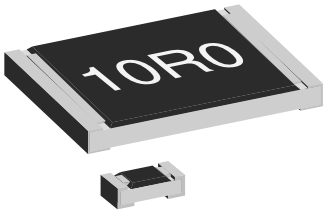
Pulse Proof Thick Film Chip Resistors



FEATURES

- High pulse performance
- Stability $\Delta R/R \leq 1$ % for 1000 h at 70 °C
- Pure tin solder contacts on Ni barrier layer provides compatibility with lead (Pb)-free and lead containing soldering processes
- Metal glaze on high quality ceramic
- Compliant to RoHS Directive 2002/95/EC
- Halogen-free according to IEC 61249-2-21 definition
- AEC-Q200 qualified

RoHS COMPLIANT
HALOGEN FREE

STANDARD ELECTRICAL SPECIFICATIONS

MODEL	CASE SIZE	SIZE METRIC	POWER RATING $P_{70\,°C}$ W	LIMITING ELEMENT VOLTAGE $U_{max.}$ AC/DC	TEMPERATURE COEFFICIENT ppm/K	TOLERANCE %	RESISTANCE RANGE Ω	SERIES
D10/CRCW0402-IF	0402	RR 1005M	0.063	50	± 200	± 5, ± 10	1R0 to 100K	E24
D11/CRCW0603-IF	0603	RR 1608M	0.10	75	± 200	± 5, ± 10	1R0 to 100K	E24
D12/CRCW0805-IF	0805	RR 2012M	0.125	150	± 200	± 5, ± 10	1R0 to 100K	E24
D25/CRCW1206-IF	1206	RR 3216M	0.25	200	± 200	± 5, ± 10	1R0 to 100K	E24
CRCW1210-IF	1210	RR 3225M	0.50	200	± 200	± 5, ± 10	1R0 to 100K	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	D10/CRCW0402-IF	D11/CRCW0603-IF	D12/CRCW0805-IF	D25/CRCW1206-IF	CRCW1210-IF
Power rating P_{70} (1)	W	0.063	0.1	0.125	0.25	0.5
Limiting element voltage $U_{max.}$ AC/DC	V	50	75	150	200	200
Insulation voltage U_{ins} (1 min)	V	> 75	> 100	> 200	> 300	> 300
Insulation resistance	Ω	$> 10^9$				
Operating temperature range	°C	- 55 to +155				
Failure rate	h^{-1}	$< 0.1 \times 10^{-9}$				
Weight	mg	0.65	2	5.5	10	16

Note

(1) The power dissipation on the resistor generates a temperature rise against the local ambient, depending on the heat flow support of the printe-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: CRCW08051R00JNEAIF

C	R	C	W	0	8	0	5	1	R	0	0	J	N	E	A	I	F

MODEL	RESISTANCE	TOLERANCE	TCR	PACKAGING	SPECIAL
CRCW0402 **CRCW0603** **CRCW0805** **CRCW1206** **CRCW1210**	**R** = Decimal **K** = Thousand	**J** = ± 5 % **K** = ± 10 %	**N** = ± 200 ppm/K	**EA** **EB** **EC** **ED**	Up to 2 digits **IF** = Pulse proof

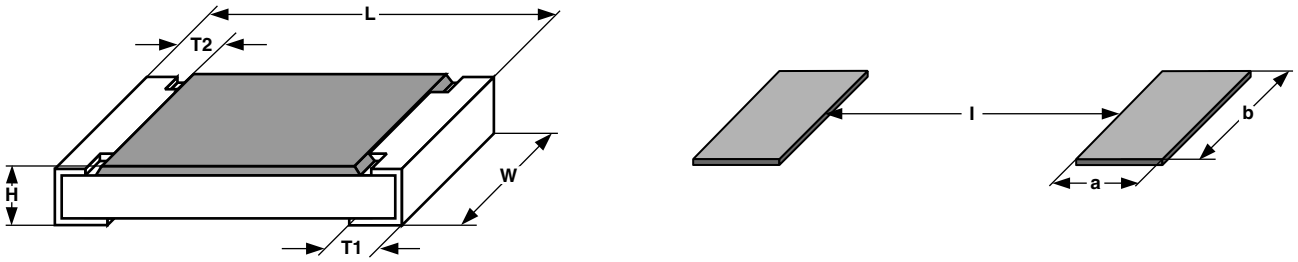
Product Description: D12/CRCW0805-IF 200 1R0 5 % ET1 e3

