

MINIATURE CRYSTALS FOR TPMS APPLICATIONS

NIHON Dempa Kogyo Co. Ltd. (NDK) offers two crystal resonator options to provide frequency control for transmitters or receivers in tire pressure monitor systems (TPMS) applications. The NX5032SD measures 5.0 mm by 3.2 mm and is 1.0 mm high, while the NX8045GB measures 8.0 mm by 4.5 mm and is 1.8 mm high. They are hermetically sealed in ceramic SMD packages exceeding the tough shock, vibration, drop, and acceleration requirements for TPMS applications. These crystals deliver excellent stabilized startup characteristics over the extreme operating temperature range of -40 °C to +125 °C. The NX5032SD, which is designed to reduce EMI, is available in the approximate frequency range of 9.84 MHz to 40 MHz. The NX8045GB is available in the approximate range of 5 MHz to 40 MHz. Both units have a frequency stability of ± 50 ppm at 25 °C.

Both of these crystals are RoHS compliant and are designed to withstand the requirements of reflow soldering using lead-free solder. NDK is also TS 16949 certified.

The NX5032SD series and NX8045GB series are respectively priced at 55 cents each and 43 cents each for 10,000 pieces.

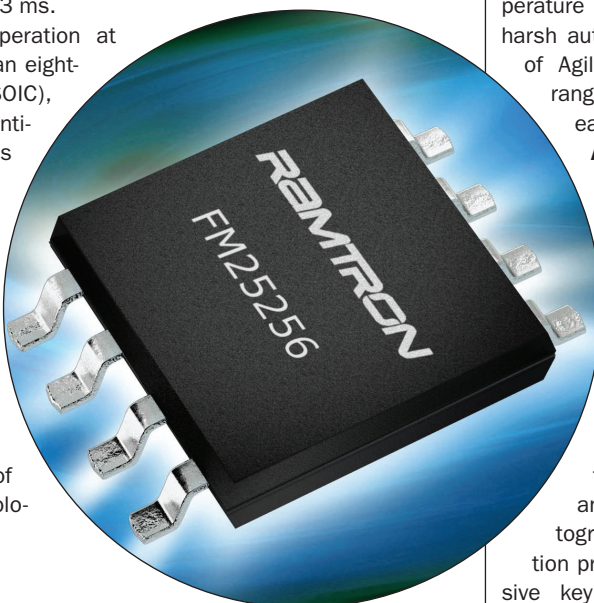
NDK • (800) NDKXTAL • www.ndk.com

SERIAL 256 K FRAM OFFERS WIDE VOLTAGE OPERATION

The FM25256 from Ramtron International Corporation is a 256 Kb non-volatile ferroelectric random access memory (FRAM) product, with a serial peripheral interface (SPI), that is designed for wide voltage operation. The company's newest 256 Kb serial FRAM offers an unlimited number of read/write cycles, whereas EEPROM is exhausted after approximately one million cycles. The product operates from 4.0 V to 5.5 V and offers drop-in compatibility with industry-standard serial EEPROMs. The FM25256 is suited to data-collection applications in which power levels vary or can be suddenly lost. Its benefits are similar to Ramtron's previously announced FM25L256, which targeted 3 V systems. The 20 MHz bus speed allows fast data collection. Reads and writes are performed at bus speeds of up to 15 MHz throughout the entire memory. There are no write delays or maximum write buffer sizes. The entire memory contents can be written in just over 13 ms.

The FM25256 is rated for operation at -40 °C to +85 °C. It is available as an eight-pin small outline plastic package (SOIC), with prices starting at \$3.84 for quantities of 10,000. The FM25256 reads and writes at bus speeds comparable to those of a high-speed RAM, but provides non-volatile storage like a conventional non-volatile memory. However, unlike EEPROM or Flash memory, there are no write delays. Also, like high-speed RAM, the FM25256 supports practically unlimited numbers of read or write cycles. These benefits allow the FM25256 to perform the functions of RAM and non-volatile memory technologies in a single chip.

