

DATA SHEET

2322 671 91...

**PTC thermistors for temperature
protection**

Product specification
File under Passive Components, PA02

1995 Apr 03

Philips Components



PHILIPS

PTC thermistors for temperature protection

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FEATURES

- Very fast action for maximum protection
- Well defined protection levels
- Well defined resistance for ease of circuit design
- Coated and leaded devices available
- High sensitivity to small temperature changes
- Excellent long term behaviour.

APPLICATIONS

- Industrial electronics
- Power supplies
- Electronic data processing.

DESCRIPTION

These directly heated thermistors have a positive temperature coefficient and are primarily intended for sensing.

QUICK REFERENCE DATA

PARAMETER	VALUE	UNIT
Maximum resistance at 25 °C	120	Ω
Minimum resistance at (T _n + 15) °C and 7.5 V _{pulse}	4000	Ω
Maximum (DC) voltage	30	V
Temperature range	0 to (T _n + 15)	°C
Weight:		
91052 to 91067	≈0.008	g
91002 to 91014	≈0.013	g
91102 to 91114	≈0.08	g
Climatic category	25/125/56	

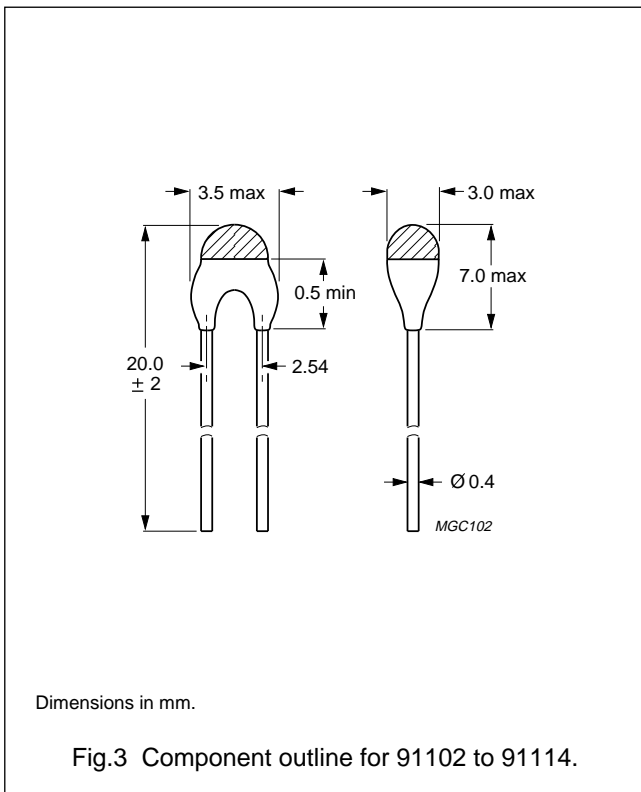
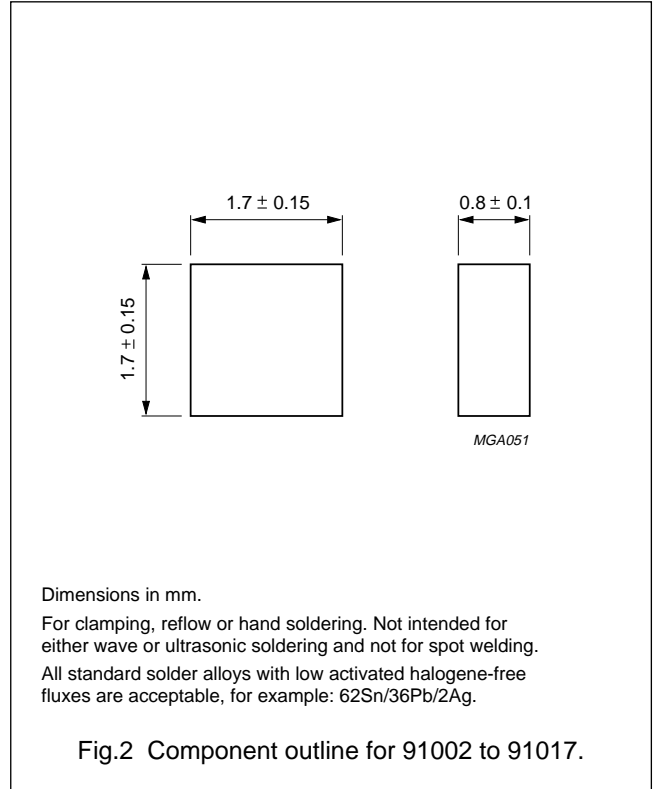
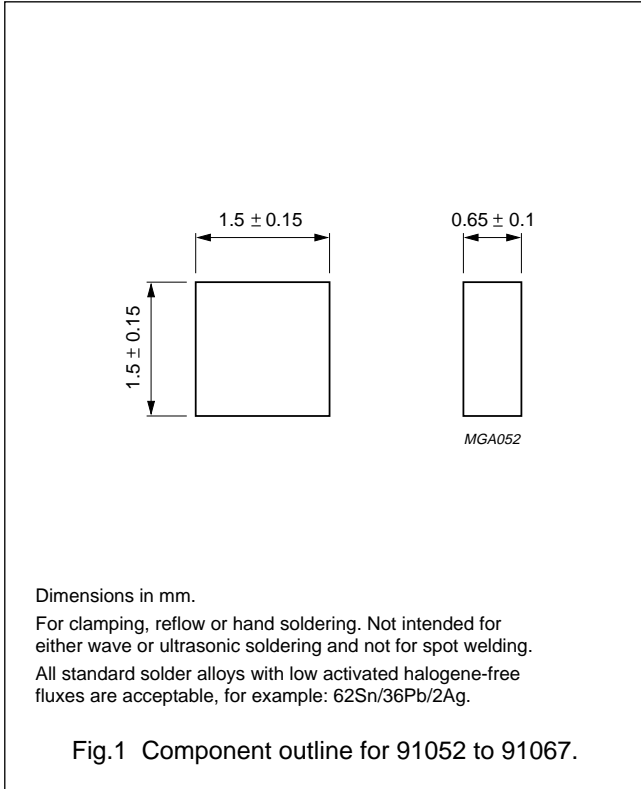
PACKAGING INFORMATION

