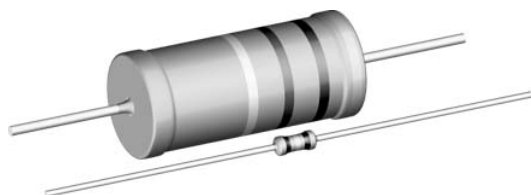


Carbon Film Resistors, Standard



FEATURES

- Securely bonded carbon film
- Good moisture resistance
- Good long term stability
- Lead (Pb)-free solder contacts on Ni barrier layer
- 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
- 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	10R - 470K	24
SK1				± 5	1R0 - 1M0	24
LCA0207	0207	0.35	300	± 2	1R0 - 1M0	24
SK2				± 5	R22 - 5M1	24
LCA0309	0309	0.45	300	± 2 ± 5	1R0 - 1M0 R22 - 4M7	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
SK4	0414	0.6	500	± 5 ± 10 ± 20	10M - 30M 30M - 90M 90M - 150M	24 12 6
LCA0617	0617	0.7	600	± 2 ± 5	2R2 - 1M0 2R2 - 20M	24 24
LCA0719	0719	1	750	± 2 ± 5	2R2 - 1M0 2R2 - 20M	24 24
SK5	0617	1.1	750	± 2 ± 5	1R0 - 5M1 1R0 - 24M	24 24
LCA0922	0922	1.5	750	± 2 ± 5	3R3 - 1M0 3R3 - 22M	24 24
LCA0933	0933	2	1000	± 2 ± 5	5R1 - 1M0 5R1 - 47M	24 24

- Coating : Beige
- Marking : colour code

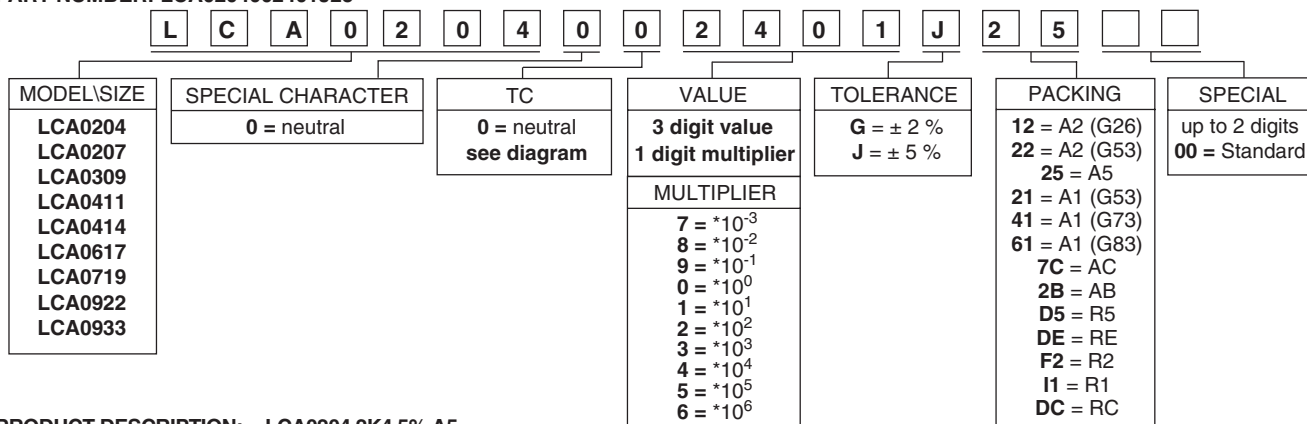
TECHNICAL SPECIFICATIONS

PARAMETER	UNIT	LCA0204 SK1	LCA0207 SK2	LCA0309	LCA0411	LCA0414	LCA0617	LCA0719	SK5	LCA0922	LCA0933
Rated Dissipation at 70°C	W	0.25	0.35	0.45	0.55	0.6	0.7	1.0	1.1	1.5	2.0
Limiting Element Voltage ¹⁾	V _≧	≤ 200	≤ 300	≤ 300	≤ 500	≤ 500	≤ 600	≤ 750	≤ 750	≤ 750	≤ 1000
Limiting Voltage, short-time	V _≧		500	600	700	1000	1000	1500		1500	2000
Insulation Voltage (1 min)	V-	> 300	> 700	> 700	> 700	> 700	> 700	> 700	> 750	> 700	> 700
Thermal Resistance	K/W	≤ 300	≤ 220	≤ 190	≤ 150	≤ 140	≤ 110	≤ 90	≤ 80	≤ 70	≤ 60
Insulation Resistance	Ω	≥ 10 ¹¹ /h									
Terminal Strength, axial	N	> 30	> 50	> 60	> 60	> 80	> 80	> 80	> 80	> 80	> 80
Category Temperature Range	°C	- 55 to + 155									
Failure Rate	10 ⁻⁹ /h	< 10									
Weight	g	0.1	0.21	0.3	0.5	0.68	1.1	1.8	1.5	3.2	4.2

