

MMPQ2222A

Preferred Device

Quad General Purpose Transistor

NPN Silicon



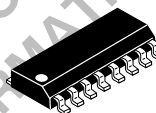
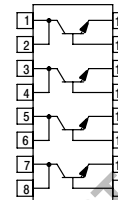
ON Semiconductor®

<http://onsemi.com>

MAXIMUM RATINGS

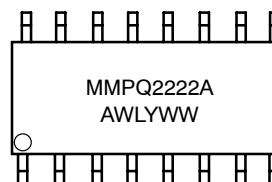
Rating	Symbol	Value	Unit
Collector – Emitter Voltage	V_{CEO}	40	Vdc
Collector – Base Voltage	V_{CB}	75	Vdc
Emitter – Base Voltage	V_{EB}	5.0	Vdc
Collector Current – Continuous	I_C	500	mAdc
		Four Transistors Equal Power	
Total Power Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	1.0	Watts
		8.0	mW/ $^\circ\text{C}$
Total Power Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	2.4	Watts
		19.2	mW/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-55 to +150	$^\circ\text{C}$

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.



SO-16
CASE 751B
STYLE 4

MARKING DIAGRAM



MMPQ2222A = Specific Device Code
 A = Assembly Location
 WL = Wafer Lot
 Y = Year
 WW = Work Week

ORDERING INFORMATION

Device	Package	Shipping
MMPQ2222A	SO-16	48 Units/Rail

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

MMPQ2222A

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

Characteristic	Symbol	Min	Typ	Max	Unit
----------------	--------	-----	-----	-----	------

OFF CHARACTERISTICS

Collector–Emitter Breakdown Voltage (Note 1) (I _C = 10 mA, I _B = 0)	V _{(BR)CEO}	40	–	–	Vdc
Collector–Base Breakdown Voltage (I _C = 10 μA, I _E = 0)	V _{(BR)CBO}	75	–	–	Vdc
Emitter–Base Breakdown Voltage (I _B = 10 μA, I _C = 0)	V _{(BR)EBO}	5.0	–	–	Vdc
Collector Cutoff Current (V _{CB} = 50 Vdc, I _E = 0) (V _{CB} = 60 Vdc, I _E = 0)	I _{CBO}	–	–	50 10	nAdc
Emitter Cutoff Current (V _{EB} = 3.0 Vdc, I _C = 0)	I _{EBO}	–	–	100	nAdc

ON CHARACTERISTICS

DC Current Gain (Note 1) (I _C = 100 μA, V _{CE} = 10 V) (I _C = 1.0 mA, V _{CE} = 10 V) (I _C = 10 mA, V _{CE} = 10 V) (I _C = 150 mA, V _{CE} = 10 V) (I _C = 500 mA, V _{CE} = 10 V) (I _C = 150 mA, V _{CE} = 1.0 V)	h _{FE}	35 50 75 100 40 50	– – – – – –	– – – 300 – –	–
Collector–Emitter Saturation Voltage (Note 1) (I _C = 150 mA, I _B = 15 mA) (I _C = 500 mA, I _B = 50 mA)	V _{CE(sat)}	–	–	0.3 1.0	Vdc
Base–Emitter Saturation Voltage (Note 1) (I _C = 150 mA, I _B = 15 mA) (I _C = 500 mA, I _B = 50 mA)	V _{BE(sat)}	–	–	1.2 2.0	Vdc

DYNAMIC CHARACTERISTICS

Current–Gain – Bandwidth Product (Note 1) (I _C = 20 mA, V _{CE} = 20 Vdc, f = 100 MHz)	f _T	200	350	–	MHz
Output Capacitance (V _{CB} = 10 Vdc, I _E = 0, f = 1.0 MHz)	C _{ob}	–	4.5	–	pF
Input Capacitance (V _{EB} = 0.5 Vdc, I _C = 0, f = 1.0 MHz)	C _{ib}	–	17	–	pF

SWITCHING CHARACTERISTICS

Turn–On Time (V _{CC} = 30 Vdc, V _{BE(off)} = –0.5 Vdc, I _C = 150 mA, I _{B1} = 15 mA)	t _{on}	–	25	–	ns
Turn–Off Time (V _{CC} = 30 Vdc, I _C = 150 mA, I _{B1} = I _{B2} = 15 mA)	t _{off}	–	250	–	ns

1. Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2%.

