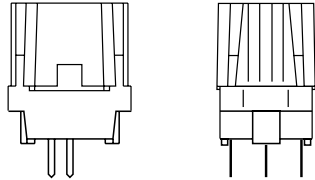
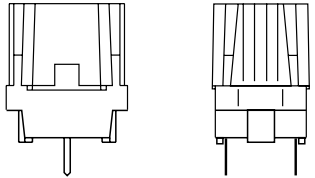


## PTC Thermistors For Degaussing, Dual, Mono And Double Mono Cased

a. Dual or double mono  
PTC degaussing.



b. Mono PTC  
degaussing.



### FEATURES

- Residual currents as low as 2 mA (p-p), ideal for high-resolution displays
- Long decay time
- Stable performance over a long time (>20000 operations)
- Self-extinguishing white plastic case ("UL 94.V.0")
- Design-in support available.

### APPLICATIONS

- Colour televisions
- Colour monitors.

### DESCRIPTION

For good picture definition, colour televisions and monitors must be degaussed by a strong alternating magnetic field which gradually and symmetrically decays to a small value of residual current. This can be achieved by connecting a PTC thermistor in the degaussing circuit.

The new generation of flat-screen, high-definition colour televisions and monitors require an excellent picture quality with high colour purity. This can only be achieved by a dual PTC device housing two PTC thermistors in intimate thermal contact, one being used to heat the other and so further reduce the residual current.

### QUICK REFERENCE DATA

PARAMETER	VALUE	UNIT
Resistance of degaussing PTC ( $R_s$ ) at 25 °C	3 to 30	$\Omega$
Standard tolerance on resistance of degaussing PTC ( $R_s$ ) at 25 °C	20 and 25	%
Resistance of heater PTC ( $R_p$ ) at 25 °C	3000	$\Omega$
Standard tolerance on resistance of heater PTC ( $R_p$ ) at 25 °C	75	%
Maximum AC voltage (RMS value)	145 to 276	V
Minimum inrush current (peak-to-peak value)	10 to 30	A
Temperature range (at maximum voltage)	0 to 60	°C
Available pitch:		
4e/1e	10.16 to 2.54	mm
4e/2e	10.16 to 5.08	mm
Standard pin length	4.2	mm
Detailed specifications based on	CECC 44000/ IEC 60738	



**DUAL RANGE**

<b>ELECTRICAL DATA AND ORDERING INFORMATION</b>													
MINIMUM PEAK-TO-PEAK <sup>(2)(6)</sup> INRUSH CURRENT (A)	MAXIMUM PEAK-TO-PEAK <sup>(2)</sup> RESIDUAL CURRENT (mA)			R <sub>25</sub> <sup>(3)</sup> (Ω)		R <sub>coil</sub> <sup>(4)(6)</sup> (Ω)		TYPICAL DECAY PERFORMANCE		TYPE <sup>(8)</sup>	CATALOG NUMBER <sup>(9)</sup> 2322 662 .....		
	after 5 s	after 30 s	after 180 s	R <sub>s</sub>	±%	MIN.	TYP.	DECAY TIME <sup>(5)(6)</sup> (ms)	ALPHA MAX. <sup>(6)</sup> (%)		4e/1e pitch	4e/2e pitch	
<b>U<sub>R</sub> = 220 to 240 V<sub>RMS</sub> (U<sub>max</sub> = 276 V<sub>RMS</sub>)</b>													
11	50	5	2	30	25	17	25	60	36	-	96209	96309	
14	50	5	2	26	25	14	17	40	43	-	96211	96311	
16	80	8	4	22	25	14	17	40	44	-	96216	96316	
16	80	8	2	22	25	10	17	65	33	LD	96616	96716	
20	80	8	2	18	25	10	13	50	38	-	96624	96724	
18	80	15	2	18	25	10	17	75	29	LD	96626	96726	
25	80	10	4	14	25	10	10	40	45	-	96602	96702	
25	80	10	4	14	25	10	10	45	40	LD	96642	96742	
21	80	10	5	12	20	10	17	70	36	LT	96606	96706	
21	100	20	5	12	20	10	17	80	30	LD/LT	96646	96746	
20	100	40	5	9	20	13	20	95	33	LT	96608	96708	
20	100	25	10	9	20	13	20	115	26	LD/LT	96648	96748	
21	100	40	10	7	20	20	20	110	33	LD/LT	-	96709	
<b>U<sub>R</sub> = 100 to 120 V<sub>RMS</sub> (U<sub>max</sub> = 145 V<sub>RMS</sub>)</b>													
19	200	20	10	7	20	5	7	80	31	LT	96213	96313	
27	200	50	14	5	30/15	5	6	85	30	-	96605	96705	
30	200	20	10	5	20	4	5	85	31	LD/LT	96645	96745	
30	200	20	10	3	30/15	4	6	115	29	LD	96643	96743	

