**For more detailed specifications and application information, contact:**

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### DC/DC CONVERTERS FOR HIGH RELIABILITY APPLICATIONS

#### Parameter

**Hi-rel (M) Grade**

- Input characteristics
  - Efficiency: 83-92%
- Output characteristics
  - Set point accuracy (at 75% load): (+/-) 2%
  - Line regulation (Ui min to max): (+/-) 0.5% max
  - Load regulation (25% to full load): (+/-) 2% max
  - Ripple output voltage
    - for 3.3 and 5 Vdc output voltage: 40 mVpp max
    - for 12 Vdc output voltage: 50 mVpp max
    - for 15 and 24 Vdc output voltage: 60 mVpp max
- General characteristics
  - Start up: soft start
  - Protections: permanent short circuit, temperature, current
  - Circuit restart: auto recovery
  - Isolation voltage: 1500 Vdc
  - Isolation resistance: 100 Mohm
  - Switching frequency: Fixed
  - Storage temperature: -55°C/125°C
  - Operating temperature (case): -40°C/105°C

**Industrial (I) Grade**

- Input characteristics
  - Efficiency: 80-87%
- Output characteristics
  - Set point accuracy (at 75% load): (+/-) 2%
  - Line regulation (Ui min to max): (+/-) 1% max
  - Load regulation (25% to full load): (+/-) 2% max
  - Ripple output voltage
    - for 3.3 and 5 Vdc output voltage: 50 mVpp max
    - for 12 Vdc output voltage: 100 mVpp max
    - for 15 and 24 Vdc output voltage: 150 mVpp max
- General characteristics
  - Start up: soft start
  - Protections: permanent short circuit, temperature, current
  - Circuit restart: auto recovery
  - Isolation voltage: 1500 Vdc
  - Isolation resistance: 100 Mohm
  - Switching frequency: Fixed
  - Storage temperature: -40°C/105°C
  - Operating temperature (case): -40°C/95°C

#### Technical Specifications

- **tcase:**
  - Hi-rel (M) Grade: -40°C to +105°C
  - Industrial (I) Grade: -40°C to +95°C
- **tstorage:**
  - Hi-rel (M) Grade: -55°C to +125°C
  - Industrial (I) Grade: -45°C to +105°C
- **Encapsulation:**
  - Hi-rel (M) Grade: qualified potting
  - Industrial (I) Grade: potting
- **Burn-in**
  - HI-rel (M) Grade: for high isolation up to 3KVdc
  - Industrial (I) Grade: for high isolation up to 3KVdc

### Modular Power Converters

#### Quick Selection Guide

**Hi-rel (M) Grade**

- Designed for demanding applications in extreme environments such as aerospace, military and high-end industrial applications.
- The modules are potted with a military qualified thermal conductive compound and packaged in a five sided metallic case.

### Ultra wide Input

- Designed for use in distributed power architecture where variable input voltage and transient are prevalent making them ideal particularly for transportation, railways or high-end industrial applications.
- **Input:**
  - 4,7 to 16 Vdc - 9 to 36 Vdc
  - 16 to 40 Vdc - 18 to 75 Vdc
  - 36 to 140/175 Vdc
- **Output:**
  - Multi batteries and robustness against transients: 12 - 160 Vdc

### Wide Input

- The wide input series is designed for use in distributed power architecture where variable input voltage and transient are prevalent making them ideal particularly for avionics, defense, marine applications.
- **Input:**
  - 9 to 45 Vdc
  - 16 to 40 Vdc
  - 16 to 80 Vdc
  - 120 to 480 Vdc
- **Output:**
  - 120 to 480 Vdc

### Standard Input

- The standard input series is designed for relatively narrow input voltage variations.
- This series represents the lowest cost approach for a given output power.
- **Input:**
  - 4,5 to 5,5 Vdc
  - 18 to 36 Vdc
- **Output:**
  - 120 to 480 Vdc

#### More than 5000 Products

18th Edition
Hi-Rel grade converters are designed for demanding applications in extreme environments such as aerospace, military and high-end industrial applications. The modules are potted with a military qualified thermal conductive compound and packaged in a five sided metallic case.

- **Tcase** : -40°C to +105°C
- **Tstorage** : -55°C to +125°C
- **Encapsulation** : Hi-Rel grade qualified potting
- **Burn-in**
- **Control function**
- **Low output ripple voltage**
- **Option** for -55°C start-up and MIL-STD-883C screening

### Wide Input

The wide input series is designed for use in distributed power architecture where variable input voltage and transient are prevalent making them ideal particularly for avionics, defense, marine applications.

