

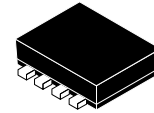
MOSFET – Power, N-Channel

20 V, 14 A, 6.8 mΩ, Single ECH8

ECH8420

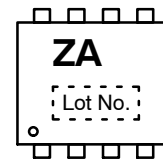
Features

- ON-resistance $R_{DS(on)1} = 5.2 \text{ m}\Omega$ (Typ.)
- 1.8 V Drive
- Protection Diode in
- This Device is Pb-Free and Halide Free

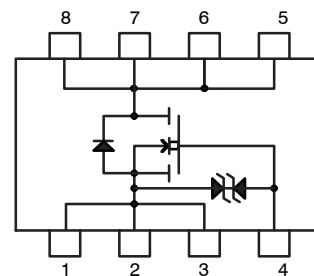


SOT-28FL / ECH8
CASE 318BF

MARKING DIAGRAM



ELECTRICAL CONNECTION



Package Dimension

Unit : mm (typ)
7011A-002

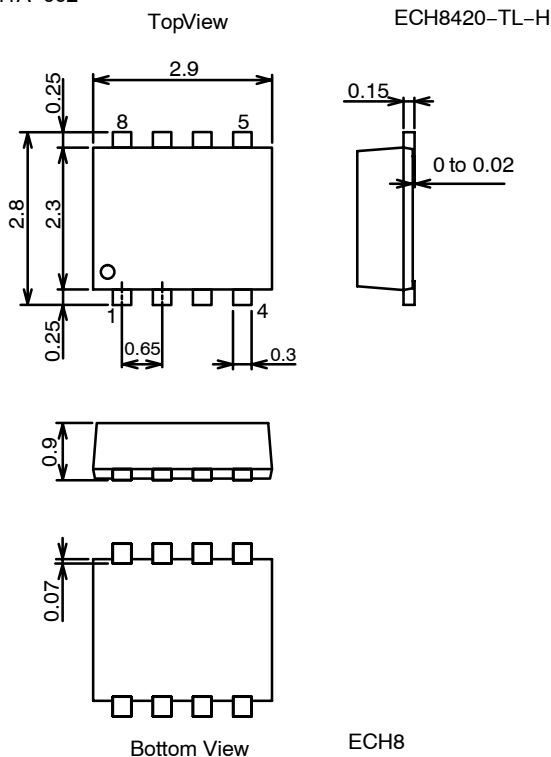
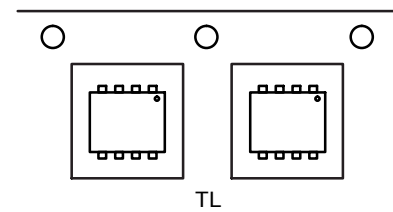


Figure 1. Package Dimensions

PACKING TYPE: TL



ORDERING INFORMATION

Device	Package	Shipping [†]
ECH8420-TL-H	SOT-28FL / ECH8 (Pb-Free, Halide Free)	3000 / Tape & Reel

[†]For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specification Brochure, BRD8011/D.

Specifications

ABSOLUTE MAXIMUM RATINGS at $T_A = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Drain-to-Source Voltage	V_{DSS}		20	V
Gate-to-Source Voltage	V_{GSS}		± 12	V
Drain Current (DC)	I_D		14	A
Drain Current (Pulse)	I_{DP}	$PW \leq 10 \mu\text{s}$, duty cycle $\leq 1\%$	50	A
Allowable Power Dissipation	P_D	When mounted on ceramic substrate ($900 \text{ mm}^2 \times 0.8 \text{ mm}$)	1.6	W
Channel Temperature	T_{ch}		150	$^\circ\text{C}$
Storage Temperature	T_{stg}		-55 to +150	$^\circ\text{C}$

