Improve your living space with ROHM LED lighting products.

- **LDO**
  - Compatible with ceramic capacitors for phase compensation.
  - High Voltage Resistance Regulators
    - BD0008AOFPS (Variable Output, 1A)
    - BD0008FWF (Variable Output, 2A)
    - BD8006AOFPS (1V Output, 1A)
    - BD9006AOFPS (1V Output, 1A)
  - High voltage resistance regulators compatible with ceramic capacitors for phase compensation.

- **DC / DC converter**
  - Optimized for noise removal.
  - Chip tantalum capacitors
    - BD5461GUL (Voltage gain : 12dB)
    - BD5413EFV (5W+5W Output Type)
    - BD5427EFS (7W+7W Output Type)
    - BD5426EFS (10W+10W Output Type)
    - BD5423EFS (17W+17W Output Type)

- **Power supply block**
  - Industry's fastest switching speed.
  - High Voltage Resistance MOSFETs
    - R5007ANX (VDSS=500V, ID=7A, TO-220FM)
    - R6008ANX (VDSS=500V, ID=16A, TO-220FM)
    - R6009ANX (VDSS=600V, ID=10A, TO-220FM)
  - Ultra-fast recovery ensures extremely low heat generation.
  - Fast Recovery Diodes
    - RF series
      - Unique technology ensures ultra-fast switching speed and low Vf.
  - Advanced element features more than twice the voltage resistance of conventional products.
  - High Voltage Resistance Chip Resistors
    - KTR03 (10.0×29.0×4.5mm / 350V)
    - KTR10 (10.0×29.0×4.5mm / 350V)
    - KTR18 (10.0×29.0×4.5mm / 500V)

- **Interface / Switch Block**
  - Free up lighting control (i.e. ON / OFF) from restrictive wired systems with ROHM’s versatile wireless solutions.
  - Short Distance Wireless Communication Modules
    - BW9419
      - Integrates all required functions, including a IEEE802.11b / g / i baseband processor and RF circuit, into a single module.
      - Enable to customize according to applications as well.
  - Detects ambient light for optimized dimming.
  - Ambient Light Sensor ICs
    - BH1603FVC (Analog Output type)
      - BH1715FVC (Digital Output type)
    - The BH1603FVC is Analog Current Output Type.
    - The BH1715FVC is Digital Serial Output Type.
  - Improve your designs with touch switch capability.
  - Capacitive Switch ICs
    - BU2105S5FS [itch (Max.) sensor input]
    - BU2105L1FS [ch (Max.) sensor input]
    - ICS for microcontroller-less P/0 drive touch switch systems.

- **High quality voice guidance and large output BGM.**
  - High Performance Class D Speaker Amplifiers (5W to 17W Output)
    - BDG423EFS (17W to 17W Output Type)
    - BDG426EFS (10W to 10W Output Type)
    - BDG427EFS (7W to 7W Output Type)
    - BDG413EFS (9W to 9W Output Type)
    - The industry’s highest efficiency, combined with low heat generation, ensure significantly greater energy savings while reducing the amount of space required for high fidelity audio playback in next-generation lighting devices that integrate audio functionality.

- **Add audio functionality to compact lighting devices.**
  - High Performance Class D Speaker Amplifiers (Compact 2.5W Output Type)
    - BDG460GUL (Voltage gain : 6dB)
    - BDG461GUL (Voltage gain : 12dB)
    - ROHM Class D speaker amps integrate multiple protection circuits that contribute to safer designs.
    - The compact high efficiency, low-heat generating design decreases mounting area.

- **Expand your lighting application by adding voice guidance capability.**
  - Voice Generation Decoder ICs
    - BU6954 series [Built-in Mask ROM Type 4ch synchronous playback]
    - BU6940FV [External Flash ROM Type with 2ch synchronous playback]
    - BU6929FV [External Flash ROM Type with 1ch playback]
    - All required functions are built-in, reducing microcontroller load to practically zero.
    - Enables high quality playback of compressed audio.
Improving lighting and illumination with semiconductor technology.
Innovate your lighting designs with ROHM’s broad lineup of versatile lighting products.

**Driver Block**

- **Simplifies standard lighting designs.**
  - High Accuracy Constant Voltage / Current Controller IC
  - BD6550G
  - Configure simple high accuracy LED lighting solutions (e.g., standard, guidance lights) by connecting an AC / DC converter.

- **Precise dimming with PWM control.**
  - LED Drivers for Down lights
  - BD6558MUV-A (6W Output)
  - BD6559MUV (10W Output)
  - Integrates a PWM DC / DC converter (42V max. step-up) and current driver with PWM dimming capability.