- 9 to 45 Vdc
- 16 to 40 Vdc
- 16 to 80 Vdc
- 120 to 480 Vdc

### Ultra Wide Input

Designed for multi batteries and transients compliance.

- 4.5 to 33 Vdc
- 9 to 60 Vdc
- 10 to 100 Vdc

### Standard Input

The standard input series is designed for relatively narrow input voltage variations. This series represents the lowest cost approach for a given output power.

- 4.5 to 5.5 Vdc
- 18 to 36 Vdc

### Wide Input

The wide input series is designed for use in distributed power architecture where variable input voltage and transient are prevalent making them ideal particularly for transportation, railways or high-end industrial applications.

- 4.7 to 16 Vdc - 9 to 36 Vdc
- 16 to 40 Vdc - 18 to 75 Vdc
- 36 to 140/175 Vdc

### Ultra Wide Input

Multi batteries and robustness against transients. 12 - 160 Vdc

Where optimum trade-off between cost and performances is of the essence, industrial grade DC/DC converters is the solution of choice. GAIA Converter proposes two classes of modules, one with standard 2:1 input range and one with wide 4:1 input range.

- **Tcase** : -40°C to +95°C
- **Tstorage** : -45°C to +105°C
- **Encapsulation** : Industrial grade potting
- **Qualified** for industrial grade applications
- **Option** for high isolation up to 3KVdc

### Technical Specifications

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Hi-Rel (M) Grade</th>
<th>Industrial (I) Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Input characteristics</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Efficiency</td>
<td>83-92%</td>
<td>80-87%</td>
</tr>
<tr>
<td><strong>Output characteristics</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Set point accuracy (at 75% load)</td>
<td>(+/-) 2%</td>
<td>(+/-) 2%</td>
</tr>
<tr>
<td>Line regulation (Ui min to max)</td>
<td>(+/-) 0.5% max</td>
<td>(+/-) 1% max</td>
</tr>
<tr>
<td>Load regulation (25% to full load)</td>
<td>(+/-) 2% max</td>
<td>(+/-) 2% max</td>
</tr>
<tr>
<td>Ripple output voltage</td>
<td>40 mVpp max</td>
<td>50 mVpp max</td>
</tr>
<tr>
<td>for 3.3 and 5 Vdc output voltage</td>
<td>50 mVpp max</td>
<td>100 mVpp max</td>
</tr>
<tr>
<td>for 12 Vdc output voltage</td>
<td>60 mVpp max</td>
<td>150 mVpp max</td>
</tr>
<tr>
<td>for 15 and 24 Vdc output voltage</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>General characteristics</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Start up</td>
<td></td>
<td>soft start</td>
</tr>
<tr>
<td>Protections</td>
<td></td>
<td>permanent short circuit, temperature, current auto recovery</td>
</tr>
<tr>
<td>Circuit restart</td>
<td></td>
<td>1500 Vdc</td>
</tr>
<tr>
<td>Isolation voltage</td>
<td></td>
<td>100 Mohm</td>
</tr>
<tr>
<td>Isolation resistance</td>
<td></td>
<td>Fixed</td>
</tr>
<tr>
<td>Switching frequency</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Storage temperature</td>
<td>-55°C/125°C</td>
<td>-40°C/105°C</td>
</tr>
<tr>
<td>Operating temperature (case)</td>
<td>-40°C/105°C</td>
<td>-40°C/95°C</td>
</tr>
</tbody>
</table>

Please consult product datasheet on our website for complete specifications.
# Isolated DC/DC Converter Modules

