

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

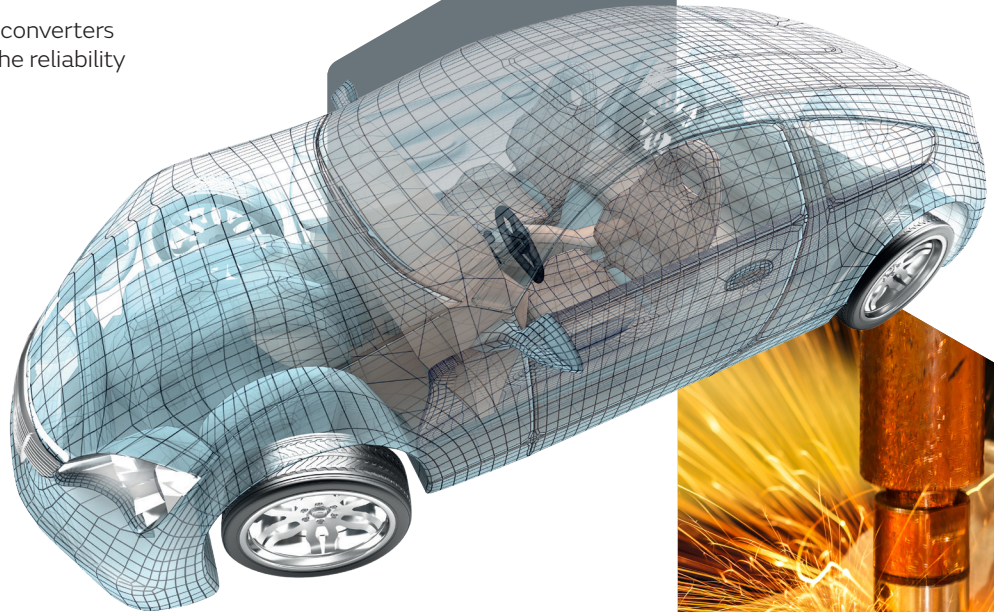
Murata MGJ series DC-DC converters have been designed and tested to withstand high  $dv/dt$  and DC link conditions without measurable breakdown within the isolation barrier.

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

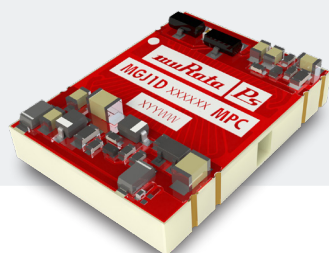
- Motor drives/motion control
- Solar inverters
- Welding
- Medical pump controllers
- Medical X-ray systems
- HVAC inversion systems
- High power AC-DC conversion
- Electrical powered transportation
- (Water) pump and valve control



### MGJ1

#### Features

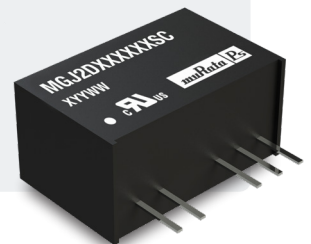
- Optimised bipolar output voltages for IGBT/SiC & MOSFET gate drives
- UL60950 recognised for reinforced insulation to a working voltage of 250Vrms
- ANSI/AAMI ES60601-1 recognition pending
- DC link voltage 3kVDC
- Creepage and clearance 9mm
- Ultra-low coupling capacitor 2pF



### MGJ2 through hole

#### Features

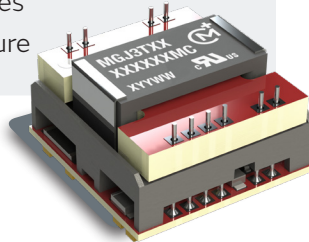
- Optimised bipolar output voltages for IGBT/Mosfet gate drives
- UL60950 recognised for reinforced insulation
- ANSI/AAMI ES60601-1 recognised
- 5.2kVDC isolation test voltage 'Hi Pot Test'
- Ultra low coupling capacitance 2.8 - 4pF
- SIP package style
- 5V, 12V, 15V & 24V inputs
- +15V/-15V, +15V/-5V, +15V/-8.7V, +17V/-9V, +20V/-3.5 & +20V/-5V outputs
- Operation to 100°C
- Characterised  $dv/dt$  immunity 80kV/ $\mu$ s at 1.5kV



## MGJ3

### Features

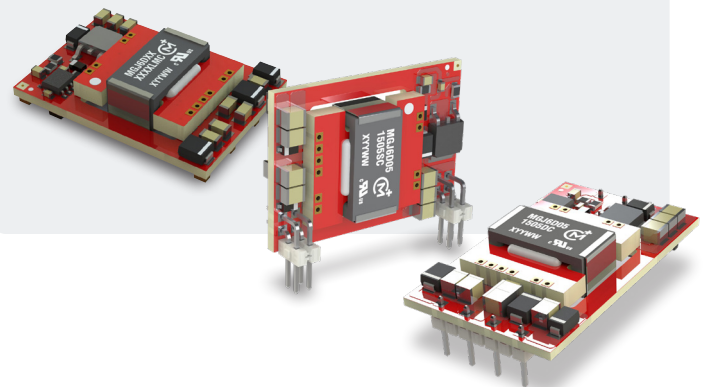
- No opto feedback
- Optimised bipolar output voltages for IGBT/SiC & MOSFET gate drives
- Configurable dual outputs for all gate drive applications: +15V/-5V, +15V/-10V & +20V/-5V outputs
- UL60950 recognised for reinforced insulation to a working voltage of 250Vrms
- ANSI/AAMI ES60601-1 recognised, 1 MOPP/2 MOOP's to a working voltage of 250Vrms
- Characterised dv/dt immunity 80kV/ $\mu$ s at 1.6kV
- 5.2kVDC isolation test voltage 'Hi Pot Test'
- Ultra low coupling capacitance 15pF
- Characterised partial discharge performance
- DC link voltage 3kVDC
- 5V, 12V & 24V input voltages
- 105°C operating temperature



