

Expand Your Innovations

ROHM automotive solutions



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The migration of consumer electronics into the automotive environment and the evolution of vehicle telematics for external communication combined with energy saving requirements, have created new design challenges.

At ROHM we view these challenges as opportunities to put our semiconductor expertise to work in your designs. Our 50 years of innovations in the consumer, telecommunications, computer, and automotive industries result in the most advanced, time-tested products on the market.

We bring you closer to your ultimate electronic architecture.

ROHM Chip Resistor Solutions



Anti-surge - ESR Series

- Greater anti-surge characteristics than conventional MCR series units (>3kV)
- Original resistive element and trimming design
- Superior power handling capability

Ultra-low Ohmic for Current Detection - PMR Series

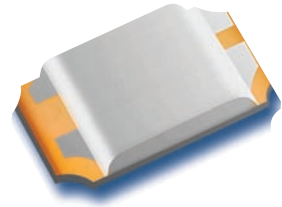
- Ultra-low resistance from 1mΩ
- Unique alloy utilized for superior resistance temperature characteristics
- Improved current detection accuracy due to original trimless design

Wide Terminal - LTR Series

- Improved junction strength against temperature cycling
- High anti-surge characteristics
- Double the rated power of conventional MCR series units

Sulfur Resistant - TRR Series

ROHM LED Lighting Solutions



White LEDs

- High heat radiation packages (SMLK15W)
- High color rendering characteristics (>97%)
- Built-in ESD protection diode (SMLD2xW)
- Ultra-compact LEDs with the same level of brightness as conventional LEDs (SMLM1xW, SMLT1xW)
- PicoLED™, the industry's smallest LED (SMLP1xW)
- Customizable binning solutions

SMLK15W: 6500 mcd @ 150 mA

SMLM13xW: 63 mcd @ 20 mA with reflector

SMLT13xW: 112 mcd @ 20 mA with reflector

SMLP12W: 71 mcd @ 5 mA PicoLED™

Color LEDs

- Ultra-compact LEDs with the same level of brightness as conventional LEDs (SML-M1xW, SML-T1xW)
- PicoLED™, the industry's smallest LED (SML-P1xW)
- Customizable color and binning solutions

SMLM1xx: 2.0 x 1.25 x 0.80 mm with Reflector

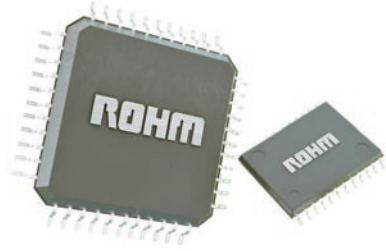
SMLT1xx: 1.6 x 0.80 x 0.55 mm with Reflector

SMLP1xx: 1.0 x 0.60 x 0.20 mm PicoLED™

Applications

- Button/Indicator Backlighting
- TFT-LCD Backlighting
- Interior Lighting
- Exterior Lighting
- Approach Lighting
- Tail Lamps: Super GigaLED™

ROHM Audio/Video Solutions



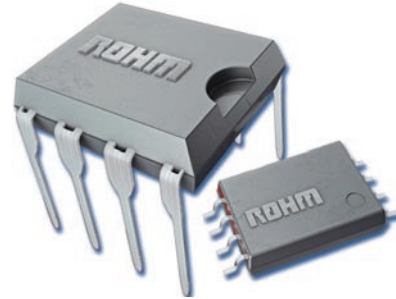
Applications

- Premium Audio CD/DVD/MP3
- Mobile Device Connectivity (Bluetooth, iPod, USB/SD)
- Navigation
- Rear Seat Entertainment
- Camera Systems

Products

- Audio
- Audio Isolation Amplifier
- Audio Switch
- High Side Switch
- MP3 Audio System IC
- Audio Sound Processor
- Class D Amplifier
- FM Transmitter/Receiver
- Voice/Tone Generator
- Video
- Video Switch
- Video Isolation Amplifier
- Adaptive Image Enhancer (AIE)
- LVDS Transmitter/Receiver
- Video Driver
- Video CODEC
- Speaker Amplifier/Video Codec
- Camera Power
- Interface
- Wireless Interface

ROHM Memory Solutions



EEPROMs

Features

- PAGE WRITE function
- High ESD resistance
- WAIT function (via HOLD pin)
- High speed operation: f_{sck}=5MHz (BR25xx0-W)
- Double cell technology + Double reset function = Superior reliability
- WRITE PROTECT pin
- Rewrite time 5ms max
- Wide operating temperature range: -40°C to +125°C

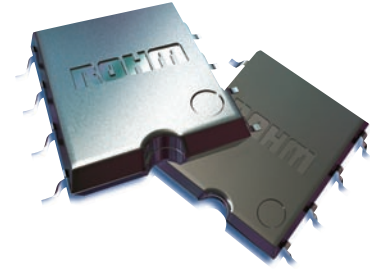
BR93xxx-W: Microwire bus, 85/105/125°C

BR24xxx-W: I²C bus, 85/105/125°C

BR25xxx0-W: SPI bus, 85/125°C

NOTE: I²C bus is a trademark of Philips Corp.

