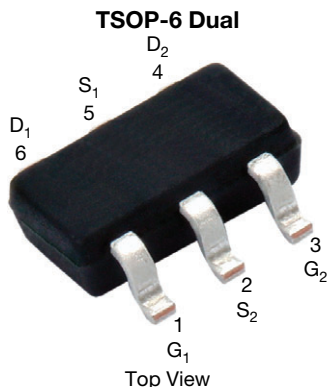


Automotive Dual P-Channel 30 V (D-S) 175 °C MOSFET



Marking code: 8X

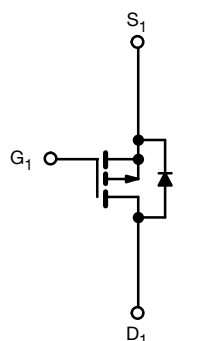
PRODUCT SUMMARY	
V_{DS} (V)	-30
$R_{DS(on)}$ (Ω) at $V_{GS} = -10$ V	-0.110
$R_{DS(on)}$ (Ω) at $V_{GS} = -4.5$ V	-0.185
I_D (A)	-2.75
Configuration	Dual
Package	TSOP-6

FEATURES

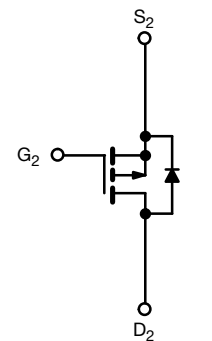
- TrenchFET® power MOSFET
- AEC-Q101 qualified
- 100 % R_g and UIS tested
- Material categorization:
for definitions of compliance please see
www.vishay.com/doc?99912



RoHS
COMPLIANT
HALOGEN
FREE



P-Channel MOSFET



P-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS ($T_A = 25$ °C, unless otherwise noted)				
PARAMETER		SYMBOL	LIMIT	UNIT
Drain-source voltage		V_{DS}	-30	V
Gate-source voltage		V_{GS}	± 20	
Continuous drain current ($T_J = 150$ °C) ^a	$T_C = 25$ °C	I_D	-3	A
	$T_C = 125$ °C		-1.74	
Pulsed drain current		I_{DM}	-11	
Continuous source current (diode conduction) ^a		I_S	-2.1	W
Maximum power dissipation ^a	$T_C = 25$ °C	P_D	1.67	
	$T_C = 125$ °C		0.56	
Unclamped inductive surge UIS		I_{AV}	-5	A
Operating junction and storage temperature range		T_J, T_{stg}	-55 to +175	°C

THERMAL RESISTANCE RATINGS				
PARAMETER		SYMBOL	LIMIT	UNIT
Maximum junction-to-ambient ^a	Steady state	R_{thJA}	150	°C/W
Maximum junction-to-foot (drain)	Steady state	R_{thJF}	90	