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

ELECTRICAL CHARACTERISTICS at $T_A = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings			Unit
			Min	Typ	Max	
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D = 1 \text{ mA}$, $V_{GS} = 0 \text{ V}$	20	–	–	V
Zero-Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 20 \text{ V}$, $V_{GS} = 0 \text{ V}$	–	–	1	μA
Gate-to-Source Leakage Current	I_{GSS}	$V_{GS} = \pm 8 \text{ V}$, $V_{DS} = 0 \text{ V}$	–	–	± 10	μA
Cutoff Voltage	$V_{GS(off)}$	$V_{DS} = 10 \text{ V}$, $I_D = 1 \text{ mA}$	0.4	–	1.3	V
Forward Transfer Admittance	$ y_{fs} $	$V_{DS} = 10 \text{ V}$, $I_D = 7 \text{ A}$	–	14.5	–	S
Static Drain-to-Source On-State Resistance	$R_{DS(on)1}$	$I_D = 7 \text{ A}$, $V_{GS} = 4.5 \text{ V}$	–	5.2	6.8	$\text{m}\Omega$
	$R_{DS(on)2}$	$I_D = 4 \text{ A}$, $V_{GS} = 2.5 \text{ V}$	–	8	11.5	$\text{m}\Omega$
	$R_{DS(on)3}$	$I_D = 2 \text{ A}$, $V_{GS} = 1.8 \text{ V}$	–	15	22.5	$\text{m}\Omega$
Input Capacitance	C_{iss}	$V_{DS} = 10 \text{ V}$, $f = 1 \text{ MHz}$	–	2430	–	pF
Output Capacitance	C_{oss}		–	410	–	pF
Reverse Transfer Capacitance	C_{rss}		–	330	–	pF
Turn-ON Delay Time	$t_d(on)$	See specified Test Circuit.	–	21	–	ns
Rise Time	t_r		–	88	–	ns
Turn-OFF Delay Time	$t_d(off)$		–	210	–	ns
Fall Time	t_f		–	115	–	ns
Total Gate Charge	Q_g	$V_{DS} = 10 \text{ V}$, $V_{GS} = 4.5 \text{ V}$, $I_D = 14 \text{ A}$	–	29	–	nC
Gate-to-Source Charge	Q_{gs}		–	4.8	–	nC
Gate-to-Drain "Miller" Charge	Q_{gd}		–	8.7	–	nC
Diode Forward Voltage	V_{SD}	$I_S = 14 \text{ A}$, $V_{GS} = 0 \text{ V}$	–	0.75	1.2	V

