

Bipolar Transistor

50 V, 15 A, Low $V_{CE(sat)}$,
NPN TO-220F-3SG

2SC6082

Features

- Adoption of MBIT Process
- Low Collector-to-Emitter Saturation Voltage
- Large Current Capacitance
- High-Speed Switching
- This is a Pb-Free Device

Applications

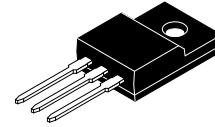
- High-Speed Switching Applications (Switching Regulator, Driver Circuit)

Specifications

ABSOLUTE MAXIMUM RATINGS (Ta = 25°C)

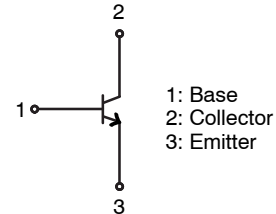
Symbol	Rating	Condition	Value	Unit
V_{CBO}	Collector-to-Base Voltage		60	V
V_{CES}	Collector-to-Emitter Voltage		60	V
V_{CEO}			50	V
V_{EBO}	Emitter-to-Base Voltage		6	V
I_C	Collector Current		15	A
I_{CP}	Collector Current (Pulse)	$PW \leq 10 \mu s$, duty cycle $\leq 1\%$	20	A
I_B	Base Current		3	A
P_C	Collector Dissipation		2	W
		$T_C = 25^\circ C$	23	W
T_j	Junction Temperature		150	°C
T_{stg}	Storage Temperature		-55 to +150	°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.

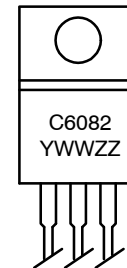


TO-220 Fullpack, 3-Lead /
TO-220F-3SG
CASE 221AT

ELECTRICAL CONNECTION



MARKING DIAGRAM



C6082 = Device Code
YWW = Date Code (Year & Week)
ZZ = Assembly Lot

ORDERING INFORMATION

Device	Package	Shipping
2SC6082-1E	TO-220F (Pb-Free)	50 / Tube

ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
I_{CBO}	Collector Cutoff Current	$V_{CB} = 40\text{ V}, I_E = 0\text{ A}$	–	–	10	μA
I_{EBO}	Emitter Cutoff Current	$V_{EB} = 4\text{ V}, I_C = 0\text{ A}$	–	–	10	μA
H_{FE1}	DC Current Gain	$V_{CE} = 2\text{ V}, I_C = 330\text{ mA}$	200	–	560	
H_{FE2}		$V_{CE} = 2\text{ V}, I_C = 10\text{ A}$	50	–	–	
f_T	Gain–Bandwidth Product	$V_{CE} = 10\text{ V}, I_C = 2\text{ A}$	–	195	–	MHz
C_{ob}	Output Capacitance	$V_{CB} = 10\text{ V}, f = 1\text{ MHz}$	–	85	–	pF
$V_{CE(sat)}$	Collector–to–Emitter Saturation Voltage	$I_C = 7.5\text{ mA}, I_B = 375\text{ mA}$	–	200	400	mV
$V_{BE(sat)}$	Base–to–Emitter Saturation Voltage	$I_C = 7.5\text{ mA}, I_B = 375\text{ mA}$	–	–	1.2	V
$V_{(BR)CBO}$	Collector–to–Base Breakdown Voltage	$I_C = 100\text{ }\mu\text{A}, I_E = 0\text{ A}$	60	–	–	V
$V_{(BR)CES}$	Collector–to–Emitter Breakdown Voltage	$I_C = 100\text{ }\mu\text{A}, R_{BE} = 0\text{ }\Omega$	60	–	–	V
$V_{(BR)CEO}$		$I_C = 1\text{ mA}, R_{BE} = \infty$	50	–	–	V
$V_{(BR)EBO}$	Emitter–to–Base Breakdown Voltage	$I_E = 100\text{ }\mu\text{A}, I_C = 0\text{ A}$	5	–	–	V
t_{on}	Turn–On Time	See specified Test Circuit		52	–	ns
t_{stg}	Storage Time			560	–	ns
t_f	Fall Time			37	–	ns

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.

