DC-DC converters for

Gate drive applications

Designed with high dv/dt immunity for safety & reliability
DC-DC converters for gate drive applications

Designed for reliability

Murata MGJ series DC-DC converters have been designed and tested to withstand high dv/dt and DC link conditions without measurable breakdown within the isolation barrier.

Gate drive applications create challenging conditions which are not factored into the design of standard DC-DC converters.

For this reason Murata has created a range of converters specifically engineered and tested to ensure the reliability and safety required in gate drive applications:

Applications

- Motor drives / motion control
- Solar inverters
- Welding
- Medical pump controllers
- Medical X-ray systems
- HVAC inversion systems
- High power AC-DC conversion
- Electrical powered transportation
- (Water) pump and valve control

MGJ1

Features

- Optimised bipolar output voltages for IGBT/SiC & MOSFET gate drives
- Reinforced insulation to UL60950 to a working voltage of 250Vrms
- ANSI/AAMI ES60601-1, 2 MOPP recognised
- Characterised CMTI >200kV/uS
- Continuous barrier withstand voltage 3kVDC
- 5.7kVDC isolation test voltage ‘Hi Pot Test’
- Ultra-low isolation capacitance 3pF
- 5V, 12V, 15V & 24V inputs
- +15V/-3V, +15V/-5V, +15V/-9V & +19V/-5V outputs
- Creepage and clearance 9 mm

MGJ2 through hole

Features

- Optimised bipolar output voltages for IGBT/SiC & MOSFET gate drives
- Reinforced insulation to UL60950 recognised
- ANSI/AAMI ES60601-1, 1 MOPP/2 MOOP’s recognised
- Continuous barrier withstand voltage 2.4kVDC
- Characterised CMTI >200kV/uS
- 5.2kVDC isolation test voltage ‘Hi Pot Test’
- Ultra-low isolation capacitance 3pF
- 5V, 12V, 15V & 24V inputs
- +15V/-3V, +15V/-5V, +15V/-8.7V, +15V/-15V, +17V/-9V, +18V/-2.5V, +18V/-5V, +20V/-3.5 & +20V/-5V outputs
- Operation to 100°C
**MGJ3**

**Features**
- No opto feedback
- Optimised bipolar output voltages for IGBT/SiC & MOSFET gate drives
- UL60950 reinforced isolation to a working voltage of 250Vrms
- ANSI/AAMI ES60601-1, 1 MOPP/2 MOOP's recognised
- Continuous barrier withstand voltage 3kVDC
- Characterised CMTI >100kV/uS
- Isolation capacitance 15pF
- 5.2kVDC isolation test voltage 'Hi Pot Test'
- Characterised partial discharge performance
- 5V, 12V & 24V input voltages
- Configurable dual outputs for all gate drive applications: +15V/-5V, +15V/-10V & +20V/-5V
- 105°C operating temperature

**MGJ6 SIP, DIP & Low Profile**

**Features**
- Optimised bipolar output voltages for IGBT, silicon and silicon carbide gate drives
- Continuous barrier withstand voltage 3kVDC
- Characterised CMTI >100kV/uS
- Isolation capacitance 15pF
- Wide 2:1 input voltage ranges of 5V, 12V & 24V
- +15V/-5V, +15V/-10V & +20V/-5V outputs
- Creepage and clearance 8 mm

**MGJ6 half, full and 3-phase**

**Features**
- Two, three or four isolated output voltages for IGBT/SiC & Mosfet gate drives in half-bridge, full bridge, three phase configuration
- UL60950 reinforced isolation to a working voltage of 250Vrms
- ANSI/AAMI ES60601-1, 2 MOOP's recognised
- Continuous barrier withstand voltage 3kVDC
- Characterised CMTI >100kV/uS
- Isolation capacitance 15pF
- Wide 2:1 input voltage range of 5V, 12V and 24V
- Creepage and clearance 8 mm

