

BC546B, BC547A, B, C, BC548B, C

Amplifier Transistors

NPN Silicon

Features

- Pb-Free Packages are Available*

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector - Emitter Voltage BC546 BC547 BC548	V_{CE0}	65 45 30	Vdc
Collector - Base Voltage BC546 BC547 BC548	V_{CB0}	80 50 30	Vdc
Emitter - Base Voltage	V_{EB0}	6.0	Vdc
Collector Current – Continuous	I_C	100	mAdc
Total Device Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	625 5.0	mW mW/ $^\circ\text{C}$
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	1.5 12	W mW/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-55 to +150	$^\circ\text{C}$

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	200	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	83.3	$^\circ\text{C}/\text{W}$

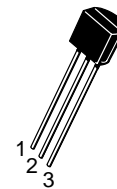
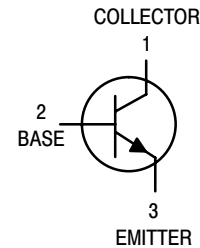
Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

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



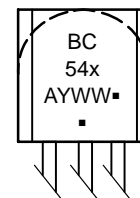
ON Semiconductor®

<http://onsemi.com>



TO-92
CASE 29
STYLE 17

MARKING DIAGRAM



BC54x = Device Code
x = 6, 7, or 8
A = Assembly Location
Y = Year
WW = Work Week
■ = 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 5 of this data sheet.

BC546B, BC547A, B, C, BC548B, C

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

Characteristic	Symbol	Min	Typ	Max	Unit	
OFF CHARACTERISTICS						
Collector – Emitter Breakdown Voltage (I _C = 1.0 mA, I _B = 0)	BC546 BC547 BC548	V _{(BR)CEO}	65 45 30	– – –	– – –	V
Collector – Base Breakdown Voltage (I _C = 100 μA _{dc})	BC546 BC547 BC548	V _{(BR)CBO}	80 50 30	– – –	– – –	V
Emitter – Base Breakdown Voltage (I _E = 10 μA, I _C = 0)	BC546 BC547 BC548	V _{(BR)EBO}	6.0 6.0 6.0	– – –	– – –	V
Collector Cutoff Current (V _{CE} = 70 V, V _{BE} = 0) (V _{CE} = 50 V, V _{BE} = 0) (V _{CE} = 35 V, V _{BE} = 0) (V _{CE} = 30 V, T _A = 125°C)	BC546 BC547 BC548 BC546/547/548	I _{CES}	– – – –	0.2 0.2 0.2 –	15 15 15 4.0	nA μA
ON CHARACTERISTICS						
DC Current Gain (I _C = 10 μA, V _{CE} = 5.0 V)	BC547A BC546B/547B/548B BC548C	h _{FE}	– – –	90 150 270	– – –	–
(I _C = 2.0 mA, V _{CE} = 5.0 V)	BC546 BC547 BC548 BC547A BC546B/547B/548B BC547C/BC548C		110 110 110 110 200 420	– – – 180 290 520	450 800 800 220 450 800	
(I _C = 100 mA, V _{CE} = 5.0 V)	BC547A/548A BC546B/547B/548B BC548C		– – –	120 180 300	– – –	
Collector – Emitter Saturation Voltage (I _C = 10 mA, I _B = 0.5 mA) (I _C = 100 mA, I _B = 5.0 mA) (I _C = 10 mA, I _B = See Note 1)		V _{CE(sat)}	– – –	0.09 0.2 0.3	0.25 0.6 0.6	V
Base – Emitter Saturation Voltage (I _C = 10 mA, I _B = 0.5 mA)		V _{BE(sat)}	–	0.7	–	V
Base – Emitter On Voltage (I _C = 2.0 mA, V _{CE} = 5.0 V) (I _C = 10 mA, V _{CE} = 5.0 V)		V _{BE(on)}	0.55 –	– –	0.7 0.77	V
SMALL-SIGNAL CHARACTERISTICS						
Current – Gain – Bandwidth Product (I _C = 10 mA, V _{CE} = 5.0 V, f = 100 MHz)	BC546 BC547 BC548	f _T	150 150 150	300 300 300	– – –	MHz
Output Capacitance (V _{CB} = 10 V, I _C = 0, f = 1.0 MHz)		C _{obo}	–	1.7	4.5	pF
Input Capacitance (V _{EB} = 0.5 V, I _C = 0, f = 1.0 MHz)		C _{ibo}	–	10	–	pF
Small – Signal Current Gain (I _C = 2.0 mA, V _{CE} = 5.0 V, f = 1.0 kHz)	BC546 BC547/548 BC547A BC546B/547B/548B BC547C/548C	h _{fe}	125 125 125 240 450	– – 220 330 600	500 900 260 500 900	–
Noise Figure (I _C = 0.2 mA, V _{CE} = 5.0 V, R _S = 2 kΩ, f = 1.0 kHz, Δf = 200 Hz)	BC546 BC547 BC548	NF	– – –	2.0 2.0 2.0	10 10 10	dB