Ramtron International Corp. • 800-545-3726 • www.ramtron.com



WHITE LEDs FEATURE SUPERWIDE VIEWING ANGLE

Agilent's HSMW-A10xx and HSMW-A40xx series white surface-mount (SMT) LEDs feature a superwide 120 ° viewing angle. Applications include panel, push-button or general backlighting in automotive interiors. Their flat top-emitting surface makes it easy to mate these LEDs with light pipes. With their built-in reflector increasing the intensity of the light output, these LEDs are also well suited for automotive ambient lighting such as vanity mirror lights, cabin or dome lights, and car-door puddle lights. Other applications include panel lighting for office and industrial equipment and home appliances, variable message signs and indoor and outdoor ambient lighting.

In the PLCC-2 package, the HSMW-A101-R50J1 provides 100 millicandela (mcd) minimum luminous intensity (Iv); the HSMW-A100-T50J1 provides 250 mcd minimum Iv. The Iv specifications are based on both products operating at 20 mA of forward current. In the Power PLCC-4 package, the HSMW-A400-U00M2 provides 400 mcd minimum Iv when operating at 30 mA of forward current.

The HSMW-A10xx and HSMW-A40xx series LEDs are supplied in Agilent's reliable and optically efficient packages, and operate over a -40 °C to +100 °C temperature range to assure reliability in harsh automotive environments. Pricing of Agilent's PLCC SMT white LEDs range from 23 cents to 34 cents each in high-volume quantities.

Agilent Technologies • (800) 235 0312 • www.agilent.com

PIC MICROCONTROLLER TARGETS PASSIVE KEYLESS ENTRY

The PIC16F639 from Microchip Technology is a Flash, eight-bit PIC microcontroller with a three-channel transponder analog front end and an integrated KEELOQ cryptographic peripheral. This combination provides a total solution for passive keyless entry (PKE) and other

wireless authentication applications. These applications are diverse and range in possibilities from tire-pressure monitoring systems to gate openers—all in a small 20-pin SSOP package.

The three-channel transponder analog front end provides bidirectional LF communication, commonly used in PKE and RFID applications. KEELOQ technology is based on a proprietary, non-linear encryption algorithm that creates a unique transmission on every use, rendering code capture and resend schemes useless. Additional key features of the microcontroller include a precision 8 MHz internal oscillator, up to 3.5 Kbytes of Flash program memory, 128 bytes of RAM, 256 bytes of EEPROM, two analog comparators and programmable antenna tuning.

The PIC microcontroller is available as a 20-pin SSOP package. Samples are available, and volume production is expected in the third quarter. In 10,000-unit quantities, the PIC16F639 is \$2.18 each.

Microchip Technology • (480) 792-7200 • www.microchip.com

MLCC CAPACITORS GUARANTEE HIGH RELIABILITY

KEMET “L” series capacitors are well suited for high reliability applications, including those for military, aerospace, and high reliability telecommunications. They are available in commercial surface-mount EIA sizes from 0402 to 2225. The L series dielectric availability includes X5R, X7R and COG dielectrics, which are the most widely used in the industry. Voltage ratings are available from 6.3 V up to 200 V. Examples of high reliability in the L series include a dielectric strength of 2.5 times the voltage rating for a given component, and 500 M Ω - μ F or 50 G Ω (whichever is less) of internal resistance at 25 °C for the component’s voltage rating.

Capacitance ranges include all commercially available ceramic surface-mount MLCC capacitors from low capacitance 0.5 pF up to high capacitance 47 μ F depending on case size, dielectric, and voltage rating selection. The capacitors contain tin/lead terminations with a minimum lead content of 5%. Pricing information is available from KEMET.

KEMET Corp. • (864) 963-6300 • www.kemet.com

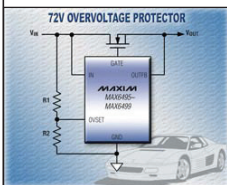
OVERVOLTAGE PROTECTION CIRCUITS OPERATE UP TO 72 V

The MAX6495-MAX6499 series of overvoltage protection circuits from Maxim Integrated Products operates as a switch controller to either disconnect or limit the output voltage to a load during an overvoltage condition. The circuits turn off an external n-channel MOSFET with an internal 100 mA pulldown current when the monitored voltage exceeds its overvoltage threshold. These low-power devices consume only 20 microamps of quiescent current and operate from 5.5 V to 72 V, making them suitable for automotive, industrial and server applications.