Switching Time Test Circuit

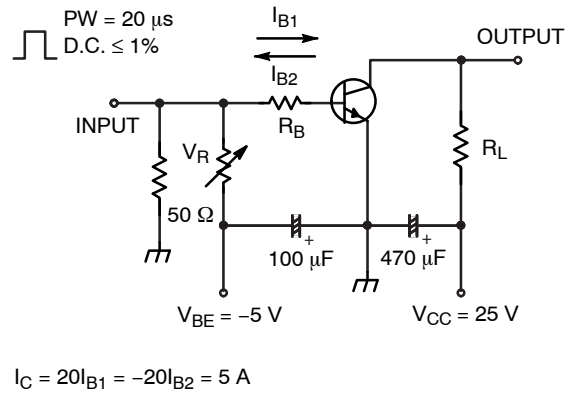
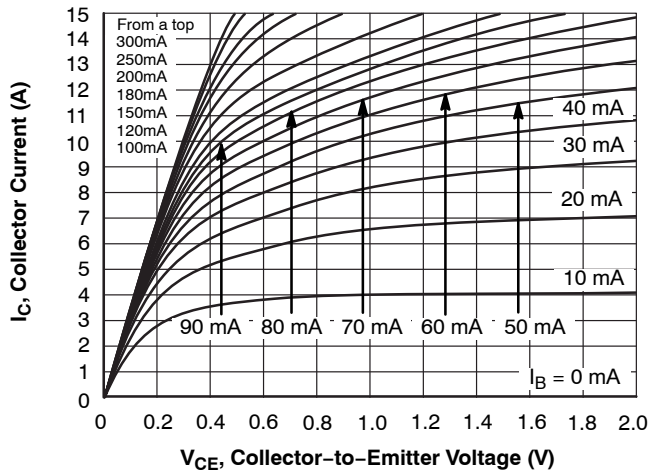
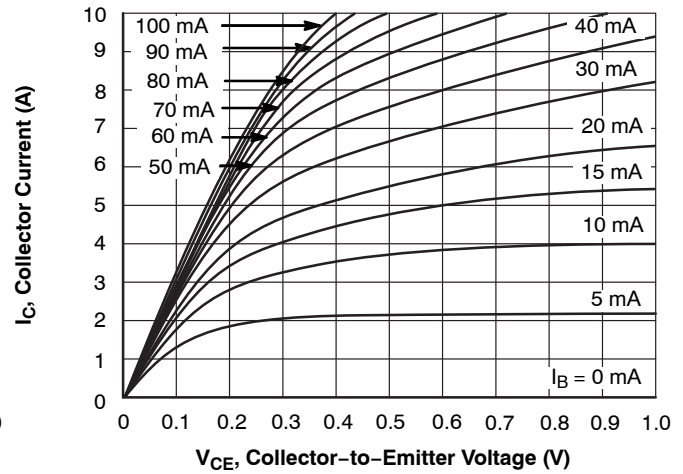
