



Is Now Part of



ON Semiconductor®

To learn more about ON Semiconductor, please visit our website at
www.onsemi.com

Please note: As part of the Fairchild Semiconductor integration, some of the Fairchild orderable part numbers will need to change in order to meet ON Semiconductor's system requirements. Since the ON Semiconductor product management systems do not have the ability to manage part nomenclature that utilizes an underscore (_), the underscore (_) in the Fairchild part numbers will be changed to a dash (-). This document may contain device numbers with an underscore (_). Please check the ON Semiconductor website to verify the updated device numbers. The most current and up-to-date ordering information can be found at www.onsemi.com. Please email any questions regarding the system integration to Fairchild_questions@onsemi.com.

ON Semiconductor and the ON Semiconductor logo are trademarks of Semiconductor Components Industries, LLC dba ON Semiconductor or its subsidiaries in the United States and/or other countries. ON Semiconductor owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of ON Semiconductor's product/patent coverage may be accessed at www.onsemi.com/site/pdf/Patent-Marking.pdf. ON Semiconductor reserves the right to make changes without further notice to any products herein. ON Semiconductor makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does ON Semiconductor 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 ON Semiconductor products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by ON Semiconductor. "Typical" parameters which may be provided in ON Semiconductor 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. ON Semiconductor does not convey any license under its patent rights nor the rights of others. ON Semiconductor 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 ON Semiconductor products for any such unintended or unauthorized application, Buyer shall indemnify and hold ON Semiconductor 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 ON Semiconductor was negligent regarding the design or manufacture of the part. ON Semiconductor is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

MM74HC573 3-STATE Octal D-Type Latch

General Description

The MM74HC573 high speed octal D-type latches utilize advanced silicon-gate P-well CMOS technology. They possess the high noise immunity and low power consumption of standard CMOS integrated circuits, as well as the ability to drive 15 LS-TTL loads. Due to the large output drive capability and the 3-STATE feature, these devices are ideally suited for interfacing with bus lines in a bus organized system.

When the LATCH ENABLE(LE) input is HIGH, the Q outputs will follow the D inputs. When the LATCH ENABLE goes LOW, data at the D inputs will be retained at the outputs until LATCH ENABLE returns HIGH again. When a HIGH logic level is applied to the OUTPUT CONTROL OC input, all outputs go to a HIGH impedance state, regardless of what signals are present at the other inputs and the state of the storage elements.

The 74HC logic family is speed, function and pinout compatible with the standard 74LS logic family. All inputs are protected from damage due to static discharge by internal diode clamps to V_{CC} and ground.

Features

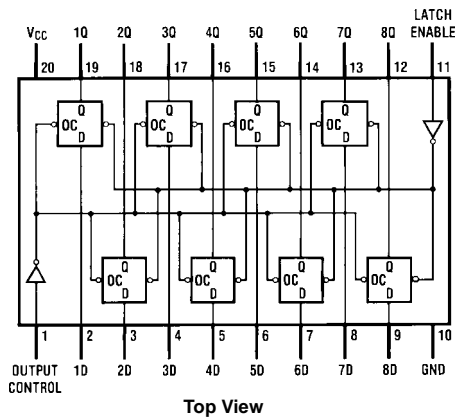
- Typical propagation delay: 18 ns
- Wide operating voltage range: 2 to 6 volts
- Low input current: 1 μ A maximum
- Low quiescent current: 80 μ A maximum (74HC Series)
- Compatible with bus-oriented systems
- Output drive capability: 15 LS-TTL loads

Ordering Code:

| Order Number | Package Number | Package Description |
|--------------|----------------|---|
| MM74HC573WM | M20B | 20-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-013, 0.300" Wide |
| MM74HC573SJ | M20D | 20-Lead Small Outline Package (SOP), EIAJ TYPE II, 5.3mm Wide |
| MM74HC573MTC | MTC20 | 20-Lead Thin Shrink Small Outline Package (TSSOP), JEDEC MO-153, 4.4mm Wide |
| MM74HC573N | N20A | 20-Lead Plastic Dual-In-Line Package (PDIP), JEDEC MS-001, 0.300" Wide |

Devices also available in Tape and Reel. Specify by appending the suffix letter "X" to the ordering code.

