Carbon Film Resistors, Standard

FEATURES

- Securely bonded carbon film
- Good moisture resistance ($\Delta R_{max} \leq \pm 1.5$ % R)
- Good long term stability ($\Delta R_{max} \leq \pm 1.5$ % R, for 1000 h)
- Lead (Pb)-free solder contacts
- Pure tin plating provides compatibility with lead (Pb)-free and lead containing soldering processes
- Compatible with "Restriction of the use of Hazardous Substances" (RoHS) directive 2002/95/EC (issue 2004)
- Low Noise (refer to graph)
- Suitable for general purpose commercial electronics and pulse load applications

STANDARD ELECTRICAL SPECIFICATIONS

MODEL	SIZE	POWER RATING $P_{70\,°C}$ W	LIMITING ELEMENT VOLTAGE MAX. V≅	TOLERANCE ± %	RESISTANCE RANGE Ω	E-SERIES
LCA0204	0204	0.25	200	± 2 ± 5	10R - 470K 1R0 - 1M0	24 24
LCA0207	0207	0.35	300	± 2 ± 5	1R0 - 1M0 R22 - 5M1	24 24
LCA0411	0411	0.55	500	± 2 ± 5	1R0 - 1M0 R22 - 10M	24 24
LCA0414	0414	0.6	500	± 2 ± 5	1R0 - 1M0 R22 - 10M	24 24

Notes

- Coating: Beige
- Marking: color code

TECHNICAL SPECIFICATIONS

PARAMETER	UNIT	LCA0204	LCA0207	LCA0411	LCA0414
Rated Dissipation at 70 °C	W	0.25	0.35	0.55	0.6
Limiting Element Voltage[1)]	V≅	≤ 200	≤ 300	≤ 500	≤ 500
Limiting Voltage, short-time	V≅		500	700	1000
Insulation Voltage (1 min)	V-	> 300	> 700	> 700	> 700
Thermal Resistance	K/W	≤ 300	≤ 220	≤ 150	≤ 140
Insulation Resistance	Ω	≥ 10^{11}/h			
Terminal Strength, axial	N	> 30	> 50	> 60	> 80
Category Temperature Range	°C	- 55 to + 155			
Failure Rate	10^{-9}/h	< 10			
Weight	g	0.1	0.21	0.5	0.68

Note

1. Rated Voltage $\sqrt{P \times R}$

PART NUMBER AND PRODUCT DESCRIPTION LCA-SERIES

PART NUMBER: LCA0204002401J2500

L	C	A	0	2	0	4	0	0	2	4	0	1	J	2	5	0	0

MODEL/SIZE	SPECIAL CHARACTER	TCR	VALUE	TOLERANCE	PACKAGING	SPECIAL
LCA0204 **LCA0207** **LCA0411** **LCA0414**	**0** = neutral	**0** = neutral **see diagram**	3 digit value 1 digit multiplier MULTIPLIER **7** = $*10^{-3}$ **8** = $*10^{-2}$ **9** = $*10^{-1}$ **0** = $*10^{0}$ **1** = $*10^{1}$ **2** = $*10^{2}$ **3** = $*10^{3}$ **4** = $*10^{4}$ **5** = $*10^{5}$ **6** = $*10^{6}$	**G** = ± 2 % **J** = ± 5 %	**12** = A2(G26) **22** = A2(G53) **25** = A5 **21** = A1(G53) **41** = A1(G73) **D5** = R5 **DE** = RE **F2** = R2	up to 2 digits **00** = standard

PRODUCT DESCRIPTION: LCA0204 2K4 5 % A5

LCA0204	2K4	5 %	A5
MODEL	RESISTANCE VALUE	TOLERANCE	PACKAGING[1)]
LCA0204 **LCA0207** **LCA0411** **LCA0414**	**220K** = 220 kΩ **10R** = 10 Ω	± **2** % ± **5** %	**A2** (G26) **A2** (G53) **A5** **A1** (G53) **A1** (G73) **R5** **RE** **R2**

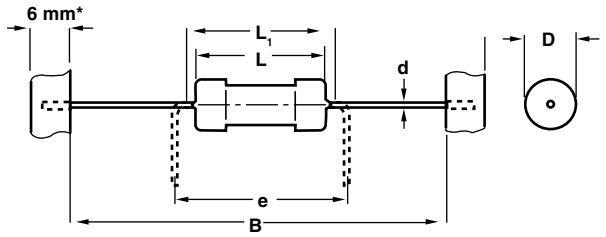
[1)] Please refer to table PACKAGING.

