

Technical Data Sheet



THICK FILM MATERIALS

Product Type: Resistors
9300 Series



Low TCR Resistor Series

Description

Series 9300 resistors were developed for use in multilayer hybrid circuits. This system provides excellent environmental stability, low firing sensitivity and low TCR's. Resistance values range from 100 ohms/sq up to 100 Mohms/sq.

Key Benefits

- REACH¹ and ROHS² compliant
- Low TCRs
- Excellent stability on dielectric

Typical Properties

9300 Series ¹	9321	9331	9333	9341	9343	9351	9361	9371	9371
Resistivity ² (Ω/□)	100	1K	3K	10K	30K	100K	1M	10M	100M
Tolerance %	± 10	± 10	± 10	± 10	± 10	± 10	± 10	± 10	± 10
TCR ² (ppm/°C)	± 25	± 25	± 25	± 25	± 25	± 25	± 25	± 25	± 25
Short term overload voltage ³ (V/mm)	27	71	125	205	275	470	775	1200	600
Standard working voltage ⁴ (V/mm)	10.8	28.4	50	82	110	188	310	480	240
Quan tech noise ⁵ (db)	< -35	< -25	-13	> -17	-16	> -15	> -0.4	-	-
ESD ⁶ (2000V/mm)	± 0.1 %	± 0.1 %	0.2 %	± 0.4 %	± 0.5 %	± 0.3 %	± 0.1 %	< 0.1 %	0.1 %

TEST CONDITIONS

1. Resistor properties based on laboratory tests using recommended processing conditions;
Termination: 3504 Palladium Silver Conductor pre-fired at 850 °C
Substrate: 96 % alumina
Printing: 280 mesh stainless screen, 0.5 mil emulsion thickness
Dried thickness: 20 – 22 μm
Firing: 30 minute cycle to peak temperature of 850 °C for 10 minutes.
2. Resistor geometry: 1mm x 1mm
CTCR: -55 °C to +25 °C and HTCR: +25 °C to +125 °C.
3. Short Term overload voltage. Voltage required (5 second duration) to induce a resistance change to 0.1% in a 1mm x 1mm resistor at 25 °C.
4. Standard working voltage = 0.4 x short term overload voltage.
5. Resistor geometry 5mm x 1mm.
6. Electrostatic Discharge. Resistance change after two X 2000 volt pulses on a 1mm x 1mm resistor.

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Thinner:

RV-372

Warranty:

Material guaranteed to meet specifications for 6 months from date of shipment.

Storage:

Store in a dry location at 5 – 25 °C.

DO NOT REFRIGERATE.

Allow paste to come to room temperature prior to opening. Spatulate well before using, as settling may occur during storage.

Legend:

1) REACH compliant according to the latest * Annex XIV to Regulation (EC) of the European Parliament and of the council on the Registration, Evaluation, Authorisation and Restriction of Chemicals ("REACH") by European Chemicals Agency and its subsequent amendments; the material does not contain any substance listed in Annex XIV.

2) RoHS compliant according to the latest * Directives (European Union) of Restriction of Hazardous Substances ("RoHS") and its subsequent amendments (including the exceptions related to Pb)

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