The MAX6497 features a latch-off mode that disables the MOSFET until the power or shutdown input is cycled. The MAX6498 features an auto-retry mode that attempts to turn on the MOSFET when the voltage falls to 130 mV. Three of the devices (MAX6495/MAX6496/MAX6499) can also be configured as a voltage limiter that provides a regulated output to allow for continuous operation. An internal charge pump on all circuits provides a 10 V gate-to-source enhancement to minimize drain-to-source resistance during normal operation. Other features include a POK indicator (MAX6497/MAX6498) and the control logic for driving a p-channel MOSFET to provide reverse battery protection. All devices offer a shutdown input. These protection circuits are offered in a 3 mm by 3 mm TDFN package and are fully specified from

-40 °C to 125 °C. Prices for these devices start at \$1.23 in 1000-unit quantities.

Maxim Integrated Products • (408) 530-6000 • www.maxim-ic.com



SHORT-VIBRATION FEEDBACK DEVICE IMPROVES OPERATION

To improve the operability of electronic products, Alps Electric Co. Ltd. developed the Force Reactor AF series of short-vibration feedback devices, which generate an array of vibration settings. Many electronic components such as mobile phones and car navigation systems are equipped with an increasing number of touch panels, input sensor devices and other equipment that are operated by the touch of a fingertip. These devices require visual confirmation of input. Recently, however, demand is rising for vibration, clicking and other sensory functions at the fingertips to indicate to users that their input has been properly accomplished. The common method of creating vibration has been to use eccentric vibration motors such as those driving mobile phone vibration functions, piezoelectric devices and other devices. However, Alps has developed proprietary magnetic circuitry to drive an oscillator supported by a spring. The results of user actions can then be relayed back as tactile sensations (force feedback), and users are provided with a confirmed status of their input. One prime application for this method would be in-car navigation systems, where being able to carry out input without sight improves safety during driving time and contributes to universal product design.

Alps-applied actuator technology cultivated in the development of floppy disc drives to the development of the Reactor AF series. By using magnetism and spring tension for vibration control, balance is created and short vibration is accomplished, thereby enabling a variety of vibrations. Moreover, with vibration strengths of 0.8 G and 1.9 G for the S and L types, respectively, a measure of flexibility is provided to optimize for desired size or vibration power. The S and L types are further differentiated, also respectfully, by the following parameters: ratings voltage (3.3 V and 3.3 V to 5 V), time of applied voltage (3 pulse/1.1 ms and 2 pulse/1.5 ms), peak current (82.5 mA and 120 mA), driving current (41.3 mA and 60 mA), and dc resistance (40 Ω and 27.5 Ω).

The S-type Force Reactor AF weighs 0.8 g and has dimensions of 3.0 mm x 25.0 mm x 2.5 mm. The L-type weighs 5.1 g and has dimensions 7.5 mm x 35.0 mm x 5.0 mm.

Alps Electric Co. Ltd. •
(408) 361-6400 •
<http://www.alps.com/>

CUSTOMIZABLE ROTARY POSITION SENSORS

Murata Manufacturing Co. Ltd. has produced two distinct series of rotary position sensors that feature long lifetimes and configurable outputs. The distinct features of each allows for optimizing for form factor or high reliability (contactless).

The SV21 features a rotating magnet and a Hall-effect device to eliminate contact wear. This device has an effective rotational angle of 200°. Customers may specify the inclination, offset, upper limit, and lower limit of the output voltage. The form factor of the SV21 is 23.0 mm x 16.0 mm x 32.5 mm. The SV01 has a much smaller form factor and a greater effective rotational angle. It features a linearity of 2% and an operational lifetime of one million cycles.

