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muRata

Innovator in Electronics



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EMI TECHNOLOGY

High Current noise suppression



Optimal performance of products working in the 1.0MHz to 1.0GHz range can be achieved by using our BNX022 LC filters. They minimise EMI without significantly attenuating signals.

New miniature designs reduce occupied PCB / substrate space and volume while optimising performance. Our filter has a profile height of only 3.3mm, yet gives high insertion loss over a wide frequency range with low DC resistance, protecting power lines in many products.

It has a surface mount configuration with a mounted height of 3.3mm max. on a 9.3 by 12.3 base; rated at 10A at 85°C, operating from -40°C to 125°C, derating linearly to 1.0A at 125°C. [www](http://www.murata.com) Ref. 1601

Features

- Insertion loss: 50 ohms @ 1.0 MHz to 1.0GHz (20°C to 25°C.)
- Withstanding voltage: 125VDC
- Insulation resistance (Min): 500M ohm
- Insertion Loss: 35dB min, 1MHz to 1GHz (20°C to 25°C line impedance 50 ohm)

Applications

- PDP
- LCD-TVs entertainment gadgets
- PCs and peripherals
- And many others



RESISTORS

Auto re-set Over-Current Protection

Our new thermistor offers internal resistance of only 0.20 ohm; allowing non-operating current flows up to 500mA at 60°C in an 0805 format (PRG210R2).

The PRG18/21 family of Posistors® (positive temperature coefficient thermistors) provides over-current protection across a broad range of operating and non-operating current levels. They exhibit a rapid increase in resistance at their operating currents, or if subjected to external over-heating. They also get progressively smaller, with the



"knock-on" benefit of increasing sensitivity and reducing re-set times; helping to meet the universal demand for tiny products. Current ratings up to 25mA are in the 0603 format (PRG18), above that they are

in an 0805 package (PRG21). More intermediate values can be expected to provide designers with extra options in the future. [www](http://www.murata.com)

Ref. 1602

Features

- Very sharp resistance/temperature characteristic
- Non-operating currents from 7mA to 500mA
- Operating-currents from 25mA to 2,000mA
- Self-resetting
- Auto-handling
- Reflow soldering

Applications

- Over-temperature protection
- Over-current protection
- Temperature sensing



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COIL & INDUCTOR TECHNOLOGY

Miniature chip coils hold the solution to DC power-circuit noise

Tiny wire-wound chip coils (LQH32C) with low DC resistance and high current capacity make cleaning up power supply circuits easier.

This extensive family of ferrite core inductors benefits from exclusive winding techniques developed by Murata. Combined with special Murata materials, they provide plenty of options on a 3.2x2.5mm footprint 2.0mm high, with 1.55mm (nom) option for those with especially difficult height limits. Nominal inductance values range from 1.0 μ H

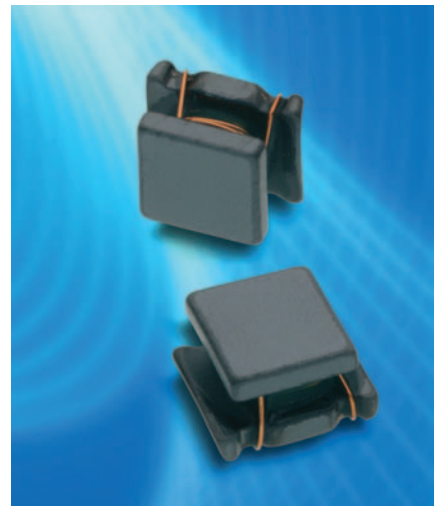
to 560 μ H. There are rated currents up to a full 1.0 Amperes and DC resistances down to 0.06 ohm. The designs exhibit low voltage drop and little change in inductance with temperature.

Features

- Good for high speed assembly
- Low profile version included
- Low DCR - High rated currents
- High inductance values

Applications

EMI suppression in miniature circuits subject to EMI legislation or performance requirements



They all have excellent resistance to soldering heat and can be flow or reflow soldered.

Packaging is in reels of 2,000 pieces and the size makes them easy to process automatically. Ref. 1603



Tiny High Q 1GHz Wound Chip Inductors

Miniature Alumina cores, using a combination of unique materials and horizontal winding methods, are at the heart of our LQW04A series of inductors.

