MSR1560

SWITCHMODE™ Soft Recovery Power Rectifier

Designed for boost converter or hard–switched converter applications, especially for Power Factor Correction application. It could also be used as a free wheeling diode in variable speed motor control applications and switching mode power supplies. These state–of–the–art devices have the following features:

- Soft Recovery with Low Reverse Recovery Charge (Q_{RR}) and Peak Reverse Recovery Current (I_{RRM})
- 150°C Operating Junction Temperature
- Popular TO–220 Package
- Epoxy meets UL94, V_O @ 1/8″
- Low Forward Voltage
- Low Leakage Current
- High Temperature Glass Passivated Junction

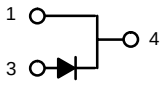
Mechanical Characteristics:

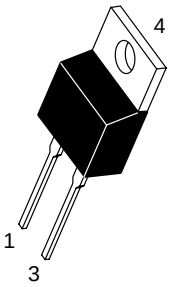
- Case: Molded Epoxy
- Weight: 1.9 Grams (approximately)
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads Readily Solderable
- Lead Temperature for Soldering Purposes: 260°C Max. for 10 Seconds
- Shipped in 50 Units per Plastic Tube
- Marking: MSR1560

ON Semiconductor

http://onsemi.com

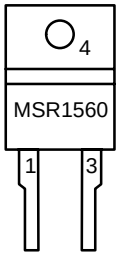
SOFT RECOVERY POWER RECTIFIER 15 AMPERES 600 VOLTS





CASE 221B TO–220 PLASTIC

MARKING DIAGRAM



ORDERING INFORMATION

Device	Package	Shipping
MSR1560	TO–220	50 Units/Rail

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	V_{RRM} V_{RWM} V_R	600	V
Average Rectified Forward Current (At Rated V_R, T_C = 125°C)	I_O	15	A
Peak Repetitive Forward Current (At Rated V_R, Square Wave, 20 kHz, T_C = 125°C)	I_{FRM}	30	A
Non–Repetitive Peak Surge Current (Surge applied at rated load conditions, halfwave, single phase, 60 Hz)	I_{FSM}	100	A
Storage / Operating Case Temperature	T_{stg}, T_C	– 65 to 150	°C
Operating Junction Temperature	T_J	– 65 to 150	°C

THERMAL CHARACTERISTICS

Thermal Resistance — Junction–to–Case Thermal Resistance — Junction–to–Ambient	$R_{\theta JC}$ $R_{\theta JA}$	1.6 72.8	°C/W

ELECTRICAL CHARACTERISTICS

Maximum Instantaneous Forward Voltage (Note 1.) (I_F = 15 A)	V_F	**T_J = 25°C**	**T_J = 150°C**	V
Typical		1.8 *1.5*	1.4 *1.2*	
Maximum Instantaneous Reverse Current (V_R = 600 V)	I_R	**T_J = 25°C**	**T_J = 150°C**	μA
Typical		15 *0.4*	5000 *100*	
Maximum Reverse Recovery Time (Note 2.) (V_R = 30 V, I_F = 1 A, di/dt = 100 A/μs)	t_{rr}	**T_J = 25°C**	**T_J = 100°C**	ns
Typical		45 *35*	65 *54*	
Typical Recovery Softness Factor (V_R = 30 V, I_F = 1 A, di/dt = 100 A/μs)	$s = t_b/t_a$	*.67*	*.74*	
Typical Peak Reverse Recovery Current (V_R = 30 V, I_F = 1 A, di/dt = 100 A/μs)	I_{RRM}	2.3	3.2	A
Typical Reverse Recovery Charge (V_R = 30 V, I_F = 1 A, di/dt = 100 A/μs)	Q_{RR}	31	78	nC