MMPQ2222A

SWITCHING TIME EQUIVALENT TEST CIRCUITS

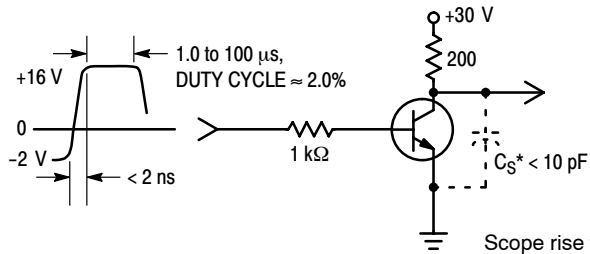


Figure 1. Turn-On Time

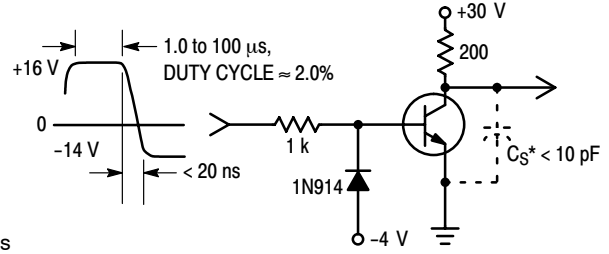


Figure 2. Turn-Off Time

Scope rise time < 4 ns
*Total shunt capacitance of test jig, connectors, and oscilloscope.

