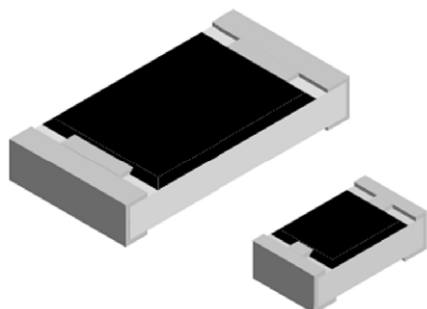


Thick Film Surface Mount Chip Resistors, Wraparound, Extremely Low Value (0.1 Ω to 0.91 Ω)



FEATURES

- Ultra low sensing resistance
- Suitable for current sensing and shunts
- Lead (Pb)-free solder contacts on Ni barrier layer
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



APPLICATIONS

- Switching power supply
- Voltage regulation module
- DC/DC converter, adaptor, battery pack, charger
- Pad and cell phone
- Power management

STANDARD ELECTRICAL SPECIFICATIONS

GLOBAL MODEL	CASE SIZE	POWER RATING W	TOLERANCE %	RESISTANCE RANGE Ω
RCWC0402	0402	0.0625	$\pm 1, \pm 2, \pm 5$	0.100 to 0.910
RCWC0603	0603	0.125	$\pm 1, \pm 2, \pm 5$	0.100 to 0.910
RCWC0805	0805	0.25	$\pm 1, \pm 2, \pm 5$	0.100 to 0.910
RCWC1206	1206	0.50	$\pm 1, \pm 2, \pm 5$	0.100 to 0.910
RCWC1210	1210	0.50	$\pm 1, \pm 2, \pm 5$	0.100 to 0.910
RCWC2010	2010	0.75	$\pm 1, \pm 2, \pm 5$	0.100 to 0.910
RCWC2512	2512	1.0	$\pm 1, \pm 2, \pm 5$	0.100 to 0.910

Note

- Resistance values available based on E24 and E96 decade values, see document www.vishay.com/doc?28372

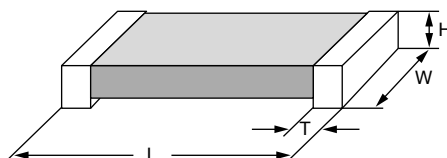
GLOBAL PART NUMBER INFORMATION

Global Part Numbering Example: RCWC1206R0100FE66

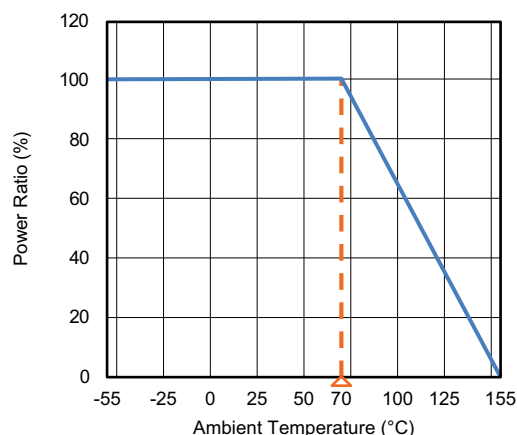
R	C	W	C	1	2	0	6	R	0	1	0	0	F	E	6	6
GLOBAL MODEL (4 digits)				CASE SIZE (EIA) (4 digits)				RESISTANCE VALUE (5 digits)					TOLERANCE CODE (1 digit)		PACKAGING CODE (3 digits)	
RCWC				0402 0603 0805 1206 1210 2010 2512				R = decimal R1000 = 0.10 Ω					F = $\pm 1.0\%$ G = $\pm 2.0\%$ J = $\pm 5.0\%$		E66 = lead (Pb)-free 7" tape/reel	

TECHNICAL SPECIFICATIONS

PARAMETER	UNIT	RESISTOR CHARACTERISTICS	
		RCWC0402	RCWC0603 TO RCWC2512
Temperature coefficient	ppm/°C	± 200 for 0.51 mΩ to 0.91 mΩ ± 300 for 0.10 mΩ to 0.50 mΩ	± 200
Operating temperature range	°C	-55 to +155	
Insulation resistance	MΩ	Over 100	
Maximum working voltage	V	$(P \times R)^{1/2}$	

DIMENSIONS in inches (millimeters)


MODEL (INCH SIZE)	DIMENSIONS (in millimeters)			
	L	W	T	H
RCWC0402	1.00 ± 0.10	0.50 ± 0.05	0.25 ± 0.10	0.35 ± 0.05
RCWC0603	1.60 ± 0.10	0.80 ± 0.10	0.35 ± 0.20	0.45 ± 0.10
RCWC0805	2.00 ± 0.10	1.25 ± 0.10	0.35 ± 0.20	0.50 ± 0.10
RCWC1206	3.10 ± 0.20	1.55 ± 0.10	0.40 ± 0.20	0.55 ± 0.10
RCWC1210	3.10 ± 0.20	2.55 ± 0.20	0.50 ± 0.20	0.55 ± 0.15
RCWC2010	5.00 ± 0.20	2.50 ± 0.20	0.50 ± 0.25	0.55 ± 0.10
RCWC2512	6.30 ± 0.20	3.20 ± 0.20	0.50 ± 0.25	0.55 ± 0.10

