Micromax™ QM44

Electronic Inks and Pastes

Dielecttic

Micromax™ QM44 is a filled, crystallizable screen printed thick film dielectric composition and is an integral element of the Micromax™ QM44 multilayer system. It is a versatile dielectric for use in both high reliability and low cost MCM (Multi-Chip Module) and hybrid interconnect applications.

Product benefits

- Broad conductor compatibility (gold, silver, and mixed metal)
- Thin, 2 print, hermetic dielectric film.
- High resistance to E.M.F. (electro-motive force) blistering and shorting.
- Robust electrical and mechanical properties.
- Compatible co-fire conductors.

Product information

Solvent or thinner	Micromax™ 4553

Rheological properties

Viscosity	80 - 120[1]	Pa.s

[1]: Brookfield HBT, UC&SP, 50rpm, 25 °C

Application technique

Mask mesh	230 - 280	
Drying time	10 - 15	min
Drying temperature	150	°C
Theoretical coverage	110 - 130[2]	cm^2/g
Recommended film thickness, fired	28 - 32	µm
Via, diameter resolution	250 - 300	µm
Leveling time	5 - 10	min

[2]: based on a fired thickness of 14 µm

Electrical properties

Dielectric Constant	8 - 10[3]	
Dissipation Factor	≤0.2[3]	%
Insulation Resistance, DC	≥1E12	Ohm
Surface Leakage Current	≤1[5]	$µA/cm^2$
Breakdown Voltage	≥1000	V

[3]: at 1 KHZ

[4]: at 100VDC

[5]: Standard measurements made after 5 min at 10 VDC.

[6]: at 30µm

Micromax™ QM44

Electronic Inks and Pastes

Storage and stability

Shelf life	6[7] months

[7]: in unopened containers, from date of shipment, at room temperature (<25°C)

Additional information

How to use

Processing

- Substrates
  - Properties are based on tests on 96% alumina substrates. Substrates of other compositions and from various manufacturers may result in variations in performance properties.
- Printing
  - Printing should be carried out in a clean and well ventilated area. The combined fired thickness of the dielectric should be 30±2 µm. This can generally be obtained by printing the individual layers with a 230-280 mesh stainless steel screen at speeds of 6 ips.
- Drying
  - Allow prints to level at room temperature, then dried.
- Firing
  - Fire each dielectric print separately in well ventilated moving conveyor furnace, in air. A 30-minute cycle with a peak temperature of 850°C held for 10 minutes should be used.

Properties

Typical Fired & Electrical Properties

Test	Properties
Max.no.circuit layers	< 8
Camber*1 (mil/in)	< 2
EMF Blister Resistance*2 (firings)	> 30

*1 Measured deflection of 5"x1" substrate with 5 circuit layers. Single-sided.
*2 Maximum no. of firings performed without blisters observed with Substrate/gold/dielectric/silver configuration.

Information in this datasheet shows anticipated typical physical properties for Micromax™ QM44 based on specific controlled experiments in our labs and are not intended to represent the product specifications, details of which are available upon request.

System Elements

Micromax™ QM44

Electronic Inks and Pastes

	Silver	Mixed Metal	Gold
Top Conductor	Micromax™ QM22 (3:1) Micromax™ 7484 (3:1) Micromax™ 6277 (6:1) Micromax™ QM18 (100:1)	Micromax™ 5771 (Gold) Micromax™ 4597R (Solderable) Micromax™ QG150 (Fine line)	Micromax™ 5771 Micromax™ 4597R Micromax™ QG150
Inner Conductor	Micromax™ QM17 (Pt/Ag) Micromax™ QM14 (Ag)	Micromax™ QM17 Micromax™ QM14	Micromax™ 5771 Micromax™ QG150
Via Fill	Micromax™ QM34	Micromax™ QM34 (Inner) Micromax™ QM35 (Top)	Micromax™ 5747
Resistor Series	Micromax™ S1X0	Micromax™ S1X0	Micromax™ S1X0

Micromax™ QM14, QM17, QM18, QM22, QM34, QM35, QG150, 5771 denotes that the conductor may be cofired on Micromax™ QM44.

Dielectric

• Micromax™ QM44 : A filled, crystallizable, two print Dielectric Compositon.

Silver Conductors

• Micromax™ QM22 : A unique 3:1 silver/palladium, cofire or sequentially fire, not for aluminum Wirebonding.
• Micromax™ 7484 : 3:1 silver/palladium sequentially fire only, used when Al wire bonding is needed.
• Micromax™ 6277 : 6:1 silver/palladium sequentially fire only.
• Micromax™ QM17 : Silver/palladium, cofire or sequentially fire internal conductor, sequentially fire top conductor for traces only.
• Micromax™ QM18 : Silver/palladium, cofire or sequentially fire top conductor.
• Micromax™ QM14 : Silver, cofire or sequentially fire internal conductor, sequentially fire top conductor, sequentially fire top conductor for traces only.
• Micromax™ QM34 : A unique silver via fill, cofire or sequentially fire, not for connecting silver to gold conductors.
• Micromax™ QM35 : A unique silver/platinum via fill, used as transition via for connecting silver to gold conductors, not recommended for stacked vias.

Gold Conductors

• Micromax™ 5771 : A general purpose cadmium-free* gold, internal & top conductor, cofire or sequentially fire, not for large (>2 mil) aluminum wire bonding.

Micromax™ QM44

Electronic Inks and Pastes

• Micromax™ QG150 : Cadmium-free* high density gold conductor, cofire or sequentially fire.
• Micromax™ 4597R : Cadmium-free* replacement of Micromax™ 4596 (solderable gold), cofire or sequentially fire.
• Micromax™ 5747 : Cadmium-free* replacement of Micromax™ 5727 (gold via fill), cofire or sequentially fire.

Resistors

• Micromax™ S1X0 : Variant of Micromax™ 2000 Series Resistor Composition for Micromax™ QM44, 10 ohm-1Meg ohm, sequentially fire.

*Cadmium 'free' as used herein means that these are not intentionally added to the referenced product. Trace amounts however may be present.

Storage and shelf life

Containers should be stored, tightly sealed, in a clean, stable environment at room temperature (<25°C). Shelf life of material in unopened containers is six months from date of shipment. Some settling of solids may occur and compositions should be thoroughly mixed prior to use.

Safety and handling

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

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