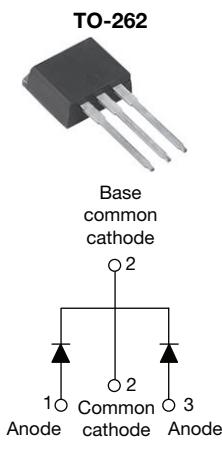
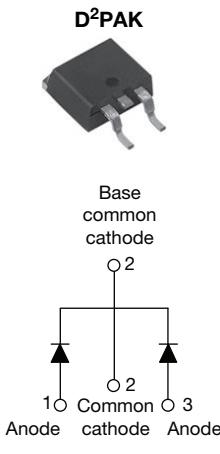


High Performance Schottky Rectifier, 2 x 15 A



FEATURES

- 150 °C T_J operation
- Center tap D²PAK and TO-262 packages
- Low forward voltage drop
- High frequency operation
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- Guard ring for enhanced ruggedness and long term reliability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Designed and qualified according to JEDEC®-JESD 47
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912



RoHS
COMPLIANT
HALOGEN
FREE

DESCRIPTION

This center tap Schottky rectifier has been optimized for low reverse leakage at high temperature. The proprietary barrier technology allows for reliable operation up to 150 °C junction temperature. Typical applications are in switching power supplies, converters, freewheeling diodes, and reverse battery protection.

PRODUCT SUMMARY	
$I_{F(AV)}$	2 x 15 A
V_R	35 V, 45 V
V_F at I_F	See datasheet
I_{RM} max.	40 mA at 125 °C
T_J max.	150 °C
E_{AS}	16 mJ
Package	TO-263AB (D ² PAK), TO-262AA
Diode variation	Common cathode

MAJOR RATINGS AND CHARACTERISTICS				
SYMBOL	CHARACTERISTICS	VALUES	UNITS	
$I_{F(AV)}$	Rectangular waveform (per device)	30	A	
I_{FRM}	$T_C = 130$ °C (per leg)	30		
V_{RRM}		35/45	V	
I_{FSM}	$t_p = 5$ µs sine	1060	A	
V_F	30 A _{pk} , $T_J = 125$ °C	0.73	V	
T_J	Range	-65 to 150	°C	

VOLTAGE RATINGS				
PARAMETER	SYMBOL	VS-MBRB2535CT-M3 VS-MBR2535CT-1-M3	VS-MBRB2545CT-M3 VS-MBR2545CT-1-M3	UNITS
Maximum DC reverse voltage	V_R	35	45	V
Maximum working peak reverse voltage	V_{RWM}			

ABSOLUTE MAXIMUM RATINGS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum average forward current	$I_{F(AV)}$	$T_J = 130^\circ\text{C}$, rated V_R		15	A
per leg				30	
per device					
Peak repetitive forward current per leg	I_{FRM}	Rated V_R , square wave, 20 kHz, $T_J = 130^\circ\text{C}$		30	
Non-repetitive peak surge current	I_{FSM}	5 μs sine or 3 μs rect. pulse	Following any rated load condition and with rated V_{RRM} applied	1060	A
		Surge applied at rated load conditions halfwave, single phase, 60 Hz		150	
Non-repetitive avalanche energy per leg	E_{AS}	$T_J = 25^\circ\text{C}$, $I_{AS} = 2\text{ A}$, $L = 8\text{ mH}$		16	mJ
Repetitive avalanche current per leg	I_{AR}	Current decaying linearly to zero in 1 μs Frequency limited by T_J maximum $V_A = 1.5 \times V_R$ typical		2	A

ELECTRICAL SPECIFICATIONS						
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS	
Maximum forward voltage drop	$V_{FM}^{(1)}$	30 A	$T_J = 25^\circ\text{C}$	0.82	V	
			$T_J = 125^\circ\text{C}$	0.73		
Maximum instantaneous reverse current	$I_{RM}^{(1)}$	$T_J = 25^\circ\text{C}$	Rated DC voltage	0.2	mA	
		$T_J = 125^\circ\text{C}$		40		
Threshold voltage	$V_{F(TO)}$	$T_J = T_J$ maximum		0.355	V	
Forward slope resistance	r_t			12.3	$\text{m}\Omega$	
Maximum junction capacitance	C_T	$V_R = 5\text{ V}_{\text{DC}}$ (test signal range 100 kHz to 1 MHz), 25°C		700	pF	
Typical series inductance	L_S	Measured from top of terminal to mounting plane		8.0	nH	
Maximum voltage rate of change	dV/dt	Rated V_R		10 000	$\text{V}/\mu\text{s}$	