<table>
<thead>
<tr>
<th>Family</th>
<th>Package</th>
<th>Power</th>
<th>Grade</th>
<th>Input</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>MGDxx-04</td>
<td>Dil 24</td>
<td>4 W</td>
<td>Hi-Rel</td>
<td>4.5-5.5V, 18-36V, 9-36V, 16-40V, 36-140V</td>
<td>Single, Bi, Triple</td>
</tr>
<tr>
<td>MGDDx-08</td>
<td>1&quot; x 0.75&quot;</td>
<td>8 W</td>
<td>Hi-Rel</td>
<td>4.5-33V, 9-60V</td>
<td></td>
</tr>
<tr>
<td>MGDDx-10</td>
<td>1&quot; x 1.5&quot;</td>
<td>10 W</td>
<td>Hi-Rel</td>
<td>4.5-5.5V, 18-36V, 9-36V, 16-40V, 36-140V</td>
<td>Single, Bi, Triple</td>
</tr>
<tr>
<td>MGDSx-18</td>
<td>1&quot; x 1.5&quot;</td>
<td>18 W</td>
<td>Hi-Rel</td>
<td>4.5-5.5V, 18-36V, 9-36V, 16-40V, 36-140V</td>
<td>Single</td>
</tr>
<tr>
<td>MGDDx-20</td>
<td>2&quot; x 2&quot;</td>
<td>20 W</td>
<td>Hi-Rel</td>
<td>4.5-5.5V, 18-36V, 9-36V, 16-40V, 36-140V</td>
<td>Single, Bi, Triple</td>
</tr>
<tr>
<td>MGDDx-20</td>
<td>1&quot; x 1.5&quot;</td>
<td>20 W</td>
<td></td>
<td>12-160V</td>
<td>Dual</td>
</tr>
<tr>
<td>MGDDx-21</td>
<td>1&quot; x 1.25&quot;</td>
<td>20 W</td>
<td></td>
<td>4.5-33V, 9-60V</td>
<td></td>
</tr>
<tr>
<td>MGDDx-25</td>
<td>2&quot; x 2&quot;</td>
<td>25 W</td>
<td></td>
<td>9-36V, 16-40V, 18-75V</td>
<td>Single, Bi, Triple</td>
</tr>
<tr>
<td>MGDSx-26</td>
<td>2&quot; x 2&quot;</td>
<td>25 W</td>
<td></td>
<td>9-36V, 16-40V</td>
<td>Single</td>
</tr>
<tr>
<td>CGDx-30</td>
<td>3&quot; x 2&quot;</td>
<td>30 W</td>
<td></td>
<td>18-36V, 4.7-16V, 9-36V, 16-40V, 36-140V</td>
<td>Up to Six</td>
</tr>
<tr>
<td>MGDDx-35</td>
<td>3&quot; x 2&quot;</td>
<td>35 W</td>
<td></td>
<td>9-36V, 16-75V, 36-140V</td>
<td>Single, Bi, Triple</td>
</tr>
<tr>
<td>MGDSx-60</td>
<td>3&quot; x 2&quot;</td>
<td>60 W</td>
<td></td>
<td>14-55V, 36-140V</td>
<td>Single</td>
</tr>
<tr>
<td>MGDDx-60</td>
<td>3&quot; x 2&quot;</td>
<td>60 W</td>
<td></td>
<td>12-160V</td>
<td>Dual</td>
</tr>
<tr>
<td>MGDSx-75</td>
<td>1/4 Brick</td>
<td>75 W</td>
<td></td>
<td>9-45V, 16-80V, 155-480V</td>
<td>Single</td>
</tr>
<tr>
<td>MGDSx-100</td>
<td>3&quot; x 2&quot;</td>
<td>100 W</td>
<td></td>
<td>14-55V, 36-140V, 10.7-100V</td>
<td>Single</td>
</tr>
<tr>
<td>MGDSx-150</td>
<td>1/2 Brick</td>
<td>150 W</td>
<td></td>
<td>9-45V, 16-80V, 120-480V</td>
<td>Single</td>
</tr>
<tr>
<td>MGDS-155</td>
<td>1/4 Brick</td>
<td>155 W</td>
<td></td>
<td>9-45V, 16-80V, 155-480V</td>
<td>Single</td>
</tr>
<tr>
<td>MGDS-200</td>
<td>2/3 Brick</td>
<td>200 W</td>
<td></td>
<td>9-45V, 16-80V</td>
<td>Single</td>
</tr>
</tbody>
</table>
## Front End Modules