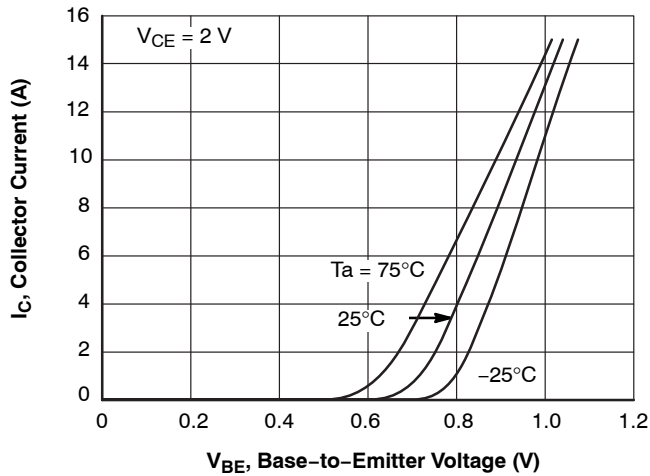
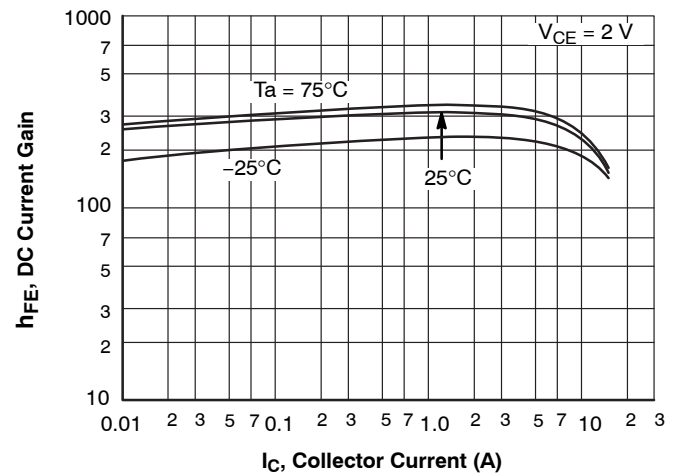
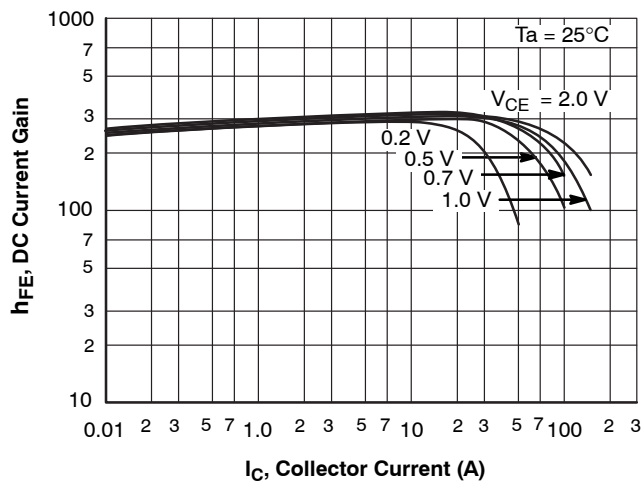
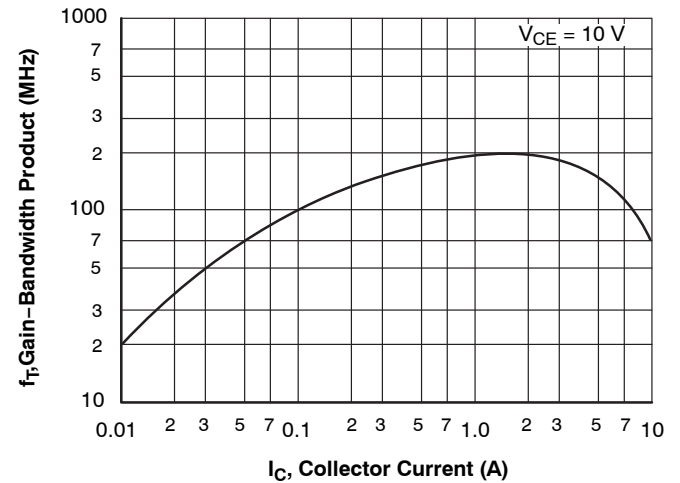