Stable inductance values range from 1.1nH to 22nH in twentyfour steps, with minimum Q of 15 or 20.

Low DC resistance in all values ensures low loss, with maximum output in low power applications.

The operating temperature range is a full -55 to 125°C, making them suitable for robust applications and a



resin coating provides protection during processing and subsequent operation.

The miniature package (0.8x0.4mm)

allows very high-density mounting and the 0.4mm profile height adds to that. In turn, this puts 10,000 pieces in 180mm diameter reels, reducing replenishment stops, labour time and storage space.

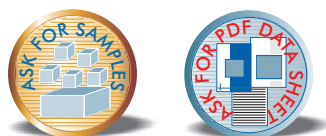
Ref. 1604

Features

- High Q (Typically 50 at 1.0 GHz)
- High SRF (10nH=4.0GHz min.)
- Reflow soldering - Low DCR
- Horizontal windings
- Low volume (0.128cc)
- Small footprint
- Easy / fast processing

Applications

- Mobile phone High frequency modules: PA, ANT, VCO, SAW, etc.
- Mobile phones like GSM, PDC CDMA
- Digital TV tuners and W-LAN
- Bluetooth
- High frequency circuits in general
- High density circuits in general



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25 Years in Europe



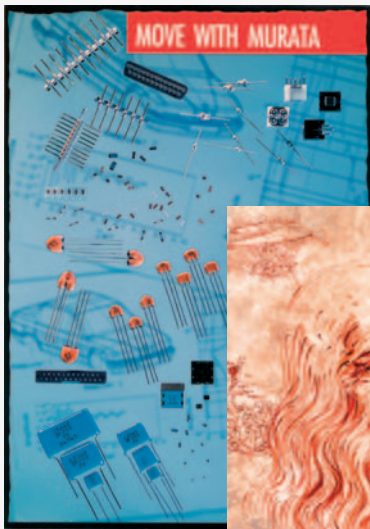
You are used to reading all about the latest Murata Technologies in this section of Murata Mail but, on this one occasion, we make an exception. Murata celebrates 25 years in Europe and this milestone calls for very special attention. Murata is very proud of its role as "Innovator in Electronics" and has achieved enormous technical and commercial growth in Europe.

In October 1981 the headlines read "Japanese Electronic Component manufacturer Murata purchases the Canadian/US component manufacturer Erie Technological Products". This was the European start of a very successful business and technological adventure. Though it originally started in Dusseldorf, it was not long before Nuernberg, Germany, became the home of Murata Elektronik GmbH. In addition to this factory-based German sales operation, the takeover also brought with it the Italian (Caponago, Milano) and French (Paris) sales companies.



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In 1982, a sales office was opened in the UK (in a semi-detached house in Fleet, Hampshire) and in 1989 Murata Electronics Netherlands was founded in Hoofddorp, close to Amsterdam. In 1997, Murata Switzerland was established in Moenchaltorf near Zurich. Local representation as the key for success lead to completing the European organisation with a network of satellite sales offices across Europe, including Finland, Sweden, Spain and the Czech Republic.

Some of you may remember that conducting business in those days was different; communication was by telephone, (expensive and noisy lines with plenty of crackles), and telex. Telex technology was all that was available for electronic transmission of written messages. Not many companies had a fax machine and e-mail was something out of a science fiction book. All ears were subject to the rattle of the typewriters...

And then came the 90's, a decade of unprecedented growth.

Sales levels reached record-breaking heights and doing business in Europe proved to be a constant process of change.

For 25 years Murata has been up to doing the job, taking on the challenges that a dynamic and dramatically changing market brings.

The new business model came with some hard blows, but in our opinion we have survived better than most. Globally and in Europe, Murata companies remain financially strong and independent.

Our KFS have always been Agility, Flexibility and Innovation; targeting new applications with new and exciting products based on the latest technologies. From the very beginning we understood the

importance of building partnerships with our customers.

In that beginning, we were known as an important capacitor company, but this quarter century has shown our wider contribution to the world of electronic components.

