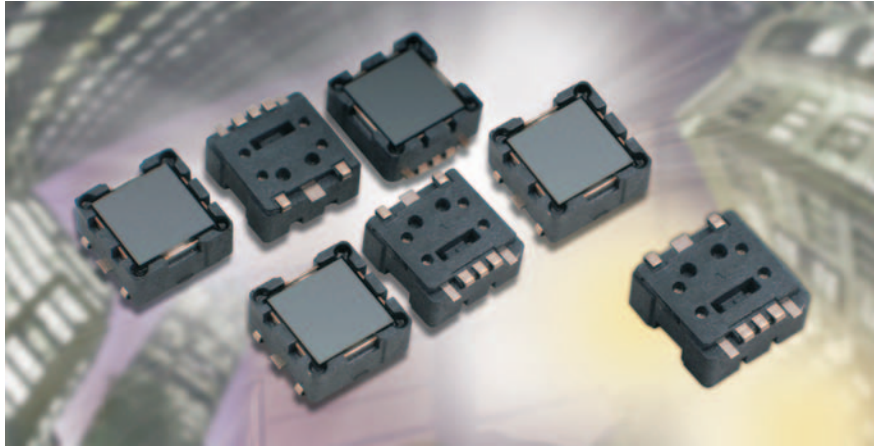


murata mail

Ask for samples & specifications at info@murata.eu - Visit www.murata.eu 



World's smallest pyroelectric infrared sensor

The latest version of Murata's pyroelectric infrared (PIR) sensor is the world's smallest at just 5.0 x 4.7 x 2.4 mm, enabling the sensor to be used in compact, low profile electronic devices and equipment.

The IRS-B210ST01-R1 is also the only surface-mount PIR sensor on the market. It features high sensitivity and signal to noise ratio, excellent stability against temperature changes and white light and enhanced RFI immunity.

The IRS-B210ST01-R1 series is suitable for person detection for security and proximity sensing applications, since it detects infrared at the wavelength emitted by the human body. Its small package size makes it suitable for consumer devices. Considering the surge in demand for energy saving devices, use of this sensor in household appliances such as lighting which switch off automatically when there is no-one

in proximity, is anticipated. The device features dual 0.85 x 1.2 mm electrodes with a field of vision of $\pm 70^\circ$ (horizontal) and $\pm 50^\circ$ (vertical). Its operating temperature range is -40 to $+70^\circ\text{C}$ and the device is driven by a supply voltage in the range of 2 to 15V.

Applications:

- Energy saving of home electronics.
- Security system.
- Light appliances.
- Human detection of other appliances.

Features:

- Small package.
- Available in surface mounting.
- Very cost effective.
- High responsiveness.

More info?
send ref.
2501
to
info@murata.eu

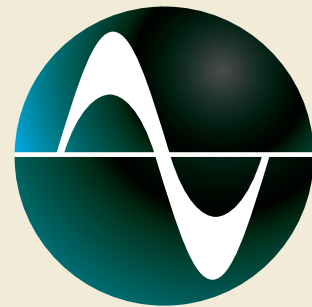
25 summary

World's smallest pyroelectric infrared sensor.

New high accuracy hybrid crystal resonator.

Ultra-tight $\pm 0.5\%$ tolerance chip NTC thermistors.

Improve Q-factor of high-frequency circuits.



electronica 2010

Meet with us

Electronica 2010: demonstrations including unicycling robot and RFID capabilities. Munich, November 9-12th 2010 on booth B5-107.

We are there

ID World International Congress Milan, November 17-18th 2010.

Technical News

Choose carefully: how the wrong capacitor choice can limit the lifetime of your LED lighting product.