1. Pulse Test: Pulse Width ≤ 380 μs, Duty Cycle ≤ 2%
2. T_{RR} measured projecting from 25% of I_{RRM} to zero current

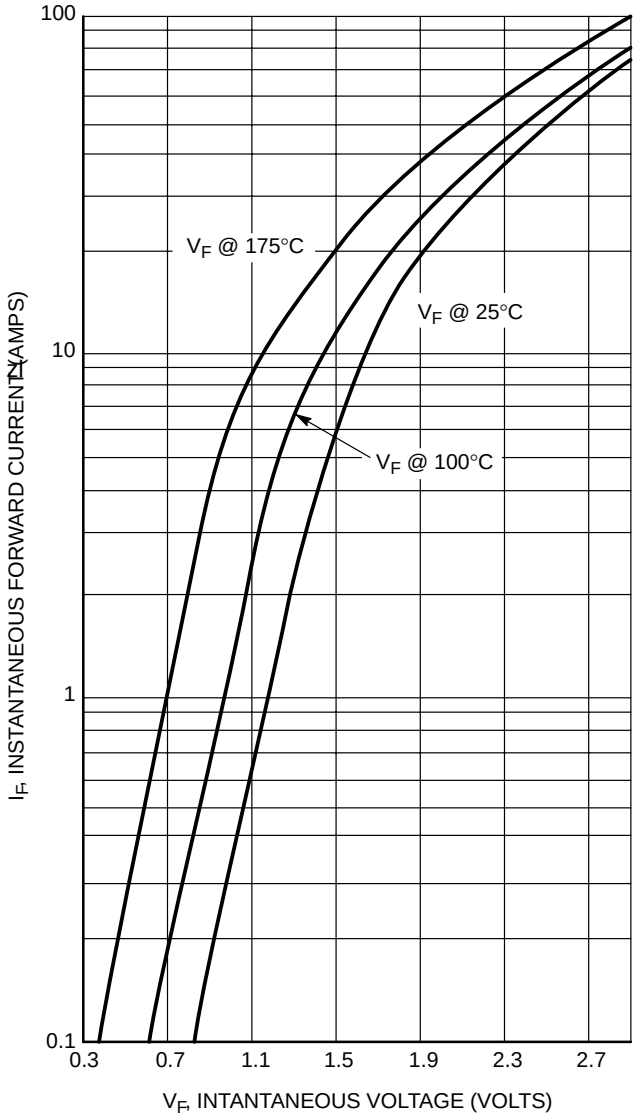


Figure 1. Maximum Forward Voltage

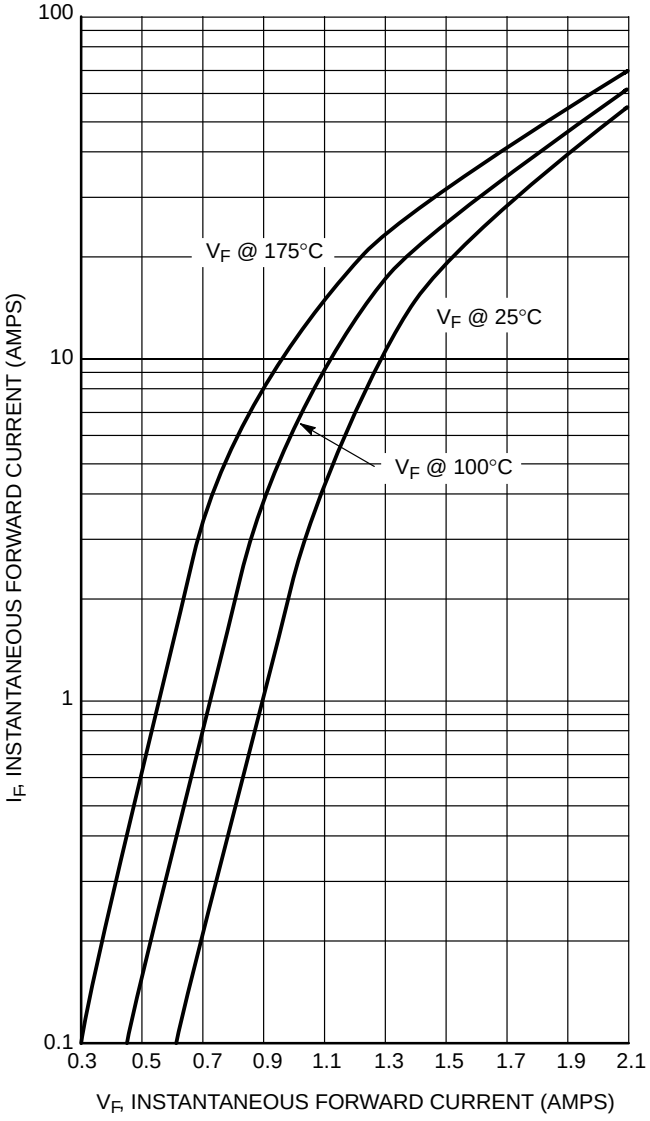


Figure 2. Typical Forward Voltage

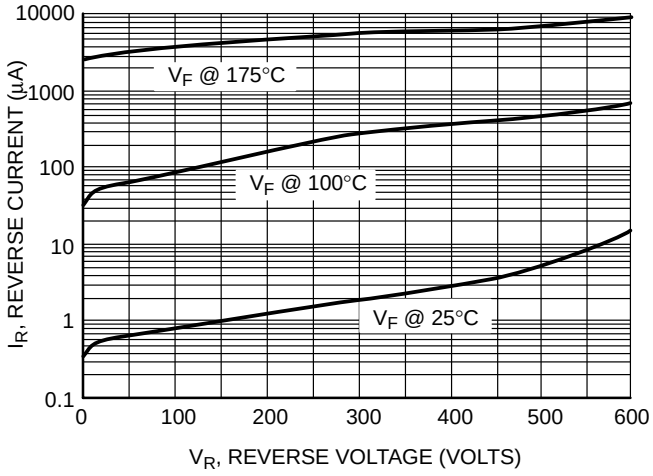


Figure 3. Maximum Reverse Current

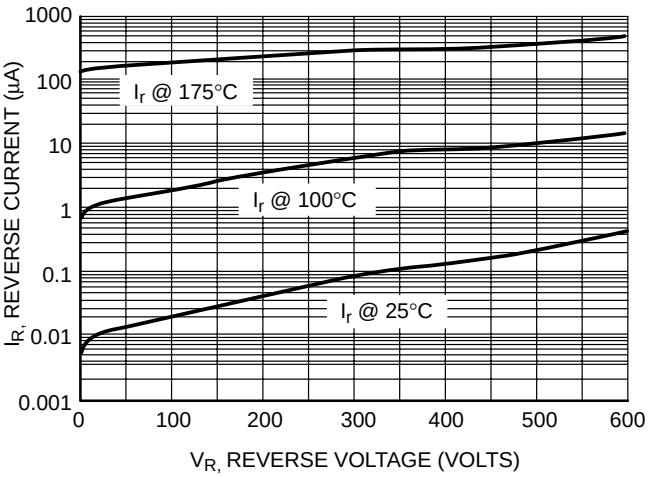


Figure 4. Typical Reverse Current

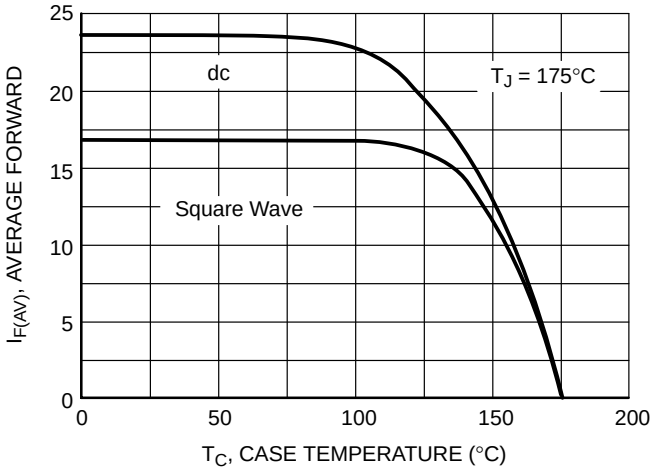


Figure 5. Current Derating