1. I_B is value for which I_C = 11 mA at V_{CE} = 1.0 V.

BC546B, BC547A, B, C, BC548B, C

BC547/BC548

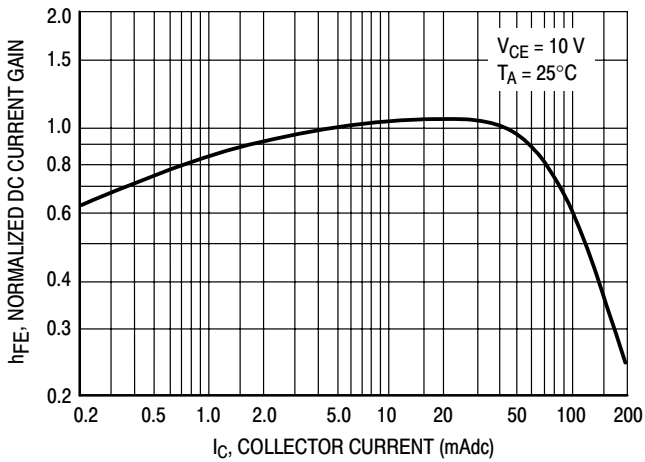


Figure 1. Normalized DC Current Gain

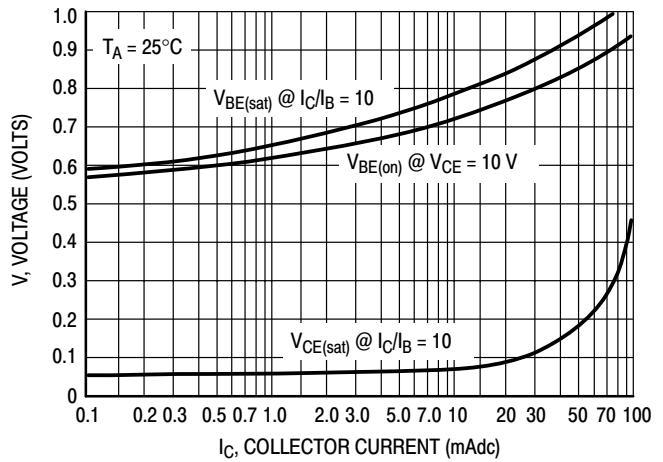


Figure 2. "Saturation" and "On" Voltages

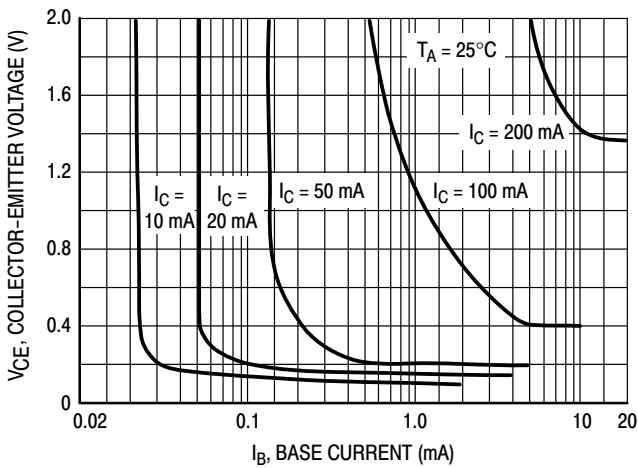


Figure 3. Collector Saturation Region

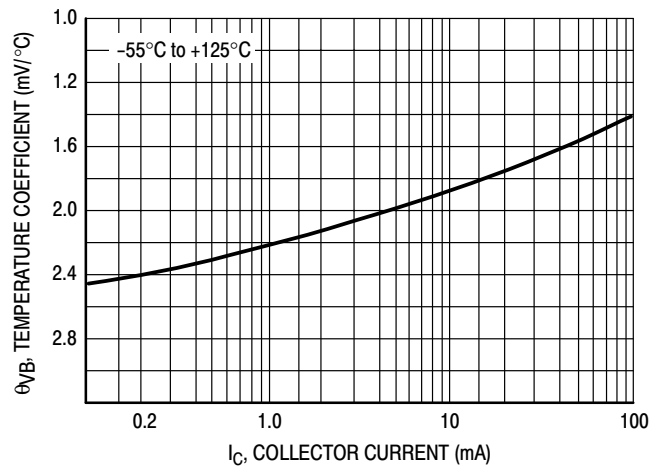


Figure 4. Base-Emitter Temperature Coefficient

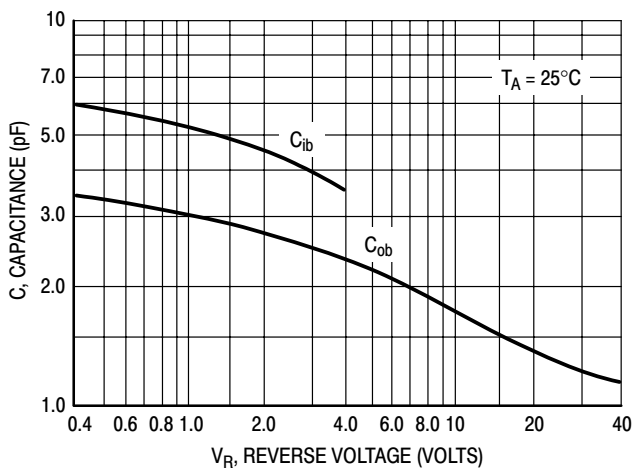


Figure 5. Capacitances

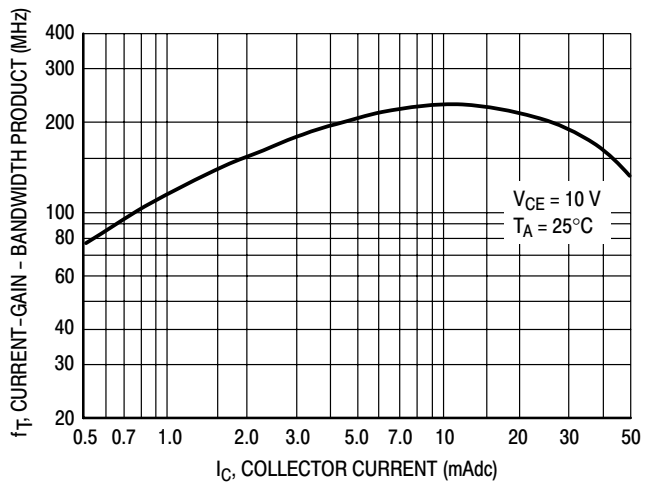


Figure 6. Current-Gain - Bandwidth Product

BC546B, BC547A, B, C, BC548B, C

BC546

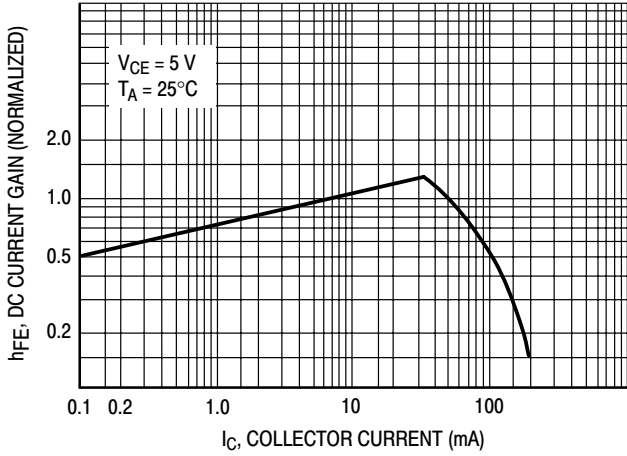


Figure 7. DC Current Gain

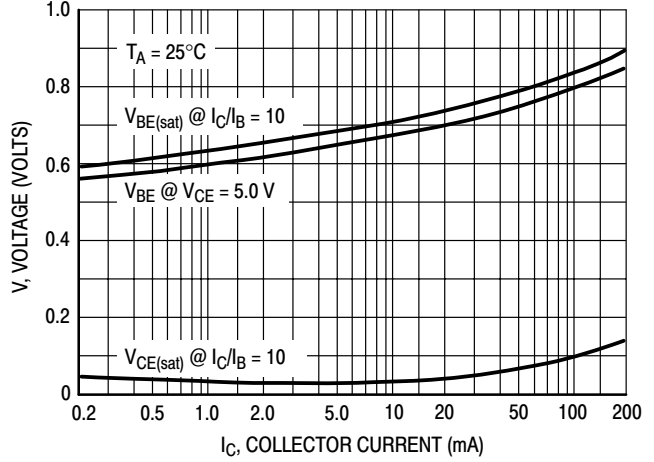


Figure 8. "On" Voltage

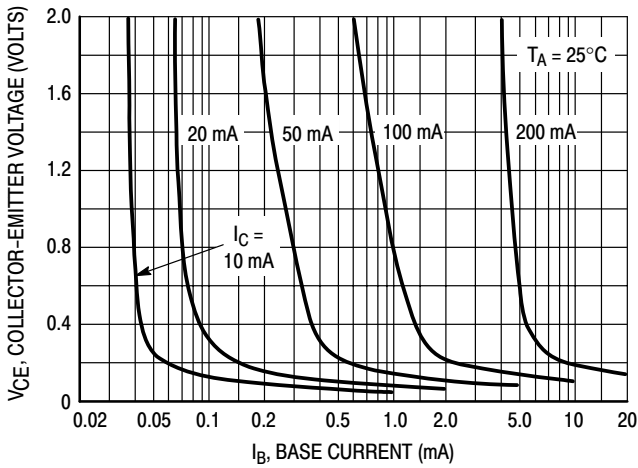


Figure 9. Collector Saturation Region

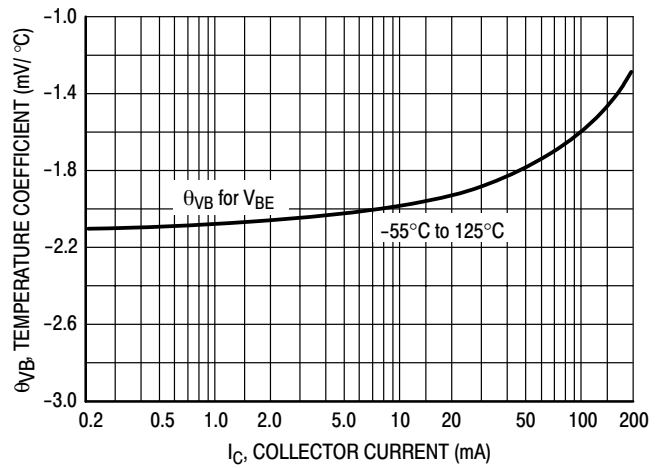


Figure 10. Base-Emitter Temperature Coefficient

