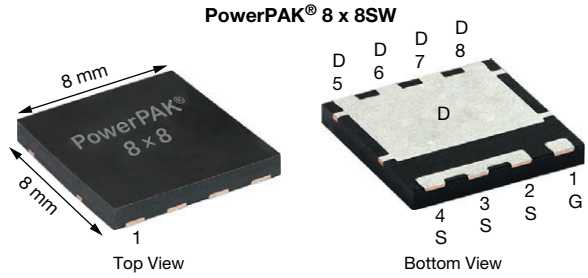
N-Channel 80 V (D-S) 175 °C MOSFET



FEATURES

- TrenchFET® Gen III power MOSFET
- Wettable flanks enhances solderability
- Fully lead (Pb)-free device
- Very low $R_{DS(on)}$
- Very low R_{thJC}
- PowerPAK® 8 x 8 with fuse lead to increase current density
- 100 % R_g and UIS tested
- Up to 322 A maximum continuous drain current
- Optimized safe operating area / SOA
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

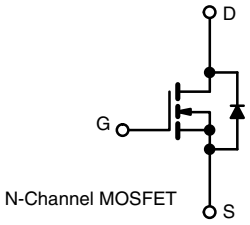
Pb-free

RoHS COMPLIANT

HALOGEN FREE

APPLICATIONS

- Hot swap
- Load switch
- Oring
- Motor drive
- Battery management



PRODUCT SUMMARY	
V_{DS} (V)	80
$R_{DS(on)}$ max. (Ω) at V_{GS} = 10 V	0.00175
$R_{DS(on)}$ max. (Ω) at V_{GS} = 7.5 V	0.00250
Q_g typ. (nC)	154
I_D (A) [a]	322
Configuration	Single

ORDERING INFORMATION	
Package	PowerPAK® 8 x 8SW
Lead (Pb)-free and halogen-free	SiEH3812EW-T1-GE3

ABSOLUTE MAXIMUM RATINGS (T_A = 25 °C, unless otherwise noted)

PARAMETER		SYMBOL	LIMIT	UNIT
Drain-source voltage		V_{DS}	80	V
Gate-source voltage		V_{GS}	± 20	
Continuous drain current (T_J = 175 °C)	T_C = 25 °C	I_D	322	A
	T_C = 70 °C		269	
	T_A = 25 °C		29 [b]	
	T_A = 70 °C		24 [b]	
Pulsed drain current (t = 100 µs)		I_{DM}	800	
Continuous source-drain diode current	T_C = 25 °C	I_S	379	
	T_A = 25 °C		3.1 [b]	
Single pulse avalanche current	L = 0.1 mH	I_{AS}	92	
Single pulse avalanche energy		E_{AS}	430	mJ
Maximum power dissipation	T_C = 25 °C	P_D	417	W
	T_C = 70 °C		292	
	T_A = 25 °C		3.4 [b]	
	T_A =70 °C		2.4 [b]	
Operating junction and storage temperature range		T_J, T_{stg}	-55 to +175	°C
Soldering recommendations (peak temperature) [c]			260	

THERMAL RESISTANCE RATINGS

PARAMETER		SYMBOL	TYPICAL	MAXIMUM	UNIT
Maximum junction-to-ambient [b]	Steady state	R_{thJA}	33	44	°C/W
Maximum junction-to-case (drain)	Steady state	R_{thJC}	0.27	0.36	

Notes

a. T_C = 25 °C

b. Surface mounted on 1" x 1" FR4 board

c. See solder profile (www.vishay.com/doc?73257). The PowerPAK 8 x 8L is a leadless package. The end of the lead terminal is exposed copper (not plated) as a result of the singulation process in manufacturing. A solder fillet at the exposed copper tip cannot be guaranteed and is not required to ensure adequate bottom side solder interconnection

d. Rework conditions: manual soldering with a soldering iron is not recommended for leadless components

For technical questions, contact: pmostechsupport@vishay.com

THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE. THE PRODUCTS DESCRIBED HEREIN AND THIS DOCUMENT ARE SUBJECT TO SPECIFIC DISCLAIMERS, SET FORTH AT www.vishay.com/doc?91000

