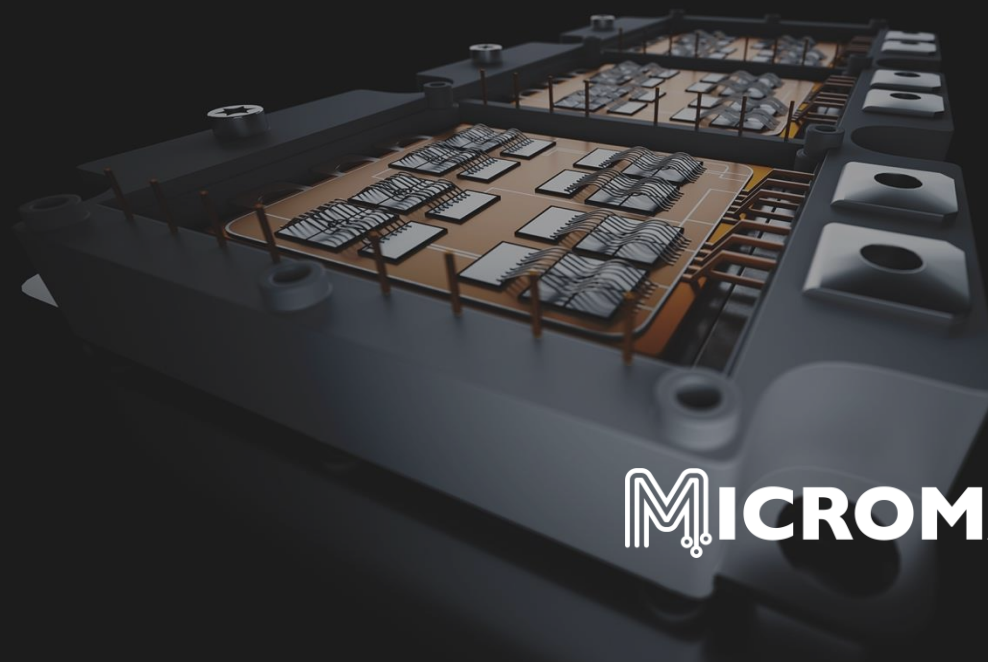




Micromax™ Product Selector Guide

Introducing Micromax™ Conductive Inks



MICROMAX™

Automotive

Enhancing the Safety and
Comfort of ICEs and EVs
Under Tough Conditions



Key Applications

Micromax™ enables smaller, faster, thinner, and more reliable electronics for automotive control, motion control, touch, and fluid level sensors.



- Human-machine interface
- Electronic control units
- Radar applications
- Battery conditioning
- Automatic transmission control
- Injector heaters, glow-plugs, piezoelectric actuators
- Direct injection systems
- Seat occupation sensors
- Cabin and steering wheel heating
- Mirror heating
- Window defogger and transponder
- Rear lights
- LED light demister
- HV coolant heaters
- Power modules

Use Micromax™ fired-on and polymer thick film pastes and glass ceramic tapes to integrate automotive electronic circuitry on metal, polymer, glass, and ceramic substrate surfaces.

Turn to Micromax™ for:

- Thick film pastes for hybrid ceramic circuits (HCC)
- Low-temperature co-fired ceramic (LTCC) materials
- Printed polymer sensor materials
- Solutions that enable heater patterns on multiple substrates
- Thermoformable pastes to create In-Mold Electronics devices

Automotive

Product	Technology	Paste Type	Application(s)	Composition	Feature
3391	Functional Pastes/Inks	Conductor Paste/Ink	Defogger	Silver	Lead free
3392	Functional Pastes/Inks	Conductor Paste/Ink	Defogger	Silver	Lead free
3393	Functional Pastes/Inks	Conductor Paste/Ink	Defogger	Silver	Lead free
5025	Functional Pastes/Inks	Conductor Paste/Ink	Sensor: Cockpit HMI, capacitive sw itching Heater: Seat, Heater: Panel/Surface Heater: Mirror	Silver	Best general-purpose Ag for higher temperature operations Compatible w ith a variety of substrate types: Polyester, Polyimide, Paper, Epoxy glass
5028	Functional Pastes/Inks	Conductor Paste/Ink	LED lighting	Silver	High conductivity signal lines
5056	Functional Pastes/Inks	Dielectric Paste/Ink	LED lighting	Dielectric	Flexible solder mask and w hite reflector
5499	Functional Pastes/Inks	Encapsulant Paste/Ink	HV coolant heater	Dielectric	Glass encapsulant
5775	Functional Pastes/Inks	Conductor Paste/Ink	Various	Gold	Heavy Al w ire bonding
6690	Functional Pastes/Inks	Conductor Paste/Ink	Defogger	Silver	
6691	Functional Pastes/Inks	Conductor Paste/Ink	Defogger	Silver	
7162	Functional Pastes/Inks	Electroluminescent Paste/Ink	Electroluminescent	Translucent	Front translucent electrode
7292	Functional Pastes/Inks	Conductor Paste/Ink	Heaters	Carbon	PTC composition for self-limiting heaters
8153	Functional Pastes/Inks	Electroluminescent Paste/Ink	Electroluminescent	Dielectric	High dielectric constant
9169	Functional Pastes/Inks	Conductor Paste/Ink	OLED lighting, touch panels/smart glass	Silver	Bus lines, good adhesion to ITO
3500N	Functional Pastes/Inks	Dielectric Paste/Ink	HV coolant heater	Dielectric	Insulation for stainless steel substrates
3510N	Functional Pastes/Inks	Resistor Paste/Ink	HV coolant heater	Resistor	Resistor w ith defined R/TCT properties
3515N	Functional Pastes/Inks	Resistor Paste/Ink	HV coolant heater	Resistor	Resistor w ith defined R/TCT properties
5780R	Functional Pastes/Inks	Conductor Paste/Ink	Various		Fine Au w ire bonding, etchable
5785R	Functional Pastes/Inks	Conductor Paste/Ink	Various	Gold	Fine Al and Au w ire bonding
8150L/8152B	Functional Pastes/Inks	Electroluminescent Paste/Ink	Electroluminescent	Phosphor	White and blue-green phosphors
9141R	Functional Pastes/Inks	Conductor Paste/Ink	Various	Platinum	Standard platinum
9145/8144	Functional Pastes/Inks	Electroluminescent Paste/Ink	Electroluminescent	Silver/Carbon	Rear electrode / Front bus bar
9475R	Functional Pastes/Inks	Conductor Paste/Ink	Various	Silver/Palladium	3:1 Ag/Pd
9896R	Functional Pastes/Inks	Conductor Paste/Ink	Various	Platinum	Fritless platinum, for laser w elding

