



## Standard Carbon Film Leaded Resistors



### 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)
- Low noise (refer to graph)
- Suitable for general purpose commercial electronics and pulse load applications
- Lead (Pb)-free solder contacts
- Pure tin plating provides compatibility with lead (Pb)-free and lead containing soldering processes
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?999912](http://www.vishay.com/doc?999912)



RoHS  
COMPLIANT

### STANDARD ELECTRICAL SPECIFICATIONS

MODEL	SIZE	POWER RATING $P_{70}$ W	LIMITING ELEMENT VOLTAGE $U_{\max.}$ $V_{\equiv}$	TOLERANCE $\pm \%$	RESISTANCE RANGE $\Omega$	E-SERIES
LCA0207	0207	0.35	300	2 5	1 to 1M 0.22 to 5.1M	E24
LCA0414	0414	0.6	500	2 5	1 to 1M 0.22 to 10M	E24

#### Notes

- Coating: light blue
- Marking: color coded. Additional blue color marking after second band

### TECHNICAL SPECIFICATIONS

PARAMETER	UNIT	LCA0207	LCA0414
Rated dissipation, $P_{70}$	W	0.35	0.6
Limiting element voltage, $U_{\max.}$ <sup>(1)</sup>	$V_{\equiv}$	$\leq 300$	$\leq 500$
Limiting voltage, short-time	$V_{\equiv}$	500	1000
Insulation voltage, $U_{\text{ins}}$ (1 min)	V	$> 700$	$> 700$
Thermal resistance	K/W	$\leq 220$	$\leq 140$
Insulation resistance	$\Omega$	$\geq 10^{11}$	
Category temperature range	$^{\circ}\text{C}$	-55 to +155	
Failure rate	$10^{-9}/\text{h}$	$< 10$	
Weight	g	0.21	0.68

#### Note

<sup>(1)</sup> Rated voltage  $\sqrt{P \times R}$

PART NUMBER AND PRODUCT DESCRIPTION																	
Part Number: LCA0207002401J2500																	
L	C	A	0	2	0	7	0	0	2	4	0	1	J	2	5	0	0
MODEL/SIZE		VARIANT		TCR		VALUE				TOLERANCE		PACKAGING <sup>(1)</sup>		SPECIAL			
LCA0207 LCA0414		0 = neutral		0 = neutral See diagram		3 digit value 1 digit multiplier <b>Multiplier</b> 7 = *10 <sup>-3</sup> 8 = *10 <sup>-2</sup> 9 = *10 <sup>-1</sup> 0 = *10 <sup>0</sup> 1 = *10 <sup>1</sup> 2 = *10 <sup>2</sup> 3 = *10 <sup>3</sup> 4 = *10 <sup>4</sup> 5 = *10 <sup>5</sup> 6 = *10 <sup>6</sup>				G = ± 2 % J = ± 5 %		25 = A5 22 = A2 (G53) 21 = A1 D5 = R5 D2 = R2		Up to 2 digits 00 = standard			
Product Description: LCA0207 2K4 5 % A5																	
LCA0207		2K4		5 %		A5											
MODEL		RESISTANCE VALUE		TOLERANCE		PACKAGING <sup>(1)</sup>											
LCA0207 LCA0414		220K = 220 kΩ 10R = 10 Ω		± 2 % ± 5 %		A5, R5 A1, R2 A2											

Notes

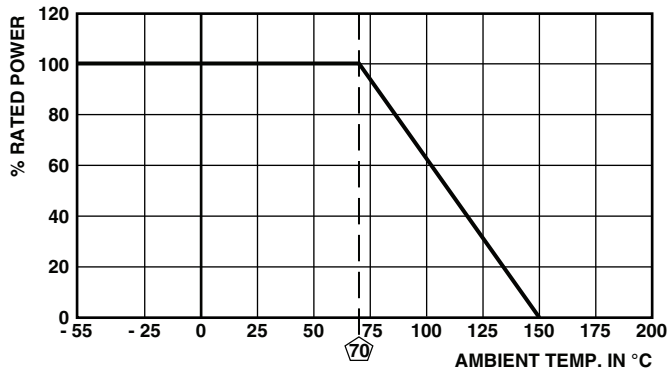
- The PART NUMBER shown above is to facilitate the unified part numbering system for ordering products
- <sup>(1)</sup> Please refer to table PACKAGING

