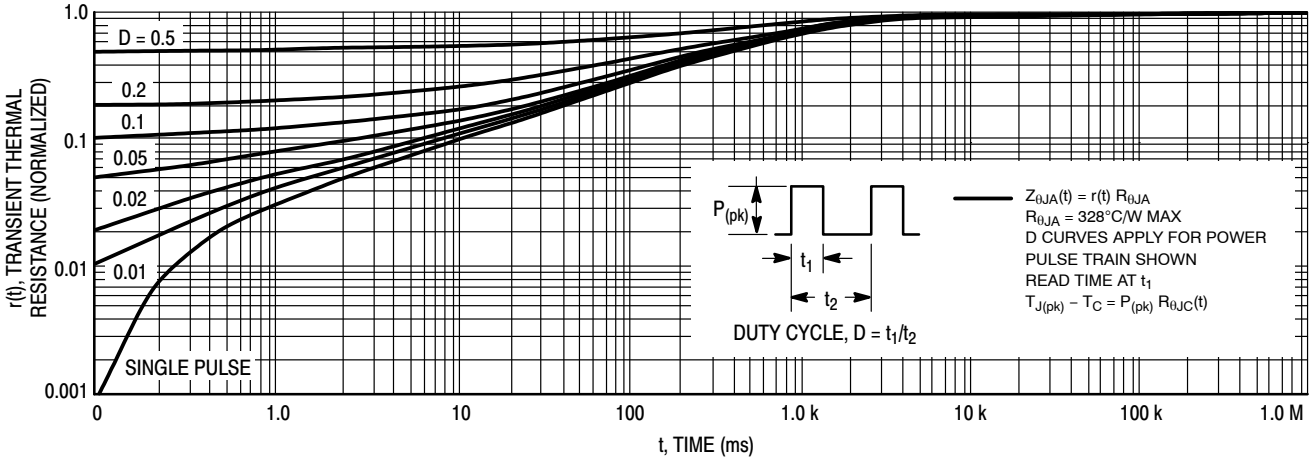


Figure 13. Thermal Response

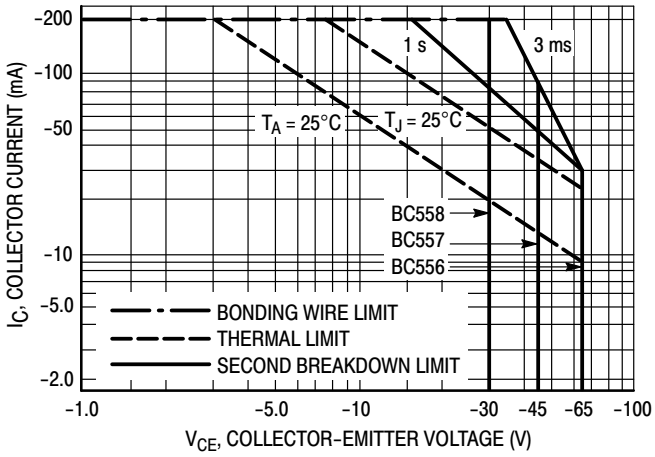


Figure 14. Active Region Safe Operating Area

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.

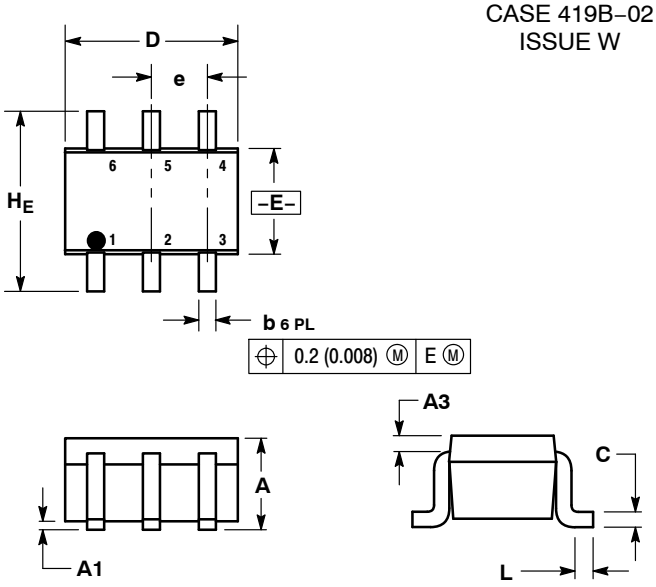
ORDERING INFORMATION

Device	Device Marking	Package	Shipping†
BC856BDW1T1G	3B	SOT−363 (Pb−Free)	3,000 / Tape & Reel
SBC856BDW1T1G	3B	SOT−363 (Pb−Free)	3,000 / Tape & Reel
BC856BDW1T3G	3B	SOT−363 (Pb−Free)	10,000 / Tape & Reel
SBC856BDW1T3G	3B	SOT−363 (Pb−Free)	10,000 / Tape & Reel
BC857BDW1T1G	3F	SOT−363 (Pb−Free)	3,000 / Tape & Reel
SBC857BDW1T1G	3F	SOT−363 (Pb−Free)	3,000 / Tape & Reel
BC857CDW1T1G	3G	SOT−363 (Pb−Free)	3,000 / Tape & Reel
SBC857CDW1T1G	3G	SOT−363 (Pb−Free)	3,000 / Tape & Reel
BC858CDW1T1G	3L	SOT−363 (Pb−Free)	3,000 / 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.