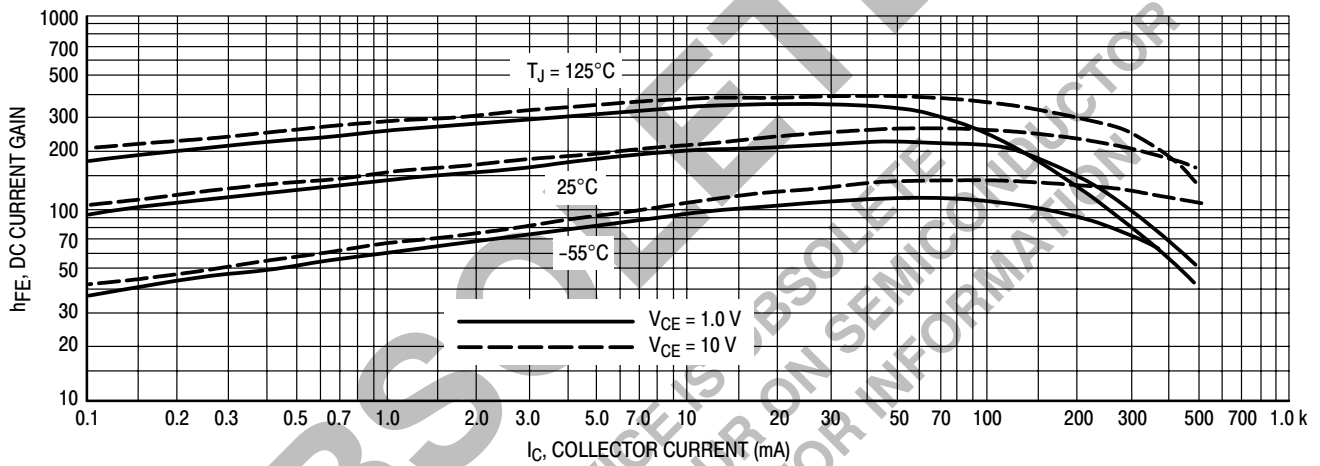


Figure 3. DC Current Gain

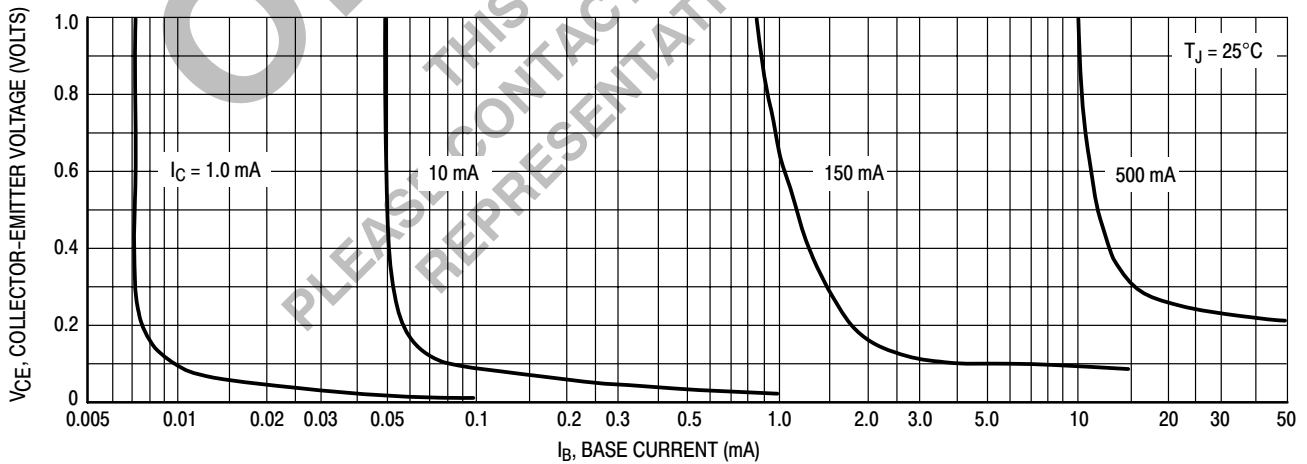


Figure 4. Collector Saturation Region

MMPQ2222A

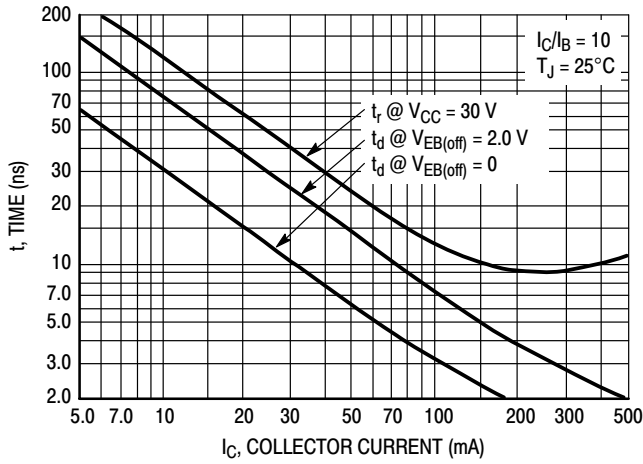


Figure 5. Turn-On Time

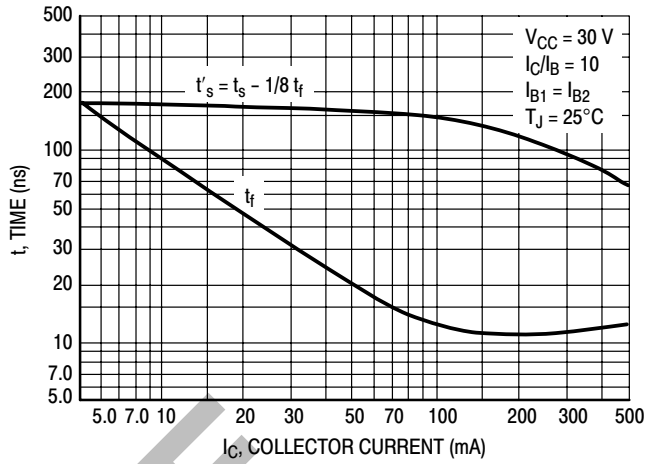


Figure 6. Turn-Off Time

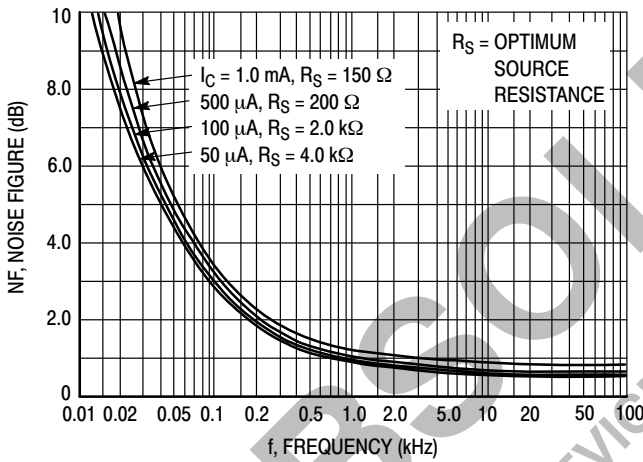


Figure 7. Frequency Effects

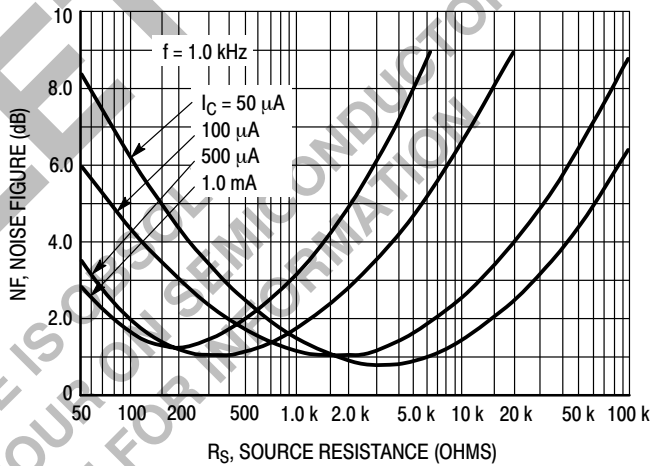


Figure 8. Source Resistance Effects

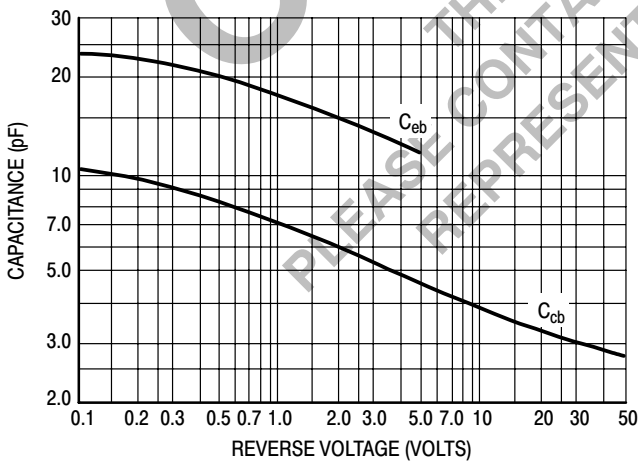


Figure 9. Capacitances

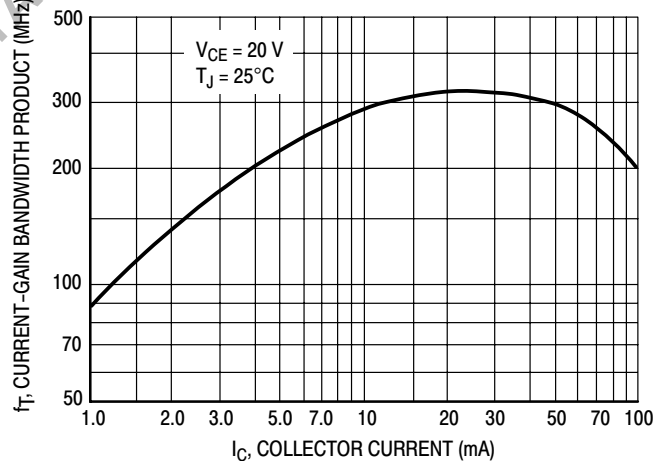


Figure 10. Current-Gain Bandwidth Product

MMPQ2222A

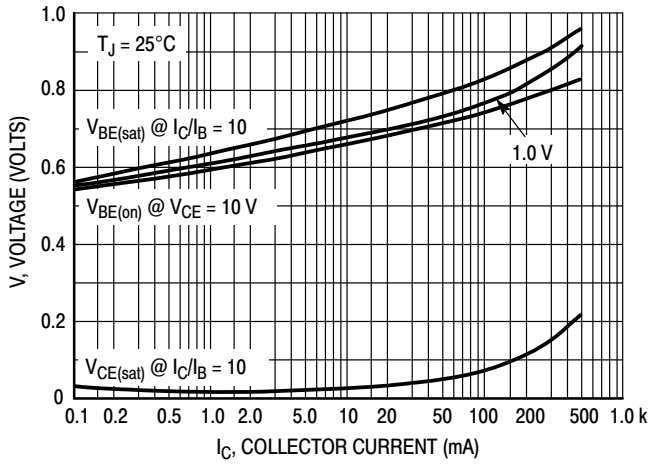


Figure 11. "On" Voltages

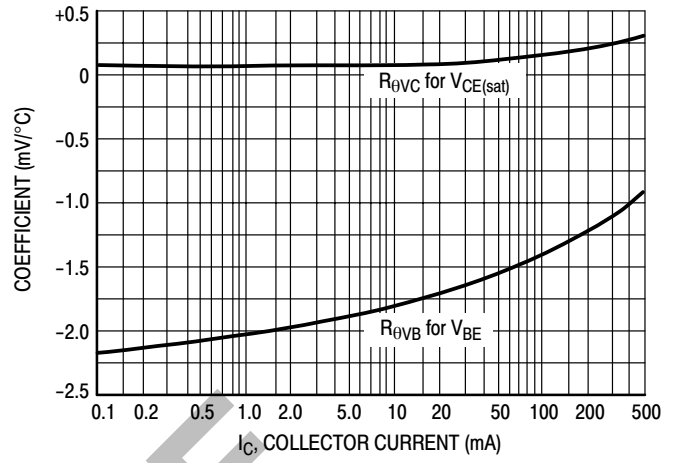