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

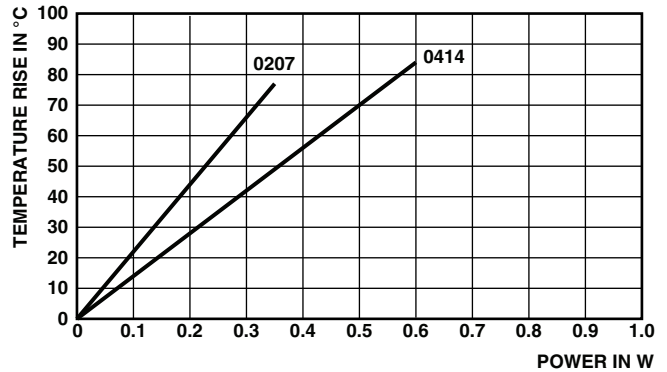
DIMENSIONS in millimeters						
MODEL	D <sub>max.</sub>	L	L <sub>1</sub>	B	d	e
LCA0207	2.4 - 0.3	6.1 - 0.5	8.1	53 ± 1	0.6	7.5
LCA0414	4.2 - 0.5	12.2 - 0.7	14.2	63 ± 1	0.8	15.0

Notes

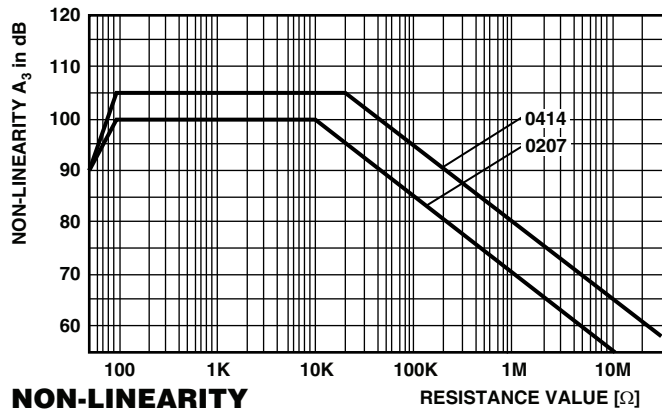
- Taping in according with IEC 60286-1
- D and L measured in according with IEC 60294
- d according to IEC 60301