Connection Diagram



Truth Table

| Output Control | Latch Enable | Data | Output |
|----------------|--------------|------|--------|
| L | H | H | H |
| L | H | L | L |
| L | L | X | Q_0 |
| H | X | X | Z |

H = HIGH Level
L = LOW Level
 Q_0 = Level of output before steady-state input conditions were established.
Z = High Impedance
X = Don't Care

Absolute Maximum Ratings (Note 1)

(Note 2)

| | |
|--|-----------------------|
| Supply Voltage (V_{CC}) | -0.5 to +7.0V |
| DC Input Voltage (V_{IN}) | -1.5 to $V_{CC}+1.5V$ |
| DC Output Voltage (V_{OUT}) | -0.5 to $V_{CC}+0.5V$ |
| Clamp Diode Current (I_{IK}, I_{OK}) | ± 20 mA |
| DC Output Current, per pin (I_{OUT}) | ± 35 mA |
| DC V_{CC} or GND Current, per pin (I_{CC}) | ± 70 mA |
| Storage Temperature Range (T_{STG}) | -65°C to +150°C |
| Power Dissipation (P_D) | |
| (Note 3) | 600 mW |
| S.O. Package only | 500 mW |
| Lead Temperature (T_L) | |
| (Soldering 10 seconds) | 260°C |

Recommended Operating Conditions

| | Min | Max | Units |
|--|-----|----------|-------|
| Supply Voltage (V_{CC}) | 2 | 6 | V |
| DC Input or Output Voltage (V_{IN}, V_{OUT}) | 0 | V_{CC} | V |
| Operating Temperature Range (T_A) | -40 | +85 | °C |
| Input Rise or Fall Times (t_r, t_f) | | | |
| $V_{CC} = 2.0V$ | | 1000 | ns |
| $V_{CC} = 4.5V$ | | 500 | ns |
| $V_{CC} = 6.0V$ | | 400 | ns |

Note 1: Absolute Maximum Ratings are those values beyond which damage to the device may occur.

Note 2: Unless otherwise specified all voltages are referenced to ground.

Note 3: Power Dissipation temperature derating — plastic "N" package: -12 mW/°C from 65°C to 85°C.

DC Electrical Characteristics (Note 4)

| Symbol | Parameter | Conditions | V_{CC} | $T_A = 25^\circ\text{C}$ | | $T_A = -40$ to 85°C | $T_A = -55$ to 125°C | Units |
|-----------------|--|---|----------|--------------------------|-------------------|-----------------------------------|------------------------------------|---------------|
| | | | | Typ | Guaranteed Limits | | | |
| V_{IH} | Minimum HIGH Level Input Voltage | | 2.0V | | 1.5 | 1.5 | 1.5 | V |
| | | | 4.5V | | 3.15 | 3.15 | 3.15 | V |
| | | | 6.0V | | 4.2 | 4.2 | 4.2 | V |
| V_{IL} | Maximum LOW Level Input Voltage | | 2.0V | | 0.5 | 0.5 | 0.5 | V |
| | | | 4.5V | | 1.35 | 1.35 | 1.35 | V |
| | | | 6.0V | | 1.8 | 1.8 | 1.8 | V |
| V_{OH} | Minimum HIGH Level Output Voltage | $V_{IN} = V_{IH}$ or V_{IL} $ I_{OUT} \leq 20 \mu\text{A}$ | 2.0V | 2.0 | 1.9 | 1.9 | 1.9 | V |
| | | | 4.5V | 4.5 | 4.4 | 4.4 | 4.4 | V |
| | | | 6.0V | 6.0 | 5.9 | 5.9 | 5.9 | V |
| | | $V_{IN} = V_{IH}$ or V_{IL} $ I_{OUT} \leq 6.0$ mA $ I_{OUT} \leq 7.8$ mA | 4.5V | 4.2 | 3.98 | 3.84 | 3.7 | V |
| | | | 6.0V | 5.7 | 5.48 | 5.34 | 5.2 | V |
| | | | | | | | | |
| V_{OL} | Maximum LOW Level Output Voltage | $V_{IN} = V_{IH}$ or V_{IL} $ I_{OUT} \leq 20 \mu\text{A}$ | 2.0V | 0 | 0.1 | 0.1 | 0.1 | V |
| | | | 4.5V | 0 | 0.1 | 0.1 | 0.1 | V |
| | | | 6.0V | 0 | 0.1 | 0.1 | 0.1 | V |
| | | $V_{IN} = V_{IH}$ or V_{IL} $ I_{OUT} \leq 6.0$ mA $ I_{OUT} \leq 7.8$ mA | 4.5V | 0.2 | 0.26 | 0.33 | 0.4 | V |
| | | | 6.0V | 0.2 | 0.26 | 0.33 | 0.4 | V |
| | | | | | | | | |
| I_{IN} | Maximum Input Current | $V_{IN} = V_{CC}$ or GND | 6.0V | | ± 0.1 | ± 1.0 | ± 1.0 | μA |
| I_{OZ} | Maximum 3-STATE Output Leakage Current | $V_{OUT} = V_{CC}$ or GND $OC = V_{IH}$ | 6.0V | | ± 0.5 | ± 5.0 | ± 10 | μA |
| I_{CC} | Maximum Quiescent Supply Current | $V_{IN} = V_{CC}$ or GND $I_{OUT} = 0 \mu\text{A}$ | 6.0V | | 8.0 | 80 | 160 | μA |
| ΔI_{CC} | Quiescent Supply Current per Input Pin | $V_{CC} = 5.5V$ $V_{IN} = 2.4V$ or 0.4V (Note 4) | OE | 1.0 | 1.5 | 1.8 | 2.0 | mA |
| | | | LE | 0.6 | 0.8 | 1.0 | 1.1 | mA |
| | | | DATA | 0.4 | 0.5 | 0.6 | 0.7 | mA |

