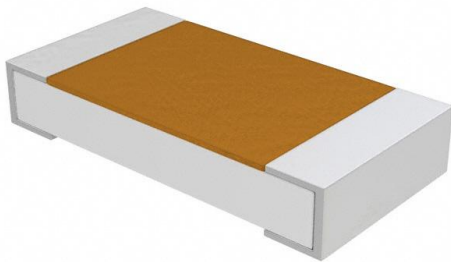


RCWE120651L0JKEA Datasheet

www.digi-electronics.com



<https://www.DiGi-Electronics.com>

DiGi Electronics Part Number	RCWE120651L0JKEA-DG
Manufacturer	Vishay Dale
Manufacturer Product Number	RCWE120651L0JKEA
Description	RES 0.051 OHM 5% 1/2W 1206
Detailed Description	51 mOhms ±5% 0.5W, 1/2W Chip Resistor 1206 (3216 Metric) Automotive AEC-Q200, Current Sense, Moisture Resistant Thick Film

This model RCWE120651L0JKEA is available at DiGi Electronics.

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Purchase and inquiry

Manufacturer Product Number:

RCWE120651L0JKEA

Series:

RCWE

Resistance:

51 MOhms

Power (Watts):

0.5W, 1/2W

Features:

Automotive AEC-Q200, Current Sense, Moisture Resistant

Operating Temperature:

-55°C ~ 155°C

Supplier Device Package:

1206

Size / Dimension:

0.122" L x 0.063" W (3.10mm x 1.60mm)

Number of Terminations:

2

Manufacturer:

Vishay Dale

Product Status:

Active

Tolerance:

±5%

Composition:

Thick Film

Temperature Coefficient:

±100ppm/°C

Package / Case:

1206 (3216 Metric)

Ratings:

AEC-Q200

Height - Seated (Max):

0.028" (0.70mm)

Failure Rate:

-

Environmental & Export classification

RoHS Status:

ROHS3 Compliant

REACH Status:

REACH Unaffected

HTSUS:

8533.21.0030

Moisture Sensitivity Level (MSL):

1 (Unlimited)

ECCN:

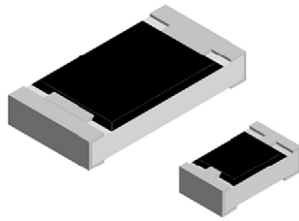
EAR99


www.vishay.com

RCWE

Vishay Dale

Thick Film Surface Mount Chip Resistors, Wraparound, Extremely Low Value (0.01 Ω to 0.976 Ω)



LINKS TO ADDITIONAL RESOURCES



3D Models

FEATURES

- Extremely low resistance values (0.01 Ω to 0.976 Ω)
- Sulfur resistant (per ASTM B809-95 humid vapor test)
- Enhanced power rating due to long side terminal construction (0612, 1020 types)
- Suitable for current sensing and shunts
- Metal glaze on high quality ceramic
- Protective overglaze
- Lead (Pb)-free solder contacts on Ni barrier layer
- AEC-Q200 qualified
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912