PACKAGE DIMENSIONS

SC−88/SC70−6/SOT−363
CASE 419B−02
ISSUE W

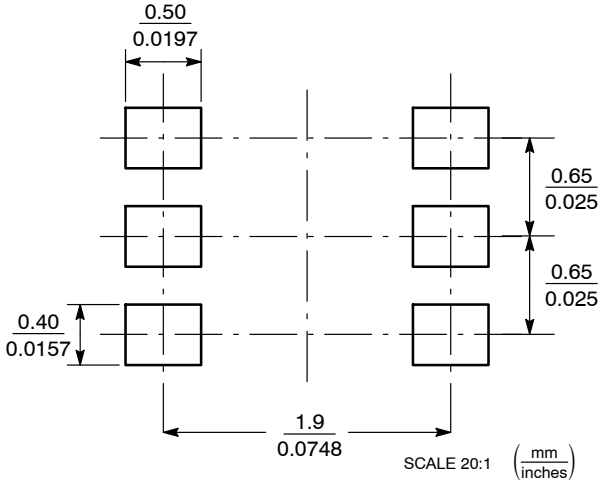


NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. 419B−01 OBSOLETE, NEW STANDARD 419B−02.

	MILLIMETERS			INCHES		
DIM	MIN	NOM	MAX	MIN	NOM	MAX
A	0.80	0.95	1.10	0.031	0.037	0.043
A1	0.00	0.05	0.10	0.000	0.002	0.004
A3	0.20 REF			0.008 REF		
b	0.10	0.21	0.30	0.004	0.008	0.012
C	0.10	0.14	0.25	0.004	0.005	0.010
D	1.80	2.00	2.20	0.070	0.078	0.086
E	1.15	1.25	1.35	0.045	0.049	0.053
e	0.65 BSC			0.026 BSC		
L	0.10	0.20	0.30	0.004	0.008	0.012
H_E	2.00	2.10	2.20	0.078	0.082	0.086

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

SOLDERING FOOTPRINT*



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

ON Semiconductor and ON are registered trademarks of Semiconductor Components Industries, LLC (SCILLC). SCILLC reserves the right to make changes without further notice to any products herein. SCILLC makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does SCILLC 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. "Typical" parameters which may be provided in SCILLC 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. SCILLC does not convey any license under its patent rights nor the rights of others. SCILLC products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the SCILLC product could create a situation where personal injury or death may occur. Should Buyer purchase or use SCILLC products for any such unintended or unauthorized application, Buyer shall indemnify and hold SCILLC 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 SCILLC was negligent regarding the design or manufacture of the part. SCILLC is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:
Literature Distribution Center for ON Semiconductor
P.O. Box 5163, Denver, Colorado 80217 USA
Phone: 303−675−2175 or 800−344−3860 Toll Free USA/Canada
Fax: 303−675−2176 or 800−344−3867 Toll Free USA/Canada
Email: orderlit@onsemi.com

N. American Technical Support: 800−282−9855 Toll Free USA/Canada
Europe, Middle East and Africa Technical Support:
Phone: 421 33 790 2910
Japan Customer Focus Center
Phone: 81−3−5817−1050

ON Semiconductor Website: **www.onsemi.com**

Order Literature: http://www.onsemi.com/orderlit

For additional information, please contact your local Sales Representative

OCEAN CHIPS
Океан Электроники
Поставка электронных компонентов

Компания «Океан Электроники» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Поставка оригинальных импортных электронных компонентов напрямую с производств Америки, Европы и Азии, а так же с крупнейших складов мира;
- Широкая линейка поставок активных и пассивных импортных электронных компонентов (более 30 млн. наименований);
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Помощь Конструкторского Отдела и консультации квалифицированных инженеров;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Поставка электронных компонентов под контролем ВП;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- При необходимости вся продукция военного и аэрокосмического назначения проходит испытания и сертификацию в лаборатории (по согласованию с заказчиком);
- Поставка специализированных компонентов военного и аэрокосмического уровня качества (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Actel, Aeroflex, Peregrine, VPT, Syfer, Eurofarad, Texas Instruments, MS Kennedy, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Компания «Океан Электроники» является официальным дистрибьютором и эксклюзивным представителем в России одного из крупнейших производителей разъемов военного и аэрокосмического назначения «**JONHON**», а так же официальным дистрибьютором и эксклюзивным представителем в России производителя высокотехнологичных и надежных решений для передачи СВЧ сигналов «**FORSTAR**».

AVIC JONHON

«JONHON» (основан в 1970 г.)

Разъемы специального, военного и аэрокосмического назначения:

(Применяются в военной, авиационной, аэрокосмической, морской, железнодорожной, горно- и нефтедобывающей отраслях промышленности)

«FORSTAR» (основан в 1998 г.)

ВЧ соединители, коаксиальные кабели, кабельные сборки и микроволновые компоненты:

(Применяются в телекоммуникациях гражданского и специального назначения, в средствах связи, РЛС, а так же военной, авиационной и аэрокосмической отраслях промышленности).

FORSTAR®

Телефон: 8 (812) 309-75-97 (многоканальный)
Факс: 8 (812) 320-03-32
Электронная почта: ocean@oceanchips.ru
Web: http://oceanchips.ru/
Адрес: 198099, г. Санкт-Петербург, ул. Калинина, д. 2, корп. 4, лит. А