

Zener Diodes with Surge Current Specification



FEATURES

- Silicon planar Zener diodes
- Low profile surface-mount package
- Zener and surge current specification
- Low leakage current
- Excellent stability
- High temperature soldering: 260 °C/10 s at terminals
- AEC-Q101 qualified
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC
- Halogen-free according to IEC 61249-2-21 definition



RoHS
COMPLIANT
HALOGEN
FREE

PRIMARY CHARACTERISTICS

PARAMETER	VALUE	UNIT
V _Z range nom.	3.6 to 200	V
Test current I _{ZT}	5 to 100	mA
V _Z specification	Pulse current	
Int. construction	Single	

ORDERING INFORMATION

DEVICE NAME	ORDERING CODE	TAPED UNITS PER REEL	MINIMUM ORDER QUANTITY
BZD27C3V6P-M to BZD27C200P-M	BZD27C3V6P-M to BZD27C200P-M-series-08	3000 per 7" reel (8mm tape)	15 000/box
BZD27C3V6P-M to BZD27C200P-M	BZD27C3V6P-M to BZD27C200P-M-series-18	10 000 per 13" reel (8 mm tape)	10 000/box

PACKAGE

PACKAGE NAME	WEIGHT	MOLDING COMPOUND FLAMMABILITY RATING	MOISTURE SENSITIVITY LEVEL	SOLDERING CONDITIONS
DO-219AB (SMF)	15 mg	UL 94 V-0	MSL level 1 (according J-STD-020)	260 °C/10 s at terminals

ABSOLUTE MAXIMUM RATINGS (T_{amb} = 25 °C, unless otherwise specified)

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Power dissipation	T _L = 80 °C	P _{tot}	2300	mW
	T _A = 25 °C ⁽¹⁾	P _{tot}	800	mW
Non repetitive peak surge power dissipation ⁽²⁾	100 µs square pulse	P _{ZSM}	300	W
	10/1000 µs waveform (BZD27-C7V5P-M to BZD27-C100P-M)	P _{RSM}	150	W
	10/1000 µs waveform (BZD27-C110P-M to BZD27-C200P-M)	P _{RSM}	100	W
Junction to lead		R _{thJL}	30	K/W
Junction to ambient air	Mounted on epoxy-glass PCB with 3 mm x 3 mm Cu pads (≥ 40 µm thick)	R _{thJA}	180	K/W
Junction temperature		T _j	150	°C
Storage temperature range		T _{stg}	- 55 to + 150	°C

Notes

⁽¹⁾ Mounted on epoxy-glass PCB with 3 mm x 3 mm Cu pads (≥ 40 µm thick)