Note 4: For a power supply of $5V \pm 10\%$ the worst-case output voltages (V_{OH} , and V_{OL}) occur for HC at 4.5V. Thus the 4.5V values should be used when designing with this supply. Worst-case V_{IH} and V_{IL} occur at $V_{CC} = 5.5V$ and 4.5V respectively. (The V_{IH} value at 5.5V is 3.85V.) The worst-case leakage current (I_{IN} , I_{CC} , and I_{OZ}) occur for CMOS at the higher voltage and so the 6.0V values should be used.

| AC Electrical Characteristics | | | | | | | | |
|---|--|------------------------------------|--------------------------------|--------------------|-------------------|---------------------------|----------------------------|-------|
| $V_{CC} = 5V, T_A = 25^\circ C, t_r = t_f = 6 ns$ | | | | | | | | |
| Symbol | Parameter | Conditions | Typ | Guaranteed Limit | Units | | | |
| t_{PHL}, t_{PLH} | Maximum Propagation Delay, Data to Q | $C_L = 45 pF$ | 16 | 20 | ns | | | |
| t_{PHL}, t_{PLH} | Maximum Propagation Delay, LE to Q | $C_L = 45 pF$ | 14 | 22 | ns | | | |
| t_{PZH}, t_{PZL} | Maximum Output Enable Time | $R_L = 1 k\Omega$ $C_L = 45 pF$ | 15 | 27 | ns | | | |
| t_{PHZ}, t_{PLZ} | Maximum Output Disable Time | $R_L = 1 k\Omega$ $C_L = 5 pF$ | 13 | 23 | ns | | | |
| t_S | Minimum Set Up Time, Data to LE | | 10 | 15 | ns | | | |
| t_H | Minimum Hold Time, LE to Data | | 2 | 5 | ns | | | |
| t_W | Minimum Pulse Width, LE or Data | | 10 | 16 | ns | | | |
| AC Electrical Characteristics | | | | | | | | |
| Symbol | Parameter | Conditions | V_{CC} | $T_A = 25^\circ C$ | | $T_A = -40 to 85^\circ C$ | $T_A = -55 to 125^\circ C$ | Units |
| | | | | Typ | Guaranteed Limits | | | |
| t_{PHL}, t_{PLH} | Maximum Propagation Delay Data to Q | $C_L = 50 pF$ | 2.0V | 45 | 110 | 138 | 165 | ns |
| | | | 2.0V | 58 | 150 | 188 | 225 | ns |
| | | $C_L = 150 pF$ | 4.5V | 17 | 22 | 28 | 33 | ns |
| | | | 4.5V | 21 | 30 | 38 | 40 | ns |
| | | 6.0V | 15 | 19 | 24 | 29 | ns | |
| t_{PHL}, t_{PLH} | Maximum Propagation Delay, LE to Q | $C_L = 50 pF$ | 2.0V | 46 | 115 | 138 | 165 | ns |
| | | | 2.0V | 60 | 155 | 194 | 233 | ns |
| | | $C_L = 150 pF$ | 4.5V | 14 | 23 | 29 | 35 | ns |
| | | | 4.5V | 21 | 31 | 47 | 47 | ns |
| | | 6.0V | 12 | 20 | 25 | 30 | ns | |
| t_{PZH}, t_{PZL} | Maximum Output Enable Time | $R_L = 1 k\Omega$ | 2.0V | 55 | 140 | 175 | 210 | ns |
| | | | | | | | | |
| | | $C_L = 150 pF$ | 2.0V | 67 | 180 | 225 | 270 | ns |
| | | | 4.5V | 15 | 28 | 35 | 42 | ns |
| | | 4.5V | 24 | 36 | 45 | 54 | ns | |
| t_{PHZ}, t_{PLZ} | Maximum Output Disable Time | $R_L = 1 k\Omega$ | 2.0V | 40 | 125 | 156 | 188 | ns |
| | | | | | | | | |
| | | $C_L = 150 pF$ | 4.5V | 13 | 25 | 31 | 38 | ns |
| | | | 6.0V | 12 | 21 | 27 | 32 | ns |
| | | t_S | Minimum Set Up Time Data to LE | | 2.0V | 30 | 75 | 95 |
| 4.5V | 10 | | | | 15 | 19 | 22 | ns |
| 6.0V | 9 | | | | 13 | 16 | 19 | ns |
| t_H | Minimum Hold Time LE to Data | | 2.0V | | 25 | 31 | 38 | ns |
| | | | 4.5V | | 5 | 6 | 7 | ns |
| | | | 6.0V | | 4 | 5 | 6 | ns |
| t_W | Minimum Pulse Width LE, or Data | | 2.0V | 30 | 80 | 100 | 120 | ns |
| | | | 4.5V | 9 | 16 | 20 | 24 | ns |
| | | | 6.0V | 8 | 14 | 18 | 20 | ns |
| t_{TLH}, t_{THL} | Maximum Output Rise and Fall Time, Clock | $C_L = 50 pF$ | 2.0V | 25 | 60 | 75 | 90 | ns |
| | | | 4.5V | 7 | 12 | 15 | 18 | ns |
| | | | 6.0V | 6 | 10 | 13 | 15 | ns |
| C_{PD} | Power Dissipation Capacitance (Note 5) (per latch) | OC = V_{CC} OC = GND | | 5 | | | | pF |
| | | | | 52 | | | | pF |
| C_{IN} | Maximum Input Capacitance | | | 5 | 10 | 10 | 10 | pF |