Figure 1. Switching Time Test Circuit

TYPICAL CHARACTERISTICS

Figure 2. $I_C - V_{CE}$ Figure 3. $I_C - V_{CE}$ Figure 4. $I_C - V_{BE}$ Figure 5. $h_{FE} - I_C$ Figure 6. $h_{FE} - I_C$ Figure 7. $F_T - I_C$

TYPICAL CHARACTERISTICS (continued)

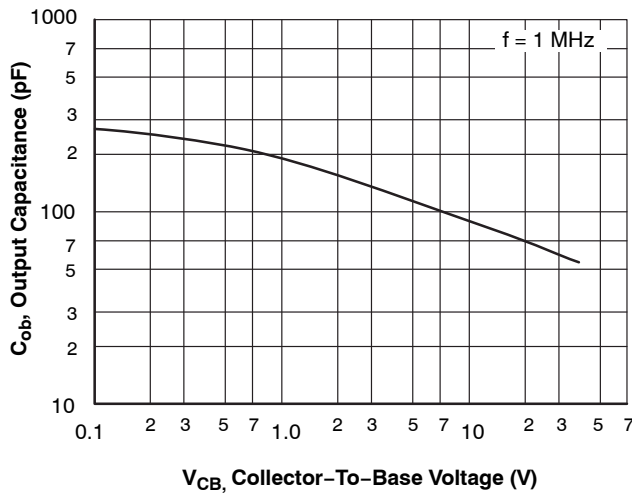
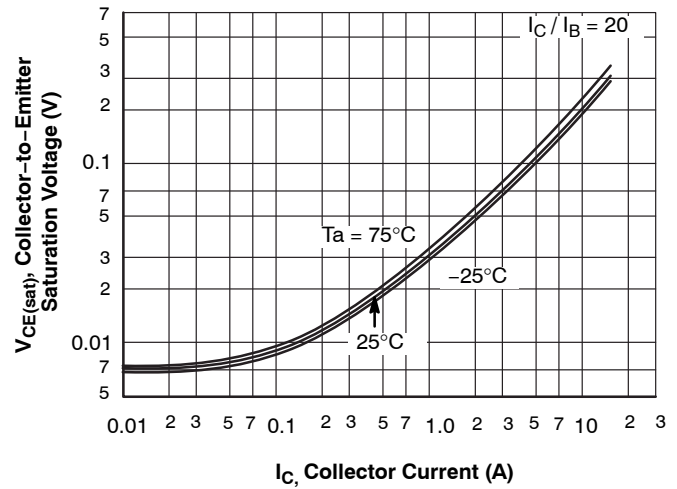
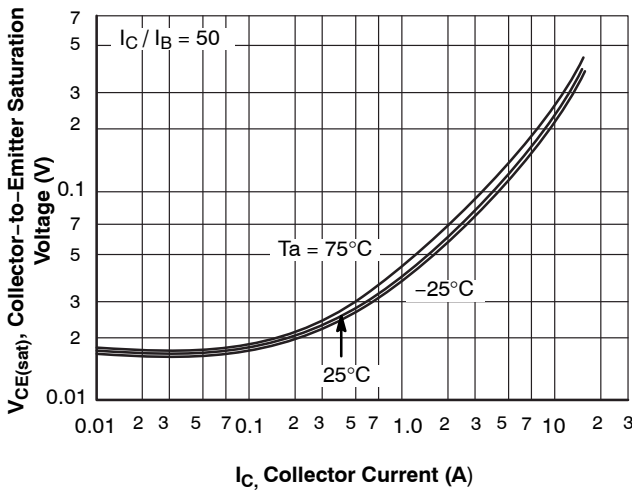
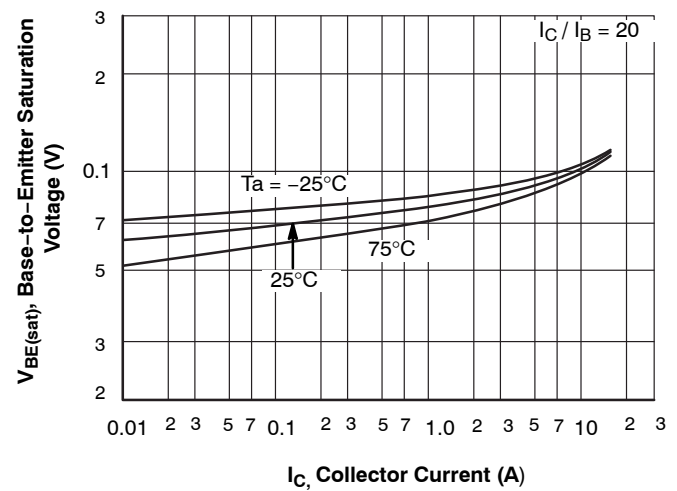
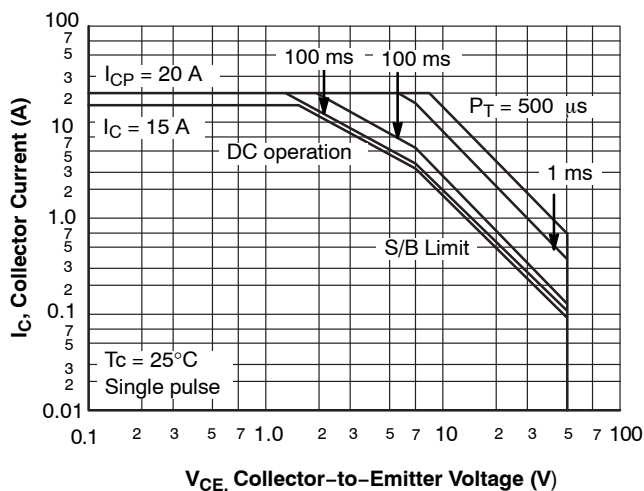
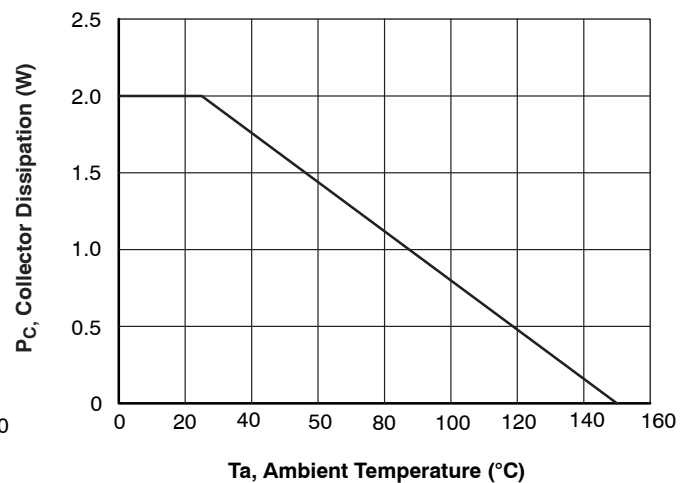
Figure 8. $C_{ob} - V_{CB}$ Figure 9. $V_{CE(sat)} - I_C$ Figure 10. $V_{CE(sat)} - I_C$ Figure 11. $V_{BE(sat)} - I_C$ 

