

# MJD340 (NPN), MJD350 (PNP)

## High Voltage Power Transistors

### DPAK for Surface Mount Applications

Designed for line operated audio output amplifier, switchmode power supply drivers and other switching applications.

#### Features

- Lead Formed for Surface Mount Applications in Plastic Sleeves (No Suffix)
- Electrically Similar to Popular MJE340 and MJE350
- Epoxy Meets UL 94 V-0 @ 0.125 in
- NJV Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable
- These Devices are Pb-Free, Halogen Free/BFR Free and are RoHS Compliant

#### MAXIMUM RATINGS

Rating	Symbol	Max	Unit
Collector-Emitter Voltage	$V_{CEO}$	300	Vdc
Collector-Base Voltage	$V_{CB}$	300	Vdc
Emitter-Base Voltage	$V_{EB}$	3	Vdc
Collector Current – Continuous	$I_C$	0.5	Adc
Collector Current – Peak	$I_{CM}$	0.75	Adc
Total Power Dissipation @ $T_C = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	15 0.12	W W/ $^\circ\text{C}$
Total Power Dissipation (Note 1) @ $T_A = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	1.56 0.012	W W/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	$T_J, T_{stg}$	-65 to +150	$^\circ\text{C}$
ESD – Human Body Model MJD340 (NPN) MJD350 (PNP)	HBM	3B 2	V
ESD – Machine Model MJD340 (NPN) MJD350 (PNP)	MM	M4 M4	V

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.

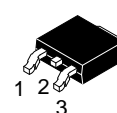
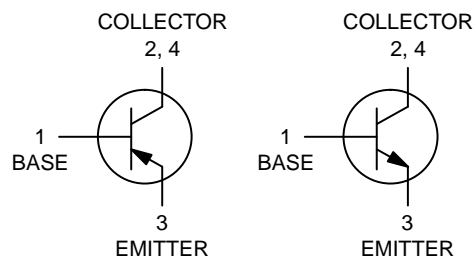
1. These ratings are applicable when surface mounted on the minimum pad sizes recommended.



ON Semiconductor®

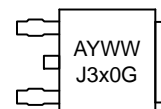
[www.onsemi.com](http://www.onsemi.com)

### SILICON POWER TRANSISTORS 0.5 AMPERE 300 VOLTS, 15 WATTS



DPAK  
CASE 369C  
STYLE 1

#### MARKING DIAGRAM



A = Assembly Location  
Y = Year  
WW = Work Week  
J3x0 = Device Code  
x = 4 or 5  
G = Pb-Free Package

#### ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 5 of this data sheet.

## MJD340 (NPN), MJD350 (PNP)

### THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	8.33	$^{\circ}\text{C}/\text{W}$
Thermal Resistance, Junction-to-Ambient (Note 2)	$R_{\theta JA}$	80	$^{\circ}\text{C}/\text{W}$
Leading Temperature for Soldering Purpose	$T_L$	260	$^{\circ}\text{C}$

2. These ratings are applicable when surface mounted on the minimum pad sizes recommended.

### ELECTRICAL CHARACTERISTICS ( $T_C = 25^{\circ}\text{C}$ unless otherwise noted)

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

#### OFF CHARACTERISTICS

Collector-Emitter Sustaining Voltage (Note 3) ( $I_C = 1\text{ mA}$ , $I_B = 0$ )	$V_{CEO(sus)}$	300	-	V
Collector Cutoff Current ( $V_{CB} = 300\text{ V}$ , $I_E = 0$ )	$I_{CEO}$	-	0.1	mA
Emitter Cutoff Current ( $V_{BE} = 3\text{ V}$ , $I_C = 0$ )	$I_{EBO}$	-	0.1	mA

#### ON CHARACTERISTICS (Note 3)

DC Current Gain ( $I_C = 50\text{ mA}$ , $V_{CE} = 10\text{ V}$ )	$h_{FE}$	30	240	-
Collector-Emitter Saturation Voltage ( $I_C = 100\text{ mA}$ , $I_B = 10\text{ mA}$ )	$V_{CE(sat)}$	-	1	V
Base-Emitter On Voltage ( $I_C = 1\text{ A}$ , $V_{CE} = 10\text{ V}$ )	$V_{BE(on)}$	-	1.5	V

#### DYNAMIC CHARACTERISTICS

Current Gain – Bandwidth Product ( $I_C = 50\text{ mA}$ , $V_{CE} = 10\text{ V}$ , $f = 10\text{ MHz}$ )	$f_T$	10	-	MHz
---	-------	----	---	-----

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.

