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CERMET RESISTOR SYSTEM

3980 SERIES

- **FOR HYBRID CIRCUITS & DISCRETE COMPONENTS**
- **HIGH PERFORMANCE**
- **LOW COST**
- **EASY PROCESSING**
- **OUTSTANDING VOLTAGE STABILITY**
- **EXCELLENT LASER TRIM STABILITY**

The 3980 Resistor Series are ruthenium based resistor pastes designed for use in thick film hybrid microelectronic circuits and discrete components. They meet the most demanding telecommunication, aerospace, and medical applications and combine high performance, low cost, with ease of processing. The 3980 Resistor Series exhibits outstanding voltage, thermal, laser trim and load stability.

PASTE DATA

STIR WELL BEFORE USE

RHEOLOGY:	Thixotropic screen printable paste
VISCOSITY: (Brookfield RVT, ABZ spindle, 10 RPM, 25.5°C±0.5°C)	225±25 Pa•s
SHELF LIFE:	6 months

PROCESSING

SCREEN MESH/EMULSION:		200/12.5 µm
LEVELING TIME: (25°C)		5-10 minutes
DRYING TIME: (125°C)		10-15 minutes
FIRING TEMPERATURE:		850°C
	TIME AT PEAK:	10-12 minutes
	TOTAL CYCLE:	45 minutes
TERMINATIONS:		9635-A

ESL Affiliates
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THINNER: ESL 401

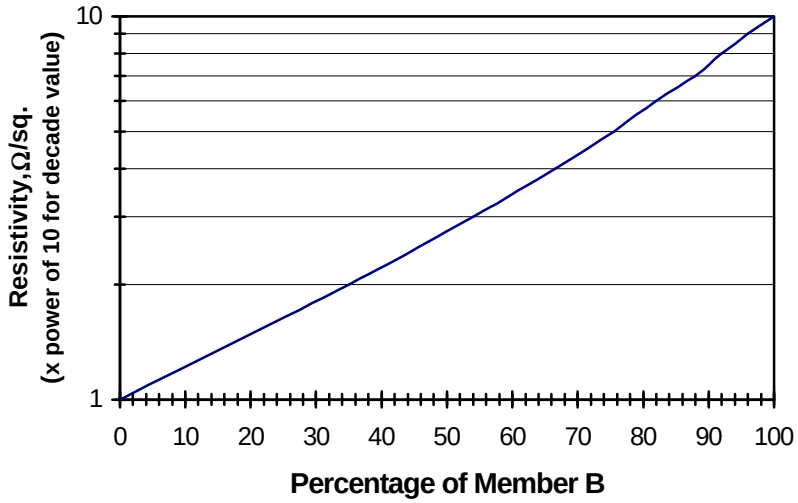
SUBSTRATE OF CALIBRATION: 96% alumina

3980 RESISTOR SERIES – TYPICAL PROPERTIES

PROPERTIES	3980	3981	3982	3983	3984	3985	3986	3987
Viscosity (Pa·s)	225±25							
Resistivity (Ω/sq.)	1	10	100	1 k	10 k	100 k	1 M	10 M
Tolerance(%)	±25%	±10%	±10%	±10%	±10%	±10%	±10%	±10%
Coefficient of Variation (%)	≤8	≤8	≤5	≤7	≤7	≤6	≤6	≤6
Dried Thickness	22.5±2.5µm							
Average TCR (ppm/°C)	150±100	±100	±100	±50	±50	±50	±100	-50±100
STOL (V/mm)[a]	--	5.91	23.6	78.7	217	492	--	--
Standard Working Voltage (V/mm)[b]	--	2.36	9.45	31.5	86.6	197	--	--
Maximum Rated Power (mW/mm^2)[c]	--	559	890	990	753	387	--	--
Noise (dB)[d]	--	-30	-20	-10	0	10	--	--
Laser Trim (%ΔR)	--	--	±0.3	±0.3	±0.3	±0.3	±0.3	±0.3

a. STOL: Voltage required, 5 seconds duration, to induce a resistance change of ±0.1% in a 1 mm x 1 mm resistor at 25°C; limited to 500 VDC.
b. Standard Working Voltage: 0.4 x STOL voltage.
c. Maximum Rated Power: $(\text{Standard Working Voltage})^2$ / resistance.
d. Noise: Quan Tech noise measured on a 1.25 mm x 1.25 mm resistor.

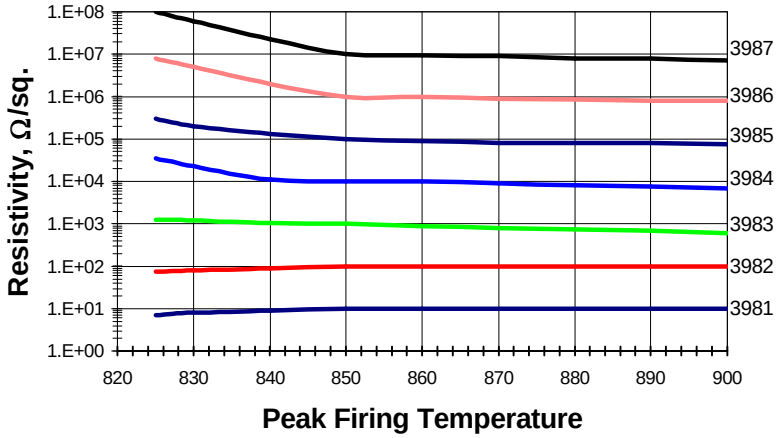
Typical Blending Curve -- 3980 Series



TYPICAL BLENDING OF ADJACENT DECADE VALUES

A	B
3981	3982
3982	3983
3983	3984
3984	3985
3985	3986

3980 Series --Typical Resistivity vs. Peak Firing Temperature



3980 Series --Typical Resistivity vs. Peak Firing Temperature