Note

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

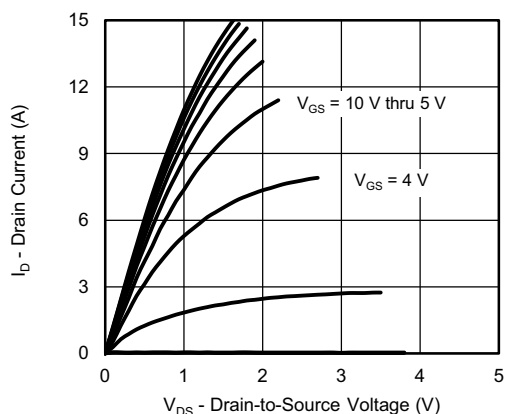
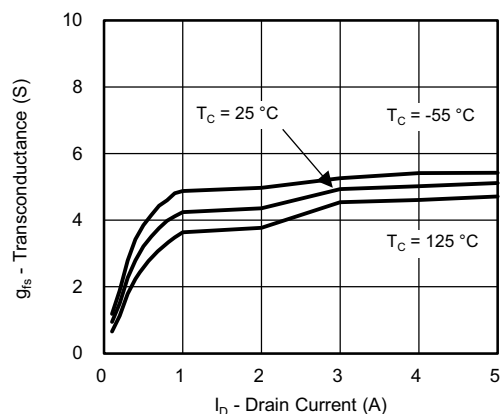
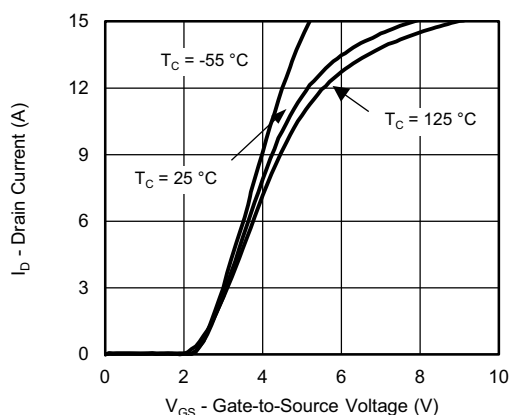
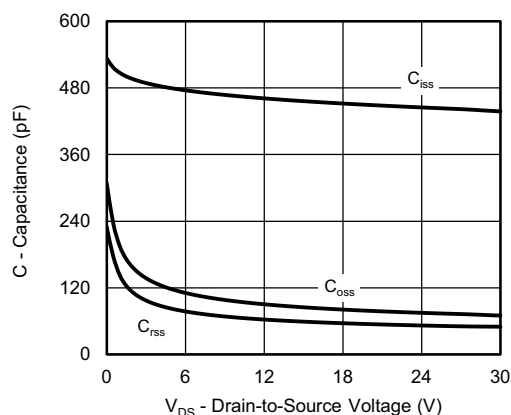
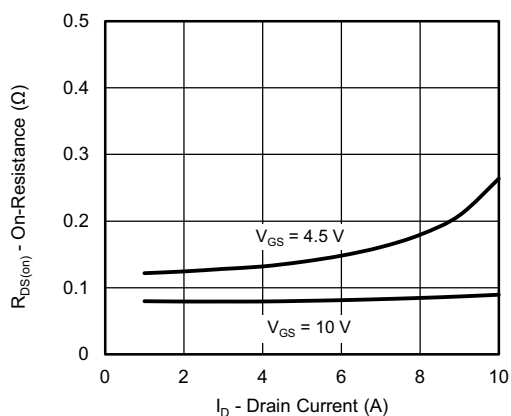
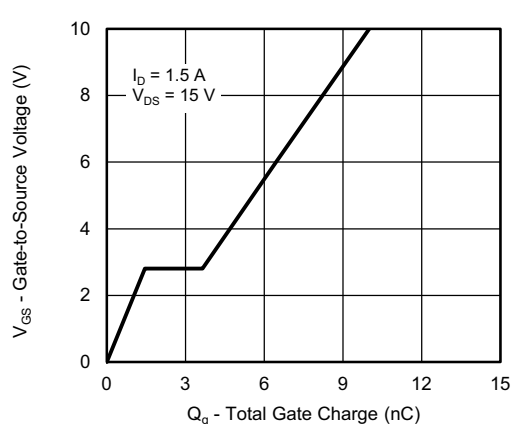


