

Micromax™ 0060A

Electronic Inks & Pastes

PRODUCT DESCRIPTION

00X0A Resistor Series

Designed to give an ideal balance of properties, the Micromax™ 00x0A Series has been specifically developed for Chip Resistor applications. Excellent electrical properties have been achieved while satisfying the market needs of lower overall cost, smaller resistors and process insensitivity when used with high silver terminations. Micromax™ 00X0A Series is fully blendable allowing a wide range of resistance without sacrifice of electrical properties.

The series is Cadmium, Nickel and Phthalate free*.

Product benefits

- Exceptional ESD stability
- Excellent power handling stability
- Low Quan-Tech noise
- Well controlled TCRs
- Small TCR length and thickness effects
- Linear blend behavior of electrical properties between adjacent members
- Excellent thermal cycle stability
- Cadmium, Nickel and Phthalate free*

*Cadmium, Nickel and Phthalate 'free' as used herein means that cadmium, nickel and phthalate are not intentional ingredients in and are not intentionally added to the referenced product. Trace amount however may be present.

Processing features

- Co-fireable with specified termination
- Optimized high resolution printing speeds of up to 30cm/sec
- Fast firing – 850°C/30 minute profile

READ ENTIRE TECHNICAL DATA SHEET BEFORE USING THIS PRODUCT

PRODUCT INFORMATION

Application	Chip resistor
Solvent or thinner	Micromax™ 8250(T)
Blend member or series	00X0Asrs

TECHNICAL DATA

Rheological Properties	Value	Unit
Viscosity ¹	110 to 180	Pa.s

Application Technique	Value	Unit
Mask mesh	250 to 325	
Mask emulsion	10 to 15	µm
Drying time	10 to 15	min
Drying temperature	150	°C
Recommended film thickness	18 to 22	µm
Leveling time	5 to 10	min

Electrical Properties	Value	Unit
Resistivity ²	0.85 to 1.15	MOhm per square
Hot Temperature Coefficient Resistance ³	20 to 40	ppm/°C
Cold Temperature Coefficient Resistance ⁴	-60 to 0	ppm/°C
Electrostatic discharge ⁵	-0.1 to 0.1 (avgDeltaR)(%)	
Noise ⁶	≤-6	dB

Storage and Stability	Value	Unit
Shelf life ⁷	6	months

¹Brookfield HAT 10 rpm, UC&SP; (SC4-14/6R), 25°C ± 0.2°C

²Unless otherwise noted, resistors were printed on Micromax™ 5426 terminations at 18-22µm dried thickness, then co-fired in 30 minute cycles with 850°C peak for 10 minutes. Resistor geometry is 0.8 x 0.8mm.

³Temperature coefficient of resistance from 25°C to 125°C for Hot TCR.

⁴Temperature coefficient of resistance from 25°C to -55°C for Cold TCR.

⁵Electrostatic discharge using 100pF/1500Ω R/C network. Untrimmed resistors, 0.8mm x 0.8mm.

⁶Using Quan-Tech Model 315C meter, untrimmed 0.8mm x 0.8mm resistors.

⁷in unopened containers, from date of shipment, stable environment at room temperature between 5°C - 30°C

PROCESSING GUIDELINES

Terminations

Micromax™ 00x0A resistors were designed for use with high silver-containing terminations. Reported properties were obtained using Micromax™ 5426 Ag/Pd termination. Data with other terminations is available.

Blendability

Micromax™ 00x0A Series is blendable between each adjacent member.

Substrates

Reported properties are based on tests with 96% alumina substrates. Good performance properties have also been observed on Micromax™ QM44 dielectric. Substrates of other compositions may yield variation in performance properties.

Printing

Unless otherwise noted, properties are based on resistors printed to $20 \pm 2 \mu\text{m}$ dried thickness. This can be achieved by using 250-325 mesh screens with emulsions of 10-15 μm . Resistors smaller than 0.3x0.3mm will require finer mesh screen to achieve the desired print resolution. Although Resistance and TCR values will change, similar functional properties have been observed with thinner dried film prints (<18 μm). To optimize laser trainability, dried thickness >22 μm should be avoided.