New Data

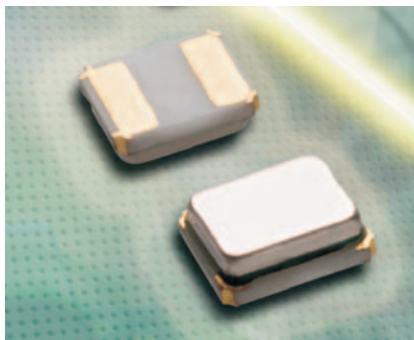
Murata Product Catalogue 2010-2011.

New high accuracy hybrid crystal resonator

Murata announces a new series of devices in its hybrid crystal resonator family, featuring improved accuracy of less than ± 100 ppm.

Murata's hybrid crystal resonator family features a quartz crystal element manufactured by Tokyo Denpa alongside Murata's ceramic resonator technology in the same package, using Murata's production technology to create a device smaller and lower cost than a quartz crystal whilst maintaining the precision of quartz.

The XRCGB-M series features high accuracy of less than ± 100 ppm, complementing the already available XRCGA-L series, which has standard accuracy of ± 150 ppm. At low frequency (24 to 30MHz), initial tolerance of the XRCGB-M series is



± 30 ppm, plus temperature characteristic of ± 40 ppm over the range -30 to +85°C. At high frequency (30.1 to 48MHz), initial tolerance is ± 45 ppm, plus temperature characteristic ± 40 ppm over the range -30 to +85°C. The XRCGB-M range also benefits from a tiny package size of just 2.0 x 1.6 x 0.7mm, comparing favourably to its

quartz crystal equivalents. The series is available in frequencies of: 24, 25, 27, 27.12, 30, 33.86, 40 and 48MHz, with additional frequencies under development. Murata's hybrid crystal resonators now all feature four connection pads on the base to make them a more direct replacement for quartz.

All Murata's hybrid crystal resonators are RoHS compliant.

More info?
send ref.
2502
to
info@murata.eu

Applications:

- Equipment for USB3.0.
- PC/Mobile Phone/Visual equipment/ Small portable equipment.

Features:

- Frequency Tolerance:
 ± 30 ppm ... < 30MHz
 ± 45 ppm ... > 30MHz
- Temp. Stability ± 40 ppm.

www.murata.com/products/catalog/pdf/p79e.pdf

Ultra-tight $\pm 0.5\%$ tolerance chip NTC thermistors

Murata announces ultra-tight tolerance versions of its market-leading chip NTC (negative temperature coefficient) thermistor series, the NCP series. $\pm 0.5\%$ tolerance versions are now available with consumer, industrial and automotive temperature ranges.

These $\pm 0.5\%$ tolerance chip NTC thermistors are the first of their kind to be developed and offer a low-cost alternative to IC-based sensing solutions when high sensing accuracy is required.

These parts are aimed at applications where the most accurate temperature sensing is required, such as air conditioning systems, power supply cooling/thermal management systems

and automotive temperature sensing applications. Ultra-tight tolerance thermistors are particularly important in situations where the thermistors are to be used near the maximum operating temperature, since low accuracy could mean the maximum operating temperature of the system is exceeded.

Murata's NCP series of chip NTC thermistors offer benefits such as small package sizes (down to 0201) and feature constant temperature coefficient for all the package sizes, supporting customers who wish to downsize their designs. Simulation software which calculates the output characteristics of any of 418 of Murata's NCP series of thermistors is available online, to help designers find the right part without any trial and error.



The simulator is available at:
www.murata.com/products/design_support/mcnvs/index.html

More info?
send ref.
2503
to
info@murata.eu

Applications:

- Various automotive.
- A/C.
- Power Supplies.

Features:

- Ultra tight tolerance type ($\pm 0.5\%$).

meetwithus

Electronica 2010: demonstrations including unicycling robot and RFID capabilities



Murata Power Solutions power products also featured

Murata will be exhibiting at Electronica 2010 in Munich, Germany, 9-12 November 2010, on booth B5-107. The company will demonstrate its unicycling robot, Murata Girl, alongside the flexibility of its RFID technology, MAGICSTRAP[®], plus its micro-blower spot cooling device and other solutions for consumer, automotive and industrial electronics. Murata Power Solutions will also be showcasing AC-DC and DC-DC products on the Murata booth.

