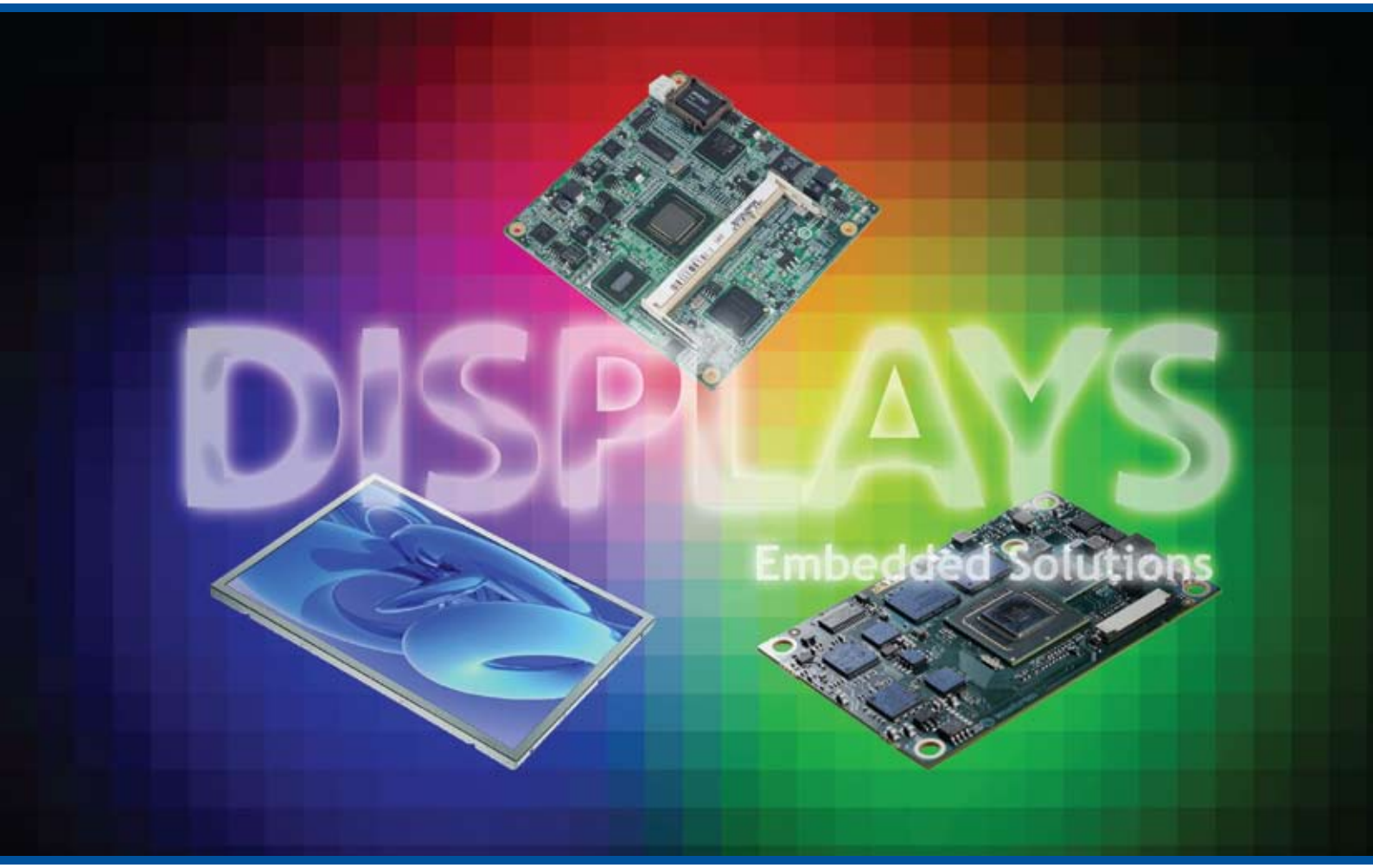
arrow innovation

Vol.21 Jan/Apr 2009 www.arrowne.com/innovation - From Ideas to Solutions



The latest news from Arrow and our suppliers

Delivering Enhanced Display Technologies

Arrow Northern Europe's combined product lines

3M
3M Touch Systems
AAAVID Thermalloy
Advanced Micro Devices (AMD)
Advantech
Alpha Wire
Altera
Amphenol
Analog Devices
Anderson Power Products (APP)
Apem
Aptina
Arcolectric
Arrow
Asiliant
Astrodyne
Atmel
Avago Technologies (formerly Agilent Technologies)
AVX
AVX/Kyocera
Axon
Belden
BI Technologies (TT Electronics)
BLP
Bourns
Bulgin
C&K Components (formerly ITT Switches)
Carclo
Cherry
Cinch
ConnectBlue
Cooper Bussmann
Cortina
Cree
Crydom
Crystal Clear Technology
Cypress Semiconductor
Datacraft
Dialight
Dialight Lumidrives
DMC
Ebm-papst
ELO Touchsystems
Emerson Network Power (formerly Astec and Artesyn)
EPCOS
ES Cable
Everbouquet
Everlight
Everspin
Exar
Fairchild Semiconductor
FCI
FDK
Ferroxcube
Fischer Elektronik
Fraen
Freescale Semiconductor
Friwo
Fujitsu
Hamlin
Harting
Harwin
Hellermann
Hitachi
Honeywell (not Finland)
Ichia Technologies
Integrated Device Technology (IDT)
Infineon Technologies
Intel
International Rectifier
Intersil
ISSI
ITT Interconnect
ITW ERG
ITW Switches
IQD Frequency Products (formerly Rakon)
JST
Kemet Electronics
Khatod
KNCTEC
Knitter-Switch
Kontron
Lapp Cable
Lattice Semiconductor
Ledil
Lineage Power
Linear Technology
Littelfuse
LSI Tech
Lumberg
Mathstar
Meder Electronic
Micrel
Micron Technology
Micronel
Microsemi
Microsoft
Molex (not Norway or Denmark)
Murata
Murata Power Solutions
National Semiconductor
NEC Electronics
NEC-Tokin
Neutrik
Nichicon
NKK (Nikkai)
Numonyx
NXP Semiconductors (formerly Philips Semiconductors)
OEP
OKI Electric
Omron
ON Semiconductor
Osram Semiconductor
Panasonic Electric Works
Panasonic Industrial
Panduit
Phoenix Contact
Power One
Powertip Technology
Precidip
Pulse Electronics
QuickLogic
Radiall
Recom
Renesas Technology
RIA Connect
Samsung Electronics
Samtec
Sandisk
Schaffner
Schurter
Sharp Microelectronics
Siemens
Souriau
Spansion
Stanley
STEC
STMicroelectronics
Syfer Technology
Tadiran (formerly Sonnenschein)
Taiwan Semiconductor
TDK
TEAC
Teledyne
Telit
Texas Instruments
Thermometrics
Thomas & Betts
Toshiba
Touch International
TXC
Tyco Electronics
Tyco Electronics Raychem
Vigortronix
Vishay
Vitelec
Vitrohm
Walsin Technology Corporation
Weidmuller
Welwyn (TT Electronics)
Wima
Yageo
Zetex Semiconductors

Published by: Arrow NE Marcom Department

Comments:
Email: innovations@arrowuk.com
Tel.: +44 (0) 1279 455398
Fax: +44 (0) 1279 455526

For changes in your name or address please contact your local sales office.

ARROW ALLIANCE EUROPE
Kronborgsgränd 19,
SE-164 94 Kista
Tel.: +46 8 56 26 55 00
Fax: +46 8 56 26 55 25
arrowallianceeurope@
arrowuk.com

DENMARK
Arrow Denmark ApS
Smedeholm 13A,
DK-2730 Herlev
Tel.: +45 70 10 22 11
Fax: +45 44 50 82 10

ESTONIA
Arrow Electronics Estonia OÜ
Sõpruse pst. 145
Section B, floor 3
13417 Tallinn
Estonia
Tel: +372 6 77 42 50
Fax: +372 6 77 42 51

FINLAND
Arrow Finland OY
Kalkkipellontie 4,
FIN-02650 Espoo
Tel.: +358 9 47 6660
Fax: +358 8 47 66 63 19

IRELAND
Arrow Electronics
47/51 Northwood Court
Northwood Business Campus
Santry, Dublin 9
Tel: +353 1 6298700
Fax: +353 1 6298701

LATVIA
Arrow Latvia
Unijas 47
Riga, LV-1039
Tel.: +371 67311490
Fax: +371 67313195

LITHUANIA
Arrow Lithuania
Savanoriu pr. 363A-306
Kaunas
LT-49425
Tel.: +370-37-759015
Fax: +370-37-452801

NORWAY
Arrow Norway AS
Åmsosen,
N-5578 Nedre Vats
Tel.: +47 52 76 30 00
Fax: +47 52 76 53 39

SWEDEN
Arrow Components Sweden AB
Kronborgsgränd 19,
SE-164 94 Kista
Tel.: +46 8 56 26 55 00
Fax: +46 8 56 26 55 50

UNITED KINGDOM
Arrow Electronics (UK) Ltd.
London Road Campus
London Road
Harlow, Essex
CM17 9NA
Tel.: (Sales) 01279 626777
Fax: 01279 455777

Supporting Innovation is the key to success

Dear Reader

As we reflect on the global events of the last 12 months, very few of us are likely to describe 2008 as uneventful. Now, however, it is time to put 2008 behind us and consider how best to address the challenges that lie ahead in 2009.

For companies in the electronics sector, the key to success in even the most challenging market conditions lies in the ability to innovate. Innovation is fundamental to addressing evolving customer demands, creating and maintaining competitive advantage, matching costs to market expectations and keeping time-to-market windows as short as possible.

Arrow has always recognised the need to provide the products and technical resources needed to support its customers' innovation and creativity. Indeed, one of our aims is to be the partner of choice not just for purchasers looking for a broad range of products but for the R&D departments and engineering project teams tasked with creating and delivering innovative ideas.

Key to supporting innovative design is the ability to offer the very latest on- and off-board technologies, from smaller, faster and more efficient semiconductors to advanced passive, e-mech and interconnection products. In addition, as design teams look to focus their efforts on their core competencies, they require their distribution partners to offer system-level solutions – solutions that they can quickly and easily integrate into a design to deliver the requisite performance and functionality with minimum design overhead. To address this demand, Arrow continues to expand its range of platform-level technologies including wireless modules, power supplies, single-board computers and displays.

But it's not just about the technology. Support for innovation also requires dedicated technical and engineering resources – another area in which Arrow continues to invest. As a result, our customer-facing teams can help with every aspect of a design, from initial concept and selection, through design-in of components and solutions, to prototyping and final manufacture.

We look forward to supporting your design and manufacturing activities in 2009 and beyond. In the meantime, should you have any comments or queries on any of the stories covered in this, or other issues, of Arrow Innovation, please do not hesitate to get in touch.

Morten Kreiberg Block
Strategic Marketing Director

CONTENTS

The latest news from Arrow and our suppliers

Engineering Feature:
Delivering Enhanced Display Technologies

POWER SUPPLY SOLUTIONS

Recom Drivers Speed Power LED Lighting Designs 4

EMECH SOLUTIONS

Omron Relays Address New Electrical Design Challenges 5

Tyco Electronics Relays Enable Solar Powered Systems 6

INTERCONNECT SOLUTIONS

Tyco Electronics Low Cost Centreline Connectors Mate with Other Brands 7

FCI Electronics Connectors Key to Medical System Performance 8

Molex (not Norway or Denmark) Board to Board Connectors Keep a Low Profile 9

Samtec High Speed, High Reliability Interconnects 10

PASSIVE SOLUTIONS

EPCOS SMD Aluminium Capacitors for Consumer and Industrial Applications 11

Panasonic Industrial Metal Thin Film Chip Resistors - High Reliability Series 12

Syfer Technology High Voltage, Multilayer Ceramic Capacitors 13

MICROCONTROLLER SOLUTIONS

Renesas Technology A Quantum Leap in Low-End Motor Control 14

STMicroelectronics Bluetooth, Processor and Power Solutions for Medical Applications 15

COMMUNICATION SOLUTIONS

ON Semiconductor LIN and CAN Transceivers for Automotive Applications 16

ENGINEERING FEATURE

Arrow Delivering Enhanced Display Technologies 17

PROTECTION SOLUTIONS

Vishay Low Capacitance, Single Line ESD Protection Diode in Leadless LLP1006-2L Package 21

POWER AND LINEAR IC SOLUTIONS

Linear Technology New Device Stops High Voltage Surges 22

Linear Technology Triple Output, Multiphase, Synchronous Step-Down Controller 23

Infineon Technologies Efficient, Intelligent Solutions for LED Lighting Applications 24

NXP Semiconductors (formerly Philips Semiconductors) High Performance MOSFET for Automotive Systems 25

Texas Instruments Four New Analogue Front-End Devices Enable Portable and Handheld Ultrasound 26

Toshiba Motor Control SoC Improves Efficiency, Cuts Noise and Component Count 27

Analog Devices Digitally Isolated Devices Enhanced 28

PROCESSOR SOLUTIONS

Analog Devices Low Power Processors Feature USB OTG and Ethernet 29

VISUAL SOLUTIONS

Everbouquet Liquid Crystal Displays for Every Occasion and Application 30

Sharp Microelectronics High Power LED Lighting Modules Shed More Light for Less Power 31

TECHNOLOGY ROUNDUP

Arrow Sensors for Defence, Aerospace and Automotive Applications 32

ARROW NEWS

Arrow Arrow Announces Power Supply Deal and Exclusive Connector Promotion 34

Forthcoming events:

Visit our websites for details of Seminars and events in your region.

http://www.arrowne.com/events-training/

Drivers Speed Power LED Lighting Designs

Compact, efficient and fully featured drivers

Power Supply

A new series of integrated, high-efficiency and compact power LED drivers from Recom International will significantly simplify the implementation of LED-based lighting applications.

The Recom International RCD-24 series of step-down constant current sources has been specifically designed to provide a compact, fully featured and highly efficient solution for driving high-power white LEDs.

Offering current outputs of 300mA, 350mA, 500mA, 600mA and 700mA, the RCD-24 series allows designers to implement lighting designs using LEDs from a variety of manufacturers without the need for additional external components. Furthermore, a compact form factor means that the drivers can be incorporated directly into the LED lamp fixtures. Alternatively, designers can mount the modules separately so that they can be installed or exchanged as easily as any other light fitting.

Despite their compact size, Recom's RCD-24 drivers integrate a high level of functionality, including both analogue and PWM/digital dimming control. The dimming controls are fully independent and can be combined to offer maximum design flexibility. There is also a remote on/off function for energy saving applications.

The new drivers are based on a non-isolated, buck regulator topology and feature a very wide DC input voltage range of 4.5V to 36V to accommodate the widest possible range of design requirements. With efficiency levels up to 97%, the internal power losses are so low that RCD-24 devices can be used in ambient temperatures of up to +85°C at full load. The high-efficiency buck regulator topology is also behind the compact construction, with each driver measuring just 22.1mm x 12.6mm x 8.5mm.