Thinning

Micromax™ 00x0A Series has been optimized for screen printing and thinning is not normally required or recommended. Micromax™ 8250 thinner may be added sparingly to compensate for evaporative losses.

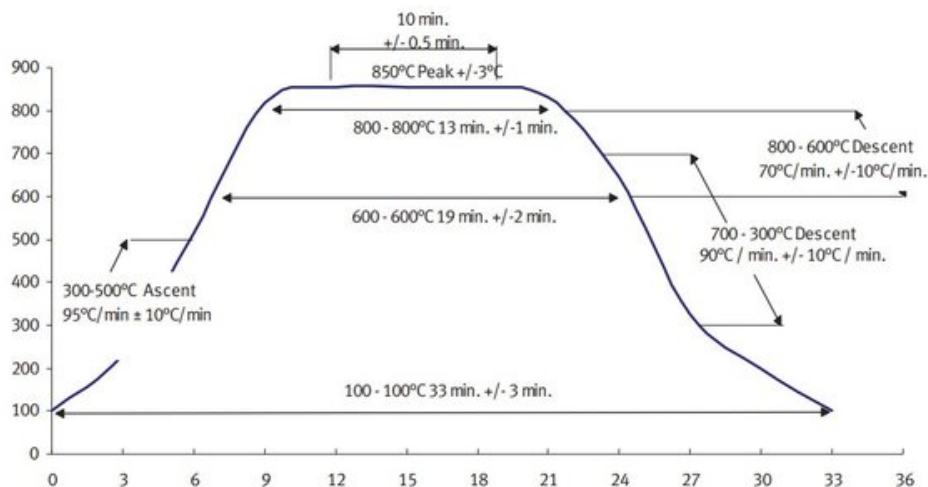
Drying

Parts should be allowed to level at room temperature and then dried.

Firing

Properties are based on a 30 minute firing cycle (100°C - 100°C) with 10 minutes at a peak temperature of 850°C. Micromax™ 00x0A was designed to allow cofiring of selected termination materials with the resistors. See sample furnace profile.

Typical 30 Minute Furnace Profile



Storage and shelf life

Containers should be stored, tightly sealed, in a clean, stable environment at room temperature between 5°C - 30°C. Shelf life of material in unopened containers is 6 months from date of shipment. Some settling of solids may occur and compositions should be thoroughly mixed prior to use.

Storage conditions on the product data sheets are intended to represent long-term material storage recommendations and not a shipping or temperature-at-receipt requirement.

Transportation: Under normal shipping conditions, without temperature control, Micromax™ products are not expected to exhibit a change in quality or fitness for use. Should extraordinary events result in extended transportation periods, Micromax™ recommends customers confirm products remain suitable for the intended application.

Safety and handling

For safety and handling information pertaining to this product, read Safety Data Sheet (SDS).

SAFETY & WARNING

It is recommended that the company/operator read and review the Safety Data Sheets for the appropriate health and safety warnings before use.

Safety Data Sheets are available.

WASTE TREATMENT

Prior to using any recommendations or suggestions for waste treatment, the user is required to know the appropriate local/state/federal regulations for on-site or off-site treatment which may require permits. If there is any conflict regarding our recommendations, local/state/federal

regulations take precedence.

CONTACT INFORMATION

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Also read carefully warning and safety information on the Safety Data Sheet. This data sheet contains technical information required for safe and economical operation of this product. READ IT THOROUGHLY PRIOR TO PRODUCT USE. Emergency safety directory assistance: US 1 202 464 2554, Europe + 44 1235 239 670, Asia + 65 3158 1074, Brazil 0800 707 7022 and 0800 172 020, Mexico 01800 002 1400 and (55) 5559 1588

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