3. Pulse Test: Pulse Width  $\leq 300\ \mu\text{s}$ , Duty Cycle  $\leq 2\%$ .

# MJD340 (NPN), MJD350 (PNP)

## TYPICAL CHARACTERISTICS

### MJD340

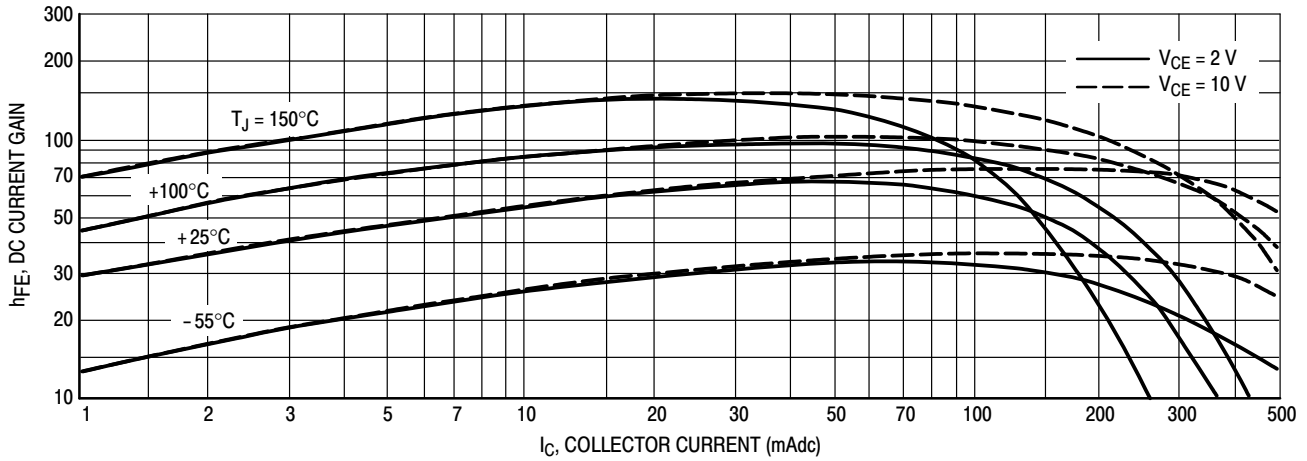


Figure 1. DC Current Gain

### MJD340

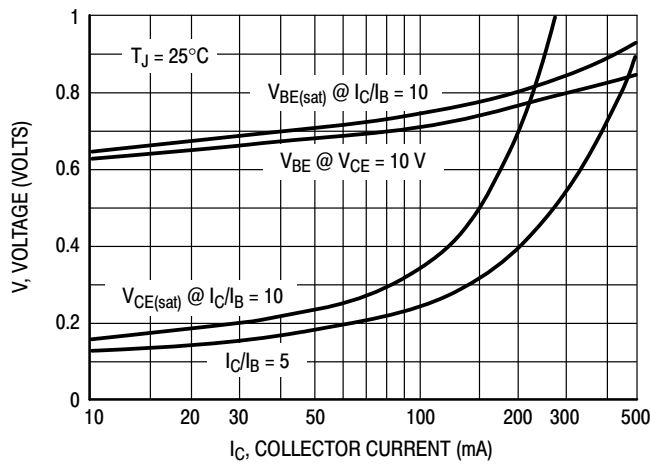


Figure 2. "On" Voltages

### MJD350

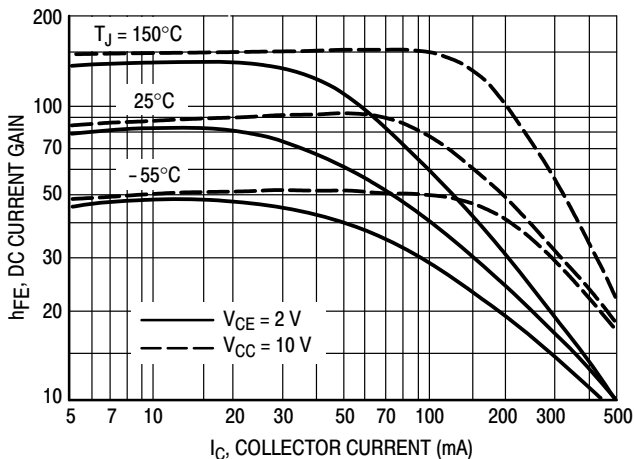


Figure 3. DC Current Gain

### MJD350

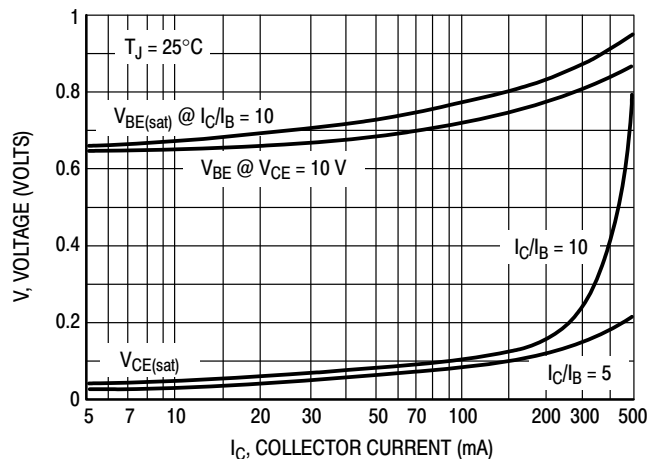


Figure 4. "On" Voltages