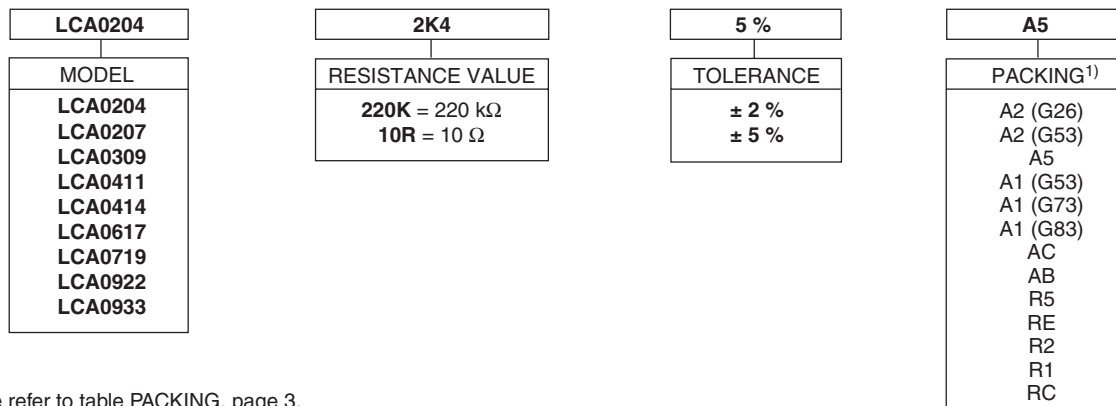
¹⁾ Rated voltage $\sqrt{P \times R}$

**PART NUMBER AND PRODUCT DESCRIPTION LCA-SERIES**

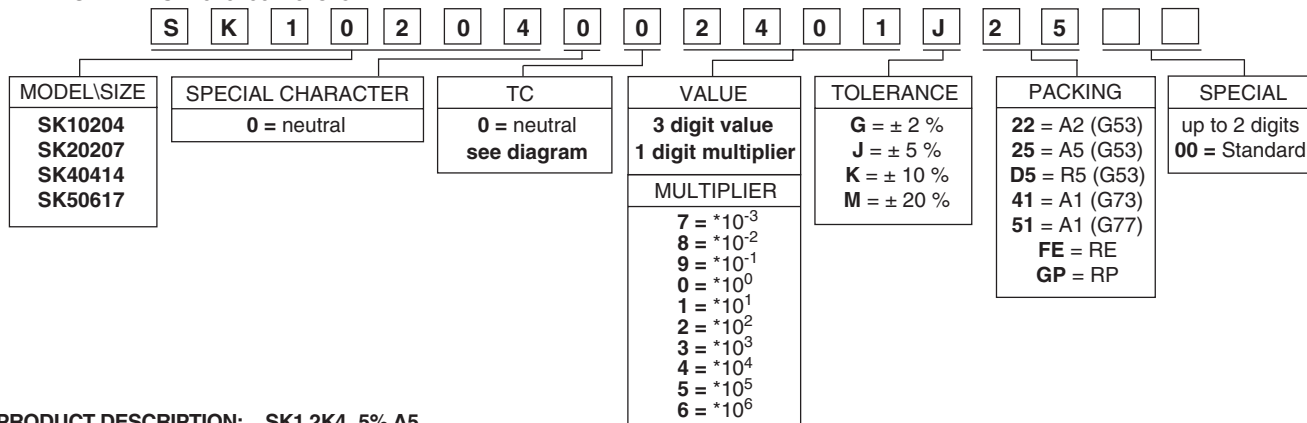
PART NUMBER: LCA0204002401J25



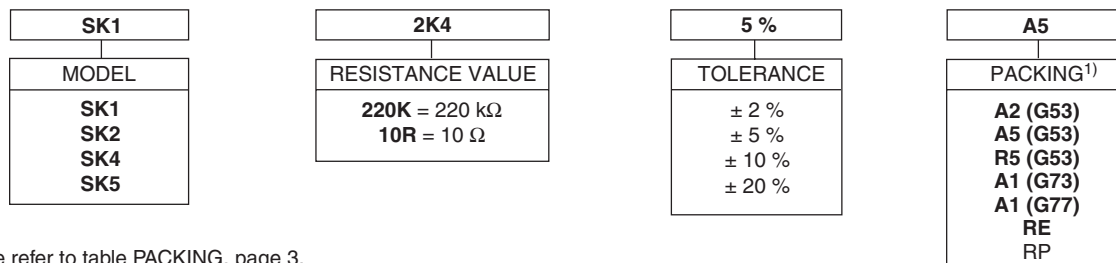
PRODUCT DESCRIPTION: LCA0204 2K4 5% A5

¹⁾ Please refer to table PACKING, page 3.**PART NUMBER AND PRODUCT DESCRIPTION SK-SERIES**

PART NUMBER: SK10204002401J25

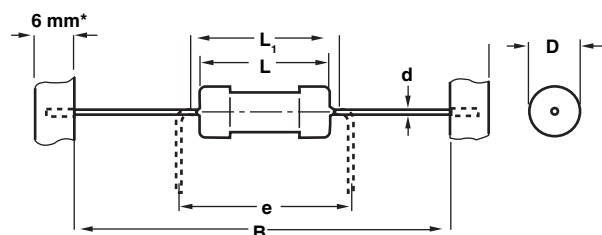


PRODUCT DESCRIPTION: SK1 2K4 5% A5

¹⁾ Please refer to table PACKING, page 3.

PACKING						
MODEL	REEL			BOX		
	PIECES / REEL	CODE	MIN. ORDER QTY PACKING UNITS	PIECES / BOX	CODE	MIN. ORDER QTY PACKING UNITS