Note: The PART NUMBER shown above is to facilitate the unified part numbering system for ordering products.

PACKAGING

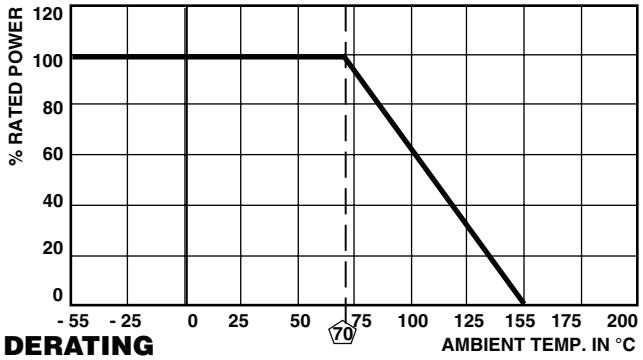
MODEL	REEL			BOX		
	PIECES/REEL	CODE	MIN. ORDER QTY PACKAGING UNITS	PIECES/BOX	CODE	MIN. ORDER QTY PACKAGING UNITS
LCA0204	5000	R5	1	5000 2000	A5 A2	1 1
LCA0207	5000	R5	1	5000 2000	A5 A2	1 1
LCA0411	2500	RE	1	1000	A1	1
LCA0414	2000	R2	1	1000	A1	1

DIMENSIONS

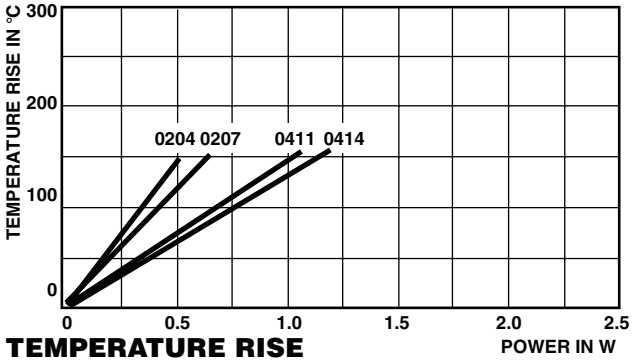


MODEL	DIMENSIONS [in millimeters]					
	D_{max}	L	L1	B	d	e
LCA0204	$1.6_{-0.3}$	$3.6_{-0.4}$	5.0	$53_{\pm 1}$	0.5	5.0
LCA0207	$2.4_{-0.3}$	$6.1_{-0.5}$	8.1	$53_{\pm 1}$ [1)]	0.6	7.5
LCA0411	$3.7_{-0.4}$	$10.5_{-0.6}$	12.5	$53_{\pm 1}$ [2)]	0.7	12.5
LCA0414	$4.2_{-0.5}$	$12.2_{-0.7}$	14.2	$53_{\pm 1}$ [2)]	0.8	15.0

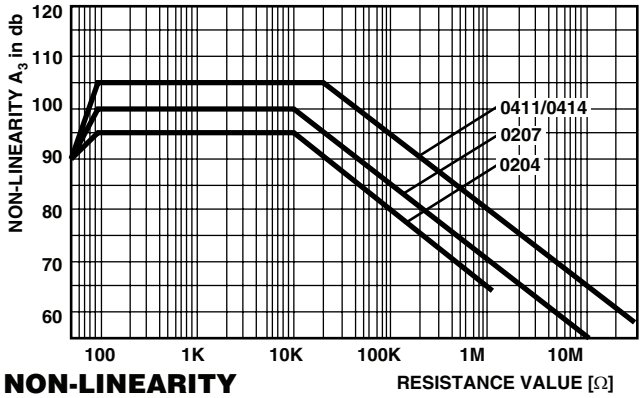
[1)] Also available in 26 mm tape spacing
[2)] Also available in 73 mm tape spacing
- Taping in acc. with IEC60286-1
- D and L measured in acc. with IEC60294
- d according to IEC60301