D12/CRCW0805-IF	200	1R0	5 %	ET1	e3
MODEL	TCR	RESISTANCE	TOLERANCE	PACKAGING	LEAD (Pb)-FREE
D10/CRCW0402-IF **D11/CRCW0603-IF** **D12/CRCW0805-IF** **D25/CRCW1206-IF** **CRCW1210-IF**	± **200** ppm/K	**1R0** = 1 Ω **10K** = 10 kΩ	± **5 %** ± **10 %**	**ET1** **ET5** **ET6** **ET7**	**e3** = Pure tin termination finish

PACKAGING

MODEL	UNIT	PAPER TAPE ON REEL ACC. TO IEC 60286-3, TYPE I		
		QUANTITY	PART NUMBER	PRODUCT DESCRIPTION
D10/CRCW0402-IF	180 mm/7"	10 000	ED	ET7
	330 mm/13"	50 000	EE	EF4
D11/CRCW0603-IF	180 mm/7"	5000	EA	ET1
	285 mm/11.25"	10 000	EB	ET5
	330 mm/13"	20 000	EC	ET6
D12/CRCW0805-IF	180 mm/7"	5000	EA	ET1
	285 mm/11.25"	10 000	EB	ET5
	330 mm/13"	20 000	EC	ET6
D25/CRCW1206-IF	180 mm/7"	5000	EA	ET1
	285 mm/11.25"	10 000	EB	ET5
	330 mm/13"	20 000	EC	ET6
CRCW1210-IF	180 mm/7"	5000	EA	ET1
	285 mm/11.25"	10 000	EB	ET5
	330 mm/13"	20 000	EC	ET6

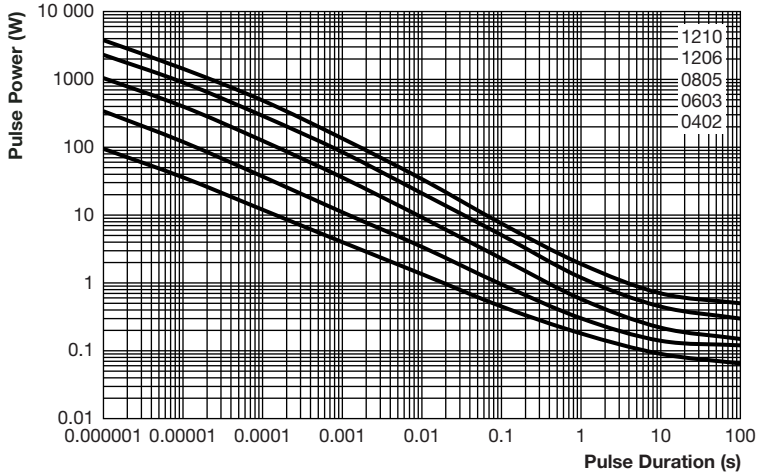
DIMENSIONS



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 $^{+0.10}_{-0.20}$	1.25 ± 0.15	0.45 ± 0.05	0.3 ± 0.2	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