RoHS
COMPLIANT
HALOGEN
FREE

STANDARD ELECTRICAL SPECIFICATIONS						
GLOBAL MODEL	CASE SIZE	POWER RATING $P_{70\text{ }^{\circ}\text{C}}$ W	TEMPERATURE COEFFICIENT + ppm/ $^{\circ}\text{C}$	RESISTANCE RANGE Ω	TOLERANCE ± %	E-SERIES ⁽²⁾
RCWE0402 ⁽³⁾⁽⁴⁾	0402	0.125	400	0.033 to 0.05	5.0	24
			200	0.051 to 0.196	1.0, 5.0	24; 96
			100	0.2 to 0.976	0.5 ⁽¹⁾ , 1.0, 5.0	
RCWE0603 ⁽⁴⁾	0603	0.2	700	0.010 to 0.018	5.0	24
			400	0.02 to 0.0324	1.0, 5.0	24; 96
			200	0.033 to 0.105	1.0, 5.0	
RCWE0805 ⁽⁴⁾	0805	0.25	100	0.11 to 0.976	0.5 ⁽¹⁾ , 1.0, 5.0	24; 96
			400	0.010 to 0.018	5.0	
			300	0.02 to 0.0324	1.0, 5.0	
RCWE0612 ⁽⁴⁾	0612	1.0	200	0.033 to 0.05	1.0, 5.0	24; 96
			100	0.051 to 0.976	0.5 ⁽¹⁾ , 1.0, 5.0	
			300	0.010 to 0.016	2.0, 5.0	
RCWE1206 ⁽⁴⁾	1206	0.5	600	0.010 to 0.018	5.0	24
			300	0.02 to 0.0324	1.0, 5.0	24; 96
			200	0.033 to 0.05	1.0, 5.0	
RCWE1210 ⁽⁴⁾	1210	1.0	100	0.051 to 0.976	0.5 ⁽¹⁾ , 1.0, 5.0	24; 96
			500	0.010 to 0.018	5.0	
			300	0.02 to 0.0324	1.0, 5.0	
RCWE1020 ⁽⁴⁾	1020	2.0	200	0.010 to 0.016	2.0, 5.0	24
			100	0.0162 to 0.976	1.0, 5.0	24; 96
			600	0.010 to 0.018	5.0	
RCWE2010 ⁽⁴⁾	2010	1.0	300	0.02 to 0.0324	1.0, 5.0	24; 96
			200	0.033 to 0.05	1.0, 5.0	
			100	0.051 to 0.976	0.5 ⁽¹⁾ , 1.0, 5.0	
RCWE2512 ⁽⁴⁾	2512	2.0	600	0.010 to 0.018	5.0	24
			300	0.02 to 0.0324	1.0, 5.0	24; 96
			200	0.033 to 0.05	1.0, 5.0	
			100	0.051 to 0.976	0.5 ⁽¹⁾ , 1.0, 5.0	

Notes

- Power rating depends on the max. temperature at the solder point, the component placement density and the substrate material
- Part marking: Reference "Surface Mount Resistor Marking" (www.vishay.com/doc?20020)
- Temperature range of TCR rating is 0 °C to 150 °C. TCR values are (+) range only with no (-) range values; 1/2 of previous tolerance range
- ⁽¹⁾ Tight tolerance of 0.5 % is available for resistance values above 0.300 Ω (0402 size) and above 0.200 Ω (0603 to 2512 sizes)
- ⁽²⁾ Use E24 decades only for 5.0 % tolerance. E24 or E96 decades are available for 0.5 % and 1.0 % tolerance. Refer to standard decade table (www.vishay.com/doc?31001)
- ⁽³⁾ Terminal strength tested per AEC-Q200-006 with the exception of 0.75 kg force is used
- ⁽⁴⁾ Qualified to AEC-Q200 rev. D



GLOBAL PART NUMBER INFORMATION

Global Part Numbering Example: RCWE060351L0FNEA (visit www.vishay.net Vishay Dale parts numbering manual for all options)

R	C	W	E	0	6	0	3	5	1	L	0	F	N	E	A		
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	--	--

GLOBAL MODEL (8 digits) RCWE0402 RCWE0603 RCWE0805 RCWE0612 RCWE1206 RCWE1210 RCWE1020 RCWE2010 RCWE2512	VALUE (4 digits) L = mΩ * R = decimal 10L0 = 0.01 Ω R470 = 0.47 Ω Note: * Use "L" for resistance values < 0.1 Ω	TOLERANCE (1 digit) D = ± 0.5 % F = ± 1.0 % G = ± 2.0 % J = ± 5.0 %	TCR (1 digit) K = +100 ppm/°C N = +200 ppm/°C M = +300 ppm/°C Q = +400 ppm/°C P = +500 ppm/°C T = +600 ppm/°C G = +700 ppm/°C	PACKAGING (2 digits) EA = lead (Pb)-free, tape/reel	SPECIAL (up to 2 digits) (dash number) from 1 to 99 as applicable
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TECHNICAL SPECIFICATIONS