Technical experts from both Murata and Murata Power Solutions will be on hand to answer any questions about the companies' extensive product offering.

Visitors will be able to see a demonstration from Murata Girl, the unicycling robot. Murata Girl's ultrasound sensors enable her to keep a fixed distance away from moving objects; there are sensors front and back enabling her to ride forwards and backwards. She has a gyro sensor and a flywheel in her chest which help her to keep her balance. Like her older cousin Murata Boy, her batteries are carried in her backpack.

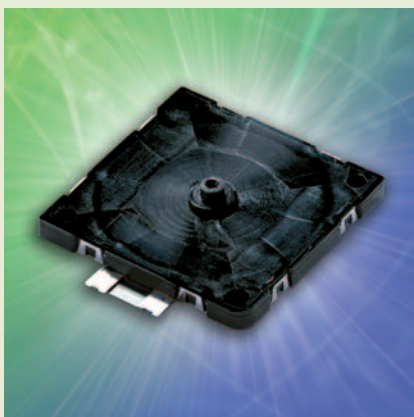
Murata's RFID technology will also be demonstrated live on the booth, focusing on MAGICSTRAP[®]. This product is a multilayer ceramic RFID module for the UHF band, which includes the IC alongside antenna matching circuitry.

Munich, Germany
9-12 November 2010,
on booth
B5 - 107



This matching circuitry allows the utilisation of existing metallic structures in products or packages as a booster antenna. It can for example use the ground plane of a PCB or the metallisation layer of a pharmaceutical blister pack as an antenna. Even without a booster antenna, MAGICSTRAP[®] can serve as a tag and conforms to EPC Global C1G2 and ISO-18000-6C. Its overall dimensions are just 3.2 x 1.6 x 0.55mm.

The RFID demonstration, realised with partners, will focus on MAGICSTRAP[®] integrated into a complete system and its flexibility as the ideal solution for the electronics industry. Once Murata's RFID module is applied to the PCB it can be used not only for simple process control or traceability. As the UHF RFID will give enough read range, it can also serve as a means for anti-counterfeiting and supply chain management. The product equipped with the MAGICSTRAP[®] will literally become the RFID tag.



Another demonstration will show the capability of MAGICSTRAP[®] to function as a complete tag in the close communication range (approximately 1cm), while using standard UHF RFID equipment. Due to its tiny size, MAGICSTRAP[®] can be easily embedded or moulded into products in order to serve as hidden protection against counterfeiting.

Murata will also show its range of upcoming RFID products, including RW-modules for HF and UHF, as well as new variants of MAGICSTRAP[®] which include a version for the HF band.

Murata will also be demonstrating its piezoelectric micro-blower device at Electronica 2010. The compact and very low profile device produces a jet of air which can be used in applications such as providing forced-air cooling in confined spaces, as well as many other non-cooling applications such as air pumps or air-freshening systems.

Ask for samples & specifications at info@murata.eu Visit www.murata.eu

muRata

Improve Q-factor of high-frequency circuits

Murata has added a series of 500V-rated low loss monolithic ceramic capacitors for high frequency applications to the lineup of its popular GQM series, by integrating its low loss materials technology and its base metal electrode technology.

The GQM22 series is the world's first 500V-rated MLCC with base metal electrodes, featuring high Q-factor, tight capacitance tolerance and excellent high frequency characteristics.

Although the use of base metal electrodes has been known to be effective in reducing loss and improving Q-factor, their use had until now been accompanied by problems involving characteristic adjustments and firing conditions, among other issues.

With the addition of the GQM22 series, Murata has used its materials technology and co-fired ceramic technology to make the use of base metal electrodes possible.

