

DC-DC converters for

Gate drive applications

*Designed with high dv/dt immunity
for safety & reliability*



DC-DC converters for gate drive applications

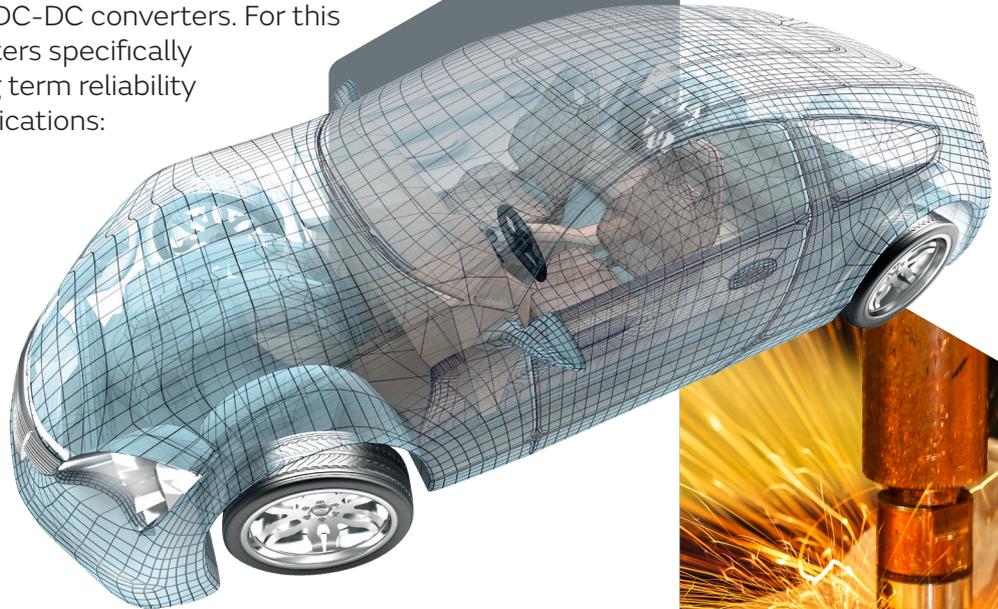
Designed for reliability

Murata's series of DC-DC converters for gate drive applications have been designed and tested to withstand high dv/dt and DC link (continuous barrier withstand voltage) 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 a range of converters specifically engineered and tested to ensure long term reliability and safety required in gate drive applications:

Applications

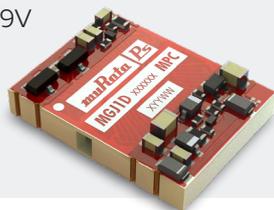
- Motor drives/motion control
- EV charging
- BESS
- Solar inverters
- Welding
- HVAC inversion systems
- Medical pump controllers
- Medical X-ray systems
- High power AC-DC conversion
- Electrical powered transportation
- (Water) pump and valve control



MGJ1

Features

- Optimised bipolar output voltages for IGBT/SiC & MOSFET gate drives
- UL60950 reinforced insulation to a working voltage of 250Vrms
- ANSI/AAMI ES60601-1, 2 MOPP recognised
- Characterised CMTI >200kV/μS
- 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 & clearance 9mm



MGJ1 SIP

Features

- Optimised output voltages for IGBT/Mosfet, SiC & GaN gate drives
- UL62368 reinforced insulation to a working voltage of 300Vrms
- ANSI/AAMI ES60601-1, 1 MOPP/2 MOOPs recognition pending
- Continuous barrier withstand voltage 2.4kVDC
- Characterised CMTI >200kV/μS
- Ultra low isolation capacitance 3pF
- 5.2kVDC isolation test voltage 'Hi Pot Test'
- 5V, 12V, 15V & 24V inputs
- +6V/-3V, +15V/-3V, +15V/-5V, +15V/-9V, +18V/-2.5V & +20V/-5V outputs
- Operation to 105°C
- Creepage & clearance 6mm



MGJ2 surface mount

Features

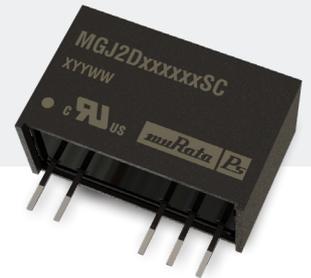
- Optimised bipolar output voltages for IGBT/SiC & MOSFET gate drives
- Reinforced insulation to UL62368 recognition pending
- ANSI/AAMI ES60601-1 recognition pending
- Continuous barrier withstand voltage 2.5kV
- Characterised CMTI >200kV/μS
- Ultra low isolation capacitance 3pF
- 5.7kVDC isolation test voltage 'Hi Pot Test'
- 12V & 15V inputs
- +15V/-9V, +15V/-5V & +20V/-5V outputs
- Characterised partial discharge performance
- Creepage & clearance 9mm