## MGJ6 SIP, DIP & Low Profile

### Features

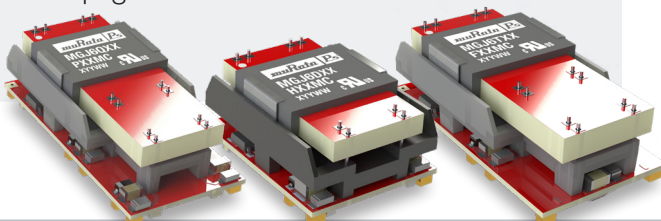
- Optimised bipolar output voltages for IGBT, silicon and silicon carbide gate drives
- DC link voltage 3kVDC
- Wide 2:1 input voltage ranges of 5V, 12V & 24V
- +15V/-5V, +15V/-10V & +20V/-5V outputs
- Characterised dv/dt immunity 80kV/ $\mu$ s at 1.6kV and partial discharge performance
- Ultra-low coupling capacitor 15pF
- Creepage and clearance 8mm



## MGJ6 half, full and 3-phase

### Features

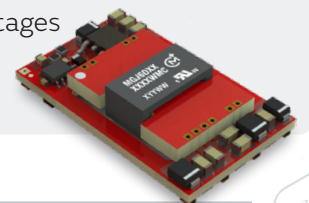
- Two, three or four isolated output voltages for IGBT/SiC & Mosfet gate drives in half-bridge, full bridge, three phase configuration
- DC link voltage 3kVDC
- UL60950 recognised for reinforced insulation
- Wide 2:1 input voltage range of 5V, 12V and 24V
- ANSI/AAMI ES60601-1 recognised, 2 MOPP based on a working voltage of 250Vrms
- Characterised dv/dt immunity 80kV/ $\mu$ s at 1.6kV and partial discharge performance
- Ultra low coupling capacitor 15pF
- Creepage and clearance 8mm



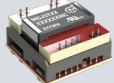
## MGJ6 14mm

### Features

- No opto feedback
- Optimised bipolar output voltages for IGBT/SiC & MOSFET gate drives
- Configurable dual outputs for all gate drive applications: +15V/-5V, +15V/-10V & +20V/-5V outputs
- UL60950 recognised for reinforced insulation to a working voltage of 690Vrms
- IEC 61800-5-1 recognition pending
- Characterised dv/dt immunity 80kV/ $\mu$ s at 1.6kV
- 14mm creepage and clearance
- Ultra low coupling capacitance 13pF
- DC link voltage 3kVDC
- 5V, 12V & 24V input voltages
- 105°C operating temperature



## MGJ Product overview

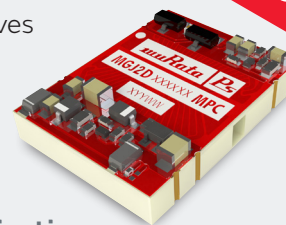
Power	Description	Coupling capacitance	Package type	Murata series
1 Watt	1 Channel; Embedded transformer	3pF	SMD, low profile	MGJ1 
2 Watt	1 Channel; Fixed outputs	2.8 - 4pF	THT, SIP7	MGJ2 
3 Watt	1 Channel; Configurable outputs	15pF	SMD	MGJ3T 
6 Watt	1 Channel; Configurable outputs	15pF	SMD	MGJ6T 
6 Watt	1 Channel; Fixed outputs	15pF	SMD low profile, THT SIP + DIP	MGJ6-LP, -SIP, -DIP 
6 Watt	2 channels for Half-Bridge	15pF	SMD	MGJ6H 
6 Watt	3 channels for Full-Bridge	15pF	SMD	MGJ6F 
6 Watt	4 channels for 3~ Phase	15pF	SMD	MGJ6P 
6 Watt	1 channel; 14mm cr/cl for 690Vac reinforced isolation	13pF	SMD	MGJ6W - 14mm 

dV/dt rating up to 80kV/μs and partial discharge performance characterised

### MGJ2 surface mount

#### Features

- Optimized bipolar output voltages for IGBT/SiC & MOSFET gate drives
- Reinforced insulation to UL60950 recognition pending
- ANSI/AAMI ES60601-1 recognition pending
- 5.7kVDC isolation test voltage 'Hi Pot Test'
- Ultra low coupling capacitance
- 5V, 12V, 15V & 24V inputs
- +15V/-9V, +15V/-5V & +20V/-5V outputs
- Characterised partial discharge performance pending
- DC link voltage 3kVDC



**COMING SOON**

#### Applications

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