Capacitors of course, but also Microwave components/modules, Coils, EMI suppression filters, Thermistors, Filters, Resonators, Piezoelectric components, Power Supplies, Sensors, Optical Products, Modules (Bluetooth, DC-DC converter etc.), LTCC and transparent ceramics.

Murata also leads in the field of RoHS and our focus on quality is known throughout the industry.

We are targeting approvals like TS16949, the toughest in the market.

We look with excitement to the next



25 years, knowing we can only be successful if we have our customers' support.

We greatly appreciate the trust you have placed in Murata over the past 25 years, and look forward to expanding existing relationships and building new ones.

CAPACITORS

Better Trimmer Capacitors



Our latest trimmer design has greater protection against flux invasion. The TZY2 series also offers better post-adjustment stability, excellent resistance to soldering heat, accommodation of a built-in parallel capacitor and size reduction.

Only 1.25mm high, the footprint is 2.5 x 3.2mm. Nominal values range from 1.0 to 45pF and use high stability low-loss COG dielectric to give a self-resonant frequency of almost 5GHz.

Unique construction with no plastic material improves soldering heat resistance and maintains excellent

characteristic performance after reflow soldering.

We recommend reflow or hand-soldering, not immersing the trimmer in solder for the usual reasons.

Ref. 1605



Features

- Large capacitor range
- Improved resistance to flux invasion
- Higher post-soldering / adjustment stability
- Built-in capacitor capability
- Substrate compatibility with early model (TZV2)

Applications

- Garage door openers
- Remote keyless entry
- Wireless game controllers and toys
- Cordless phones
- Wireless headphones
- Small TV tuner modules



Save money, time, space and labour

Not so long ago, Murata's 0805 chip capacitor was small and difficult to handle. True, it was rated at 50Vdc and 125°C, but most applications don't need those ratings today and today's machinery handles the smallest parts with precision.

Now, our GNM214, the same size as the 0805 (2.0x1.25x0.95mm) is a four-capacitor array. That simple change reduces both mounting cycles and investment in machinery by 75%. At the same time, it reduces the volume of the four capacitors

from a nominal 9.5cc to a mere 2.375cc, another dramatic reduction. Less machinery, less labour, less investment, less space; a win-win win-win choice. But the story gets better. Four capacitors in a row may not be convenient. So, we offer two capacitor arrays in the familiar 0805 GNM214 package, and in both the 0504 and 0302 packages (1.37x1.0x0.65 and 0.9x0.6x0.45). Obviously, the laws of physics impose limits on the values that can be achieved in a given package.

Ref. 1606



Features

- Popular 0805 configuration
- Space saved every time
- Reduced component count
- Increased processing capacity
- Reduced mounting cycles
- Higher C/V per unit volume
- Reduced packaging waste
- Reliability and ease of use

Applications

- Mobile-phones: MB and LCD modules; DSC/ PDA/ PC-MB
- Charge pumps, noise filters, de-coupling



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DIELECTRIC TECHNOLOGY

New Business Domain: Power Mono

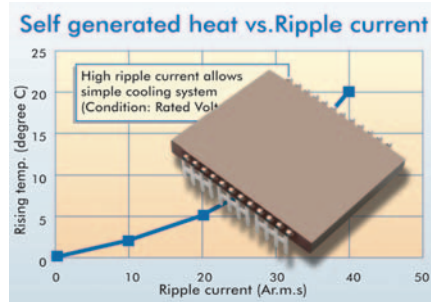
One of Murata's target business domains is the environment or even better environmental applications such as wind power generation and solar regeneration.

The Clean Energy Recycling-program is clear; MLCC for Power Electronics...where our focus is f.i. invertors for wind powered generators but also invertors for automotive starters and generators.

Murata's Power Mono (PWRMNO) offers low loss high dielectric constant capacitors with values up to 390F, voltage ratings up to 630Vdc and rated currents up to 30Arms.

Naturally, the range will grow. These devices are Pb-free, compatible with Pb-free re-flow soldering and have excellent resistance to thermal cycling.

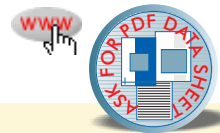
In many cases Film cap and Aluminum cap are combined and from the DC-Link between battery and inverter.



This solution becomes less effective as the customers' requirement gets tougher in ambient temperature, ESR and limited space. PWRMNO's requirement is expanding in this background.