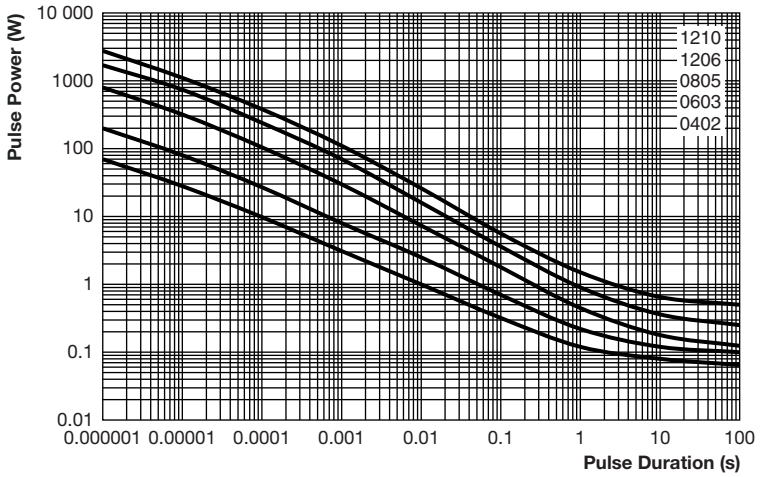
FUNCTIONAL PERFORMANCE

Maximum pulse dissipation as a function of the pulse duration, single pulse



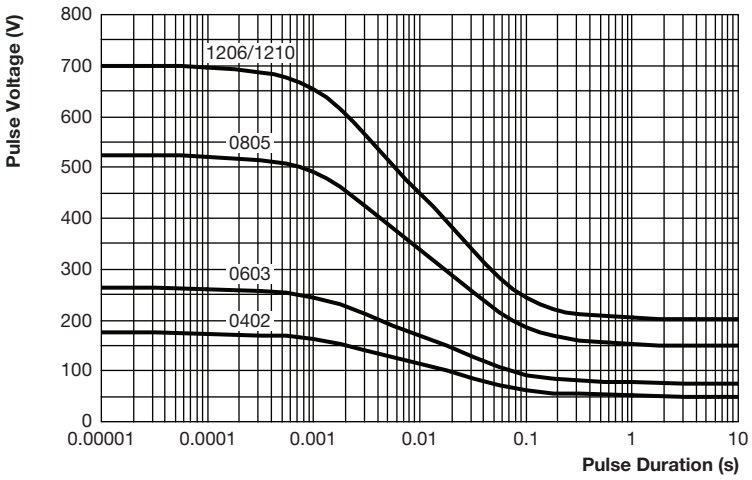
Maximum pulse load, single pulse; applicable if $\bar{P} \rightarrow 0$ and $n \leq 1000$ and $\hat{U} \leq \hat{U}_{max.}$;
for permissible resistance change equivalent to 8000 h operation

Maximum pulse dissipation as a function of the pulse duration, continuous pulse loading



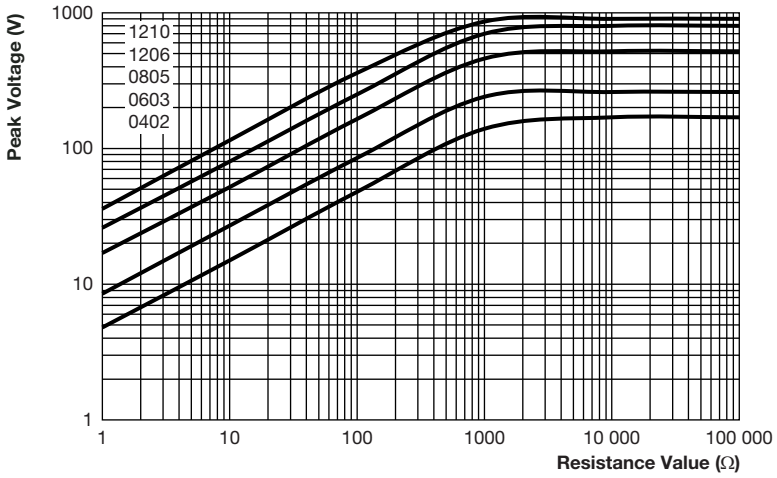
Maximum pulse load, continuous pulses; applicable if $\bar{P} \leq P\,(\vartheta_{amb})$ and $\hat{U} \leq \hat{U}_{max.}$; for permissible resistance change equivalent to 8000 h operation

Maximum pulse dissipation as a function of the pulse duration,single pulse



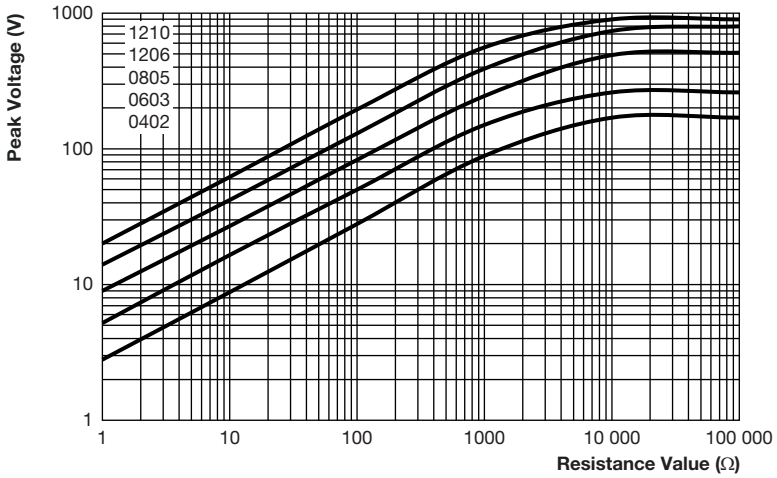
Maximum pulse voltage, single and continuous pulses; applicable if $\hat{P} \leq \hat{P}_{max.}$; for permissible resistance change equivalent to 8000 h operation