Figure 12. Forward Bias ASO

Figure 13. $P_C - T_a$

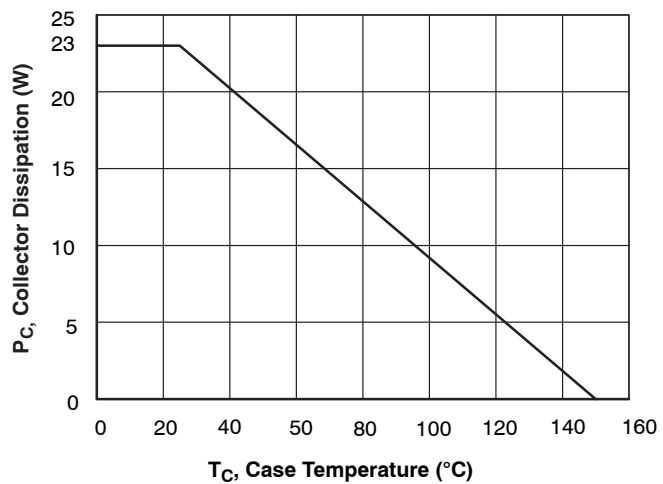
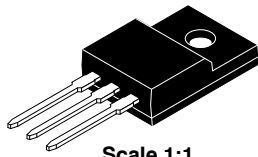