PACKAGING		CATALOGUE NUMBERS 2322
S.P.Q.	P.Q.	
5000	20000	671 91052 to 671 91067
5000	20000	671 91002 to 671 91014
500	6000	671 91102 to 671 91114

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MECHANICAL DATA



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ELECTRICAL CHARACTERISTICS

PARAMETER	VALUES
Maximum resistance at 25 °C	120 Ω
Maximum resistance at (T _n - 5) °C: 2322 671 91052 to 91067 2322 671 91002 to 91014 2322 671 91102 to 91114	see Table 1 see Table 1 see Table 1
Minimum resistance at (T _n + 15) °C and 7.5 V _{pulse}	4000 Ω
Minimum resistance at (T _n + 5) °C: 2322 671 91052 to 91067 2322 671 91002 to 91014 2322 671 91102 to 91114	see Table 1 see Table 1 see Table 1
Maximum voltage	30 V (DC)

Table 1 Nominal working temperatures and ordering information

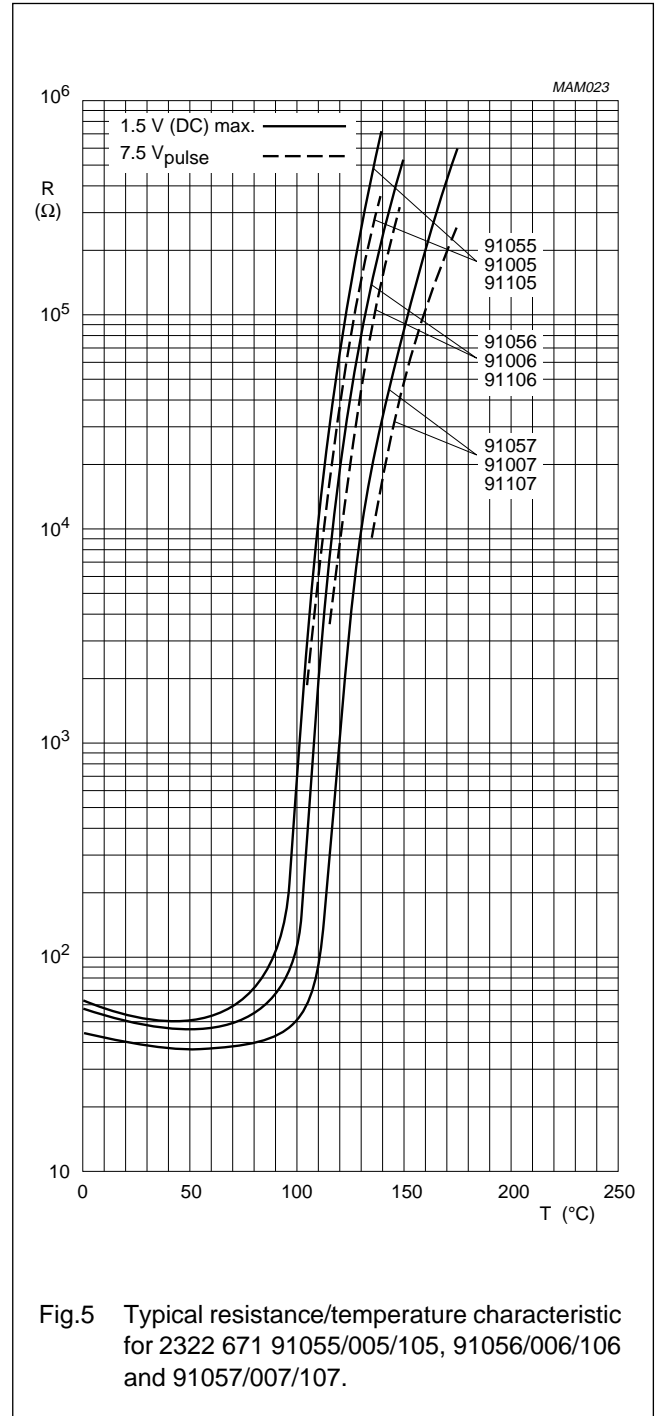
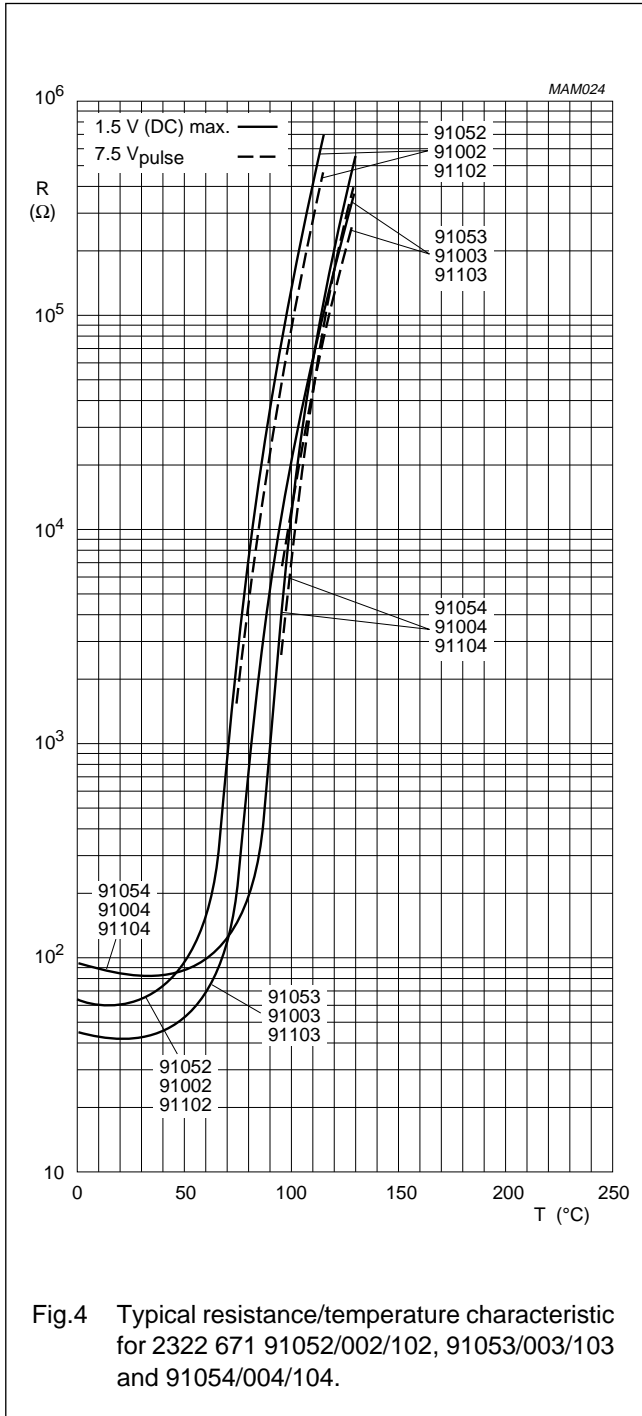