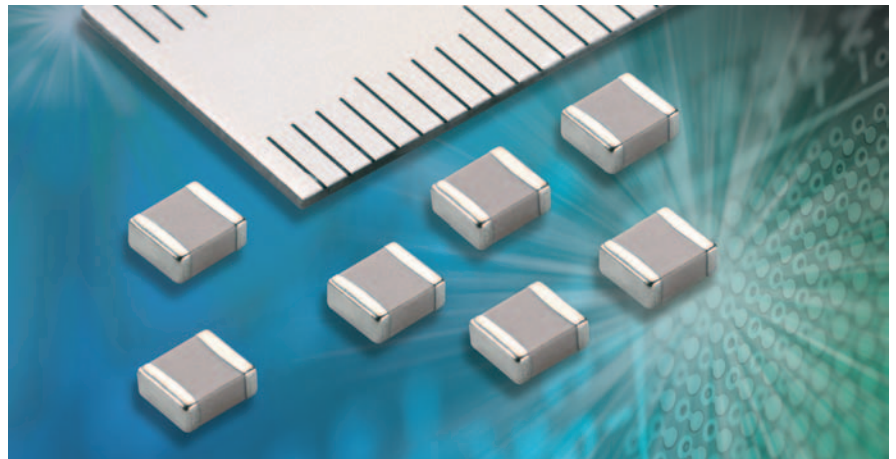
The GQM22 series is ideal for matching or coupling circuits used in applications such as power amplifiers for mobile communication, WiMAX and LTE base stations, as well as other related high frequency RF modules. Together with Murata's existing 100V and 250V-rated

products, the introduction of the GQM22 series makes high Q and low ESR possible at VHF, UHF and GHz frequencies. The new devices feature a 40% improvement in Q at 1MHz over Murata's general-purpose medium and high voltage capacitors.

With dimensions of 2.8 x 2.8 x 1.15mm

and capacitance ranging from 0.5pF to 100pF, the GQM series may be used for tight tolerance products (around capacitance tolerance $\pm 0.1\text{pF}$). DC withstand voltage is 1250V. Q-factor may be calculated as follows: $Q > 800 + 20C$ where C is the nominal capacitance of the product in pF and is between 1 and 30pF. Above 30pF, $Q > 1400$, measured at 1MHz. Operating temperature range of the GQM22 series is -55 to +125°C.

More info?
send ref.
2504
to
info@murata.eu

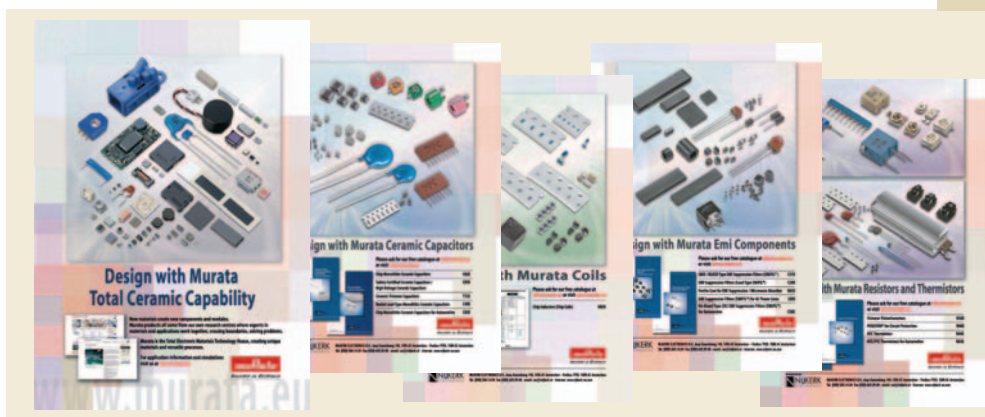


Applications:

- Matching circuits or coupling circuits used in applications such as power amplifiers for mobile communication, WiMAX and LTE base stations; other related high frequency RF modules.