⁽²⁾ T_j = 25 °C prior to surge

**ELECTRICAL CHARACTERISTICS** ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)

PART NUMBER	MARKING CODE	ZENER VOLTAGE RANGE ⁽¹⁾			TEST CURRENT	REVERSE CURRENT		DYNAMIC RESISTANCE		TEMPERATURE COEFFICIENT	
		V_Z at I_{ZT1}			I_{ZT1}	I_R at V_R		Z_Z at I_{ZT1}		α_{VZ} at I_{ZT1}	
		V			mA	μA	V	Ω		%/ $^{\circ}\text{C}$	
		MIN.	NOM.	MAX.		MAX.		TYP.	MAX.	MIN.	MAX.
BZD27C3V6P-M	N0	3.4	3.6	3.8	100	100	1	4	8	- 0.14	- 0.04
BZD27C3V9P-M	N1	3.7	3.9	4.1	100	50	1	4	8	- 0.14	- 0.04
BZD27C4V3P-M	N2	4	4.3	4.6	100	25	1	4	7	- 0.12	- 0.02
BZD27C4V7P-M	N3	4.4	4.7	5	100	10	1	3	7	- 0.1	0
BZD27C5V1P-M	N4	4.8	5.1	5.4	100	5	1	3	6	- 0.08	0.02
BZD27C5V6P-M	N5	5.2	5.6	6	100	10	2	2	4	- 0.04	0.04
BZD27C6V2P-M	N6	5.8	6.2	6.6	100	5	2	2	3	- 0.01	0.06
BZD27C6V8P-M	N7	6.4	6.8	7.2	100	10	3	1	3	0	0.07
BZD27C7V5P-M	N8	7	7.5	7.9	100	50	3	1	2	0	0.07
BZD27C8V2P-M	N9	7.7	8.2	8.7	100	10	3	1	2	0.03	0.08
BZD27C9V1P-M	O0	8.5	9.1	9.6	50	10	5	2	4	0.03	0.08
BZD27C10P-M	O1	9.4	10	10.6	50	7	7.5	2	4	0.05	0.09
BZD27C11P-M	O2	10.4	11	11.6	50	4	8.2	4	7	0.05	0.1
BZD27C12P-M	O3	11.4	12	12.7	50	3	9.1	4	7	0.05	0.1
BZD27C13P-M	O4	12.4	13	14.1	50	2	10	5	10	0.05	0.1
BZD27C15P-M	O5	13.8	15	15.6	50	1	11	5	10	0.05	0.1
BZD27C16P-M	O6	15.3	16	17.1	25	1	12	6	15	0.06	0.11
BZD27C18P-M	O7	16.8	18	19.1	25	1	13	6	15	0.06	0.11
BZD27C20P-M	O8	18.8	20	21.2	25	1	15	6	15	0.06	0.11
BZD27C22P-M	O9	20.8	22	23.3	25	1	16	6	15	0.06	0.11
BZD27C24P-M	P0	22.8	24	25.6	25	1	18	7	15	0.06	0.11
BZD27C27P-M	P1	25.1	27	28.9	25	1	20	7	15	0.06	0.11
BZD27C30P-M	P2	28	30	32	25	1	22	8	15	0.06	0.11
BZD27C33P-M	P3	31	33	35	25	1	24	8	15	0.06	0.11
BZD27C36P-M	P4	34	36	38	10	1	27	21	40	0.06	0.11
BZD27C39P-M	P5	37	39	41	10	1	30	21	40	0.06	0.11
BZD27C43P-M	P6	40	43	46	10	1	33	24	45	0.07	0.12
BZD27C47P-M	P7	44	47	50	10	1	36	24	45	0.07	0.12
BZD27C51P-M	P8	48	51	54	10	1	39	25	60	0.07	0.12
BZD27C56P-M	P9	52	56	60	10	1	43	25	60	0.07	0.12
BZD27C62P-M	Q0	58	62	66	10	1	47	25	80	0.08	0.13
BZD27C68P-M	Q1	64	68	72	10	1	51	25	80	0.08	0.13
BZD27C75P-M	Q2	70	75	79	10	1	56	30	100	0.08	0.13
BZD27C82P-M	Q3	77	82	87	10	1	62	30	100	0.08	0.13
BZD27C91P-M	Q4	85	91	96	5	1	68	60	200	0.08	0.13
BZD27C100P-M	Q5	94	100	106	5	1	75	60	200	0.09	0.13
BZD27C110P-M	Q6	104	110	116	5	1	82	80	250	0.09	0.13
BZD27C120P-M	Q7	114	120	127	5	1	91	80	250	0.09	0.13
BZD27C130P-M	Q8	124	130	141	5	1	100	110	300	0.09	0.13
BZD27C150P-M	Q9	138	150	156	5	1	110	130	300	0.09	0.13
BZD27C160P-M	R0	153	160	171	5	1	120	150	350	0.09	0.13
BZD27C180P-M	R1	168	180	191	5	1	130	180	400	0.09	0.13
BZD27C200P-M	R2	188	200	212	5	1	150	200	500	0.09	0.13

Notes

- Electrical characteristics when used as regulator diodes
- Maximum $V_F = 1.2\text{ V}$, at $I_F = 0.2\text{ A}$
- ⁽¹⁾ Pulse test: $t_p \leq 5\text{ ms}$

