

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 $P_{70^\circ\text{C}}$ W	LIMITING ELEMENT VOLTAGE MAX. V_{\equiv}	TOLERANCE $\pm \%$	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_{\equiv}	≤ 200	≤ 300	≤ 500	≤ 500
Limiting Voltage, short-time	V_{\equiv}		500	700	1000
Insulation Voltage (1 min)	V-	> 300	> 700	> 700	> 700
Thermal Resistance	K/W	≤ 300	≤ 220	≤ 150	≤ 140
Insulation Resistance	Ω	$\geq 10^{11}/h$			
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
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MODEL/SIZE LCA0204 LCA0207 LCA0411 LCA0414	SPECIAL CHARACTER 0 = neutral	TCR 0 = neutral see diagram	VALUE 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	TOLERANCE G = ± 2 % J = ± 5 %	PACKAGING 12 = A2(G26) 22 = A2(G53) 25 = A5 21 = A1(G53) 41 = A1(G73) D5 = R5 DE = RE F2 = R2	SPECIAL up to 2 digits 00 = standard
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PRODUCT DESCRIPTION: LCA0204 2K4 5 % A5

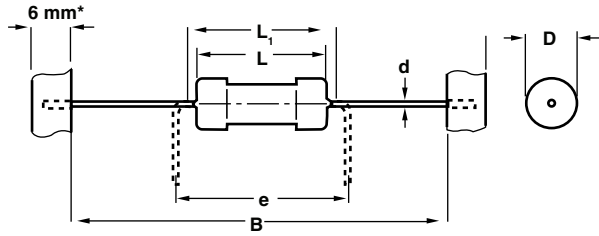
<table border="1" style="width: 100%;"> <tr><td style="text-align: center;">LCA0204</td></tr> <tr><td style="text-align: center;">MODEL</td></tr> <tr><td style="text-align: center;">LCA0204 LCA0207 LCA0411 LCA0414</td></tr> </table>	LCA0204	MODEL	LCA0204 LCA0207 LCA0411 LCA0414	<table border="1" style="width: 100%;"> <tr><td style="text-align: center;">2K4</td></tr> <tr><td style="text-align: center;">RESISTANCE VALUE</td></tr> <tr><td style="text-align: center;">220K = 220 kΩ 10R = 10 Ω</td></tr> </table>	2K4	RESISTANCE VALUE	220K = 220 kΩ 10R = 10 Ω	<table border="1" style="width: 100%;"> <tr><td style="text-align: center;">5 %</td></tr> <tr><td style="text-align: center;">TOLERANCE</td></tr> <tr><td style="text-align: center;">± 2 % ± 5 %</td></tr> </table>	5 %	TOLERANCE	± 2 % ± 5 %	<table border="1" style="width: 100%;"> <tr><td style="text-align: center;">A5</td></tr> <tr><td style="text-align: center;">PACKAGING¹⁾</td></tr> <tr><td style="text-align: center;">A2 (G26) A2 (G53) A5 A1 (G53) A1 (G73) R5 RE R2</td></tr> </table>	A5	PACKAGING ¹⁾	A2 (G26) A2 (G53) A5 A1 (G53) A1 (G73) R5 RE R2
LCA0204															
MODEL															
LCA0204 LCA0207 LCA0411 LCA0414															
2K4															
RESISTANCE VALUE															
220K = 220 kΩ 10R = 10 Ω															
5 %															
TOLERANCE															
± 2 % ± 5 %															
A5															
PACKAGING ¹⁾															
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.