Each module in the new series can be supplied with either six pins or with four 110mm flying pre-tinned leads, ideal for pcb-less applications. Operating temperature range (without derating) is from -40°C to either +71°C or +85°C depending on the model chosen. EMC compatibility with EN 55022 Class B is easily achieved through the addition of just two further components, with another four ceramic capacitors providing compatibility with EN 61000-4-2, -3, -4 and -6.

Reliability is up to 516k hours, which is longer than the LED the RCD series drives.

Features

- Fully integrated power LED driver
- Constant current, single output
- Wide input voltage range: 4.5V to 36V
- Output current options:
  - 0mA to 300mA
  - 0mA to 350mA
  - 0mA to 500mA
  - 0mA to 600mA
  - 0mA to 700mA
- Maximum efficiency: 97%
- PWM/digital dimming: 20Hz to 200Hz
- Analogue voltage dimming
- Remote on/off function
- Short circuit protection
- Dimensions: 22.1mm x 12.6mm x 8.5mm
- Available with pins or leads
- MTBF up to 516,000 hours

Applications

- DC supply LED-based lighting applications including:
  - Traffic lights
  - Railway signalling
  - Industrial, commercial and architectural lighting
  - Commercial vehicles
  - Aircraft interior illumination
  - Lighting for harsh and hazardous environments
  - Marine
  - Security

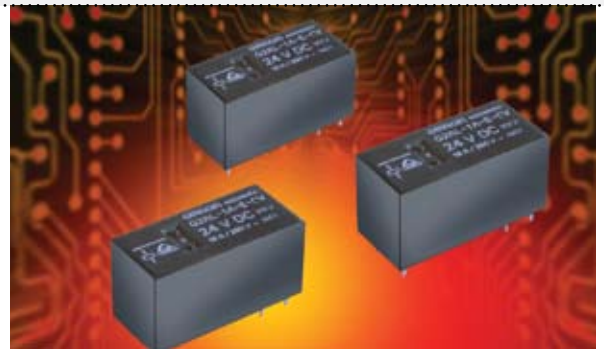
Recom RCD-24 Datasheet and Selection Guide Shortform available! Please complete the reply slip or visit the weblink below.

ENQUIRY 1473

For further information, including the RCD-24 Datasheet and the Recom Selection Guide Shortform, please please complete the reply slip or visit http://www.arrowne.com/innov/in220/f_1473.shtml

Relays Address New Electrical Design Challenges

Higher temperature and inrush current - improved switching performance



New applications for switching relays continue to emerge in industrial and domestic electrical circuits. Omron has responded to this trend with the launch of new devices, including new high temperature relays meeting the latest standards for cookers and heater controls, relays that tolerate high inrush currents and are suitable for low energy lighting and new versions of its most popular industrial control relay.

The new G2RL-1A-E-CV is rated for use at temperatures up to 20ºC higher than the standard type, tolerating up to +105ºC. It also offers superior switching performance with longer electrical endurance of up to 100,000 operations switching 16A at 250VAC and +105ºC.

Available in 24 different models, this PCB relay family is suitable for use in ovens, washing machines, boilers and HVAC equipment. A high sensitivity type, the G2RL-H, has a coil sensitivity of 250mW and is available with a UL 1446 Class F coil insulation system. The relays conform to VDE (EN 61810-1/EN 60255-23) and UL 508/ CSA C22.2 standards and meet VDE0700 regulations for safety of household and similar electrical appliances, with insulation according to VDE0110.

The G5RL-1A-E HR is a low profile relay (29.0mm x 12.7mm x 15.7mm), capable of handling high inrush currents such as those typically encountered in driving fluorescent or incandescent lamps in emergency lighting systems and appliance control applications. The relay is TV5 rated by UL and is approved to 100A steady-state, 10A(RMS), both at 240VAC for 50,000 operations by VDE. It is available with rated DC coil voltages of 5V, 12V, 24V and 48V, allowing 50,000 operations with a resistive load, bearing 16A at 250VAC or 24VDC.

A new quiet version of the G5RL, aimed at domestic applications ranging from panel heaters to video games, creates a Sound Pressure Level (SPL) of typically just 45dB at a distance of 15cm when switching.

Omron has also added four new versions to its G6RL family, designed for industrial and HVAC applications. The G6RL-ASI achieves double the standard switching performance through the use of silver-tin-indium contacts. It is rated for 100,000 operations at 8A, 250VAC. In its Normally Open (NO) form, the device achieves even higher performance of 100,000 operations at 10A, 250VAC.

For high inrush applications, the G6RL-PL type offers an even longer life of 250,000 operations with an inrush current of 20A and a steady current of 2A, allowing it to meet P1 load conditions for HVAC/boiler applications. The G6RL-SR shock resistant type and G6RL-1(A)4 fully sealed type complete the new product line-up.

Features

- High temperature G2RL-1A-E-CV
  - Up to +105ºC
  - Up to 100,000 operations at 16A, 250VAC, +105ºC
  - 24 different models
  - High sensitivity option
  - VDE and UL compliant
- Low profile, high inrush current G5RL-1A-E HR
  - 29.0mm x 12.7mm x 15.7mm
  - High inrush currents
  - TV5 rated by UL
  - VDE rated 100ADC, 10A(RMS), at 240VAC for 50,000 operations
  - DC coil voltages of 5V, 12V, 24V and 48V
  - Quiet version: 45dB sound pressure level at 15cm
- G6RL-ASI high switching performance
  - Silver-tin-indium contacts
  - Doubles switching performance: 100,000 operations
- High inrush G6RL-PL
  - 250,000 operations
  - Inrush current: 20A
  - Meets P1 load conditions for HVAC/boiler applications
- Shock resistant G6RL-SR type
- Fully sealed G6RL-1(A)4 type

Applications

- Ovens
- Washing machines
- Boilers
- HVAC
- Panel heaters
- Video games

E-Mech

Omron G2RL, G5RL and G6RL Datasheets available!

For further information, including the G2RL, G5RL and G6RL Datasheets, please complete the reply slip or visit http://www.arrowne.com/innov/in216/f_1419.shtml

ENQUIRY 1419

Relays Enable Solar Powered Systems

Safety and remote control functions

E-Mech

As environmental concerns and sustainability become more important, interest is growing in solar power generation. Tyco Electronics supplies a number of core components that may be used in PhotoVoltaic (PV) solar modules, both in domestic and commercial installations.

PV solar energy systems typically consist of a generator and a power inverter with a connection to the public power grid. The connection is bi-directional, allowing power to be taken from, or fed to, the grid. Such an arrangement is subject to special standards and regulations to ensure safety and prevent system damage.

Safety measures require an automatic switching unit with a circuit break function between the generator and feed-in point. Switching units must comply with DIN standard V VDE V 0126-1-1; the most important part of this standard is the need for a contact gap larger than 1.5mm at each switched pole.

For PV systems with galvanic isolation and single-phase AC feed-in, at least two normally open relay contacts are needed, one each for the phase and neutral lines. In PV systems with no galvanic isolation, both of the switches mounted in series must be electromechanical components.

Tyco Electronics offers a variety of solutions for solar generation systems from its RM, 041083 and PCFN product families. The PCFN Solar, for instance, is a normally open monostable relay that occupies a printed circuit area of just 490mm² and dissipates very little power. It has a continuous contact rating of 26A and the required 1.5mm contact gap. Pull-in power of 1.5W is required for 0.1s for secure operation, after which the power of the coil can be reduced to a hold level of 200mW.

Although electromechanical relays are already mandatory for interconnection to the power grid, they are also useful for coupling the PV generator to the inverter electronics. Use of a component such as the Tyco Electronics EV 200 allows implementation of special features such as remote on/off switching, service disconnection and reversible emergency shutdown in the event of a fault. The EV 200 can accommodate voltages up to 900VDC and current requirements up to 200A.

Relays may also be used in PV systems for interface functions and for internal monitoring, test and diagnostic purposes. Relays with large contact gaps such as the RP920145 are often required for such applications.

Features: PCFN Solar

- One normally open contact
- 26A current rating
- Rated voltage 277VAC
- Breaking capacity 7,200VA
- Contact gap larger than 1.5mm
- Coil-to-contact dielectric strength 4000V
- Clearance/creepage 6.1mm
- Operation requires 1.5W for 100ms
- 200mW holding power

Features: EV 200

- One normally open bridging contact
- 200A current rating
- Rated voltage 320V (900V maximum)
- 2,000A breaking capacity
- Contact gap larger than 1.3mm
- Coil voltage 9VDC to 36VDC
- Coil-to-contact dielectric strength 2,000V
- Operation requires 1.5W for 100ms
- 200mW holding power

Tyco Electronics Solar Flyer available! Please complete the reply slip or visit the weblink below.

ENQUIRY 1422

For further information, including the Solar Flyer, please complete the reply slip or visit http://www.arrowne.com/innov/in216/f_1422.shtml

Low Cost Centreline Connectors Mate with Other Brands

Centreline spacing of 4.2mm for compatibility

The VAL-U-LOK connector system from Tyco Electronics is a low cost, wire to wire, wire to board connector system with 4.2mm centreline spacing.

Available in single row configurations with three to five positions and double row configurations with up to 24 positions, VAL-U-LOK receptacle housings mate with plug housings or PC board headers. The connectors can be used in both power and signal applications.

VAL-U-LOK connectors mate and are interchangeable with other 4.2mm centreline connectors. They feature a positive locking mechanism and a durability of 30 mate/unmate cycles. Rated mating force is 6.90N and unmating 0.49N.

Available in UL 94V-2 or UL 94V-0 flammability rated nylon, connectors are available in white, red, blue and black versions for applications where colour coding is helpful for assembly or maintenance.

Housings are available in both free-hanging and panel-mount varieties, while PCB headers can be supplied in vertical, right angle, screw mount and blind mate configurations.

With a choice of brass or phosphor-bronze contacts with Pb-free tin or gold plating, the devices can accommodate operating voltages up to 600VAC and currents up to 9A.

Features

- Low cost, wire to wire, wire to board connectors
- Mate with industry standard 4.2mm centreline connectors
- Easily mated, positive locking housing
- Fully isolated terminals
- Available in UL 94V-2 or UL 94V-0 flammability rated nylon
- Free-hanging or panel-mount housing
- Vertical, right angle, screw mount and blind mate PCB headers
- Operating voltage: 600VAC
- Maximum current: 9A
- 6.90N mating/0.49N unmating force per circuit
- 30 cycles durability
- Brass or phosphor-bronze contacts with Pb-free tin or gold plating
- Black, red, blue or white for colour coding

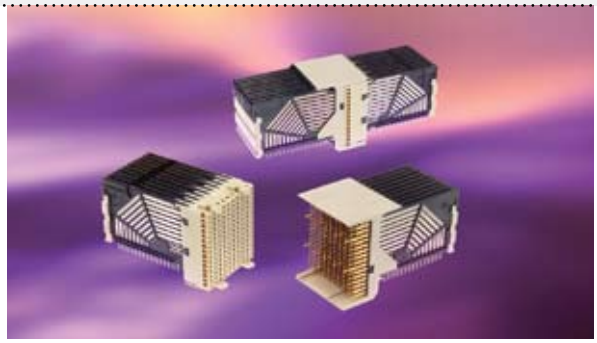
Applications

- Household appliances
- Heating, ventilation and air conditioning
- Gaming
- Vending machines

Tyco Electronics VAL-U-LOK Brochure available! Please complete the reply slip or visit the weblink below.

Connectors Key to Medical System Performance

Wide variety of solutions for imaging, communication, data collection and storage



Connectors in today's medical applications must function at higher speeds, provide higher density, smaller footprint and lower profiles and comply to ever stricter industry standards. FCI provides a range of solutions for imaging, data storage devices, communication systems, image archiving and online manipulation of images in the medical industry.

Scalability is an important feature that can make medical systems upgradeable to keep pace with market trends. For example, FCI's AirMax VS® high-speed backplane connectors offer design versatility because signal connectors can be scaled by varying the number of columns of contacts, the number of contacts per column and the column spacing.

AirMax VS connectors also allow for mixed pin assignments (differential or single-ended signals or power) to provide additional flexibility to system designers. Data rates can scale from 2.5Gbit/s to beyond 12Gbit/s without requiring re-design of a basic platform. Medical equipment continually requires better performance, but the designer's task is eased if the architecture remains intact as the specification evolves.

Improvements in flex cable connector technology enable advances in the performance of mobile monitoring, field operable CT and portable ultrasound systems. Examples are FCI's MEG-Array® flex foil or BergStak®/Conan® on flex foil for less demanding applications.

For scanning applications, the MEG-Array high-density mezzanine system is suitable for both hospital systems and portable scans. It provides the features needed for MRI, CT and other imaging applications to achieve real time, higher resolution imaging.

Used to connect the photo diode within the scanner, MEG-Array's higher density allows a greater number of slices, resulting in more accurate imaging. Additionally, MEG-Array delivers outstanding mechanical and electrical performance, achieving data rates of up to 10Gbit/s.

New industry standards such as USB, PCI, RJ45, DVI, MicroTCA and PCI Express™ are also being incorporated into medical designs. PCI Express, in particular, is finding growing acceptance in medical equipment. FCI has extended its vertical PCI Express card-edge connector family with surface mount technology to accommodate the needs of this market.

Traditionally, ultrasound systems have used standards based architectures like CompactPCI bus or VMEbus, but with backplane performance hitting the limitations of standard architectures, there is a clear need for connector technologies that offer higher performance and higher reliability at a reasonable cost. Card-edge technology is a logical choice for these backplane connections.

The use of surface mount PCIe Express card-edge connectors is not limited to backplane connections, but is also being used by ultrasound manufacturers to improve manufacturing yields for board to board connections.

Features

- Broad range of medical-standard interconnections
- AirMax VS scalable high-speed backplane connector
  - Flexible column count, contacts per column and spacing
  - Mixed pin assignments, differential or single-ended
  - Scales from 2.5Gbit/s to >12Gbit/s without architectural redesign
- MEG-Array on flex foil; BergStak/Conan on flex foil
- MEG-Array high density mezzanine system
  - Connects photo diode
  - Data rates to 10Gbit/s
- Surface mount PCI Express card-edge connectors
- Technology also suitable for board to board applications

Applications

- Mobile monitoring
- Field operable CT
- Portable ultrasound
- Imaging and scanning
  - MRI, CT and PET
- Data storage devices
- Communication systems
- Image archiving
- Online image manipulation

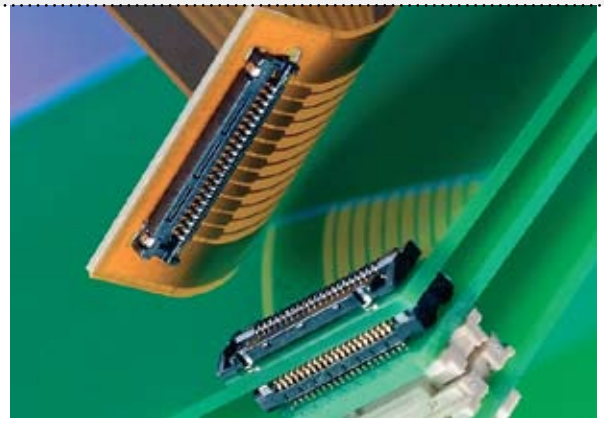
FCI Medical Imaging Applications Article available! Please complete the reply slip or visit the weblink below.