Features:

- High Q- factor.
- Strengthened magnetic coupling and stabilized self resonance frequency.
- Offers tight tolerance in the capacitance tolerance B ($\pm 0.1\text{pF}$) or C ($\pm 0.25\text{pF}$) range.
- RoHS compliant.



pressnews



Murata Products
Advertising Campaign

Choose carefully: how the wrong capacitor choice can limit the lifetime of your LED lighting product

One problem frequently encountered when designing LED lighting circuits is that the capacitors in the circuit experience very high voltages which can cause them to fail long before the expected lifetime of the product. In this article, Naoyuki Kobayashi, Senior Product Manager at Murata, explains.



LED lighting products are becoming more and more prevalent. The market for these products is extensive; practically any traditional method of lighting can be replaced with a planet-friendly LED version. LEDs make an excellent domestic light source because of their long life and excellent energy efficiency.

Components for LED lighting design must be selected carefully to ensure

that they meet the lifetime and energy efficiency requirements of the end products. These requirements can be demanding - LED lighting products may have an expected lifetime of more than 40,000 hours, for example. It's therefore crucial that all parts of the circuit are able to meet these requirements.

Ceramic capacitors in this type of circuit can be subject to high voltages

and conditions unlike those usually seen in domestic appliance applications. These conditions can adversely affect the lifetime of ceramic capacitors which can mean they fail before the minimum lifetime of the end product is reached. This article explains the root of the problem and makes recommendations for ensuring ceramic capacitors do not cause lifetime problems for LED lighting products.

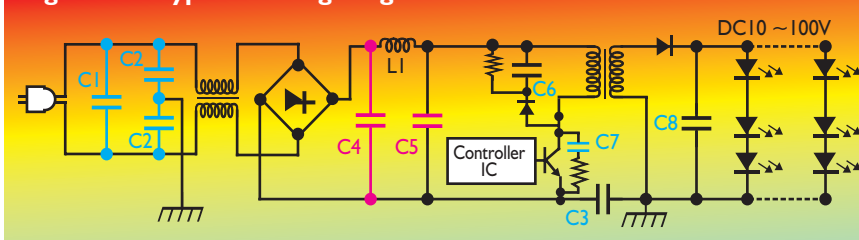
Typical conditions in LED circuitry

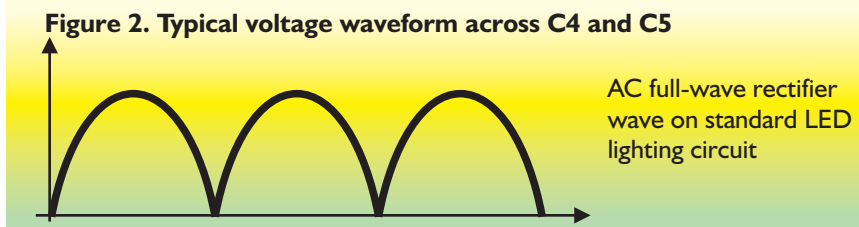
A typical LED lighting circuit is shown in figure 1. For C1, C2, and C3 safety recognised capacitors should be selected that are rated AC 250Vrms.

C6 is the snubber capacitor for the diode; parts rated to withstand DC 250V to DC 630V are needed and these can have X7R temperature characteristic. For C7, the snubber capacitor of the FET, a higher voltage rating of DC 630V to DC 1kV is necessary, and Murata recommends type U2J temperature compensated capacitors. C8 is the smoothing capacitor for the secondary circuit for which any part rated to 100V should be sufficient.

The capacitors in the circuit subject to the harshest conditions are C4 and C5, which act as AC smoothing or noise filter capacitors for the primary circuit. The typical working voltage on these capacitors is the full-wave rectified waveform shown in figure 2. X7R capacitors that are rated to DC 250V are often (wrongly) chosen for C4 and C5. The problem is that when high dielectric constant capacitors like these are subjected to full-wave rectified voltages, they succumb to the electrostrictive effect, which can cause fatal cracks in the dielectric material.

