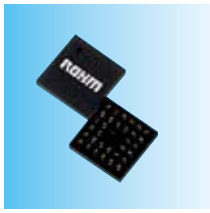
INTEGRATED CIRCUITS

ICs / LSIs

Using the most advanced circuit design and a high-quality, high-reliability process to develop innovative, next-generation system LSIs.



Wafer level CSP

The requirements for system LSI have diversified as the digitalization of devices progresses and higher performance is demanded. In order to respond swiftly to market needs, ROHM uses its expertise in product planning and circuit design cultivated through years of manufacturing custom LSIs. In addition, a uniform production system— from procurement of raw materials to pulling silicon ingots to final packaging— ensures a steady, continuous supply of stable, high quality products.

Regarding product development, ROHM makes full use of analog and digital technologies in order to design innovative LSIs that seamlessly integrate disparate functions in new ways to meet the needs of next generation devices.

MSDL serial transmission transceivers/transmitters for mobile phones feature low power consumption and low EMI. Communication between the LCD and main circuit board is enabled using a relatively few number of wires, making them ideal for the thin hinge areas of mobile flip phones.

In the consumer sector ROHM offers voice synthesis LSIs that provide high fidelity, CD-quality voice guidance functionality as well as sound source LSIs that utilize ADPCM compression technology. These audio LSIs are capable of generating realistic sounds, even in tight spaces such as in gaming devices and controllers.

Another breakthrough product is ROHM's AIE (Adaptive Image Enhancer)– a video processing LSI that adjusts the gradation of only specific areas (dark) of images in real time based on ambient light, improving visibility significantly. Applicability is far and wide ranging– from mobile phones and security cameras to automotive sets such as drive radars.


Real-time Movie Engine LSI

Power Modules

Modularization of semiconductor and electronic components produced in-house contribute significantly to reduced energy consumption and greater efficiency.


Power module for LED illumination

ROHM developed AC/DC converters with output ON/OFF functionality that minimize power during standby as well as units that supply the minimum power required by microcontrollers during non-operation. Reducing power consumption results in more efficient end-user applications and devices.

In addition, technologies created through the development of AC/DC converters for the LED lighting market have contributed to the development of high-power LED drivers that supply the optimal current for driving next generation LED applications.

Photo Link Modules

ROHM's IrDA and remote control receiver modules incorporate ICs and optical receiver/transmitter elements for greater compactness and higher speeds.


Infrared communication module for IrSimple

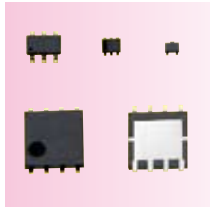
Faster speeds are being required of IrDA modules for data transmission in wireless devices of all types, including mobile phones and digital cameras. ROHM has developed a high-speed (4Mbps) IrSimple IrDA module that can transfer in one second, data that previously required 60 to 100 seconds. The IrSimple IrDA module is offered in the industry's smallest package, reducing the number of external components required.

Similarly, remote control optical receiver modules are available in a package type that reduces mounting space by half compared with competitor products, making them ideal for compact devices and high density sets such as video cameras, gaming devices, and car navigation equipment. In addition, considerable attention was given to the effects of random external light, resulting in a package design that ensures stable reception, even in the presence of intense sunlight (100,000 lux when irradiated at an angle of 45° with respect to light emission).

DISCRETE SEMICONDUCTOR DEVICES

Transistors

ROHM transistors contribute to market needs through multiple package types and stable, high quality supply.



Power MOSFETs

ROHM develops and manufacture transistors with energy saving, compactness, and high reliability in mind.

New package types include the MPT6 featuring characteristics equivalent to the standard SOP8 but in a size smaller by one order of magnitude. Even more compact packages are being developed that are optimized for the portable equipment market.

ROHM's MOSFET lineup includes high speed, low ON-resistance, high voltage resistance models that increase the efficiency of AC power supplies used in thin panels and gaming devices, while high power units are available for inverters in large LCD TVs.

A further addition to our package lineup is the new TCPT type 50% thinner and featuring 50% more power than current CPT packages.

Products are continually being added to our power transistor family, such as IGBTs for thin TVs and MOSFETs capable of handling currents from 50 to 100A.

Diodes

ROHM's penchant for high quality is never more apparent than with diodes, the most fundamental of semiconductor devices. ROHM's broad lineup is optimized to meet the needs of electronic devices and applications of all types.

Power Diodes

Continued efforts are being made in the power sector, resulting in development of Schottky diodes with high voltage resistance (150V-200V) and fast recovery diodes featuring high-speed response, low heat generation, low loss, and high voltage resistance (400V-600V).

In the rapidly expanding car electronics market, ROHM offers bidirectional Zener diodes for ESD protection in LANs that decrease both the mounting area and the number of components required.

Ultra-low capacitance Zener diodes are also available for high-speed digital signals and to provide ESD protection in the GHz range in HDMI devices, for example, with a target of 0.1pF or less.

Regarding package types, ROHM offers the smallest Schottky and Zener diodes in the market (0603 size, 0.6x0.3mm) for high density sets.

Light Emitting Diodes

ROHM's LEDs utilize original semiconductor technologies and proprietary compounds, making them among the smallest, thinnest, and most energy efficient in the industry.