**MONO CASED RANGE**

<b>ELECTRICAL DATA AND ORDERING INFORMATION</b>													
MINIMUM PEAK-TO-PEAK <sup>(2)</sup> INRUSH CURRENT (A)	MAXIMUM PEAK-TO-PEAK <sup>(2)</sup> RESIDUAL CURRENT (mA)			R <sub>25</sub> <sup>(3)</sup> (Ω)		R <sub>coil</sub> <sup>(4)(7)</sup> (Ω)		TYPICAL DECAY PERFORMANCE		TYPE <sup>(8)</sup>	CATALOG NUMBER <sup>(9)</sup> 2322 662 .....		
	after 5 s	after 30 s	after 180 s	R <sub>s</sub>	±%	MIN.	TYP.	DECAY TIME <sup>(5)(7)</sup> (ms)	ALPHA MAX. <sup>(6)</sup> (%)		4e pitch		
<b>U<sub>R</sub> = 220 to 240 V<sub>RMS</sub> (U<sub>max</sub> = 276 V<sub>RMS</sub>)</b>													
11	100	40	20	30	25	17	25	75	30	-	96281		
12	50	30	20	26	25	14	25	90	30	-	96688		
16	80	40	20	22	25	14	17	40	44	-	96286		
20	100	50	25	18	25	10	13	50	38	-	96682		
25	200	50	30	14	25	10	10	40	45	-	96683		
25	200	80	30	14	25	10	10	45	40	LD	96692		
21	200	80	30	12	20	10	17	70	36	-	96684		
21	200	80	30	12	20	10	17	80	30	LD	96696		
20	100	50	30	9	20	13	20	95	33	LT	96687		
20	200	50	25	9	20	13	20	115	26	LD/LT	96698		
21	100	50	30	7	20	20	20	110	33	LD/LT	96681		
<b>U<sub>R</sub> = 100 to 120 V<sub>RMS</sub> (U<sub>max</sub> = 145 V<sub>RMS</sub>)</b>													
19	200	70	40	7	20	5	7	80	31	-	96285		
27	200	70	40	5	30/1	5	6	85	30	-	96686		
30	200	70	40	5	20	4	5	85	31	LD	96695		
30	200	70	40	3	30/1	4	6	115	29	LD	96693		

**Notes**

1. Electrical data and catalog numbers. The shading indicates preferred types.
2. All peak-to-peak currents are measured at typical resistance of the coil, at 50 Hz (AC), at 25°C and at 220 Vrms for the 276V types, and 110Vrms for the 145V types.
3. Lower tolerances on resistance of degaussing PTC are available on request.
4. Lower minimum coil resistance is available on request.
5. Decay time is the time from the moment of maximum peak current until the half of the maximum peak inrush current.
6. Alpha maximum is the maximum decrease in current expressed in percent between two successive peaks.
7. Inrush currents and decay times at other voltage coil combinations can be derived from Figures 7 to 13, see section 'Introduction, PTC thermistors for degaussing'.
8. LT = low tolerance; LD = long decay.
9. Smallest packaging quantity (SPQ) = 600 units.