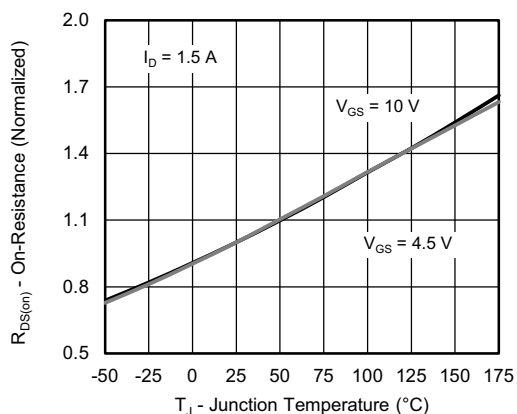
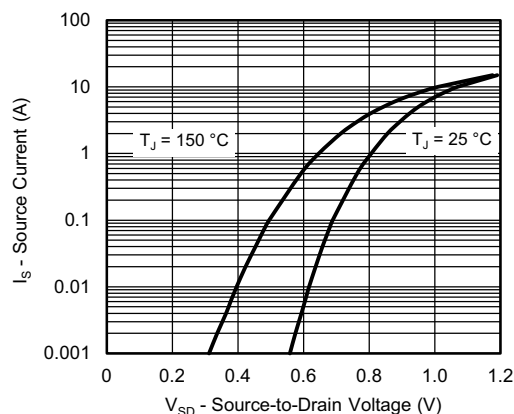
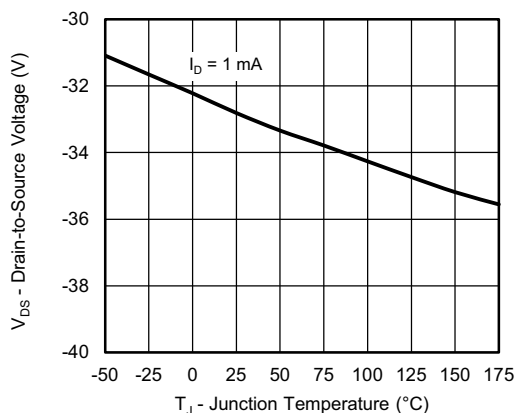
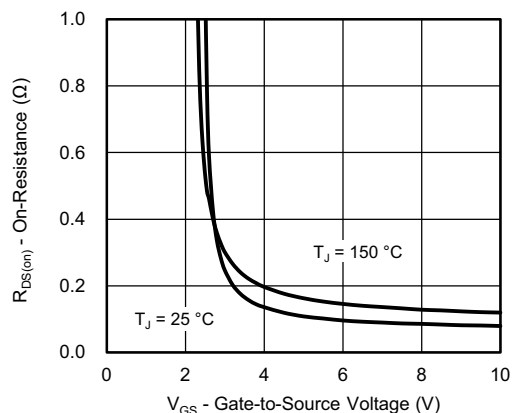
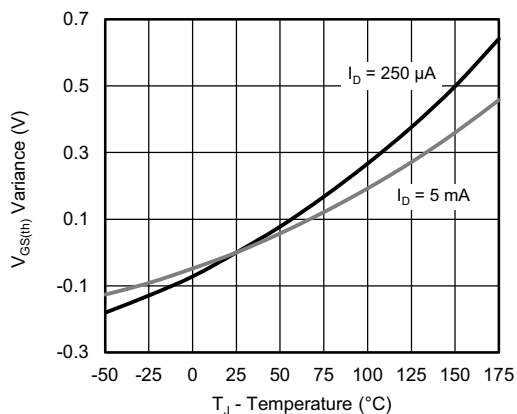
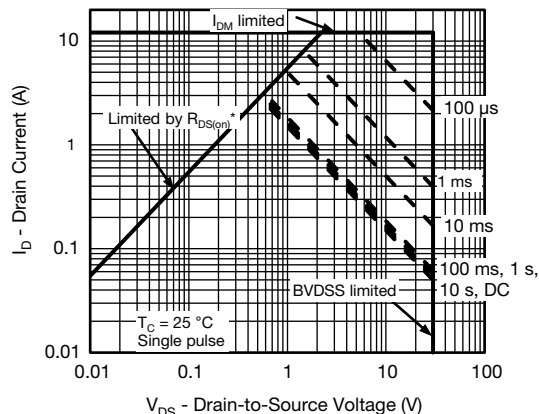
SPECIFICATIONS (T _J = 25°C, unless otherwise noted)							
PARAMETER	SYMBOL	TEST CONDITIONS		MIN.	TYP.	MAX.	UNIT
Static							
Gate threshold voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = -250 μA		-1.5	-	-2.5	V
Gate-body leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ± 20 V		-	-	± 100	nA
Zero gate voltage drain current	I _{DSS}	V _{GS} = 0 V	V _{DS} = -30 V	-	-	-1	μA
		V _{GS} = 0 V	V _{DS} = -30 V, T _J = 175 °C	-	-	-50	
On-state drain current ^a	I _{D(on)}	V _{GS} = -10 V	V _{DS} ≤ -5 V	-4	-	-	A
Drain-source on-state resistance ^a	R _{DS(on)}	V _{GS} = -10 V	I _D = -1.5 A	-	0.085	0.133	Ω
		V _{GS} = -4.5 V	I _D = -2 A	-	0.135	0.185	
Forward transconductance ^a	g _{fs}	V _{DS} = -5 V, I _D = -1 A		-	4.2	-	S
Diode forward voltage ^a	V _{SD}	I _S = -0.5 A, V _{GS} = 0 V		-	-0.83	-1.10	V
Dynamic ^b							
Input capacitance	C _{iss}	V _{GS} = 0 V	V _{DS} = -15 V	-	456	570	pF
Output capacitance	C _{oss}			-	85	106	
Reverse capacitance	C _{rss}			-	59	74	
Total gate charge	Q _g	V _{GS} = -10 V	V _{DS} = -15 V, I _D = -3 A	-	9.7	12.2	nC
Gate-source charge	Q _{gs}			-	1.3	-	
Gate-drain charge	Q _{gd}			-	2	-	
Gate resistance	R _g	f = 1 MHz		9	-	24	Ω
Turn-on delay time	t _{d(on)}	V _{DD} = -10 V, R _L = 10 Ω, I _D ≅ -1 A, V _{GEN} = -10 V, R _g = 1 Ω		-	6.6	8.3	ns
Rise time	t _r			-	2.4	3	
Turn-off delay time	t _{d(off)}			-	18.4	23	
Fall time	t _f			-	2.2	2.8	
Source-Drain Diode Ratings and Characteristic ^b							
Pulsed current	I _{SM}			-	-	-11	A
Forward voltage	V _{SD}	I _F = 0.5 A, V _{GS} = 0 V		-	-0.83	-1.1	V
Reverse recovery fall time	t _a	V _{DD} = -24 V, I _{FM} = -1.5 A, di/dt = 100 A/μs, R = 160 Ω, L = 1 mH, pulse W = 2 μs		-	9.1	-	ns
Reverse recovery rise time	t _b			-	4.8	-	ns
Body diode reverse recovery time	t _{rr}			-	14	28	ns
Body diode reverse recovery charge	Q _{rr}			-	9	18	μC
Body diode peak reverse recovery current	I _{RM(REC)}			-	-1.4	-	A