- **High power LEDs for high performance sets.**
  - High Power LED Drivers
  - BD9207FPS
  - High power LED drivers with built-in step-down switching regulator.

**Optical Block**

- **LED dot matrices for information display.**
  - LED Driver for Dot Matrix Displays
  - BH6948GU
  - 7x7 (max.) LED dot matrix driver with built-in charge pump featuring automatic gain switching.

- **Simultaneous low Vf and In.**
  - Schottky Barrier Diodes
  - RSX101VA-30 (Vfm=30V, Ic=1A)
  - RSX201VA-30 (Vfm=30V, Ic=0.7A)
  - RSX051VA-30 (Vfm=30V, Ic=0.5A)

- **Ideal for noise suppression in power supply lines.**
  - Three-terminal EMI filters
  - MCF16 series (1608 [0603] size)
  - Supports rated currents up to 4A in the 1608 size.
  - Low internal resistance (20mΩ max.) ensures low loss.

**LED Lighting Block**

- **Power supply**
  - LDO
  - DC / DC Converter
  - Constant Current Controller IC
  - LED Driver
  - LED Matrix Driver

**Interface / Switch Block**

- **Short Distance Wireless Communication Module**
- **Ambient Light Sensor IC**
- **Capacitive Switch IC**

**Remote Control Receiver Module**

**Remote Controller**

**General Purpose**

- EEPROM
- Op-Amps / Comparator

**General-purpose Products**

- **High reliability series optimized for LED lighting correction.**
  - High Reliability EEPROMs
  - BR24L series
  - BR24S series
  - BR25L series
  - BR25S series
  - BR93L series
  - Original W-CELL technology utilized for high reliability. Operation from 1.7V possible.

- **Large variety of Op-Amp, Comparators for any application and environment.**
  - Operational Amplifiers / Comparators
  - BA2904 family
  - BA2904S family
  - BA2905 family
  - BA2905S family
  - BA4586 family
  - BA4586R family
  - BU7262 family
  - BU7262S family
  - BD7542 family
  - BD7542S family
  - And more than 20 products.
  - ROHM offers a broad lineup of op-amps and comparators in various electrical / temperature characteristics and package types to suit virtually any need.
Application Guide/LED Lighting

Optical Block

**Colorful LEDs**
Light Sources for Indicators
- SML-Z series (3.5x2.8x1.9mm)
- SML-512 series (1.6x0.8x0.55mm)
- SML-212 series (2.0x1.25x0.8mm)
- SML-01 series (3.0x2.0x1.3mm)
  - With reflector

**Shining LEDs**
High Heat radiation white LEDs
- TOP View type
- PSML2 (SMLK series)
  - Side view type
- PSML-S
- PSML-ST
  - Compact types available (0.8mm, t=2.15mm)

**Rendering LEDs**
High Power LEDs
1W, 3W, 5W
  - Features a color rendering index Ra > 95 and a CIE rank of 1A – suitable for fine art (museum-quality) and color test applications.

Remote Control

**Backlight brightness control based on ambient conditions.**
Ambient Light Sensor ICs
- BH1603FVC (Analog Output type)
- BH1715FVC (Digital Output type)
  - The BH1603FVC is Analog Current Output Type.
  - The BH1715FVC is Digital Serial Output Type.

**A broad lineup is offered in both leaded and surface mount configurations.**
Remote Control Receiver Modules
- RPM series

Modules

**Easy drive with AC input.**
High power LED Drivers for Illumination
BP5844A Series
Constant current (250 to 350mA).
Significantly reduced current consumption contribution to greater energy savings.

**Flexible control for smooth dimming.**
LED Driver with Dimming Function
BP5845W
  - Dimming possible using only PWM input.
  - Constant current output: 166 to 360mA.

Supports a variety of lighting needs.
LED Lighting Modules
LTG series
High brightness with less heat generation using standard LEDs. Unique reflectors ensure uniform chromaticity.

