EPCOS

Electronic Parts and Components

# Technology update

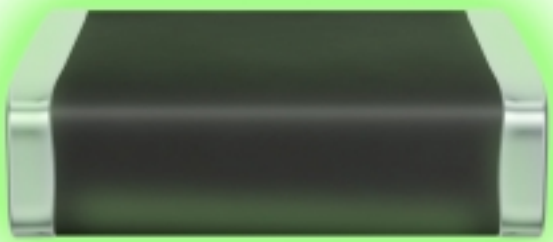
Volume 4 No.2

## Protection Innovations

### Aggressive Pricing for TransGuard ® Equivalents

If you're a design engineer or purchasing agent using TransGuard Voltage Suppressors, you owe it to yourself to consider EPCOS Multilayer SMD(MLSMD) Varistors.

- EPCOS is the world leader in over-voltage circuit protection and the leading developer of high-energy multilayer construction.
- EPCOS MLSMD Varistors are equivalent to TransGuard, with most crosses one-for-one.
- EPCOS MLSMD Varistors are available at exceptionally attractive prices.
- Available in industry-standard packages, including *arrays*.
- Automotive series to protect sensitive auto electronics; jump start, load dump rated.

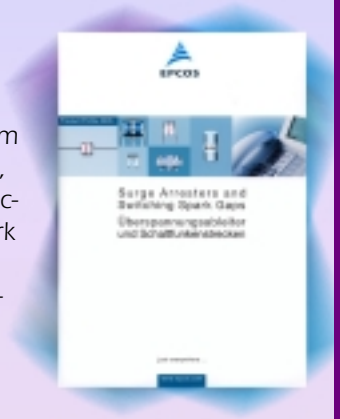


Rely on EPCOS MLSMD Varistors for protection from voltage transients caused by inductive switching, lightning, ESD and more.

**For aggressive pricing, call 800-888-7728 or e-mail protectors.usa@epcos.com**

TransGuard is a registered trade name of AVX.

### New brochure: Surge Arresters and Switching Spark Gaps



Surge Arresters and Switching Spark Gaps Product Profile 2005 from EPCOS covers 2-electrode arresters, arrester-varistor combinations, 3-electrode arresters, and switching spark gaps. Also included is information about applications, functions, definitions and measuring conditions, quality, environmental protection, and taping and packaging.

**For a free copy call EPCOS at 800-888-7728, or e-mail protectors.usa@epcos.com**

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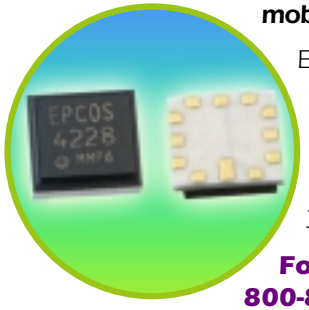
# Innovative RF Solutions

### World's smallest modules for mobile phones



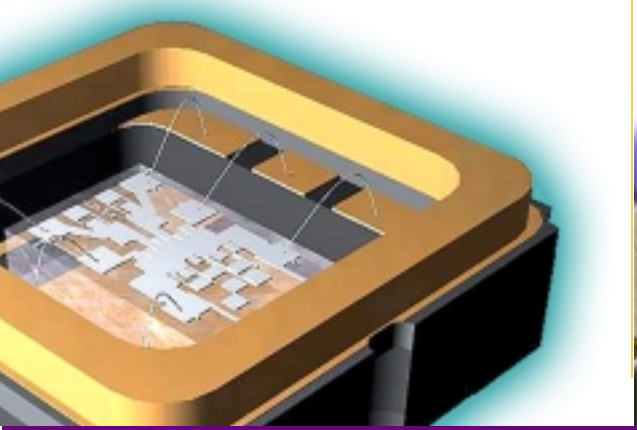

EPCOS offers the smallest duplexers for mobile phones in the world, with dimensions of only 3.0 x 2.5 x 0.6 mm.