**DOUBLE MONO CASED RANGE**

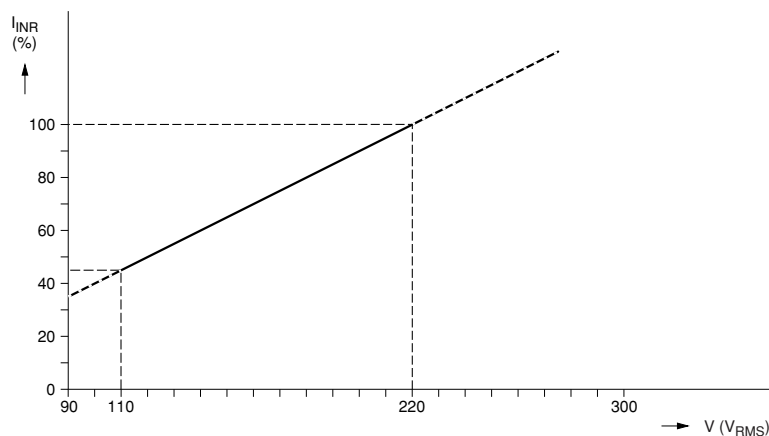
<b>ELECTRICAL DATA AND ORDERING INFORMATION</b>											
MINIMUM PEAK-TO-PEAK <sup>(1)</sup> INRUSH CURRENT (A)	MAXIMUM PEAK-TO-PEAK <sup>(1)</sup> RESIDUAL CURRENT (mA)			R <sub>25</sub> <sup>(3)</sup> (Ω)		R <sub>coil</sub> <sup>(2)(6)</sup> (Ω)		TYPICAL DECAY PERFORMANCE		TYPE <sup>(7)</sup>	CATALOG NUMBER <sup>(8)</sup> 2322 662 .....
	after 5 s	after 30 s	after 180 s	R <sub>s</sub>	±%	MIN.	TYP.	DECAY TIME <sup>(4)(6)</sup> (ms)	ALPHA MAX. <sup>(5)</sup> (%)		4e/2e pitch
<b>U<sub>R</sub> = 220 to 240 V<sub>RMS</sub> (U<sub>max</sub> = 276 V<sub>rms</sub>)</b>											
33	200	35	25	9.0 (18 × 2)	25	7	10	80	31	LD	96754
34	200	35	25	7.0 (14 × 2)	25	7	10	80	31	LD	96752
36	200	40	30	6.0 (12 × 2)	20	7	10	85	31	LD/LT	96756
33	200	45	35	4.5 (9 × 2)	20	10	13	130	27	LD/LT	96758
35	200	50	40	3.5 (7 × 2)	20	13	13	135	27	LD/LT	96759
<b>U<sub>R</sub> = 100 to 120 V<sub>RMS</sub> (U<sub>max</sub> = 145 V<sub>rms</sub>)</b>											
27	250	80	45	3.5 (7 × 2)	20	3	7	255	16	LD/LT	96757
34	250	80	45	2.5 (5 × 2)	20	3	6	200	19	LD/LT	96755
39	250	80	45	1.5 (3 × 2)	20	4	6	250	21	LD/LT	96753

**Notes**

- All peak-to-peak currents are measured at typical resistance of the coil, at 50 Hz (AC), at 25°C and at 220 Vrms for the 276V types, and 110Vrms for the 145V types.
- Lower minimum coil resistance is available on request.
- The indicated resistance value is the parallel combination of two degaussing PTCs.
- Decay time is the time from the moment of maximum peak current until the half of the maximum peak inrush current.
- Alpha maximum is the maximum decrease in current expressed in percent between two successive peaks.
- Inrush currents and decay times at other voltage coil combinations can be derived from Figures 7 to 13 in the section, "Introduction, PTC thermistors for degaussing".
- LT = low tolerance; LD = long decay.
- Smallest packaging quantity (SPQ) = 600 units.

**INRUSH CURRENT**

Minimum inrush current as a percentage of mains voltage.

**APPLICATION SPECIFIC DATA**

The data shown in the above tables is obtained from measurements at reference parameters. If these parameters do not correspond to the application parameters required, refer to Figures 7 to 13 in the "Introduction, PTC thermistors for degaussing", datasheet.