[Diagram showing LED lighting applications]
### General-purpose ICs

#### Analog Current Output Ambient Light Sensor IC
- **Part No.**: BH1103FVC
- **Supply Voltage**: 2.4 to 3.6 V
- **Operating Temperature**: 0°C to 70°C

#### Digital 16bit Serial Output Ambient Light Sensor IC
- **Part No.**: BH1715FVC
- **Supply Voltage**: 2.4 to 3.6 V
- **Operating Temperature**: 0°C to 70°C

#### Capacitive Sensor/Control ICs
- **Part No.**: BU21050FS
- **Supply Voltage**: 4.0 to 5.5 V
- **Output Sensitivity**: Max. 8 ch
  - **Output Type**: PIO
- **Part No.**: BU21051FS
- **Supply Voltage**: 4.0 to 5.5 V
- **Output Sensitivity**: Max. 8 ch
  - **Output Type**: PIO

#### LSI Capacitive Switch ICs
- **Part No.**: BD5423FS
  - **Supply Voltage**: 10.0 to 16.5 V
  - **Maximum Voltage**: 40 V
  - **Operating Temperature**: 0°C to 70°C
  - **Output Voltage**: 3.3 V
  - **Output Current**: 150 mA
- **Part No.**: BD5426FS
  - **Supply Voltage**: 10.0 to 16.5 V
  - **Maximum Voltage**: 40 V
  - **Operating Temperature**: 0°C to 70°C
  - **Output Voltage**: 3.3 V
  - **Output Current**: 150 mA
- **Part No.**: BD5427FS
  - **Supply Voltage**: 10.0 to 16.5 V
  - **Maximum Voltage**: 40 V
  - **Operating Temperature**: 0°C to 70°C
  - **Output Voltage**: 3.3 V
  - **Output Current**: 150 mA
- **Part No.**: BD5413EF
  - **Supply Voltage**: 6.0 to 10.5 V
  - **Maximum Voltage**: 40 V
  - **Operating Temperature**: 0°C to 70°C
  - **Output Voltage**: 3.3 V
  - **Output Current**: 150 mA

#### High Performance Class D Speaker Amplifiers (SW - 17W Output)
- **Part No.**: BD540GUL
  - **Supply Voltage**: 2.5 to 5.5 V
  - **Output Voltage**: 0.89 (Vcc = 3.3V)
  - **Output Current**: 600 mA
  - **Gain Bandwidth**: 8 kHz
  - **Slew Rate**: 2 V/μs
  - **Protection circuit**: Over current
  - **Protection circuit**: Heat sink
  - **Protection circuit**: Short circuit
- **Part No.**: BD541GUL
  - **Supply Voltage**: 2.5 to 5.5 V
  - **Output Voltage**: 0.89 (Vcc = 3.3V)
  - **Output Current**: 600 mA
  - **Gain Bandwidth**: 8 kHz
  - **Slew Rate**: 2 V/μs
  - **Protection circuit**: Over current
  - **Protection circuit**: Heat sink
  - **Protection circuit**: Short circuit

#### Voice Generation Decoder ICs
- **Part No.**: BU9634F
  - **Supply Voltage**: 2.7 to 5.5 V
  - **Output Voltage**: 2.048 V
  - **Synchronization Source**: Synchronous Serial
  - **Output Current**: Max. 128 M
  - **Output Current**: 1 ch
  - **Supply Voltage**: 2.048 V

#### LCD Segment Driver ICs
- **Part No.**: BU9796FS
  - **Supply Voltage**: 2.0 to 5.5 V
  - **Operating Temperature**: 0°C to 70°C
  - **Output Voltage**: 3.3 V
  - **Output Voltage**: 0.89 (Vcc = 3.3V)
  - **Output Voltage**: 150 mA
  - **Output Voltage**: 150 mA

#### Microcontroller ICs
- **Part No.**: BU9794KV
  - **Supply Voltage**: 2.0 to 5.5 V
  - **Operating Temperature**: 0°C to 70°C
  - **Output Voltage**: 3.3 V
  - **Output Voltage**: 0.89 (Vcc = 3.3V)
  - **Output Voltage**: 150 mA
  - **Output Voltage**: 150 mA
- **Part No.**: BU9795KV
  - **Supply Voltage**: 2.0 to 5.5 V
  - **Operating Temperature**: 0°C to 70°C
  - **Output Voltage**: 3.3 V
  - **Output Voltage**: 0.89 (Vcc = 3.3V)
  - **Output Voltage**: 150 mA
  - **Output Voltage**: 150 mA
- **Part No.**: BU9795KV
  - **Supply Voltage**: 2.0 to 5.5 V
  - **Operating Temperature**: 0°C to 70°C
  - **Output Voltage**: 3.3 V
  - **Output Voltage**: 0.89 (Vcc = 3.3V)
  - **Output Voltage**: 150 mA
  - **Output Voltage**: 150 mA

#### Driver Block
- **Part No.**: BD555G
  - **Supply Voltage**: 2.0 to 3.3 V
  - **Output Voltage**: 0.89 (Vcc = 3.3V)
  - **Output Voltage**: 150 mA
  - **Output Voltage**: 150 mA
  - **Output Voltage**: 150 mA
  - **Output Voltage**: 150 mA