Automotive

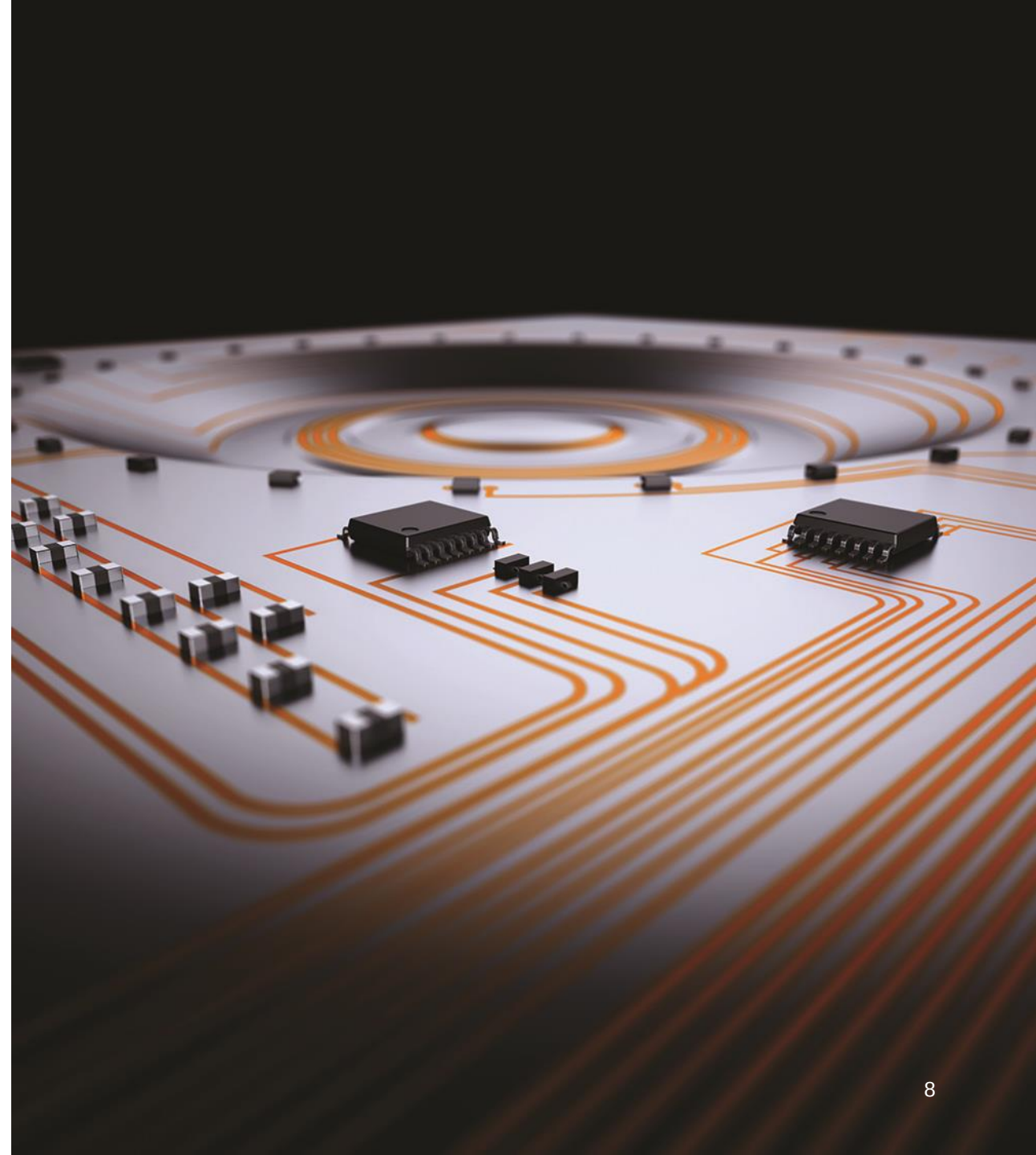
Product	Technology	Paste Type	Application(s)	Composition	Feature
9903	Functional Pastes/Inks	Conductor Paste/Ink	Defogger	Silver	
9903B	Functional Pastes/Inks	Conductor Paste/Ink	Defogger	Silver	
9912	Functional Pastes/Inks	Conductor Paste/Ink	Defogger	Silver	
9912B	Functional Pastes/Inks	Conductor Paste/Ink	Defogger	Silver	
9915B	Functional Pastes/Inks	Conductor Paste/Ink	Defogger	Silver	
AS100	Functional Pastes/Inks	Dielectric Paste/Ink	HV coolant heater	Dielectric	Insulation for Al substrates
AS300	Functional Pastes/Inks	Conductor Paste/Ink	HV coolant heater	Silver	Solderable Ag conductor for AS100 dielectric
AS320	Functional Pastes/Inks	Conductor Paste/Ink	Various	Silver	Via fill for AS system
CB230	Functional Pastes/Inks	Conductor Paste/Ink	LED lighting	Silver/Copper	Solderable contact pad
DA510	Functional Pastes/Inks	Conductor Paste/Ink	Power modules	Silver	Sinter silver for die and heat sink attach
HT702	Functional Pastes/Inks	Thermally Conductive Paste/Ink	Heaters	Dielectric	High temperature operation up to 300°C
HT802	Functional Pastes/Inks	Thermally Conductive Paste/Ink	Heaters	Silver	High temperature operation up to 300°C
LF100	Functional Pastes/Inks	Conductor Paste/Ink	Various	Silver/Palladium	200:1 Ag/Pt
LF122	Functional Pastes/Inks	Conductor Paste/Ink	Various	Silver/Palladium	Lead free 6:1 silver palladium conductor
LF131	Functional Pastes/Inks	Conductor Paste/Ink	HV coolant heater	Silver	Solderable Ag on 3500N
LF142	Functional Pastes/Inks	Conductor Paste/Ink	Various	Gold/Palladium	Lead free solderable Au
LF151	Functional Pastes/Inks	Dielectric Paste/Ink	Various	Dielectric	Multilayer dielectric
LF162	Functional Pastes/Inks	Encapsulant Paste/Ink	Various	Encapsulant	850C glass
LF172	Functional Pastes/Inks	Conductor Paste/Ink	Various	Silver/Platinum	100:1 Ag/Pt
LF231	Functional Pastes/Inks	Conductor Paste/Ink	Thermal vias, DBC replacement	Silver	Ultra thick printing
LF911	Functional Pastes/Inks	Conductor Paste/Ink	Various	Copper	900C Copper
LFXXA	Functional Pastes/Inks	Resistor Paste/Ink	Various	Resistor	1R - 10M hybrid resistor series

Automotive

Product	Technology	Paste Type	Application(s)	Composition	Feature
ME102	Functional Pastes/Inks	Conductor Paste/Ink	Heaters, RFID, antennae	Silver	Thermoformable
ME201	Functional Pastes/Inks	Conductor Paste/Ink	HMI devices, 3D capacitive switches	Carbon	Thermoformable
ME201	Functional Pastes/Inks	Conductor Paste/Ink	In-mold electronics	Carbon	Formable carbon overprint
ME602	Functional Pastes/Inks	Conductor Paste/Ink	HMI devices, 3D capacitive switches	Silver	Thermoformable
ME602	Functional Pastes/Inks	Conductor Paste/Ink	In-mold electronics	Silver	Formable conductors, good adhesion to polycarbonate
ME603	Functional Pastes/Inks	Conductor Paste/Ink	HMI devices, 3D capacitive switches	Silver	Thermoformable
ME604	Functional Pastes/Inks	Conductor Paste/Ink	HMI devices, 3D capacitive switches	Silver	Thermoformable
ME614	Functional Pastes/Inks	Conductor Paste/Ink	HMI devices, 3D capacitive switches	Silver	Thermoformable, laser ablatable
ME778	Functional Pastes/Inks	Dielectric Paste/Ink	HMI devices, 3D capacitive switches	Dielectric	Thermoformable
ME778	Functional Pastes/Inks	Dielectric Paste/Ink	In-mold electronics	Dielectric	Formable dielectric, white solvent-based crossover
ME779	Functional Pastes/Inks	Dielectric Paste/Ink	HMI devices, 3D capacitive switches	Dielectric	Thermoformable
ME780	Functional Pastes/Inks	Encapsulant Paste/Ink	HMI devices, 3D capacitive switches	Dielectric	Thermoformable
ME780	Functional Pastes/Inks	Dielectric Paste/Ink	In-mold electronics	Dielectric	Formable transparent protective overprint
ME801	Functional Pastes/Inks	Conductor Paste/Ink	HMI devices, 3D capacitive switches	PEDOT	Thermoformable
ME801	Functional Pastes/Inks	Conductor Paste/Ink	In-mold electronics	Transparent	Formable organic transparent conductor
ME902	Functional Pastes/Inks	Adhesive	HMI devices, 3D capacitive switches	Silver	Electric conductive adhesive
ME902	Functional Pastes/Inks	Conductor Paste/Ink	In-mold electronics	Silver	Conductive adhesive for electronic component attach
PE410	Functional Pastes/Inks	Conductor Paste/Ink	OLED lighting	Silver	Ink-jet nano-Ag for bus and grid lines
QQ620	Functional Pastes/Inks	Encapsulant Paste/Ink	Various	Encapsulant	620C glass
THR35	Functional Pastes/Inks	Conductor Paste/Ink	Various	Gold	Thru hole conductor