NOMINAL WORKING TEMPERATURE					TYPE/CATALOGUE NUMBER 2322			
T _n (°C)	30 to 250 Ω from -20 °C to T (°C)	50 to 550 Ω at T (°C)	1.33 to 50 kΩ at T (°C)	>4 kΩ at T (°C)	NAKED CHIP ⁽¹⁾		LEADED DEVICE	
					1.5 × 1.5 mm	1.7 × 1.7 mm	671	COLOUR CODE
					671	671		
70	50	65	75	85	91052 ⁽²⁾	91002 ⁽²⁾	91102 ⁽²⁾	black
80	60	75	85	95	91053	91003	91103	brown
90	70	85	95	105	91054	91004	91104	red
100	80	95	105	115	91055	91005	91105	orange
110	90	105	115	125	91056	91006	91106	yellow
120	100	115	125	130	91057	91007	91107	green
125	105	120	130	135	91058	–	–	–
130	110	125	135	140	91059	91009	91109	blue
135	115	130	140	145	91061	–	–	–
140	120	135	145	150	91062	91012	91112	violet
145	125	140	150	155	91063	–	–	–
150	130	145	155	160	91064	91014	91114	grey
155	135	150	160	165	91065	–	–	–
160	140	155	165	170	91066	–	–	–
170	150	165	175	175	91067	–	–	–