**For samples, call 800-888-7297 or e-mail SAWS-MWC.usa@epcos.com**

### 42% Smaller SAW packages

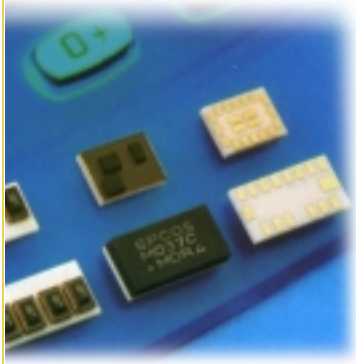
Narrowband SAW filters previously encapsulated in the 8 pin QCC8C package (5 x 5 mm) are now available in the 8 pin QCC8B package (3.8 x 3.8 mm) manufactured in large volumes for SMD. EPCOS also has miniaturized its broadband filters on lithium tantalite substrate to fit into 3 x 3 mm DCC6C packages. The smaller packages open new design opportunities in smaller footprints usually without any performance trade-offs, but with substantial cost savings.

**For samples, call 800-888-7297 or e-mail SAWS-MWC.usa@epcos.com**



### World's smallest GSM front-end module based on LTCC

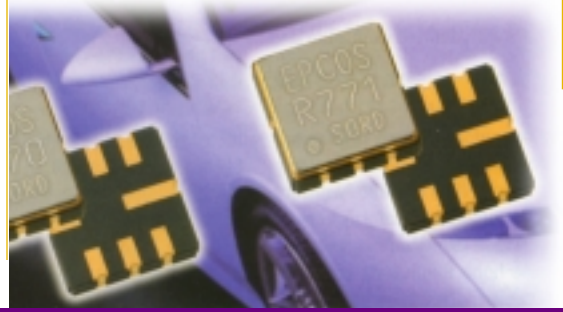
EPCOS has set a milestone in miniaturization with the world's smallest GSM front-end module based on LTCC. With a footprint of only 4.5 x 3.2 mm, it is 30% smaller than previous solutions. Insertion height has been reduced to 1.2 mm by using SAW filters in CSSPlus packages. Switching losses in the send and receive paths have been significantly reduced.



**For samples, call 800-888-7297 or e-mail SAWS-MWC.usa@epcos.com**

### Two-in-one SAW resonators

For wireless keyless entry and tire pressure monitoring systems, EPCOS two-in-one SAW resonators solve the problem of cramming and interference within the ISM band and its perimeters by retransmitting the data telegram on different frequencies or channels within the ISM band. The transmitter and receiver alternately use different frequencies. Because interference usually affects only one channel, the message can be received and evaluated via the second. Channels are selected in the intermediate frequency with an IF filter. Transmitter frequency is stabilized with a phase-locked loop or by switching between two SAW resonators.




This solution offers simplicity of design and low cost.

**For samples, call 800-888-7297 or e-mail SAWS-MWC.usa@epcos.com**

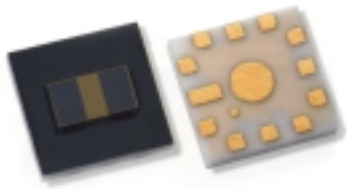
### New generation of SAW filters for remote controls

EPCOS is miniaturizing all product families on the basis of quartz. The latest addition is a new generation of broadband filters for all major frequencies in automotive applications available in a smaller DCC6C package with a footprint of 3 x 3 mm.

Electrical performance is as good or better than previous models. For example, typical insertion loss has been reduced by at least 1 dB to a low value of only 1.7 dB in type B3711.

**For samples, call 800-888-7297 or e-mail SAWS-MWC.usa@epcos.com**

### FBAR Duplexers

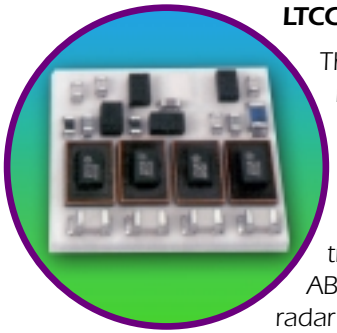


EPCOS FBAR (Film Bulk Acoustic Wave Resonator) duplexers are ushering in the next era in filter technology. These components combine the benefits of

SAW and microwave ceramic technologies: outstanding filter characteristics and extremely steep slopes with high power compatibility.