ENQUIRY 1440

For further information, including the Medical Imaging Applications Article, please complete the reply slip or visit http://www.arrowne.com/innov/in219/f_1440.shtml

Board to Board Connectors Keep a Low Profile

Wide range of space saving options



The SlimStack™ Surface Mount Technology (SMT) board-to-board connector system from Molex provides a proven, reliable way to connect PCBs together using slim, low-profile connectors.

Molex believes that its SlimStack product family is the industry's broadest range of micro-SMT stacking connectors. The series offers designers a wide variety of space-saving choices for applications such as mobile telephones, digital cameras, PDAs and other mobile devices.

Stack heights range from 0.90mm to 20.0mm, with four pitch sizes between 0.40mm and 1.00mm. Optional J-lead SMT tails provide up to 35% PCB space savings compared with the standard gullwing format.

Available in vertical and right-angle formats, the SlimStack range includes connectors suitable for use in IEEE1386 mezzanine applications. Other variants include gold or tin plated contacts, shielded versions and a flex-circuit option.

Various friction-locking mechanisms can be specified to improve mating/unmating force specifications: these include housing, terminal and tab lock versions. Single- and dual-row variants are available, with mating guides optional to prevent mis-mating and to ease assembly.

Features

- SMT format board-to-board stacking connectors
- Pitch sizes: 0.40mm, 0.50mm, 0.635mm and 1.00mm (0.016in, 0.020in, 0.025in and 0.039in)
- Stack heights: 0.90mm to 20.00mm (0.035in to 0.787in)
- Circuit size range: 7 to 240
- Gold or tin plating
- Vertical and right-angle mating
- Shielded versions
- Mezzanine IEEE 1386 options
- Variety of locking and alignment mechanisms

Applications

- Mobile telephones
- Digital cameras
- PDAs
- IEEE 1386 (common mezzanine card) systems

Molex SlimStack Brochure available! Please complete the reply slip or visit the weblink below.

Interconnect

Franchised with Arrow in the Baltics, Finland, Sweden, UK and Ireland

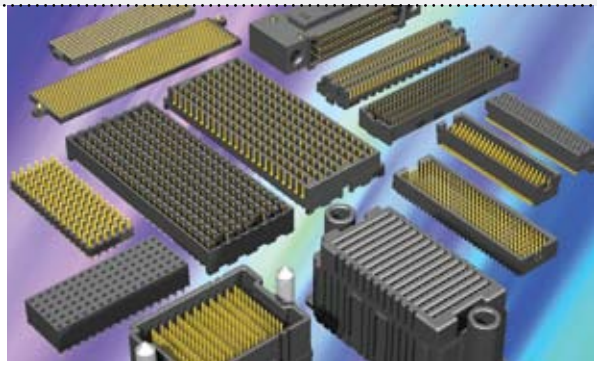
For further information, including the SlimStack Brochure, please complete the reply slip or visit http://www.arrowne.com/innov/in215/f_1412.shtml

ENQUIRY 1412

High Speed, High Reliability Interconnects

Wide selection of board to board and cable assemblies

Interconnect



Samtec makes one of the widest selections of high speed, high reliability, board to board interconnects.

Samtec's Q-Series® offers the popular Q-Strip® single-ended and Q-Pairs® differential interconnects for high speed, controlled impedance applications. Their design minimises impedance mismatch and crosstalk and optimises capacitance and inductance. Q-Strip and Q-Pairs are available in 0.5mm pitch (QTH, QSH), 0.635mm (QTS, QSS) and 0.8mm pitch (QTE, QSE). The 9.5A rated, integral ground/power plane has SMT leads to save board space. The 0.8mm pitch Q-Pairs carry <8.5GHz per pair rating at -3dB insertion loss.

Second generation, Q2™ high speed interconnects suit rugged applications thanks to greater insertion depth, optional retention pins that almost double the unmating force, guideposts and optional locking screws/holes. All Q2 products offer optional EMI shielding, power pins rated up to 3A per pin and MMCX scale RF connectors.

The ERM8 and ERF8 interconnects use the Edge Rate contact system for smaller pitch and high speed, reduced broadside coupling and capacitance. Rated at 10.5GHz, the system is rugged, handles more mating cycles than other high-speed systems and can be zippered for mating and unmating. They are available in 7mm, 9mm, 10mm, 12mm, 14mm, and 16mm stack heights with <150 pins on a 0.8mm centreline.

High-density array configurations provide high speed, controlled impedance, board to board interfaces with much higher pin counts than traditional strip connectors, increasing board routing flexibility and grounds. The extra pins available for grounding reduce crosstalk, allowing elevated board stacking.

Several footprints, stack heights and contact designs are available to meet a variety of applications. SEARAY®, and HD Mezz* for elevated board stacking, are 1.27 x 1.27 open-pin field arrays that can map as single-ended configurations in differential pairs or a combination. SEARAY and HD Mezz are available from Samtec and Molex. DPArray® has a staggered pin design; perimeter ground pins reduce the number of grounds needed, providing easier board routing, fewer board layers and more differential pairs per square inch.

Samtec offers Data Rate cable systems for flexibility and high speed. At 31cm length, in single-ended configurations, Data Rate cable assemblies are rated at 2.57GHz (EQCD series) and 1.87GHz (HQCD) at -3dB insertion loss. Maximum performance of these cable assemblies can be higher. These cable assemblies are preferable when an application requires low crosstalk, low EMI emission and susceptibility, higher frequency, less loss or lower voltage drop. They are ideal when mechanical routings are challenging, for high flex and crush life; they suit applications from 200mm to 3m.

* HD Mezz is a trademark of Molex Incorporated

Samtec TLS Guide available!

Features

- Q-Strip and Q-Pairs
  - 0.5mm pitch (QTH, QSH)
  - 0.635mm (QTS, QSS)
  - 0.8mm pitch (QTE, QSE)
  - 9.5A rated, integral ground/power plane
  - <8.5GHz rating for 0.8mm pitch Q-Pairs
- ERM8 and ERF8 Edge Rate interconnects
  - Micro pitch and rugged
  - Reduced broadside coupling and capacitance
  - Rated at 10.5GHz/pin
  - Zipper mating and unmating
  - Stack heights 7mm, 9mm, 10mm, 12mm, 14mm and 16mm <150 pins, 0.8mm centreline
- High-density arrays
  - Controlled impedance, board to board interface
  - Higher pin counts increase routing flexibility and grounds
  - Extra pins for grounding reduce crosstalk, allow elevated board stacking
  - HD Mezz stack heights: 20mm, 25mm, 30mm, 35mm
- Data Rate cable assembly
  - Rated at 2.57GHz EQCD; 1.87GHz HQCD
- Final Inch® free tool available: provides optimised interconnect PCB breakout region

Applications

- Medical equipment
- Industrial applications
- Telecommunications

SMD Aluminium Capacitors for Consumer and Industrial Applications

Six series cover many requirements

Six new series of SMD aluminium electrolytic capacitors from EPCOS offer options with small case size, extended temperature operation, low ESR values and long operating life.

Aluminium electrolytic types are attractively priced alternatives to tantalum types. The B411xx devices cover a capacitance range from 0.1µF to 1500µF and are designed for voltages from 4VDC to 100VDC. Depending on the CV value, their case sizes vary between 4mm x 5.4mm and 10mm x 10mm (diameter x length).

The B41141 and B41142 series feature ESR values as low as 0.8Ω, suiting them for a variety of applications requiring low impedance or high ripple current. Both series operate within a wide temperature range of -55°C to +105°C. The B41141 devices offer 1000 hours load life at +105°C and voltage rating of 6.3VDC to 50VDC, while the B41142 provides an extended 3000 hour load life and a maximum operating voltage of 35V.

The B41112 and B41121 capacitors are miniature devices designed for space constrained applications. The B41112 range offers an extended 2000 hour load life, 4V to 100V voltage range and an operating temperature of -40°C to +85°C. The B41121 provides the standard 1000 hour load life over a wider temperature range of -40°C to +105°C and voltage range of 4V to 50V.

The B41115 and B41124 series are general purpose devices featuring 2000 hour load life and wide temperature ranges of -55°C to +85°C and -55°C to +105°C, respectively.

All the new devices are RoHS compatible and suitable for applications in consumer and industrial electronics. To assist in selection and specification, EPCOS provides comprehensive product details in its new Alu-X® 2008 data book. In addition, more than 5000 competitor ordering codes for SMD aluminium electrolytic capacitors have been added to the company's online cross-reference database to facilitate the search for EPCOS types.

Features

- Six SMD aluminium electrolytic capacitor series
- Values from 0.1µF to 1500µF
- Choice of operating ranges between 4V and 100V
- Case sizes down to 4mm x 5.4mm
- Low ESR options
- Extended load life: up to 3000 hours
- Temperature options:
  - -40°C to +85°C
  - -40°C to +105°C
  - -55°C to +85°C
  - -55°C to +105°C
- RoHS compatible

Applications

- Industrial electronics
- Consumer products

EPCOS Aluminium Electrolytic Capacitors Alu-X Data Book, Product Datasheets and Aluminium Electrolytic Capacitors Press Release available!

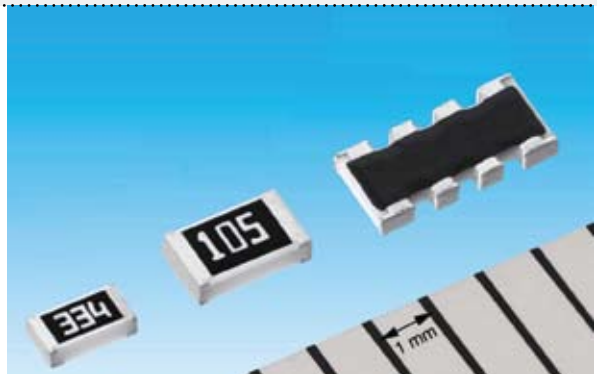
For further information, including how to order the EPCOS Aluminium Electrolytic Capacitors–Alu-X Data Book, Product Datasheets and Press Release, please complete the reply slip or visit http://www.arrowne.com/innov/in220/f_1462.shtml

ENQUIRY 1462

Metal Thin Film Chip Resistors - High Reliability Series

Excellent lifetime stability for auto/transport, medical and measurement

Passives



Panasonic's ERA 2A, 3A and 6A high reliability type, metal thin film chip resistors are extremely well suited to applications in the automotive, transportation, medical and measurement industries.

These new ERA-type devices achieve outstanding reliability and stability at high temperatures and humidity. Their construction uses a newly developed, highly reliable, metal thin film technology in conjunction with a moisture resistant overcoat.

Available in 0402, 0603 and 0805 package sizes with power ratings of 0.063W, 0.1W and 0.125W respectively, the resistors are designed for a wide operating temperature range from a low -55°C and up to +155°C (1000 hours ±0.1%) and are AEC-Q200 rated.

The devices exhibit a small resistance tolerance and Temperature Coefficient of Resistance (TCR) and are therefore highly accurate. Low current noise and excellent non-linearity contribute to their high performance.

The device values range from 10Ω to 1MΩ, with a choice of ±0.1% or ±0.5% tolerance. TCR values as low as 25ppm/°C are attainable. The ERA3AEBxxxV in 0603 and ERA6AEBxxxV in 0805, for example, feature ±0.1% accuracy and TCRs of 25ppm/°C.

The table illustrates the main product characteristics.

Features

- High reliability, thin film resistors
- 0402, 0603 and 0805 case sizes
- Rated for +85°C/85% relative humidity: 1000 hours with drift under ±0.1%
- High heat resistance: +155°C, 1000 hours
- Temperature range: -55°C to +155°C
- Excellent linearity
- AEC-Q200
- Tape and reel packaging

Applications

- Automotive
- Transportation
- Medical
- Test and measurement

Panasonic E12 Samples, Circuit Components Brochure and High Reliability Metal Film Chip Resistors Datasheet available!

ERA Device Ratings

Device Type (Packaging)	Power Rating at +85°C (W)	Limiting Element (Max RCW*) Voltage (V)	Maximum Overload Voltage (V)	Resistance Tolerance (Ω)	TCR (ppm/°C)	Resistance (Ω)
ERA2AKD (0402)	0.063	25	50	±0.5	100	10 to 43
ERA2AED (0402)	0.063	25	50	±0.5	±25	47 to 100K
ERA2AEB (0402)	0.063	25	50	±0.1	±25	47 to 100K
ERA3AHD (0603)	0.100	75	150	±0.5	±50	10 to 43
ERA3AED (0603)	0.100	75	150	±0.5	±25	47 to 330K
ERA3AEB (0603)	0.100	75	150	±0.1	±25	47 to 330K
ERA6AHD (0805)	0.125	100	200	±0.5	±50	10 to 43
ERA6AED (0805)	0.125	100	200	±0.5	±25	47 to 1M
ERA6AEB (0805)	0.125	100	200	±0.1	±25	47 to 1M

* Rated continuous working voltage is determined from the lowest of the square root of the product of rated power x resistance values or the limiting element voltage

ENQUIRY 1445

For further information, including the Circuit Components Brochure, High Reliability Metal Film Chip Resistors Datasheet and how to obtain E12 Samples, please complete the reply slip or visit http://www.arrowne.com/innov/in219/f_1445.shtml

High Voltage, Multilayer Ceramic Capacitors

Downsize with smallest high-voltage MLCCs

Some Syfer high voltage multilayer ceramic capacitors now offer double the capacitance thanks to breakthroughs in ceramic materials and manufacturing technology. The ability to reduce package size, or increase capacitance range in the same package size, will prove critical to meet today's tight design constraints.

Already one of the most extensive high-voltage capacitor families available, Syfer now offers higher values. In most case sizes from 0805 to 1812, for example, Syfer offers the highest capacitance 1kV MLCCs in the market. Devices in the range from 500V to 1.5kV are of particular interest to power supply and DC/DC converter designers in the telecoms, military and aerospace markets.

Higher capacitance is available without increasing package size; the 1206 1.5kV capacitor, for example, now offers an impressive 10nF, up from 2.7nF. Many devices offer double the capacitance of earlier versions. The 1812 1kV device has increased from 56nF to 100nF.