PARAMETER	UNIT	0402	0603	0805	0612	1206	1210	1020	2010	2512
Operating temperature range	°C	-55 to +155								
Maximum operating voltage	V	$(P \times R)^{1/2}$								
Insulation voltage U_{ins} (1 min)	V	> 75	> 100	> 200	> 100	> 300	> 300	> 300	> 300	> 300
Insulation resistance	Ω	> 10 ⁹								
Weight/1000 pieces (typical)	g	0.7	3	5.5	11.5	10.5	17.5	27.5	26	40.5

DIMENSIONS

RCWE0402 to RCWE2512

RCWE0612, RCWE1020

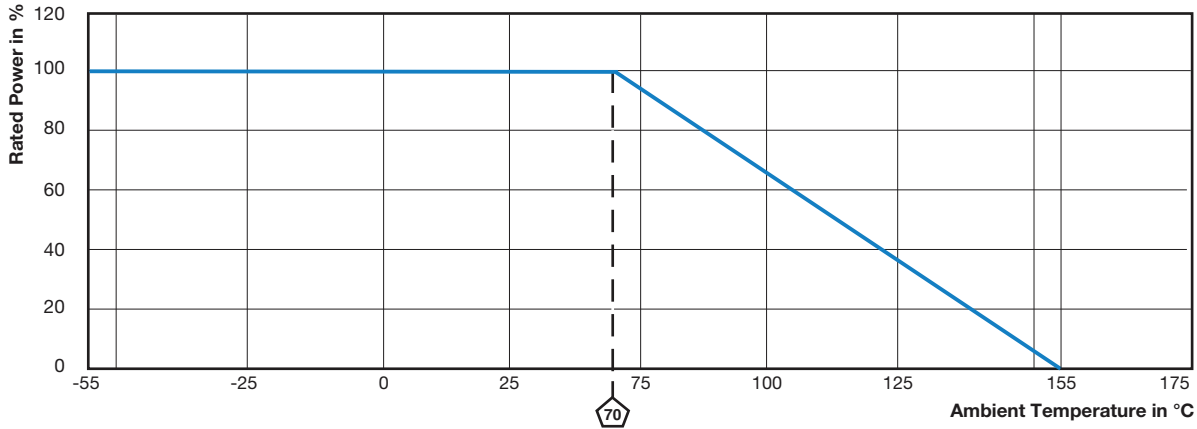
SIZE	DIMENSIONS in millimeters						SOLDER PAD DIMENSIONS in millimeters			
	RESISTANCE RANGE Ω	L	W	H	T1	T2	a	b	l	
0402	0.033 to 0.976	1.05 ± 0.05	0.55 ± 0.05	0.35 ± 0.1	0.3 ± 0.15	0.25 ± 0.1	0.7	0.7	0.3	
0603	0.01 to 0.03	1.6 ± 0.1	0.85 ± 0.1	0.5 ± 0.1	0.5 ± 0.2	0.3 ± 0.2	0.9	1.0	0.4	
	0.033 to 0.976				0.3 ± 0.2					0.7
0805	0.01 to 0.03	2.0 ± 0.15	1.3 ± 0.1	0.55 ± 0.1	0.6 ± 0.2	0.35 ± 0.2	1.0	1.4	0.6	
	0.033 to 0.976				0.4 ± 0.2					0.8
0612	0.01 to 0.976	1.6 ± 0.2	3.2 ± 0.2	0.6 ± 0.1	0.4 ± 0.15	0.25 ± 0.15	0.9	3.5	0.8	
1206	0.01 to 0.03	3.1 ± 0.15	1.6 ± 0.15	0.6 ± 0.1	0.9 ± 0.2	0.45 ± 0.2	1.3	1.8	1.0	
	0.033 to 0.05				0.8 ± 0.2					1.2
	0.051 to 0.976				0.45 ± 0.2					1.0
1210	0.01 to 0.03	3.1 ± 0.2	2.5 ± 0.2	0.6 ± 0.1	0.8 ± 0.2	0.4 ± 0.2	1.3	2.6	1.1	
	0.033 to 0.976				0.4 ± 0.2					0.9
1020	0.01 to 0.976	2.5 ± 0.2	5.0 ± 0.2	0.6 ± 0.1	0.55 ± 0.15	0.30 ± 0.15	1.2	5.5	1.4	
2010	0.01 to 0.03	5.0 ± 0.2	2.5 ± 0.15	0.6 ± 0.1	1.6 ± 0.3	0.6 ± 0.2	2.3	3.0	1.4	
	0.033 to 0.05				0.7 ± 0.3					1.4
	0.051 to 0.976				0.7 ± 0.3					1.4
2512	0.01 to 0.03	6.3 ± 0.2	3.15 ± 0.15	0.6 ± 0.1	2.0 ± 0.3	0.6 ± 0.2	2.8	3.6	1.4	
	0.033 to 0.05				0.8 ± 0.3					1.6
	0.051 to 0.976				0.8 ± 0.3					1.6