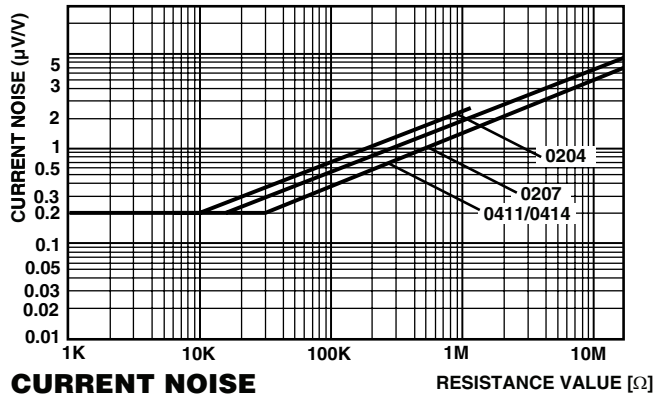
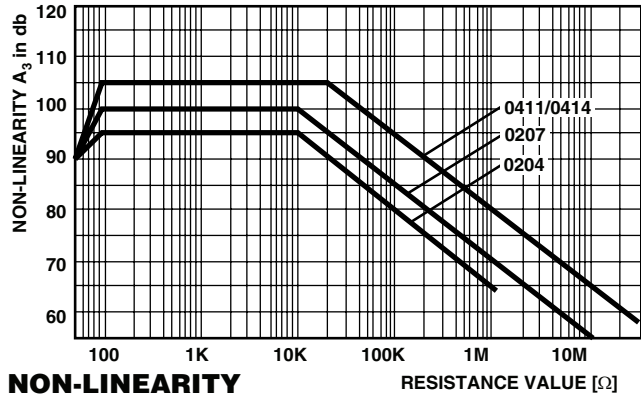
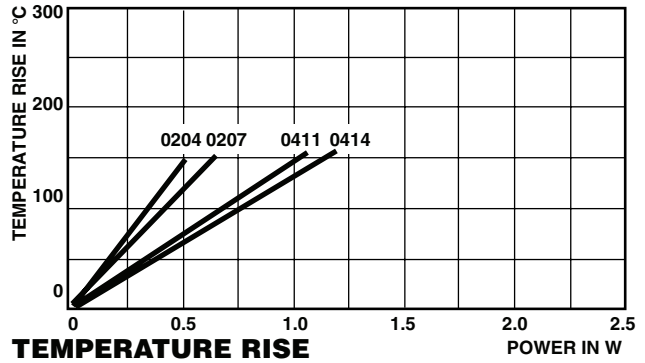
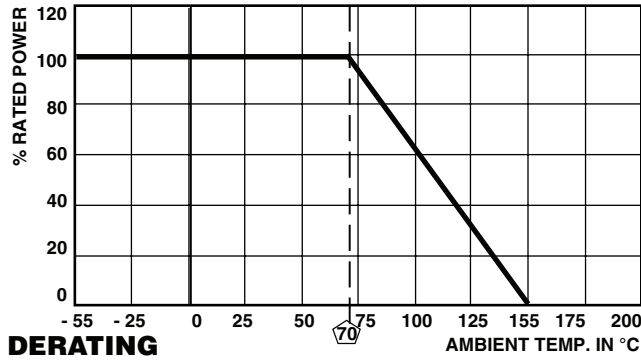
PACKAGING						
MODEL	REEL			BOX		
	PIECES/REEL	CODE	MIN. ORDER QTY PACKAGING UNITS	PIECES/BOX	CODE	MIN. ORDER QTY PACKAGING UNITS
LCA0204	5000	R5	1	5000 2000	A5 A2	1 1
LCA0207	5000	R5	1	5000 2000	A5 A2	1 1
LCA0411	2500	RE	1	1000	A1	1
LCA0414	2000	R2	1	1000	A1	1

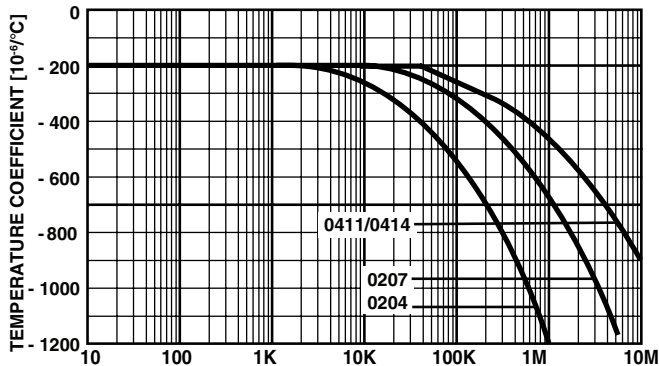
DIMENSIONS



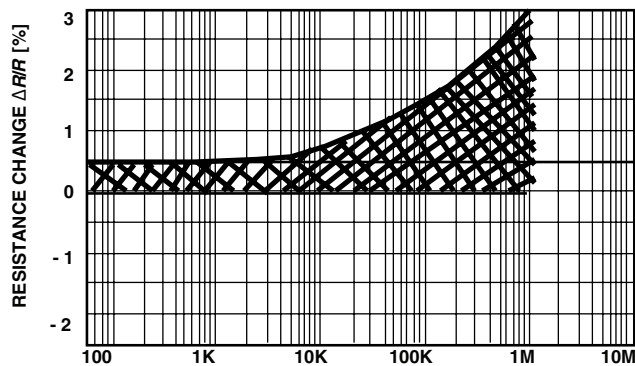
- 1) Also available in 26 mm tape spacing
- 2) Also available in 73 mm tape spacing
- Taping in acc. with IEC60286-1
- D and L measured in acc. with IEC60294
- d according to IEC60301