EPCOS currently offers FBAR duplexer B7634 for the US PCS band with a footprint of 5 x 5 mm. The next miniaturization is expected later this year – a footprint of 3.8 x 3.8 mm.

**For samples, call 800-888-7297 or e-mail SAWS-MWC.usa@epcos.com**



### LTCC Modules

The high reliability and miniaturization of EPCOS LTTC modules unlock new applications in motor vehicles, including transmission control ABS and interval radar systems.

**For samples, call 800-888-7297 or e-mail SAWS-MWC.usa@epcos.com**

### Compact SAW filters with integrated balun function

Wireless multimedia terminals no larger than conventional handsets have become a reality. EPCOS CSSP packaging technology and LTCC multilayer technology enable further miniaturization in next-generation mobile phones. The latest EPCOS CSSP3 filters have a footprint of only 1.1 x 1.4 mm.

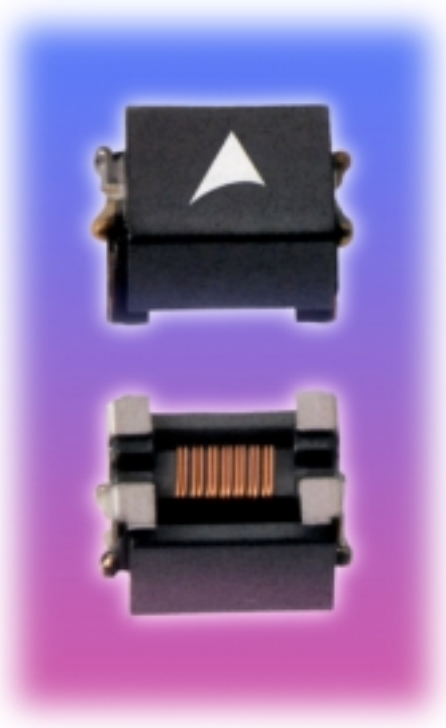
**For samples, call 800-888-7297 or e-mail SAWS-MWC.usa@epcos.com**

# Inductor Innovations

### New series of miniaturized transformers

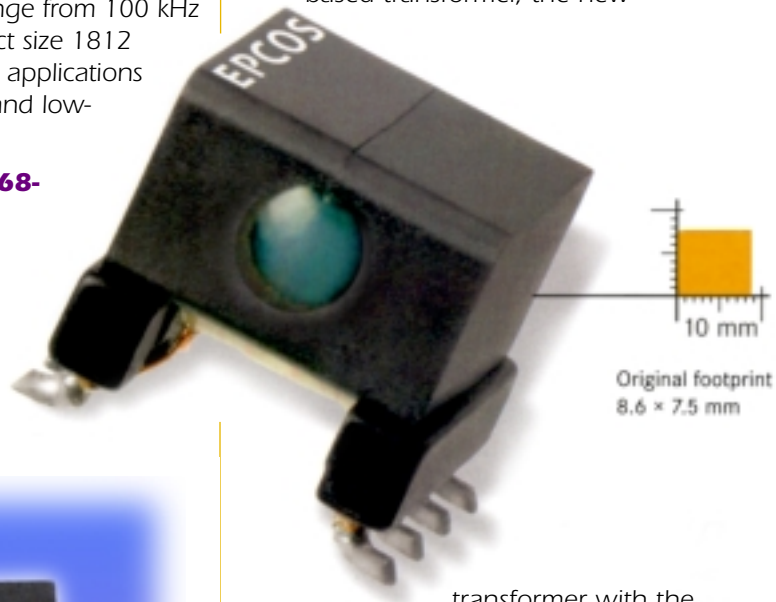
The new B82789T series of transformers features a broad frequency range from 100 kHz to 1 GHz as well as compact size 1812 (4.5 x 3.2 x 3 mm). Typical applications are in telecom equipment and low-power DC/DC converters.