Single-pulse high voltage overload test 1.2 µs/50 µs EN 140000 4.27



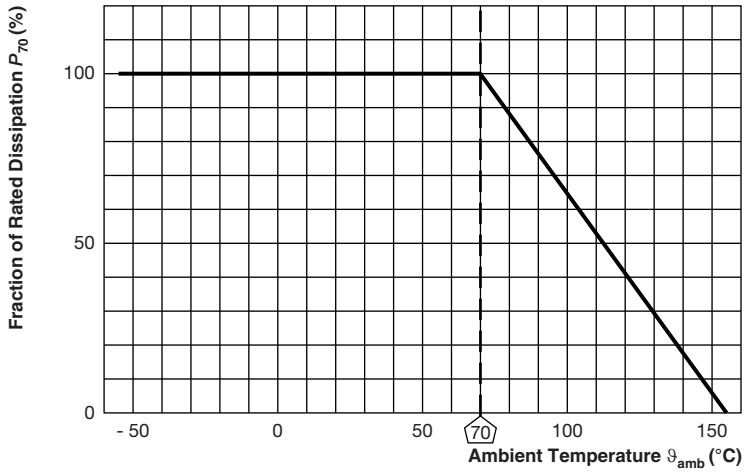
Pulse load rating in accordance to EN 60115-1, 4.27; 1.2 µs/50 µs;
5 pulses at 12 s intervals; for permissible resistance change 1 %

Single-pulse high voltage overload test 10 µs/700 µs EN 140000 4.27



Pulse load rating in accordance to EN 60115-1, 4.27; 10 µs/700 µs;
10 pulses at 1 min intervals; for permissible resistance change 1 %

Derating



TEST PROCEDURES AND REQUIREMENTS				
EN 60115-1 CLAUSE	IEC 60082-2 TEST METHOD	TEST	PROCEDURE	RWQUIREMENTS PERMISSIBLE CHANGE (ΔR)
				STABILITY CLASS 1 OR BETTER
			Stability for product type:	1 Ω to 100 kΩ
			D/CRCW-IF e3	
4.5	-	Resistance	-	± 5 %; ± 10 %
4.7	-	Voltage proof	U = 1.4 x 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	± (0.25 % R + 0.05 Ω)
4.17.2	58 (Td)	Solderability	Solder bath method; Sn60Pb40; non-activated flux; (235 ± 5) °C, (2 ± 0.2) s	Good tinning (≥ 95 % covered); no visible damage
			Solder bath method; Sn96.5Ag3Cu0.5; non-activated flux; (245 ± 5) °C, (3 ± 0.3) s	Good tinning (≥ 95 % covered); no visible damage
4.8.4.2	-	Temperature coefficient	(20/- 55/20) °C and (20/125/20) °C	± 200 ppm/K
4.19	14 (Na)	Rapid change of temperature	30 min. at - 55 °C; 30 min. at 125°C 5 cycles 1000 cycles	± (0.25 % R + 0.05 Ω) ± (1 % R + 0.05 Ω)

TEST PROCEDURES AND REQUIREMENTS				
EN 60115-1 CLAUSE	IEC 60082-2 TEST METHOD	TEST	PROCEDURE	RWQUIREMENTS PERMISSIBLE CHANGE (ΔR)
				STABILITY CLASS 1 OR BETTER
			Stability for product type:	1 Ω to 100 kΩ
			D/CRCW-IF e3	
4.23	-	Climatic sequence:	-	± (1 % R + 0.05 Ω)
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	
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	$U = \sqrt{P_{70} \times R}$	
4.25.1	-	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	± (1 % R + 0.05 Ω) ± (2 % R + 0.1 Ω)
4.18.2	58 (Td)	Resistance to soldering heat	Solder bath method (260 ± 5) °C; (10 ± 1) s	± (0.25 % R + 0.05 Ω)
4.24	78 (Cab)	Damp heat, steady state	(40 ± 2) °C; (93 ± 3) % RH; 56 days	± (1 % R + 0.05 Ω)
4.25.3	-	Endurance at upper category temperature	155 °C; 1000 h	± (1 % R + 0.05 Ω)
4.27	-	Single pulse high voltage overload, 10 µs/700 µs	$\hat{U} = 10 \times \sqrt{P_{70} \times R} \leq 2 \times U_{max.}$; 10 pulses	± (1 % R + 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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