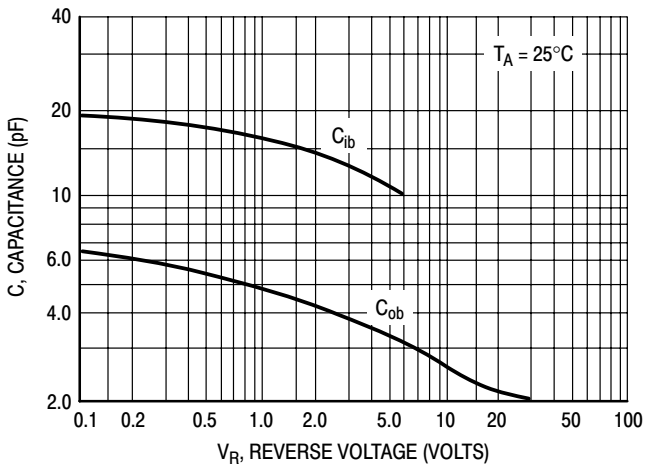


Figure 11. Capacitance

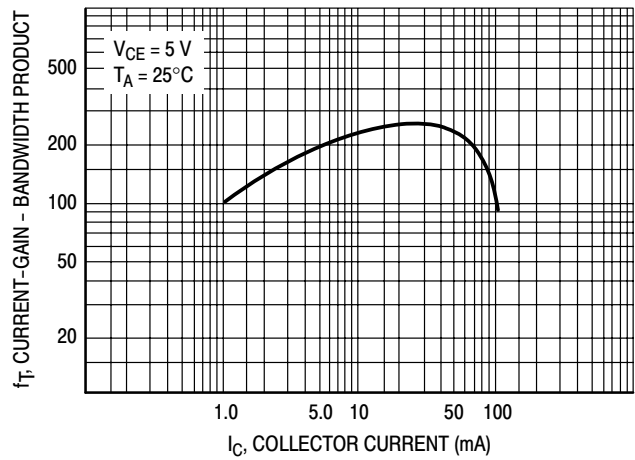


Figure 12. Current-Gain - Bandwidth Product

BC546B, BC547A, B, C, BC548B, C

DEVICE ORDERING INFORMATION

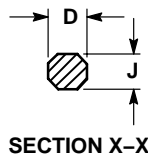
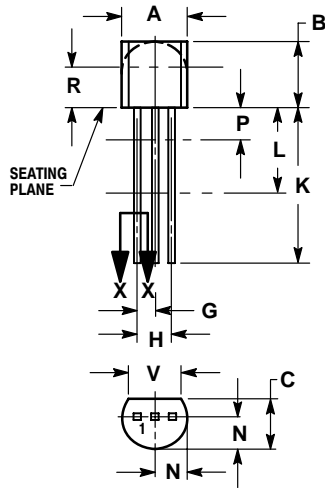
Device	Package	Shipping†
BC546B	TO-92	5000 Units / Bulk
BC546BG	TO-92 (Pb-Free)	5000 Units / Bulk
BC546BRL1	TO-92	2000 / Tape & Reel
BC546BRL1G	TO-92 (Pb-Free)	2000 / Tape & Reel
BC546BZL1	TO-92	2000 / Ammo Box
BC546BZL1G	TO-92 (Pb-Free)	2000 / Ammo Box
BC547ARL	TO-92	2000 / Tape & Reel
BC547ARLG	TO-92 (Pb-Free)	2000 / Tape & Reel
BC547ARL1	TO-92	2000 / Tape & Reel
BC547ARL1G	TO-92 (Pb-Free)	2000 / Tape & Reel
BC547AZL1	TO-92	2000 / Ammo Box
BC547AZL1G	TO-92 (Pb-Free)	2000 / Ammo Box
BC547B	TO-92	5000 Units / Bulk
BC547BG	TO-92 (Pb-Free)	5000 Units / Bulk
BC547BRL1	TO-92	2000 / Tape & Reel
BC547BRL1G	TO-92 (Pb-Free)	2000 / Tape & Reel