Notes

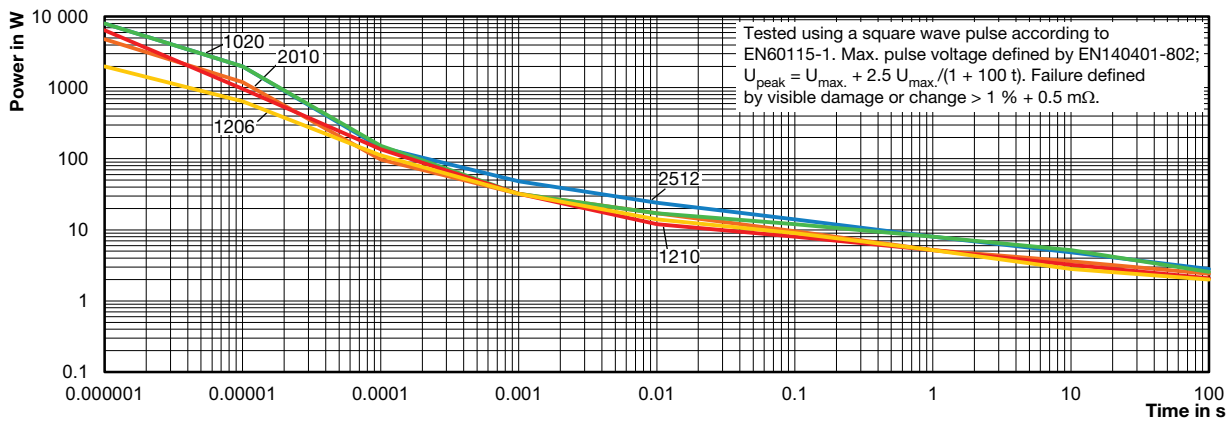
- 3D models available: www.vishay.com/doc?31106
- Surface mount solder profile recommendations: www.vishay.com/doc?31052