**For samples, call 888-768-2673 or e-mail inductors-emc.usa@epcos.com**



### EPCOS shrinks DSL transformers

EPCOS Series B78416 interface transformers for DSL equipment set a new milestone in miniaturization. Compared with the EP7-based transformer, the new transformer with the EP5XL core is 25 percent smaller, 31 percent lower and occupies 48 percent less volume. Despite its smaller core volume, the new transformer has the same longitudinal balance and total harmonic distortion values while satisfying the leakage inductance requirements. Only its ohmic resistance is higher. The tiny transformer can even satisfy the requirements for surge voltage strength and is designed for 2.5 kV/2/10 µs or 1.5 kV10/700 µs. The higher ohmic resistances can be compensated by next-generation line card chips.




**For samples, call 888-768-2673 or e-mail inductors-emc.usa@epcos.com**

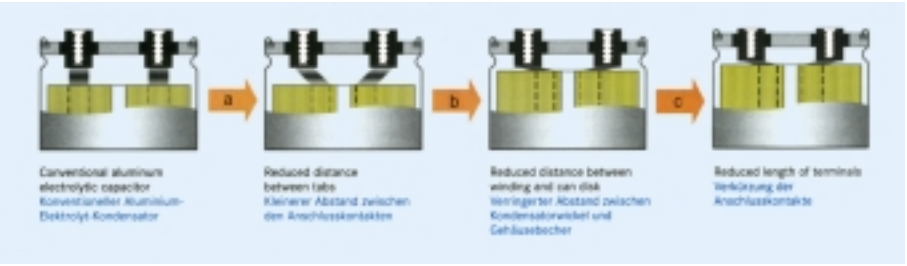
# Capacitor Innovations

### Inductance halved, costs cut

EPCOS offers a better solution to the problem of parasitic inductance with aluminum electrolytic capacitors in which self-inductance has been halved. At 10 nH, it is now the lowest in the world.

These components are characterized by:

- Reduced distance between the tabs (a)
- Special folding of the terminals, reducing the distance between winding and can disk (b)
- Shorter terminals (c)




Voltage overshoots can be reduced by as much as 50 V, resulting in these benefits:

- More economical power switches of a lower voltage class than in converters.
- Minimized inductance leading to reduced capacitor impedance, with a positive effect on current-handling capability and self-heating.

**For samples, call 800-888-7729, or e-mail caps.usa@epcos.com**

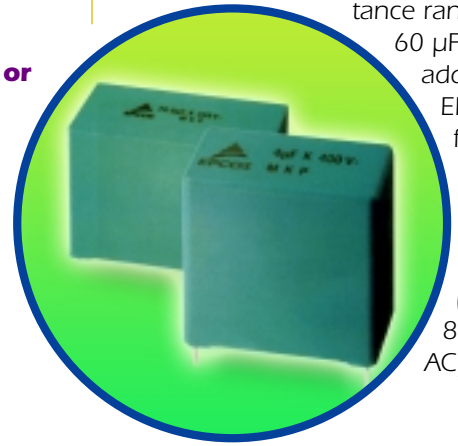
### Design combination slashes ESR by factor of 10


By combining polymer and multianode technology, EPCOS has reduced the equivalent series resistance (ESR) of tantalum capacitors by a factor of 10. ESR in the region of 10 mΩ can be obtained, and even single-figure milliohm values will be feasible in the medium term.

EPCOS is the first manufacturer in the world to offer a tantalum capacitor as an SMD with triple polymer anode. This can be used in switch mode power supplies to smooth ripple currents up to 4.5 A.

**For samples, call 800-888-7729, or e-mail caps.usa@epcos.com**

### New link circuit series power capacitors



New types covering the capacitance range from 5 to 60 µF have been added to the EPCOS line of four-pin link circuit capacitors operating on voltages from 250 V DC (180 V AC) to 850 V DC (350 AC). These capacitors are equipped with four terminal wires as standard, and spacing varies with case size.

A polypropylene film metalized with an aluminum-zinc alloy and specified for -55 to +85° C is used as the dielectric, which – like all film capacitors – is self-healing. Winding is fixed in place by epoxy encapsulation in a plastic case, ensuring mechanical stability.