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



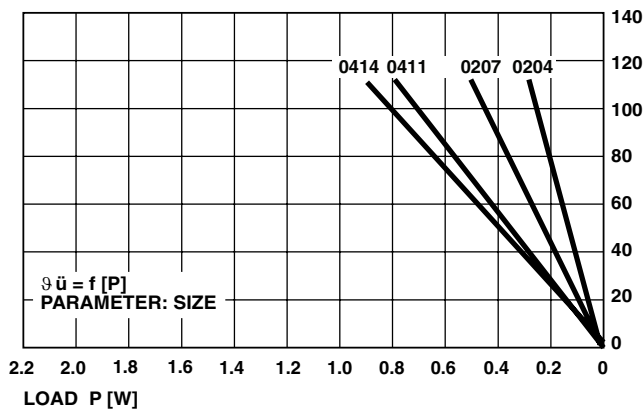


TEMPERATURE COEFFICIENT
(mean value) between - 25... + 125 °C deviation $\pm 25\%$

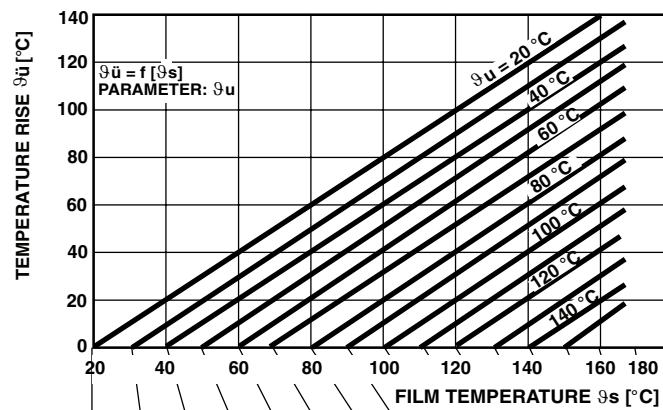


ENDURANCE
at upper category temperature, 155 °C 1000 h

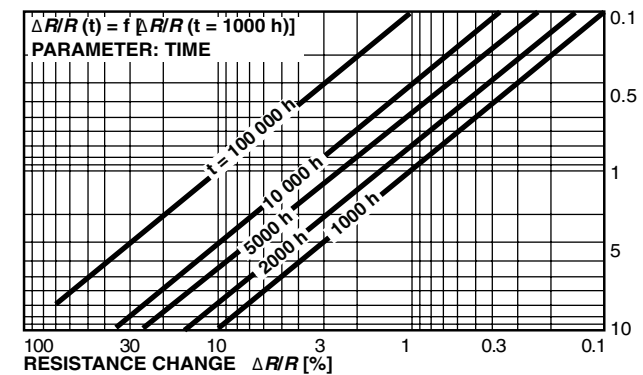
STABILITY NOMOGRAM, TYPICAL VALUES (For handling see General Information)