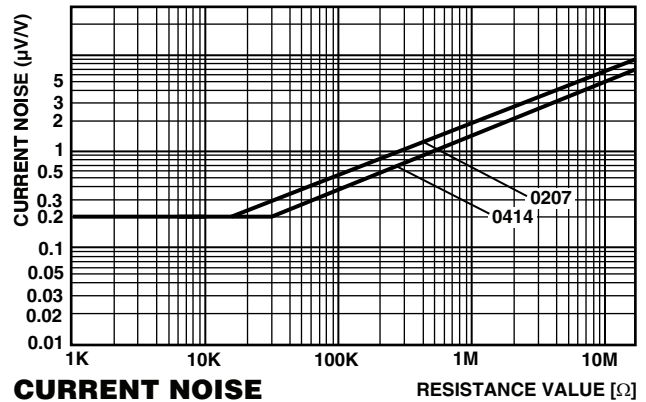
**DERATING**



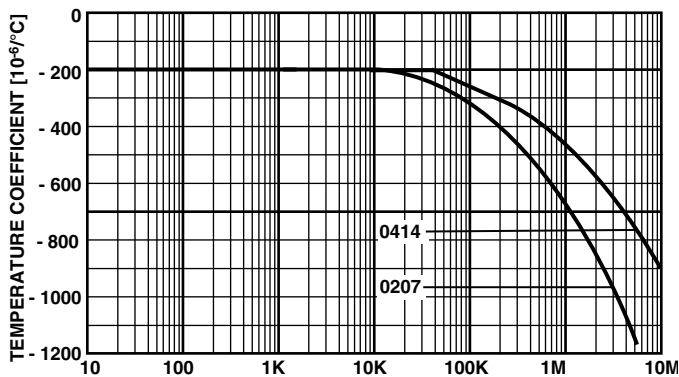
**TEMPERATURE RISE**



**NON-LINEARITY**

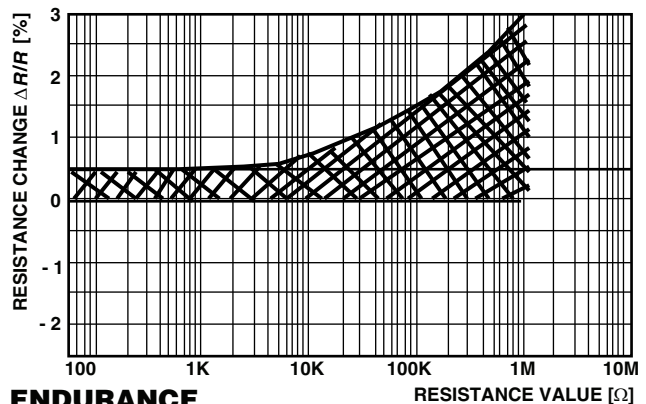


**CURRENT NOISE**



**TEMPERATURE COEFFICIENT**

(mean value) between - 25 °C to + 125 °C deviation ± 25 %

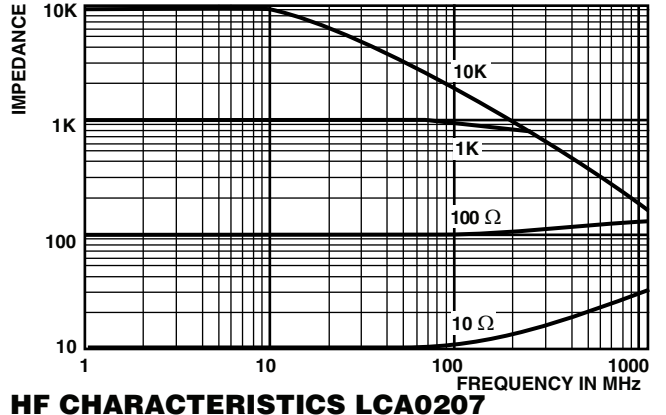
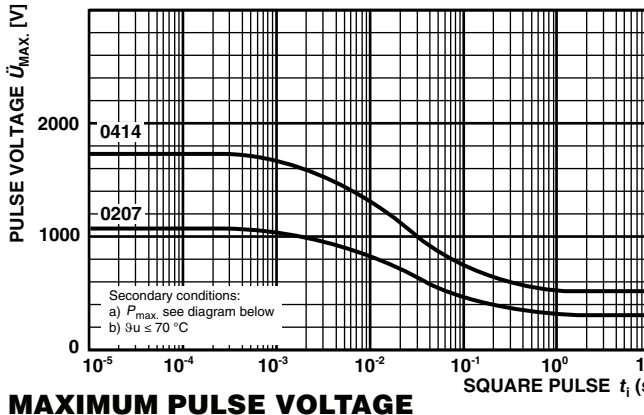
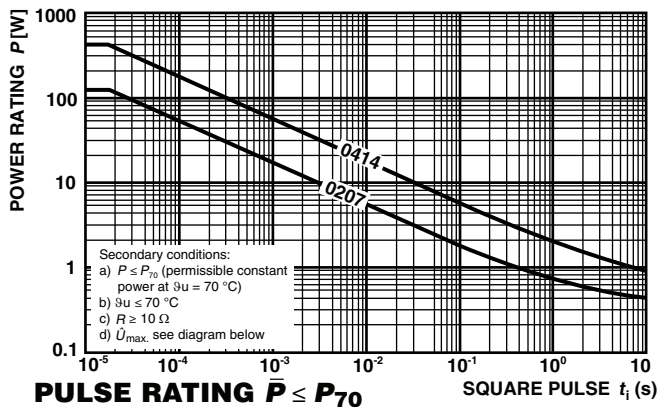
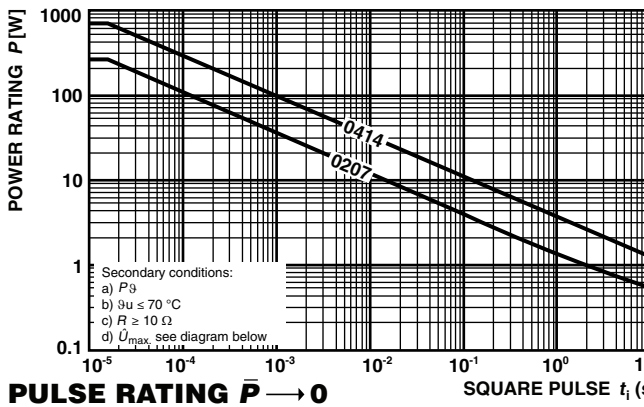
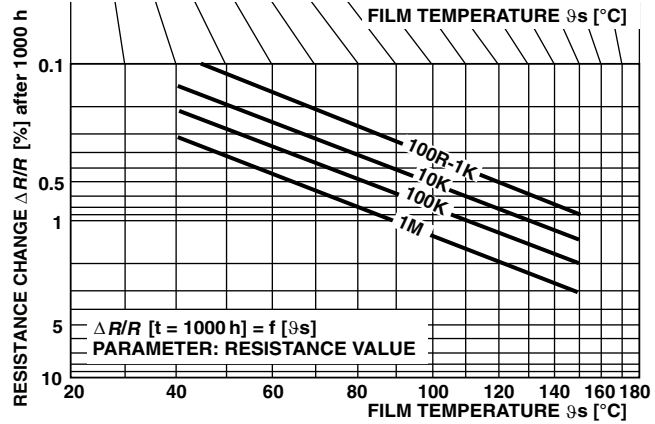
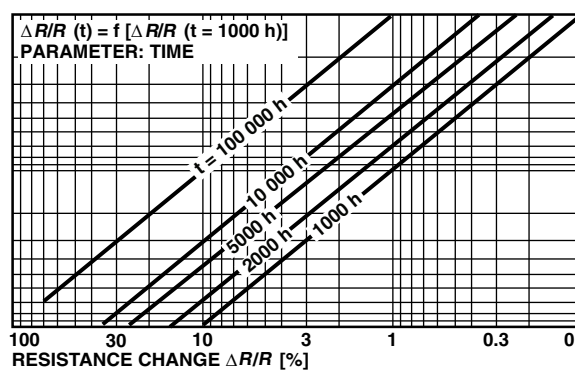
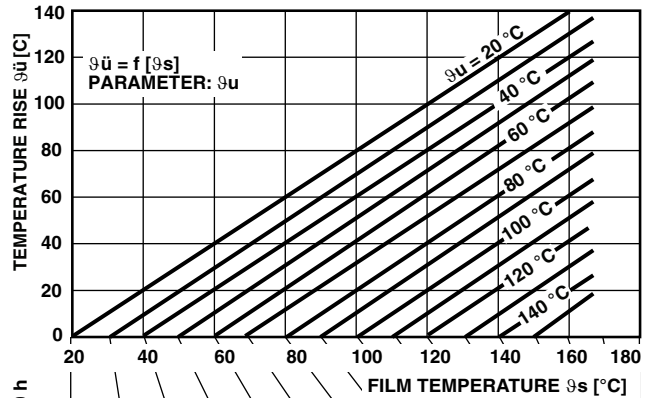
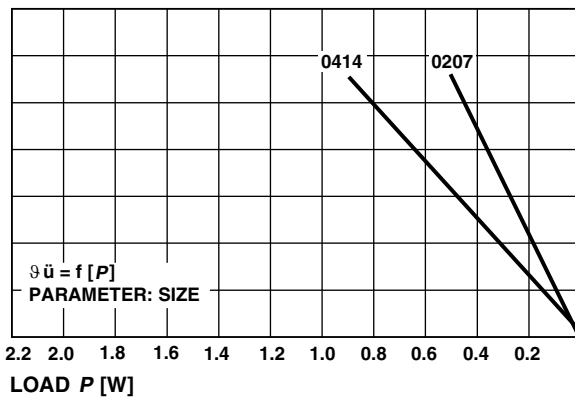