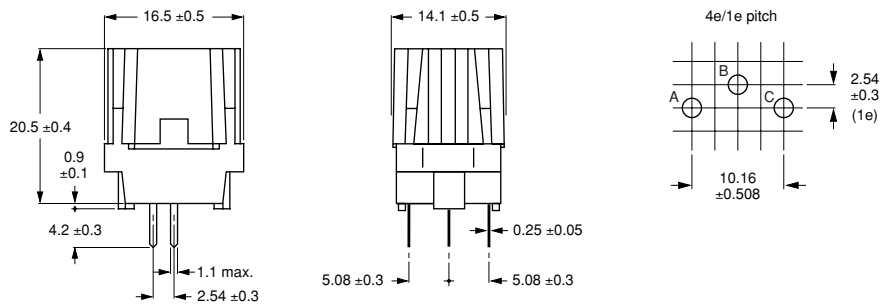
DIMENSIONS AND PIN CONFIGURATION <sup>(1)</sup>			
PRODUCT TYPE			
MONO	DUAL		DOUBLE MONO
4e	4e/1e	4e/2e	4e/2e
2322 662 9628.	2322 662 962..	2322 662 963..	-
2322 662 9668.	2322 662 966..	2322 662 967..	2322 662 9675.
2322 662 9669.			

**Note**

1. See Mono, Dual and Dual and Double drawings below.

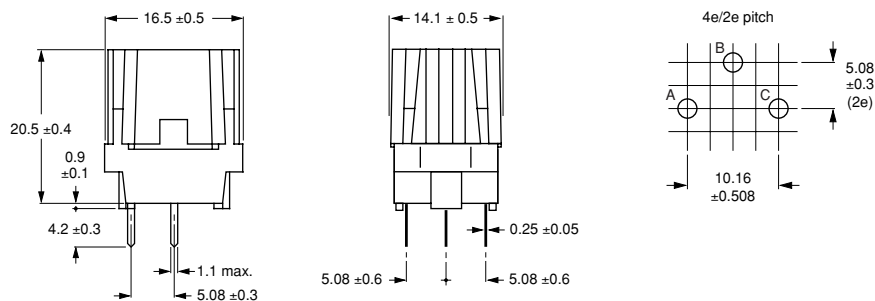
**DIMENSIONS** in millimeters

Dual PTC pin configuration 4e/1e pitch.



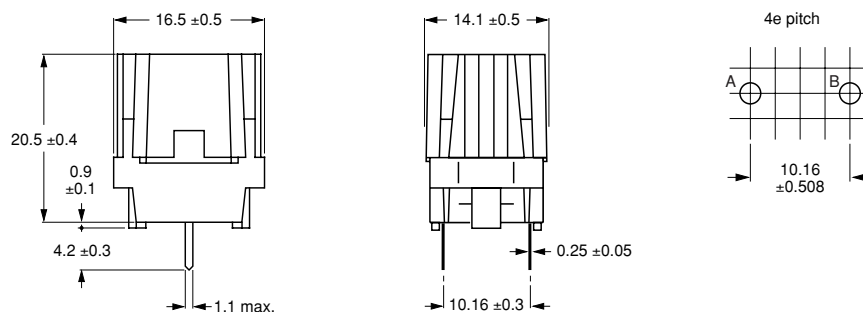
For electrical data and ordering information, see Dual Range table.

Dual and Double mono PTC pin configuration 4e/2e pitch.



For electrical data and ordering information, see Dual Range and Double Mono Range tables.

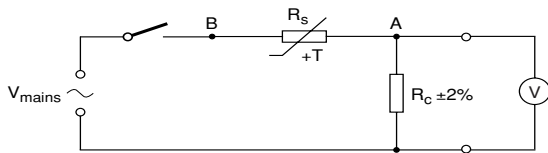
Mono PTC pin configuration 4e pitch.