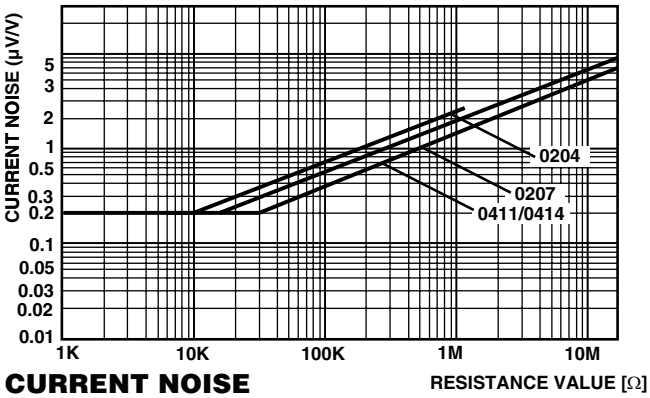
DERATING



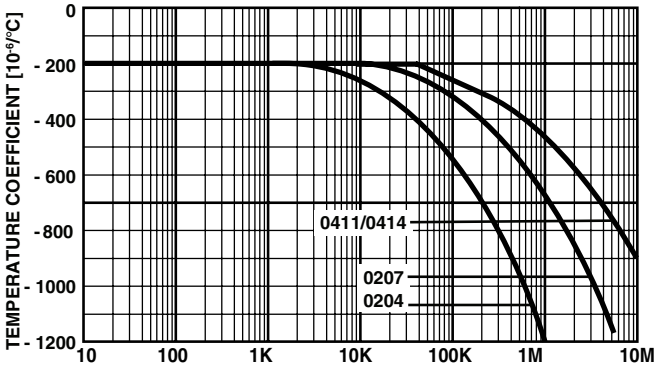
TEMPERATURE RISE



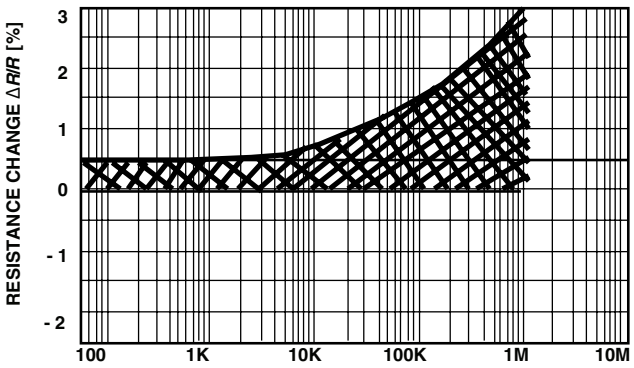
NON-LINEARITY



CURRENT NOISE

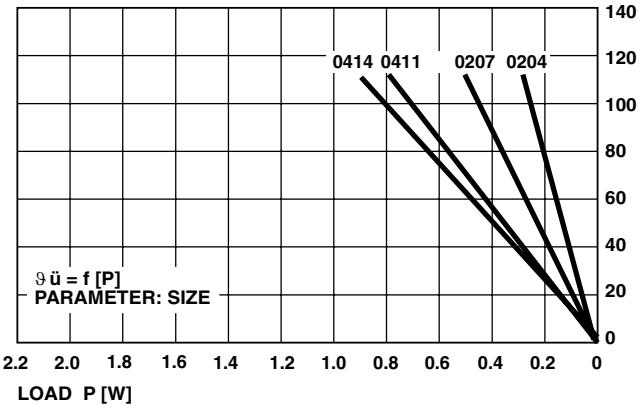


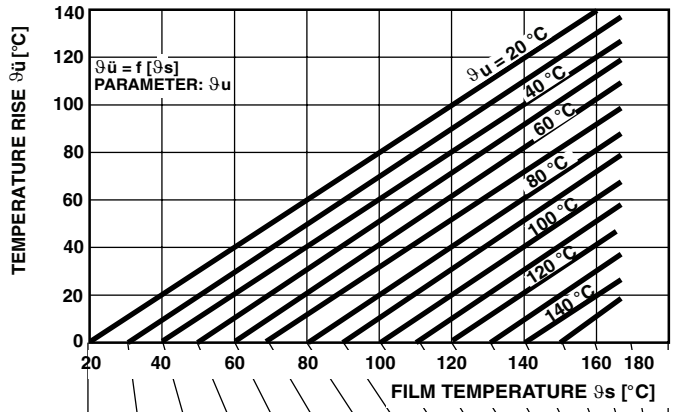
TEMPERATURE COEFFICIENT
(mean value) between - 25... + 125 °C deviation ± 25 %

