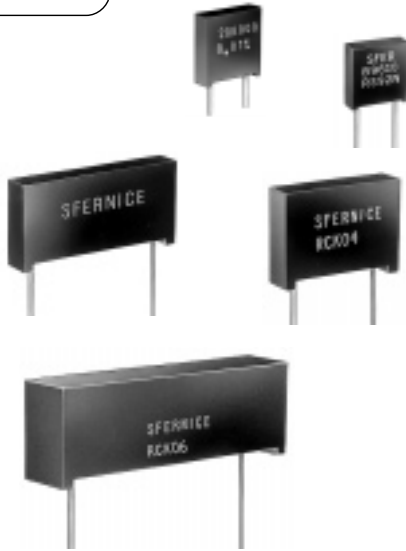




RCK 02-02A
04
05-05A
06

very high precision and stability metal foil resistor – bulk metal®

5 W to 1,5 W
to 70°C
NF C/UTE 83-220
CECC 40300
CECC 40302-001
BS CECC 40302-004
MIL-R-55182J
ESA/SCC 4001 011



The ultra-high precision planar resistors of the RCK series are produced according to a special process.

The technology used is unique and based on an etched nickel-chromium foil bonded on to an alumina substrate.

The resistor's small size (thickness 2,5 mm) enables compact side by side mounting on a 2,54 mm PCB grid and their unmatched performances make them particularly well suited for all military and high performance applications.

- **VERY TIGHT TOLERANCE** $\pm 0,005\%$ to $\pm 1\%$
Matching to 0,01%
- **VERY LOW TEMPERATURE COEFFICIENT**
typical $\leq +3$ ppm/°C (-55°C to $+155^{\circ}\text{C}$) ± 1 ppm/°C (0°C to $+60^{\circ}\text{C}$)
tracking to 0,5 ppm/°C
- **ELECTRICAL INSULATION** $>10^6$ M Ω
- **VERY HIGH STABILITY** < 25 ppm/year or < 50 ppm/3 years (shelf life)
- **NEGLIGIBLE RISE TIME** approx. $1 \cdot 10^{-9}$ s.
- **CLIMATIC CATEGORY**
CECC : -55°C / $+155^{\circ}\text{C}$ / 56 days
RCK 02 : -55°C / $+175^{\circ}\text{C}$ / 56 days

RCK02 - RS92 N

RCK04

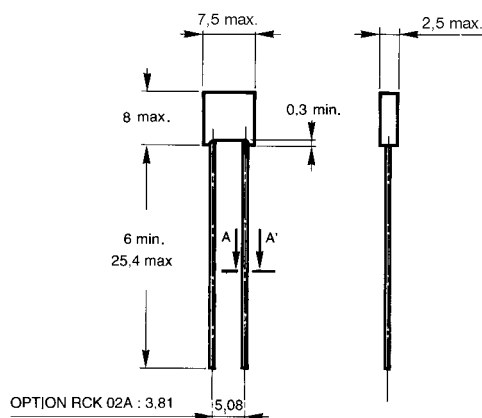


Fig. 1

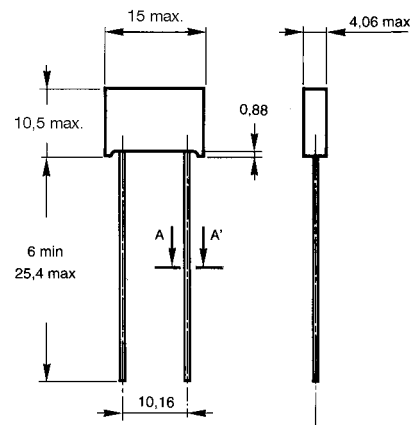
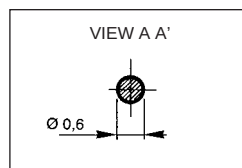