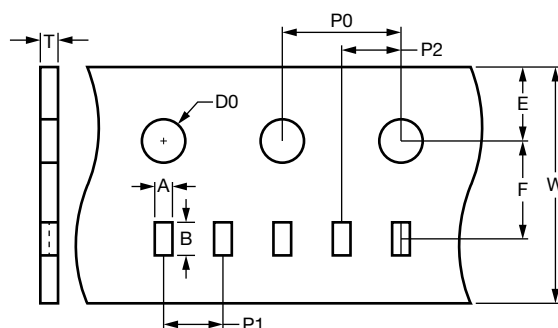
DERATING


PERFORMANCES

RELIABILITY TESTS			
NO.	ITEM	TEST CONDITION	SPECIFICATION
1	Temperature coefficient of resistance	-55 °C to +125 °C	Refer to Technical Specifications table
2	Short time overload	2.5 x rated power for 5 s	1 %: $\pm (1 \% + 0.5 \text{ m}\Omega)$ 2 %, 5 %: $\pm (3 \% + 0.5 \text{ m}\Omega)$ Remark: 0402: $\pm (2 \% + 0.5 \text{ m}\Omega)$
3	Load life	1000 h at rated power 70 °C, 1.5 h "ON", 0.5 h "OFF"	1 %: $\pm (1 \% + 0.5 \text{ m}\Omega)$ 2 %, 5 %: $\pm (3 \% + 0.5 \text{ m}\Omega)$ Remark: 0402: $\pm (3 \% + 0.5 \text{ m}\Omega)$
4	Load life with humidity	1000 h at rated power 40 °C $\pm$ 2 °C, 90 % to 95 % RH 1.5 h "ON", 0.5 h "OFF"	1 %: $\pm (1 \% + 0.5 \text{ m}\Omega)$ 2 %, 5 %: $\pm (3 \% + 0.5 \text{ m}\Omega)$ Remark: 0402: $\pm (3 \% + 0.5 \text{ m}\Omega)$
5	Rapid change of temperature	-55 °C (30 min) / +155 °C (30 min) 5 cycles	$\pm (1 \% + 0.5 \text{ m}\Omega)$
6	Resistance to soldering heat	270 °C $\pm$ 5 °C solder, 10 s $\pm$ 1 s dwell	$\pm (1 \% + 0.5 \text{ m}\Omega)$
7	Solderability	245 °C $\pm$ 5 °C solder, 2 s $\pm$ 0.5 s dwell Solder: Sn96.5 / Ag3.0 / Cu0.5	At least 95 % of surface area of electrode shall be covered with new solder.
8	Board flex	3 mm deflection 2 mm deflection (RL20,25)	$\pm (1 \% + 0.5 \text{ m}\Omega)$
9	Resistance to dry heat	155 °C $\pm$ 5 °C for 96 h $\pm$ 4 h	1 %: $\pm (1 \% + 0.5 \text{ m}\Omega)$ 2 %, 5 %: $\pm (2 \% + 0.5 \text{ m}\Omega)$

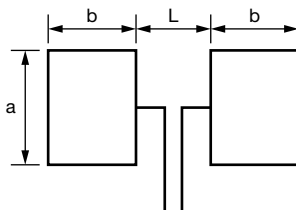
TAPE PACKAGING SPECIFICATIONS			
MODEL	REEL		
	TAPE WIDTH	DIAMETER	PIECES/REEL
RCWC0402	8 mm / punched paper	178 mm	10 000
RCWC0603	8 mm / punched paper	178 mm	5000
RCWC0805	8 mm / punched paper	178 mm	5000
RCWC1206	8 mm / punched paper	178 mm	5000
RCWC1210	8 mm / punched paper	178 mm	5000
RCWC2010	12 mm / embossed plastic	178 mm	4000
RCWC2512	12 mm / embossed plastic	178 mm	4000

