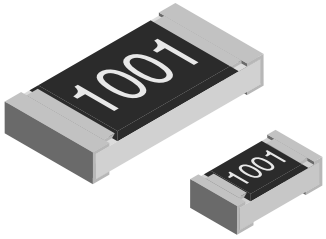
Lead (Pb)-bearing Thick Film, Rectangular Precision Chip Resistor



FEATURES

- Low temperature coefficient (25 ppm/K) and tight tolerances (± 0.25 %)
- Excellent stability ($|\Delta R/R| \leq \pm 1$ % for 1000 h at 70 °C)
- SnPb contacts on Ni barrier layer
- Metal glaze on high quality ceramic
- Protective overglaze

STANDARD ELECTRICAL SPECIFICATIONS

MODEL	SIZE		POWER RATING $P_{70\,°C}$ W	LIMITING ELEMENT VOLTAGE MAX. V≅	TEMPERATURE COEFFICIENT ppm/K	TOLERANCE %	RESISTANCE RANGE Ω	E-SERIES
	INCH	METRIC						
D10/CRCW0402-P	0402	1005	0.063	50	± 100	± 0.5	10R - 1M0	24 + 96
					± 50	± 0.25; ± 0.5; ± 1	100R - 1M0	
					± 25	± 0.5; ± 1	1K0 - 10K	
D11/CRCW0603-P	0603	1608	0.1	75	± 100	± 0.5	10R - 10M	24 + 96
					± 50	± 0.5; ± 1	100R - 10M	
						± 0.25	100R - 1M0	
					± 25	± 0.25; ± 0.5; ± 1	200R - 10K	
D12/CRCW0805-P	0805	2012	0.125	150	± 100	± 0.5	10R - 10M	24 + 96
					± 50	± 0.5; ± 1	100R - 10M	
						± 0.25	100R - 1M0	
					± 25	± 0.25; ± 0.5; ± 1	150R - 10K	
D25/CRCW1206-P	1206	3216	0.25	200	± 100	± 0.5	10R - 10M	24 + 96
					± 50	± 0.5; ± 1	100R - 10M	
						± 0.25	100R - 1M0	
					± 25	± 0.25; ± 0.5; ± 1	150R - 10K	
CRCW1210-P	1210	3225	0.33	200	± 100	± 0.5	100R - 1M0	24 + 96
					± 50	± 0.5; ± 1		
CRCW1218-P	1218	3246	1.0	200	± 100	± 0.5	100R - 2M2	24 + 96
					± 50	± 0.5; ± 1		
CRCW2010-P	2010	5025	0.5	400	± 100	± 0.5	10R - 10M	24 + 96
					± 50	± 0.5; ± 1	100R - 10M	
CRCW2512-P	2512	6332	1.0	500	± 100	± 0.5	10R - 10M	24 + 96
					± 50	± 0.5; ± 1	100R - 10M	

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 and packaging: see appropriate catalog or web pages
- Power rating depends on the max. temperature at the solder point, the component placement density and the substrate material

TECHNICAL SPECIFICATIONS

PARAMETER	UNIT	D10/ CRCW0402-P	D11/ CRCW0603-P	D12/ CRCW0805-P	D25/ CRCW1206-P	CRCW1210-P	CRCW1218-P	CRCW2010-P	CRCW2512-P
Rated Dissipation at 70 °C (3)	W	0.063	0.1	0.125	0.25	0.33	1	0.5	1
Limiting Element Voltage (2)	$V_{\cong}$	50	75	150	200	200	200	400	500
Insulation Voltage (1 min)	V_{peak}	> 75	> 100	> 200	> 300	> 300	> 300	> 300	> 300
Thermal Resistance (1)	K/W	≤ 870	≤ 550	≤ 440	≤ 220	≤ 140	≤ 65	≤ 88	≤ 65
Insulation Resistance	Ω	$> 10^9$							
Category Temperature Range	°C	- 55 to + 155							
Failure Rate	h^{-1}	0.3×10^{-9}							
Weight/1000 pieces	g	0.65	2	5.5	10	16	29.5	25.5	40.5

Notes

(1) For sizes 0402 until 1206 the measuring conditions are in acc. to EN 140401-802. For all other sizes the result depends on the solder pad dimensions.