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

ECH8420

Switching Time Test Circuit

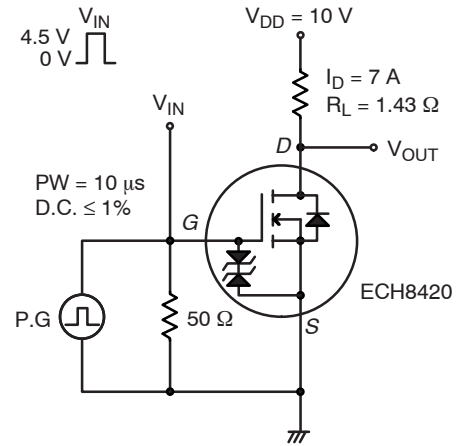


Figure 2. Switching Time Test Circuit

TYPICAL CHARACTERISTICS

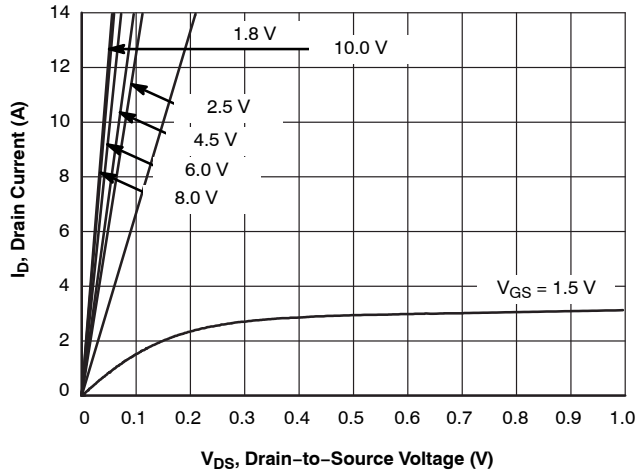


Figure 3. $I_D - V_{DS}$

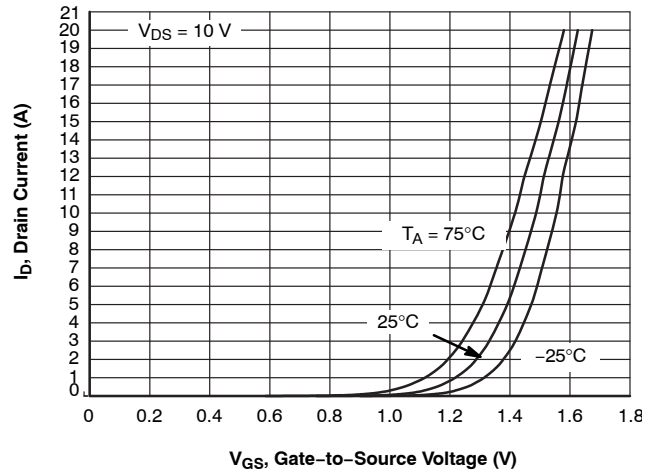


Figure 4. $I_D - V_{GS}$