Note

⁽¹⁾ Pulse width < 300 μs , duty cycle < 2 %

THERMAL - MECHANICAL SPECIFICATIONS						
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS	
Maximum junction temperature range	T_J			- 65 to 150	$^\circ\text{C}$	
Maximum storage temperature range	T_{Stg}			- 65 to 175		
Maximum thermal resistance, junction to case per leg	R_{thJC}	DC operation		1.5	$^\circ\text{C}/\text{W}$	
Typical thermal resistance, case to heatsink	R_{thCS}	Mounting surface, smooth and greased		0.50		
Approximate weight				2	g	
				0.07		
Mounting torque	minimum	Non-lubricated threads		6 (5)	$\text{k}\text{gf} \cdot \text{cm}$ (lbf · in)	
	maximum			12 (10)		
Marking device		Case style D ² PAK		MBRB2535CT MBRB2545CT		
		Case style TO-262		MBR2535CT-1 MBR2545CT-1		

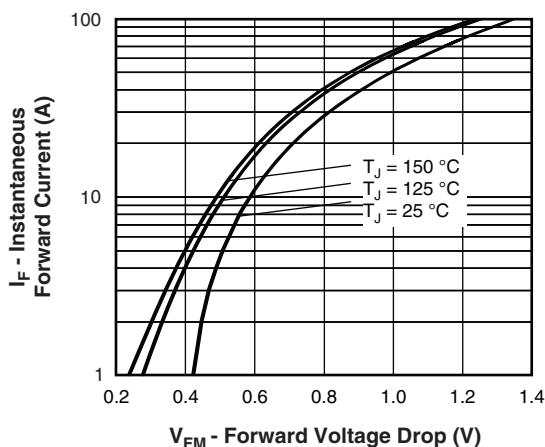


Fig. 1 - Maximum Forward Voltage Drop Characteristics
(Per Leg)

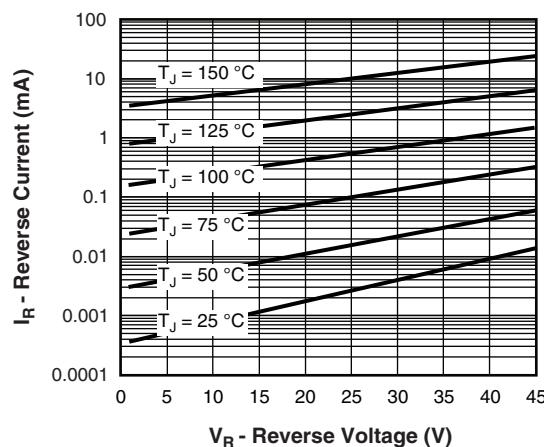


Fig. 2 - Typical Values of Reverse Current vs.
Reverse Voltage (Per Leg)

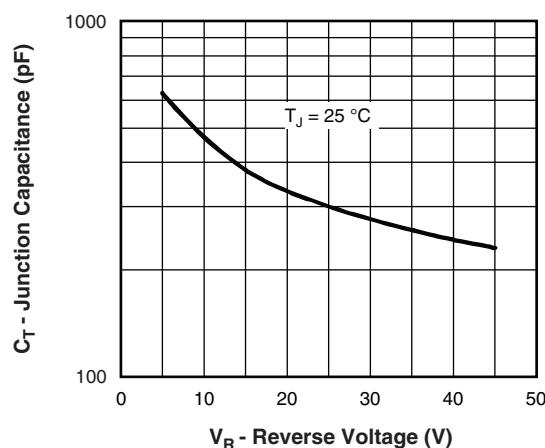


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage (Per Leg)