TAPE SPECIFICATIONS



TYPE	CARRIER DIMENSIONS (in millimeters)									
	A	B	W	F	E	P1	P2	P0	D0	T
RCWC0402	0.7 $\pm$ 0.05	1.2 $\pm$ 0.05	8.0 $\pm$ 0.2	3.5 $\pm$ 0.05	1.75 $\pm$ 0.1	2.0 $\pm$ 0.1	2.0 $\pm$ 0.1	4.0 $\pm$ 0.1	$\varnothing$ 1.5	0.64 $\pm$ 0.1
RCWC0603	1.1 $\pm$ 0.1	1.9 $\pm$ 0.1	8.0 $\pm$ 0.2	3.5 $\pm$ 0.05	1.75 $\pm$ 0.1	2.0 $\pm$ 0.1	2.0 $\pm$ 0.1	4.0 $\pm$ 0.1	$\varnothing$ 1.5	0.84 $\pm$ 0.1
RCWC0805	1.6 $\pm$ 0.15	2.4 $\pm$ 0.2	8.0 $\pm$ 0.2	3.5 $\pm$ 0.05	1.75 $\pm$ 0.1	2.0 $\pm$ 0.1	2.0 $\pm$ 0.1	4.0 $\pm$ 0.1	$\varnothing$ 1.5	0.84 $\pm$ 0.1
RCWC1206	2.0 $\pm$ 0.15	3.6 $\pm$ 0.2	8.0 $\pm$ 0.2	3.5 $\pm$ 0.05	1.75 $\pm$ 0.1	2.0 $\pm$ 0.1	2.0 $\pm$ 0.1	4.0 $\pm$ 0.1	$\varnothing$ 1.5	0.84 $\pm$ 0.1
RCWC1210	2.8 $\pm$ 0.2	3.6 $\pm$ 0.2	8.0 $\pm$ 0.2	3.5 $\pm$ 0.05	1.75 $\pm$ 0.1	2.0 $\pm$ 0.1	2.0 $\pm$ 0.1	4.0 $\pm$ 0.1	$\varnothing$ 1.5	0.84 $\pm$ 0.1
RCWC2010	2.8 $\pm$ 0.2	5.3 $\pm$ 0.2	12.0 $\pm$ 0.2	5.5 $\pm$ 0.05	1.75 $\pm$ 0.1	4.0 $\pm$ 0.1	2.0 $\pm$ 0.05	4.0 $\pm$ 0.05	$\varnothing$ 1.5	0.85 $\pm$ 0.15
RCWC2512	3.6 $\pm$ 0.2	6.9 $\pm$ 0.2	12.0 $\pm$ 0.2	5.5 $\pm$ 0.05	1.75 $\pm$ 0.1	4.0 $\pm$ 0.1	2.0 $\pm$ 0.05	4.0 $\pm$ 0.05	$\varnothing$ 1.5	0.85 $\pm$ 0.15

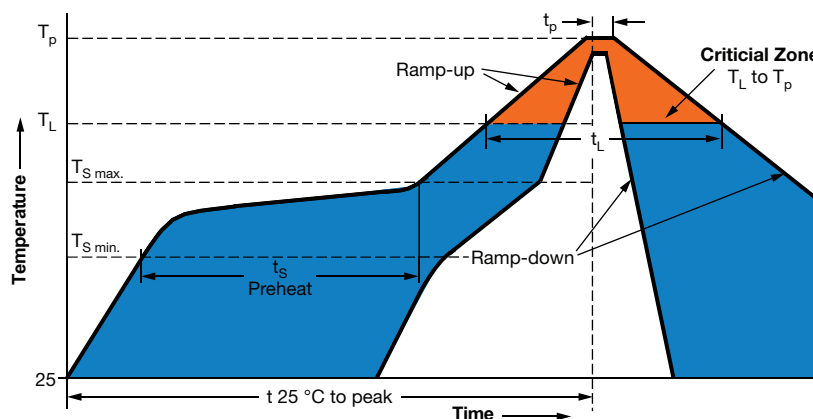
RECOMMENDED SOLDER PAD LAYOUT



TYPE	PAD LAYOUT DIMENSIONS (in millimeters)		
	a	b	L
RCWC0402	0.4 to 0.6	0.45 to 0.5	0.5 to 0.6
RCWC0603	0.8 to 1.0	0.65	0.7 to 0.9
RCWC0805	0.9 to 1.4	1.1 to 1.2	1.0 to 1.4
RCWC1206	1.2 to 1.8	1.2 to 1.3	2.0 to 2.4
RCWC1210	2.3 to 3.5	1.2 to 1.3	2.0 to 2.4
RCWC2010	2.3 to 3.5	1.2 to 1.4	3.3 to 3.7
RCWC2512	2.3 to 3.5	2.0 to 2.3	3.6 to 4.0

SOLDERING RECOMMENDATIONS

TEMPERATURE PROFILE



REFLOW PROFILE

PROFILE FEATURE	TIN / LEAD REFLOW PROFILE
Average ramp-up rate ($T_{S \text{ max.}}$ to T_p)	3 °C/s max.
Preheat	
Temperature min. ($T_{S \text{ min.}}$)	150 °C
Temperature max. ($T_{S \text{ max.}}$)	200 °C
Time ($T_{S \text{ min.}}$ to $T_{S \text{ max.}}$) (t_S)	60 s to 120 s
Time maintained above	
Temperature (T_L)	217 °C
Time (t_L)	60 s to 150 s
Maximum peak temperature (T_p)	260 °C
Time within 5 °C of recommended peak temperature (t_p)	10 s
Ramp-down rate	6 °C/s max.
Time 25 °C to peak temperature	8 minutes max.



Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and / or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Hyperlinks included in this datasheet may direct users to third-party websites. These links are provided as a convenience and for informational purposes only. Inclusion of these hyperlinks does not constitute an endorsement or an approval by Vishay of any of the products, services or opinions of the corporation, organization or individual associated with the third-party website. Vishay disclaims any and all liability and bears no responsibility for the accuracy, legality or content of the third-party website or for that of subsequent links.

Vishay products are not designed for use in life-saving or life-sustaining applications or any application in which the failure of the Vishay product could result in personal injury or death unless specifically qualified in writing by Vishay. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.