

COMPLIANT

HALOGEN

FREE

Long Side Termination Thick Film Chip Resistors



FEATURES

- Enhanced power rating
- Long side terminations
- Pure tin solder contacts on Ni barrier layer, provides compatibility with lead (Pb)-free and lead containing soldering processes
- Compliant to RoHS Directive 2002/95/EC
- Halogen-free according to IEC 61249-2-21 definition
- AEC-Q200 qualified

STANDAR	STANDARD ELECTRICAL SPECIFICATIONS									
	SIZE		RATED	LIMITING ELEMENT	TEMPERATURE		DECICTANOE			
MODEL	INCH	METRIC	DISSIPATION P ₇₀ W	VOLTAGE U _{max.} AC/DC V	COEFFICIENT ppm/K	TOLERANCE %	RESISTANCE RANGE Ω	SERIES		
RCL0612 e3	-0. 0010 DD 1000M	0.5	75	± 100	± 1	1R0 to 1M	E24; E96			
NULU012 83	0612	RR 1632M	0.5	75	± 200	± 5		E24		
RCL1218 e3	1218	RR 3246M	1.0	200	± 100	± 1	1R0 to 2.2M	E24; E96		
NUL1218 83	1210	nn 32401VI	1.0	200	± 200	± 5	1 NU 10 2.211	E24		
RCL1225 e3	1225	RR 3263M	2.0 (1)	200	± 100	± 1	1R0 to 1M	E24; E96		
1021223 63	1220	1111 0200101	2.0 (1)	200	± 200	± 5		E24		

Notes

• These resistors do not feature a limited lifetime when operated within the permissible limits. However, resistance value drift increasing over operating time may result in exceeding a limit acceptable to the specific application, thereby establishing a functional lifetime.

• Marking: See datasheet "Surface Mount Resistor Marking" (document number 20020).

• Power rating depends on the max. temperature at the solder point, the component placement density and the substrate material.

⁽¹⁾ Specified power rating requires dedicated mounting conditions to achieve the required thermal resistance.

TECHNICAL SPECIFICATIONS							
DESCRIPTION	UNIT	RCL0612	RCL1218	RCL1225			
Rated Dissipation P70 ⁽²⁾	W	0.5	1.0	2.0 (3)			
Limiting Element Voltage U _{max.} AC/DC	v	75 200		200			
Insulation Voltage Uins (1 min)	V	> 100	> 300	> 300			
Insulation Resistance	Ω	> 10 ⁹					
Category Temperature Range	°C	- 55 to + 155					
Weight	mg	11	29.5	55			

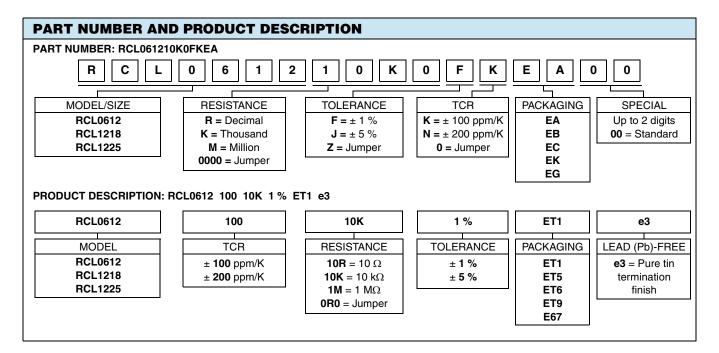
Notes

⁽²⁾ The power dissipation on the resistors generates a temperature rise against the local ambient, depending on the heat flow support of the printed-circuit board (thermal resistance). The rated dissipation applies only if the permitted film temperature of 155 °C is not exceeded.

⁽³⁾ Specified power rating requires dedicated mounting conditions to achieve the required thermal resistance.

