

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 WR-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 ⁽¹⁾		SPECIAL			
LCA0204 LCA0207 LCA0411 LCA0414		0 = Neutral		0 = Neutral See diagram		3 digit value 1 digit multiplier MULTIPLIER 7 = *10 ⁻³ 2 = *10 ² 8 = *10 ⁻² 3 = *10 ³ 9 = *10 ⁻¹ 4 = *10 ⁴ 0 = *10 ⁰ 5 = *10 ⁵ 1 = *10 ¹ 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) A1 (G73) A2 (G53) R5 A5 RE A1 (G53) R2											

Notes:

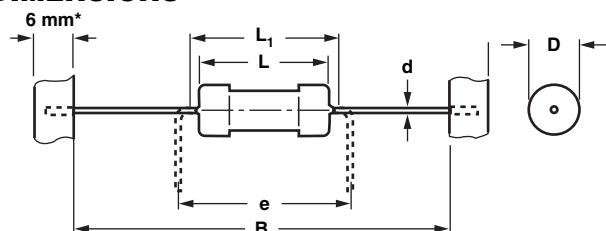
⁽¹⁾ Please refer to table PACKAGING

- 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



Notes:

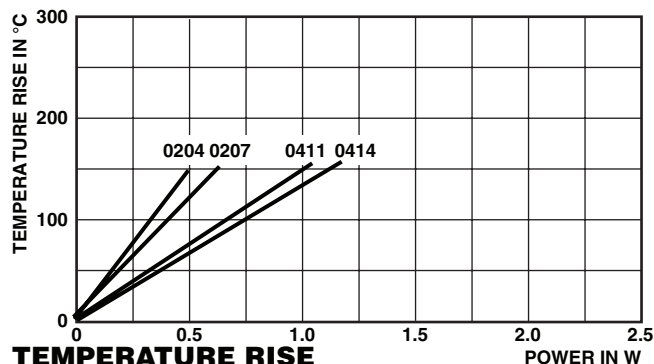
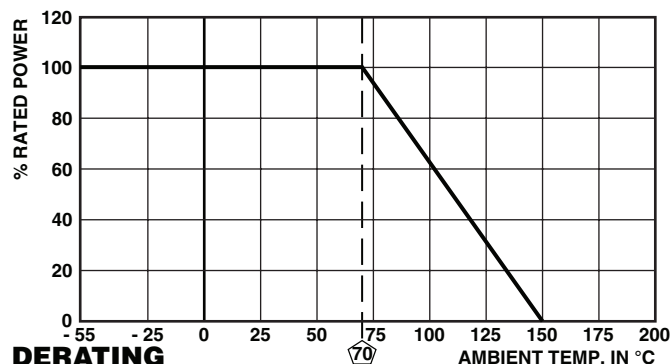
- Taping in acc. with IEC60286-1
- D and L measured in acc. with IEC60294
- d according to IEC60301