Notes

- a. Pulse test; pulse width $\leq 300\ \mu\text{s}$, duty cycle $\leq 2\ \%$
b. Guaranteed by design, not subject to production testing

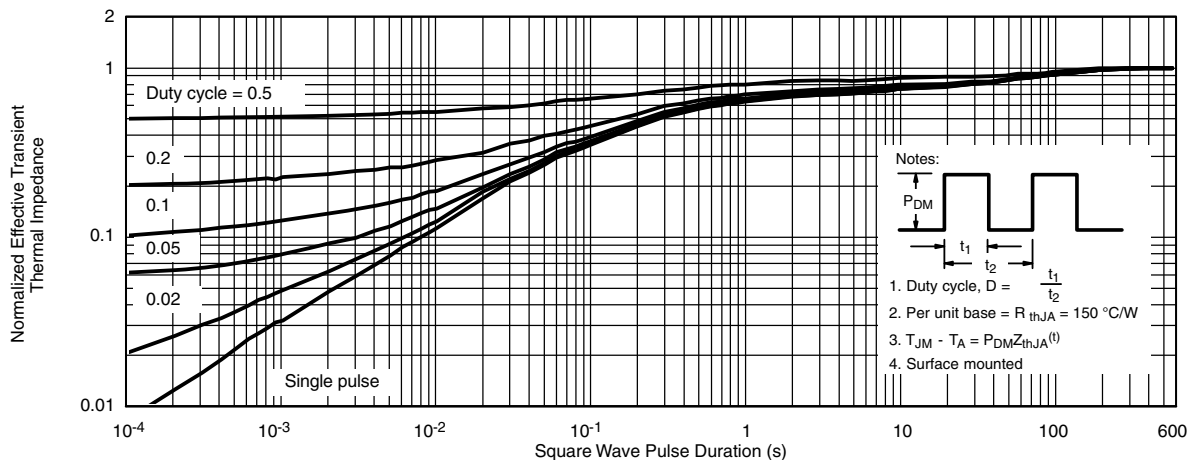
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure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