SPECIFICATIONS (T_J = 25 °C, unless otherwise noted)						
PARAMETER	**SYMBOL**	**TEST CONDITIONS**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
Static						
Drain-source breakdown voltage	V_{DS}	V_{GS} = 0 V, I_D = 250 µA	80	-	-	V
V_{DS} temperature coefficient	$\Delta V_{DS}/T_J$	I_D = 10 mA	-	50	-	mV/°C
$V_{GS(th)}$ temperature coefficient	$\Delta V_{GS(th)}/T_J$	I_D = 250 µA	-	-7	-	
Gate-source threshold voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D =250 µA	1	-	3	V
Gate-source leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ± 20	-	-	± 100	nA
Zero gate voltage drain current	I_{DSS}	V_{DS} = 80 V, V_{GS} =0 V	-	-	1	µA
		V_{DS} = 80 V, V_{GS} = 0 V, T_J = 70 °C	-	-	15	
Drain-source on-state resistance [a]	$R_{DS(on)}$	V_{GS} = 10 V, I_D = 20 A	-	0.00140	0.00175	Ω
		V_{GS} = 4.5 V, I_D = 20 A	-	0.00195	0.00250	
Forward transconductance [a]	g_{fs}	V_{DS} = 15 V, I_D = 40 A	-	130	-	S
Dynamic [b]						
Input capacitance	C_{iss}	V_{DS} = 40 V, V_{GS} = 0 V, f = 1 MHz	-	7780	-	pF
Output capacitance	C_{oss}		-	3145	-	
Reverse transfer capacitance	C_{rss}		-	150	-	
Total gate charge	Q_g	V_{DS} = 40 V, V_{GS} = 10 V, I_D = 20 A	-	154	231	nC
		V_{DS} = 40 V, V_{GS} = 4.5 V, I_D =20 A	-	74	111	
Gate-source charge	Q_{gs}		-	30	-	
Gate-drain charge	Q_{gd}		-	31	-	
Gate resistance	R_g	f = 1 MHz	0.8	4	8	Ω
Turn-on delay time	$t_{d(on)}$	V_{DD} = 40 V, R_L = 4 Ω, I_D ≅ 10 A, V_{GEN} = 10 V, R_g = 1 Ω	-	16	32	ns
Rise time	t_r		-	22	45	
Turn-off delay time	$t_{d(off)}$		-	137	275	
Fall time	t_f		-	49	100	
Turn-on delay time	$t_{d(on)}$	V_{DD} = 40 V, R_L = 4 Ω, I_D ≅ 10 A, V_{GEN} = 4.5 V, R_g = 1 Ω	-	96	195	
Rise time	t_r		-	166	330	
Turn-off delay time	$t_{d(off)}$		-	96	195	
Fall time	t_f		-	52	105	
Drain-Source Body Diode Characteristics						
Continuous source-drain diode current	I_S	T_C = 25 °C	-	-	379	A
Pulse diode forward current	I_{SM}		-	-	800	
Body diode voltage	V_{SD}	I_S = 10 A, V_{GS} = 0 V	-	0.72	1.1	V
Body diode reverse recovery time	t_{rr}	I_F = 10 A, dI/dt = 100 A/µs, T_J = 25 °C	-	98	200	ns
Body diode reverse recovery charge	Q_{rr}		-	285	570	nC
Reverse recovery fall time	t_a		-	60	-	ns
Reverse recovery rise time	t_b		-	38	-	

Notes

a. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2 %

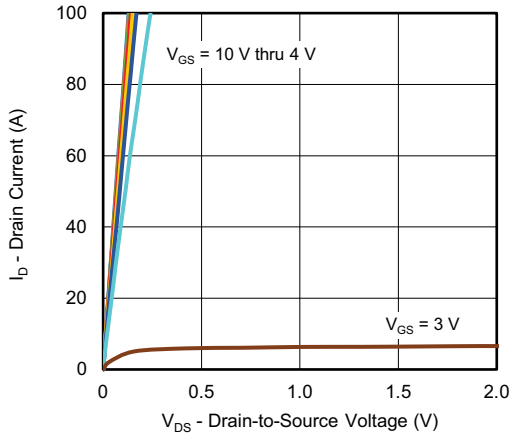
b. Guaranteed by design, not subject to production testing

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

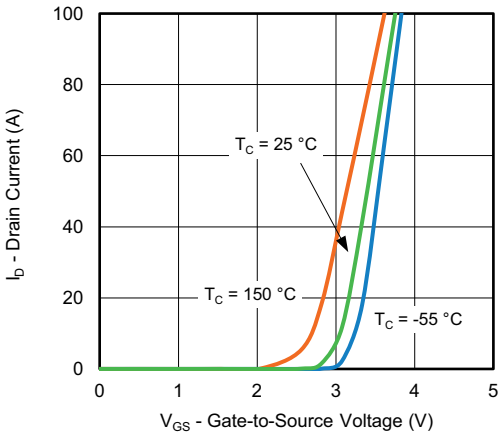
For technical questions, contact: pmostechsupport@vishay.com

THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE. THE PRODUCTS DESCRIBED HEREIN AND THIS DOCUMENT ARE SUBJECT TO SPECIFIC DISCLAIMERS, SET FORTH AT www.vishay.com/doc?91000

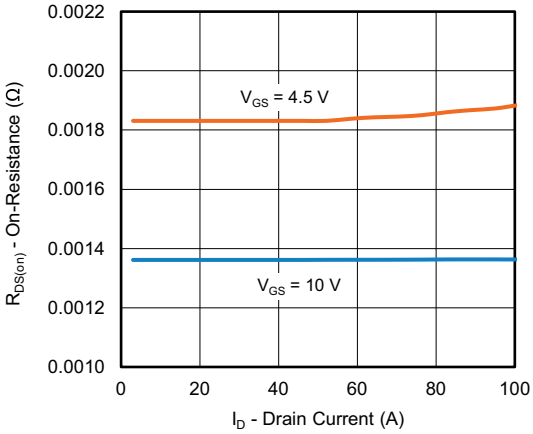
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



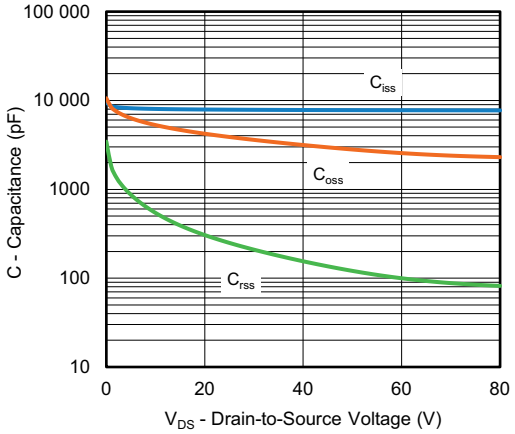
Output Characteristics



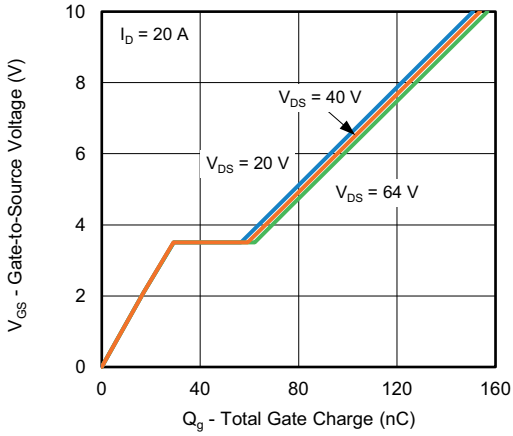
Transfer Characteristics



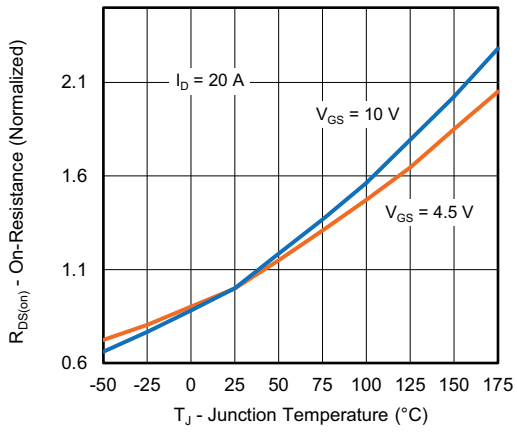
On-Resistance vs. Drain Current and Gate Voltage