**ELECTRICAL CHARACTERISTICS** ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)

PART NUMBER	MARKING CODE	ZENER VOLTAGE RANGE			TEST CURRENT	REVERSE CURRENT		CLAMPING VOLTAGE		TEMPERATURE COEFFICIENT	
		V_Z at I_{ZT1}			I_{ZT1}	I_R at V_R		V_C at $I_{RSM}^{(1)}$		α_{VZ} at I_{ZT1}	
		V			mA	μA	V	V	A	% / $^{\circ}\text{C}$	
		MIN.	NOM.	MAX.		MAX.		MAX.		MIN.	MAX.
BZD27C7V5P-M	N8	7	7.5	7.9	100	1500	6.2	11.3	13.3	0	0.07
BZD27C8V2P-M	N9	7.7	8.2	8.7	100	1200	6.8	12.3	12.2	0.03	0.08
BZD27C9V1P-M	O0	8.5	9.1	9.6	50	100	7.5	13.3	11.3	0.03	0.08
BZD27C10P-M	O1	9.4	10	10.6	50	20	8.2	14.8	10.1	0.05	0.09
BZD27C11P-M	O2	10.4	11	11.6	50	5	9.1	15.7	9.6	0.05	0.1
BZD27C12P-M	O3	11.4	12	12.7	50	5	10	17	8.8	0.05	0.1
BZD27C13P-M	O4	12.4	13	14.1	50	5	11	18.9	7.9	0.05	0.1
BZD27C15P-M	O5	13.8	15	15.6	50	5	12	20.9	7.2	0.05	0.1
BZD27C16P-M	O6	15.3	16	17.1	25	5	13	22.9	6.6	0.06	0.11
BZD27C18P-M	O7	16.8	18	19.1	25	5	15	25.6	5.9	0.06	0.11
BZD27C20P-M	O8	18.8	20	21.2	25	5	16	28.4	5.3	0.06	0.11
BZD27C22P-M	O9	20.8	22	23.3	25	5	18	31	4.8	0.06	0.11
BZD27C24P-M	P0	22.8	24	25.6	25	5	20	33.8	4.4	0.06	0.11
BZD27C27P-M	P1	25.1	27	28.9	25	5	22	38.1	3.9	0.06	0.11
BZD27C30P-M	P2	28	30	32	25	5	24	42.2	3.6	0.06	0.11
BZD27C33P-M	P3	31	33	35	25	5	27	46.2	3.2	0.06	0.11
BZD27C36P-M	P4	34	36	38	10	5	30	50.1	3	0.06	0.11
BZD27C39P-M	P5	37	39	41	10	5	33	54.1	2.8	0.06	0.11
BZD27C43P-M	P6	40	43	46	10	5	36	60.7	2.5	0.07	0.12
BZD27C47P-M	P7	44	47	50	10	5	39	65.5	2.3	0.07	0.12
BZD27C51P-M	P8	48	51	54	10	5	43	70.8	2.1	0.07	0.12
BZD27C56P-M	P9	52	56	60	10	5	47	78.6	1.9	0.07	0.12
BZD27C62P-M	Q0	58	62	66	10	5	51	86.5	1.7	0.08	0.13
BZD27C68P-M	Q1	64	68	72	10	5	56	94.4	1.6	0.08	0.13
BZD27C75P-M	Q2	70	75	79	10	5	62	103.5	1.5	0.08	0.13
BZD27C82P-M	Q3	77	82	87	10	5	68	114	1.3	0.08	0.13
BZD27C91P-M	Q4	85	91	96	5	5	75	126	1.2	0.09	0.13
BZD27C100P-M	Q5	94	100	106	5	5	82	139	1.1	0.09	0.13
BZD27C110P-M	Q6	104	110	116	5	5	91	139	0.72	0.09	0.13
BZD27C120P-M	Q7	114	120	127	5	5	100	152	0.65	0.09	0.13
BZD27C130P-M	Q8	124	130	141	5	5	110	169	0.59	0.09	0.13
BZD27C150P-M	Q9	138	150	156	5	5	120	187	0.53	0.09	0.13
BZD27C160P-M	R0	153	160	171	5	5	130	205	0.48	0.09	0.13
BZD27C180P-M	R1	168	180	191	5	5	150	229	0.43	0.09	0.13
BZD27C200P-M	R2	188	200	212	5	5	160	254	0.39	0.09	0.13

Notes

- Electrical characteristics when used as protection diodes

(1) Non-repetitive peak reverse current in accordance with "IEC 60-1, section 8" (10/1000 μs pulse); see fig. 5.

BASIC CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)