Figure 1. A typical LED lighting circuit

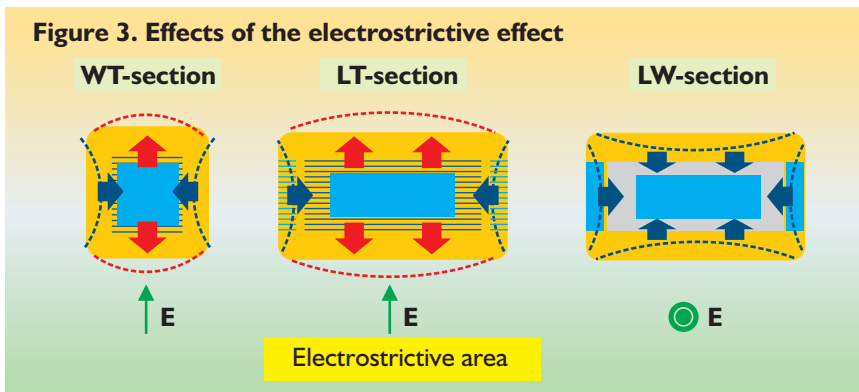




The electrostrictive effect applies to all dielectric materials. When an AC voltage is applied, the capacitor effectively stretches and shrinks in the different dimensions, as shown in figure 3. Mechanical distortion and stress concentrate around the edge of the external electrode of the capacitor. If the AC voltage is large, and the material has sufficient dielectric properties, after some time cracks can form under the external electrode which can lead to catastrophic short circuit failure of the component.

one of several types of Murata high voltage capacitors. The centre area of this structure (marked red in the figure) is not active, and is therefore free from the effects of the electrostrictive phenomenon. This is one of several ways that Murata can protect its capacitors from internal mechanical stress.

Additionally, thickness of the outer layer of the dielectric (the 'dummy' layer) can influence the formation of cracks. This layer is where cracks usually begin, so increasing its thickness, and thereby its mechanical

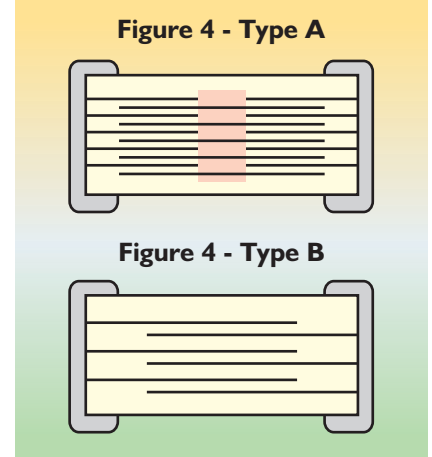


Mitigating the electrostrictive effect

There are a number of ways in which Murata mitigates the electrostrictive effect with specially designed capacitor structure.

The first factor to take into account is the thickness of the dielectric material between the inner electrodes of the capacitor. This has a direct effect on the magnitude of the electrostrictive phenomenon. When constructing high voltage capacitors, it's therefore essential to ensure the dielectric layer is thick enough to reduce the chip capacitor's internal mechanical stress.

Secondly, the structure of the inner electrodes can contribute to the electrostrictive effect. Typical inner electrode structure is shown in figure 4(b). By comparison, figure 4(a) shows



Taking all these factors into account, Murata recommends parts from its GRM series of multilayer ceramic capacitors for C4 and C5 that are able to exceed the minimum lifetime required whilst subjected to the operating conditions described above (see table 1 for suggested part numbers). These parts have the X7R temperature characteristic and come in a range of values; DC 630V rated parts come with capacitance between 0.001 and 0.22µF and DC 1kV rated parts range from 0.00047 to 0.1µF.