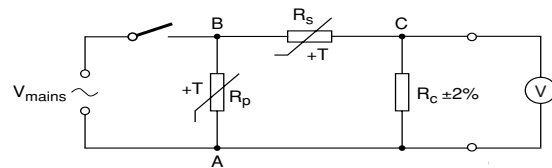
For electrical data and ordering information, see Mono Cased Range table.

PIN CONFIGURATIONS			
CONNECTION	PRODUCT TYPE		
	MONO	DUAL	DOUBLE MONO
Mains	point A	points A and B	point B
Coil(s)	point B	points A and B	points A and C

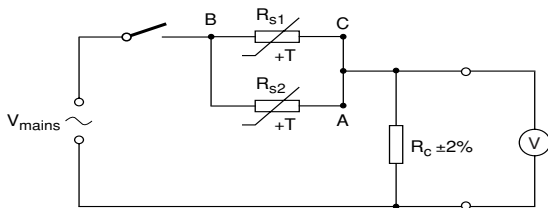
**MEASURING CIRCUITS**



a. Mono cased PTC degaussing.



b. Dual cased PTC degaussing.



c. Double mono cased PTC degaussing.

V = A/D converter or oscilloscope.

$R_s$  = resistance of series PTC or degaussing PTC.

$R_p$  = resistance of parallel PTC or heater PTC.

$R_c$  = replaces the degaussing coil.

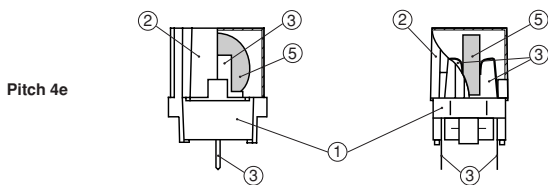
$V_{mains}$  = AC power source with high output current capability; frequency = 50 Hz  $\pm$ 1%; total harmonic distortion < 2%.

For residual current measurement the  $R_c$  resistor can be increased to 100  $\Omega$  1%, 30 s after inrush.

**CONSTRUCTION**

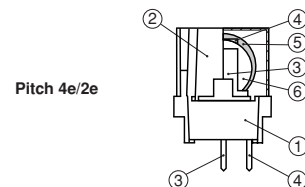
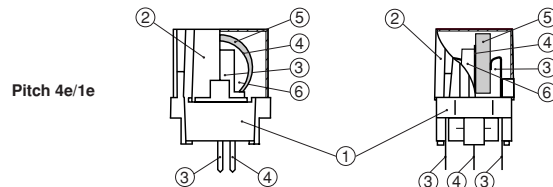
The dimensions of the ceramic are just for reference and might vary according to the PTC degaussing type.

**MONO CASED PTC DEGAUSSING**



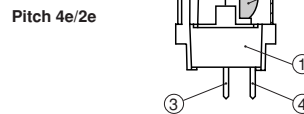
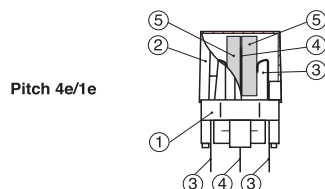
Mono cased PTC degaussing.

**DUAL CASED PTC DEGAUSSING**



Dual cased PTC degaussing.

**DOUBLE MONO CASED PTC DEGAUSSING**



Double mono cased PTC degaussing.



MATERIAL INFORMATION <sup>(1)</sup>		
NUMBER	DESCRIPTION	MATERIAL AND REMARKS
1	base	glass fibre reinforced polybutyleneterephthalate (PBTP); self-extinguishing according to "UL 94 V-0", UL number E69578(M) or equivalent
2	cap	
3	spring contact (outer)	corrosion resisting steel with nickel/silver flash; pin termination in Sn60Pb40 coated
4	central contact	
5	degaussing PTC thermistor ( $R_g$ )	BaTiO <sub>3</sub> doped
6	heater PTC thermistor ( $R_p$ )	

**Note**

- See Mono, Dual and Double mono cased PTC Degaussing drawings.

MASS		
PTC DEGAUSSING	MASS	
	PER UNIT (g)	PER BOX OF 600 units (kg)
DUAL OR DOUBLE MONO	≈5.0	≈3.6
MONO CASSED	≈4.2	≈3.0

**PACKAGE MARKING**

The package containing the thermistors marked as shown in the barcode label below.