BC547BZL1	TO-92	2000 / Ammo Box
BC547BZL1G	TO-92 (Pb-Free)	2000 / Ammo Box
BC547C	TO-92	5000 Units / Bulk
BC547CG	TO-92 (Pb-Free)	5000 Units / Bulk
BC547CZL1	TO-92	2000 / Ammo Box
BC547CZL1G	TO-92 (Pb-Free)	2000 / Ammo Box
BC548B	TO-92	5000 Units / Bulk
BC548BG	TO-92 (Pb-Free)	5000 Units / Bulk
BC548BRL1	TO-92	2000 / Tape & Reel
BC548BRL1G	TO-92 (Pb-Free)	2000 / Tape & Reel
BC548BZL1	TO-92	2000 / Ammo Box
BC548BZL1G	TO-92 (Pb-Free)	2000 / Ammo Box
BC548C	TO-92	5000 Units / Bulk
BC548CG	TO-92 (Pb-Free)	5000 Units / Bulk
BC548CZL1	TO-92	2000 / Ammo Box
BC548CZL1G	TO-92 (Pb-Free)	2000 / Ammo Box

†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.

BC546B, BC547A, B, C, BC548B, C

PACKAGE DIMENSIONS

TO-92 (TO-226)
CASE 29-11
ISSUE AL



NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED.
4. LEAD DIMENSION IS UNCONTROLLED IN P AND BEYOND DIMENSION K MINIMUM.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.175	0.205	4.45	5.20