AC Electrical Characteristics (Continued)

| Symbol | Parameter | Conditions | V _{CC} | T _A = 25°C | | T _A = -40 to 85°C | T _A = -55 to 125°C | Units |
|------------------|----------------------------|------------|-----------------|-----------------------|-------------------|------------------------------|-------------------------------|-------|
| | | | | Typ | Guaranteed Limits | | | |
| C _{OUT} | Maximum Output Capacitance | | | 15 | 20 | 20 | 20 | pF |

Note 5: C_{PD} determines the no load dynamic power consumption, $P_D = C_{PD} V_{CC}^2 f + I_{CC} V_{CC}$, and the no load dynamic current consumption, $I_S = C_{PD} V_{CC} f + I_{CC}$.

Physical Dimensions inches (millimeters) unless otherwise noted



**20-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-013, 0.300" Wide
Package Number M20B**

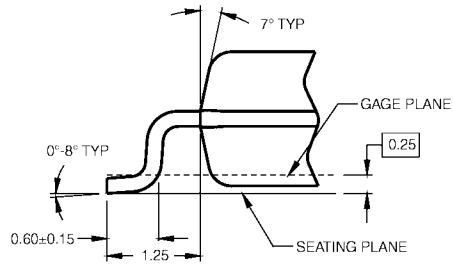
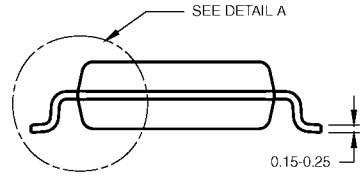
Physical Dimensions inches (millimeters) unless otherwise noted (Continued)