(2) Rated voltage: $\sqrt{P \times R}$

(3) The power dissipation on the resistor 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.

PART NUMBER AND PRODUCT DESCRIPTION

PART NUMBER: CRCW080525R0DKTAP (4)

C	R	C	W	0	8	0	5	2	5	R	0	D	K	T	A	P	

MODEL/SIZE	VALUE	TOLERANCE	TCR	PACKAGING (5)	SPECIAL
CRCW0402 **CRCW0603** **CRCW0805** **CRCW1206** **CRCW1210** **CRCW1218** **CRCW2010** **CRCW2512**	**R** = Decimal **K** = Thousand **M** = Million	**C** = ± 0.25 % **D** = ± 0.5 % **F** = ± 1 %	**E** = ± 25 ppm/K **H** = ± 50 ppm/K **K** = ± 100 ppm/K	**TA**, **TB**, **TC**, **TD**, **TE**, **TF**, **TG**, **TH**, **TI**, **TK**, **TL**	up to 2 digits **P** = Precision

PRODUCT DESCRIPTION: CRCW0805 25R0 D 100 RT1

CRCW0805	25R0	D	100	RT1
MODEL	RESISTANCE VALUE	TOLERANCE	TCR	PACKAGING (5)
CRCW0402 CRCW0603 CRCW0805 CRCW1206 CRCW1210 CRCW1218 CRCW2010 CRCW2512	49R9 = 49.9 Ω 5R1 = 5.1 Ω	C = ± 0.25 % D = ± 0.5 % F = ± 1 %	± 25 ppm/K ± 50 ppm/K ± 100 ppm/K	RT1, RT5, RT6, RT7 RT4, R02, R67, R82, RG1, RT9, R20

Notes

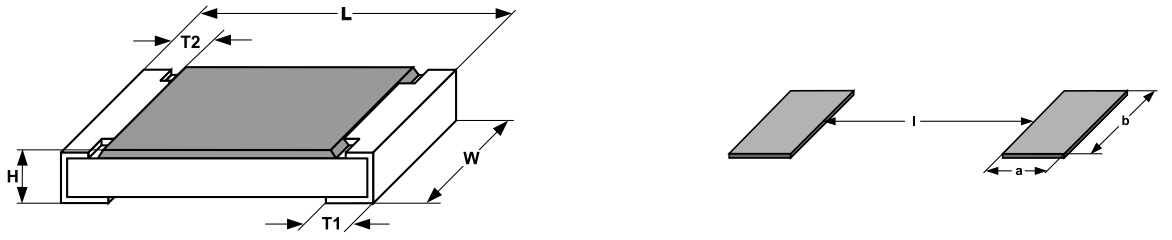
(4) Preferred way for ordering products is by use of the PART NUMBER