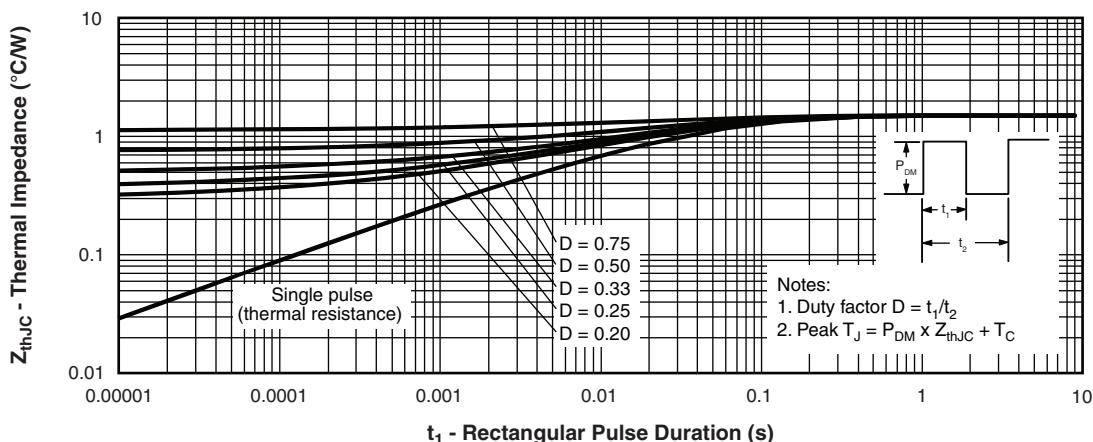


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics (Per Leg)

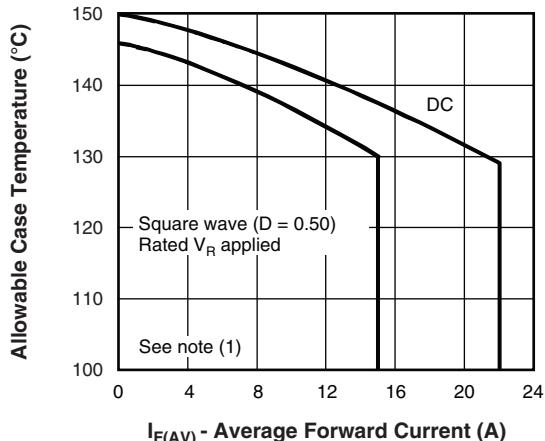


Fig. 5 - Maximum Allowable Case Temperature vs.
Average Forward Current (Per Leg)

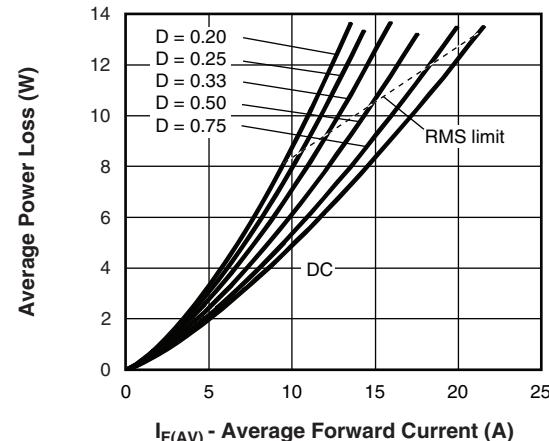


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

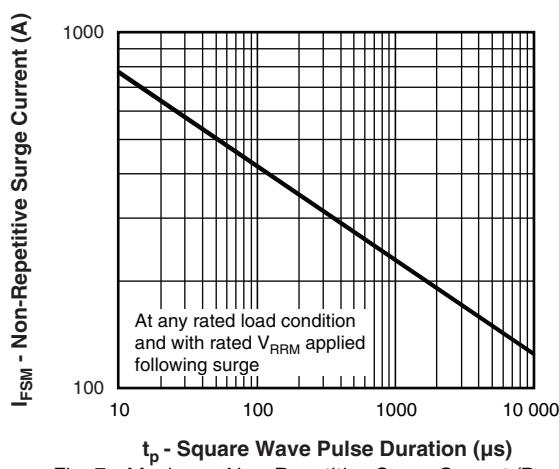


Fig. 7 - Maximum Non-Repetitive Surge Current (Per Leg)