TYPICAL CHARACTERISTICS (25 °C unless otherwise noted)

Output Characteristics

Transconductance

Transfer Characteristics

Capacitance

On-Resistance vs. Drain Current

Gate Charge

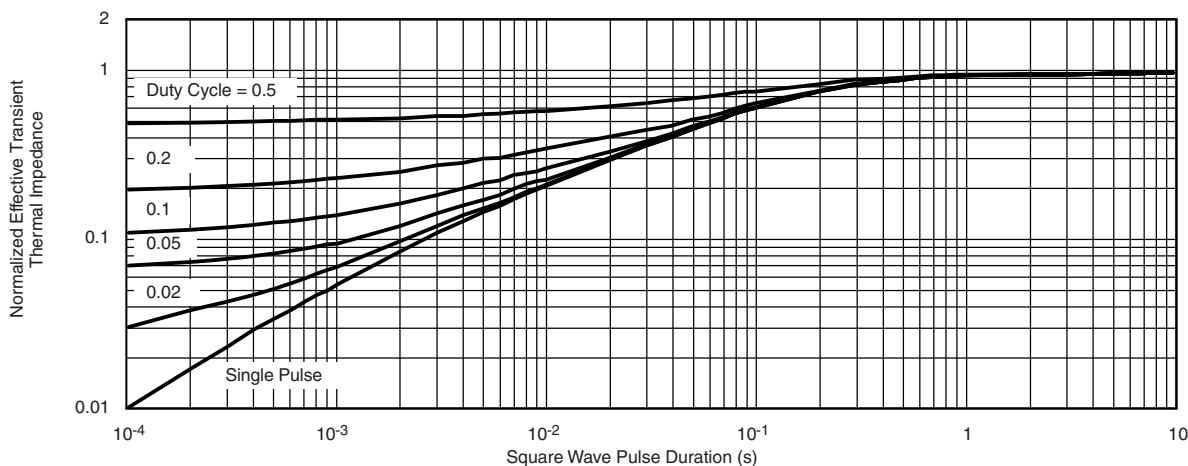
TYPICAL CHARACTERISTICS (25 °C unless otherwise noted)

On-Resistance vs. Junction Temperature

Source-Drain Diode Forward Voltage

Drain Source Breakdown vs. Junction Temperature

On-Resistance vs. Gate-to-Source Voltage

Threshold Voltage

Safe Operating Area, Junction-to-Case



TYPICAL CHARACTERISTICS (25 °C unless otherwise noted)



Normalized Thermal Transient Impedance, Junction-to-Ambient

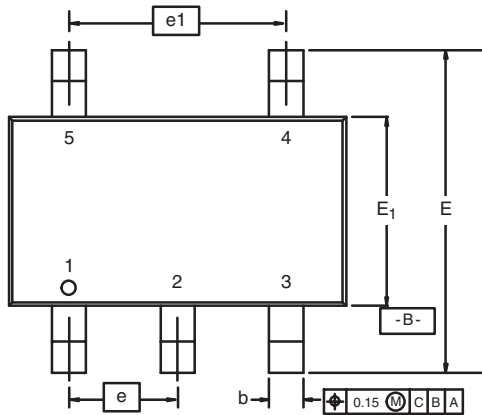


Normalized Thermal Transient Impedance, Junction-to-Foot

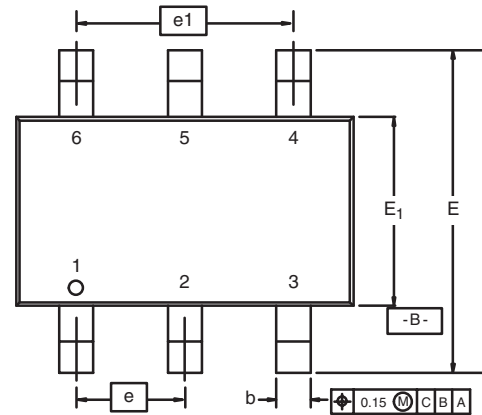
Vishay Siliconix maintains worldwide manufacturing capability. Products may be manufactured at one of several qualified locations. Reliability data for Silicon Technology and Package Reliability represent a composite of all qualified locations. For related documents such as package/tape drawings, part marking, and reliability data, see www.vishay.com/ppg?75315.