Notes

- Naked chips are packed in a hermetically-sealed alu-plastic bag.
- R at 25 °C: 30 to 120 Ω.
R at T_n - 5 °C: 50 to 570 Ω.
R at T_n + 5 °C: 570 to 25000 Ω.
For all other types, R₂₅ is between 30 and 120 Ω.

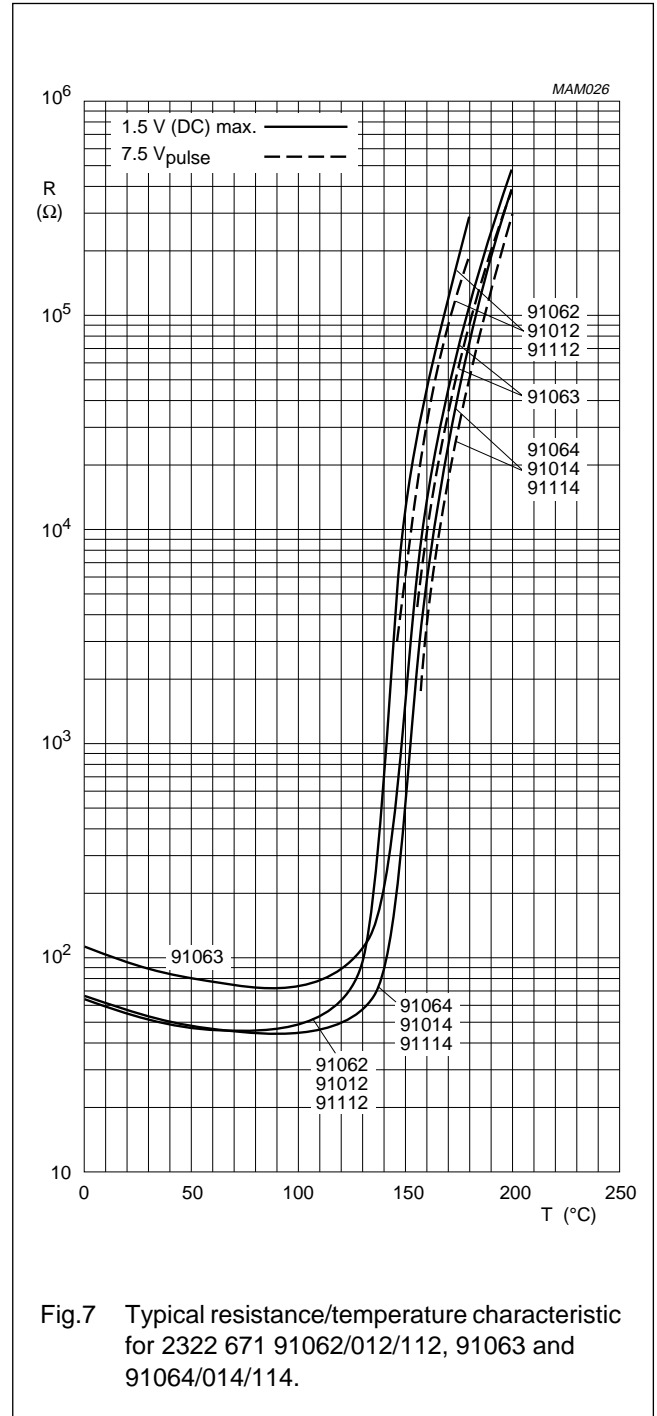
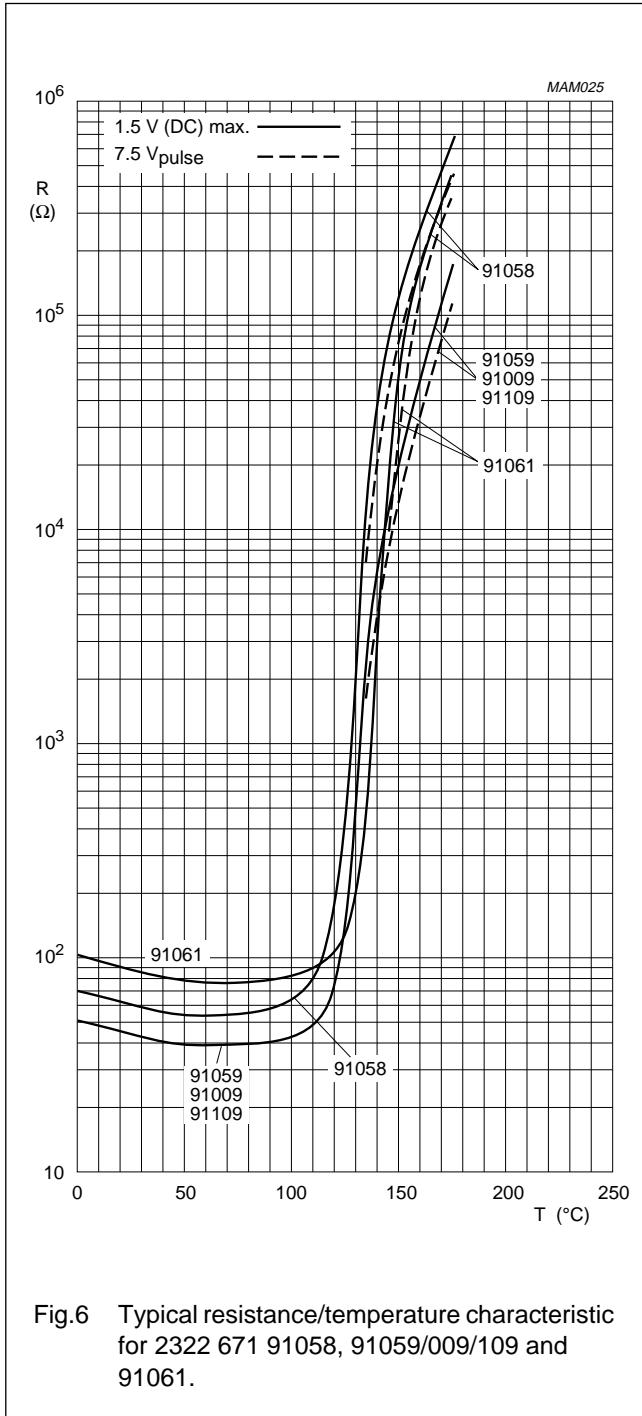
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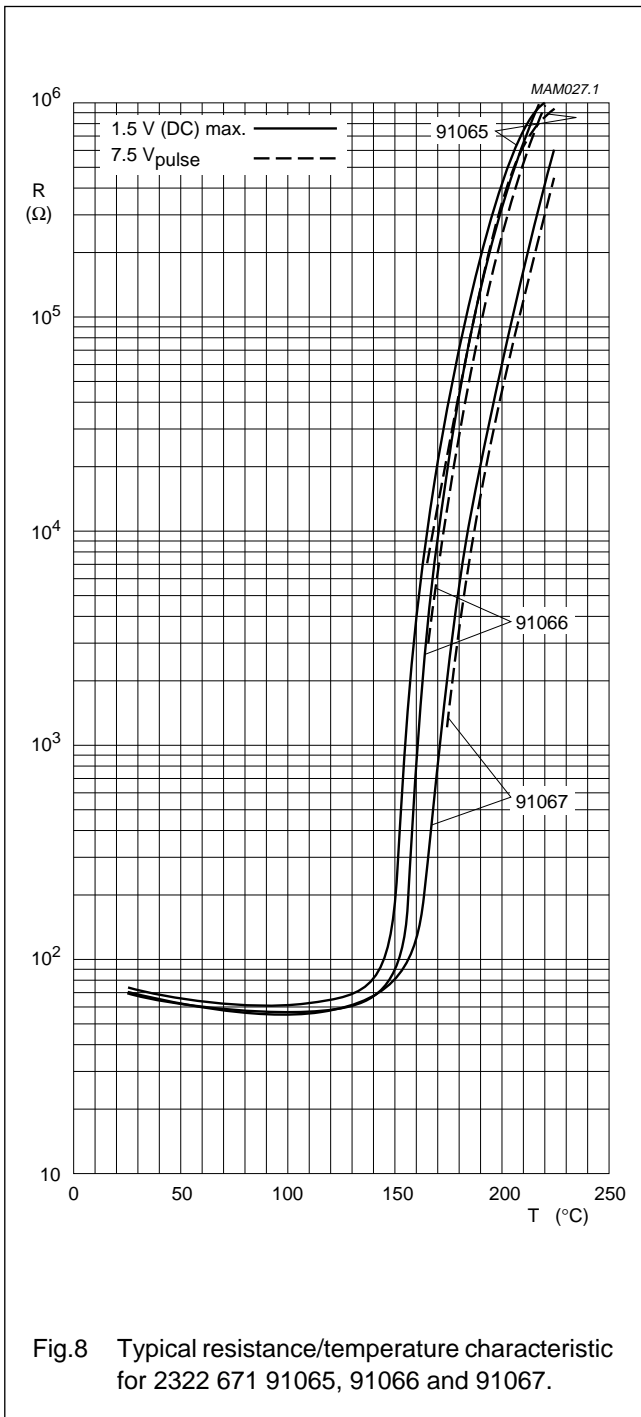
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TEST AND REQUIREMENTS