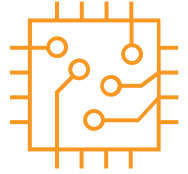
In-Mold Electronics

Enhancing Aesthetic Effects
and Simplicity



Key Applications & Advantages

In-Mold Electronics



Micromax™ IME inks withstand the intense stretching and high temperatures of thermoforming and injection molding, opening new design possibilities for:

- Appliances
- Automotive
- Aerospace
- Consumer electronics



70% Weight Reduction



40% Less Assembly Time



30% Production Cost Reduction

In-Mold Electronics

Product	Technology	Paste Type	Application(s)	Composition	Feature
ME102	Functional Pastes/Inks	Conductor Paste/Ink	In-mold electronics	Silver	Formable low stretch conductor for antennae and interconnects
ME201	Functional Pastes/Inks	Conductor Paste/Ink	In-mold electronics	Carbon	Formable carbon overprint
ME602	Functional Pastes/Inks	Conductor Paste/Ink	In-mold electronics	Silver	Formable conductors, good adhesion to polycarbonate
ME778	Functional Pastes/Inks	Dielectric Paste/Ink	In-mold electronics	Dielectric	Formable dielectric, w hite solvent-based crossover
ME780	Functional Pastes/Inks	Dielectric Paste/Ink	In-mold electronics	Dielectric	Formable transparent protective overprint
ME801	Functional Pastes/Inks	Conductor Paste/Ink	In-mold electronics	Transparent	Formable organic transparent conductor
ME902	Functional Pastes/Inks	Conductor Paste/Ink	In-mold electronics	Silver	Conductive adhesive for electronic component attach

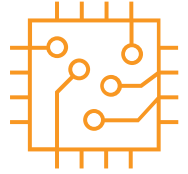
Printed Electronics

Making Everyday Objects
Smart and Interconnected



Key Applications

Printed Electronics



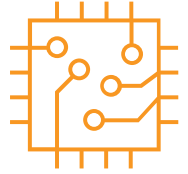
Micromax™ low-temperature curing inks for flexible substrates enables a variety of advanced printed electronics applications.



- Flexible & stretchable printing
- Printed circuit boards
- Digital printing
- Touch panels/smart glass
- Membrane switches and interconnects
- Smart packaging
- Force sensing resistors
- RFID/NFC
- LED lighting
- Electroluminescent lighting

Critical Advantages

Printed Electronics



READY-MADE & CUSTOM SOLUTIONS

Micromax™ market-ready products provide optimal performance for specific applications and fast product launches.

Plus, our thick film inks can be formulated with the metal of your choice—gold, silver, silver/silver chloride, or carbon—to achieve desired parameters.

- Compatible with many substrates including polyester, glass, and ceramics
- Versatile capabilities include fine-line, high-resolution silver pastes, digital printing capable pastes, and low-temperature curing pastes
- Right balance between performance and cost
- Fast sample and scale-up to meet stringent launch timeline

Printed Electronics

Product	Technology	Paste Type	Application(s)	Composition	Feature
5018	Functional Pastes/Inks	Dielectric Paste/Ink	Biosensors, iontophoretic drug delivery, printed electronics, ion selective sensors, medical electrodes, PTF sensors	Dielectric	Fast UV cure, high BDV performance, crossover or encapsulant, blue, clear and green color
5025	Functional Pastes/Inks	Conductor Paste/Ink	Biosensors (e.g.: Blood glucose, CGM, ECG), iontophoretic, drug delivery, PTF sensors, printed electronics	Silver Conductor	High temperature use, fast drying
5028	Functional Pastes/Inks	Conductor Paste/Ink	LED Lighting	Silver	High conductivity signal lines
5056	Functional Pastes/Inks	Dielectric Paste/Ink	LED Lighting	Dielectric	Flexible solder mask and white reflector
5065	Functional Pastes/Inks	Conductor Paste/Ink	Biosensors (e.g.: Blood glucose, CGM, ECG), PTF sensors, printed electronics	Silver Conductor	High conductivity
7102	Functional Pastes/Inks	Conductor Paste/Ink	Ion selective sensors, printed electronics	Carbon	Excellent adhesion to polycarbonate substrates, high conductivity carbon composition, high temperature stability
7105	Functional Pastes/Inks	Conductor Paste/Ink	Biosensors, printed electronics	Carbon	High abrasion resistance, high stability, low resistivity carbon, good activity in biomedical applications
7292	Functional Pastes/Inks	Conductor Paste/Ink	Heaters	Carbon	PTC composition for self-limiting heaters
9169	Functional Pastes/Inks	Conductor Paste/Ink	OLED lighting, touch panels/smart glass	Silver	Bus lines, good adhesion to ITO
CB230	Functional Pastes/Inks	Conductor Paste/Ink	LED lighting	Silver/Copper	Solderable contact pad

Printed Electronics

Product	Technology	Paste Type	Application(s)	Composition	Feature
HT702	Functional Pastes/Inks	Thermally Conductive Paste/Ink	Heaters	Dielectric	High temperature operation up to 300°C
HT802	Functional Pastes/Inks	Thermally Conductive Paste/Ink	Heaters	Silver	High temperature operation up to 300°C
PE825	Functional Pastes/Inks	Conductor Paste/Ink	Printed electronics, RFID/UHF	Silver Composite	Low silver circuitry 37%
PE826	Functional Pastes/Inks	Conductor Paste/Ink	Printed electronics, RFID/UHF	Silver Composite	Low silver circuitry 18% Ag
PE410	Functional Pastes/Inks	Conductor Paste/Ink	Printed electronics	Silver	High conductivity nano-Ag for ink-jet printing
PE410	Functional Pastes/Inks	Conductor Paste/Ink	OLED lighting	Silver	Ink-jet nano-Ag for bus and grid lines
5029	Functional Pastes/Inks	Conductor Paste/Ink	RFID/HF (NFC)	Silver	High conductivity for printed HF antennae
PE825	Functional Pastes/Inks	Conductor Paste/Ink	Printed electronics, RFID/UHF	Silver Composite	Low silver circuitry 37%
PE510	Functional Pastes/Inks	Conductor Paste/Ink	RFID/HF (NFC)	Copper	Low -cost copper for photonic curing, UHF antennae
PE827/PE828	Functional Pastes/Inks	Conductor Paste/Ink	Smart packaging	Silver	Low temperature curing (60°C – 100°C)