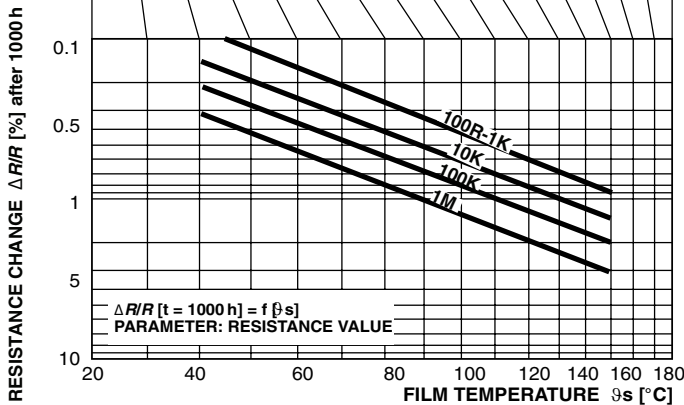
$\vartheta_u = f [P]$
PARAMETER: SIZE



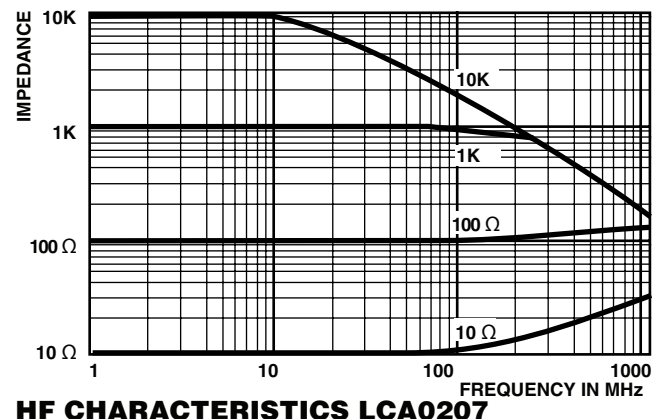
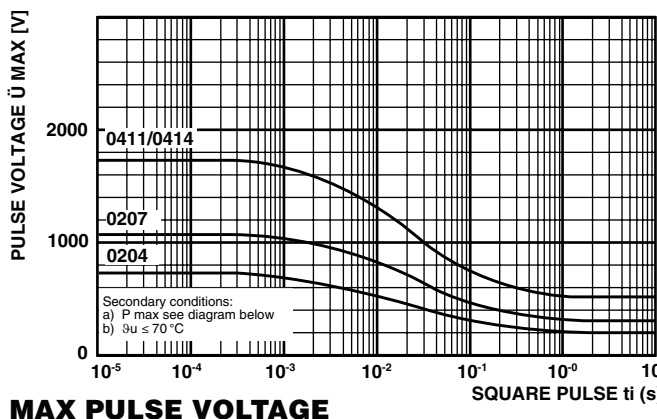
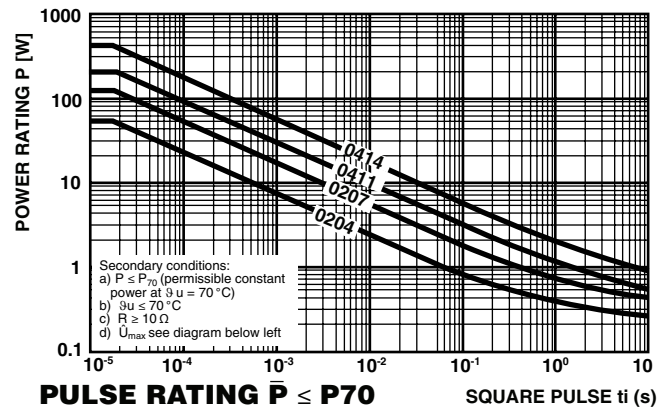
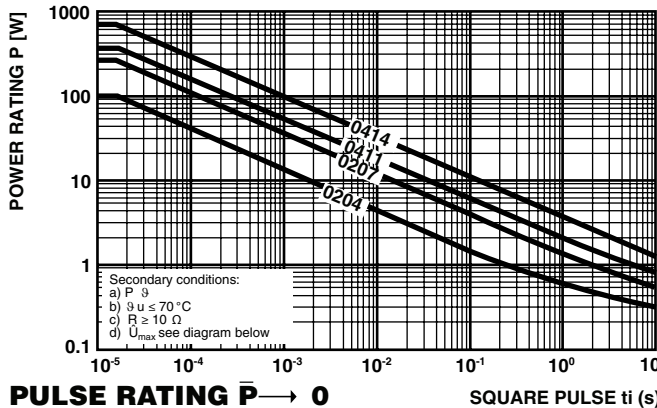
$\vartheta_u = f [\vartheta_s]$
PARAMETER: ϑ_u



$\Delta R/R(t) = f [\Delta R/R(t = 1000 h)]$
PARAMETER: TIME



$\Delta R/R [t = 1000 h] = f [\vartheta_s]$
PARAMETER: RESISTANCE VALUE



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 % relative 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
<ul style="list-style-type: none"> • CECC 40000/40100/40101 • EN 140000/140 100



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