LCA0204	5 000	R5	1	5 000	A5	1
SK1				2 000	A2	1
LCA0207	5 000	R5	1	5 000	A5	1
SK2				2 000	A2	1
LCA0309	2 500	RE	1	5 000	A5	1
				2 000	A2	1
LCA0411	2 500	RE	1	1 000	A1	1
LCA0414	2 000	R2	1	1 000	A1	1
SK4	2 500	RE	1	1 000	A1	1
LCA0617	1 000	R1	1	1 000	A1	1
LCA0719	500	RC	4	500	AC	4
SK5	1 500	RP	1	1 000	A1	1
LCA0922	500	RC	2	250	AB	4
LCA0933	500	RC	2	250	AB	4

DIMENSIONS



¹⁾ Also available in 26mm tape spacing

²⁾ Also available in 73mm spacing

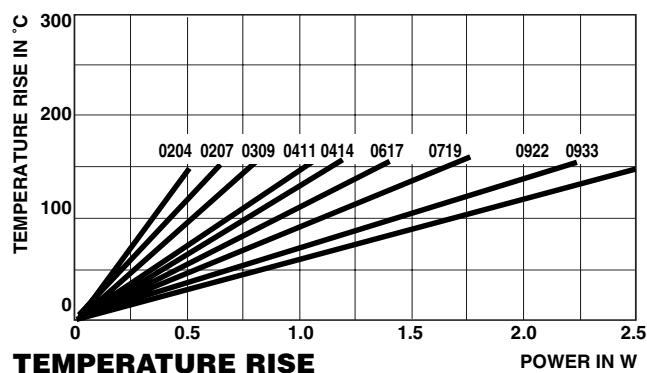
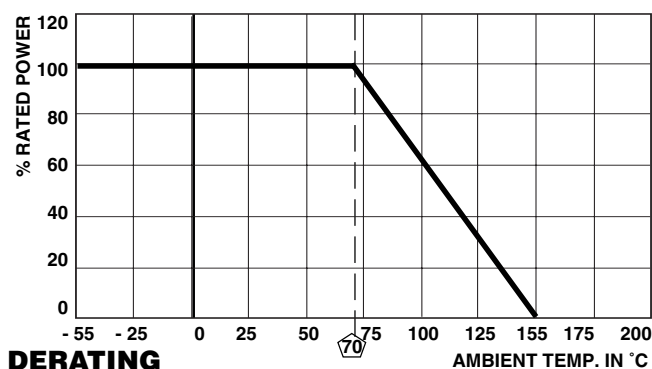
• Taping in acc. with IEC60286-1