BCcomponents      MADE IN BELGIUM

**MARKING****PRODUCT MARKING**

The thermistors are manufactured in Belgium and assembly is either in Belgium or Indonesia (Batam).

The products are marked on the top with the last five digits of the catalogue number, code of manufacturer and the date code (year, week, day and batch of manufacture).

ASSEMBLED IN BELGIUM	
MARKING	DESCRIPTION
96724	last 5-digits of code number
BC	code of manufacturer
1141A	manufacturing date (YWWDX)

**MARKING EXAMPLE**

96724

BC1141A

ASSEMBLED IN INDONESIA (BATAM)	
MARKING	DESCRIPTION
BC	code of manufacturer
96724	last 5-digits of code number
SP	code of assembler
1141A	manufacturing date (YWWDX)

**MARKING EXAMPLE**

BC96724

SP1141A



BATCH 752332



ORIG A170      RPC US



QTY 600      DATE 0407A



TYPE PTC



CODENO 2322 662 96209

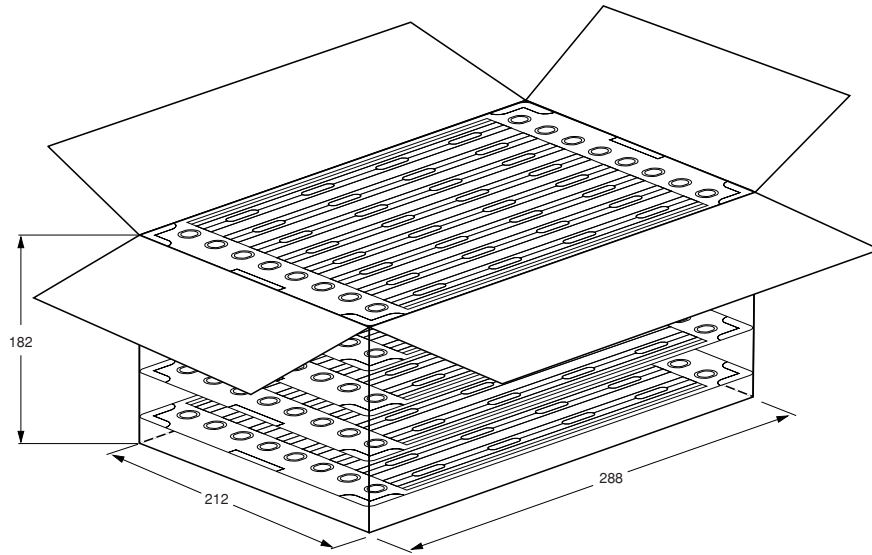
Barcode label.

**BARCODE LABEL MARKING****LINE    MARKING EXPLANATION**

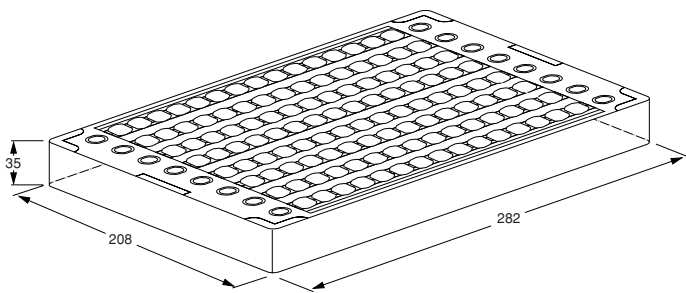
- |   |  |
|---|--|
| 1 | Name of manufacturer; country of origin  |
| 2 | Batch number   |
| 3 | Preference origin code: A<br>Country of origin in code: 170 (Belgium)<br>Responsible production centre: VS |
| 4 | Quantity and production period, year, week<br>day and batch code   |
| 5 | Product type description   |
| 6 | Product code (12NC)  |

**PACKAGING** in millimeters

The thermistors are supplied in cardboard boxes containing 5 trays of 120 items per tray; each box containing 600 units.