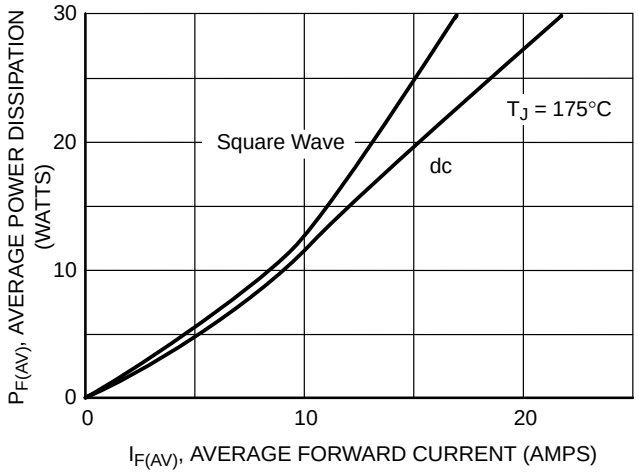


Figure 6. Power Dissipation

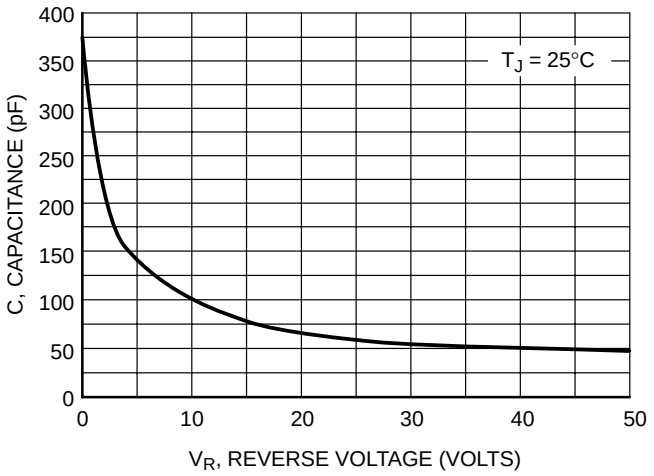


Figure 7. Maximum Capacitance

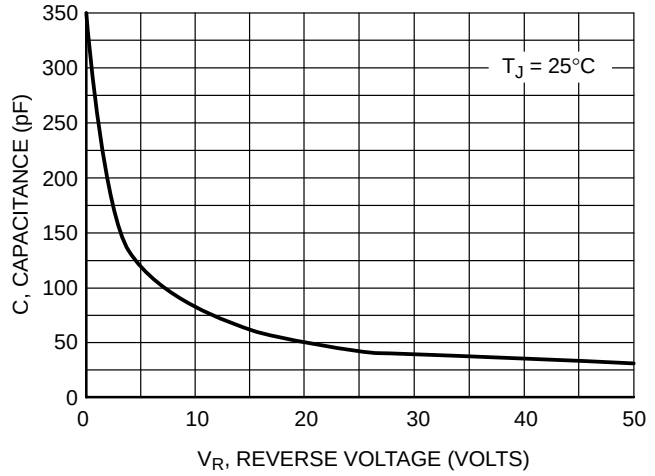


Figure 8. Typical Capacitance

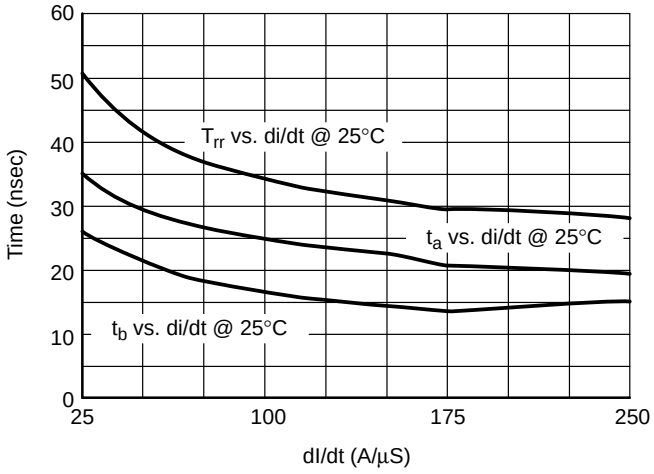


Figure 9. Typical Trr vs. di/dt

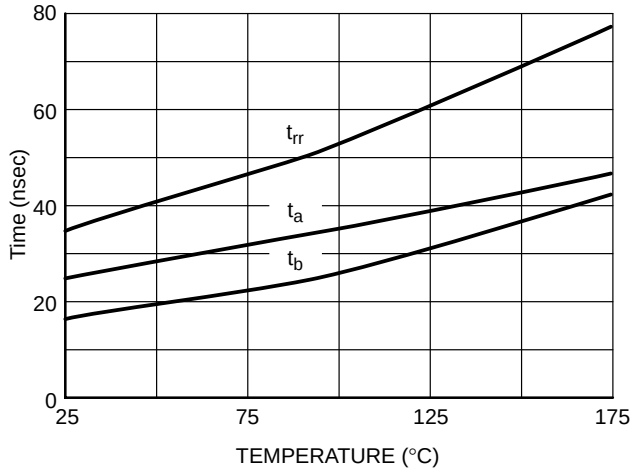


Figure 10. Typical Trr vs. Temperature

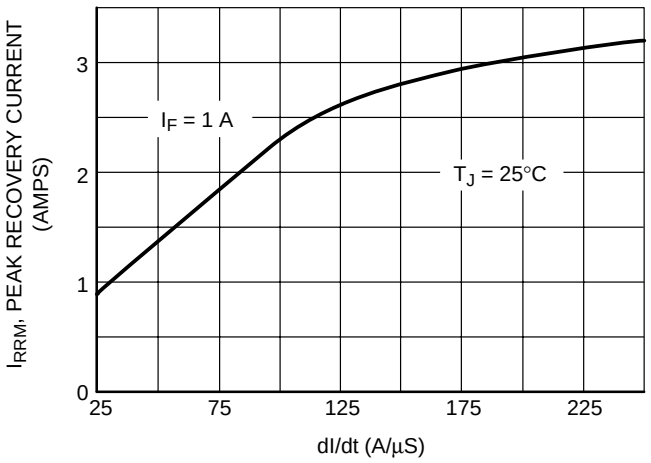


Figure 11. Typical Peak Reverse Recovery Current

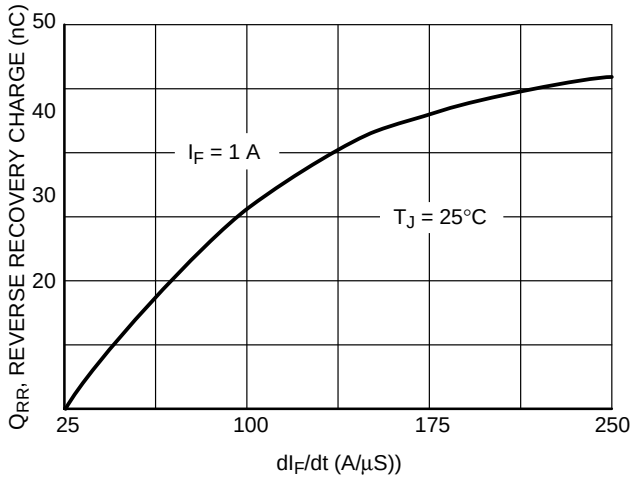