# MJD340 (NPN), MJD350 (PNP)

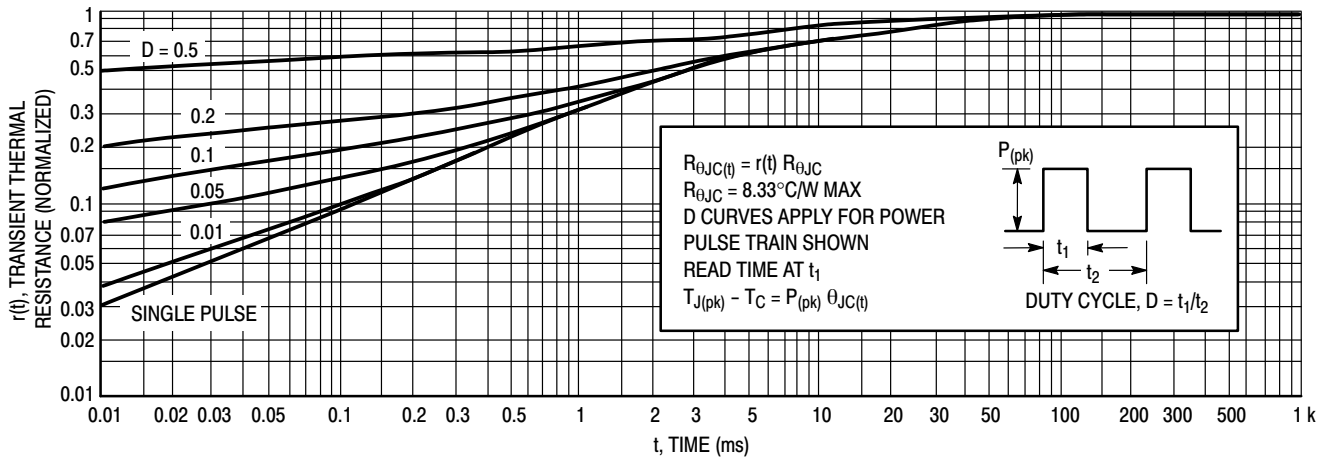


Figure 5. Thermal Response

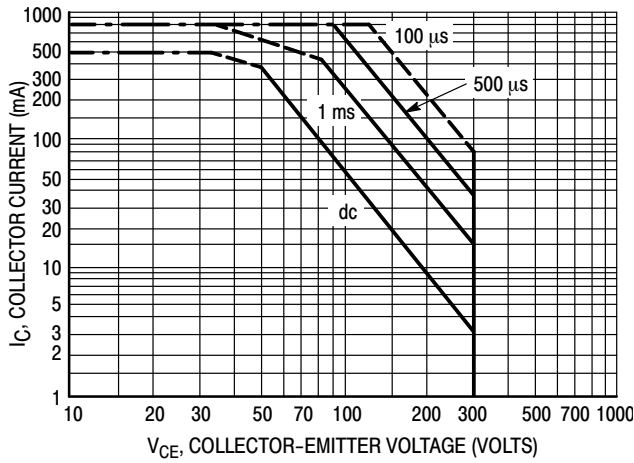


Figure 6. Active Region Safe Operating Area

There are two limitations on the power handling ability of a transistor: average junction temperature and second breakdown. Safe operating area curves indicate  $I_C - V_{CE}$  limits of the transistor that must be observed for reliable operation; i.e., the transistor must not be subjected to greater dissipation than the curves indicate.