Health Technologies

Increase Consumer Control and
Healthcare Provider Information



Key Applications

Micromax™ highly conductive inks, dielectric and fine line printing solutions enable new possibilities for eHealth product designers, including:

- Multi-layer stacking
- Miniaturization
- Stretchable and washable solutions for advanced smart garment sensors

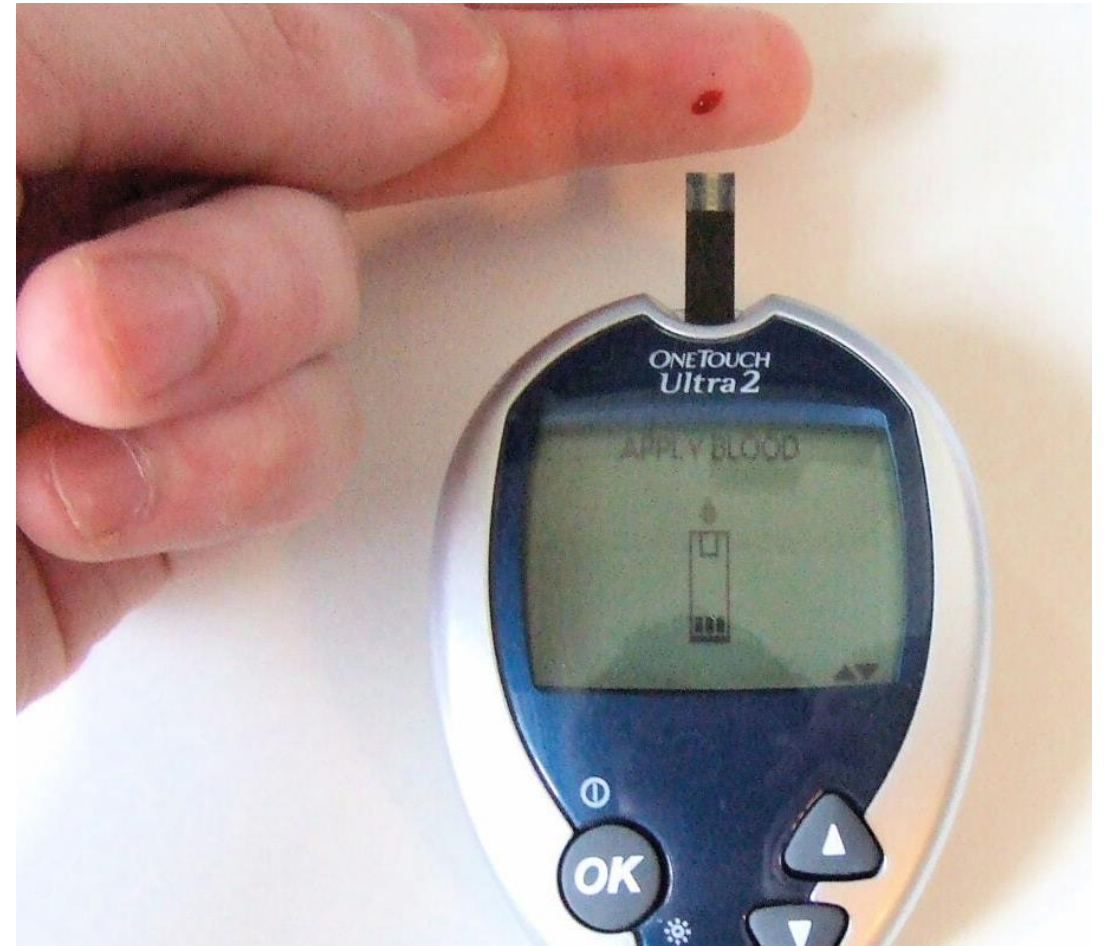
- Remote patient monitoring for long-term chronic conditions
- Post-surgical monitoring
- Accurate testing, including EKG, heart rate, blood glucose levels, temperature, and more
- Delivery of heat and neuromuscular stimulations
- Miniaturization of devices
- Low cost of ownership through high-throughput printing
- Exceptional lot-to-lot consistency

BIOMEDICAL SENSOR SOLUTIONS

Silver/silver chloride and carbon screen formulations: designed for highly stable electrode systems for point-of-care applications such as blood glucose and blood coagulation test strips.

Low temperature curing gold inks: developed for highly inert electrode surfaces of immunodiagnostic and blood gas sensors.

Highly active platinum and platinized carbon compositions are also available.





WEARABLES SOLUTIONS

Micromax™ Intexar™

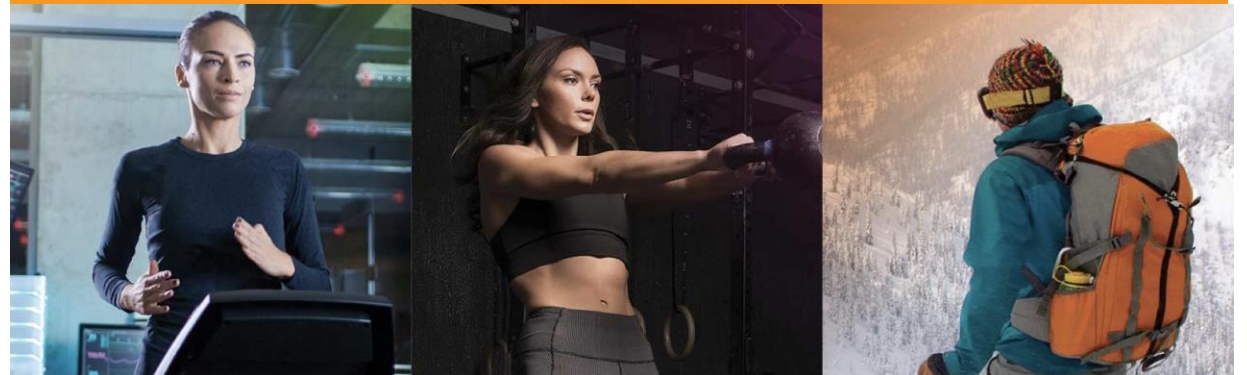
A new suite of stretchable, washable electronic ink and substrate materials that:

- Enables a manufacturing-ready approach
- Delivers superior comfort and functionality
- Offers design flexibility for smart clothing and other wearable electronics such as health patches

Micromax™ Intexar™ provides exceptional stretch performance and endurance through 100+ wash cycles.