MGJ2 through hole

Features

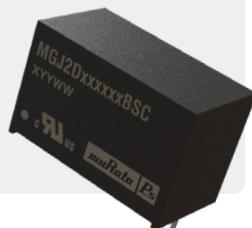
- Optimised bipolar output voltages for IGBT/SiC & MOSFET gate drives
- UL60950 reinforced insulation to a working voltage of 150Vrms
- ANSI/AAMI ES60601-1, 1 MOPP/2 MOOP's recognised
- Continuous barrier withstand voltage 2.4kVDC
- Characterised CMTI >200kV/μS
- 5.2kVDC isolation test voltage 'Hi Pot 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
- Creepage & clearance 2mm



MGJ2B

Features

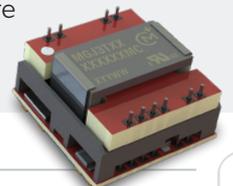
- Optimised bipolar output voltages for IGBT/SiC & Mosfet gate drives
- UL62368 reinforced insulation to a working voltage of 300Vrms
- ANSI/AAMI ES60601-1, 1 MOPP/2 MOOP's recognition pending
- Continuous barrier withstand voltage 2.4kV
- Characterised CMTI >200kV/μS
- Ultra low isolation capacitance 3pF
- 5.4kVDC isolation test voltage 'Hi Pot Test'
- 5V, 12V, 15V & 24V inputs
- +15V/-3V, +15V/-5V, +15V/-8.7V, +15V/-15V, +17V/-9V, +18V/-2.5V, +20V/-3.5V & +20V/-5V outputs
- Operation to 105°C
- Creepage & clearance 6mm



MGJ3

Features

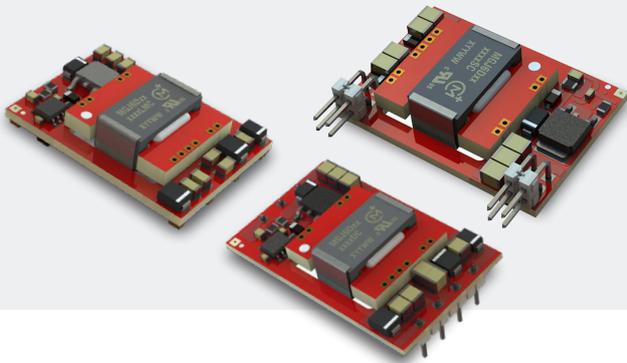
- No opto feedback
- Optimised bipolar output voltages for IGBT/SiC & MOSFET gate drives
- UL60950 reinforced insulation to a working voltage of 250Vrms
- ANSI/AAMI ES60601-1, 1 MOPP/2 MOOP's recognised
- Continuous barrier withstand voltage 3kVDC
- Characterised CMTI >100kV/μS
- Isolation capacitance 15pF
- 5.2kVDC isolation test voltage 'Hi Pot Test'
- 5V, 12V & 24V input voltages
- Configurable dual outputs for all gate drive applications: +15V/-5V, +15V/-10V & +20V/-5V
- 105°C operating temperature
- Creepage & clearance 7mm



MGJ6 SIP, DIP & Low Profile

Features

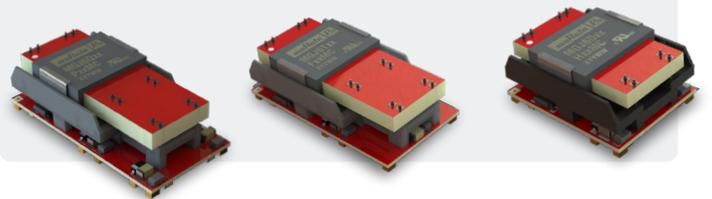
- Optimised bipolar output voltages for IGBT, silicon & silicon carbide gate drives
- Continuous barrier withstand voltage 3kVDC
- Characterised CMTI >100kV/μS
- Isolation capacitance 15pF
- Wide 2:1 input voltage ranges of 5V, 12V & 24V
- +15V/-5V, +15V/-10V & +20V/-5V outputs
- Creepage & clearance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



MGJ6 half, full and 3-phase

Features

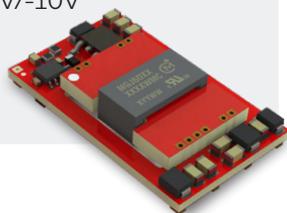
- Two, three or four isolated output voltages for IGBT/SiC & Mosfet gate drives in half-bridge, full bridge & three phase configuration
- UL60950 reinforced isolation to a working voltage of 250Vrms
- ANSI/AAMI ES60601-1, 2 MOOP's recognised
- Continuous barrier withstand voltage 3kVDC
- Characterised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