Overall, the conditions experienced by ceramic capacitors in LED lighting circuits should not be underestimated. It is Murata's experience that selecting the wrong capacitor can adversely affect the lifetime of the end product

Table 1. Suggested part numbers suitable for C4 and C5

Country	AC voltage	CAPACITANCE			
		0.047µF (473)	0.1µF (104)	0.22µF (224)	0.47µF, 1µF (474/105)
JAPAN	AC100V	GRM32DR72J473KW01L	GRM43DR72J104KW01L	GRM55DR72J224KW01L	Parallel use of left products or RDE
NORTH AMERICA	AC120V	1210,X7R,DC630V	1812,X7R,DC630V	2220,X7R,DC630V	
EUROPE/ASIA	AC220-240V	0.047µF	0.1µF	0.22µF	
NORTH AMERICA	AC277V	GRM43DR73A473KW01L 1812,X7R,DC1kV 0.047µF	GRM55DR73A104KW01L 2220,X7R,DC1kV 0.1µF	Parallel use of left products	Parallel use of left products

strength, can help increase the lifetime of these products.

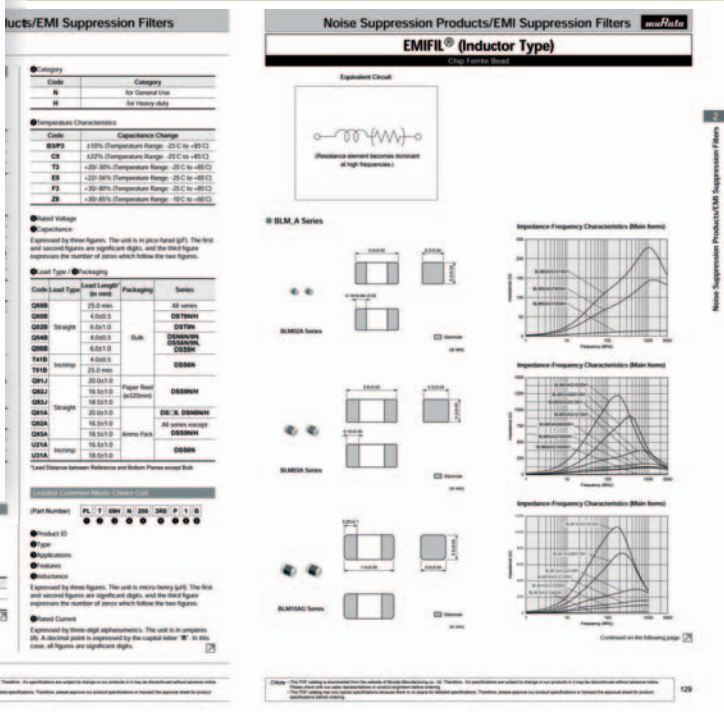
Last but not least, properties of the dielectric material itself can play a part, since it is only high dielectric constant materials that experience this effect. Murata carefully considers the properties of its materials to ensure that products specified for high voltage are constructed from suitable dielectric materials.

due to crack formation in the dielectric material of these capacitors. When designing this type of product, designers should take care to ensure they use adequately rated chip ceramic capacitors, with superior structure to mitigate the electrostrictive effect described above.

More info?
send ref.
tn25
to
info@murata.eu

New General Catalogue

Our Murata Products 2010-2011 catalogue will be available soon. If you are interested in receiving a copy please send an email to info@murata.eu with ref. 2505



ID WORLD International Congress
 You are invited to visit the Murata stand at **ID WORLD International Congress** that will take place 17-18 November 2010, in Milan

The ID WORLD International Congress is the most comprehensive showcase on the evolving world of RFID, biometrics and smart card technologies. It is the only international forum that looks at the advanced auto ID industry as a whole, rather than focusing on a specific technology or vertical sector.