PICOLED™

LEDs are being used in an increasing variety of equipment in order to add greater functionality and sophistication—which means greater power and space requirements, making compactness and greater energy efficiency imperative. ROHM addresses these needs by integrating a new 4-element structure (AlGaInP) in the industry's smallest package.

ROHM's new PICOLED™ series of chip LEDs are the smallest, thinnest in the industry at 1.0 x 0.6mm, t=0.2mm – 74% smaller in volume than the 1608 package type which was previously the smallest, with the same level of brightness.

LEDs currently under development include low voltage types optimized for energy conservation, multicolor phosphor products for LCD backlights and illumination, and ultra-high bright, high reliability units for automotive applications.

Laser Diodes

ROHM utilizes the latest device and film technologies in order to produce laser diodes optimized for a diverse market.

780nm band, high-output semiconductor laser

The optical disk sector, in particular laser printers and A/V equipment, continues to drive the need for laser diodes with dual wavelength capability that can both read and write data on different optical formats.

In addition to combo (DVD low output/CD high output) type laser diodes, recorder (DVD high output/CD low output) products featuring simplified pickup construction and super-combo units (DVD high output/CD high output) for PCs have recently been developed.

In the laser printer segment, we offer low-droop, high-output (5mW-10mW) laser diodes that promise faster speeds.

Internal frame materials and construction have been improved as well. The lineup includes both low and high output types produced with equipment developed entirely in-house, resulting in products of the highest quality.

PASSIVE COMPONENTS

Resistors

ROHM resistors, renowned for their high reliability, have continued to evolve in order to meet the needs of our customers for high quality, short delivery times, and stable supply.

Chip Resistors

From its inception, ROHM has been developing resistors that can respond to even the most stringent requirements.

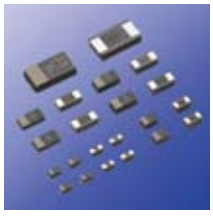
For mobile phones ROHM offers ultra-low resistance (10 mΩ) chip resistors for current detection in the 1608 size (1.6×0.8mm) – the smallest in the industry.

Automotive applications require an increasing degree of reliability due to more stringent consumer demand. In response to this ROHM has developed numerous high-reliability resistors capable of stable operation even in severe environments. These include high-power, high-surge types that utilize original resistor elements, long electrode resistors that ensure high contact reliability, and units highly resistant to sulfuration.

In the digital equipment sector ROHM offers compact 3-pin EMI filters that can handle high currents and are capable of suppressing noise over a wide band.

Capacitors

ROHM provides high performance, compact capacitors for applications requiring high capacitance and low ESR.



Chip Tantalum Capacitors (CSP package)

A broad lineup of tantalum capacitors is offered from compact (1.6 x 0.8mm), low profile (0.8mm) high capacitance (220uF, 4V) types featuring low ESR and an underside electrode configuration (TCT series) optimized for mobile phones, HDDs, PDAs, DSCs/DVCs, MP3 audio devices, and other compact applications, to large sized models (CL case: 6 x 3.2mm, t=1.4mm). Ultra-low profile (0.9mm) capacitors in the AS case size (3.2 x 1.6mm) are also available.

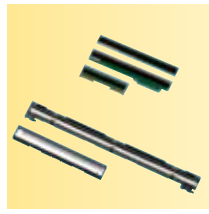
Conductive polymer tantalum capacitors feature significantly reduced ESR and feature decreased risk of smoke and fire compared to conventional units composed of manganese dioxide, making them better suited for applications requiring high reliability and a high degree of safety such as optical storage and gaming devices. Future products include even thinner, more compact capacitors with high capacitance and low ESR.

(Murata Co., Ltd. has taken over our multilayer ceramic capacitor business as of January 2007)

DISPLAYS

Thermal Printheads / Contact Image Sensor Heads

High performance, high reliability thermal printheads and contact image sensor heads, utilizing ROHM's considerable expertise and vast resources, provide the ideal solution for a variety of needs.



Thermal Printheads and Contact Image Sensor Heads

ROHM utilizes the latest in thick and thin film, LSI, and optical technologies in order to develop thermal printheads and contact image sensor heads tailored to market demands.

Our SE and SH series of thermal printheads feature greatly improved thermal efficiency, greater durability, and higher speeds by adopting a unique step-free construction, making them optimal for industrial equipment such as bar code labelers. For POS systems requiring high-speed printing and energy efficiency we developed ICs capable of high-speed transfer and integrated them in a lineup of ultra-compact thermal printheads (CG, CF, DG, and DF series).

ROHM's contact image sensor heads include models utilizing original optical design and resolution-switching sensor ICs originally developed for high-speed, high quality document scanners.

Products currently under development are A4-sized models featuring maximum resolutions of 600dpi and 1200dpi as well as sensors compatible with a greater variety of scanning widths.

LED Displays

From standard to custom modules, ROHM's high brightness LEDs and high quality components are incorporated into each and every display.

LED Numeric Displays (Surface Mount Type)

ROHM has recently developed 0.3-, 0.4-, and 0.6-inch LED numeric displays that incorporate its own high-luminance LEDs (AlGaInP). Features include 10 times the brightness of conventional products, low power consumption, and high reliability. A broad selection of colors is offered, making them ideally suited for all types of devices, such as household appliances and gaming devices.

ROHM's dot matrix modules—optimized for both consumer and public displays—feature 1024-step RGB color capability for natural, lifelike color expression.