ROHM Power Management Solutions: Switching Regulators



Features

- Step-up and step-down available
- Internal FET or external (controller) type
- Adjustable or fixed frequency
- External synchronization.
- High accuracy (1~2%)
- Wide input voltage range (up to 48V)
- Wide operating temperature (up to 125°C)
- Integrated protection circuits
- Customized solutions also available

BD9870: 1.5A 900kHz Step-Down Switching Regulator

BD9778: 2A Step-Down Switching Regulator

BD9001: 2A Step-Down Switching Regulator with High Input Voltage

BD9007: 2A Step-Down Switching Regulator with External Synchronization

BD9006: 2A Step-Down Switching Regulator with External Sync & Improved Frequency Accuracy

BD9781: 4A Step-Down Switching Regulator

BD9006: 4A Step-Down Switching Regulator with External Sync & Improved Frequency Accuracy

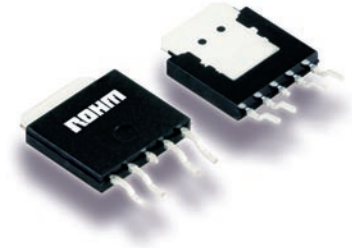
BD9011: 2Ch Synchronous Buck/Boost Converter

BD9012: 2Ch Synchronous Buck/Boost Converter with High Frequency

BD9305: 1Ch Buck Converter Controller

BD9306: 1Ch Boost Converter Controller

900kHz Step-down Regulator Improves Efficiency and Reduces Space



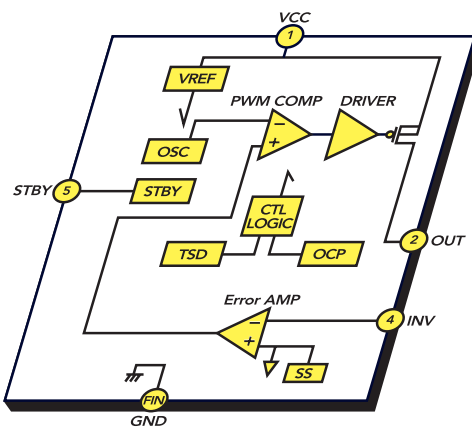
BD9870FPS

Features

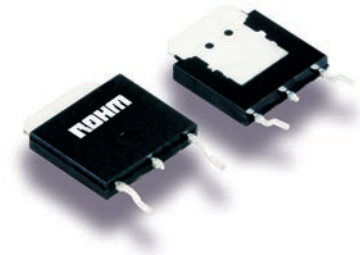
- 900kHz oscillation frequency reduces external coil size (10 μ H)
- Compatible with ceramic capacitors at output LC filter
- Built-in Pch MOSFET (diode rectification)
- Only 3 external components required: coil, diode, output capacitor
- Integrated Over-Current Protection (OCP) and Thermal Shutdown (TSD) circuits
- Built-in phase compensation circuitry
- Soft Start function

Applications

- TVs
- Printers
- Gaming consoles
- Car audio and navigation
- Communication devices
- A/V equipment
- Office and industrial equipment



ROHM Power Management Solutions: LDO Regulators



Features

- Low power consumption
- Adjustable or fixed output type
- Primary or secondary LDO
- 0 μ A standby current with shutdown switch
- High precision ($\pm 1\%$)
- Low noise
- High input voltage (up to 50V)
- Wide operating temperature range (up to 125°C)
- Low quiescent current (I_q)
- Optional built-in reverse polarity protection
- Integrated adjustable or fixed voltage detector
- Available with watchdog timer
- Multiple protection circuits