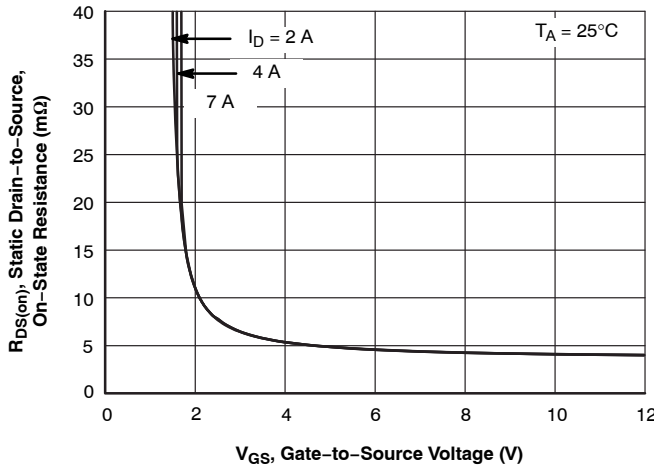


Figure 5. $R_{DS(on)} - V_{GS}$

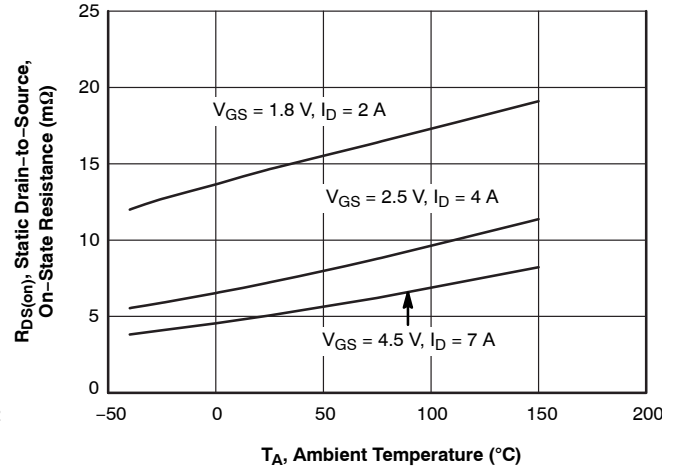


Figure 6. $R_{DS(on)} - T_A$

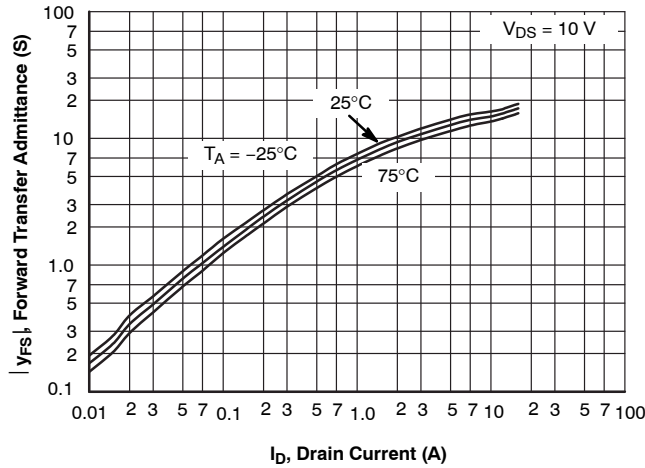


Figure 7. $|y_{fs}| - I_D$

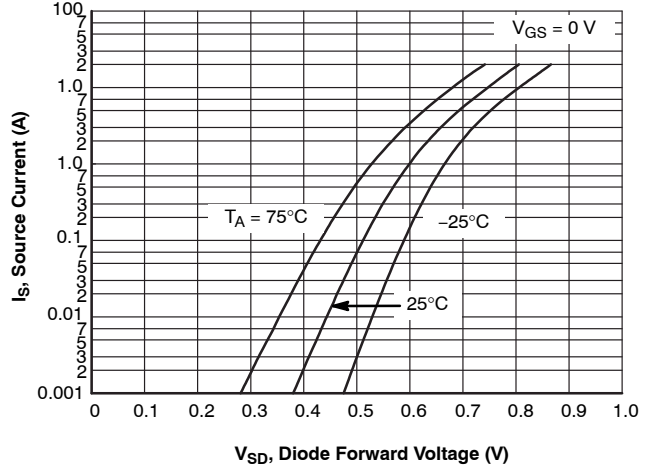


Figure 8. $I_S - V_{SD}$

TYPICAL CHARACTERISTICS (continued)