Ideal applications include:

- Wearable health monitoring and therapy
- Fitness performance clothing
- Wearable heat smart clothing

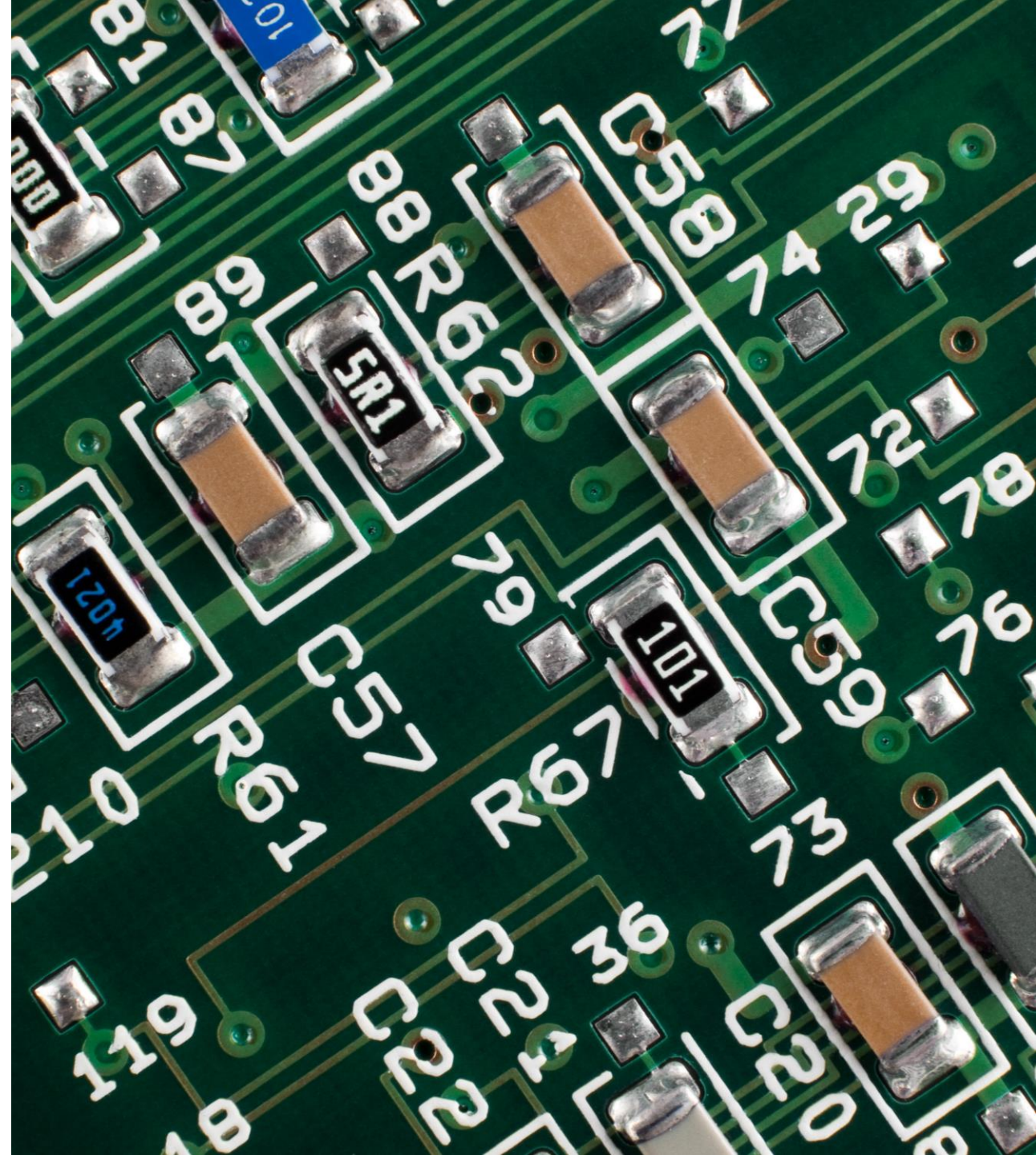


Product	Technology	Paste Type	Application(s)	Composition	Feature
Intexar™ PE671	Functional Pastes/Inks	Conductor Paste/Ink	Wearables	Carbon	Stretchable, w ashable overprint
Intexar™ PE672	Functional Pastes/Inks	Conductor Paste/Ink	Wearables	Carbon	Low PTC carbon for heater applications
Intexar™ PE773	Functional Pastes/Inks	Conductor Paste/Ink	Wearables	Dielectric	Stretchable, w ashable encapsulant
Intexar™ PE874	Functional Pastes/Inks	Conductor Paste/Ink	Wearables	Silver	Stretchable, w ashable conductor. Best stretch recovery
Intexar™ PE876	Functional Pastes/Inks	Conductor Paste/Ink	Wearables	Silver	Stretchable, w ashable conductor. Best washability
Intexar™ TE-11C	Functional Pastes/Inks	Film	Wearables	Film	Stretchable polyurethane base film
Intexar™ TE-21C	Functional Pastes/Inks	Film	Wearables	Film	Cover film for part packaging
5000	Functional Pastes/Inks	Conductor Paste/Ink	Biosensors (e.g.: Blood Glucose, CGM, ECG), Iontophoretic, Drug delivery, Medical electrodes, PTF sensors	Silver Conductor	High abrasion resistance, long screen life
5018	Functional Pastes/Inks	Dielectric Paste/Ink	Biosensors, Iontophoretic drug delivery, Printed electronics, Ion selective sensors, Medical electrodes, PTF sensors	Dielectric	Fast UV cure, High BDV performance, crossover or encapsulant, blue, clear and green color
5025	Functional Pastes/Inks	Conductor Paste/Ink	Biosensors (e.g.: Blood Glucose, CGM, ECG), Iontophoretic, Drug delivery, PTF sensors, Printed electronics	Silver Conductor	High temperature use, fast drying
5028	Functional Pastes/Inks	Conductor Paste/Ink	Biosensors (e.g.: Blood Glucose, CGM, ECG), Iontophoretic, Drug delivery, PTF sensors	Silver Conductor	High electrical conductivity, compatible w ith polycarbonate, signal lines and sensor pads
5036	Functional Pastes/Inks	Dielectric Paste/Ink	Biosensors, Iontophoretic drug delivery, Ion selective sensors, Medical electrodes, PTF sensors	Dielectric	Protective barrier for graphic ink overprint Strong adhesion to a variety of PET substrates Compatible w ith most BQ series conductors
5065	Functional Pastes/Inks	Conductor Paste/Ink	Biosensors (e.g.: Blood Glucose, CGM, ECG), PTF sensors, Printed electronics	Silver Conductor	High conductivity
5085	Functional Pastes/Inks	Conductor Paste/Ink	Biosensors	Carbon and Silver/Carbon	Low er cost than Ag conductors, fast cure
5524	Functional Pastes/Inks	Conductor Paste/Ink	PTF Sensors	Carbon and Silver/Carbon	Excellent high temperature stability Low er cost than Ag conductor
5874	Functional Pastes/Inks	Conductor Paste/Ink	Biosensors, Iontophoretic drug delivery, Ion selective sensors	Silver/Silver Chloride	Ratio of 65/35 Ag/AgCl, equal electrode capacity for anode and cathode for iontophoretic applications, low electrode polarization, high stability reference potential, fast drying High solid for thicker printing