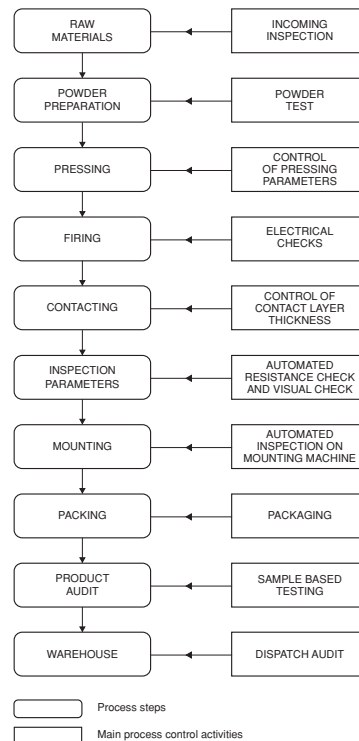


Outer box dimensions.



Tray dimensions.

**GENERAL OVERVIEW OF PRODUCTION AND QUALITY CONTROL FLOWCHART**





**TEST AND REQUIREMENTS**

<b>STANDARD TEST SCHEDULE</b>				
<b>CECC 44003 CLAUSE</b>	<b>TEST</b>	<b>D* or ND</b>	<b>CONDITIONS</b>	<b>PERFORMANCE REQUIREMENTS</b>
<b>Outgoing inspection (lot-by-lot)</b>				
4.3.1	visual examination	ND		no visible damage legible as detailed specifications
4.3.2	marking			
4.3.3	dimensions (gauging)			
4.4	zero power resistance: degaussing PTC ( $R_s$ ) heater PTC ( $R_p$ )	ND	at 25 °C	as specified
4.27	minimum peak to peak inrush current	ND	at 220/110 $V_{RMS}$ and reference coil	as specified
	maximum peak to peak current after: 5 s 30 s 180 s	ND	at 220/110 $V_{RMS}$ and reference coil	
4.13.1	solderability	D	solder bath method: 235 ±5 °C	the terminations shall be evenly tinned; 95% covered

\* D = Destructive, ND = Non-destructive.

<b>LIFE TESTS</b>			
<b>IEC 60738 TEST METHOD</b>	<b>TEST</b>	<b>PROCEDURE</b>	<b>REQUIREMENTS</b>
	endurance cycling: maximum voltage at low temperature	maximum voltage with minimum coil: see detailed specifications; temperature: 0 ±5 °C; duration, 100 cycles	no visible damage $\Delta R_s/R_s$ (25 °C) max.: ±20% $\Delta R_p/R_p$ (25 °C) max.: ±50% inrush current at 25 °C: $I_{inrush} > 95\%$ ; $I_{inrush}$ specified final current at 25 °C: $I_{final} < 105\%$ ; $I_{final}$ specified $I_{final} = I$ after 3 minutes
	endurance cycling: maximum voltage at 25 °C	maximum voltage with minimum coil: see detailed specifications; temperature: 25 ±5 °C; duration, 40 000 cycles	
	endurance at maximum rated temperature and maximum voltage	maximum voltage: see detailed specifications; temperature: 60 ±5 °C; duration, 2000 hours	
	endurance cycling at maximum voltage in humidity	maximum voltage with minimum coil: see detailed specifications; conditions: 40 °C, 95% RH; cycle; 30 on 60 off; duration, 56 days (900 cycles)	
<b>Other tests in accordance with IEC 60068-2</b>			
3 (Ca)	damp heat (steady state)	56 days; 40 °C; 95% RH	
2 (Ba)	dry heat	1000 hours; 125 °C	
6 (Fc)	vibration (mounted state)	frequency: 10 to 55 Hz; displacement 0.75 mm or acceleration 10 g; 3 directions; total 6 hours	
20 (Tb)	resistance to soldering heat	10 s; 260 ±5 °C	
<b>Other test in accordance with IEC 60695.2</b>			
2	flammability needle flame test	vertical severity; duration 10 s	flammability: flame 5 s max.



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Datasheets for electronics components.