Fig. 2



RCK05

RCK06

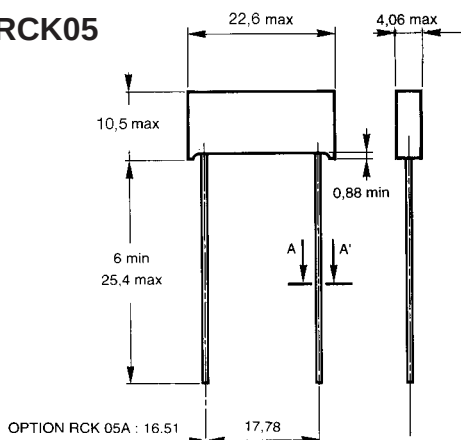


Fig. 3

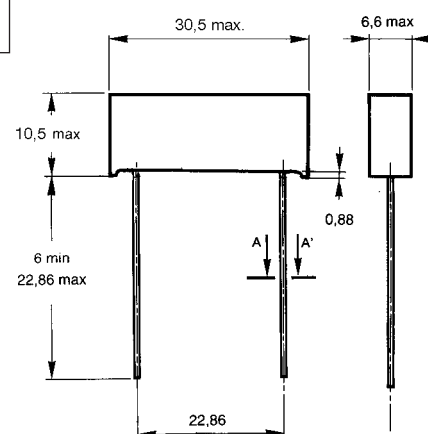


Fig. 4

Dimensions in mm

SPECIFICATIONS

MECHANICAL

MECHANICAL PROTECTION... insulated case
 RESISTIVE ELEMENT... nickel-chromium
 TERMINAL LEADS... tinned copper
 weldable solderable
 type C MIL-STD 1276
 UNIT WEIGHT... 0,3 - 1 - 2 - 4 g

ENVIRONMENTAL

TEMPERATURE LIMITS... -55°C + 175°C
 CLIMATIC CATEGORY... 55 / 155 / 56

ELECTRICAL

RESISTANCE VALUE RANGE... 1 Ω ... 1 MΩ
 RESISTANCE TOLERANCE... ± 0,005% to ± 1%
 POWER RATING... 0,25 W... 2 W
 TEMPERATURE COEFFICIENT... see diagram
 fig. 6 and fig. 7
 DIELECTRIC VOLTAGE... 750 V RMS
 INSULATION RESISTANCE... > 10⁶ MΩ
 THERMAL RESISTANCE... 0,14°C/mW
 THERMAL EMF... < 0,5 μV for 1°C of
 difference between leads
 NOISE... non measurable (> -32dB)