Product	Technology	Paste Type	Application(s)	Composition	Feature
5876	Functional Pastes/Inks	Conductor Paste/Ink	Biosensors Iontophoretic drug delivery	Silver/Silver Chloride	Ratio of 32/68 Ag/AgCl, high silver chloride content, fast signal response, stable potential
5881	Functional Pastes/Inks	Conductor Paste/Ink	Biosensors Medical electrodes	Silver/Silver Chloride	Ratio of 75/25 Ag/AgCl, low electrode polarization, high electrical conductivity, excellent stability on contact with high salt gel
7102	Functional Pastes/Inks	Conductor Paste/Ink	Ion selective sensors, printed electronics	Carbon	Excellent adhesion to polycarbonate substrates, high conductivity carbon composition, high temperature stability
7105	Functional Pastes/Inks	Conductor Paste/Ink	Biosensors, printed electronics	Carbon	High abrasion resistance, high stability, low resistivity carbon, good activity in biomedical applications
7112	Functional Pastes/Inks	Conductor Paste/Ink	Biosensors	Platinum/Carbon	High sensitivity for a variety of sensor applications
BQ10	Functional Pastes/Inks	Dielectric Paste/Ink	Biosensors	Dielectric	Fast UV cure, high resolution flexible insulator, zero VOC when properly cured, strong adhesion to polyester and polycarbonate substrates, works well with 7112
BQ221	Functional Pastes/Inks	Conductor Paste/Ink	Biosensors	Carbon and Silver/Carbon	High conductivity carbon composition, high sensitivity, long screen life
BQ226	Functional Pastes/Inks	Conductor Paste/Ink	Biosensors	Carbon and Silver/Carbon	Low resistivity carbon, high abrasion resistance, high stability, good activity in biomedical applications
BQ242	Functional Pastes/Inks	Conductor Paste/Ink	Biosensors	Carbon and Silver/Carbon	High electrochemical activity, high conductivity / adhesion to polyester, superior electrode wettability
BQ321	Functional Pastes/Inks	Conductor Paste/Ink	PTF sensors	Platinum	High sensitivity, strong adhesion to a variety of PET substrates
BQ331	Functional Pastes/Inks	Conductor Paste/Ink	PTF sensors	Gold	High sensitivity, strong adhesion to a variety of PET substrates

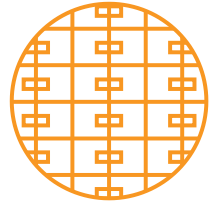
Passive Electronic Chip Components

Enabling Smaller, More Complex
and More Powerful Designs

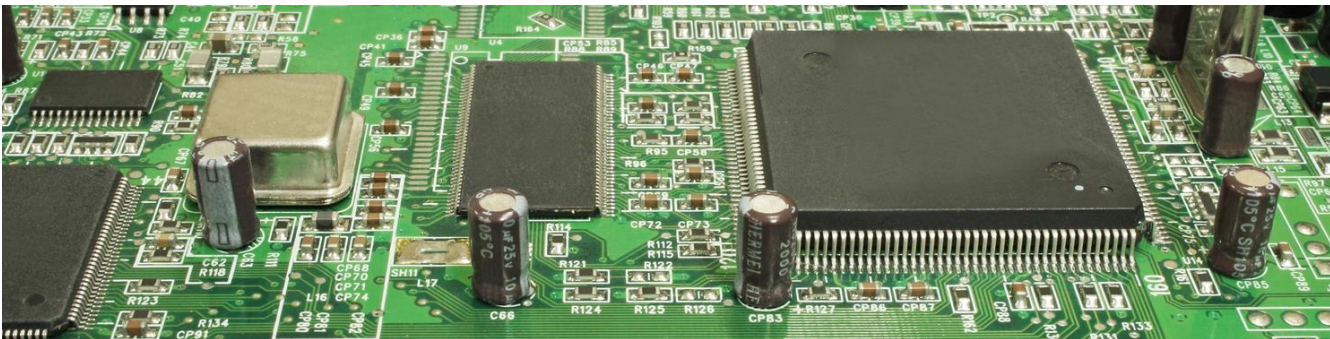


Key Applications

Passive Electronic
Chip Components

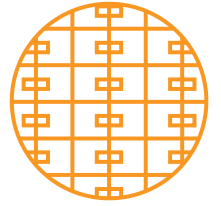


Micromax™ is a leading global supplier of passive component materials that support the fast-growing markets of advanced mobility and data connectivity.



- Fixed chip resistor
- Resistor network and array
- Multilayer ceramic capacitor
- Tantalum chip capacitor
- Multilayer chip inductor
- Common mode choke coil
- Chip power inductor
- Multilayer chip varistor
- Thermistor

Critical Advantages



Micromax™ materials for smaller chip components for demanding and complex applications—such as automotive and infrastructure—enable:

- Tighter tolerance
- Higher performance
- High precision
- More robustness

Complete sets of resistive materials provide:

- Tight resistivity and TCR control on small chip sizes
- Excellent power handling performance
- Superior field reliability
- Cost-effective manufacturing processes
- Sustainable lead-free systems

Capacitor terminations & electrodes provide:

- Industry-leading performance such as green strength, solderability, adhesion, and dip cosmetics

Passive Components

Product	Technology	Paste Type	Application(s)	Composition	Feature
0001	Functional Pastes/Inks	Resistor Paste/Ink	Chip Resistor	Resistor	1Ω resistor, best suited for small chips with balanced TCR and power handling
0011Z	Functional Pastes/Inks	Resistor Paste/Ink	Chip Resistor	Resistor	10Ω resistor, best suited for small chips with balanced TCR and power handling
0012Z	Functional Pastes/Inks	Resistor Paste/Ink	Chip Resistor	Resistor	10Ω resistor, best suited for small chips with balanced TCR and power handling
0021Z	Functional Pastes/Inks	Resistor Paste/Ink	Chip Resistor	Resistor	100Ω resistor, best suited for small chips with balanced TCR and power handling
0022Z	Functional Pastes/Inks	Resistor Paste/Ink	Chip Resistor	Resistor	100Ω resistor, best suited for small chips with balanced TCR and power handling
0031Z	Functional Pastes/Inks	Resistor Paste/Ink	Chip Resistor	Resistor	1kΩ resistor, best suited for small chips with balanced TCR and power handling
0032Z	Functional Pastes/Inks	Resistor Paste/Ink	Chip Resistor	Resistor	1kΩ resistor, best suited for small chips with balanced TCR and power handling
0033Z	Functional Pastes/Inks	Resistor Paste/Ink	Chip Resistor	Resistor	1kΩ resistor, best suited for small chips with balanced TCR and power handling
0034Z	Functional Pastes/Inks	Resistor Paste/Ink	Chip Resistor	Resistor	1kΩ resistor, best suited for small chips with balanced TCR and power handling
0041Z	Functional Pastes/Inks	Resistor Paste/Ink	Chip Resistor	Resistor	10kΩ resistor, best suited for small chips with balanced TCR and power handling
0042Z	Functional Pastes/Inks	Resistor Paste/Ink	Chip Resistor	Resistor	10kΩ resistor, best suited for small chips with balanced TCR and power handling
0051Z	Functional Pastes/Inks	Resistor Paste/Ink	Chip Resistor	Resistor	100kΩ resistor, best suited for small chips with balanced TCR and power handling
0061	Functional Pastes/Inks	Resistor Paste/Ink	Chip Resistor	Resistor	1MΩ resistor, best suited for small chips with balanced TCR and power handling
0071	Functional Pastes/Inks	Resistor Paste/Ink	Chip Resistor	Resistor	10MΩ resistor, best suited for small chips with balanced TCR and power handling
0F01A	Functional Pastes/Inks	Resistor Paste/Ink	Chip Resistor	Resistor	1Ω resistor - Pb free, best suited for small chips with balanced TCR and power handling
0F10A	Functional Pastes/Inks	Resistor Paste/Ink	Chip Resistor	Resistor	10Ω resistor - Pb free, best suited for small chips with balanced TCR and power handling
0F20A	Functional Pastes/Inks	Resistor Paste/Ink	Chip Resistor	Resistor	100Ω resistor - Pb free, best suited for small chips with balanced TCR and power handling
0F30A	Functional Pastes/Inks	Resistor Paste/Ink	Chip Resistor	Resistor	1kΩ resistor - Pb free, best suited for small chips with balanced TCR and power handling