TSOP: 5/6-LEAD

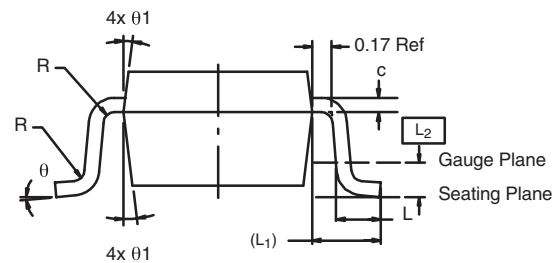
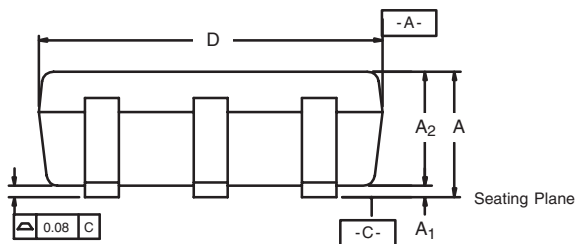
JEDEC Part Number: MO-193C



5-LEAD TSOP

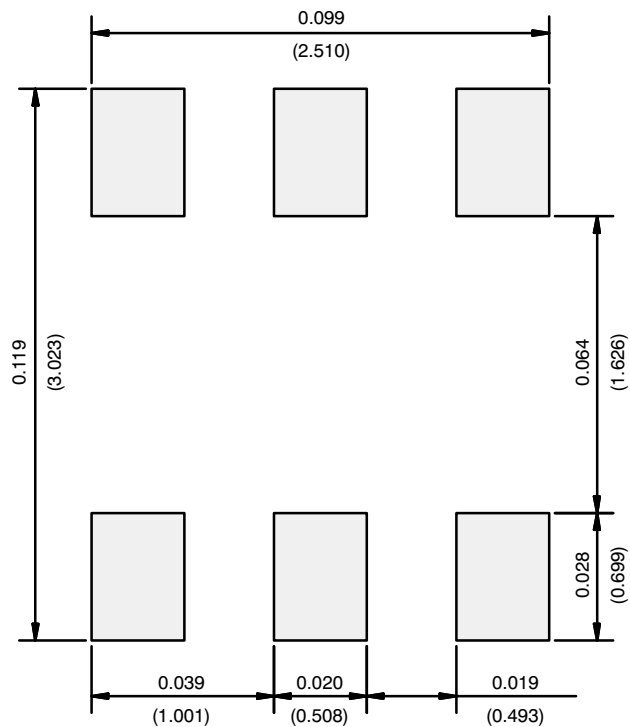


6-LEAD TSOP



Dim	MILLIMETERS			INCHES		
	Min	Nom	Max	Min	Nom	Max
A	0.91	-	1.10	0.036	-	0.043
A ₁	0.01	-	0.10	0.0004	-	0.004
A ₂	0.90	-	1.00	0.035	0.038	0.039
b	0.30	0.32	0.45	0.012	0.013	0.018
c	0.10	0.15	0.20	0.004	0.006	0.008
D	2.95	3.05	3.10	0.116	0.120	0.122
E	2.70	2.85	2.98	0.106	0.112	0.117
E ₁	1.55	1.65	1.70	0.061	0.065	0.067
e	0.95 BSC			0.0374 BSC		
e ₁	1.80	1.90	2.00	0.071	0.075	0.079
L	0.32	-	0.50	0.012	-	0.020
L ₁	0.60 Ref			0.024 Ref		
L ₂	0.25 BSC			0.010 BSC		
R	0.10	-	-	0.004	-	-
θ	0°	4°	8°	0°	4°	8°
θ ₁	7° Nom			7° Nom		
ECN: C-06593-Rev. I, 18-Dec-06						
DWG: 5540						

RECOMMENDED MINIMUM PADS FOR TSOP-6



Recommended Minimum Pads
Dimensions in Inches/(mm)

[Return to Index](#)



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.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. 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.