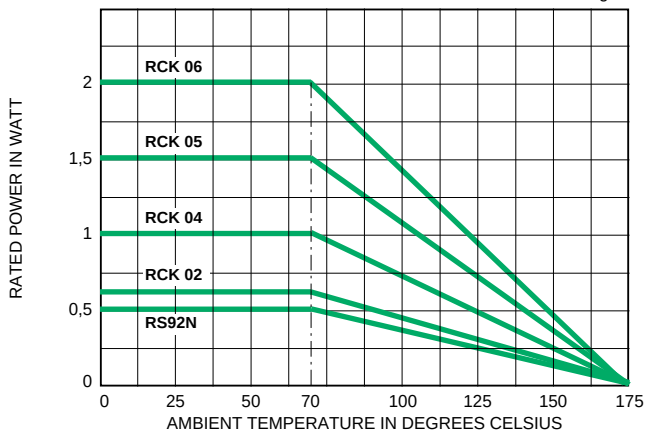
CHARACTERISTICS PER RESISTOR

Table 1

SERIES	RCK 02 / RS 92N	RCK 02 / 02A	RCK 04	RCK 05 / 05A	RCK 06
POWER RATING IN RELATION TO OHMIC VALUES AND AMBIENT TEMPERATURE	80,6 Ω to 120 kΩ 0,5 W at +70°C 0,25 W at +125°C	1 Ω to 100 kΩ 0,6 W at +70°C 0,3 W at +125°C 101 kΩ to 250 kΩ 0,2 W at +125°C	1 Ω to 200 kΩ 1 W at +70°C 0,5 W at +125°C 201 kΩ to 500 kΩ 0,3 W at +125°C	1 Ω to 300 kΩ 1,5 W at +70°C 0,75 W at +125°C 301 kΩ to 750 kΩ 0,4 W at +125°C	0,5 Ω to 400 kΩ 2 W at +70°C 1 W at +125°C 401 kΩ to 1 MΩ 0,5 W at +125°C
TOLERANCES IN RELATION TO OHMIC VALUES	+0,005 % +0,02 % + 0,01 % +0,05 % +0,1 % ± 0,2 % +0,5 % ± 1 %	25 Ω 250 kΩ 12 Ω 250 kΩ 25 Ω 250 kΩ 5 Ω 250 kΩ 2 Ω 250 kΩ 2 Ω 250 kΩ	30 Ω 500 kΩ 10 Ω 500 kΩ 20 Ω 500 kΩ 5 Ω 500 kΩ 1 Ω 500 kΩ	30 Ω 750 kΩ 10 Ω 750 kΩ 20 Ω 750 kΩ 5 Ω 750 kΩ 1 Ω 750 kΩ	30 Ω 1 MΩ 40 Ω 1 MΩ 20 Ω 1 MΩ 5 Ω 1 MΩ 1 Ω 1 MΩ 0,5 Ω 1 MΩ
LIMITING ELEMENT VOLTAGE	200 V	300 V	350 V	350 V	500 V
CRITICAL RESISTANCE AT +70°C	80 kΩ	180 kΩ	122,5 kΩ	208,3 kΩ	281,6 kΩ
TEMPERATURE COEFFICIENT	± 5 ppm/°C	See diagram fig. 6 and fig. 7			

POWER RATING CHART

Fig. 5



POWER RATING

In order to increase stability, it is recommended to reduce the nominal power (P_r) in relation with tolerance.
 For ± 0,1% to ± 0,05% Power = $P_r \times 0,75$
 For ± 0,02% to ± 0,01% Power = $P_r \times 0,5$
 For ± 0,005% Power = $P_r \times 0,25$.

NOISE

< 0,025 μV/V RMS (> -32 dB).

HIGH FREQUENCY CHARACTERISTICS

Very low reactance.
 Shunt capacitance is approximately 1 pF
 Total inductance is approximately 100 nH

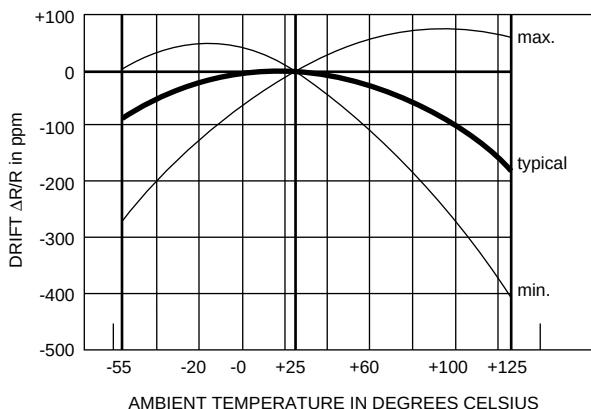
RISE TIME

Approximately 1 nanosecond.
 Allows very high performance in the field of very fast electronics (totally oscillation-free).

TEMPERATURE COEFFICIENTS

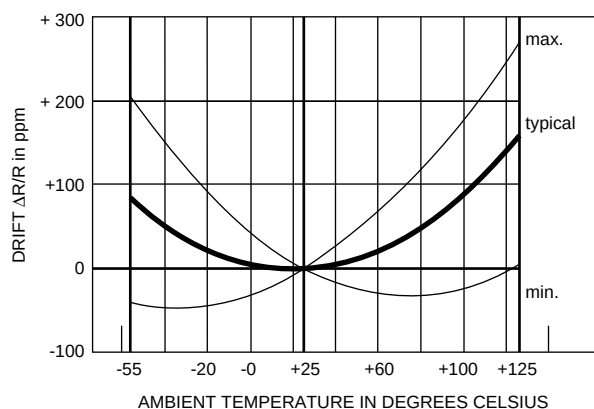
RCK...

