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THERMISTOR COMPOSITION

NTC-2100 SERIES

FEATURE DESIGN FLEXIBILITY, SMALLER SIZE, AND ECONOMIC ADVANTAGES COMPARED TO DISCRETE THERMISTORS

The NTC-2100 Series of thermistor pastes are designed for making negative temperature coefficient thermistor films. They are printed and fired on ceramic substrates using typical thick film processing. These materials are used in applications where the thermistor is to be intimately bonded to the substrate, such as temperature compensation of hybrid circuits. This design flexibility, decreased size and lower cost are advantageous when compared to discrete thermistor components.

Designation	Average Beta (ß) -55°C to 125°C	Nominal Sheet Resistivity*	Resistance Range (Ω)**
NTC-2131	300	30	3 to 300
NTC-2112	725	100	10 to 1 k
NTC-2113	1700	1 k	100 to 10 k
NTC-2114	2125	10 k	1 k to 100 k
NTC-2115	2500	100 k	10 k to1 M
NTC-2116	3100	1,000 k	100 k to 10 M

Notes: * 0.040 x 0.040 Resistor, Ω/square at a dry print thickness of 22.5 µm.

** Resistive Element Geometry ranging from 1/10 of a square to 10 squares

Beta Tolerance of ±20%

Resistivity Tolerance of ±20%; except NTC-2115 and NTC-2116, ±30%

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Resistive Element Geometry / Sheet Resistivity

Consider the resistive element (resistor material) between the termination materials as a rectangular solid. It has thickness t, length l, (distance between terminations) and width w, (distance perpendicular to terminations). The ratio of the resistive element length to width (l:w) is called the number of squares. Resistive element geometry is an important consideration when designing a thick film circuit.

A resistance value can be targeted by multiplying the Nominal Sheet Resistivity by the resistive element geometry. ESL NTC-2100 Series materials retain their sheet resistivity over resistive element geometry ranging from 1/10 of a square to 10 squares.

PASTE DATA

RHEOLOGY:	Thixotropic, screen printable paste
VISCOSITY: (Brookfield RVT, 10 rpm, ABZ spindle, 25.5°C±0.5°C)	250±50 Pa·s
SHELF LIFE:	6 months

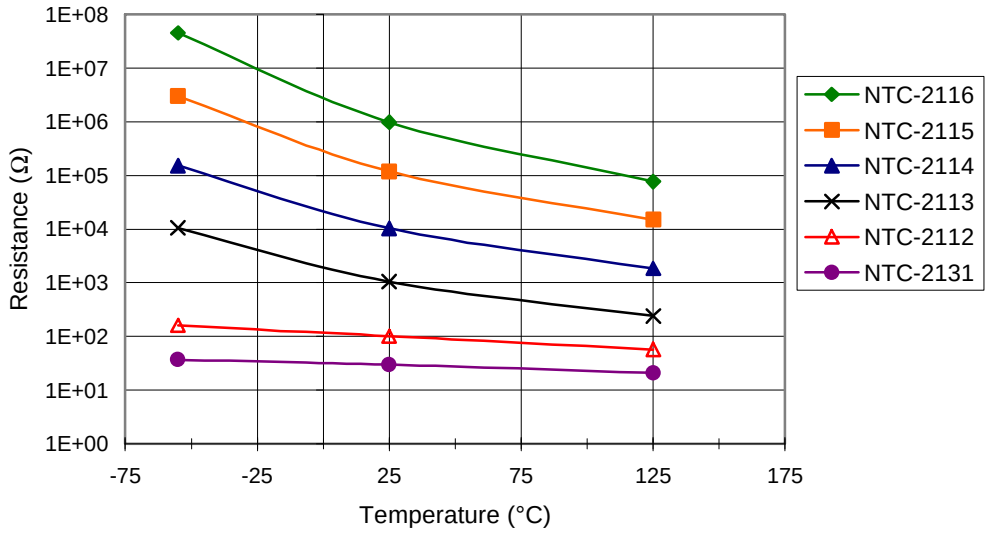
PROCESSING

SCREEN MESH/EMULSION:	200/10-25 µm
LEVELING TIME:	5-10 minutes
DRYING TIME AT 125°C:	10-15 minutes
FIRING TEMPERATURE:	850°C (in air)
SUBSTRATE FOR CALIBRATION:	96% alumina
RECOMMENDED TERMINATIONS:	5837 (PtAu), 9635-A (AgPd)
OVERGLAZE: (1-2 minutes at a peak temperature of 490°C)	4782
STABILIZATION: (After overglaze)	150°C for 16 hours
THINNER:	ESL 437

TYPICAL PROPERTIES

DRY PRINT THICKNESS: 20-25 µm

NTC-2100 Series Resistance vs. Temperature



RECOMMENDED PROFILE FOR THE NTC-2100 SERIES THERMISTORS