If physical space is critical, Syfer's new devices offer the possibility of a smaller case size, resulting in reduced board space requirements and lower costs. For example, a 1kV, 1nF capacitor previously offered in a 1206 package is now available in the 0805 case size and a 1kV 10nF part, previously in a 1812 footprint, is now offered in a 1206 package.

These extensions give engineers a broader choice of high-voltage devices to optimise their designs for performance and package size, while ensuring they are cost effective to meet tight budgetary constraints.

For added reliability, Syfer offers its FlexiCap™ polymer-termination option as an alternative to a standard plated termination. Syfer received the Queen's Award for Innovation, the most coveted commercial award in the UK, for this development in 2008.

FlexiCap accommodates a greater degree of board flex than a conventional termination and reduces the chance of mechanical cracking. Devices meet RoHS standards with lead-free terminations. However, for exempt applications, versions with tin-lead contacts are available. Syfer can also offer additional testing services to meet the most stringent quality standards.

Smaller Case Size Equivalents

Type	Voltage	Capacitance	Previous Case Size
0805KY00102KXT	1kV	1nF	1206
0805Y1K00472KXT	1kV	4.7nF	1206
1206Y100103KXT	1kV	10nF	1812
1206Y1K00273KXT	1kV	27nF	1210
1812Y1K00104KXT	1kV	15nF	1825/2220

Features

- Some capacitance values up to four times higher
- C0G and X7R dielectrics for 500V to 6kV rated MLCCs
- More choice for designers:
  - Increase capacitance values without increasing board space
  - Choose a smaller case size, without reducing capacitance value
- Reduced board space
- Lower component cost
- FlexiCap termination option enhances reliability and long term performance

Applications

- Telecoms
- Power supplies
- DC-DC converters
- Communications equipment
- Military and aerospace

Free Syfer high voltage Sample Kit and the MLCC Soldering and Handling Guide available! Please complete the reply slip or visit the weblink below.

For further information, including a Free high voltage Sample Kit and the MLCC Soldering and Handling Guide, please complete the reply slip or visit http://www.arrowne.com/innov/in215/f_1414.shtml

ENQUIRY 1414

RENESAS

A Quantum Leap in Low-End Motor Control

Integrated motor-control timer, zero-wait Flash and easy system development

µcontroller

Low-end motor control applications require increasingly sophisticated control algorithms to squeeze improvements in energy efficiency from the new generation of motors. The SH/Tiny from Renesas is designed to meet these needs, and to bring design advantages when compared to standard digital signal processors.

The 50MHz SH/Tiny devices, designated DF7125xx50Fxx, have been designed with a focus on the details of motor control; Renesas believes that for this reason they represent a quantum leap in the cost-performance ratio of low-end motor drives.

The MCUs are based on a simple, easily understood architecture, which is optimised for C programming. Designers are supported with a free optimising compiler that produces high-quality code. Simplicity is also provided by the use of a single 5V power supply with a typical run current of 52mA. The designer can therefore employ a standard power supply in a standard package.

The SH/Tiny includes two channels of 10-bit, 5V A/D conversion, providing improved noise resistance when compared with 3V alternatives.

To enable safety features, the SH/Tiny has an internal watchdog timer that will continue to run even if the external oscillator stops. EMC behaviour is another important contributor to safe operation: here the SH/Tiny offers best-in-class performance. Renesas also provides free software routines to meet the IEC 60730-1 standard.

The heart of the SH/Tiny's motor control capabilities is a specially designed timer block, MTU2, that includes six channels of 16-bit timers, supporting three-phase PWM capability with automatic dead-time insertion and compensation. The devices also feature a quadrature encoder feedback capability and a channel that can measure actual dead times, enabling closed loop control for higher motor efficiency.

Each of the two ADCs can be triggered by the MTU2 with an additional, defined delay time to support algorithms such as single-shunt motor drive. Port output-enable pins provide a hardware connection to shut down the timer quickly and deterministically when necessary.

Equipped with 8Kbyte SRAM and options of 128Kbyte, 64Kbyte or 32Kbyte Flash, the SH/Tiny has very fast Flash programming and erase times (1ms and 1.2s, respectively per 128bytes), which can save significant cost in the production flow. The use of Renesas' MONOS Flash technology allows the devices to run at full speed without wait states.

The devices include three SCIs (Serial Communications Interfaces). Package options are 64- or 48-pin LQFP or 52- or 64-pin QFN, depending on precise configuration. Temperature range variants of -20°C to +85°C or -40°C to +85°C are available.

Renesas are offering Arrow Innovation readers the chance to win a HS7125EDB01H development board. Please complete the reply slip or visit http://www.arrowne.com/innov/in214/f_1393.shtml.

Enter draw to Win a Free Renesas HS7125EDB01H Development Board!

Features

- 50MHz 32-bit RISC processors
- Dedicated MTU2 timer unit
  - Six 16-bit timer channels
- Additional two-channel 16-bit timer
- Single 5V supply
- 8Kbyte SRAM
- 32Kbyte, 64Kbyte, 128Kbyte Flash variants
  - Zero wait states
  - Fast erase and programming functions
- C-programmable with free optimising compiler
- Two 10-bit 5V ADCs
- Watchdog timer
- Three SCIs
- Quadrature encoder input
- 64- or 48-pin LQFP; or 52- or 64-pin QFN
- Temperature range: -20°C to +85°C or -40°C to +85°C

Applications

- Low cost motor control
- Air conditioners
- Washing machines
- Refrigerators
- Vacuum cleaners
- Printers
- Office automation
- UPSs
- General purpose inverters

ENQUIRY 1393

For further information, including the SuperH DVD and SH/Tiny article and an opportunity to win the Renesas HS7125EDB01H development board, please complete the reply slip or visit http://www.arrowne.com/innov/in214/f_1393.shtml

Bluetooth, Processor and Power Solutions for Medical Applications

Full range of components

STMicroelectronics offers a full range of components for medical applications. These include advanced STM32 processors, Bluetooth modules and power solutions including IGBTs (Insulated Gate Bipolar Transistors).

STMicroelectronics' STM32 range of 32-bit Flash microcontrollers is based on the ARM Cortex™-M3 core. With low voltage (2.0V to 3.6V) operation, the MCU devices provide extremely low active power consumption of 0.5mA/MHz and standby currents as low as 1.4µA.

STM32 family devices use the Thumb-2 instruction set to improve code density and hence reduce memory requirements, while delivering deterministic, real-time operation and fast interrupt response.

To cater for the needs of safety-critical applications, STMicroelectronics provides a complete suite of self-diagnostic firmware routines to test STM32 core functions efficiently according to IEC60335 Type B. Certified by VDE, the routines are ready to integrate into any application.

STMicroelectronics' BlueModule products are extremely stable and reliable Bluetooth core-embedded modules. Available in both Class 1 and Class 2 versions for a choice of long range or low power, they support protocol layers up to HCI.

Modules are available to comply with Bluetooth v1.2 and v2.0 specifications, including Enhanced Data Rate (EDR) options. STMicroelectronics Bluetooth products successfully passed the first set of interoperability tests on the Bluetooth Medical Profile in an official standardisation committee event.

Modules can be fully controlled using AT commands, implementing all Bluetooth core protocols and Serial Port Profile (SPP). Typical applications include continuous monitoring of patient temperature, respiratory rate, blood oxygenation and heart rate.

Applications such as automated external defibrillators require high-voltage boost control switching that is best provided by an IGBT. STMicroelectronics offers a number of components of this type specifically aimed at medical applications. These include the 1200V G7NB120SD1, with a specified collector current of 7A and VCE of 2.3V at +70°C. Available packaged or as a bare die, this device will soon be supplemented by a 2500V device, the STGHixxxN250S, which shares its low quiescent current characteristics.

Features: STM32

- 32-bit ARM Cortex™-M3-based Flash microcontrollers
- Low voltage operation: 2.0V to 3.6V
- Low active power: 0.5mA/MHz
- Standby current down to 1.4µA
- Thumb-2 instruction set for high code density
- Fast interrupt response.
- VDE certified IEC60335 type B self-diagnostic firmware
- Wide range of peripherals
- Fast start-up from sleep and standby
- Evaluation boards and reference designs available
  - Includes datalogger platform
- Range of firmware including USB medical device class

Features: BlueModules

- Stable, reliable Bluetooth modules
- Class 1 and Class 2 versions
- Support for protocol layers up to HCI
- Bluetooth v1.2 or v2.0 compliant
- Enhanced data rate options
- Passed initial interoperability testing on Bluetooth Medical Profile
- Control using AT commands
- Implement all Bluetooth core protocols and serial port profile

STMicroelectronics Medical Brochure, Bluetooth Module Solutions Flyer, IGBT Selection Guide and STM32 MCU Family Brochure available!

µcontroller

For further information, including the Medical Brochure, Bluetooth Module Solutions Flyer, the IGBT Selection Guide or the STM32 MCU Family Brochure, please complete the reply slip or visit http://www.arrowne.com/innov/in211/f_1359.shtml

ENQUIRY 1359

LIN and CAN Transceivers for Automotive Applications

Broad range of data speeds and functionality

Communication

ON Semiconductor offers a wide variety of LIN and CAN bus transceivers intended for use in automotive applications. The range includes high and low speed options, devices with extremely low power consumption and fault tolerant components with failure detection logic.

The AMIS-42665 and AMIS-30660 are high speed (1Mbaud), differential CAN transceivers. Designed for use in both 12V and 24V systems, they feature excellent common-mode voltage range at the receiver inputs, improving their ElectroMagnetic Susceptibility (EMS) performance. Due to excellent matching on the output side, they also offer outstanding ElectroMagnetic Emissions (EME) performance, eliminating the need for an external common-mode choke.

The AMIS-42665 exhibits ideal passive behaviour when the supply voltage is removed. It has an extremely low (60mA) standby current and includes 'wake-up over bus' functionality, allowing its use in power-sensitive applications.

The AMIS-4168x devices are fault tolerant, low speed CAN transceivers designed for communication at up to 125kbaud, primarily in cars. They provide differential transmit capability, but will switch to act as a single-wire transmitter and/or receiver in the event of a fault condition under control of failure detection logic. The AMIS-41682 has a 5V interface to the CAN controller, while the AMIS-41683 has a true 3.3V interface. Short circuit, thermal and transient protection are included.

The NCV7356 is a CAN 2.0 physical layer device intended for use in applications where high data rate is not critical. It allows designers to make cost savings in both the physical media components and in the microprocessor and/or logic devices that use the network. In addition to its low-speed operating mode, the device includes a high-speed mode that is designed for assembly line and service data-transfer use and requires the bus to be terminated by an off-board service node.

The AMIS-30600 single-wire LIN transceiver is standards compliant and designed for a transmission rate of up to 20kbaud. For enhanced EMC performance, it features an integrated receiver filter with hysteresis and transmitter slope control. It is designed for power-sensitive applications with an operating voltage of 4.75V to 5.25V.

Features

- Wide range of single-wire and differential LIN and CAN transceivers
- Fully compatible with CAN/LIN standards
- Several operating voltage range options
- Low power modes
- Excellent EMS/EMC performance
- Range of maximum data rates: 40kbaud to 1Mbaud
- Wake-up over bus options
- Bus dominant timeout option
- Various protection options
  - Undervoltage lockout
  - Short circuit protection
- AEC qualified and PPAP capable

Applications

- In-vehicle communication systems
- ISO9141 diagnostic systems
- Sensors and controls
- Electronic locking
- Window lifters
- Mirror control
- Engine control
- Gearbox
- Air conditioning
- Airbags
- Seats
- Body control module
- Infotainment

ON Semiconductor AMIS-30600, AMIS-30660, AMIS-30663, AMIS-4168X DS REV5, AMIS-42665 and NCV7356 Datasheets available!

ENQUIRY 1420

For further information, including AMIS-30600, AMIS-30660, AMIS-30663, AMIS-4168X DS REV5, AMIS-42665 and NCV7356 Datasheets, please complete the reply slip or visit http://www.arrowne.com/innov/in216/f_1420.shtml

Delivering Enhanced Display Technologies

TFTs and embedded computing platforms for information display and advanced user interfaces

Arrow's broad product offering extends beyond components and encompasses a large number of platform technologies that help designers and system integrators quickly and easily deliver complete system solutions. LCD modules and embedded computing technologies are key elements in Arrow's platform portfolio. Together they support the rapid development, prototyping and implementation of advanced user interface and information display applications.

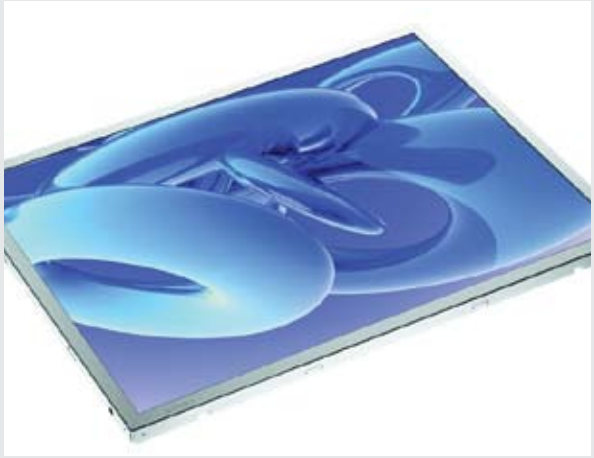


Figure 1: Display Image, Courtesy of Sharp

Compressing Big Computing Power into Small Packages

At the heart of many systems is a computing and processing module and Arrow's product range offers a rich selection, including the latest platform devices from Advantech and Kontron. Both make use of the Atom™ processor range from Intel® and are Computers On Modules (COMs).

Figure 2: Advantech's SOM-6760 Micro Computer On Module

Advantech's COM-Express SOM-6760 incorporates a processor from the Intel Atom Z500 series in a micro size, 95mm x 95mm, board that performs the same functions as larger System On Modules (SOMs). Pin definitions are the same as standard COM-Express™ boards so that the cards can work directly with existing carrier boards, providing an upgrade path for customers.

The Intel Atom Z500 series processor's small size, thermal design and 45nm manufacturing process reduce power consumption while providing high performance. It also contains the Intel single chip, system controller hub US15W and a 4Mbyte Flash BIOS controller.

Offering Industry Standard Operating Systems

The SOM-6760 supports up to 1Gbyte Double Data Rate (DDR2), 533MHz SODIMM memory and offers 10/100Mb/s Ethernet, eight USB 2.0 ports and one PCI Express (PCIe) interface. It has integral graphic support for 24-bit CRT displays up to 1600 pixels x 1200 pixels and 24-bit LCD display modes up to 1280 pixels x 1024 pixels and a high-definition audio interface.

The target operating system platform is either Microsoft Windows® XP Embedded or Windows Vista. Advantech's API (Application Programming Interface) software, SUSI, helps customers implement key functions, while the SOM-DB5700-00A2E development board enables developers to create smaller, more mobile and portable embedded applications more quickly.