Our low loss dielectrics allow operation at the higher frequencies, temperatures and ripple current levels expected, in a way that film cannot.

Ref. 1607



Features

- Low ESR and ESL
- High C/V per unit volume
- Lower Cap. value for same effect
- Supports downsizing
- High ripple current

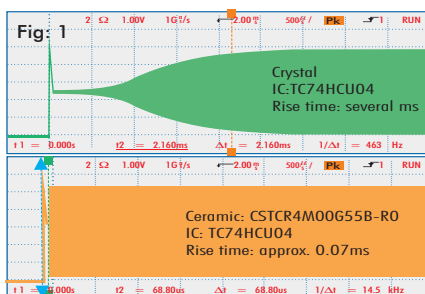
Applications

- Solar Power generators
- Wind Power generators
- Automotive air-conditioning
- I.S.G. systems
- H.E.V. motor drive invertes

RESONATORS

Lose Crystal Oscillators

Ceramic resonator stability has been getting progressively closer to that of crystal oscillators (XO). Our CSTCE-SK now replaces +/- 500ppm types.



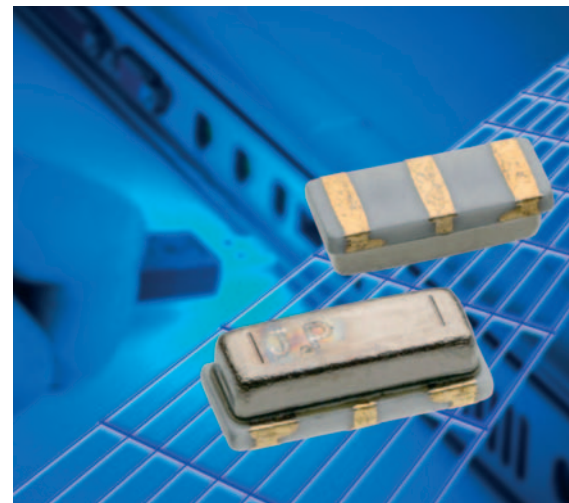
For some years now, the only advantage the XO had over the resonator was frequency stability. The XO is bigger, heavier and uses more power. We have been reducing that difference.

The resonator has other advantages over the XO, the rise-time is about 100 times faster (please see fig.1) and a load capacitor is build in, reducing occupied space and machine cycles.

Our range of frequencies with this stability is rising but 24MHz and 30MHz are in production now. These are ideal for the latest high speed USB applications.

We recommend reflow soldering and optical positioning rather than mechanical. Packaging is in plastic tape with 3,000 pieces on 180mm reels or 9,000 on 330mm reels.

Ref. 1608



Features

- XO stability - Faster rise-time
- No external load capacitor
- Reduced size (3.2x1.3x1.1mm)
- Lighter - Low profile
- Competitive price

Applications

- This design is specifically for high-speed USB applications.

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SENSORS

Use Non-contact Position Sensors to replace contact types and get a 10,000,000 cycle life

This new Hall Effect design (SV21) replaces contacts in position sensing technology. In doing so, it eliminates all the noise and wear problems that contacts bring.



With 10,000,000 Cycles Rotational Life and up to 200 degrees rotational angle, the technology gives higher reliability, better performance and longer life.

Greater flexibility is provided by programmable Hall Effect ICs that give a choice of four output characteristics; slope, offset, lower voltage limit and higher voltage limit.

The 200 degree rotation compares well with the currently used typical range of about 90 degrees.

In addition, the internal temperature compensation allows operation from -25°C to 85°C. Assembly could hardly be easier, being a simple socket and bush mounting.

Ref.1609



Features

- Temperature Characteristics $\pm 4\%$ / 25°C / full scale.
- Input current: 10mA max.
- Output Voltage range: $10 \pm 4\%$ (0.5V \pm 0.2V) to $90 \pm 4\%$
- Rot life: Linearity; $\pm 3\%$ full scale
- Vibration: Linearity; $\pm 3\%$ full scale
- Shock: $\pm 3\%$ full scale

Applications

- Valve actuators
- Measuring equipment
- Agricultural instruments
- Construction machinery
- High-quality joy-stick



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