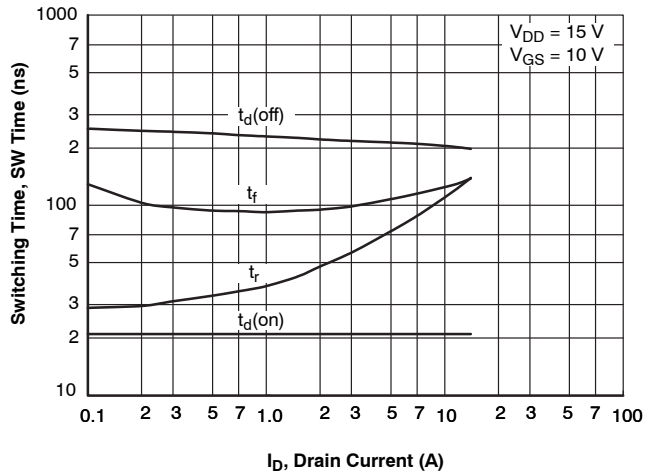


Figure 9. SW Time – I_D

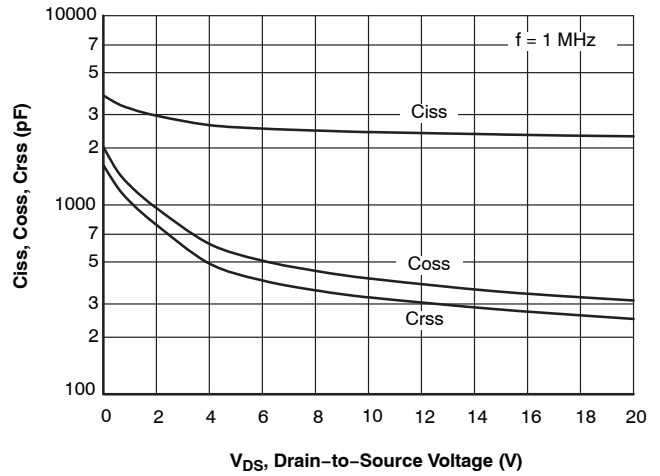


Figure 10. C_{iss} , C_{oss} , C_{rss} – V_{DS}

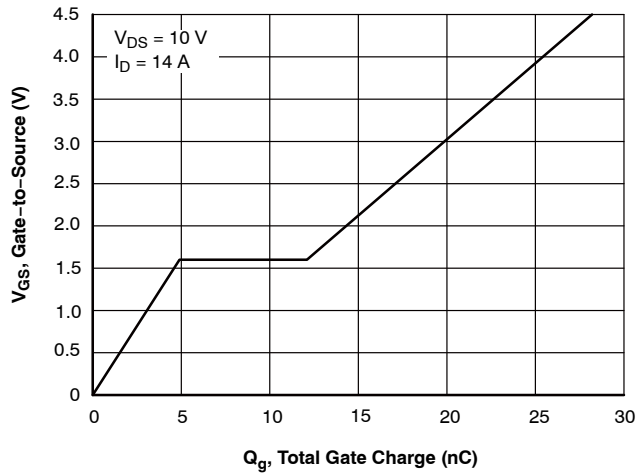


Figure 11. V_{GS} – Q_g

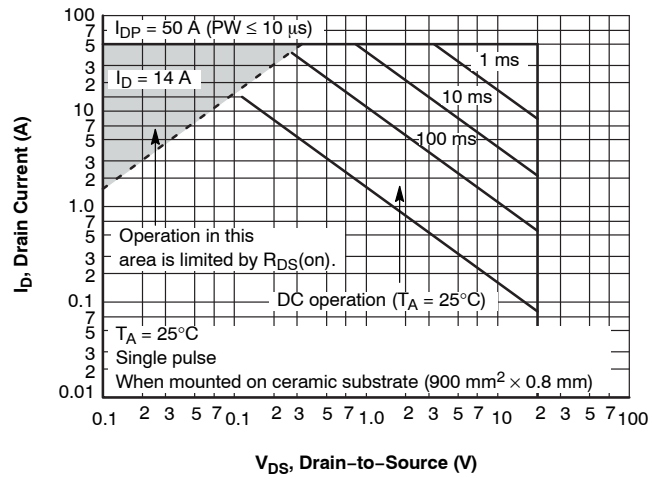


Figure 12. ASO

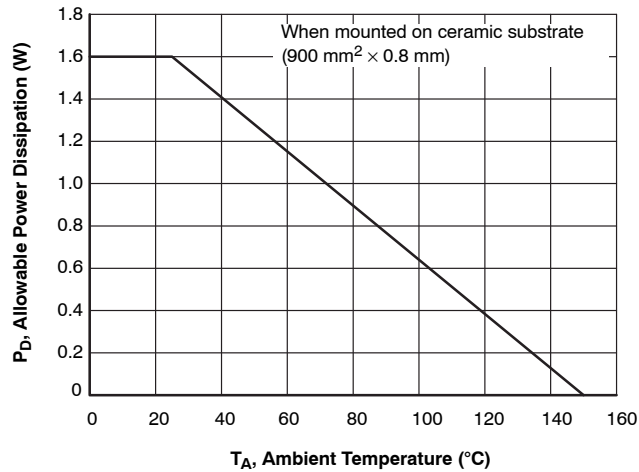
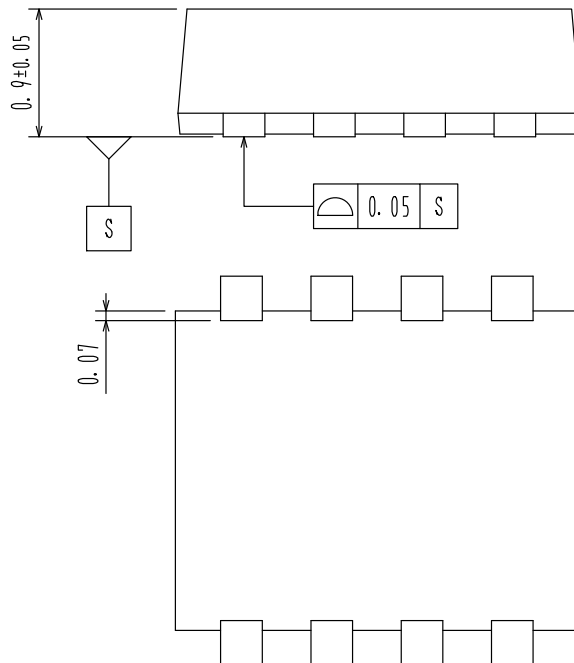
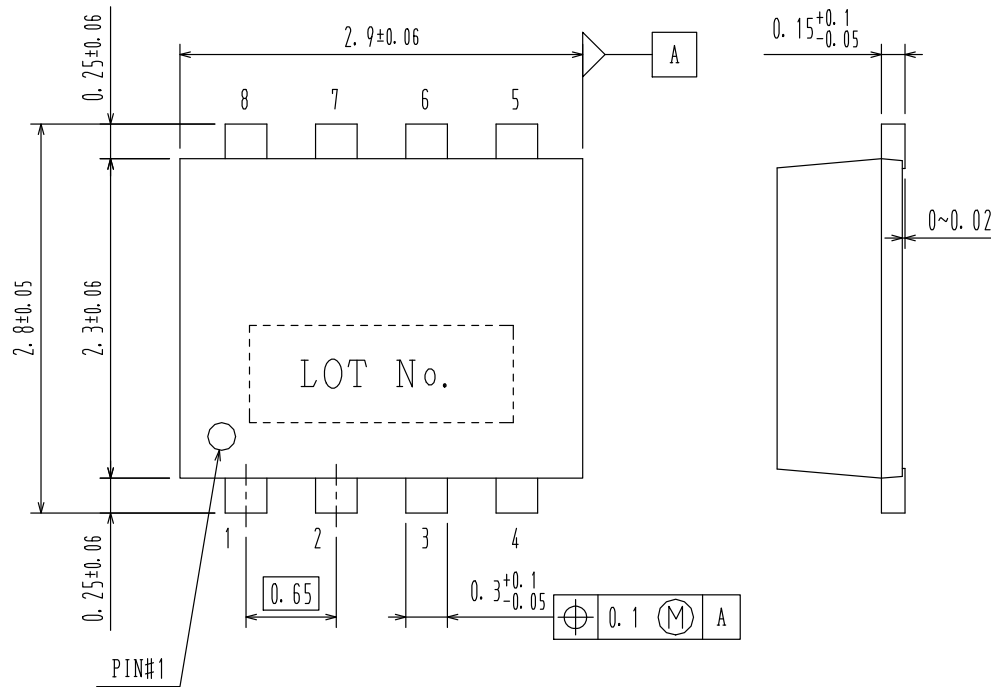


Figure 13. P_D – T_A

SOT-28FL / ECH8
CASE 318BF
ISSUE O

DATE 31 MAR 2012



DOCUMENT NUMBER:	98AON78700E	Electronic versions are uncontrolled except when accessed directly from the Document Repository. Printed versions are uncontrolled except when stamped "CONTROLLED COPY" in red.
DESCRIPTION:	SOT-28FL / ECH8	PAGE 1 OF 1

onsemi and onsemi are trademarks of Semiconductor Components Industries, LLC dba onsemi or its subsidiaries in the United States and/or other countries. onsemi reserves the right to make changes without further notice to any products herein. onsemi makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does onsemi 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. onsemi does not convey any license under its patent rights nor the rights of others.

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

ADDITIONAL INFORMATION

TECHNICAL PUBLICATIONS:

Technical Library: www.onsemi.com/design/resources/technical-documentation
onsemi Website: www.onsemi.com

ONLINE SUPPORT: www.onsemi.com/support

For additional information, please contact your local Sales Representative at
www.onsemi.com/support/sales