Micro to Nano

Figure 3: Nano Size Computer On Module from Kontron

For further information regarding any of the featured products, or a copy of the Arrow Embedded Solutions Display Brochure, please complete the reply slip or visit http://www.arrowne.com/innov/in218/f_1469.shtml

ENQUIRY 1469

Delivering Enhanced Display Technologies

(...continued from page 17)

With its 1.1GHz to 1.6GHz Intel Atom processor, up to 1Gbyte RAM and integral 4Gbyte Flash, the new Kontron nanoETXexpress COM further expands the range of COM types available for embedded applications in mobile systems. Kontron's platform combines the Intel Atom processor with a US15W system controller hub to offer high-end graphics and a wide variety of interfaces and functions in a low power, credit card sized 55mm x 84mm board. Total power dissipation of the Intel Atom processor and US15W together is under 5W.

The nanoETXexpress COM has the smallest possible form factor, low weight and low power usage, making it suitable for medical and diagnostic applications, mobile data solutions and other handheld designs. Interfaces include PCIe (Gen 2 capable), PCI, PEG, USB 2.0, GbE and SATA. The Kontron nanoETXexpress-SP supports Linux, VxWorks, Windows XP Pro Embedded, XPe and Windows CE and it is 100% compatible with the COM Express type 1 pin-out positioning and contact assignments.

Displays Enhance Every Application

Figure 4: Outdoor E-Signage Using a Sharp Display

From mobile phones to large street signs and from ATMs to POS terminals, displays have become a common feature of everyday life. The latest technologies behind these applications can provide amazing colours, wide fields of view and superb resolution for observers – yet use minimal board space and power.

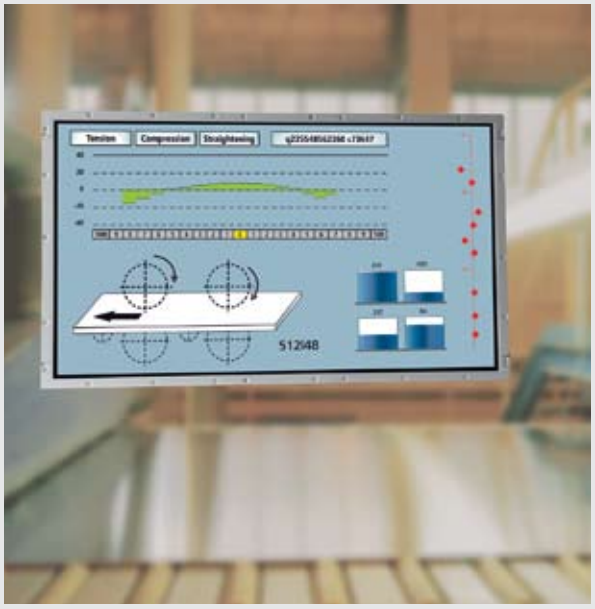


Figure 5: Industrial 46 Inch Sharp Display

Turning first to large-scale displays, Sharp Microelectronics offers a wide range, recently expanding the size of its bright, clear displays suitable for electronic signage applications. Sharp's large format LCD panels currently include a 65in portrait orientation display with a new 82in version expected. These address an increasing market demand for high quality displays for digital signage in such environments as airports, train stations, shopping centres and casinos.

Sharp's developers are working to introduce larger size panels that nonetheless offer high brightness and contrast with fast response times. These displays also need to provide assurance of continuous operation in extreme environments while keeping running costs lower or comparable with traditional displays.

High Performance Displays for Portable Devices

In the more compact display arena, Hitachi Displays recently announced a new, high performance 5.0in VGA TFT display module. The TX13D03VM1CAA transmissive display module provides VGA (640 x 480 pixels) resolution, exceptional optical performance and many integrated features. A long life, high brightness LED backlight yields a brightness of 600cd/m², excellent display uniformity and a contrast ratio of 400:1.

Figure 6: Wide Format Hitachi Display

This compact, robust and feature-packed display is suitable for many applications including industrial process control, home automation, marine instrumentation, security and handheld metering systems and data logging devices. A number of integrated features, including an integral timing controller, onboard LED backlight and dimming controller, aid and simplify the design-in process. A further feature, the image flip function, allows a display image to be flipped horizontally and vertically. The 6-bit RGB CMOS data interface allows images with up to 262K colours to be displayed.

From Everbouquet's high quality, compact LCD range is the MF320240C35-BF. This is a 3.5in 320 x 240 pixel colour, active matrix TFT LCD featuring a Chip-On-Glass (COG) driver circuit to provide 24-bit input; its low power suits it for use in PDAs and other handheld devices. It has a transmissive type panel using amorphous silicon TFTs and integrated LED backlight. It provides high quality images with 16.7M colours, contrast ratio of 250:1 and brightness of 250cd/m².

The MGG2432A series is a complete range of 240 x 320 dot 3.8in monochrome LCDs available in Super Twisted Nematic (STN) or Film compensated STN (FSTN) types. LCD colours are blue (STN-negative), black (FSTN-negative) or white (FSTN positive). These modules include integrated LED backlights in a choice of seven colours: yellow-green, pure green, amber, blue, white, orange and red.

There are options for 6 o'clock and 12 o'clock viewing angles and all MGG2432A variants operate within the extended -20°C to +70°C temperature range.

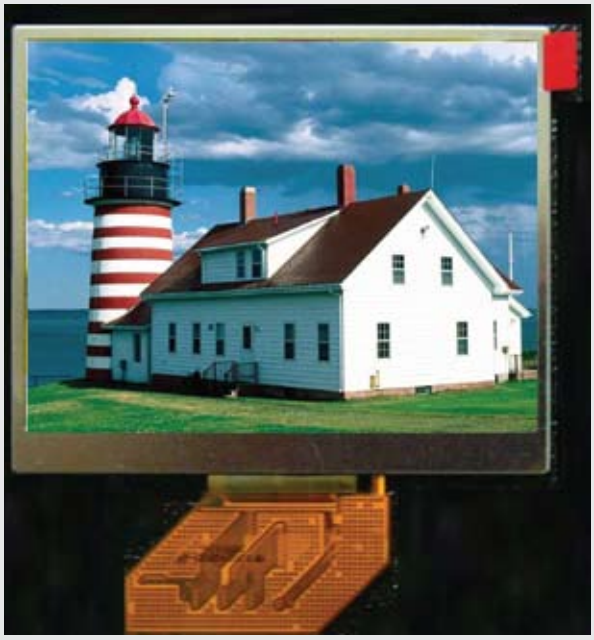


Figure 7: Everbouquet High Quality Compact LCD

Meeting the Display Needs of Industrial Applications

A new series of industrial LCD modules from Toshiba Matsushita Displays (TMD) features long lasting, replaceable LED backlights and integral LED driver functionality to deliver high brightness with low power consumption. The LED backlighting system used with this new family of colour active-matrix TFTs provides an outstanding 70,000 hour lifetime. The modules will satisfy the requirements of a broad range of industrial applications, including test and measurement equipment, medical devices, portable handheld computing products and panel computers.

Toshiba's new series comprises five LCD products, in screen sizes of 5.7in, 6.5in, 8.4in and 10.4in; all feature a luminance rating of 400cd/m². Contrast ratios are 400:1. TMD will add 12.1in versions with SVGA and XGA resolutions to this series during the first quarter of 2009.

The 5.7in LTA057A343F is supplied in a QVGA (320 x 240) format and the 6.5in LTA065B0D2F in a VGA (640 x 480) format. The 8.4in LTA084C271F and LT084AC37000 are available in SVGA (800 x 600) and XGA (1024 x 768) formats respectively, while the 10.4in LT104AC36100 provides an XGA (1024 x 768) resolution. All the products offer the option to add a resistive touch panel.

Delivering Enhanced Display Technologies

(...continued from page 19)

Figure 8: One of TMD's Industrial LCD Modules

Reduced Environmental Impact

The advantage of an LED backlight includes reduced power consumption and the ability to dispense with the high voltage inverters required for CCFL (Cold Cathode Fluorescent Lamp) backlit displays. As a result, LED backlit displays have superior weight, electrical noise and power characteristics as well as providing a wider, adjustable luminance range.

Additionally, such displays also reduce environmental impact since they are virtually mercury-free and do not require the high voltages and high frequencies required to control luminance in CCFL displays. This increases the flexibility of system design in terms of safety, ElectroMagnetic Interference (EMI) compensation and system architecture.

Summary

Within the Arrow Embedded Solutions portfolio of system level technologies, there is a wide range of industrial display and embedded computing platforms from some of the world's leading manufacturers. These technologies are backed by comprehensive, local engineering support, extending the offering beyond off the shelf products to complete custom designs. As a result, whether a display application demands a higher temperature range, increased resistance to shock, vibration, moisture, dust and electrical noise - or simply a space and cost efficient design, Arrow has the resources and the technologies to deliver the optimum solution.

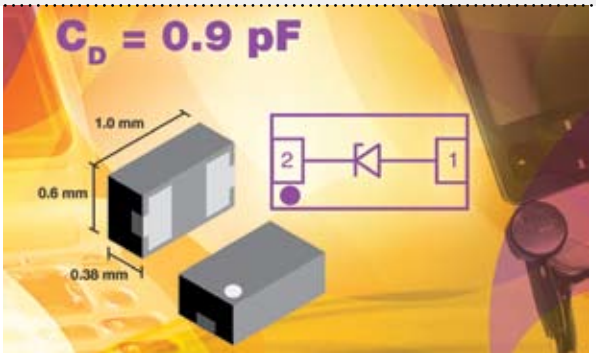
Figure 9: The Arrow Embedded Solutions Display Brochure

ENQUIRY 1469

For further information regarding any of the featured products, or a copy of the Arrow Embedded Solutions Display Brochure, please complete the reply slip or visit http://www.arrowne.com/innov/in218/f_1469.shtml

Low Capacitance, Single Line ESD Protection Diode in Leadless LLP1006-2L Package

And quad diode-protection arrays in ultra-compact LLP1010-5L



The VBUS051BD-HD1 from Vishay Semiconductors is an ESD, single line protection diode providing 0.9pF typical and 1.3pF maximum capacitance in the new LLP1006 package; its 0.6mm by 1.0mm footprint and ultra-low profile of 0.38mm saves board space. It is highly suited to ESD protection of portable electronics in mobile computing, mobile communication, consumer, industrial and medical applications.

The VBUS051BD-HD1 provides transient protection for one data line at ±15kV contact discharge in compliance with IEC 61000-4-2 (ESD) and for a peak pulse current of 3A (t_p=8/20µs) in accordance with IEC 61000-4-5 (surge immunity). Its new, compact LLP package uses an environmentally friendly 'green' moulding compound and it features a low maximum leakage current of 0.1µA at 5V and a maximum clamping voltage of 15V at 3A. Breakthrough voltage ratings are 8.7V (maximum) and 7.9V (typical) at 1mA. The diode is compliant with RoHS 2002/95/EC and WEEE 2002/96/EC.

VBUS051BD-HD1 Electrical Characteristics

Pin 2 to Pin 1 Test Conditions at +25°C	Minimum	Typical	Maximum
Reverse working voltage at I_R=0.1µA (V)	5		
Reverse current at V_R=V_{RWM}=5V (µA)		<0.01	0.1
Reverse breakdown voltage at I_R=1mA (V)	6.9	7.9	8.7
Clamping voltage at I_{pp}=3A (V)			16
Forward clamping voltage at I_F=3A (V)		1.9	2.5
Line capacitance at V_R=0V, f=1MHz (pF)		1.3	1.8

Two quad ESD diode-protection arrays feature low capacitance of 6.5pF and 12pF and maximum working ranges of 5V and 9V in an LLP1010-5L package; its 1mm by 1mm footprint and 0.4mm profile offers board space savings.

The small size of the VESD05A4A-HS4 and VESD09A4A-HS4 diode-protection arrays provides four-line ESD data-port protection suitable for space-limited mobile electronics, such as portable gaming systems, MP3 players and mobile phones. The devices offer different maximum working range, load capacitance, surge current and low typical leakage current (see table). Both diodes provide transient protection for four data lines as per IEC 61000-4-2 (ESD) at ±15kV (contact discharge) and ±20kV (air discharge) and are compliant with RoHS 2002/95/EC and WEEE 2002/96/EC.

Diode Protection Array Specification Table

Part Number	Working Range	Capacitance	Surge Current	Typical Leakage Current
VESD05A4A-HS4	5V	12pF	>2.5A	<1µA at 5V
VESD09A4A-HS4	9V	6.5pF	>1.5A	<0.5µA at 9V

Features

- One line protection: VBUS051BD-HD1
- Four line protection: VESD05A4A-HS4/VESD09A4A-HS4
- Ultra compact:
  - 0.6mm x 1.0mm x 0.38mm LLP1006-2L leadless package for VBUS051BD-HD1
  - 1mm x 1mm x 0.4mm LLP1010-5L package for VESD05A4A-HS4 and VESD09A4A-HS4
- Low load capacitance:
  - C_D=1.5pF for VBUS051BD-HD1
  - C_D=12pF for VESD05A4A-HS4
  - C_D=6.2pF for VESD09A4A-HS4
- Low leakage current: <0.1µA
- ESD immunity: ±15kV contact discharge
- RoHS compliant, environmentally friendly 'green' moulding compound
- Compliant with RoHS 2002/95/EC and WEE 2002/96/EC

Applications

- Mobile communication/mobile phones
- Mobile consumer (MP3)
- HDMI applications
- Mobile computing

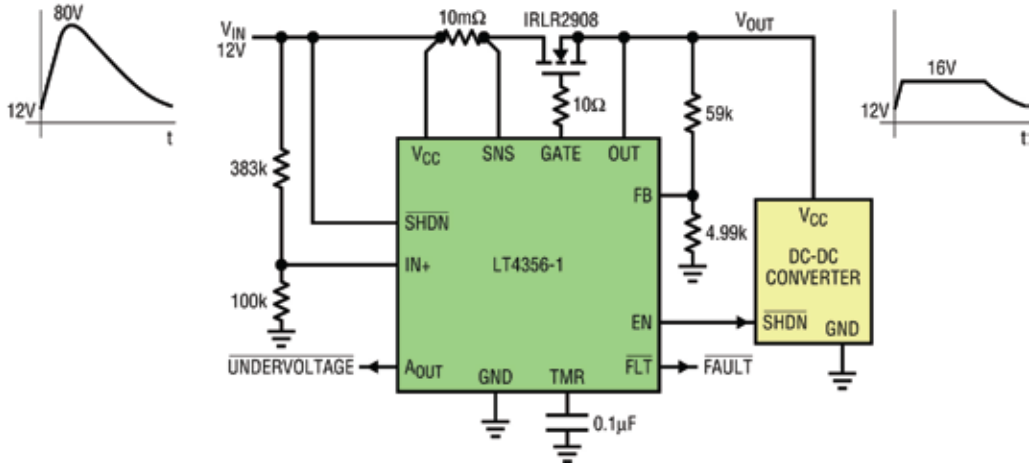
Vishay ESD Protection and VBUS051 Product Sheets available!