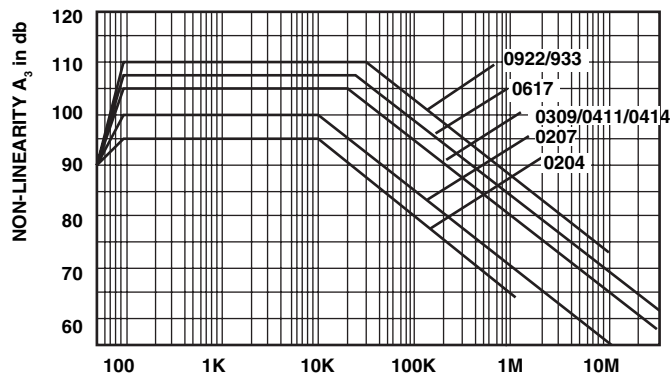
• D and L measured in acc. with IEC60294

• d according to IEC60301

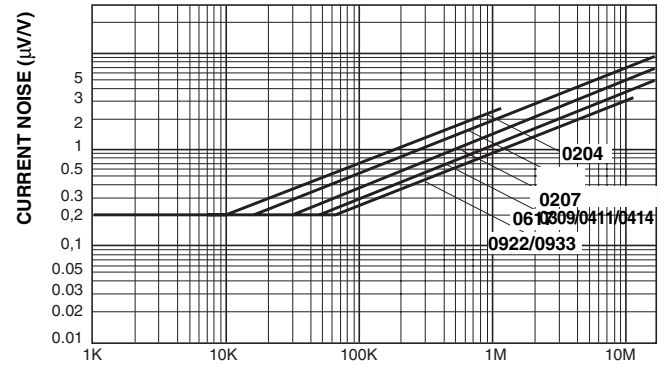
* 9mm for SK5

MODEL	DIMENSIONS [in millimeters]					
	D max.	L	L ₁	B	d	e
LCA0204/SK1	1.6 _{-0.3}	3.6 _{-0.4}	5.0	53 _{±1}	0.5	5.0
LCA0207/SK2	2.4 _{-0.3}	6.1 _{-0.5}	8.1	53 _{±1} ¹⁾	0.6	7.5
LCA0309	3.0 _{-0.4}	8.1 _{-0.6}	10.1	53 _{±1} ¹⁾	0.7	10.0
LCA0411/SC4	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
SK4	4.1 _{-0.5}	12.0 _{-1.5}	14.2	73 _{±1} ²⁾	0.8	15.0
LCA0617	5.0 _{-0.5}	15.3 _{-0.8}	18.3	83 _{±1}	0.8	17.5
LCA0719	6.5 _{-0.5}	18.5 _{-0.8}	21.5	83 _{±1}	0.8	22.5
SK5	6.0 _{-0.5}	16.5 _{-1.5}	20.5	77 _{±1}	0.8	15.0
LCA0922	8.3 _{-0.6}	21.4 _{-0.9}	24.4	83 _{±1}	0.8	25.0
LCA0933	8.3 _{-0.6}	31.4 _{-0.9}	34.4	83 _{±1}	0.8	35.0