Note

(1) Formula used: $T_C = T_J - (P_d + P_{dREV}) \times R_{thJC}$;
 $P_d = \text{Forward power loss} = I_{F(AV)} \times V_{FM} \text{ at } (I_{F(AV)}/D)$ (see fig. 6);
 $P_{dREV} = \text{Inverse power loss} = V_{R1} \times I_R (1 - D)$; I_R at V_{R1} = Rated V_R

ORDERING INFORMATION TABLE

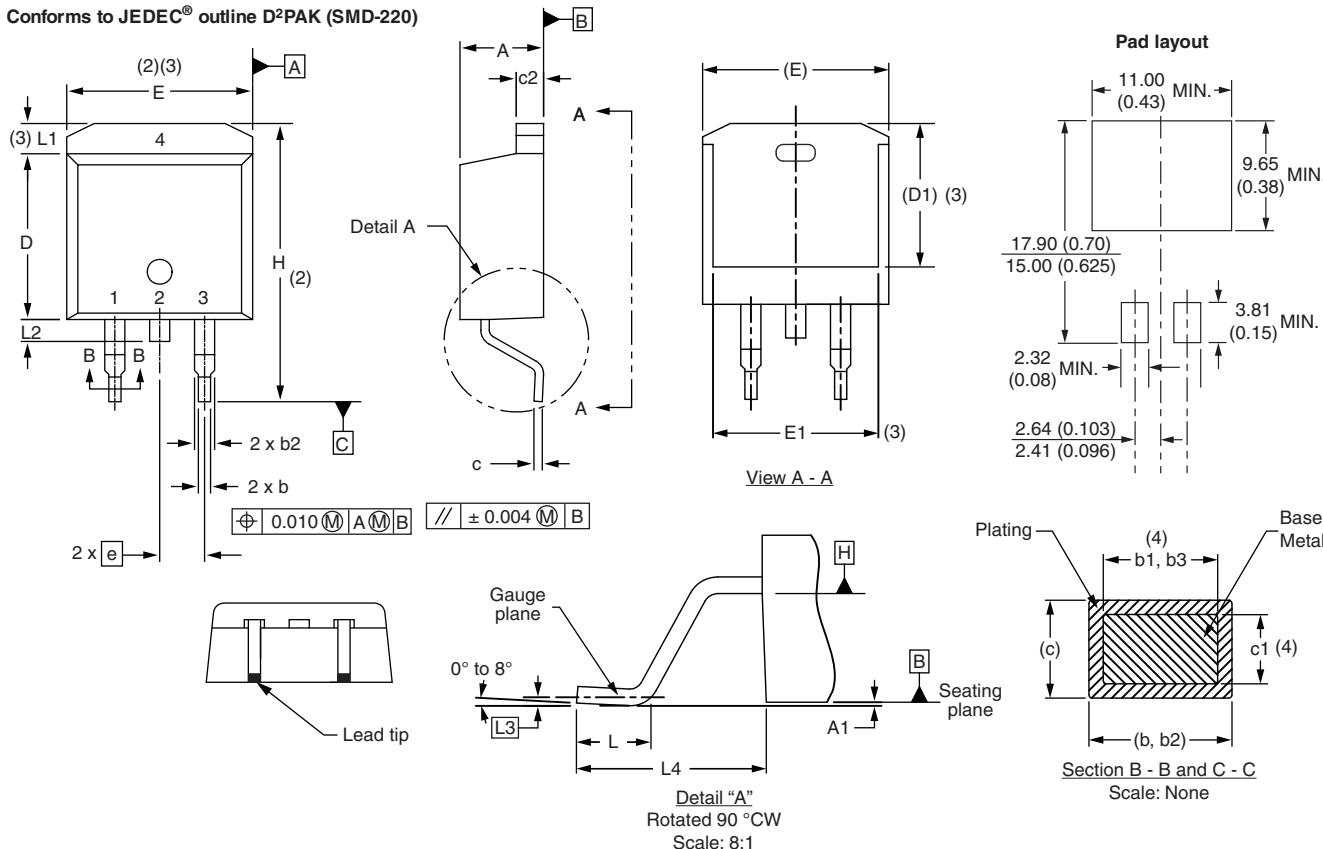
Device code	VS-	MBR	B	25	45	CT	-1	L	-M3
	1	2	3	4	5	6	7	8	9
1	-	Vishay Semiconductors product							
2	-	Essential part number							
3	-	• B = D ² PAK	7	None					
		• None = TO-262	7	= -1					
4	-	Current rating (25 = 25 A)							
5	-	Voltage ratings			35 = 35 V				
6	-	CT = Essential part number			45 = 45 V				
7	-	• None = D ² PAK	3	= B					
		• -1 = TO-262	3	None					
8	-	• None = Tube							
		• L = Tape and reel (left oriented - for D ² PAK only)							
		• R = Tape and reel (right oriented - for D ² PAK only)							
9	-	-M3 = Halogen-free, RoHS-compliant and termination lead (Pb)-free							