#### Driver Block
- **Part No.**: BD5830UV-A
  - **Supply Voltage**: 2.7 to 5.5 V
  - **Output Voltage**: 2.048 V
  - **Output Voltage**: 128 M
  - **Output Voltage**: 1 ch
  - **Output Voltage**: 2.048 V
  - **Output Voltage**: 0.89 (Vcc = 3.3V)

#### Driver Block
- **Part No.**: BD5929UV
  - **Supply Voltage**: 2.7 to 5.5 V
  - **Output Voltage**: 2.048 V
  - **Output Voltage**: 128 M
  - **Output Voltage**: 1 ch
  - **Output Voltage**: 2.048 V
  - **Output Voltage**: 0.89 (Vcc = 3.3V)
## Discrete Product Specifications

### Power supply

- **High Voltage Resistance MOSFETs**
  - **Part No.**: R5007ANX
    - **Package**: TO-220FN
    - **Vds**: 500
    - **Ids**: 7
    - **Rds(on)**: 0.6
    - **Vg(th)**: 10
  - **Part No.**: R5016EXK
    - **Package**: TO-220FN
    - **Vds**: 500
    - **Ids**: 15
    - **Rds(on)**: 0.21
    - **Vg(th)**: 10
  - **Part No.**: R6008ANX
    - **Package**: TO-220FN
    - **Vds**: 600
    - **Ids**: 5
    - **Rds(on)**: 0.6
    - **Vg(th)**: 10
  - **Part No.**: R6010ANX
    - **Package**: TO-220FN
    - **Vds**: 600
    - **Ids**: 10
    - **Rds(on)**: 0.43
  - **Fast Recovery Diodes**
    - **Part No.**: RF1001TD2
      - **Package**: TO-220FN
      - **Vgs**: 200
      - **Igs**: 10
      - **Rds(on)**: 0.93
      - **Vg(th)**: 10
      - **Fmax**: 200
    - **Part No.**: RF2001TD2
      - **Package**: TO-220FN
      - **Vgs**: 200
      - **Igs**: 100
      - **Rds(on)**: 0.93
      - **Vg(th)**: 10
      - **Fmax**: 200
    - **Part No.**: RF2001TTS
      - **Package**: TO-220FN
      - **Vgs**: 430
      - **Igs**: 100
      - **Rds(on)**: 1.6
      - **Vg(th)**: 10
      - **Fmax**: 400
    - **Part No.**: RF208LE5
      - **Package**: PDWS
      - **Vds**: 0.4
      - **Igs**: 20
      - **Rds(on)**: 1.3
      - **Vg(th)**: 10
      - **Fmax**: 600
    - **Part No.**: RF208LE6
      - **Package**: PDWS
      - **Vds**: 1.5
      - **Igs**: 40
      - **Rds(on)**: 1.55
      - **Vg(th)**: 10
      - **Fmax**: 600

### Driver & DC / DC Converter

- **MOSFETs**
  - **Part No.**: SPBK23
    - **Package**: SOP
    - **Vgs**: 45
    - **Igs**: 1
    - **Rds(on)**: 0.47
    - **Vg(th)**: 0.9
    - **Fmax**: 30
  - **Part No.**: SPBK33
    - **Package**: SOP
    - **Vgs**: 45
    - **Igs**: 2
    - **Rds(on)**: 0.45
    - **Vg(th)**: 24
    - **Fmax**: 4
  - **Part No.**: RTR030N05
    - **Package**: TSMF3
    - **Vgs**: 45
    - **Igs**: 1
    - **Rds(on)**: 53
    - **Vg(th)**: 48
    - **Fmax**: 8
  - **Part No.**: RSR030N06
    - **Package**: TSMF3
    - **Vgs**: 45
    - **Igs**: 1
    - **Rds(on)**: 75
    - **Vg(th)**: 70
    - **Fmax**: 5
  - **Part No.**: Q56K21
    - **Package**: TSMF3
    - **Vgs**: 45
    - **Igs**: 1.25
    - **Rds(on)**: 310
    - **Vg(th)**: 30
    - **Fmax**: 1.5

### Schottky Barrier Diodes

- **Part No.**: RXS051VA-30
  - **Package**: TSMF2
  - **Vgs**: 30
  - **Igs**: 1
  - **Rds(on)**: 0.47
  - **Vg(th)**: 0.9
  - **Fmax**: 30

### Power supply

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ROH1208A