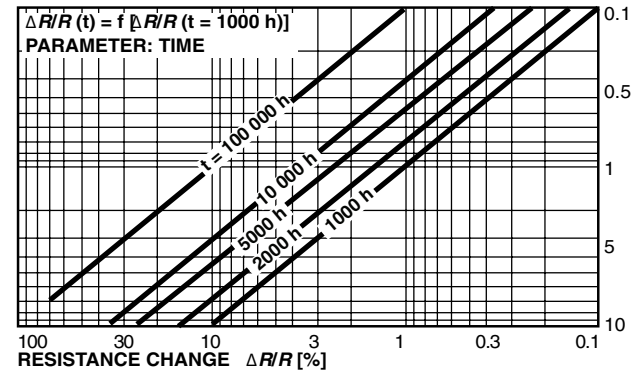


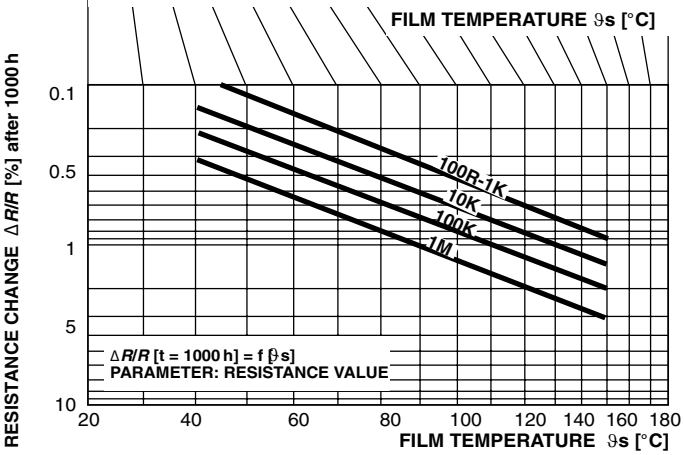
ENDURANCE
at upper category temperature, 155 °C 1000 h

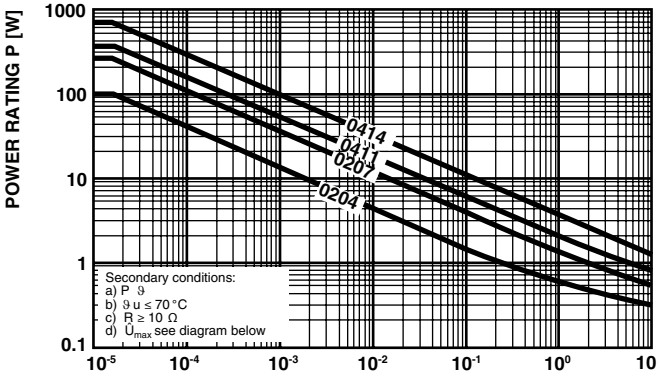
STABILITY NOMOGRAM, TYPICAL VALUES (For handling see General Information)