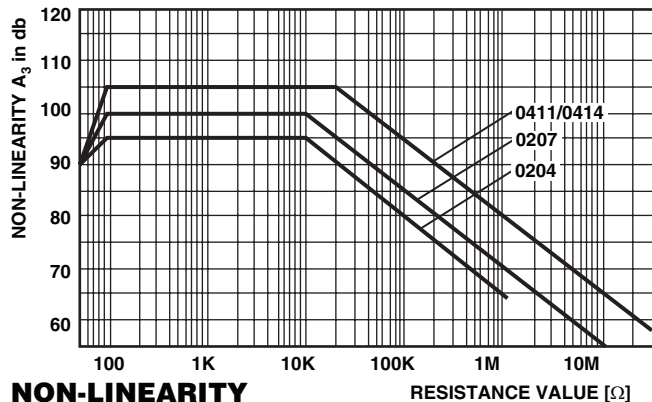
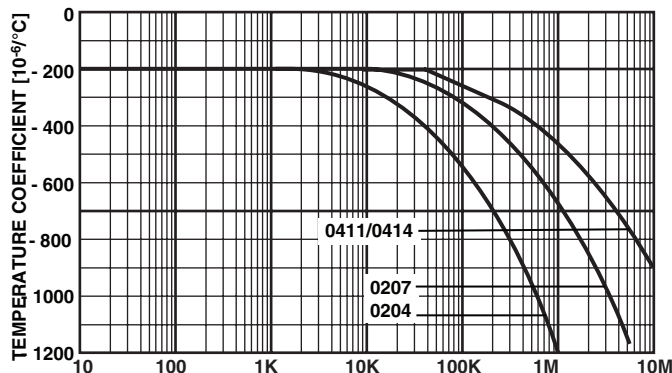
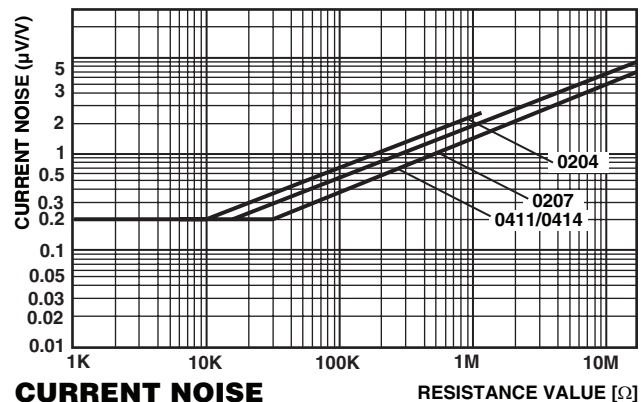
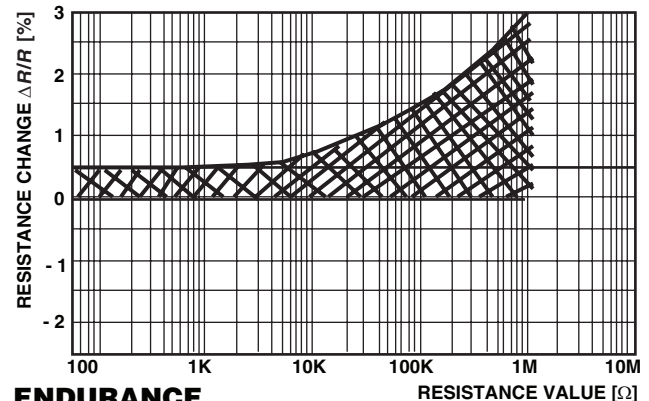
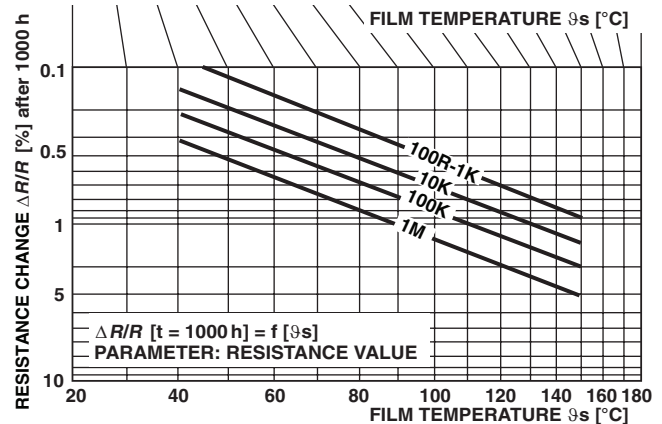
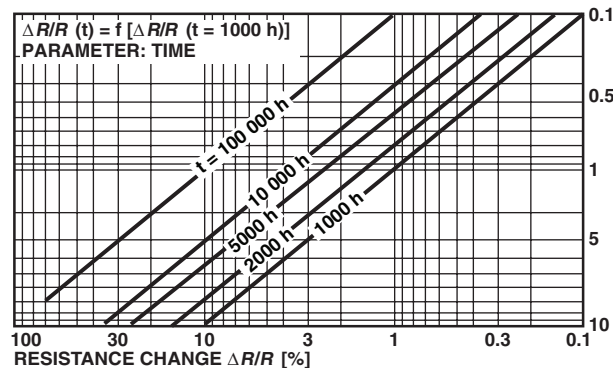
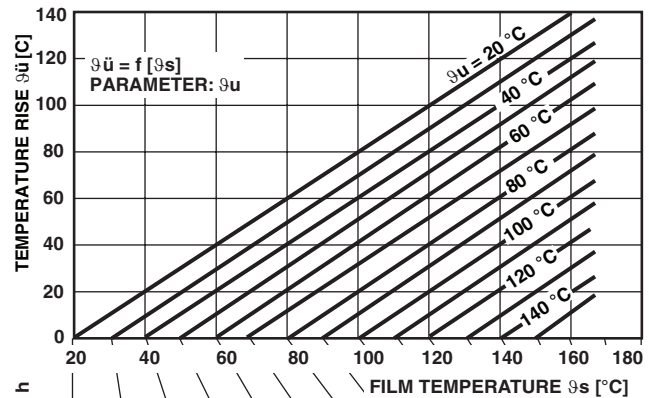
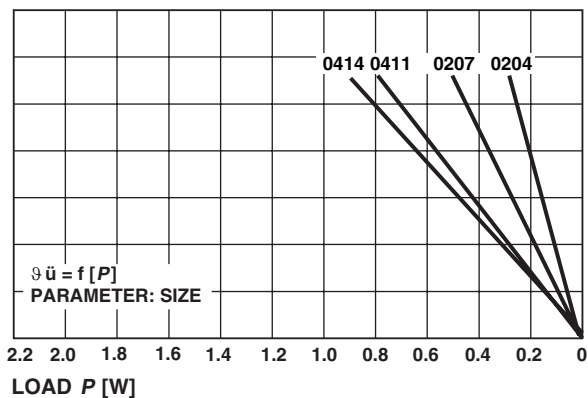
MODEL	DIMENSIONS [in millimeters]					
	D _{max.}	L	L ₁	B	d	e
LCA0204	1.6 - 0.3	3.6 - 0.4	5.0	53 ± 1	0.5	5.0
LCA0207	2.4 - 0.3	6.1 - 0.5	8.1	53 ± 1 ⁽¹⁾	0.6	7.5
LCA0411	3.7 - 0.4	10.5 - 0.6	12.5	53 ± 1 ⁽²⁾	0.7	12.5
LCA0414	4.2 - 0.5	12.2 - 0.7	14.2	53 ± 1 ⁽²⁾	0.8	15.0