Passive Components

Product	Technology	Paste Type	Application(s)	Composition	Feature
0F39A	Functional Pastes/Inks	Resistor Paste/Ink	Chip Resistor	Resistor	1kΩ resistor - Pb free, best suited for small chips with balanced TCR and power handling
0F40A	Functional Pastes/Inks	Resistor Paste/Ink	Chip Resistor	Resistor	10kΩ resistor - Pb free, best suited for small chips with balanced TCR and power handling
0F49A	Functional Pastes/Inks	Resistor Paste/Ink	Chip Resistor	Resistor	10kΩ resistor - Pb free, best suited for small chips with balanced TCR and power handling
0F59A	Functional Pastes/Inks	Resistor Paste/Ink	Chip Resistor	Resistor	100kΩ resistor - Pb free, best suited for small chips with balanced TCR and power handling
0F69A	Functional Pastes/Inks	Resistor Paste/Ink	Chip Resistor	Resistor	1MΩ resistor - Pb free, best suited for small chips with balanced TCR and power handling
0F79A	Functional Pastes/Inks	Resistor Paste/Ink	Chip Resistor	Resistor	10MΩ resistor - Pb free, best suited for small chips with balanced TCR and power handling
1187	Functional Pastes/Inks	Conductor Paste/Ink	Multilayered Ceramic Capacitor	Silver	Platable silver termination, for dipping, 800 °C fired
4899R	Functional Pastes/Inks	Conductor Paste/Ink	Multilayered Ceramic Capacitor	Silver	Solderable silver termination, for dipping, 850 °C fired
4999	Functional Pastes/Inks	Conductor Paste/Ink	Multilayered Ceramic Capacitor	Silver/Palladium	Solderable 4/1 silver/palladium termination, for dipping, 710 - 750 °C fired
5418	Functional Pastes/Inks	Conductor Paste/Ink	Chip Resistor	Silver/Palladium	Superior sulfur resistance by 18% Pd content, Pb free, compatible with 00X1Z and 0FxxA resistors
5421E	Functional Pastes/Inks	Conductor Paste/Ink	Chip Resistor	Silver/Palladium	Standard 0.5% Pd C1 conductor, Pb free, compatible with 00X1Z and 0FxxA resistors
5450T	Functional Pastes/Inks	Conductor Paste/Ink	Chip Resistor	Silver	Polymeric platable silver C2 edge termination, suitable for dipping and roller coating
5463	Functional Pastes/Inks	Conductor Paste/Ink	Chip Resistor	Silver	Standard silver C1 conductor, Pb free, compatible with 00X1Z resistors
5477	Functional Pastes/Inks	Encapsulant Paste/Ink	Chip Resistor	Glass paste	Laser trimmable G1 glass encapsulant, green color, 600 - 620 °C fired
5499	Functional Pastes/Inks	Encapsulant Paste/Ink	Chip Resistor	Polymer encapsulant	Thermosetting polymer encapsulant, black color, 180 °C 30min cured
5499A	Functional Pastes/Inks	Encapsulant Paste/Ink	Chip Resistor	Polymer encapsulant	Thermosetting polymer encapsulant, black color, 180 °C 5min fast cured
7775	Functional Pastes/Inks	Conductor Paste/Ink	Polymer Tantalum Capacitor	Silver	Thermoplastic polymeric silver to coat polymer tantalum capacitor body, Low ESR
8453	Functional Pastes/Inks	Conductor Paste/Ink	Multilayered Ceramic Capacitor	Silver	Polymeric plateable silver termination, for dipping

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Improving Reliability, Conductivity,
and Compatibility



Key Applications

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Micromax™ high-performance LTCC materials enable high-frequency, high-reliability applications as well as 5G telecom.



- Satellite and flight hardware
- Airborne radar and flight avionics
- Military communications applications
- Naval and ground-based radar
- Wireless base stations
- Smartphones/mobile devices
- High-frequency transmitter/receiver modules

Critical Advantages

Micromax™ electronic materials provide critical advantages and are trusted by telecom, military, and commercial organizations.

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- Increased functionality in smaller, lighter packages
- Physical durability and vibration resistance
- Low signal loss and stable Dk through mmWave frequency nodes in all operating conditions
- High chemical resistance
- Embedded electronics



Portfolio

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Micromax™ solutions for high-frequency communications include:

- Ceramic packaging materials
- Proprietary processing technology
- Design knowledge covering 1-120 GHz and LTCC
- Thick film on various substrates

- Full line of conductors
- Dielectric materials
- Resistor materials
- Encapsulants
- Micromax™ GreenTape™ ceramic tapes
- Micromax™ Fodel™ photo-imageable materials

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Product	Technology	Paste Type	Application(s)	Composition	Feature
5740A	Functional Pastes/Inks	Conductor Paste/Ink	Radar module, sensor module, control units, RF module	Gold	951 LTCC Au system- internal/external signal line, ground plane, wire bondable
5742	Functional Pastes/Inks	Conductor Paste/Ink	Radar module, sensor module, control units, RF module	Gold	951 LTCC Au system- internal/external signal line, ground plane, wire bondable
5742	Functional Pastes/Inks	Conductor Paste/Ink	High frequency on dielectric/alumina, interconnect, radar, system in package, hermetic package	Gold	High reliability, high conductivity, high circuit density, Au and Al wire bondable (1 mil), co-fireable processing
5747	Functional Pastes/Inks	Conductor Paste/Ink	High frequency on dielectric/alumina, interconnect, radar, system in package, hermetic package	Gold	Capable of via filling two to three dielectric layers with a single print, good top surface coplanarity when used with DuPont multi-layer dielectric
5771	Functional Pastes/Inks	Conductor Paste/Ink	High frequency on dielectric/alumina, interconnect, radar, system in package, hermetic package	Gold	High conductivity, wire bondable with 1 & 2 mil Au wire
6160	Functional Pastes/Inks	Conductor Paste/Ink	High frequency on dielectric/alumina, interconnect, radar, system in package, hermetic package	Silver	Very low resistivity of <2mohms/sq Compatible with 62Sn/36Pb/2Ag solder
6130	Functional Pastes/Inks	Conductor Paste/Ink	Radar module, sensor module, control units, RF module	Silver/Palladium	LTCC Ag system– post-fired solderable conductor
6130	Functional Pastes/Inks	Conductor Paste/Ink	High frequency on dielectric/alumina, interconnect, radar, system in package, hermetic package	Silver/ Palladium	High thermal cycle and long-term aged adhesion, broad process latitude, excellent solderability
17xx srs	Functional Pastes/Inks	Resistor Paste/Ink	High frequency on dielectric/alumina, interconnect, radar, system in package, hermetic package	Resistor	Post laser trim stability of less than 0.5% average ΔR under all standard testing conditions. TCRs of less than 100ppm/°C, even with blends. Low sensitivity to variations in firing temperature, time at peak and resistor geometry. Range from 10ohm/sq to 1Mohm/sq
20xx srs	Functional Pastes/Inks	Resistor Paste/Ink	High frequency on dielectric/alumina, interconnect, radar, system in package, hermetic package	Resistor	Excellent laser post-trim stability, encapsulated or unencapsulated HTCR's less than 50 ppm. Small length and thickness effects on Resistivity and TCR. Small shifts of resistivity and TCR on refiring. Compatible with Ag/Pt or Ag/Pd terminations. Excellent noise characteristics. Compatible with QQ620 and LF161. Range from 4ohm/sq to 10Mohm/sq.
4597R	Functional Pastes/Inks	Conductor Paste/Ink	Radar module, sensor module, control units, RF module	Gold/ Platinum/ Palladium	LTCC Au system– post-fired solderable conductor
4597R	Functional Pastes/Inks	Conductor Paste/Ink	High frequency on dielectric/alumina, interconnect, radar, system in package, hermetic package	Gold/ Platinum/ Palladium	Excellent solderability, high reliability
5062S	Functional Pastes/Inks	Conductor Paste/Ink	Radar module, sensor module, control units, RF module	Gold	LTCC Au system– post-fired braze adhesion layer