For further information, including the ESD Protection and VBUS051 Product Sheets, please complete the reply slip or visit http://www.arrowne.com/innov/in216/f_1427.shtml

ENQUIRY 1427

New Device Stops High Voltage Surges

Protects sensitive electronics from high voltage transients



Even short duration, high voltage power spikes threaten the electronics in automotive and industrial applications although they may only last from a few µs to hundreds of ms. Critical electronic subsystems must survive these transients, rejecting surges, spikes and transients; in many applications, they must also operate reliably throughout such events.

Linear Technology has developed a new means of blocking surges, spikes and transients commonly found in automotive and industrial systems. The LT4356 eliminates the need for bulky filtering components while isolating low-voltage circuitry from damage. The regulating action eliminates the need for high-voltage rated components downstream of the LT4356, allowing use of inexpensive low-voltage components.

The LT4356 surge stopper implements a series-pass regulator with an external N-channel MOSFET, as can be seen in the diagram of a typical application circuit. Under normal conditions, the LT4356 drives the MOSFET fully on so that input power passes directly through to the load circuitry with little loss. If the input voltage rises beyond a set threshold, the LT4356 begins regulating the output at a safe level.

After the surge has dissipated, the LT4356 returns to normal operation or disconnects the output if the fault persists.

In addition to voltage regulation, the LT4356 offers overcurrent and reverse input protection and a 'micropower' shutdown state that reduces supply current to about 7µA. The LT4356 limits inrush current at turn-on by soft-starting the MOSFET.

The LT4356 tolerates reverse voltage down to -60V on its input and can drive a second reverse-blocking MOSFET to stop the reverse voltage passing through to the load. The LT4356's wide operating voltage range, from 4V minimum to 100V absolute maximum, enables it to operate in systems where the input voltage may sag on the low side as well as surge on the high side of nominal.

The LT4356 surge stopper offers solid front-end protection for electronic control systems. Compared to blocking diodes and filter inductors, it absorbs less board space and reduces heat dissipation and voltage loss. Its higher efficiency and wider usable voltage range allow designers to incorporate more functionality into space-constrained products.

Features

- Front-end protection
- Compact, low heat dissipation
- High efficiency
- Wide operating voltage: 4V to 100V
- Tolerates <-60V reverse input voltage

Applications

- Protection from transients, surges, spikes
- Overcurrent protection, reverse input protection

Linear Technology LT4356 Datasheet available and FREE Demo Board Sample to qualifying customers! Please complete the reply slip or visit the weblink below.

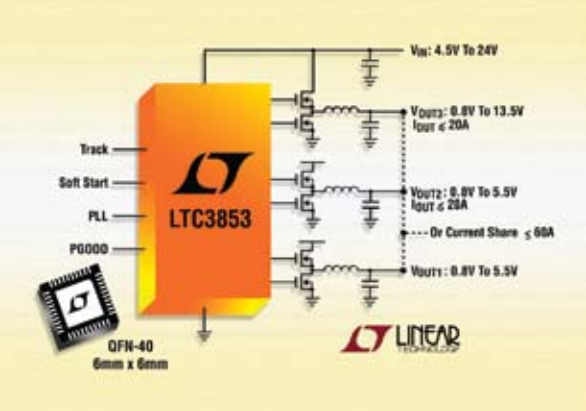
Franchised with Arrow in Denmark, Norway, Sweden, UK and Ireland

ENQUIRY 1431

For further information, including the LT4356 Datasheet and information on how to obtain Demo Board Samples, please complete the reply slip or visit http://www.arrowne.com/innov/in216/f_1431.shtml

Triple Output, Multiphase, Synchronous Step-Down Controller

Highly efficient, switching step-down DC/DC controller has numerous features



The LTC3853 is a highly efficient, synchronous step-down switching regulator, DC/DC controller with three outputs and numerous features that include output voltage tracking, Burst Mode® operation and pulse skipping, which safely powers pre-biased loads.

The latest device in Linear Technology's next generation of step-down controllers, the LTC3853, complements the LTC3850 dual output and LTC3851 single output controllers. It has a 4.5V to 24V ($28V_{max}$) input voltage range and can be powered from most intermediate bus voltages and battery chemistries.

The illustration shows a simplified schematic and the package of the LTC3853 step-down DC/DC converter. Strong onboard gate drivers power all N-channel MOSFET stages. Each stage can produce output currents up to 20A per channel with output voltages ranging from 0.8V to 13.5V on one channel and from 0.8V to 5.5V on the other two channels, making it ideal for point of load regulator requirements in medical, datacom, telecom, industrial, automotive applications, displays and set top boxes.

Its constant frequency, current-mode architecture provides a selectable fixed or synchronisable frequency from 250kHz to 750kHz using Phase Lock Loop (PLL). Operating the three channels 120° out of phase minimises power loss and supply noise. The LTC3853 can also be configured with one output channel 180° out of phase from channels two and three. True current-mode control enables stable operation over a wide range of output capacitance and ESR values, including all ceramic capacitors for the smallest solution size. It has current foldback to limit MOSFET heat dissipation during short circuit and overload conditions.

Additionally, the LTC3853 can be configured with DCR (inductor) current sensing to maximise efficiency and has a minimum on time of only 90ns for applications requiring high step-down ratios. An onboard regulator develops its own internal IC bias voltage and an adjustable soft-start controls the turn-on time. A precision 0.8V reference has ±1% accuracy over a -40°C to +125°C operating temperature range.

With up to 98% duty cycle, the LTC3853 has a very low dropout voltage, a useful feature for extending run times in battery powered applications.

The LTC3853 is offered in a thermally enhanced 6mm x 6mm QFN-40 package.

Features

- Onboard 5V linear bias voltage regulator
- Safely powers pre-biased loads
- Output voltage tracking
- Burst mode operation
- Pulse skipping
- Input voltage range: 4.5V to 24V, $28V_{max}$
- Output current: <20A per channel
- Powerful onboard MOSFET gate drivers
- Output voltage: 0.8V to 13.5V on one channel, 0.8V to 5.5V on two channels
- <98% duty cycle
- Operating temperature range: -40°C to +125°C with ±1% reference voltage accuracy
- Fixed or synchronisable operating frequency from 250kHz to 750kHz using PLL
- QFN-40, 6mm x 6mm package

Applications

- Point of load regulators
- Medical
- Data and telecom
- Industrial
- Automotive
- Displays
- Set top boxes

Power & Linear IC

Linear Technology LTC3853 Datasheet available!

Franchised with Arrow in Denmark, Norway, Sweden, UK and Ireland

For further information, including the LTC3853 Datasheet, please complete the reply slip or visit http://www.arrowne.com/innov/in218/f_1455.shtml

ENQUIRY 1455

Efficient, Intelligent Solutions for LED Lighting Applications

Comprehensive range of solutions meets the evolving requirements of lighting applications

Power & Linear IC

LEDs and LED displays suffer varying illumination levels as the power supply voltage changes. This affects displays used in automotive applications, battery operated handheld devices or fixed architectural installations.

To keep LED brightness constant needs a stable current over the anticipated variation in power supply voltage. The usual method of a resistor in series with the LEDs has serious drawbacks: the resistor must present a large near-infinite resistance but this produces a large voltage drop across it. Additional parallel resistors are necessary to drive a given number of LEDs, increasing current consumption. Secondly, series resistors waste power as heat.

Infineon's LED driver family overcomes all the drawbacks and offers an easy, cost effective and reliable way to achieve LED current stabilisation. The BCR 401R, BCR 402R, BCR 402U and BCR 405U cover the most common LED supply current ranges, 10mA, 20mA and 50mA and enable easy adjustment upwards from the nominal driver current value by adding a single external resistor. Voltage drop with these ICs is only 0.75V, maximising DC efficiency. A negative temperature coefficient protects LEDs against thermal runaway. The ICs are small, in surface mounted SOT143R packages.

For applications requiring even higher LED currents, Infineon offers powerful linear and DC/DC switched constant-current drivers. The TLE 424x linear LED driver family consists of three different drivers covering a current range from 60mA (TLE 4240-3) to 500mA (TLE 4242G). All parts have on-chip diagnostics and comprehensive protection mechanisms. Maximum permissible input voltage is 45V, making this part attractive also for higher board voltages (for trucks, tractors etc.). All parts are ROHS compliant and available in the full automotive temperature range, -40°C to +150°C.

High brightness LEDs with currents exceeding the 500mA limit can be driven with Infineon's DC/DC switched constant-current LED drivers, offering solutions up to 2.3A continuous current. In terms of highest input voltage and output current, the TLE 6389-2GV is an excellent choice with 60V maximum input voltage and 2.3A maximum output current. This part combines high output voltage accuracy with special features like reset circuitry and battery low detector.

Infineon LED Sample Kit and LED Driver Brochure available!

In terms of highest integration and small package solutions, Infineon is also offering a 1.8A DC/DC switching regulator in a PG-SO8 package. The TLE8366-GV incorporates the control IC, power switch and protection circuitry. Moreover only five or six additional external parts are necessary to realise a switched regulator.

Features

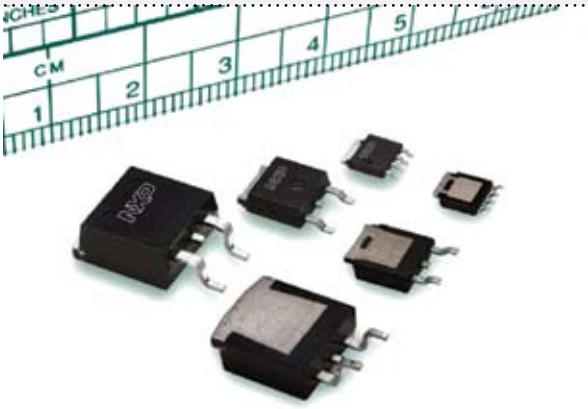
- BCR 401R
  - Low cost
  - Few external parts
  - Easy to use and fast
  - Small SOT143R packaging (2.9mm x 1.6mm x 1.1mm incl. leads)
- TLE 4240-3GM
  - Low cost, automotive qualified
  - 60mA
  - Protected against short circuit to GND or V_{bat}, reverse polarity, overtemperature
  - SCT-595 package
- TLE 4241GM
  - Adjustable output current up to 70mA
  - Protected against short circuit, reverse polarity, overtemperature
  - Open load detection/diagnosis
  - PG-SO8 package, automotive qualified
- TLE 4242G
  - Up to 500mA output current, adjustable
  - Comprehensive protection features
  - PWM logic level input
  - Status/diagnostic output
  - D2PAK package, automotive qualified
- TLE 8366EV
  - Up to 1.8A adjustable output current
  - Efficient DC/DC switching regulator with 370kHz switching frequency
  - Integrated power stage, soft start, synchronisation input
  - PG-SO8 package, fully automotive qualified
- TLE 6389-2GV
  - Up to 2.3A adjustable output current with high accuracy of ±3%
  - 60V maximum input voltage
  - Driver output for external power switch
  - PWM input, reset generator, sync input and low battery detector
  - PG-DSO14 package, fully automotive qualified

ENQUIRY 1468

For further information, including the Infineon LED Driver Brochure and how to obtain a Sample Kit, please complete the reply slip or visit http://www.arrowne.com/innov/in220/f_1468.shtml

High Performance MOSFET for Automotive Systems

Advanced HPA TrenchMOS technology improves performance and powers automotive innovation



NXP Semiconductors' High Performance Automotive (HPA) TrenchMOS™ family of MOSFETs has specific features to satisfy the high power requirements of safety and comfort systems and improve system performance throughout the car.

Vehicles contain multiple features that make driving more comfortable, convenient and safer, such as engine management units, catalytic converters, ABS, passenger restraint systems, power assisted steering and electric windows, mirrors and seats. Electric Power Assisted Steering (EPAS) systems, for example, require around 1kW while pump and fan motors draw between 500W and 800W. Other applications, such as electric braking, turbochargers or valve train control, also consume high power with an Integrated Starter Alternator (ISA) requiring <10kW.

Such high power demands mean drawing higher current levels from the standard 14V automotive supply. Power MOSFETs need to provide the large current handling capability in standard, inexpensive discrete packages without the need for large arrays of devices and at minimum heat dissipation, even when operated for long periods.

The HPA TrenchMOS products are extremely rugged with very low on-state resistance and an excellent balance of current handling, low dissipation and cost-effectiveness in industry standard packages, supremely suited to the automotive environment. HPA devices meet today's electrical power demands and are flexible enough for future automotive innovations. Devices are available in 30V, 40V, 55V, 75V and 100V versions.

An established leader in proven Trench technology, NXP has advanced capabilities to the next level with an innovative stripe configuration for the MOSFET cells that allows smaller cell pitch – and hence lower on-state resistance - without a corresponding increase in capacitance and gate charge. Consequently, HPA devices offer faster switching for a given RDS_{on}, leading to an outstanding combination of size, reliability, efficiency and performance that reduces system costs without cutting back on functionality. Devices fabricated using this process are 20% more rugged than previous generations, allowing HPA devices to perform to their maximum potential even in the harshest automotive environments. With enhanced avalanche capability, they are rated for temperatures between -55°C and +175°C and are fully compliant with the AEC Q101 standard stress test qualification for discrete semiconductors.

As space efficiency becomes an important factor in system design, the HPA family maximises the performance available from small footprints.

Devices are available in a wide range of compact, standard packages including TO220, D²PAK, LFPAK and DPAK as well as Known Good Die (KGD) with the added benefit of even lower RDS_{on} values.

Features

- Low RDS_{on}
- Rated for -55°C to +175°C
- AEC Q101 compliant
- TO220, D²PAK, LFPAK, DPAK or KGD

Applications

- Electric power assisted steering
- Integrated starter alternator
- Electric turbochargers
- Catalytic converter heaters
- Water, oil and fuel pump motors
- Windscreen wiper, seat, window and mirror motors
- Engine management
- Driving motors for power roofs and door locks
- Seat belt pre-tensioning
- Fuel pumps

Power & Linear IC

NXP High Performance MOSFETs for Automotive Systems Brochure available!