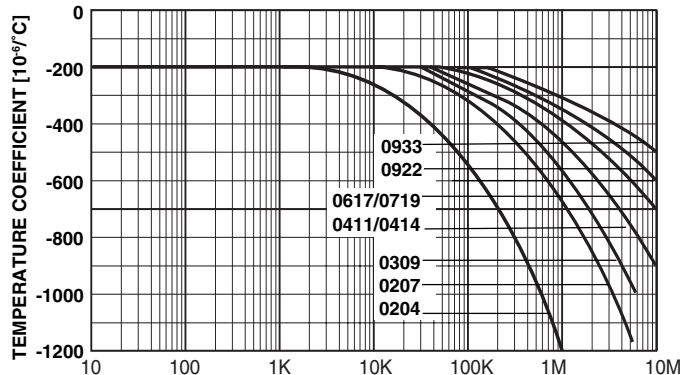




NON-LINEARITY

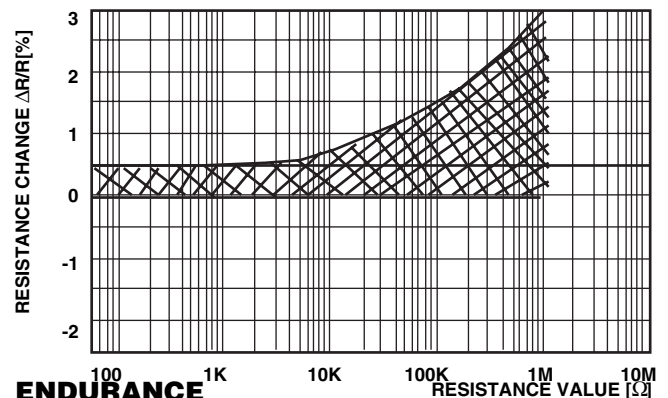


CURRENT NOISE



TEMPERATURE COEFFICIENT

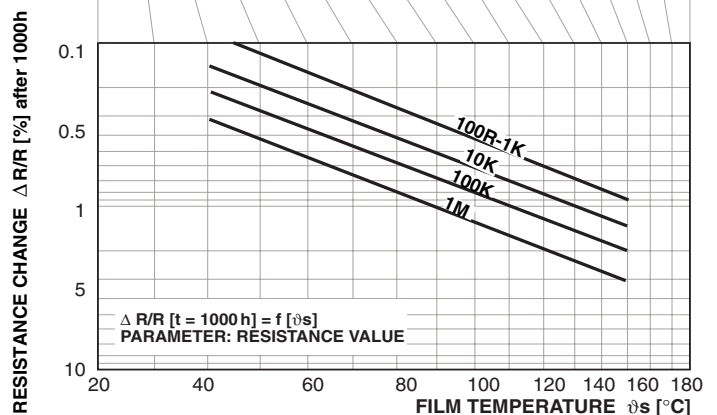
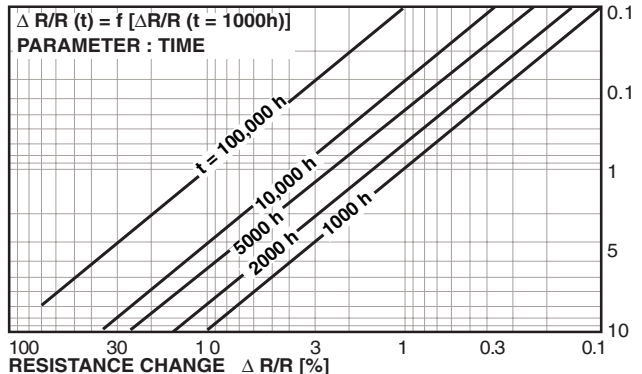
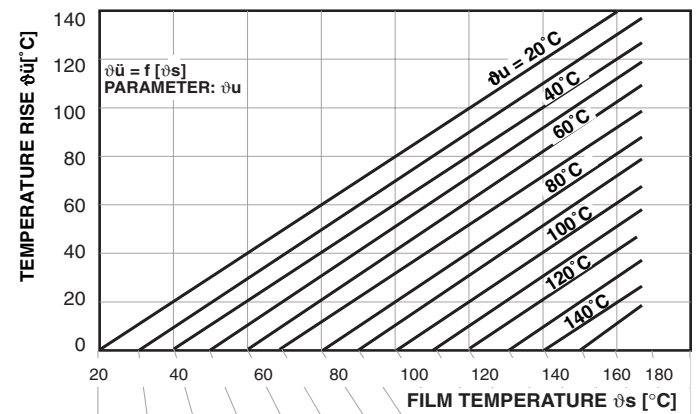
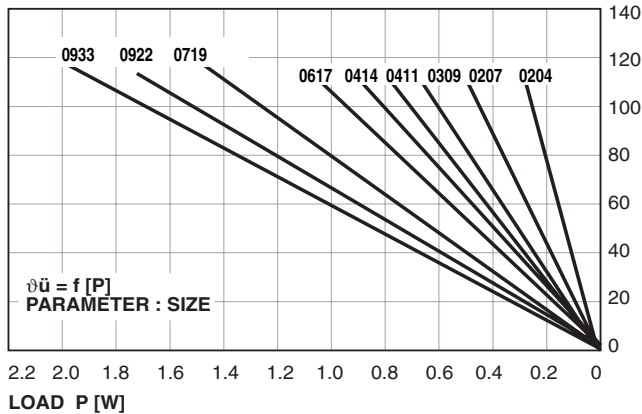
(mean value) between $-25...+125^{\circ}C$ deviation $\pm 25\%$