MGJ6-14mm

Features

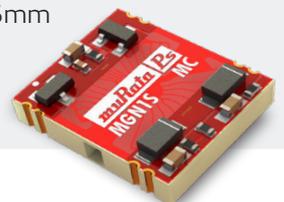
- No opto feedback
- Optimised bipolar output voltages for IGBT/SiC & MOSFET gate drives
- UL60950 reinforced isolation to a working voltage of 690Vrms
- IEC 61800-5-1 to a working voltage of 690Vrms
- Continuous barrier withstand voltage 3kVDC
- Characterised CMTI >100kV/μS
- Isolation capacitance 13pF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



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/μS
- 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
- Creepage & clearance 6.5mm



NXE1

Features

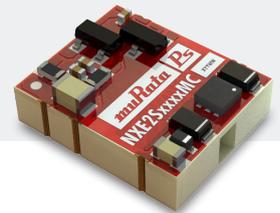
- 3.3V & 5V inputs
- 3.3V & 5V outputs
- UL60950 reinforced isolation to a working voltage of 125Vrms & basic insulation to a working voltage of 250Vrms
- ANSI/AAMI ES60601-1, 1 MOPP recognised to a working voltage of 250Vrms
- Isolation capacitance 3pF
- 3kVDC isolation test voltage 'Hi Pot Test'
- 85°C operating temperature
- Creepage 2.5mm & clearance 2mm
- Substrate embedded transformer
- Short circuit protection
- Halogen free



NXE2

Features

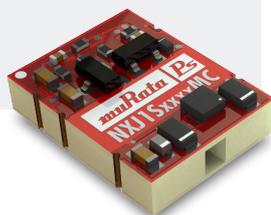
- 5V & 12V inputs
- 5V, 12V & 15V outputs
- UL60950 reinforced isolation to a working voltage of 125Vrms & basic insulation to a working voltage of 250Vrms
- ANSI/AAMI ES60601-1, 1 MOPP recognised to a working voltage of 250Vrms
- Isolation capacitance 2.1pF
- 3kVDC isolation test voltage 'Hi Pot Test'
- Up to 100°C operating temperature
- Creepage 2.5mm & clearance 2mm
- Substrate embedded transformer
- Short circuit protection
- Halogen free



NXJ1

Features

- 3.3V, 5V & 12V inputs
- 3.3V, 5V, 12V & 15V outputs
- UL60950 reinforced isolation to a working voltage of 200Vrms & basic insulation to a working voltage of 250Vrms
- ANSI/AAMI ES60601-1, 1 MOPP recognised to a working voltage of 250Vrms
- Isolation capacitance up to 2.5pF
- 4.2kVDC isolation test voltage 'Hi Pot Test'
- Up to 110°C operating temperature
- Creepage & clearance 4mm
- Substrate embedded transformer
- Short circuit protection
- Halogen free

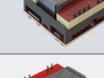


NXJ2

Features

- 5V, 12V & 24V inputs
- 5V, 12V & 15V outputs
- UL60950 reinforced isolation to a working voltage of 250Vrms
- ANSI/AAMI ES60601-1, 1 MOPP & 2 MOOP recognised to a working voltage of 250Vrms
- Isolation capacitance up to 2.4pF
- 5.2kVDC isolation test voltage 'Hi Pot Test'
- Up to 95°C operating temperature
- Creepage & clearance 5mm
- Substrate embedded transformer
- Short circuit protection
- Halogen free



Power	Description	Isolation capacitance	Package type	Murata series
1 Watt	1 channel, embedded transformer	3pF	SMD, low profile	MGJ1 
1 Watt	1 channel, fixed outputs	2.5pF	SMD, low profile	MGN1 
1 Watt	1 channel, fixed outputs	3pF	SMD, low profile	NXE1 
1 Watt	1 channel, fixed outputs	2.5pF	SMD, low profile	NXJ1 
1 Watt	1 channel, configurable outputs	3pF	THT, SIP7	MGJ1 SIP 
2 Watt	1 channel, configurable outputs	3pF	THT, SIP7	MGJ2B 
2 Watt	1 channel, fixed outputs	2.1pF	SMD, low profile	NXE2 
2 Watt	1 channel, fixed outputs	2.4pF	SMD, low profile	NXJ2 
2 Watt	1 channel, fixed outputs	4pF	THT, SIP7	MGJ2 
2 Watt	1 channel, fixed outputs	3pF	SMD	MGJ2 SM 
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-Bridge	15pF	SMD	MGJ6P 
6 Watt	1 channel, 690VAC reinforced isolation	13pF	SMD	MGJ6W 

Global locations

For details please visit www.murata.com



Note

1 Export Control

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- ② Undersea equipment
- 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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