ORDERING INFORMATION (Example)				
PREFERRED P/N	QUANTITY PER T/R	MINIMUM ORDER QUANTITY	PACKAGING DESCRIPTION	
VS-MBRB2535CT-M3	50	1000	Antistatic plastic tube	
VS-MBRB2535CTR-M3	800	800	13" diameter reel	
VS-MBRB2535CTL-M3	800	800	13" diameter reel	
VS-MBR2535CT-1-M3	50	1000	Antistatic plastic tube	
VS-MBRB2545CT-M3	50	1000	Antistatic plastic tube	
VS-MBRB2545CTR-1-M3	800	800	13" diameter reel	
VS-MBRB2545CTL-M3	800	800	13" diameter reel	
VS-MBR2545CT-1-M3	50	1000	Antistatic plastic tube	

LINKS TO RELATED DOCUMENTS		
Dimensions	TO-263AB (D ² PAK)	www.vishay.com/doc?95046
Dimensions	TO-262AA	www.vishay.com/doc?95419
Part marking information	TO-263AB (D ² PAK)	www.vishay.com/doc?95444
Part marking information	TO-262AA	www.vishay.com/doc?95443
Packaging information		www.vishay.com/doc?95032

D²PAK

DIMENSIONS in millimeters and inches

Conforms to JEDEC® outline D²PAK (SMD-220)


SYMBOL	MILLIMETERS		INCHES		NOTES		SYMBOL	MILLIMETERS		INCHES		NOTES
	MIN.	MAX.	MIN.	MAX.				MIN.	MAX.	MIN.	MAX.	
A	4.06	4.83	0.160	0.190			D1	6.86	8.00	0.270	0.315	3
A1	0.00	0.254	0.000	0.010			E	9.65	10.67	0.380	0.420	2, 3
b	0.51	0.99	0.020	0.039			E1	7.90	8.80	0.311	0.346	3
b1	0.51	0.89	0.020	0.035	4		e	2.54 BSC		0.100 BSC		
b2	1.14	1.78	0.045	0.070			H	14.61	15.88	0.575	0.625	
b3	1.14	1.73	0.045	0.068	4		L	1.78	2.79	0.070	0.110	
c	0.38	0.74	0.015	0.029			L1	-	1.65	-	0.066	3
c1	0.38	0.58	0.015	0.023	4		L2	1.27	1.78	0.050	0.070	
c2	1.14	1.65	0.045	0.065			L3	0.25 BSC		0.010 BSC		
D	8.51	9.65	0.335	0.380	2		L4	4.78	5.28	0.188	0.208	