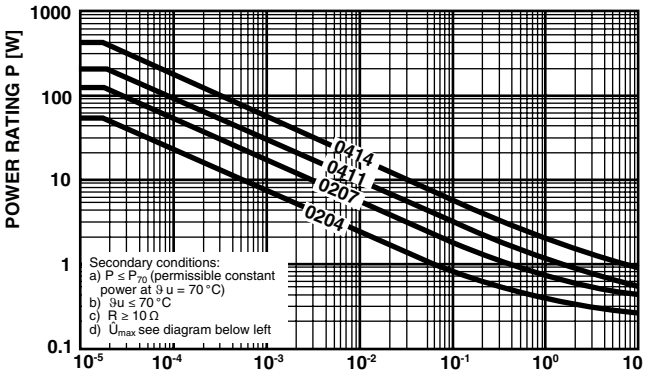




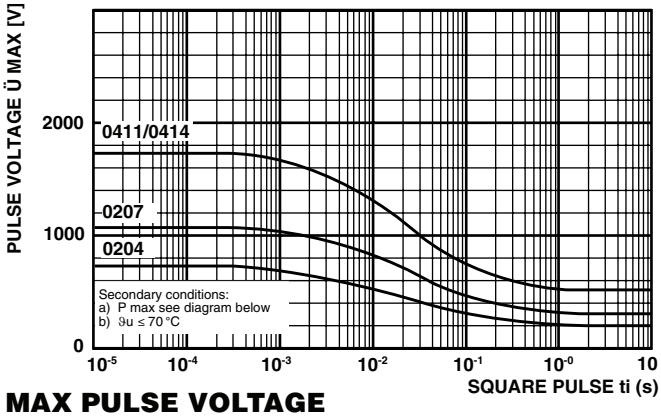




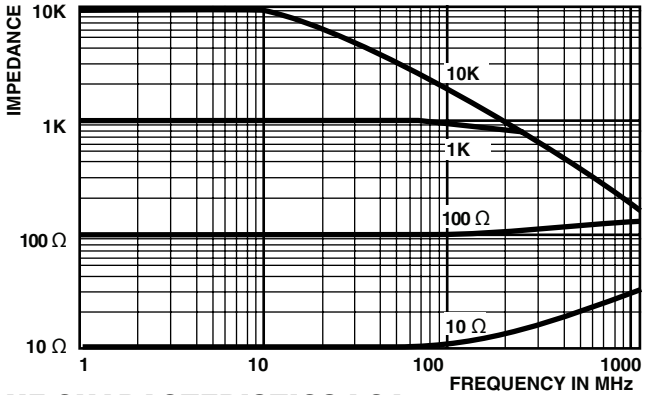
PULSE RATING $\bar{P} \longrightarrow 0$



PULSE RATING $\bar{P} \leq$ P70



MAX PULSE VOLTAGE



HF CHARACTERISTICS LCA0207

PERFORMANCE CHARACTERISTICS

TEST	CONDITIONS OF TEST	REQUIREMENTS[1)]
Endurance Test at 70 °C IEC 60115-1 4.25.1	1000 hours at 70 °C, 1.5 hours “ON”, 0.5 hours “OFF” 8000 hours at 70 °C, 1.5. hours “ON”, 0.5 hours “OFF”	≤ ± 1.5 % ≤ ± 4.0 %
Endurance at UCT IEC 60115-1 4.25.3	1000 hours at 155 °C without load 8000 hours at 155 °C without load	≤ ± 3.0 % ≤ ± 8.0 %
Overload Test IEC 60115-1 4.13	2.5 x rated power or twice the limiting element voltage, 2 seconds for sizes ≤ 0207; 5 seconds for sizes ≥ 0309	≤ ± 0.5 %
Thermal Shock IEC 60115-1 4.19, IEC 60068-2-14	Rapid change between upper and lower category temperature	≤ ± 0.25 %
Climatic Sequence IEC 60115-1 4.23	Dry heat, damp heat cyclic, cold, low air pressure	≤ ± 1.5 %
Damp Heat Steady State IEC 60115 4.24, IEC 60068-2-3	56 days at 40 °C, 93 % realtive humidity	≤ ± 1.5 %
Resistance to Soldering Heat IEC 60115-1 4.18, IEC 60068-2-20	10 seconds at 260 °C solder bath temperature	≤ ± 0.25 %
Robustness of Terminations IEC 60115-1 4.16, IEC 60068-2-21	Tensile, bending and torsion	≤ ± 0.25 %
Vibration IEC 60115-1 4.22, IEC 60068-2-6	0.75 mm or 10 g 10 Hz - 500 Hz 6 hours	≤ ± 0.25 %

Note

1. For ohmic values between 10 Ω and 1 MΩ

APPLICABLE SPECIFICATIONS

- CECC 40000/40100/40101
- EN 140000/140 100

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