Product	Technology	Paste Type	Application(s)	Composition	Feature
5063R	Functional Pastes/Inks	Conductor Paste/Ink	Radar module, sensor module, control units, RF module	Gold	LTCC Au system– post-fired braze barrier layer
5081R	Functional Pastes/Inks	Conductor Paste/Ink	Radar module, sensor module, control units, RF module	Silver/Platinum	LTCC Ag system– post-fired braze adhesion layer
5082R	Functional Pastes/Inks	Conductor Paste/Ink	Radar module, sensor module, control units, RF module	Silver/Platinum	LTCC Ag system– post-fired braze barrier layer
5738R	Functional Pastes/Inks	Conductor Paste/Ink	Radar module, sensor module, control units, RF module	Gold	951 LTCC Au system- via fill
5780R	Functional Pastes/Inks	Conductor Paste/Ink	High frequency on dielectric/alumina, interconnect, radar, system in package, hermetic package	Gold	Gold wire bondable for high density hybrids, high reliability and yields
6118A	Functional Pastes/Inks	Conductor Paste/Ink	Radar module, sensor module, control units, RF module	Silver	951 LTCC Ag system- external signal line, plateable
6141R	Functional Pastes/Inks	Conductor Paste/Ink	Radar module, sensor module, control units, RF module	Silver	951 LTCC Ag system- via fill
6142D	Functional Pastes/Inks	Conductor Paste/Ink	Radar module, sensor module, control units, RF module	Silver	951 LTCC Ag system- internal/ external ground plane, internal/ external signal line
7484R	Functional Pastes/Inks	Conductor Paste/Ink	Radar module, sensor module, control units, RF module	Silver/Palladium	LTCC Ag system- post fired solderable conductor
7484R	Functional Pastes/Inks	Conductor Paste/Ink	High frequency on dielectric/alumina, interconnect, radar, system in package, hermetic package	Silver/ Palladium	Thin, dense fired film, 5 and 10 mil Al bondable, excellent solderability
951 tape	Functional Pastes/Inks	GreenTape™	Radar module, sensor module, control units, RF module	Ceramic GreenTape™	LTCC (Low Temperature Cofired Ceramic) tape, various thickness available
9K7 tape	Functional Pastes/Inks	Ceramic tape	Radar module, sensor module, control units, RF module	Ceramic GreenTape™	LTCC (Low Temperature Cofired Ceramic) tape, various thickness available, Pb-free, low insertion loss
CF0xx srs	Functional Pastes/Inks	Resistor Paste/Ink	Radar module, sensor module, control units, RF module	Resistor	Resistivity range from 10ohm-10kohm, buried, co-fired with 951 GreenTape™
LF171	Functional Pastes/Inks	Conductor Paste/Ink	High frequency on dielectric/alumina, interconnect, radar, system in package, hermetic package	Silver/ Platinum	Excellent fine line resolution, excellent solderability with lead and lead-free solders
LFxx srs	Functional Pastes/Inks	Resistor Paste/Ink	High frequency on dielectric/alumina, interconnect, radar, system in package, hermetic package	Resistor	Pb free resistor series. REACH compliant. Thin printing 12um. Narrow TCR gap Compatible with Pb free terminations. Laser trim stability. Power handling. QQ620 over-glaze. Range from 1ohm/sq to 10Mohm/sq.

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Product	Technology	Paste Type	Application(s)	Composition	Feature
LL502	Functional Pastes/Inks	Conductor Paste/Ink	Radar module, sensor module, control units, RF module	Gold	9K7 LTCC Au system- via fill
LL505	Functional Pastes/Inks	Conductor Paste/Ink	Radar module, sensor module, control units, RF module	Gold	9K7 LTCC Au system- internal signal line/ground plane
LL507	Functional Pastes/Inks	Conductor Paste/Ink	Radar module, sensor module, control units, RF module	Gold	9K7 LTCC Au system- external signal line/ground plane, wire bondable
LL509	Functional Pastes/Inks	Conductor Paste/Ink	Radar module, sensor module, control units, RF module	Gold/Platinum	9K7 LTCC Au system- external solderable conductor
QM14	Functional Pastes/Inks	Conductor Paste/Ink	High frequency on dielectric/alumina, interconnect, radar, system in package, hermetic package	Silver	High conductivity, high speed printing, excellent solderability and adhesion on DuPont™ QM42 dielectric and DuPont™ QM44
QM34	Functional Pastes/Inks	Conductor Paste/Ink	High frequency on dielectric/alumina, interconnect, radar, system in package, hermetic package	Silver/Palladium	Thermal expansion coefficient adjusted for compatibility with DuPont™ QM44, QM42, & their variants. Crack-free via connections. Suitable to fill two dielectric layers with single via print. Co-fireable with top silver or silver/palladium conductors. Co-fireable with dielectric layer
QM42	Functional Pastes/Inks	Dielectric Paste/Ink	High frequency on dielectric/alumina, interconnect, radar, system in package, hermetic package	Dielectric	Dense, hermetic dielectric, high yields with silver conductors, ability to mix conductor metallurgies on the AME circuit
QM44	Functional Pastes/Inks	Dielectric Paste/Ink	High frequency on dielectric/alumina, interconnect, radar, system in package, hermetic package	Dielectric	Thin, hermetic dielectric film, broad conductor compatibility, robust electrical and mechanical properties
QR150	Functional Pastes/Inks	Conductor Paste/Ink	High frequency on dielectric/alumina, interconnect, radar, system in package, hermetic package	Gold	High conductivity, fine line, very dense fired film
S1xx srs	Functional Pastes/Inks	Resistor Paste/Ink	High frequency on dielectric/alumina, interconnect, radar, system in package, hermetic package	Resistor	Superior long-term stability. Tight TCR Control. Low sensitivity to firing temperatures and time. Minimum length and thickness effects on resistivity and TCR. Minimum shifts of resistivity and TCR on refiring. Compatibility with Ag and Ag/Pd termination metallurgies. Compatible with other S1XX series resistors and blendable. Compatible with DuPont™ QM44. Range from 10ohm/sq to 1Mohm/sq.
TC502	Functional Pastes/Inks	Conductor Paste/Ink	Radar module, sensor module, control units, RF module	Gold	951 LTCC Au system- internal/external signal line, ground plane, wire bondable



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