Figure 12. Typical Reverse Recovery Charge

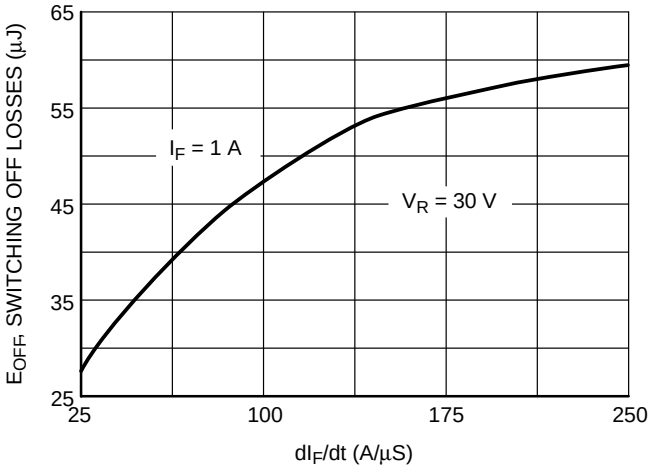


Figure 13. Typical Switching Off Losses

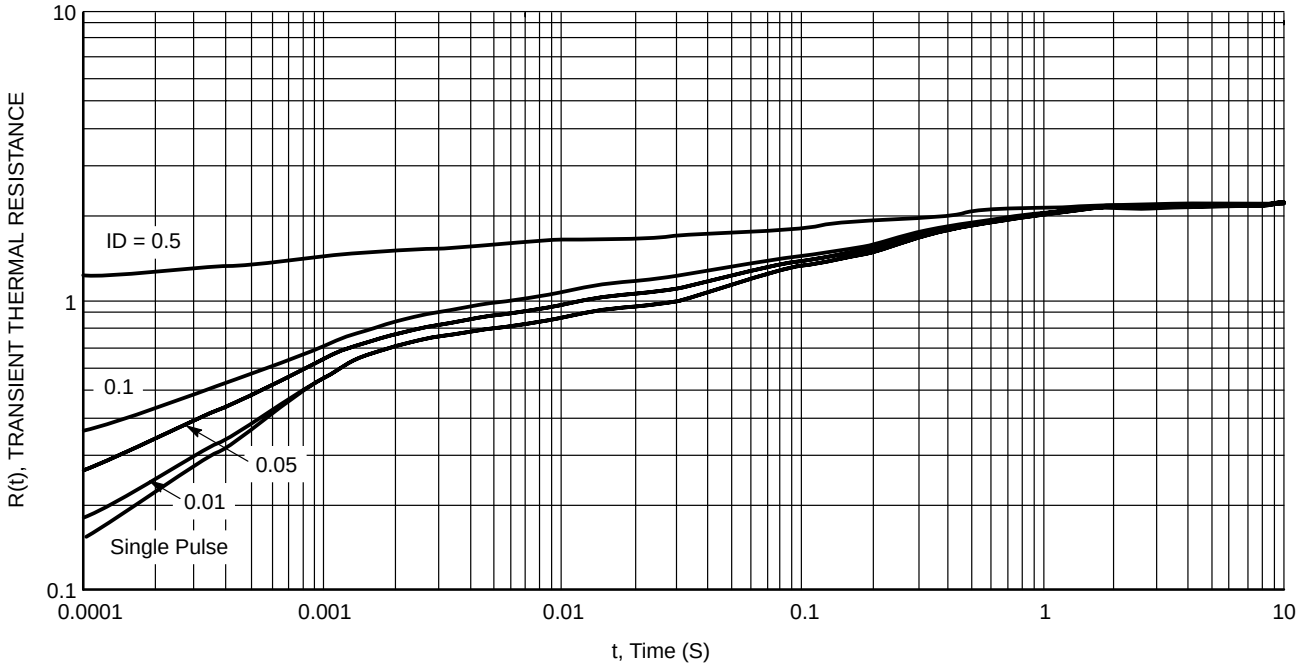
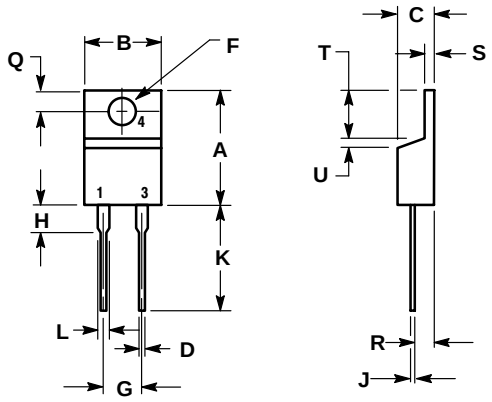


Figure 14. Transient Thermal Response

PACKAGE DIMENSIONS

TO–220
PLASTIC
CASE 221B–04
ISSUE D



NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.

	INCHES		MILLIMETERS	
DIM	MIN	MAX	MIN	MAX
A	0.595	0.620	15.11	15.75
B	0.380	0.405	9.65	10.29
C	0.160	0.190	4.06	4.82
D	0.025	0.035	0.64	0.89
F	0.142	0.147	3.61	3.73
