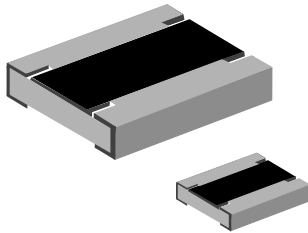


## Long Side Termination Thick Film Chip Resistors



### FEATURES

- Enhanced power rating
- Long side terminations
- Protective overglaze
- 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, rev. C compliant



**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**

### STANDARD ELECTRICAL SPECIFICATIONS

MODEL	SIZE		POWER RATING $P_{70}$ W	LIMITING ELEMENT VOLTAGE MAX. V	TEMPERATURE COEFFICIENT ppm/K	TOLERANCE %	RESISTANCE RANGE $\Omega$	E-SERIES
	INCH	METRIC						
RCL0612 e3	0612	RR1632	0.5	75	$\pm 100$	$\pm 1$	1 to 1M	E24 + E96
					$\pm 200$	$\pm 5$		E24
RCL1218 e3	1218	RR3246	1.0	200	$\pm 100$	$\pm 1$	1 to 2M2	E24 + E96
					$\pm 200$	$\pm 5$		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 data sheet "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

### TECHNICAL SPECIFICATIONS

PARAMETER	UNIT	RCL0612	RCL1218
Rated Dissipation $P_{70}$ <sup>(1)</sup>	W	0.5	1.0
Limiting Element Voltage $U_{max. AC/DC}$	V	75	200
Insulation Voltage $U_{ins.}$ (1 min)	V	> 100	> 200
Insulation Resistance	$\Omega$	> $10^9$	
Category Temperature Range	$^{\circ}\text{C}$	- 55 to + 155	
Weight	mg	11	29.5

#### Note

<sup>(1)</sup> 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  $^{\circ}\text{C}$  is not exceeded.

PART NUMBER AND PRODUCT DESCRIPTION																
PART NUMBER: RCL061210K0FKEA <sup>(1)</sup>																
R	C	L	0	6	1	2	1	0	K	0	F	K	E	A		
MODEL/SIZE		VALUE			TOLERANCE		TCR		PACKAGING <sup>(2)</sup>		SPECIAL					
RCL0612 RCL1218		R = Decimal K = Thousand M = Million 0000 = Jumper			F = ± 1 % J = ± 5 % Z = Jumper		K = ± 100 ppm/K N = ± 200 ppm/K 0 = Jumper		EA EB EC EK		Up to 2 digits					
PRODUCT DESCRIPTION: RCL0612 10K 1 % 100 ET1 e3																
RCL0612		10K		1 %		100		ET1		e3						
MODEL		RESISTANCE VALUE		TOLERANCE		TCR		PACKAGING <sup>(2)</sup>		LEAD (Pb)-FREE						
RCL0612 RCL1218		10R = 10 Ω 10K = 10 kΩ 1M = 1 MΩ 0R0 = Jumper		± 1 % ± 5 %		± 100 ppm/K ± 200 ppm/K		ET1 ET5 ET6 ET9		e3 = Pure tin termination finish						

**Notes**

- (1) Preferred way for ordering products is by use of the PART NUMBER
- (2) Please refer to table PACKAGING, see below

PACKAGING								
MODEL	TAPE WIDTH	DIAMETER	PITCH	PIECES/ REEL	REEL			
					PACKAGING CODE			
					PART NUMBER		PRODUCT DESC.	
					PAPER	BLISTER	PAPER	BLISTER
RCL0612	8 mm	180 mm/7"	4 mm	5000	EA		ET1	
		285 mm/11.25"	4 mm	10 000	EB		ET5	
		330 mm/13"	4 mm	20 000	EC		ET6	
RCL1218	12 mm	180 mm/7"	4 mm	4000		EK		ET9

**DIMENSIONS** in millimeters

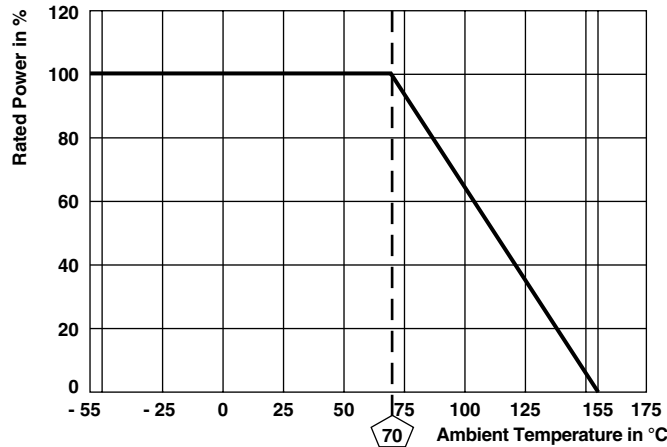


SIZE		DIMENSIONS					SOLDER PAD DIMENSIONS					
							REFLOW SOLDERING			WAVE SOLDERING		
INCH	METRIC	L	W	H	T1	T2	a	b	l	a	b	l
0612	1632	1.6 ± 0.2	3.2 ± 0.2	0.55 ± 0.1	0.35 ± 0.15	0.25 ± 0.15	0.6	3.2	1.0	1.1	3.2	1.0
1218	3246	3.2 <sup>+0.10</sup> <sub>-0.20</sub>	4.6 ± 0.15	0.55 ± 0.05	0.45 ± 0.2	0.4 ± 0.2	1.1	4.9	1.9	1.25	4.8	1.9