BD394x: 500mA Low I_q LDO

BD393x: 500mA Low I_q LDO with Built-In Reverse Polarity Protection

BD357x: 500mA Low I_q LDO with High Input Voltage

BD3004: 500mA Low I_q LDO with Adjustable Voltage Detector + Watchdog Timer

BD3005: 500mA Low I_q LDO with 4.5V Voltage Detector + Watchdog Timer

BD3010: 200mA Low I_q LDO with Adjustable Voltage Detector + Watchdog Timer

BD3951: 150mA Low I_q LDO with Reset

BAxxCC0: 1A Standard LDO

BAxxDD0: 2A Standard LDO

BDxxKA5: 500mA Standard Secondary LDO

BAxxBC0: 1A Standard Secondary LDO

BAxxJC5: 1.5A Standard Secondary LDO

ROHM Power Management Solutions: LED Driver ICs



Features

- Multi-channel serial/parallel
- Buck-boost converter
- PWM dimmer
- Open/short/ground/temperature protection

Applications

- Button/indicator backlighting
- TFT-LCD backlighting, interior lighting
- Exterior lighting (approach lighting, head/tail lamps)

BD8105: 12ch, 50mA

BD8118: 4ch, 150mA boost

BD8109: 4ch, 150mA buck-boost

BD8113EFV-E2

Features

- 2ch constant current driver that delivers 150mA/ch
- Integrated buck-boost converter
- Control via PWM or VDAC
- 36V input voltage resistance
- High efficiency operation

ROHM Sensor Solutions



Ambient Light

- Prolongs battery life
- Uniform output sensitivity
- Compact WSOF6 package (3.0x1.6mm, t=0.7mm)

Applications

Car navigation/entertainment systems, LCDs

Temperature

- Low current consumption (16uA typ.)
- High temperature accuracy: $\pm 4^{\circ}\text{C}$
- Open Drain output
- Detection temperature switching function ($\pm 5^{\circ}\text{C}$) via control pin (ROHM exclusive)
- Detection hysteresis (10°C typ.)
- Wide detection temperature lineup: -20°C to $+120^{\circ}\text{C}$ (in 10°C increments)
- High accuracy analog output: $\pm 2.5^{\circ}\text{C}$

Applications

Car navigation/audio/entertainment systems

Capacitive Touch Switch Controller

- Detects capacitive displacement as a voltage change
- Compact surface mount packages
- Ideal for car entertainment systems

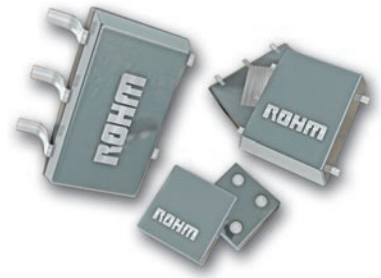
Hall IC

- Available in various detection types (Bipolar, Discrimination, Unipolar, Onmipolar, Alternating)
- Multiple compact package types
- Intermittent control offered for lower power consumption

Photointerrupter

- Original Eco-device technology results in 1/3rd the power consumption while maintaining the same S/N ratio
- New infrared LED improves receiving sensitivity
- Wide lineup available in different gap and slit widths ideal for a wide variety of applications: rotation, interruption, transfer/passage, size, position, presence

Hall Sensors



Features

- Intermittent control reduces power consumption
- Wide operating temperature range: -40°C to $+85^{\circ}\text{C}$
- High ESD resistance: 8kV (HBM)
- High sensitivity for precise magnetic field detection
- CMOS output enables direct microcontroller detection (no external resistor required)
- High accuracy offset cancellation results in high efficiency
- Hysteresis comparator integrated for increased noise resistance
- Compact (HVSO5) and ultra-compact chip scale packages offered
- Broad lineup optimized for a variety of applications:
- Unipolar: Switches ON/OFF upon detection of only one (predetermined) pole
- Omnipolar: Switches ON/OFF upon detection of either pole
- Polarity Discriminating: Features 2 separate outputs, one for each pole
- Bipolar: Switches ON upon detection of a South magnetic field and OFF with a North magnetic field
- Alternating: Detects changes in the magnetic flux and not on the field strength

Applications

- Car navigation/entertainment systems
- Single Output Omnipolar Type: BU52001GUL, BU52011HFV, BU52021HFV, BU52025G, BD7411G, BU52015GUL (Reversible dual-output)
- Dual Output Type with Polarity Discrimination: BU52004GUL, BU52014HFV
- Single Output Alternating Type: BU52040HFV
- Single Output Unipolar Type: BU52002GUL, BU52003GUL, BU52012HFV, BU52013HFV

Ambient Light Sensors

Features

Analog Current Detection Type

- Sensitivity close to the human eye
- Built-in shutdown function
- 2-stage current output gain control (BH1603FVC: 3-stage)
- 1.8V logic input interface
- Uniform output sensitivity
- Longer battery life