Capacitance



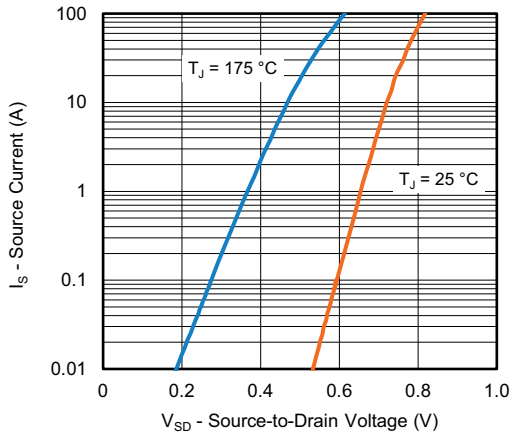
Gate Charge



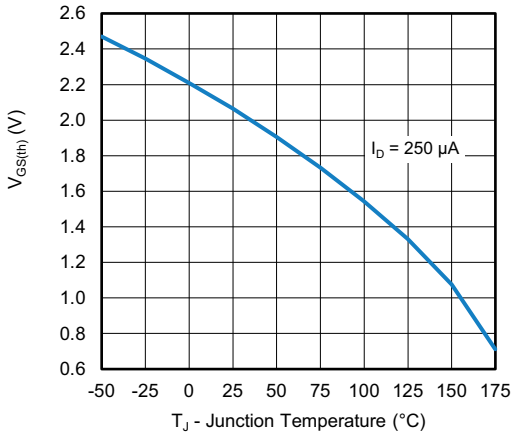
On-Resistance vs. Junction Temperature

For technical questions, contact: pmostechsupport@vishay.com
THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE. THE PRODUCTS DESCRIBED HEREIN AND THIS DOCUMENT ARE SUBJECT TO SPECIFIC DISCLAIMERS, SET FORTH AT www.vishay.com/doc?91000

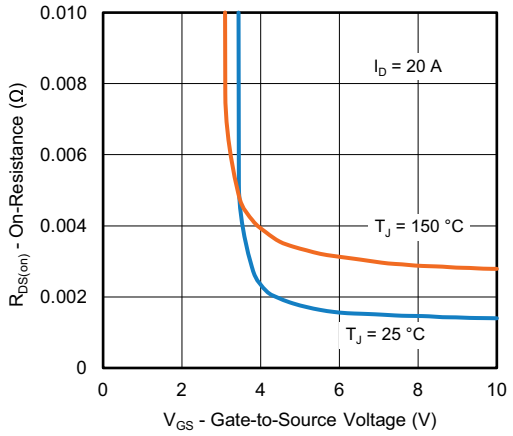
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



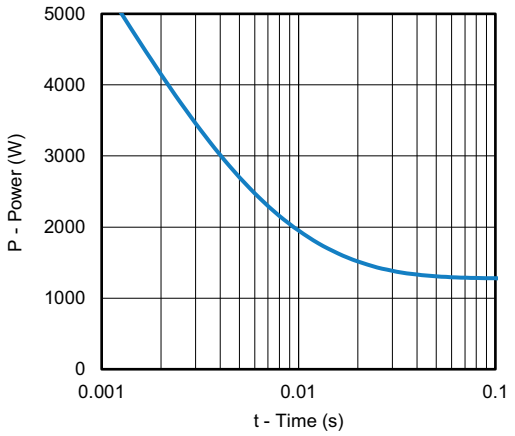
Source-Drain Diode Forward Voltage



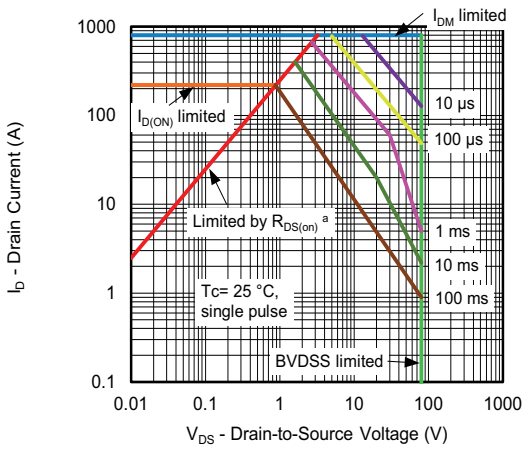
Threshold Voltage



On-Resistance vs. Gate-to-Source Voltage



Single Pulse Power, Junction-to-Case



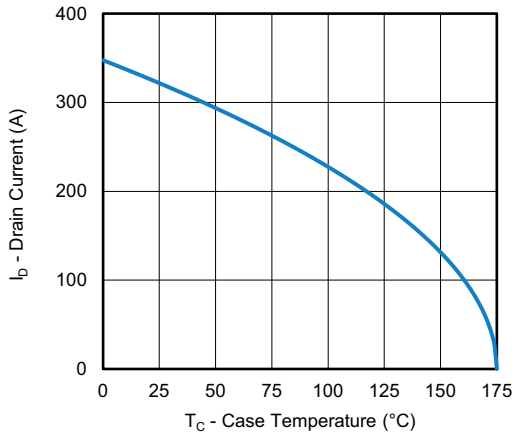
Safe Operating Area, Junction-to-Case

Note

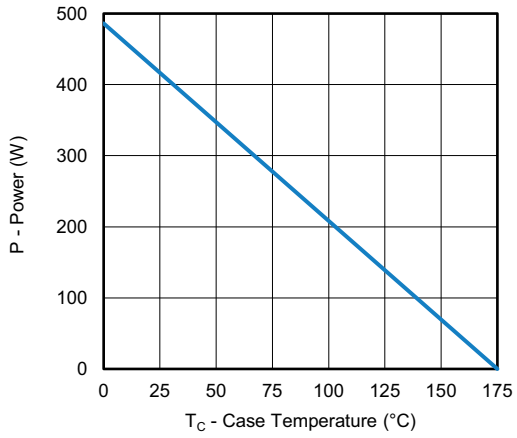
a. V_{GS} > minimum V_{GS} at which $R_{DS(on)}$ is specified