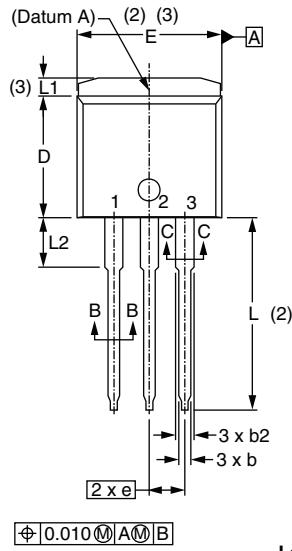
Notes

- (1) Dimensioning and tolerancing per ASME Y14.5 M-1994
- (2) Dimension D and E do not include mold flash. Mold flash shall not exceed 0.127 mm (0.005") per side. These dimensions are measured at the outmost extremes of the plastic body
- (3) Thermal pad contour optional within dimension E, L1, D1 and E1
- (4) Dimension b1 and c1 apply to base metal only
- (5) Datum A and B to be determined at datum plane H
- (6) Controlling dimension: inch
- (7) Outline conforms to JEDEC® outline TO-263AB

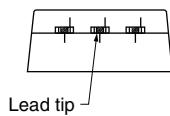
TO-262

DIMENSIONS in millimeters and inches

Modified JEDEC outline TO-262

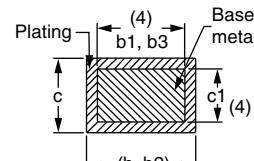
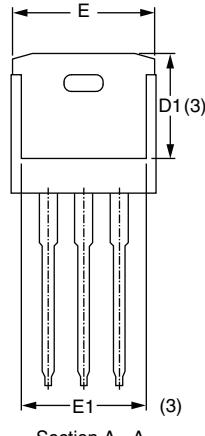
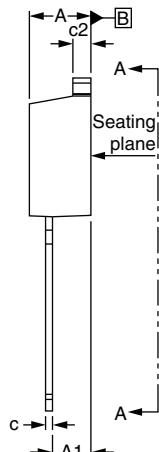


$\oplus 0.010 \ominus 0.005$ B



Lead assignments

Diodes
 1. - Anode (two die)/open (one die)
 2., 4. - Cathode
 3. - Anode



Section B-B and C-C

Scale: None

SYMBOL	MILLIMETERS		INCHES		NOTES
	MIN.	MAX.	MIN.	MAX.	
A	4.06	4.83	0.160	0.190	
A1	2.03	3.02	0.080	0.119	
b	0.51	0.99	0.020	0.039	
b1	0.51	0.89	0.020	0.035	4
b2	1.14	1.78	0.045	0.070	
b3	1.14	1.73	0.045	0.068	4
c	0.38	0.74	0.015	0.029	
c1	0.38	0.58	0.015	0.023	4
c2	1.14	1.65	0.045	0.065	
D	8.51	9.65	0.335	0.380	2
D1	6.86	8.00	0.270	0.315	3
E	9.65	10.67	0.380	0.420	2, 3
E1	7.90	8.80	0.311	0.346	3
e	2.54 BSC		0.100 BSC		
L	13.46	14.10	0.530	0.555	
L1	-	1.65	-	0.065	3
L2	3.56	3.71	0.140	0.146	

Notes

- (1) Dimensioning and tolerancing as per ASME Y14.5M-1994
- (2) Dimension D and E do not include mold flash. Mold flash shall not exceed 0.127 mm (0.005") per side. These dimensions are measured at the outmost extremes of the plastic body
- (3) Thermal pad contour optional within dimension E, L1, D1 and E1

(4) Dimension b1 and c1 apply to base metal only

(5) Controlling dimension: inches

(6) Outline conform to JEDEC TO-262 except A1 (maximum), b (minimum) and D1 (minimum) where dimensions derived the actual package outline

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.

Material Category Policy

Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as RoHS-Compliant fulfill the definitions and restrictions defined under Directive 2011/65/EU of The European Parliament and of the Council of June 8, 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (EEE) - recast, unless otherwise specified as non-compliant.

Please note that some Vishay documentation may still make reference to RoHS Directive 2002/95/EC. We confirm that all the products identified as being compliant to Directive 2002/95/EC conform to Directive 2011/65/EU.

Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as Halogen-Free follow Halogen-Free requirements as per JEDEC JS709A standards. Please note that some Vishay documentation may still make reference to the IEC 61249-2-21 definition. We confirm that all the products identified as being compliant to IEC 61249-2-21 conform to JEDEC JS709A standards.