**ENDURANCE**

at upper category temperature, 155 °C 1000 h



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





PERFORMANCE CHARACTERISTICS		
TEST	CONDITIONS OF TEST	REQUIREMENTS ( $\Delta R/R$ ) <sup>(1)</sup>
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	Room temperature; $P = 6.25 \times P_n$ ; voltage not more than 2x limiting voltage; 2 s for size 0207; 5 s for size 0414	$\leq \pm 0.5 \%$
Thermal shock IEC 60115-1, 4.19	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	56 days; 40 °C; 90 % to 95 % RH; loaded with 0.01 $P_{70}$	$\leq \pm 1.5 \%$
Resistance to soldering heat IEC 60115-1, 4.18	10 s at 260 °C solder bath temperature	$\leq \pm 0.25 \%$
Robustness of terminations IEC 60115-1, 4.16	Tensile, bending and torsion	$\leq \pm 0.25 \%$
Vibration IEC 60115-1, 4.22	Frequency 10 Hz to 500 Hz; displacement 1.5 mm or acceleration 10 g; three directions; 6 h	$\leq \pm 0.25 \%$

**Note**

<sup>(1)</sup> For ohmic values between 10  $\Omega$  and 1 M $\Omega$

**APPLICABLE SPECIFICATIONS**

- CECC 40101-806
- EN 140100; EN 60115-1



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