Digital 16bit Detection Type

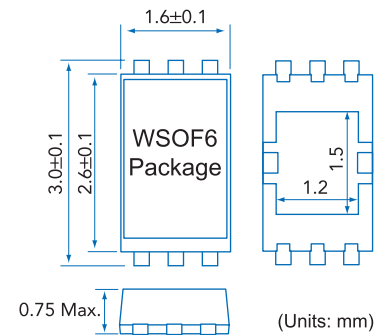
- Wide input range (0 to 65,535lx)
- I²C bus interface (Fast Mode: 400kHz max.)
- Integrated shutdown function
- 50/60Hz optical noise cancellation circuit built in for stable detection
- Uniform output sensitivity
- Prolongs battery life
- Built-in A/D converter reduces the number of external components

Applications

Car navigation/entertainment systems, LCDs

BH1600FVC: Analog 2-level output
 BH1603FVC: High precision analog 3-level output
 BH1710FVC: 16bit digital with I²C interface
 BH1715FVC: High precision 16bit digital with I²C interface

NOTE: I²C bus is a trademark of Philips Corp.



Capacitive Touch Switch Controllers

Features

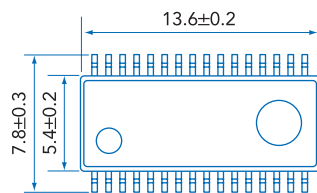
- Sensing circuit unaffected by sensor electrode resistance due to utilization of unique CV conversion circuit technology
- Supports both SPI and I²C interfaces
- Equipped with LED illumination functionality (i.e. flicker, PWM control)
- Gesture identification capability (e.g. short/long press, slide)
- X-Y touch panel control (48x80 matrix)
- Compact surface mount packages

Applications

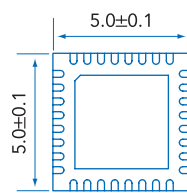
Car navigation/entertainment/audio systems

BU21008MUV: 16 input channels
BU21009MUV: X-Y matrix (48x80)
BU21010MUV: 8 input channels

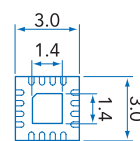
SSOP-A32 Package



VQFN032V5050 Package



VQFN016V3030 Package



(Units: mm)

Quick Links to Product Information

ROHM Chip Resistor Solutions

- Anti-surge: http://www.rohm.com/products/passive/resistor/anti_surge
- Ultra-low Ohmic: http://www.rohm.com/products/passive/resistor/ultra_low_ohmic
- Wide Terminal: http://www.rohm.com/products/passive/resistor/high_power
- Sulfur Resistant: http://www.rohm.com/products/passive/resistor/sulfur_tolerant

ROHM LED Lighting Solutions

- http://www.rohm.com/products/opto_device/led

ROHM Audio/Video Solutions

- <http://www.rohm.com/products/lsi/sound>
- http://www.rohm.com/products/application/caraudio_lsi.html
- <http://www.rohm.com/products/lsi/video>

ROHM Memory Solutions

- <http://www.rohm.com/products/lsi/eeprom>

ROHM Power Management Solutions: Switching Regulators/LDO Regulators

- <http://www.rohm.com/products/lsi/power>

900kHz Step-down Regulator Improves Efficiency and Reduces Space

- http://www.rohm.com/products/lsi/power/1chip_fet/single-chip/

ROHM Power Management Solutions: LED Driver ICs

- <http://www.rohm.com/products/lsi/led>

ROHM Sensor Solutions

- Ambient Light: http://www.rohm.com/products/lsi/sensor/ambient_light_sensor/ic/
- Temperature: http://www.rohm.com/products/shortform/03general/general_index30a.html
- Capacitive Touch: http://www.rohm.com/products/shortform/03general/general_index23a.html
- Hall-IC: http://www.rohm.com/products/lsi/sensor/hall_sensor/ic/
- Photointerrupter: http://www.rohm.com/products/opto_device/sensor/photointerrupter

Car Navigation

- http://www.rohm.com/products/application/carnavi_lsi.html

General Automotive

- http://www.rohm.com/products/application/auto_lsi.html

Excellence in Electronics

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ROHM Electronics USA

10145 Pacific Heights Blvd., Suite 1000

San Diego, CA 92121

www.rohmelectronics.com | 1.888.775.ROHM

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The products listed in this catalog are designed to be used with ordinary electronic equipment or devices (such as audio visual equipment, office-automation equipment, communications devices, electrical appliances and electronic toys). Should you intend to use these products with equipment or devices which require an extremely high level of reliability and the malfunction of which would directly endanger human life (such as medical instruments, transportation equipment, aerospace machinery, nuclear-reactor controllers, fuel controllers and other safety devices), please be sure to consult with our sales representative in advance.

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