Fig. 6



RCK... S 223

Fig. 7



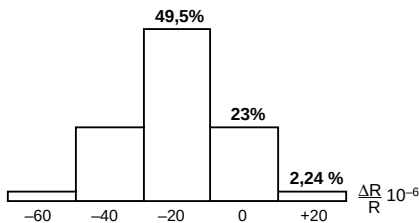
PERFORMANCES

Table 2

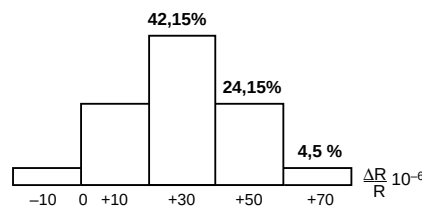
TESTS	CONDITIONS	REQUIREMENTS		TYPICAL DRIFTS
		NF C 83-220 CECC 40300	MIL-R-55182J	
OVERLOAD	2,5 un / 5 s U max. < 2 Un	± 0,01 %	± 0,2 %	± 0,002 %
TEMPERATURE CYCLING	-55°C +155°C 5 cycles CEI 68-2-14 Test Na	± 0,01 %	± 0,05 %	± 0,002 %
TERMINALS STRENGTH	CEI 68-2-21 Test Ua (pulling) Ub (bending) Uc (twisting)	± 0,01 %	± 0,2 %	± 0,002 %
RESISTANCE TO SOLDERING HEAT	260°C/10 s CEI 68-2-20A Test Tb (met. 1A)	± 0,01 %	± 0,1 %	± 0,002 %
VIBRATIONS	10 Hz to 500 Hz 0,75 mm or 10 g 6 h met. B4 CEI 68-2-6 Test Fc	± 0,01 %	± 0,2 %	± 0,002 %
CLIMATIC SEQUENCE	-55°C +155°C 6 cycles 95% R.H. 85 mbar CEI 68-1	± 0,05 % Insulation R>10 ² MΩ	—	± 0,003 % Insulation R>10 ⁴ MΩ
HUMIDITY (STEADY STATE)	56 days 95% R.H. 40°C CEI 68-2-3	± 0,05 % Insulation R>10 ² MΩ	—	± 0,003 % Insulation R>10 ⁴ MΩ
MOISTURE RESISTANCE	Method 106 MIL-STD-202	—	± 0,4 % Insulation R>10 ² MΩ	± 0,02 % Insulation R>10 ⁴ MΩ
LOAD LIFE	1000 h Pr at 70°C 90°/30° cycle	± 0,05 %	± 0,5 %	± 0,05 %
HIGH TEMPERATURE EXPOSURE	1000 h/155°C CEI 68-2-20A Test B	± 0,05 %	± 0,5 %	± 0,01 %
	100 h/175°C Sfernice RCK 02	—	± 0,5 %	± 0,05 %

TYPICAL RESISTANCE DRIFT DIAGRAMS

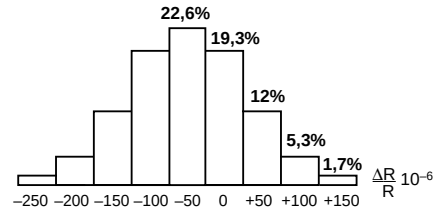
Temperature cycles
(5 cycles from -55°C to +155°C)



Humidity
(56 days at 95% H.R. 40°C)



Load life
(0,33 W at 125°C for 1000 hours)



GENERAL APPLICATIONS

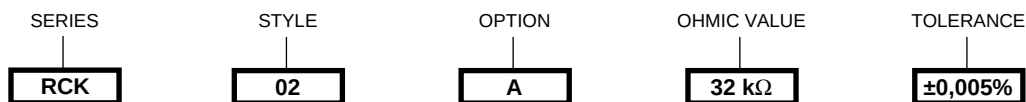
Discrete components : any circuits requiring high precision and high stability, standard resistors, fast rise time applications, high stability applications even under severe temperature variations, circuits for analog computers, etc.

Resistor networks : ladder networks (R-2R), Kelvin-Varley dividers, current source networks, any type of voltage dividers, etc.

MARKING

SFERNICE trademark (except 02 style), series, style, NF style if applicable, nominal resistance (in Ω, kΩ), tolerance (in %), manufacturing date.

ORDERING PROCEDURE



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