**For samples, call 800-888-7729, or e-mail caps.usa@epcos.com**

### New space-saving X2 capacitors

EPCOS has developed a new series of X2 capacitors with a low space requirement. Highlights include:

- Capacitance range: 10 nF to 10 µF
- Rated voltage: 305 V AC
- Maximum temperature: 125° C


**For samples, call 800-888-7729, or e-mail caps.usa@epcos.com**

### New MLCCs with reduced insertion height

EPCOS has significantly reduced insertion height in multilayer ceramic capacitors (MLCCs). Instead of 1.25 mm, the new types are only 0.8 mm high.

MLCCs are distinguished by high capacitance in a minimum of space. They are used for buffering and decoupling in all sectors of electronics.

**For samples, call 800-888-7729, or e-mail caps.usa@epcos.com**

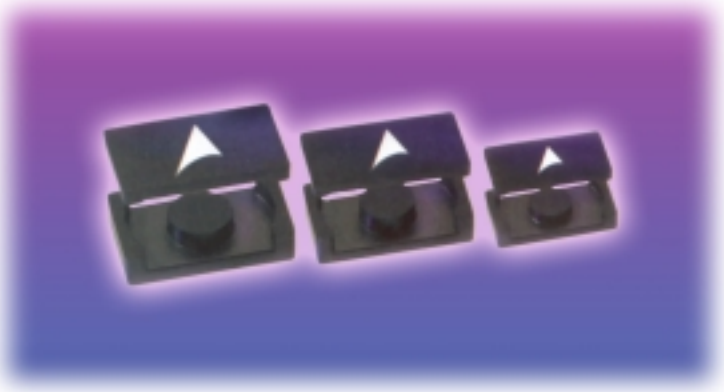
**New brochure: *Aluminum Electrolytic Caps for Automotive Applications***

Aluminum Electrolytic Capacitors for Automotive Applications Product Profile from provides technical data about three types:

- Large size B41605 and B41607 series for applications with stringent demands for power and current carrying capacity at ambient temperatures up to 150° C. Their sophisticated corrugation configurations enable designers to specify 40 g vibrational stability.
- Axial-lead (B4169x/B43693) and soldering star (B4179x/B43793) types that withstand extreme temperatures and excessive vibration, combine highest ripple current load and very low ESR with an extremely compact design, and provide a field rejection rate ≤ 1 ppm.


- Single-ended types, including special lead configurations, Protection Against Polarity Reversal (PAPR) concept extension with J leads and bent 90° leads, the new B41853 series for high performance in airbag applications, high-reliability B41868 for temperatures to 150° C, the new B41896 series with long life at temperatures to 125° C with higher ripple current capability in compact sizes for powertrain applications and control units, the B41888 series upgrade for extended life and high ripple current capability at 105° C, and the B43866 series combining high temperature resistance to 125° C at high operating voltages up to 350 V.

**For a free copy, call 800-888-7729, or e-mail caps.usa@epcos.com**



# Ferrite Innovations

**New planar cores for DC/DC converters**

EPCOS has developed improved planar cores for DC/DC converters based on high-performance ferrite materials for power applications.

Because these converters are usually of customer-specific design, a wide range of ferrite core shapes is necessary. The product range has been extended to include a complete series of EQ cores in sizes EQ13, EQ20, EQ25 and EQ30. New to the line of standard planar cores are core shapes ER24, ER26 and ER32. The height of the planar cores can be matched to customer requirements.

EPCOS can develop additional core shapes to meet specific customer requirements. All core shapes are available in EPCOS' high-performance materials N97, N92 and N49, which feature as low power dissipation, high DC magnetic bias and compatibility with high frequencies up to 1 MHz.

**For samples, call 888-768-2673, or e-mail ferrites.usa@epcos.com**

EPCOS

EPCOS, Inc.
186 Wood Avenue South
Iselin, New Jersey 08830 U.S.A.
Phone: 732-906-4300
Fax: 732-603-5935
sales.usa@epcos.com
www.usa.epcos.com

**just everywhere ...**