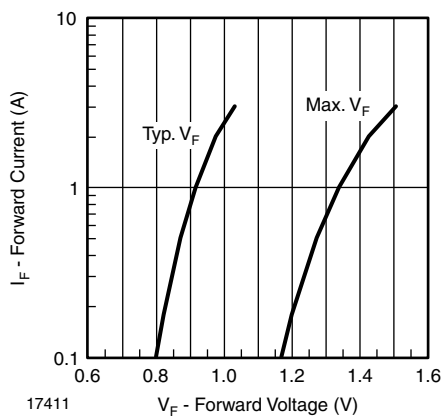


Fig. 1 - Forward Current vs. Forward Voltage

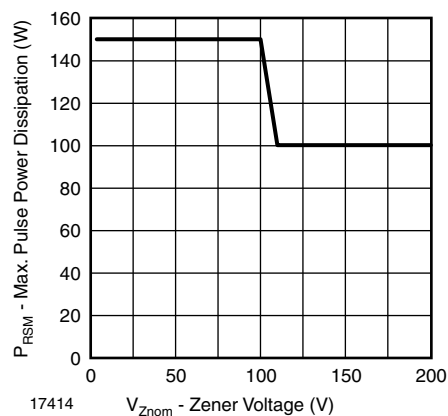


Fig. 4 - Maximum Pulse Power Dissipation vs. Zener Voltage

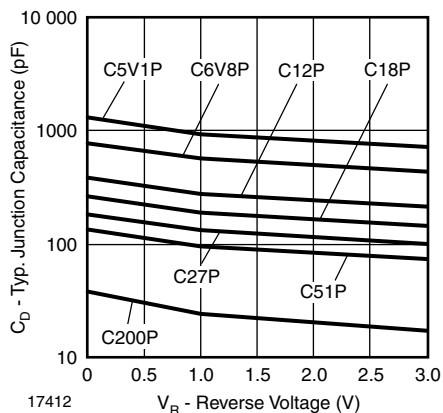


Fig. 2 - Typ. Diode Capacitance vs. Reverse Voltage

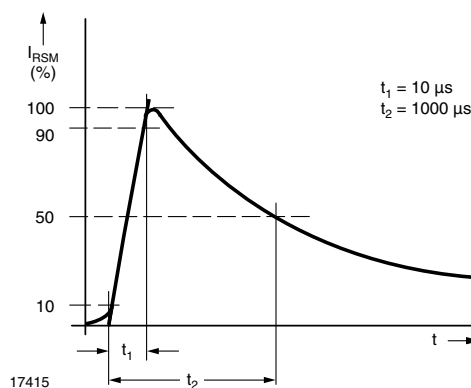


Fig. 5 - Non-Repetitive Peak Reverse Current Pulse Definition

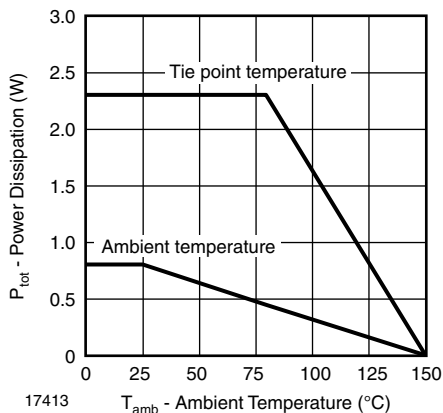
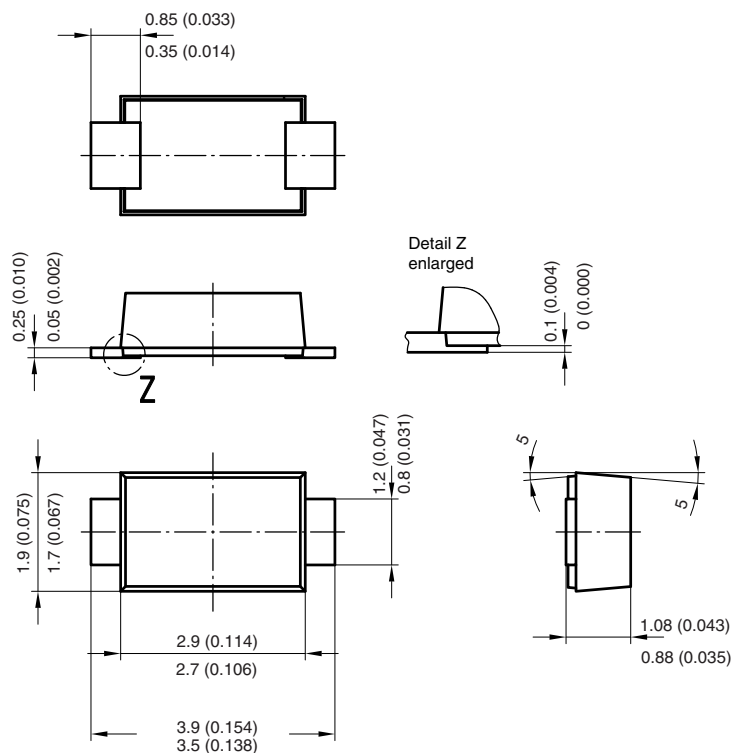


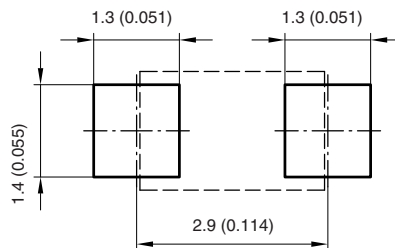
Fig. 3 - Power Dissipation vs. Ambient Temperature