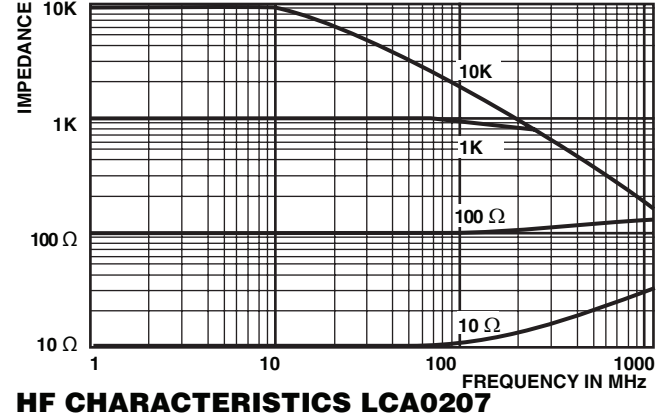
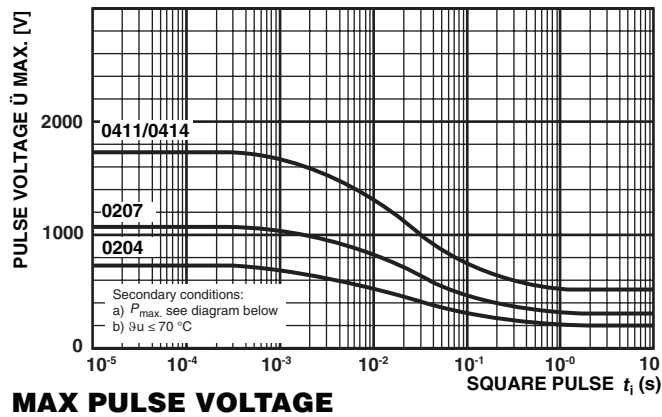
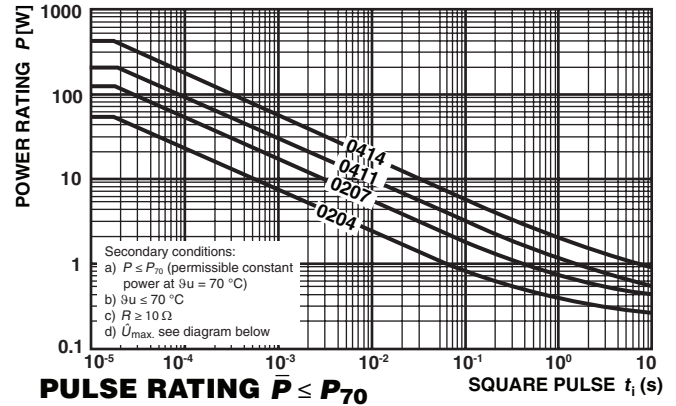
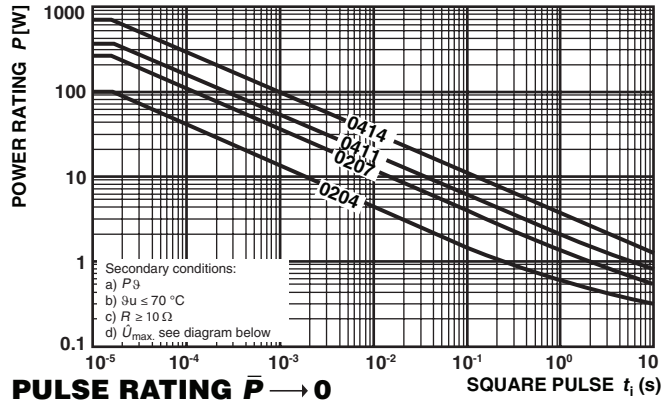
Notes:

⁽¹⁾ Also available in 26 mm tape spacing

⁽²⁾ Also available in 73 mm tape spacing



**NON-LINEARITY****TEMPERATURE COEFFICIENT**(mean value) between $-25... +125^{\circ}\text{C}$ deviation $\pm 25\%$ **CURRENT NOISE****ENDURANCE**at upper category temperature, 155°C 1000 h**STABILITY NOMOGRAM, TYPICAL VALUES** (For handling see General Information)



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

Note:

⁽¹⁾ For ohmic values between 10 Ω and 1 M Ω

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



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