Clause numbers of tests and performance requirements refer to the "CECC draft secretariat 2371 (January 1989)".

AQLs are selected from "IEC 410". Tables with requirements for lot by lot and periodic tests. In these tables:

D = Destructive

ND = Non-destructive.

Acceptable quality level

CECC CLAUSE	TEST	D or ND	PROCEDURE	REQUIREMENTS
Group A inspection (lot by lot)				
SUB-GROUP A1		ND		
4.3.1	visual examination			no defect likely to impair function
4.3.3	dimensions (gauging)			as specified
SUB-GROUP A2		ND		
4.4	zero power resistance		temperature: 25 °C ($T_n - 5$) °C ($T_n + 5$) °C ($T_n + 15$) °C and 7.5 V _{pulse}	≤120 Ω as specified as specified ≥4000 Ω
Group B inspection (lot by lot)				
SUB-GROUP B1		D		
4.13.1	soldering, solderability		for 2322 671 91052 to 91067 and 91002 to 91017: solder bath: 60/40; 260 ±5 °C and RMA flux; duration: 30 s for 2322 671 91102 to 91114 and 91102 to 91114: solder bath method: 235 ±5 °C	75% of surface covered with solder the terminations shall be evenly tinned
Group C inspection (periodic)				
SUB-GROUP C1		D		
4.12	robustness of terminations		for 2322 671 91102 to 91114: test Ua (10 N) and test Ub (5 N) of "IEC 68-2-21" visual examination zero power resistance at 25 °C	as in 4.12.4; see note 1 ΔR/R ≤±10%
4.13.2	resistance to soldering heat		for 2322 671 91102 to 91114: test Tb of "IEC 68-2-20A" visual examination zero power resistance at 25 °C	as in 4.13.2.3 ΔR/R ≤±10%

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CECC CLAUSE	TEST	D or ND	PROCEDURE	REQUIREMENTS
4.14	rapid change of temperature		for 2322 671 91052 to 91067, 91002 to 91017 and 91102 to 91114: test Na of "IEC 68-2-14" T _A : lower category temperature = -25 °C T _B : upper category temperature = +125 °C 5 cycles visual examination zero power resistance at 25 °C	as in 4.14.4 $\Delta R/R \leq \pm 10\%$ as in 4.14.4 $\Delta R/R \leq \pm 10\%$
4.18	climatic sequence: dry heat damp heat, cyclic, first cycle cold damp heat, cyclic, remaining cycles final measurements		low air pressure test not applicable visual examination zero power resistance at 25 °C	as in 4.18.7.1 $\Delta R/R \leq \pm 10\%$
SUB-GROUP C2		D		
4.20.3	endurance at maximum rated temperature		duration: 24 hours at (T _n + 15) °C and 30 V (DC) examination: at 24 hours visual examination zero power resistance at 25 °C	as in 4.20.3.10 $\Delta R/R \leq \pm 10\%$
SUB-GROUP C3		D		
4.19	damp heat, steady state		visual examination zero power resistance at 25 °C	as in 4.19.5 $\Delta R/R \leq \pm 10\%$
SUB-GROUP C4		D		
4.20.2	endurance at upper category temperatures		for 2322 671 91002 to 91017 and 91052 to 91067: duration 168 hours at 200 °C for 2322 671 91102 to 91114: duration 168 hours at 150 °C for 2322 671 91002 to 91017, 91052 to 91067 and 91102 to 91114: duration 1000 hours at 125 °C examination: at 168, 500 and 1000 hours visual examination zero power resistance at 25 °C	as in 4.20.2.7 $\Delta R/R \leq \pm 5\%$

Note

1. No loose or broken leads.