PACKAGE DIMENSIONS in millimeters (inches): **DO219-AB (SMF)**



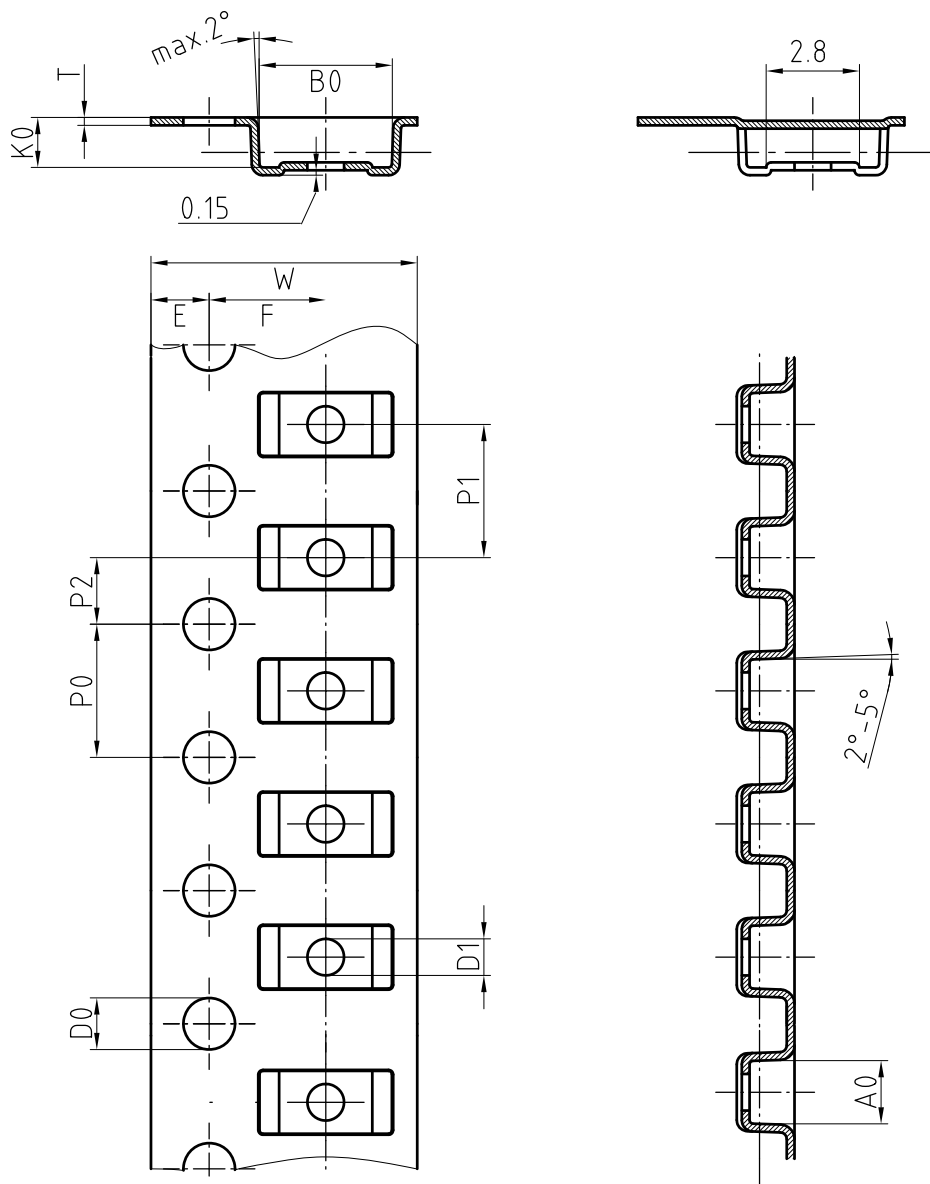
Foot print recommendation:



Created - Date: 15. February 2005
Rev. 3 - Date: 13. March 2007
Document no.:S8-V-3915.01-001 (4)
17247



Blister Tape Dimensions for SMF in millimeters



Mat:	A0	B0	K0	W	T	P0	P2	P1	D0	D1	E	F
PS	1.9	4.0	1.5	8.0	0.235	4.0	2.0	4.0	1.5	1	1.75	3.5

Document-No.: S8-V-3717.02-001 (3)

18513



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.