LAND PATTERN RECOMMENDATION



DIMENSIONS ARE IN MILLIMETERS



DETAIL A

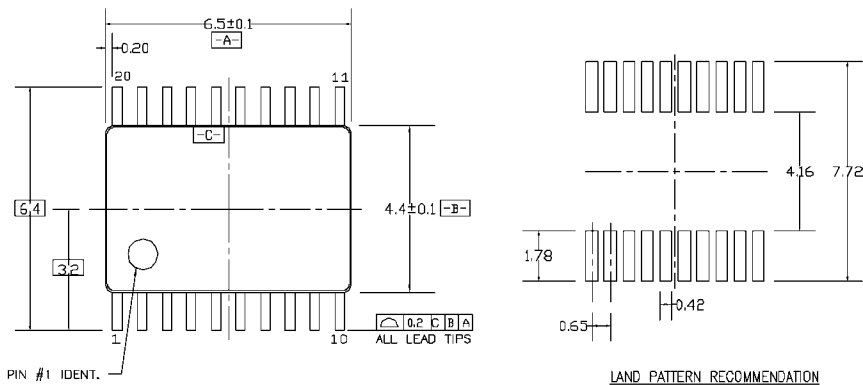
NOTES:

- A. CONFORMS TO EIAJ EDR-7320 REGISTRATION, ESTABLISHED IN DECEMBER, 1998.
- B. DIMENSIONS ARE IN MILLIMETERS.
- C. DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLD FLASH, AND TIE BAR EXTRUSIONS.

M20DRevB1

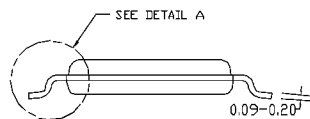
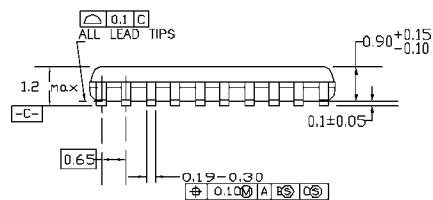
**20-Lead Small Outline Package (SOP), EIAJ TYPE II, 5.3mm Wide
Package Number M20D**

Physical Dimensions inches (millimeters) unless otherwise noted (Continued)

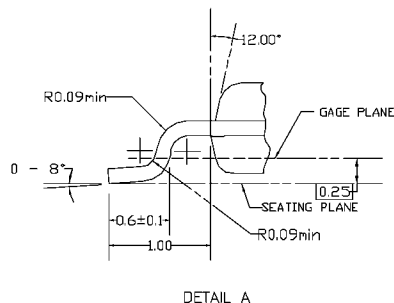


PIN #1 IDENT.

LAND PATTERN RECOMMENDATION



DIMENSIONS ARE IN MILLIMETERS



NOTES:

- A. CONFORMS TO JEDEC REGISTRATION MO-153, VARIATION AC, REF NOTE 6, DATE 7/93.
- B. DIMENSIONS ARE IN MILLIMETERS.
- C. DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLDS FLASH, AND TIE BAR EXTRUSIONS.
- D. DIMENSIONS AND TOLERANCES PER ANSI Y14.5M, 1982.

MTC20REV D1

20-Lead Thin Shrink Small Outline Package (TSSOP), JEDEC MO-153, 4.4mm Wide Package Number MTC20

Physical Dimensions inches (millimeters) unless otherwise noted (Continued)



20-Lead Plastic Dual-In-Line Package (PDIP), JEDEC MS-001, 0.300" Wide Package Number N20A

Fairchild does not assume any responsibility for use of any circuitry described, no circuit patent licenses are implied and Fairchild reserves the right at any time without notice to change said circuitry and specifications.

LIFE SUPPORT POLICY

FAIRCHILD'S PRODUCTS ARE NOT AUTHORIZED FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS WITHOUT THE EXPRESS WRITTEN APPROVAL OF THE PRESIDENT OF FAIRCHILD SEMICONDUCTOR CORPORATION. As used herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and (c) whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury to the user.
2. A critical component in any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

www.fairchildsemi.com

ON Semiconductor and  are trademarks of Semiconductor Components Industries, LLC dba ON Semiconductor or its subsidiaries in the United States and/or other countries. ON Semiconductor owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of ON Semiconductor's product/patent coverage may be accessed at www.onsemi.com/site/pdf/Patent-Marking.pdf. ON Semiconductor reserves the right to make changes without further notice to any products herein. ON Semiconductor makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does ON Semiconductor 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 ON Semiconductor products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by ON Semiconductor. "Typical" parameters which may be provided in ON Semiconductor 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. ON Semiconductor does not convey any license under its patent rights nor the rights of others. ON Semiconductor 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 ON Semiconductor products for any such unintended or unauthorized application, Buyer shall indemnify and hold ON Semiconductor 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 ON Semiconductor was negligent regarding the design or manufacture of the part. ON Semiconductor 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
19521 E. 32nd Pkwy, Aurora, Colorado 80011 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