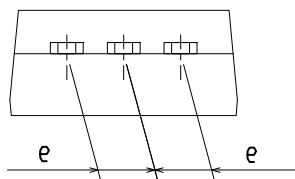
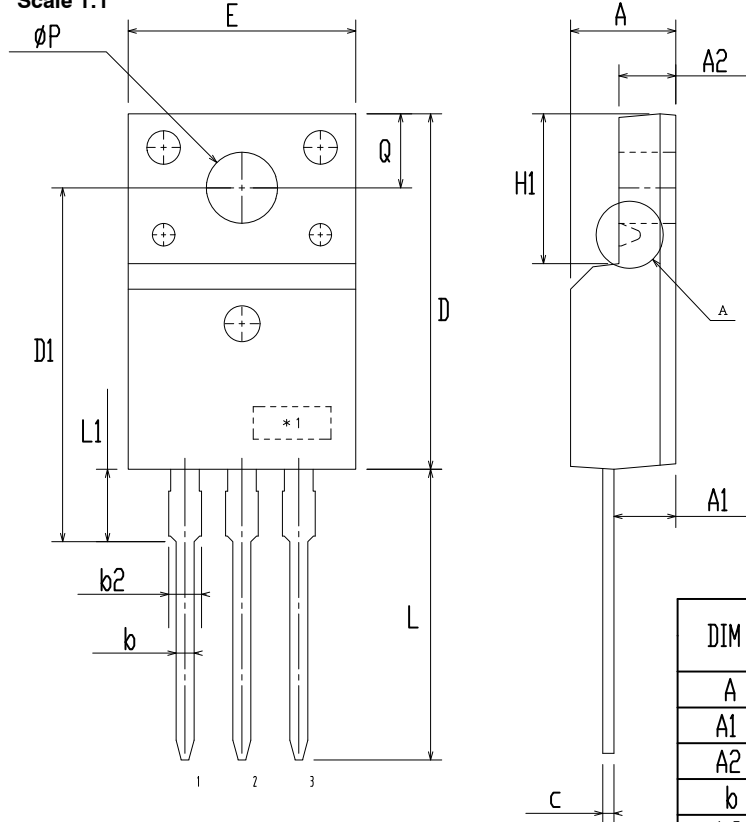
Figure 14. $P_C - T_C$

TO-220 Fullpack, 3-Lead / TO-220F-3SG
CASE 221AT
ISSUE B

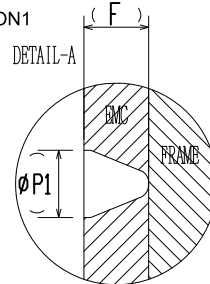
DATE 19 JAN 2021



Scale 1:1



OPTION1



DIM	MILLIMETERS		
	MIN	NOM	MAX
A	4.50	4.70	4.90
A1	2.56	2.76	2.96
A2	2.34	2.54	2.74
b	0.70	0.80	0.90
b2	~	~	1.47
c	0.45	0.50	0.60
D	15.67	15.87	16.07
D1	15.60	15.80	16.00
E	9.96	10.16	10.36
e	2.34	2.54	2.74
F	~	0.84	~
H1	6.48	6.68	6.88
L	12.78	12.98	13.18
L1	3.03	3.23	3.43
Ø P	2.98	3.18	3.38
Ø P1	~	1.00	~
Q	3.20	3.30	3.40

NOTES:

A. DIMENSION AND TOLERANCE AS ASME Y14.5-2009

B. DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLD FLASH AND TIE BAR PROTRUCTIONS.

C. OPTION 1 - WITH SUPPORT PIN HOLE

OPTION 2 - NO SUPPORT PIN HOLE

DOCUMENT NUMBER:	98AON67439E	Electronic versions are uncontrolled except when accessed directly from the Document Repository. Printed versions are uncontrolled except when stamped "CONTROLLED COPY" in red.
DESCRIPTION:	TO-220 FULLPACK, 3-LEAD / TO-220F-3SG	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