For further information, including the High Performance MOSFETs for Automotive Systems Brochure, please complete the reply slip or visit http://www.arrowne.com/innov/in216/f_1424.shtml

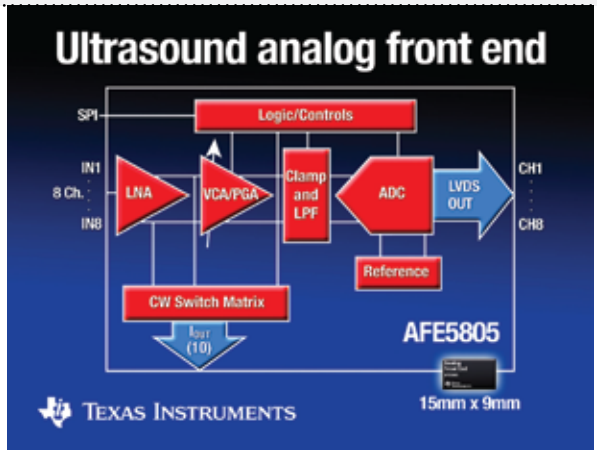
ENQUIRY 1424

TEXAS INSTRUMENTS

Four New Analogue Front-End Devices Enable Portable and Handheld Ultrasound

Integrate low noise amplifier, voltage controlled attenuator, programmable gain amplifier and ADC

Power & Linear IC



Texas Instruments' AFE58xx Analogue Front End (AFE) devices integrate multiple high-performance analogue circuits, providing superior image quality for a wide range of ultrasound applications. The devices consume less power and are more than 50% smaller than comparable devices in the market.

Despite their small size and low power, all four devices in the series maintain low noise figures, allowing designers to offer portable and handheld ultrasound systems with longer battery life and better image quality.

The AFE5805 provides low power consumption and low noise for portable to mid-range ultrasound systems. It offers 122mW per channel power efficiency and a noise figure of 0.85nV/√Hz at 2MHz, making it suitable not only for portable equipment but also for high channel density mid-range systems.

The device integrates eight Low Noise Amplifier (LNA) channels, voltage controlled attenuator, programmable gain amplifier, low pass filter and a 12-bit 50MSPS Analogue/Digital Converter (ADC) with LVDS (Low Voltage Differential Signalling) data outputs.

The AFE5804 is pin to pin compatible and allows migration to a lower power solution, 102mW/channel at 1.25nV/√Hz and 40MSPS. Mode control enables flexibility when programming the level of noise and power consumption to optimise a system.

Both the AFE5805 and the AFE5804 are available in a 15mm x 9mm package.

The newest parts in the family, the AFE5851 and AFE5801, reduce power consumption and package size further to support the new market for handheld ultrasound systems. The AFE5851 is the first 16-channel AFE for the ultrasound market. Both devices are available in an ultra-small 9mm x 9mm package.

The AFE5851 features a power efficiency of 39mW/channel at 32.5MSPS. It integrates 16 VGAs (Variable Gain Amplifiers) and eight 12-bit 65MSPS ADCs. Each ADC is therefore shared between two VGAs and each VGA differential output is sampled at alternate clock cycles to optimise power efficiency. The ADC has scalable power consumption to reduce power use with lower sampling rates. The AFE5851's high channel count and low power features allow for increased channel density in handheld systems.

The AFE5801 offers 50mW/channel at 30MSPS and 58mW/channel at 50MSPS. It integrates eight VGAs and eight 12-bit 65MSPS ADCs with LVDS data outputs.

Features

- Integrated analogue front ends
- Low noise amplifier (AFE5804/05 only)
- Voltage controlled attenuator
- Programmable gain amplifier
- Low pass filter
- Analogue/digital converter
- Best in class noise and power performance
- Improved dynamic range
- Enable portability with ultra-small package size
- Fast overload recovery

Applications

- Ultrasound equipment
  - Handheld
  - Portable
  - Mid-range

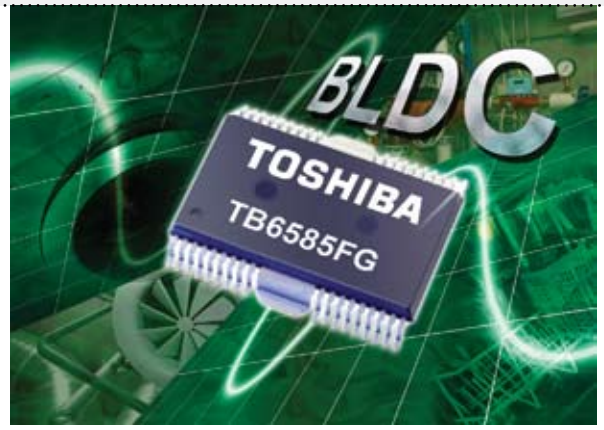
Texas Instruments Medical Applications Guide and AFE5805 Datasheet available!
Please complete the reply slip or visit the weblink below.

ENQUIRY 1446

For further information, including the Medical Applications Guide and AFE5805 Datasheet, please complete the reply slip or visit
http://www.arrowne.com/innov/in219/f_1446.shtml

Motor Control SoC Improves Efficiency, Cuts Noise and Component Count

Single chip, three phase, sine wave drivers



Toshiba Electronics Europe has expanded its family of System on Chip (SoC) motor drive solutions with a three phase, sine wave PWM driver. They reduce component count and noise and improve the efficiency of BrushLess DC (BLDC) motor applications.

The TB6585FG Application Specific Standard Product (ASSP) is a complete motor driver solution that integrates commutation logic, sine wave PWM generation, Hall sensor amplification, motor drive power stage and protection functionality into a single, 36-pin HSOP package. Designed for <45W power and a wide 4.5V to 36V input range, the IC can deliver a maximum current of 1.8A. It suits a range of applications, including home appliances, pumps, fans and industrial motion control.

An analogue signal input enables the TB6585FG to modify the PWM duty cycle and control forward or reverse motor rotation speed. Combining a triangular waveform generated on-chip with the buffered, amplified inputs from three Hall effect sensors generates three modulated, synchronised commutation waveforms to drive the motor.

By providing sinusoidal waveforms to drive the motor phases, the TB6585FG helps minimise electrical and acoustic noise when polarities in the driver circuit switch between positive and negative. This promotes more efficient operation, helps to reduce vibrations and enhances reliability. The ability to control lead angle allows a designer to tune the delay between current and voltage phases, which further improves efficiency in the target application.

The TB6585FG offers configurable modes for improving motor start-up characteristics and has inbuilt protection against overcurrent conditions. An ability to detect excessive commutation frequency and low rotation speed also improves design flexibility.

Features

- Highly integrated, system on chip ASSP
- BLDC motor drive
- Three phase, sine wave PWM generation
- Reduces noise, vibration, component count
- Increases operation efficiency
- Commutation logic
- Hall sensor amplification x 3
- Motor drive output power stage
- Input voltage: 4.5V to 36V
- Power <45W
- 36-pin HSOP package

Applications

- Home appliances
- Pumps
- Fans
- Industrial motion control

Toshiba Motor Solutions Guide and FREE TB6585FG Samples available! Please complete the reply slip or visit the weblink below.

For further information, including FREE TB6585FG Samples and the Motor Solutions Guide, please complete the reply slip or visit
http://www.arrowne.com/innov/in216/f_1428.shtml

ENQUIRY 1428

ANALOG DEVICES

Digitally Isolated Devices Enhanced

New automotive quality isolators, new gate drivers and transceivers

Power & Linear IC

Analog Devices has launched several new members of its digital isolation and iCoupler product families. The new additions include automotive versions of its digital isolation products, the ADuM5230 isolated half-bridge driver, ADuM540x digitally isolated DC/DC converters and a number of isolated transceiver products.

The ADuM120x, ADuM130x and ADuM140x families of iCoupler digital isolators are now qualified to AEC-Q100 for use in under-the-hood automotive applications. Available in eight- and 16-lead SOIC packaging, the devices offer data rates up to 25Mbit/s, 3.0V to 5.5V level translation and low power consumption. Applications include hybrid vehicle functions such as battery monitoring, motor drives, DC/AC inverters and electronic power steering. They can also be employed in any vehicle type as an interface for sensor clusters.

Analog Devices' ADuM5230 is an isolated half-bridge gate driver that provides independent and isolated high-side and low-side outputs. Supplying 150mW of power, it contains an integrated DC/DC converter, eliminating cost, space and performance difficulties associated with external supply configurations.

Also integrating an isolated DC/DC converter for simpler system design, the ADuM540x series of quad-channel digital isolators provides four independent isolation channels in a variety of channel configurations and data rates.

The ADM3251E is a high speed, single channel 2.5kV isolated RS-232 transceiver that operates from a single power supply with 15kV ESD protection on the bus pins. Its high level of protection suits it for operation in electrically harsh environments or where cables are frequently being plugged and unplugged.

For RS485/422 applications, the ADM2482E/ADM2487E are believed to be the industry's fastest integrated 2.5kV isolated data transceivers with transformer driver functionality. The devices combine a three-channel 2.5kV UL and VDE certified isolator, a three-state differential line driver and a differential input receiver into a single package.

For RS-485/422 transceiver applications that require a higher isolation rating, the ADM2484E offers 5kV UL and VDE certification and enhanced ESD protection of ±15kV on the bus pins. The device also has current-limiting and thermal shutdown features to protect against output short circuits and situations where bus contention might cause excessive power dissipation.

Features

- Enhanced isolated products
- ADuM120x, ADuM130x and ADuM140x iCoupler digital isolators
  - Qualified to AEC-Q100
  - 8- and 16-lead SOIC packaging
  - Data rates up to 25Mbit/s
- ADuM5230 isolated half-bridge gate driver
  - Independent and isolated high-side and low-side outputs
  - Integrated DC/DC converter
- ADuM540x quad-channel isolators
  - Integrated DC/DC converter
- ADM3251E high speed, single channel RS-232 transceiver
  - 2.5kV isolation
  - 15kV ESD protection
- ADM2482E/ADM2487E data transceivers
  - 2.5kV isolation
  - Three-channel UL and VDE certified isolator
  - Three-state differential line driver
  - Differential input receiver
- ADM2484E RS-485/422 transceiver
  - 5kV UL and VDE certification
  - Enhanced ESD protection: ±15kV
  - Current limiting and thermal shutdown

Applications

- Hybrid vehicle functions
  - Battery monitoring
  - Motor drives
  - DC/AC inverters
  - Electronic power steering
- General purpose automotive
- Plasma display modules
- Motor drives
- Power supplies
- Solar panel inverters
- Industrial and harsh environments

Analog Devices ADM2484E, ADM3251E, ADuM5230 and ADuM5401 /2 /3 /4 Datasheets available!

ENQUIRY 1463

For further information, including ADM2484E, ADM3251E, ADuM5230 and ADuM5401/2/3/4 Datasheets, please complete the reply slip or visit http://www.arrowne.com/innov/in220/f_1463.shtml

Low Power Processors Feature USB OTG and Ethernet

Wide range of devices optimised for power and processing requirements

Blackfin ADSP-BF52x and ADSP-BF54x processors from Analog Devices are designed for use in performance-demanding portable products that require a wide range of connectivity options.

The ADSP-BF52x and ADSP-BF54x Blackfin processor families are optimised for performance-demanding portable applications including Portable Media Players (PMPs), Voice over IP (VoIP) phones, IP cameras and mobile TV devices. With a core power as low as 0.16mW/MHz at 250MHz, the newest Blackfin processors give system designers room to innovate without increasing power consumption or system cost.

The ADSP-BF52x series offers a wide range of high performance, low power options. These include the ADSP-BF527, ADSP-BF525 and ADSP-BF523, which operate at up to 600MHz, and an ultra-low-power series, ADSP-BF522, ADSP-BF524, and ADSP-BF526, operating at up to 400MHz with excellent standby power dissipation.

The ADSP-BF54x further enhances the Blackfin portfolio and offers additional options for performance and power. The ADSP-BF542 and BF544 provide core performance ranging from 400MHZ to 600MHz, the ADSP-BF547 and BF548 provide up to 533MHz performance and the BF549 provides a full suite of connectivity options for automotive applications requiring operation at up to 533MHz.

Analog Devices supports these products with full EZ-KIT Lite Evaluation Kits. The ADSP-BF527 Kit features the processor itself, SRAM and Flash, an audio codec, USB debug agent, LCD, touch screen/keyboard controller and HS USB OTG functionality. An Ethernet PHY is also available. The ADSP-BF548 Kit includes the processor, SDRAM and Flash, audio codec, hard drive, LCD with touch screen/keyboard controller and Ethernet PHY.

Features: ADSP-BF52X

- Up to 600MHz Blackfin processor
- Two 16-bit MACs, two 40-bit ALUs, four 8-bit video ALUs and a 40-bit shifter
- RISC-like register and instruction model
- Advanced debug, trace and performance monitoring
- Core operation from 1.0V to 1.2V with optional on-chip voltage regulation
- 1.8V, 2.5V or 3.3V I/O
- CSP BGA package

Features: ADSP-BF54X

- Up to 600MHz (1200 MMACS) Blackfin processor
- HS USB OTG
- Host DMA
- UARTs
- SPORTs
- SPI
- TWI
- CAN
- SD/SDIO and ATAPI-6 controllers
- Synchronous and asynchronous memory interfaces
- Hardware-enabled security
- 18/24-bit LCD controller
- Multimedia accelerators
- CSP BGA package

Applications

- Portable and handheld devices
- Mobile TV
- Multimedia co-processor
- Biometric systems
- Consumer audio
- Industrial control
- Instrumentation
- Imaging
- Voice communication
- Automotive multimedia device interconnect
- PC peripherals
- POS/bar code scanners

Processor

Analog Devices ADSP-BF52x Series and ADSP-BF54x Series Datasheets available!

For further information, including the ADSP-BF52x Series and ADSP-BF54x Series Datasheets, please complete the reply slip or visit
http://www.arrowne.com/innov/in215/f_1404.shtml

ENQUIRY 1404

EVERBOUQUET INTERNATIONAL
WAYTON TECHNOLOGY

Liquid Crystal Displays for Every Occasion and Application

Backlit and normal displays in wide range of resolutions

Everbouquet's extensive range of LCDs includes graphic and character displays in small to mid sizes and a range of technologies to suit almost any application.

The technology represented in the range includes Chip-On-Glass (COG) and TFT devices, backlit and normal displays and extends to custom versions for unusual and specific design requirements.

In the colour TFT module range, all devices include integrated LED backlights. The smallest module has a 1.5in (3.75cm) diagonal screen size and the largest is 7.0in (17.5cm). Resolution varies from 128 pixel x 128 pixel to 800 pixel x 480 pixel and colour depth from 65K to 16.7 million.

Designers can choose between 80-system and 68-system 8-bit, 9-bit, 16-bit and 18-bit interfaces or 18-bit and 24-bit RGB inputs. Brightness ≤300cd/m² and contrast ratio ≤500:1 ensure high subjective image quality in a wide variety of ambient viewing conditions. There are also touch-screen options available.

In the COG dot matrix range, character LCD modules provide 16 characters on two lines in resolutions from 128 pixels by 64 pixels up to 320 pixels by 240 pixels. Viewable width extends from 25.1mm to 79.8mm with display heights from 6.1mm to 79.8mm. Devices are available for use with 3V, 3.3V or 5V power supplies.

Ten to 40 characters wide and between one and four lines high, a broad range of dot matrix character modules extends from 51.8mm to 154mm wide and 13mm to 31mm in height.

Graphic dot matrix modules range between 100 dots and 320 dots wide, 32 dots and 240 dots high.