For technical questions, contact: pmostechsupport@vishay.com
THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE. THE PRODUCTS DESCRIBED HEREIN AND THIS DOCUMENT ARE SUBJECT TO SPECIFIC DISCLAIMERS, SET FORTH AT www.vishay.com/doc?91000

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



Current Derating [a]



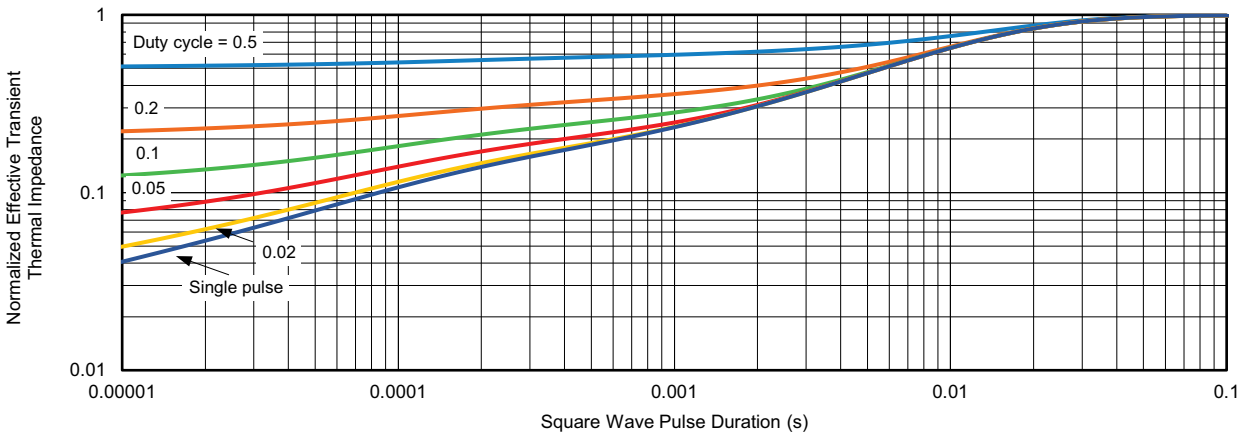
Power, Junction-to-Case

Note

a. The power dissipation P_D is based on T_J max. = 150 °C, using junction-to-case thermal resistance, and is more useful in settling the upper dissipation limit for cases where additional heatsinking is used. It is used to determine the current rating, when this rating falls below the package limit

For technical questions, contact: pmostechsupport@vishay.com
THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE. THE PRODUCTS DESCRIBED HEREIN AND THIS DOCUMENT ARE SUBJECT TO SPECIFIC DISCLAIMERS, SET FORTH AT www.vishay.com/doc?91000

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



Normalized Thermal Transient Impedance, Junction-to-Case

Vishay Siliconix maintains worldwide manufacturing capability. Products may be manufactured at one of several qualified locations. Reliability data for Silicon Technology and Package Reliability represent a composite of all qualified locations. For related documents such as package / tape drawings, part marking, and reliability data, see www.vishay.com/ppg?61731.

For technical questions, contact: pmostechsupport@vishay.com
THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE. THE PRODUCTS DESCRIBED HEREIN AND THIS DOCUMENT ARE SUBJECT TO SPECIFIC DISCLAIMERS, SET FORTH AT www.vishay.com/doc?91000

Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, “Vishay”), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and / or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Hyperlinks included in this datasheet may direct users to third-party websites. These links are provided as a convenience and for informational purposes only. Inclusion of these hyperlinks does not constitute an endorsement or an approval by Vishay of any of the products, services or opinions of the corporation, organization or individual associated with the third-party website. Vishay disclaims any and all liability and bears no responsibility for the accuracy, legality or content of the third-party website or for that of subsequent links.

Vishay products are not designed for use in life-saving or life-sustaining applications or any application in which the failure of the Vishay product could result in personal injury or death unless specifically qualified in writing by Vishay. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.

© 2025 VISHAY INTERTECHNOLOGY, INC. ALL RIGHTS RESERVED

THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE. THE PRODUCTS DESCRIBED HEREIN AND THIS DOCUMENT ARE SUBJECT TO SPECIFIC DISCLAIMERS, SET FORTH AT www.vishay.com/doc?91000