This year's ID WORLD International Congress will explore the fundamental issues associated with automatic identification in a variety of market segments via three cornerstone initiatives: the Conference, the Exhibition and the Exchange.

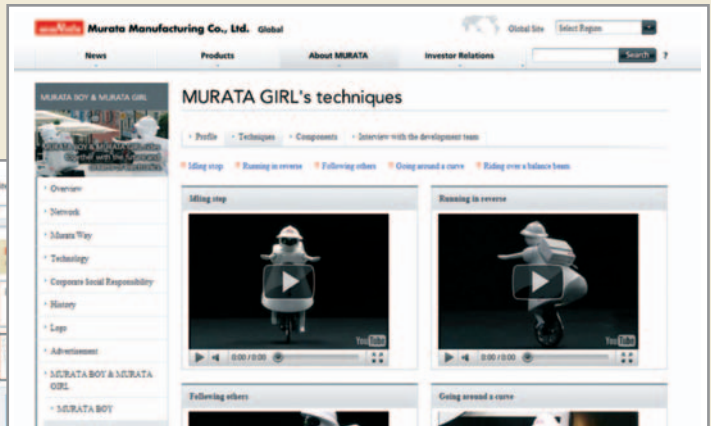
Between 16th and 18th November, ID WORLD Conference will gather together more than 150 top level speakers to discuss the fundamental issues associated with identification technologies in a variety of sectors.



On November 17th and 18th, in the ID WORLD Exhibition, more than 100 exhibitors will present their auto ID products and services in an 800 m2 area.

Murata representatives will be happy to welcome you to our stand C14.

Murata Boy and Murata Girl ride together with the future and dreams of electronics



Murata Europe Management B.V.
 Daalmeerstraat 4
 2131 HC Hoofddorp - THE NETHERLANDS
 Tel: +31 (0) 23 569 8410
 Email: info@murata.nl
Nordic office Finland:
 Pakkalankuja 7 - FIN-01510 Vantaa - FINLAND
 Tel: +358 (0) 9 2707 5155
 Email: info@murata.nl

Murata Elektronik GmbH
 Holbeinstrasse 23
 90441 Nuernberg - GERMANY
 Tel: +49 (0) 911 6687-0
Budapest office:
 Buda Plaza Irodaház, Budafoki út 111
 1117 Budapest - HUNGARY
 Tel: +36-1-2053159
Opfikon Branch:
 Europastrasse 9 - Postfach
 CH 8152 Glattbrugg - SWITZERLAND
 Tel: +41 (0) 44 949 30 40
 Email: info@murata.de

Murata Electronique SAS
 18-22, Avenue Edouard Herriot, Copernic 6
 92356 Le Plessis Robinson Cedex - FRANCE
 Tel: +33 1 40.94.83.00
 Email: info@murata.fr

Murata Electronica S.p.A.
 Via San Carlo, 1
 20040 Caponago (MB) - ITALY
 Tel: +39 02 95968.1
 Email: info@murata.it

Murata Electronics (UK) Ltd
 Oak House, Ancells Road,
 Ancells Business Park,
 Fleet, Hampshire - GU51 2QW (UK)
 Tel: +44 (0) 1252 811666
 Email: enquiry@murata.co.uk

Murata Electronics (Netherlands) B.V.
 Daalmeerstraat 4
 2131 HC Hoofddorp - THE NETHERLANDS
 Tel: +31 (0) 23 56 98 410
Spanish office:
 Centro de Empresas
 Parque Tecnológico del Vallés
 08290 Cerdanyola - Barcelona - SPAIN
 Tel: +34 (0) 93 582 0259
Nordic office Sweden:
 Strandbergsgatan 61
 112 89 Stockholm - SWEDEN
 Tel: +46 (0) 8 136 492
 Email: info@murata.nl

distributed by:

Scapro AB
 Box 15034
 SE-167 15 Bromma
 Sweden
www.scapro.se
 Phone: +46 (8) 564 599 00