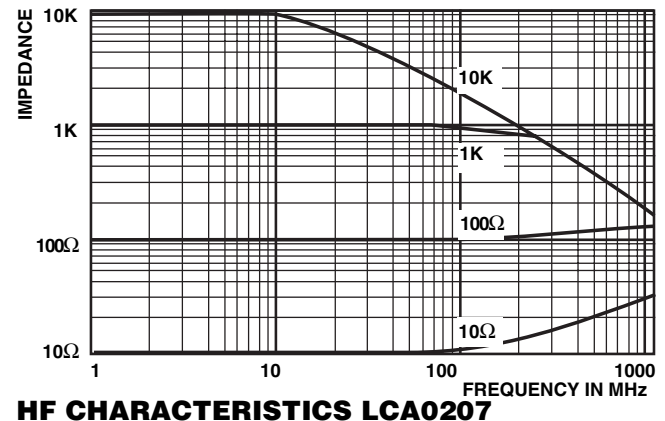
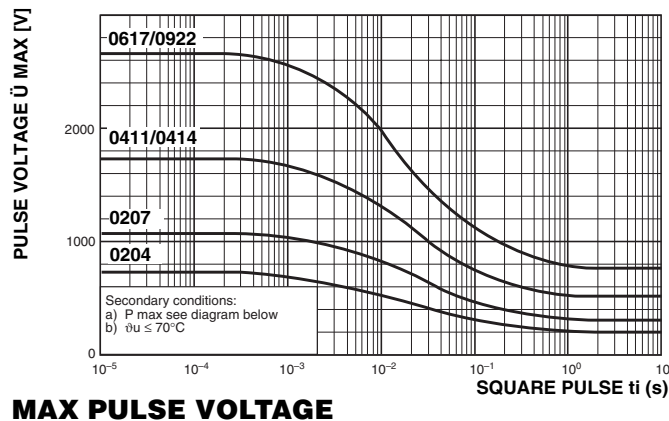
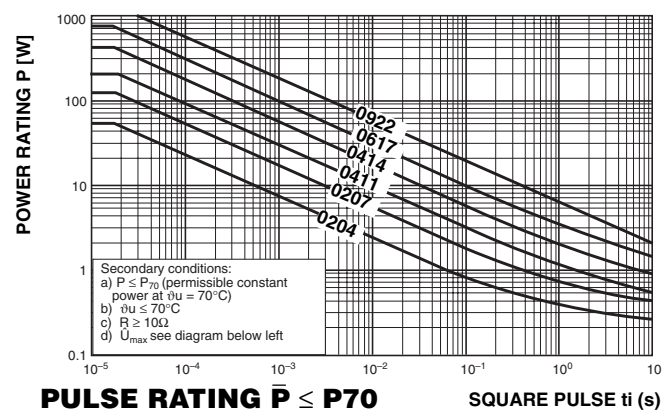
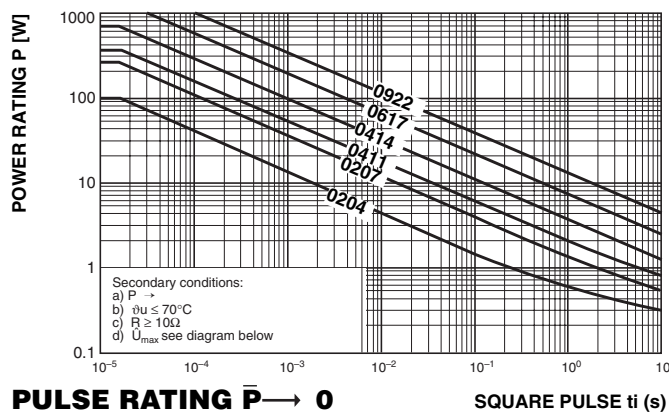


ENDURANCE

at upper category temperature, $155^{\circ}C$ 1000h

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





PERFORMANCE CHARACTERISTICS		
TEST	CONDITIONS OF TEST	REQUIREMENTS *
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	$\leq \pm 1.5\%$ $\leq \pm 4.0\%$
Endurance at UCT IEC 60115-1 4.25.3	1000 hours at 155°C without load 8000 hours at 155°C without load	$\leq \pm 3.0\%$ $\leq \pm 8.0\%$
Overload Test IEC 60115-1 4.13	2.5 x rated power or twice the limiting element voltage, 2 seconds for sizes ≤ 0207 ; - 5 seconds 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 60115-1 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 seconds 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, IEC60068-2-6	0.75mm or 10g 10 Hz - 500 Hz 6 hours	$\leq \pm 0.25\%$

* for ohmic values between 10Ω and 1MΩ



APPLICABLE SPECIFICATIONS

- CECC 40000 / 40100 / 40101
- EN 140 000 / 140 100



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