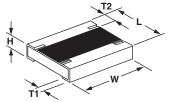
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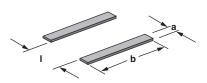




PACKA	PACKAGING							
MODEL	UNIT	PAPER TAPE ON REEL ACC. TO IEC 60286-3, TYPE I			BLISTER TAPE ON REEL ACC. TO IEC 60286-3, TYPE II			
		QUANTITY	PART NUMBER	PRODUCT DESC.	QUANTITY	PART NUMBER	PRODUCT DESC.	
	180 mm/7"	5000	EA	ET1				
RCL0612	285 mm/11.25"	10 000	EB	ET5				
	330 mm/13"	20 000	EC	ET6				
RCL1218	180 mm/7"				4000	EK	ET9	
RCL1225	180 mm/7"				2000	EG	E67	

DIMENSIONS in millimeters

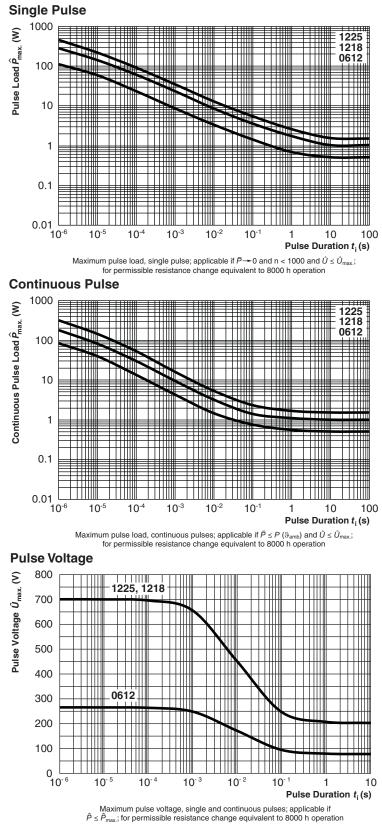




	176			SOLDER PAD DIMENSIONS								
3	SIZE DIMENSIONS			REFLOW SOLDERING			WAVE SOLDERING					
INCH	METRIC	L	W	Н	T1	T2	а	b	I	а	b	I
0612	1632	1.6 ± 0.2	3.2 ± 0.2	0.55 ± 0.1	0.35 ± 0.15	0.25 ± 0.15	0.6	3.2	1.0	1.1	3.2	1.0
1218	3246	3.2 ^{+0.10} -0.20	4.6 ± 0.15	0.55 ± 0.05	0.45 ± 0.2	0.4 ± 0.2	1.1	4.9	1.9	1.25	4.8	1.9
1225	3263	3.2 ± 0.2	6.3 ± 0.2	0.75 ± 0.15	0.8 ± 0.2	0.4 ± 0.2	1.9	7.6	1.2	1.9	7.6	1.2

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FUNCTIONAL PERFORMANCE



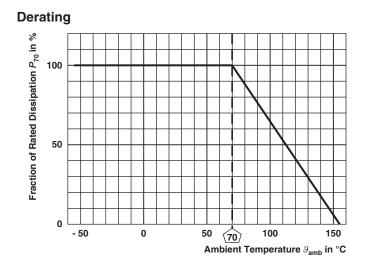
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TEST PROCEDURES AND REQUIREMENTS								
EN 60115-1 CLAUSE	IEC 60068-2 TEST	TEST	PROCEDURE	REQUIREMENTS PERMISSIBLE CHANGE (∆ <i>R</i>) STABILITY CLASS 2 OR BETTER				
CLAUSE	METHOD			STABILITY CLA	SS 2 OR BETTER			
			Stability for product types:					
			RCL e3		2.2 MΩ			
4.5	-	Resistance	-	±1%	± 5 %			
4.7	-	Voltage proof	<i>U</i> = 1.4 x <i>U</i> _{ins} ; 60 s	No flashover	or breakdown			
4.13	-	Short time overload	$U = 2.5 \times \sqrt{P_{70} \times R}$ $\leq 2 \times U_{max};$ Duration acc. to style	$\pm (0.25 \% R + 0.05 \Omega)$	$\pm (0.5 \% R + 0.05 \Omega)$			
	58 (Td)		Solder bath method; Sn60Pb40 non activated flux; $(235 \pm 5) \degree C$ $(2 \pm 0.2) \$$	Good tinning (≥ 95 % covered); no visible damage				
4.17.2	56 (10)	Solderability	Solder bath method; Sn96.5Ag3Cu0.5 non-activated flux; $(245 \pm 5) \circ C$ $(3 \pm 0.3) s$		95 % covered); e damage			
4.8.4.2	-	Temperature coefficient	(20/- 55/20) °C and (20/125/20) °C	± 100 ppm/K	± 200 ppm/K			
4.32	21 (Uu ₃)	Shear (adhesion)	45N	No visible damage				
4.33	21 (Uu ₁) Substrate bending		Depth 2 mm; 3 times	No visible damage, no open circuit in bent position \pm (0.25 % R + 0.05 Ω)				
		Rapid change of	30 min at - 55 °C; 30 min at 125 °C					
4.19	14 (Na)	temperature	5 cycles	\pm (0.25 % R + 0.05 Ω)	± (0.5 % <i>R</i> + 0.05 Ω)			
			1000 cycles	± (1 % <i>R</i> + 0.05 Ω)	± (1 % <i>R</i> + 0.05 Ω)			