G	0.190	0.210	4.83	5.33
H	0.110	0.130	2.79	3.30
J	0.018	0.025	0.46	0.64
K	0.500	0.562	12.70	14.27
L	0.045	0.060	1.14	1.52
Q	0.100	0.120	2.54	3.04
R	0.080	0.110	2.04	2.79
S	0.045	0.055	1.14	1.39
T	0.235	0.255	5.97	6.48
U	0.000	0.050	0.000	1.27

STYLE 1:
PIN 1. CATHODE
2. N/A
3. ANODE
4. CATHODE

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Literature Distribution Center for ON Semiconductor
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Phone: 303–675–2175 or 800–344–3860 Toll Free USA/Canada
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ASIA/PACIFIC: LDC for ON Semiconductor – Asia Support
Phone: 303–675–2121 (Tue–Fri 9:00am to 1:00pm, Hong Kong Time)
Toll Free from Hong Kong & Singapore:
001–800–4422–3781
Email: ONlit–asia@hibbertco.com

JAPAN: ON Semiconductor, Japan Customer Focus Center
4–32–1 Nishi–Gotanda, Shinagawa–ku, Tokyo, Japan 141–0031
Phone: 81–3–5740–2700
Email: r14525@onsemi.com

ON Semiconductor Website: http://onsemi.com

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