**MGJ6-14mm**

**Features**
- No opto feedback
- Optimised bipolar output voltages for IGBT/SiC & MOSFET gate drives
- UL60950 reinforced isolation to a working voltage of 690Vrms
- IEC 61800-5-1 to a working voltage of 690Vrms
- Continuous barrier withstand voltage 3kVDC
- Characterised CMTI >100kV/uS
- Isolation capacitance 13pF
- 14mm creepage and clearance
- 5V, 12V & 24V input voltages
- Configurable dual outputs for all gate drive applications: +15V/-5V, +15V/-10V & +20V/-5V
- 105°C operating temperature

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MGN1

Features
- Optimised output voltages designed to meet leading GaN devices requirements
- Reinforced insulation to UL62368 recognition pending
- Continuous barrier withstand voltage 1.1kV
- Characterised CMTI >200kV/uS
- Ultra low isolation capacitance 2.5pF
- 3kVAC isolation test voltage ‘Hi Pot Test’
- 5V & 12V inputs
  - +8V, +12V & +6V/-3V outputs
- Characterised partial discharge performance
- Operation up to 105°C

Applications
- EV/HEV
- Motor drives/motion control
- PV inverters

MGJ2 surface mount

Features
- Optimised bipolar output voltages for IGBT/SiC & MOSFET gate drives
- Reinforced insulation to UL62368 recognition pending
- ANSI/AAMI ES60601-1 recognition pending
- Continuous barrier withstand voltage 2kV
- Characterised CMTI >100kV/uS
- Ultra low isolation capacitance 3pF
- 5.7kVDC isolation test voltage ‘Hi Pot Test’
- 5V, 12V & 15V inputs
  - +15V/-9V, +15V/-5V & +20V/-5V outputs
- Characterised partial discharge performance

Applications
- HVAC inversion systems
- Medical pump controllers
- Water pump and valve control

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<table>
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<tr>
<th>Power</th>
<th>Description</th>
<th>Isolation capacitance</th>
<th>Package type</th>
<th>Murata series</th>
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<tbody>
<tr>
<td>1 Watt</td>
<td>1 Channel, Embedded transformer</td>
<td>3 pF</td>
<td>SMD, low profile</td>
<td>MGJ1</td>
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<tr>
<td>1 Watt</td>
<td>1 Channel, Fixed outputs</td>
<td>2.5 pF</td>
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<td>4 pF</td>
<td>THT, SIP7</td>
<td>MGJ2</td>
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<tr>
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<td>3 pF</td>
<td>SMD</td>
<td>MGJ2 SM</td>
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<tr>
<td>3 Watt</td>
<td>1 Channel, Configurable outputs</td>
<td>15 pF</td>
<td>SMD</td>
<td>MGJ3T</td>
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<tr>
<td>6 Watt</td>
<td>1 Channel, Configurable outputs</td>
<td>15 pF</td>
<td>SMD</td>
<td>MGJ6T</td>
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<tr>
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<td>1 Channel, Configurable outputs</td>
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<td>SMD low profile, THT SIP + DIP</td>
<td>MGJ6-LP, -SIP, -DIP</td>
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<td>2 channels for Half-Bridge</td>
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<tr>
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<td>3 channels for Full-Bridge</td>
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<tr>
<td>6 Watt</td>
<td>4 channels for 3-Bridge</td>
<td>15 pF</td>
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<td>MGJ6P</td>
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<tr>
<td>6 Watt</td>
<td>1 channel, 690Vac reinforced isolation</td>
<td>13 pF</td>
<td>SMD</td>
<td>MGJ6W</td>
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</tbody>
</table>
Note

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   3. Medical equipment
   4. Traffic signal equipment
   5. Data-processing equipment
   6. Aerospace equipment
   7. Power plant equipment
   8. Transportation equipment (vehicles, trains, ships, etc.)
   9. Disaster prevention / crime prevention equipment
   10. Application of similar complexity and/or reliability requirements to the applications listed above

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