The data of Figure 6 is based on  $T_{J(pk)} = 150^{\circ}C$ ;  $T_C$  is variable depending on conditions. Second breakdown pulse limits are valid for duty cycles to 10% provided  $T_{J(pk)} \leq 150^{\circ}C$ .  $T_{J(pk)}$  may be calculated from the data in Figure 5. At high case temperatures, thermal limitations will reduce the power that can be handled to values less than the limitations imposed by second breakdown.

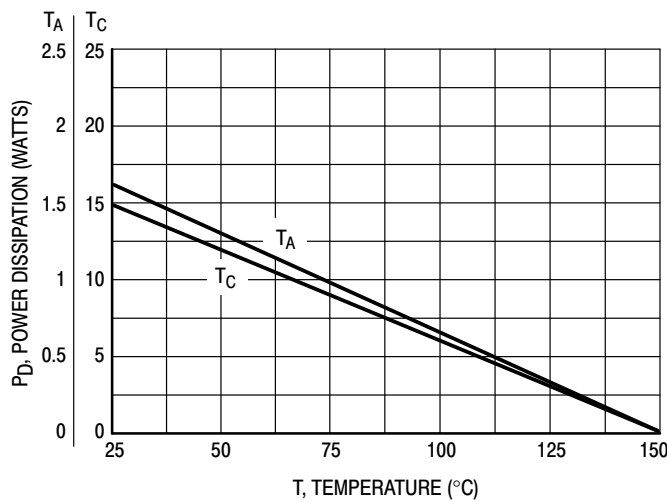


Figure 7. Power Derating

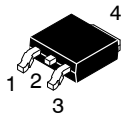
## MJD340 (NPN), MJD350 (PNP)

### ORDERING INFORMATION

Device	Package	Shipping†
MJD340G	DPAK (Pb-Free)	75 Units / Rail
MJD340RLG	DPAK (Pb-Free)	1,800 / Tape & Reel
MJD340T4G	DPAK (Pb-Free)	2,500 / Tape & Reel
NJVMJD340T4G	DPAK (Pb-Free)	2,500 / Tape & Reel
MJD350G	DPAK (Pb-Free)	75 Units / Rail
MJD350T4G	DPAK (Pb-Free)	2,500 / Tape & Reel
NJVMJD350T4G	DPAK (Pb-Free)	2,500 / Tape & Reel

†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.

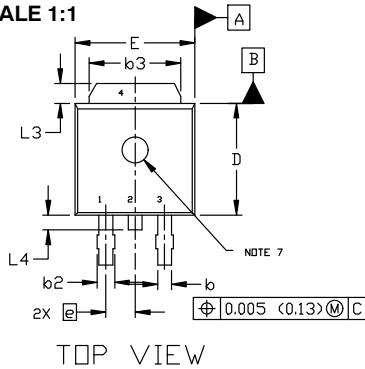
# MECHANICAL CASE OUTLINE PACKAGE DIMENSIONS



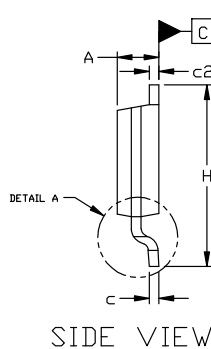
## DPAK (SINGLE GAUGE) CASE 369C ISSUE G

DATE 31 MAY 2023

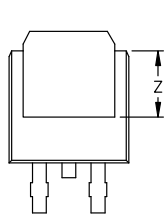
SCALE 1:1



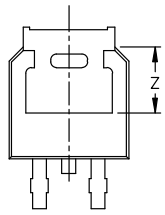
TOP VIEW



SIDE VIEW

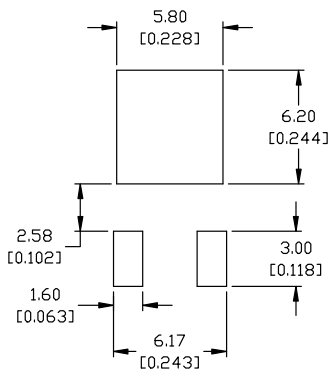


BOTTOM VIEW



BOTTOM VIEW

ALTERNATE CONSTRUCTIONS



### RECOMMENDED MOUNTING FOOTPRINT\*

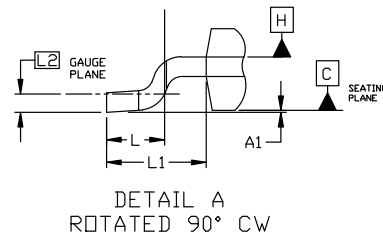
\*FOR ADDITIONAL INFORMATION ON OUR Pb-FREE STRATEGY AND SOLDERING DETAILS, PLEASE DOWNLOAD THE ON SEMICONDUCTOR SOLDERING AND MOUNTING TECHNIQUES REFERENCE MANUAL, SOLDERM/D.