B	0.170	0.210	4.32	5.33
C	0.125	0.165	3.18	4.19
D	0.016	0.021	0.407	0.533
G	0.045	0.055	1.15	1.39
H	0.095	0.105	2.42	2.66
J	0.015	0.020	0.39	0.50
K	0.500	---	12.70	---
L	0.250	---	6.35	---
N	0.080	0.105	2.04	2.66
P	---	0.100	---	2.54
R	0.115	---	2.93	---
V	0.135	---	3.43	---

STYLE 17:

1. COLLECTOR
2. BASE
3. EMITTER

ON Semiconductor and 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 61312, Phoenix, Arizona 85062-1312 USA
Phone: 480-829-7710 or 800-344-3860 Toll Free USA/Canada
Fax: 480-829-7709 or 800-344-3867 Toll Free USA/Canada
Email: orderlit@onsemi.com

N. American Technical Support: 800-282-9855 Toll Free
USA/Canada

Japan: ON Semiconductor, Japan Customer Focus Center
2-9-1 Kamimeguro, Meguro-ku, Tokyo, Japan 153-0051
Phone: 81-3-5773-3850

ON Semiconductor Website: <http://onsemi.com>

Order Literature: <http://www.onsemi.com/litorder>

For additional information, please contact your local Sales Representative.