Murata Manufacturing Co. Ltd. •
(770) 436-1300 • www.murata.com

MICROSOFT RELEASES WINDOWS AUTOMOTIVE 5.0

Microsoft Corp.'s Automotive Business Unit has released Windows Automotive 5.0, the latest version of its automotive-grade software platform designed specifically for the custom development of advanced in-vehicle solutions including navigation, infotainment and communication systems.

Windows Automotive 5.0 provides the automotive industry with a powerful, flexible software platform to create an array of cutting-edge in-vehicle solutions. Building on previous versions, new features such as the automotive user interface toolkit (AUITK) and expanded virtual memory support enable the creation of complex 3-D graphics and advanced navigation displays, while enhanced power management and faster cold-boot times improve performance. In addition, the

platform is expected to help the industry deliver better solutions to market more quickly using the new automotive system tools (ASTs), which include improved test modules and easy-to-use product engineering guidelines to help simplify the development process and increase reliability.

Based on the robust, real-time embedded operating system Windows CE 5.0, Windows Automotive 5.0 contains the building blocks necessary to integrate with off-board services, including those offering real-time traffic updates, directions to the cheapest gas in town, turn-by-turn navigation and more.

Windows Automotive 5.0 was co-developed by Microsoft teams in Redmond, WA., and Tokyo in an effort to meet the differing needs of the automotive industry worldwide. Currently, world-class automotive device suppliers including Alpine Electronics Inc., Clarion Co. Ltd., Kenwood Corp., Matsushita Electric Industrial Co. Ltd., Mitsubishi Electric Corp., Pioneer Corp. and Tottori Sanyo Electric are using the Windows Automotive platform to develop a broad range of solutions ranging from digital radios and hands-free kits to high-end 3-D navigation systems.

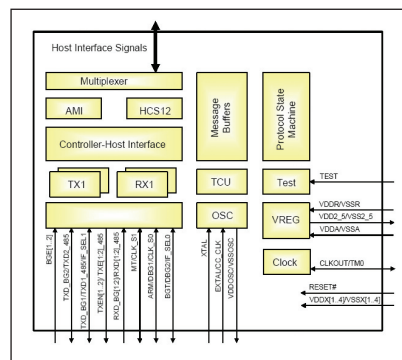
Microsoft Corp. • (888) 456-5570 • www.microsoft.com

CONTROLLER INCLUDES RICH SET OF FEATURES

Freescale's MFR4200 FlexRay communication provides system designers with the advanced networking features defined by the FlexRay consortium. This device is designed for easy integration with a wide range of MCUs such as Freescale's lines of S12X, PowerPC MPC5xx and MPC55xx, and Hawk DSP.

The MFR4200 includes a rich set of features, permitting networking that is high bandwidth, deterministic, highly reliable, and that shares a global time base. These features include a bit rate up to a maximum of 10 Mbit/s on each of two channels, a flexible error signaling mechanism that provides eight configurable counters, slot status indicators and interrupts, and a duration of the communication cycle configurable in microticks. The MFR4200 is available in production quantities.

Freescale Semiconductor Inc. • (800) 521 6274 • www.freescale.com



HARD DISC SPECIFICALLY DESIGNED FOR AUTOMOTIVE INDUSTRY

The EE25 series disc drive is Seagate's first drive designed specifically to meet the needs of the global automotive industry and other extreme environment applications. EE25 series is targeted at automobile OEMs and their system manufacturers as well as to ruggedized mobile computing and industrial PC applications. High-capacity 20 GB and 40 GB capacity points will deliver massive storage for bringing DVD-free, GPS and high-quality AV entertainment services to the car.

Extended operating temperatures will enable the EE25 series to reliably deliver digital information whether in Scandinavia or Singapore. The world's first hard drive with extreme environmental resistance that can operate in temperatures from -30 °C to 85 °C and in high-humidity and high-altitude environments, the EE25 series resists conditions that would cause lesser drives to freeze up, overheat, or fail in the mission of delivering new digital services to the automobile. Similarly, the drive's increased resistance to operating vibration of up to 2.2 Gs withstands the constant vibration of automobile operation while streaming navigation, entertainment and data services.

Seagate Technology • (405) 324-4730 • www.seagate.com