(5) Please refer to table PACKAGING, see next page

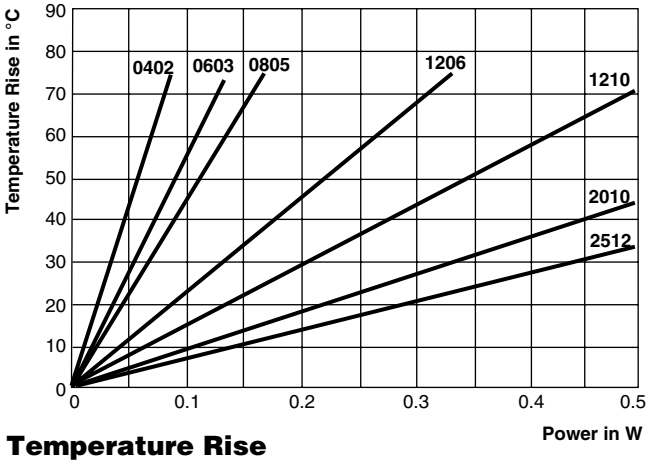
PACKAGING

MODEL	REEL						BULK	
	TAPE WIDTH	DIAMETER	PITCH	PIECES/ REEL	PART NUMBER		PRODUCT DESC.	
					PAPER	BLISTER	PAPER	BLISTER
D10/ CRCW0402	8 mm	180 mm/7"	2 mm	10 000	TD		RT7	
		330 mm/13"	2 mm	50 000	TE		RF4	
D11/ CRCW0603	8 mm	180 mm/7"	4 mm	5000	TA	TI	RT1	RG1
		285 mm/11.25"	4 mm	10 000	TB		RT5	
		330 mm/13"	4 mm	20 000	TC	TL	RT6	R20
D12/ CRCW0805	8 mm	180 mm/7"	4 mm	5000	TA	TI	RT1	RG1
		285 mm/11.25"	4 mm	10 000	TB		RT5	
		330 mm/13"	4 mm	20 000	TC	TL	RT6	R20
D25/ CRCW1206	8 mm	180 mm/7"	4 mm	5000	TA	TI	RT1	RG1
		285 mm/11.25"	4 mm	10 000	TB		RT5	
		330 mm/13"	4 mm	20 000	TC	TL	RT6	R20
CRCW1210	8 mm	180 mm/7"	4 mm	5000	TA		RT1	
		285 mm/11.25"	4 mm	10 000	TB		RT5	
		330 mm/13"	4 mm	20 000	TC		RT6	
CRCW1218	12 mm	180 mm/7"	4 mm	4000		TK		RT9
CRCW2010	12 mm	180 mm/7"	4 mm	4000		TF		R02
CRCW2512	12 mm	180 mm/7"	8 mm	2000		TG		R67
			4 mm	4000		TH		R82