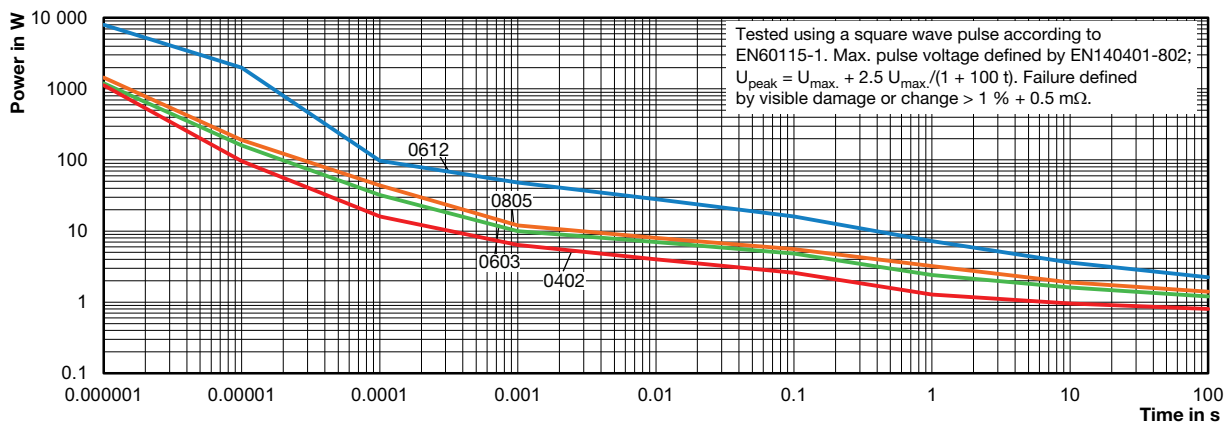
DERATING



SINGLE PULSE



SINGLE PULSE





PERFORMANCE		
TEST	CONDITIONS OF TEST	TEST LIMITS
Thermal shock	MIL-STD-202, method 107, -55 °C to +125 °C, 300 cycles at each extreme	± 1.0 % + 0.0005 Ω
Short time overload	2 x rated power; size and duration - 0402: 0.5 s, 0603 and 0805: 1 s, 1206 and larger: 2 s	± 0.5 % + 0.0005 Ω
High temperature exposure	MIL-STD-202, method 108, 1000 h at T = 125 °C, 0 % power	± 2.0 % + 0.0005 Ω
Temperature cycling	JESD 22, method JA-104, 1000 cycles (-55 °C to +125 °C)	± 2.0 % + 0.0005 Ω
Biased humidity	MIL-STD-202, method 103, 1000 h 85 °C / 85 % RH, 10 % x (P x R) ^{1/2}	± 2.0 % + 0.0005 Ω
Mechanical shock	MIL-STD-202, method 213, condition C, 10 g's, 6 ms (half sine), 3 directions	± 1.0 % + 0.0005 Ω
Vibration	MIL-STD-202, method 204, 5 g's, 20 min, 12 cycles, 3 directions, 10 Hz to 2000 Hz	± 1.0 % + 0.0005 Ω
Operational life	MIL-STD-202, method 108, 1000 h at T = 125 °C at rated power	± 2.0 % + 0.0005 Ω
Resistance to solder heat	MIL-STD-202, method 210, +260 °C solder, 10 s to 12 s dwell, 25 mm/s emergence	± 1.0 % + 0.0005 Ω
Moisture resistance	MIL-STD-202, method 106, 0 % power, 7a and 7b not required	± 2.0 % + 0.0005 Ω

Note

- Contact ww2bresistors@vishay.com for application specific performance requirements or qualification data. Typical performance is better than stated test limits

PACKAGING					
MODEL	REEL				
	TAPE WIDTH	DIAMETER	PITCH	PIECES/REEL	CODE
RCWE0402	8 mm / punched paper	180 mm / 7"	2 mm	10 000	EA
RCWE0603	8 mm / punched paper	180 mm / 7"	4 mm	5000	EA
RCWE0805	8 mm / punched paper	180 mm / 7"	4 mm	5000	EA
RCWE0612	8 mm / punched paper	180 mm / 7"	4 mm	5000	EA
RCWE1206	8 mm / punched paper	180 mm / 7"	4 mm	5000	EA
RCWE1210	8 mm / punched paper	180 mm / 7"	4 mm	5000	EA
RCWE1020	12 mm / embossed plastic	180 mm / 7"	4 mm	4000	EA
RCWE2010	12 mm / embossed plastic	180 mm / 7"	4 mm	4000	EA
RCWE2512	12 mm / embossed plastic	180 mm / 7"	8 mm	2000	EA

Notes

- Embossed carrier tape per EIA-481-1A
- Additional packaging details at: www.vishay.com/doc?31543

LINKS TO RELATED DOCUMENTS	
SELECTOR GUIDE	
Overview of Automotive Grade Products	www.vishay.com/doc?49924
TECHNICAL NOTES	
SMD Current Sense: AEC-Q200 vs. Vishay Qualification	www.vishay.com/doc?30416
MIL-PRF vs. AEC-Q200: Do You Know What You Are Getting?	www.vishay.com/doc?11000
WHITE PAPER	
Thermal Management for Surface-Mount Devices	www.vishay.com/doc?30380
Temperature Coefficient of Resistance for Current Sensing	www.vishay.com/doc?30405



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