**FUNCTIONAL PERFORMANCE**

**Derating**



TEST PROCEDURES AND REQUIREMENTS					
EN 60115-1 CLAUSE	IEC 60068-2 TEST METHOD	TEST	PROCEDURE	REQUIREMENTS PERMISSIBLE CHANGE ( $\Delta R$ )	
				STABILITY CLASS 2 OR BETTER	
			Stability for product types:		
			<b>RCL e3</b>	1 $\Omega$ to 1 M $\Omega$	
4.5	-	Resistance	-	$\pm 1\%$	$\pm 5\%$
4.7	-	Voltage proof	$U = 1.4 \times U_{ins}$ ; 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	$\pm (0.25\% R + 0.05 \Omega)$	$\pm (0.5\% R + 0.05 \Omega)$
4.17.2	58 (Td)	Solderability	Solder bath method; Sn60Pb40 non activated flux; (235 $\pm$ 5) °C (2 $\pm$ 0.2) s	Good tinning ( $\geq 95\%$ covered); no visible damage	
			Solder bath method; Sn96.5Ag3Cu0.5 non-activated flux; (245 $\pm$ 5) °C (3 $\pm$ 0.3) s	Good tinning ( $\geq 95\%$ covered); no visible damage	
4.8.4.2	-	Temperature coefficient	(20/- 55/20) °C and (20/125/20) °C	$\pm 100$ ppm/K	$\pm 200$ ppm/K
4.32	21 (Uu <sub>3</sub> )	Shear (adhesion)	45N	No visible damage	
4.33	21 (Uu <sub>1</sub> )	Substrate bending	Depth 2 mm; 3 times	No visible damage, no open circuit in bent position $\pm (0.25\% R + 0.05 \Omega)$	
4.19	14 (Na)	Rapid change of temperature	30 min at - 55 °C; 30 min at 125 °C		
			5 cycles	$\pm (0.25\% R + 0.05 \Omega)$	$\pm (0.5\% R + 0.05 \Omega)$
			1000 cycles	$\pm (1\% R + 0.05 \Omega)$	$\pm (1\% R + 0.05 \Omega)$

TEST PROCEDURES AND REQUIREMENTS					
EN 60115-1 CLAUSE	IEC 60068-2 TEST METHOD	TEST	PROCEDURE	REQUIREMENTS PERMISSIBLE CHANGE ( $\Delta R$ )	
				STABILITY CLASS 2 OR BETTER	
			Stability for product types:	1 $\Omega$ to 1 M $\Omega$	
			RCL e3		
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; $\geq 90\%$ RH; 24 h; 1 cycle		
4.23.4	1 (Aa)	Cold	- 55 °C; 2 h	$\pm (1\% R + 0.05 \Omega)$	$\pm (2\% R + 0.1 \Omega)$
4.23.5	13 (M)	Low air pressure	1 kPa; (25 $\pm$ 10) °C; 1 h		
4.23.6	30 (Db)	Damp heat, cyclic	55 °C; $\geq 90\%$ RH; 24 h; 5 cycles		
4.23.7	-	DC load	$U = \sqrt{P_{70} \times R}$		
4.25.1	-	Endurance at 70 °C	$U = \sqrt{P_{70} \times R} \leq U_{max.};$ 1.5 h on; 0.5 h off; 70 °C; 1000 h 70 °C; 8000 h	$\pm (0.5\% R + 0.05 \Omega)$ $\pm (1\% R + 0.05 \Omega)$	$\pm (2\% R + 0.1 \Omega)$ $\pm (4\% R + 0.1 \Omega)$
4.18.2	58 (Td)	Resistance to soldering heat	Solder bath method (260 $\pm$ 5) °C; (10 $\pm$ 1) s	$\pm (0.25\% R + 0.05 \Omega)$	$\pm (0.5\% R + 0.05 \Omega)$
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 $\pm$ 2) °C; (93 $\pm$ 3) % RH; 56 days	$\pm (1\% R + 0.05 \Omega)$	
4.25.3	-	Endurance at upper category temperature	155 °C, 1000 h	$\pm (1\% R + 0.05 \Omega)$	$\pm (2\% R + 0.1 \Omega)$
4.40	-	Electrostatic discharge (Human Body Model)	IEC 61340-3-1* 3 pos. + 3 neg. discharges; ESD voltage: 1000 V	$\pm (1\% R + 0.05 \Omega)$	
4.29	45 (XA)	Component solvent resistance	Isopropyl alcohol; 50 °C; method 2	No visible damage	
4.30	45 (XA)	Solvent resistance of marking	Isopropyl alcohol; 50 °C; method 1, toothbrush	Marking legible, no visible damage	
4.22	6 (Fc)	Vibration, endurance by sweeping	f = 10 Hz to 2000 Hz; x, y, z $\leq$ 1.5 mm; A $\leq$ 200 m/s <sup>2</sup> ; 10 sweeps per axis	$\pm (0.25\% R + 0.05 \Omega)$	$\pm (0.5\% R + 0.05 \Omega)$
4.37	-	Periodic electric overload	$U = \sqrt{15 \times P_{70} \times R}$ $\leq 2 \times U_{max.};$ 0.1 s on; 2.5 s off; 1000 cycles	$\pm (1\% R + 0.05 \Omega)$	
4.27	-	Single pulse high voltage overload, 10 $\mu$ s/700 $\mu$ s	$\dot{U} = 10 \times \sqrt{P_{70} \times R}$ $\leq 2 \times U_{max.};$ 10 pulses	$\pm (1\% R + 0.05 \Omega)$	

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 environmental test procedures

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



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