- |  |  |   |   |  |
|--|--|---|---|--|
| <b>STYLE 1:</b><br>PIN 1. BASE<br>2. COLLECTOR<br>3. EMITTER<br>4. COLLECTOR | <b>STYLE 2:</b><br>PIN 1. GATE<br>2. DRAIN<br>3. SOURCE<br>4. DRAIN          | <b>STYLE 3:</b><br>PIN 1. ANODE<br>2. CATHODE<br>3. ANODE<br>4. CATHODE | <b>STYLE 4:</b><br>PIN 1. CATHODE<br>2. ANODE<br>3. GATE<br>4. ANODE              | <b>STYLE 5:</b><br>PIN 1. GATE<br>2. ANODE<br>3. CATHODE<br>4. ANODE     |
| <b>STYLE 6:</b><br>PIN 1. MT1<br>2. MT2<br>3. GATE<br>4. MT2                 | <b>STYLE 7:</b><br>PIN 1. GATE<br>2. COLLECTOR<br>3. EMITTER<br>4. COLLECTOR | <b>STYLE 8:</b><br>PIN 1. N/C<br>2. CATHODE<br>3. ANODE<br>4. CATHODE   | <b>STYLE 9:</b><br>PIN 1. ANODE<br>2. CATHODE<br>3. RESISTOR ADJUST<br>4. CATHODE | <b>STYLE 10:</b><br>PIN 1. CATHODE<br>2. ANODE<br>3. CATHODE<br>4. ANODE |

### NOTES:

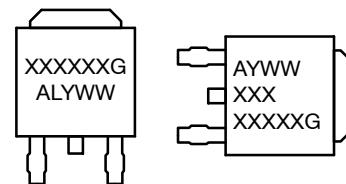
- DIMENSIONING AND TOLERANCING ASME Y14.5M, 1994.
- CONTROLLING DIMENSION: INCHES
- THERMAL PAD CONTOUR OPTIONAL WITHIN DIMENSIONS b3, L3, AND Z.
- DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR BURRS. MOLD FLASH, PROTRUSIONS, OR GATE BURRS SHALL NOT EXCEED 0.006 INCHES PER SIDE.
- DIMENSIONS D AND E ARE DETERMINED AT THE OUTERMOST EXTREMES OF THE PLASTIC BODY.
- DATUMS A AND B ARE DETERMINED AT DATUM PLANE H.
- OPTIONAL MOLD FEATURE.

DIM	INCHES		MILLIMETERS	
	MIN.	MAX.	MIN.	MAX.
A	0.086	0.094	2.18	2.38
A1	0.000	0.005	0.00	0.13
b	0.025	0.035	0.63	0.89
b2	0.028	0.045	0.72	1.14
b3	0.180	0.215	4.57	5.46
c	0.018	0.024	0.46	0.61
c2	0.018	0.024	0.46	0.61
D	0.235	0.245	5.97	6.22
E	0.250	0.265	6.35	6.73
e	0.090	BSC	2.29	BSC
H	0.370	0.410	9.40	10.41
L	0.055	0.070	1.40	1.78
L1	0.114	REF	2.90	REF
L2	0.020	BSC	0.51	BSC
L3	0.035	0.050	0.89	1.27
L4	----	0.040	---	1.01
Z	0.155	----	3.93	---



DETAIL A  
ROTATED 90° CW

### GENERIC MARKING DIAGRAM\*



- IC**  
 XXXXXX = Device Code  
 A = Assembly Location  
 L = Wafer Lot  
 Y = Year  
 WW = Work Week  
 G = Pb-Free Package
- Discrete**  
 AYWW  
 XXX  
 XXXXXG

\*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G" or microdot "•", may or may not be present. Some products may not follow the Generic Marking.

<b>DOCUMENT NUMBER:</b>	<b>98AON10527D</b>	Electronic versions are uncontrolled except when accessed directly from the Document Repository. Printed versions are uncontrolled except when stamped "CONTROLLED COPY" in red.
<b>DESCRIPTION:</b>	<b>DPAK (SINGLE GAUGE)</b>	<b>PAGE 1 OF 1</b>

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](http://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](http://www.onsemi.com/design/resources/technical-documentation)  
onsemi Website: [www.onsemi.com](http://www.onsemi.com)

### ONLINE SUPPORT: [www.onsemi.com/support](http://www.onsemi.com/support)

For additional information, please contact your local Sales Representative at [www.onsemi.com/support/sales](http://www.onsemi.com/support/sales)