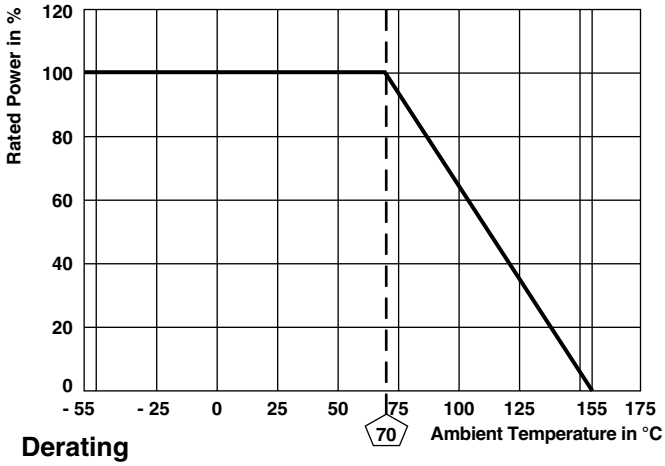
DIMENSIONS



SIZE		DIMENSIONS [in millimeters]					SOLDER PAD DIMENSIONS [in millimeters]					
							REFLOW SOLDERING			WAVE SOLDERING		
INCH	METRIC	L	W	H	T1	T2	a	b	l	a	b	l
0402	1005	1.0 ± 0.05	0.5 ± 0.05	0.35 ± 0.05	0.25 ± 0.05	0.2 ± 0.1	0.4	0.6	0.5			
0603	1608	1.55 $^{+0.10}_{-0.05}$	0.85 ± 0.1	0.45 ± 0.05	0.3 ± 0.2	0.3 ± 0.2	0.5	0.9	1.0	0.9	0.9	1.0
0805	2012	2.0 $^{+0.20}_{-0.10}$	1.25 ± 0.15	0.45 ± 0.05	0.3 $^{+0.20}_{-0.10}$	0.3 ± 0.2	0.7	1.3	1.2	0.9	1.3	1.3
1206	3216	3.2 $^{+0.10}_{-0.20}$	1.6 ± 0.15	0.55 ± 0.05	0.45 ± 0.2	0.4 ± 0.2	0.9	1.7	2.0	1.1	1.7	2.3
1210	3225	3.2 ± 0.2	2.5 ± 0.2	0.55 ± 0.05	0.45 ± 0.2	0.4 ± 0.2	0.9	2.5	2.0	1.1	2.5	2.2
1218	3246	3.2 $^{+0.10}_{-0.20}$	4.6 ± 0.15	0.55 ± 0.05	0.45 ± 0.2	0.4 ± 0.2	1.05	4.9	1.9	1.25	4.8	1.9
2010	5025	5.0 ± 0.15	2.5 ± 0.15	0.6 ± 0.1	0.6 ± 0.2	0.6 ± 0.2	1.0	2.5	3.9	1.2	2.5	3.9
2512	6332	6.3 ± 0.2	3.15 ± 0.15	0.6 ± 0.1	0.6 ± 0.2	0.6 ± 0.2	1.0	3.2	5.2	1.2	3.2	5.2



Temperature Rise



Derating

TEST PROCEDURES AND REQUIREMENTS

EN 60115-1		
TEST (clause)	**CONDITIONS OF TEST**	**REQUIREMENTS PERMISSIBLE CHANGE ($\Delta R/R$)**
		STABILITY CLASS 1 OR BETTER
	Stability for product types: **D../CRCW....-P**	10R to 10M
Resistance (4.5)	-	± 1 %; ± 0.5 %; ± 0.25 %
Temperature coefficient (4.8.4.2)	20/- 55/20 °C and 20/125/20 °C	± 100 ppm/K; ± 50 ppm/K; ± 100 ppm/K
Overload (4.13)	$U = 2.5 \times (P_{70} \times R)^{1/2}$ ≤ 2 x $U_{max.}$; Duration: according the style	± (0.25 % R + 0.05 Ω)
Solderability (4.17.5)	Aging 4 h at 155 °C, dryheat solder bath method; 235 °C; 2 s visual examination	Good tinning (≥ 95 % covered) no visible damage
Resistance to soldering heat (4.18.2)	Solder bath method; (260 ± 5) °C; (10 ± 1) s	± (0.25 % R + 0.05 Ω)
Rapid change of temperature (4.19)	30 min at LCT = - 55 °C; 30 min at UCT = 125 °C; 5 cycles	± (0.25 % R + 0.05 Ω)
Damp heat, steady state (4.24)	(40 ± 2) °C; 56 days; (93 ± 3) % RH	± (1 % R + 0.05 Ω)
Climatic sequence (4.23)	16 h at UCT = 125 °C; 1 cycle at 55 °C; 2 h at LCT = - 55 °C; 1 h/1 kPa at 15 °C to 35 °C; 5 cycles at 55 °C $U = (P_{70} \times R)^{1/2}$ $U = U_{max.}$; whichever is less severe	± (1 % R + 0.05 Ω)
Endurance at 70 °C (4.25.1)	$U = (P_{70} \times R)^{1/2}$ $U = U_{max.}$; whichever is less severe 1.5 h ON; 0.5 h OFF; 70 °C; 1000 h	± (1 % R + 0.05 Ω)
Extended endurance (4.25.1.8)	Duration extended to 8000 h	± (2 % R + 0.1 Ω)
Endurance at upper category temperature (4.25.3)	UCT = 125 °C; 1000 h	± (1 % R + 0.05 Ω)

APPLICABLE SPECIFICATIONS

• EN 60115-1	Generic Specifications
• EN 140400	Sectional Specification
• EN 140401-802	Detail Specifications
• IEC 60068-2-x	Variety of environmental test procedures
• IEC 60286-3	Packaging of SMD components

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