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Long Side Termination Thick Film Chip Resistors

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RCL e3

EN 60115-1	IEC 60068-2 TEST		PROCEDURE	REQUIREMENTS PERMISSIBLE CHANGE (A <i>R</i>)			
CLAUSE	TEST METHOD	1201	THOOLDONE	STABILITY CLAS	SS 2 OR BETTER		
			Stability for product types:				
			RCL e3	1 Ω to 2.2 M Ω			
4.23	-	Climatic sequence:	-				
4.23.2	2 (Ba)	Dry heat	125 °C; 16 h				
4.23.3	30 (Db)	Damp heat, cyclic	55 °C; ≥ 90 % RH; 24 h; 1 cycle				
4.23.4	1 (Aa)	Cold	- 55 °C; 2 h	± (1 % <i>R</i> + 0.05 Ω)	\pm (2 % R + 0.1 Ω)		
4.23.5	13 (M)	Low air pressure	1 kPa; (25 ± 10) °C; 1 h				
4.23.6	30 (Db)	Damp heat, cyclic	55 °C; ≥ 90 % RH; 24 h; 5 cycles				
4.23.7	-	DC load	$U = \sqrt{P_{70} \times R}$				
4 05 1		Endurance	$U = \sqrt{P_{70} \times R} \le U_{\text{max.}};$ 1.5 h on; 0.5 h off;				
4.25.1	-	at 70 °C	70 °C; 1000 h	\pm (0.5 % R + 0.05 Ω)	± (2 % <i>R</i> + 0.1 Ω)		
			70 °C; 8000 h	\pm (1 % R + 0.05 Ω)	± (4 % <i>R</i> + 0.1 Ω)		
4.18.2	58 (Td)	Resistance to soldering heat	Solder bath method (260 \pm 5) °C; (10 \pm 1) s	± (0.25 % <i>R</i> + 0.05 Ω)	\pm (0.5 % <i>R</i> + 0.05 Ω)		
4.35	-	Flamability, needle flame test	IEC 60695-11-5; 10 s	No burning after 30 s			
4.24	78 (Cab)	Damp heat, steady state	(40 ± 2) °C; (93 ± 3) % RH; 56 days	± (1 % <i>R</i>	+ 0.05 Ω)		
4.25.3	-	Endurance at upper category temperature	155 °C, 1000 h	\pm (1 % <i>R</i> + 0.05 Ω)	± (2 % <i>R</i> + 0.1 Ω)		
4.40	-	Electrostatic discharge (Human Body Model)	IEC 61340-3-1 3 pos. + 3 neg. discharges; ESD voltage: 1000 V	± (1 % <i>R</i> + 0.05 Ω)			
4.29	45 (XA)	Component solvent resistance	lsopropyl alcohol; 50 °C; method 2	No visible	e damage		
4.30	45 (XA)	Solvent resistance of marking	Isopropyl alcohol; 50 °C; method 1, toothbrush	Marking no visible	ı legible, e damage		
4.22	6 (Fc)	Vibration, endurance by sweeping		\pm (0.25 % <i>R</i> + 0.05 Ω)	± (0.5 % <i>R</i> + 0.05 Ω)		
4.37	-	Periodic electric overload	$U = \sqrt{15 \times P_{70} \times R} \le 2 \times U_{max};$ 0.1 s on; 2.5 s off; 1000 cycles	± (1 % <i>R</i> + 0.05 Ω)			
4.27	-	Single pulse high voltage overload, 10 µs/700 µs	$\hat{U} = 10 \text{ x } \sqrt{P_{70} \text{ x } R}$ $\leq 2 \text{ x } U_{\text{max.}};$ 10 pulses	± (1 % <i>R</i> + 0.05 Ω)			

All tests are carried out in accordance with the following specifications:

- EN 60115-1, generic specification
- EN 140400, sectional specification
- EN 140401-802, detail specification
- IEC 60068-2-x environmental test procedures

Packaging of components is done in paper or blister tapes according to IEC 60286-3



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