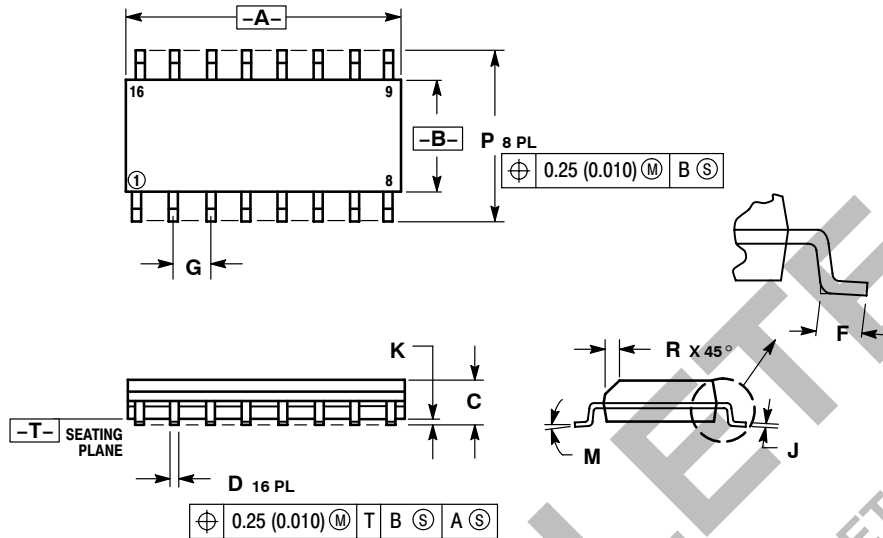
Figure 12. Temperature Coefficients

OBSOLETE
THIS DEVICE IS OBSOLETE
PLEASE CONTACT YOUR ON SEMICONDUCTOR
REPRESENTATIVE FOR INFORMATION

MMPQ2222A

PACKAGE DIMENSIONS

SO-16
CASE 751B-05
ISSUE J



NOTES:

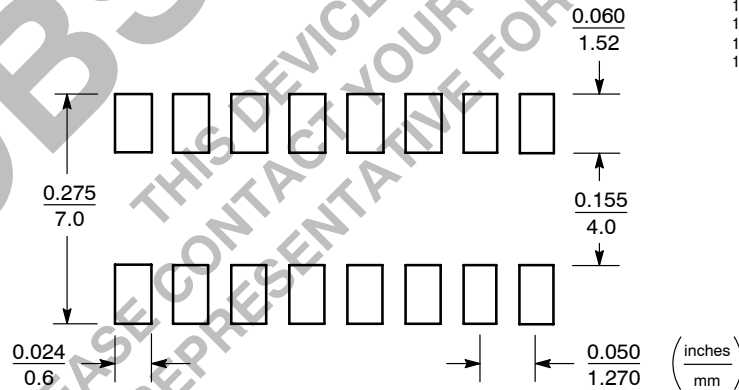
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETER.
3. DIMENSIONS A AND B DO NOT INCLUDE MOLD PROTRUSION.
4. MAXIMUM MOLD PROTRUSION 0.15 (0.006) PER SIDE.
5. DIMENSION D DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.127 (0.005) TOTAL IN EXCESS OF THE D DIMENSION AT MAXIMUM MATERIAL CONDITION.

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	9.80	10.00	0.386	0.393
B	3.80	4.00	0.150	0.157
C	1.35	1.75	0.054	0.068
D	0.35	0.49	0.014	0.019
F	0.40	1.25	0.016	0.049
G	1.27 BSC		0.050 BSC	
J	0.19	0.25	0.008	0.009
K	0.10	0.25	0.004	0.009
M	0°	7°	0°	7°
P	5.80	6.20	0.229	0.244
R	0.25	0.50	0.010	0.019

STYLE 4:

- PIN 1: COLLECTOR, DYE #1
- COLLECTOR, #1
- COLLECTOR, #2
- COLLECTOR, #2
- COLLECTOR, #3
- COLLECTOR, #3
- COLLECTOR, #4
- COLLECTOR, #4
- BASE, #4
- EMITTER, #4
- BASE, #3
- EMITTER, #3
- BASE, #2
- EMITTER, #2
- BASE, #1
- EMITTER, #1

SOLDERING FOOTPRINT



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 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: 81-3-5773-3850

ON Semiconductor Website: www.onsemi.com
Order Literature: <http://www.onsemi.com/orderlit>
For additional information, please contact your local Sales Representative