Available with Cold Cathode Fluorescent Lamp (CCFL) or LED backlight, and also as modules without backlight, these display modules incorporate integral control ICs. Viewing areas are from 54mm to 134mm wide and 16mm to 92mm high.

Features

- Complete range of character and graphic displays
- Colour TFT modules
  - With or without integral controller
  - RGB or 80/68 system interface
  - 3.75cm to 17.5cm diagonal size
  - 128 pixel x 128 pixel to 800 pixel x 480 pixel
  - Touch screen options
  - Colour depth from 65K to 16.7million
- COG dot matrix LCD modules
  - Viewable width from 25.1mm wide to 79.8mm
  - Display height from 6.1mm to 79.8mm
- Dot matrix character modules
  - 10 to 40 characters wide
  - 51.8mm to 154mm wide
  - 13mm to 31mm in height
- Graphic dot matrix modules
  - 100 dots to 320 dots wide
  - 32 dots to 240 dots high
  - CCFL and LED backlight options
  - Integral control ICs

Applications

- Mobile handsets
- Industrial
- Gaming
- Medical instruments
- Test and measurement
- Portable media players

Everbouquet Shortform available! Please complete the reply slip or visit the weblink below.

ENQUIRY 1453

For further information, including the Everbouquet Shortform, please complete the reply slip or visit http://www.arrowne.com/innov/in218/f_1453.shtml

High Power LED Lighting Modules Shed More Light for Less Power

Provide up to 540 lumens at up to 80 lumens per Watt

A new series of high-power LED modules for lighting purposes provides illumination levels of up to 540lm. With a power consumption of only 6.7W, the new Zenigata series brings LED technology into the category of 60W equivalent lamps.

Sharp says that a light yield of up to 80lm/W ranks the new series amongst the best performers in the field in terms of energy efficiency. The modules also exhibit excellent operating lifetime specifications of 40,000 hours at +80°C, reducing maintenance requirements and hence lifetime cost.

Divided into 16 parallel-switched series of three, the new modules consist of a matrix of 48 LED chips that provide an overall light output of between 350lm and 540lm. A complementary 190lm to 280lm series consists of 30 LED chips arranged as ten parallel-switched series of three.

For both series, an aluminium-ceramic plate measuring 18mm x 18mm x 1.5mm is used as a substrate. This is supplied ready-drilled with mounting holes, making it possible to fix the modules securely to a suitable cooling element quickly and simply.

The colour temperature of these white light LED lighting modules lies within a range of 2,800K to 6,500K. Four tones are available: normal, warm (comparable to a light bulb) and two types of High Colour Rendering (HCR).

By using two slightly different phosphorus compounds, the HCR LEDs attain a Colour Rendering Index (CRI) value of 90. They thus provide high colour veracity and detail fidelity – essential in applications where the use of artificial light must not distort image quality. HCR LED modules are therefore in demand in areas such as photography, display window decoration and goods presentation, as well as in medical technology, for instance for surgery lights.

Sharp's LED light modules are generally suitable for a wide range of applications. These include interior illumination, for example in study, reading and desk lamps; decorative lighting; direct and indirect lighting, for instance for kitchen work surfaces; as spotlights for stages and building sites and as components for large LED displays. They are also a long-lasting solution for reading lamps on public transport such as trains, aeroplanes and buses.

The high-power modules of the 540lm series are particularly useful in retrofit situations when conventional incandescent lamps are directly replaced for the sake of lifetime cost and high energy efficiency.

Features

- LED based incandescent retrofit lamp
- Two LED lighting module ranges
  - 48 LED, 350lm to 540lm
  - 30 LED, 190lm to 280lm
- Efficiency up to 80lm/W
- 40,000 hours operating lifetime at +80°C
- Pre-drilled aluminium-ceramic substrate
- Four white tones; normal, warm and two HCR types
- 2,800K to 6,500K colour temperature
- HCR types offer CRI value of 90

Applications

- Retrofit incandescent lamps
- Photography
- Display window decoration and goods presentation
- Medical
- Study, reading and desk lamps
- Decorative lighting
- Direct and indirect domestic lighting
- Theatrical and building site spotlights
- Components for large LED displays
- Reading lamps on public transport

Sharp Lighting Selector Guide available! Please complete the reply slip or visit the weblink below.

For further information, including the Lighting Selector Guide, please complete the reply slip or visit http://www.arrowne.com/innov/in220/f_1470.shtml

ENQUIRY 1470

Sensors for Defence, Aerospace and Automotive Applications

Devices from Analog Devices, Infineon and Vishay

Information

This review of sensors featured recently in Arrow Innovation highlights two pressure sensors from Infineon, Vishay's single and dual channel SMT optical sensors and accelerometer and yaw rate sensor technologies from Analog Devices.

Analog Devices' iSensor™ products are highly integrated, calibrated, motion sensing products that are easy to use and cost-effectively improve product precision, response time, reliability, safety and security. The ADIS16350/ADIS16355 iSensor is a complete digital inertial sensing system that combines a triple-axis gyroscope and accelerometer. The sensor combines Analog Devices' iMEMS® and mixed signal processing technology in a highly integrated, calibrated solution.

Features

- Complete digital inertial sensing system
- Tri-axis gyroscope with digital range scaling
  - Settings: ±75°/s, ±150°/s, ±300°/s
  - 14-bit resolution
- Tri-axis accelerometer
  - ±10G measurement range
  - 14-bit resolution
  - 350Hz bandwidth
- Factory calibrated sensitivity, bias and alignment
- SPI compatible serial interface
- 2000G shock survivability

Analog Devices' ADIS16100 is a yaw detector particularly suitable for defence and aerospace applications. Surface-micromachining technology makes a functionally complete yaw rate sensor that communicates via an integrated SPI. The device produces a digital output proportional to the angular rate about a defined axis. Using a single external resistor can increase the measurement range and a capacitor can reduce the bandwidth.

Features

- Complete angular rate gyroscope
- Z-axis (yaw rate) response
- SPI digital output interface
- High vibration rejection over wide frequency range
- 2000G powered shock survivability
- Externally controlled self test
- Internal temperature sensor output
- Dual auxiliary 12-bit ADC inputs
- Absolute rate output for precision applications
- 5V single supply operation
- 8.2mm × 8.2mm × 5.2mm package

Infineon's pressure sensors serve tyre pressure and engine management needs, combining high precision and low cost with reliability. The SP 30 is a third generation, single package, tyre pressure sensor containing a microcontroller, LF receiver and accelerometer. Its flexibility and high level of integration reduce system cost while permitting a high degree of customisation.

Features

- Integrated tyre pressure monitoring system
- Pressure sensor: 100kPa to 450/700/800/900/1400kPa
- Temperature sensor: -40°C to +125°C
- Supply voltage sensor: 1.8V to 3.6V
- Acceleration sensor: -12g to 115g

ENQUIRY 1435

For further information, including Datasheets on the featured devices, please complete the reply slip or visit http://www.arrowne.com/innov/in216/f_1435.shtml

Infineon's KP 126 combines high precision with low cost in miniaturised SMD packaging. An integrated signal-conditioning circuit fabricated in BiCMOS technology performs the sensing function using a surface-micromachined array of capacitive sensors, amplifies the sensor cell output then compensates and linearises the temperature using a third order, polynomial transfer function. The resulting output voltage is proportional to the applied pressure.

Features

- Capacitive absolute pressure sensor
- Ratiometric analogue output
- Calibrated transfer function
- Clamping
- High accuracy over a wide temperature range
- Maximum error: ±1.0kPa
- 'Green' eight-pin SMD package
- Onboard diagnostics for broken wire detection

Vishay Intertechnology's surface mount TC*T1300X01 devices are 950nm transmissive (interrupter) optical sensors that are AEC Q101 qualified and rated for automotive applications. A 3mm gap enables looser mechanical tolerances than other solutions and a Moisture Sensitivity Level rating of 1 (MSL1) confers an unlimited floor life. The TCPT1300X01 is a single channel sensor and the TCUT1300X01 has two channels. Aperture size for both devices is 0.3mm with 3.0mm spacing gap, suiting them for use with a wide variety of materials and automotive and industrial applications. The TC*T1300X01 series offers a wide operating temperature range of -40°C to +85°C.

Features

- Single and dual channel transmissive optical sensors
- AEC Q101 qualified for automotive use
- Moisture sensitivity level 1 for unlimited floor life
- Phototransistor type detector
- 3mm gap for relaxed tolerances
- Aperture: 0.3mm
- Surface mount package: 5.5mm x 4.0mm x 4.0mm
- Typical output current under test: 0.6mA at IF 15mA
- Emitter wavelength: 950nm
- Halogen and lead free

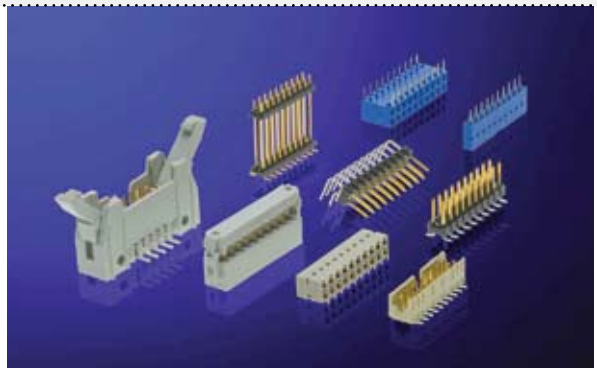
For further information, including Datasheets on the featured devices, please complete the reply slip or visit http://www.arrowne.com/innov/in216/f_1435.shtml

ENQUIRY 1435

Arrow Announces Power Supply Deal and Exclusive Connector Promotion

Support for Recom and FCI in Europe

Information



FCI's Basics+ programme is designed to offer outstanding service on industry standard connectors and has long been popular with customers looking for convenient solutions when designing interconnects.

The programme expanded worldwide in November 2006. Now FCI and Arrow have announced the next step in the programme; the pan-European initiative will be exclusively promoted with Arrow and subsidiaries in various European countries. In Northern Europe, the programme will be offered by Arrow UK and Arrow Nordic.

The campaign will include a new catalogue and website featuring a variety of new products, including a selection of fully customisable pin header parts, an expanded 2mm modular system and specially designed products for pin-in-paste processes.

To ensure short lead times, Arrow will stock the core range of FCI products while the Basics+ programme will also see most catalogue parts ready to ship from the factory in three days. A design service for specials and custom lines will also be offered.

"We chose Arrow as our promotion partner for this campaign because Arrow fully understands the meaning of giving good service," said Paul Isaac, FCI's global product marketing manager for the Basics+ programme. "The strength of Arrow's logistics system and customer relationships fully complement what we are trying to do with Basics+."

Steve Sessions, power supplies marketing manager, Arrow UK (left) and Paul Cheesman, business development manager, Recom

Arrow Electronics' power technology portfolio has expanded with the signing of a distribution agreement with Recom, a leading global supplier of DC/DC and AC/DC converters.

Under the terms of the agreement, Arrow will sell and support Recom's complete power converter product range throughout Europe. The agreement supports Arrow's strategy to provide the widest possible range of power supply and converter technologies to designers across Europe.

For Recom, the agreement will expand the penetration of its product ranges into European markets and ensure that customers have access to products and support at a local level.

Available in single, dual and triple rail outputs and a wide variety of input and output voltage configurations, power ratings and isolation voltages, Recom converters are used in most industries requiring low- to medium-power voltage conversion in the 0.25W to 60W range. The company also offers the largest range of safety-agency approved converters from any manufacturer.

"Recom is aligning itself with one of the top electronic components distributors in the world; its large base of customers will drive our expansion into the European market," comments Paul Cheesman, business development manager at Recom.

"The agreement with Recom adds innovative products and technology to our product range and demonstrates our commitment to meeting the power requirements of customers throughout Europe," said Steve Sessions, power supplies marketing manager at Arrow UK.

arrow innovation
REPLY SLIP

Would you or someone you know like to receive Arrow Innovation by e-mail 18 times a year?

All you have to do to receive this great service from Arrow NE Marcom, is to supply your e-mail address, name, company name and job title.

Go to http://www.arrowne.com/email/index.shtml

Name	**Job Function**
Company	
Address	
	Country
Phone	**Fax**
E-mail Address	**Customer No.***

*This is shown above your address details overleaf

Please tick the enquiry numbers to receive more information

Recom Drivers Speed Power LED Lighting Designs	1473	
Omron Relays Address New Electrical Design Challenges	1419	
Tyco Electronics Relays Enable Solar Powered Systems	1422	
Tyco Electronics Low Cost Centreline Connectors Mate with Other Brands	1459	
FCI Electronics Connectors Key to Medical System Performance	1440	
Molex (not Norway or Denmark) Board to Board Connectors Keep a Low Profile	1412	
Samtec High Speed, High Reliability Interconnects	1444	
EPCOS SMD Aluminium Capacitors for Consumer and Industrial Applications	1462	
Panasonic Industrial Metal Thin Film Chip Resistors - High Reliability Series	1445	
Syfer Technology High Voltage, Multilayer Ceramic Capacitors	1414	
Renesas Technology A Quantum Leap in Low-End Motor Control	1393	
Renesas Technology Entry to free prize draw to win a HS7125EDB01H development board		
STMicroelectronics Bluetooth, Processor and Power Solutions for Medical Applications	1359	
ON Semiconductor LIN and CAN Transceivers for Automotive Applications	1420	
Arrow Delivering Enhanced Display Technologies	1469	
Vishay Low Capacitance, Single Line ESD Protection Diode in Leadless LLP1006-2L Package	1427	
Linear Technology New Device Stops High Voltage Surges	1431	
Linear Technology Triple Output, Multiphase, Synchronous Step-Down Controller	1455	
Infineon Technologies Efficient, Intelligent Solutions for LED Lighting Applications	1468	
NXP Semiconductors (formerly Philips Semiconductors) High Performance MOSFET for Automotive Systems	1424	
Texas Instruments Four New Analogue Front-End Devices Enable Portable and Handheld Ultrasound	1446	
Toshiba Motor Control SoC Improves Efficiency, Cuts Noise and Component Count	1428	
Analog Devices Digitally Isolated Devices Enhanced	1463	
Analog Devices Low Power Processors Feature USB OTG and Ethernet	1404	
Everbouquet Liquid Crystal Displays for Every Occasion and Application	1453	
Sharp Microelectronics High Power LED Lighting Modules Shed More Light for Less Power	1470	
Arrow Sensors for Defence, Aerospace and Automotive Applications	1435	

Or alternatively send your choice along with your name, company and address via e-mail to: innovationreply@arrowuk.com

I prefer to receive more information ☐ **by post** ☐ **by e-mail** ☐ **by fax**

Save the date – and save more energy

2009 Power Seminar European Tour Schedule

March 17, 2009 - Birmingham, UK

March 18, 2009 - Copenhagen, Denmark

March 19, 2009 - Helsinki, Finland

Register now at: www.fairchildsemi.com/powerseminar

Seating is limited!

the power franchise