<table>
<thead>
<tr>
<th>Family</th>
<th>Standards</th>
<th>Package</th>
<th>Power/Current</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EMI FILTERS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F6DS - 2 A - 50 V</td>
<td>MIL-STD-461, DO-160</td>
<td>Dil 24</td>
<td>2 A</td>
<td></td>
</tr>
<tr>
<td>F6DS - 10 A - 50 V</td>
<td>MIL-STD-461, DO-160</td>
<td>1” x 1,5”</td>
<td>10 A</td>
<td></td>
</tr>
<tr>
<td>F6DS - 20 A - 50 V</td>
<td>MIL-STD-461, DO-160</td>
<td>1” x 1,5”</td>
<td>20 A</td>
<td></td>
</tr>
<tr>
<td><strong>HOLD UP MODULES</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HUGD - 50</td>
<td>MIL-STD-704, DO-160</td>
<td>1” x 1,5”</td>
<td>50 W</td>
<td></td>
</tr>
<tr>
<td>HUGD - 300</td>
<td>MIL-STD-704, DO-160</td>
<td>1” x 1,5”</td>
<td>300 W</td>
<td></td>
</tr>
<tr>
<td><strong>AC / DC POWER FACTOR MODULES</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HGMB - 35</td>
<td>MIL-STD-704, DO-160</td>
<td>3” x 2”</td>
<td>35 W</td>
<td></td>
</tr>
<tr>
<td>HGMS - 150</td>
<td>MIL-STD-704, DO-160</td>
<td>1/2 brick</td>
<td>150 W</td>
<td></td>
</tr>
<tr>
<td>HGMS - 350</td>
<td>MIL-STD-704, DO-160</td>
<td>1/2 brick</td>
<td>350 W</td>
<td></td>
</tr>
<tr>
<td><strong>TRANSIENT PROTECTION MODULES</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PGDS - 50</td>
<td>MIL-STD-704, MIL-STD-1275</td>
<td>1” x 1,5”</td>
<td>50 W</td>
<td></td>
</tr>
<tr>
<td>LGDSI - 50</td>
<td>EN50155</td>
<td>1” x 1,5”</td>
<td>50 W</td>
<td></td>
</tr>
<tr>
<td>LGDSI - 75</td>
<td>EN50155</td>
<td>1” x 1,5”</td>
<td>75 W</td>
<td></td>
</tr>
<tr>
<td>LGDS - 100</td>
<td>MIL-STD-1275, DEF-STAN-61.5.6</td>
<td>1” x 1,5”</td>
<td>100 W</td>
<td></td>
</tr>
<tr>
<td>LGDS - 300</td>
<td>MIL-STD-704, MIL-STD-1275</td>
<td>1” x 1,5”</td>
<td>300 W</td>
<td></td>
</tr>
</tbody>
</table>
GAÏA Converter Modular Power Architecture feeds your exact need with one of the most comprehensive range of DC/DC, AC/DC converters and bus adaptation modules. Whether you need basic power or advanced power management, you will find everything you need with GAÏA Converter to meet your sophisticated power supply requirements. This “building block” approach using off-the-shelf products provides unprecedented advantages to ease design, simplify qualification and reduce time to market.

Modular Power Architecture

**DC Modular Power Architecture**

- **DC Front-End Modules**
  - EMI filter module
  - Transient or spike protection module
  - Hold-Up module

- **DC/isolated Converters**
  - FGDS Series
  - PGDS/LGDS Series
  - HUGD Series

**AC Modular Power Architecture**

- **AC PFC module**
  - HGMM Series

**Input Buses**

- **DC Input Bus**
  - From 4.5 Vdc to 480 Vdc
  - Single, dual and triple outputs from 3.3V to 48V

- **AC Input Bus**
  - From 85 to 265 Vac/47-440 Hz
  - 320-800 Hz

www.gaia-converter.com
GAIA Converter was founded in 1993. Since that time the company has provided one of the most comprehensive range of modular power components in the market place. GAIA Converter has also brought to the market its well known concept of Modular Power Architecture to allow simple design of complex power supplies. With more than 3500 standard power component references serving the Hi-Rel industrial, transportation, aerospace and military markets, GAIA Converter is recognized as one of the world’s leaders for “power module” solutions. Strongly focused on power modules, GAIA Converter can concentrate all its efforts to propose innovative solutions and a complete comprehensive suite in this field. More than 300 new products are completed every year by our engineering team to cope with new technologies and market trends.

GAIA Converter dedicates significant R&D investment on a continuous basis in order to maintain a state of the art product range. The GAIA engineering team not only designs products with a competitive advantage but is also devoted to solving the customers’ power problems.

The company’s advanced design and development capabilities include:

- Circuit behavior simulation
- Thermal management
- Advanced packaging techniques
- Proprietary magnetic and ASIC design
- Environmental test
- Reliability evaluation

The skill and innovative spirit of our design team is supported by a full suite of computer aided engineering tools. These tools include electrical simulation, mechanical design, thermal analysis and optimization, reliability prediction, circuit board layout and manufacturing instructions. This CAE system is used extensively to ensure design performance, traceability and integrity from prototyping to mass production.

With a presence in 25 countries around the world through subsidiaries and local distributors, GAIA Converter is a global company. In three major markets (The Americas, Europe and Asia), Gaia Converter maintains a strong presence with Sales and Technical Support Offices for its distributor network and customers.

GAIA Converter’s manufacturing philosophy is based on fully automated lines with no manual operation. These automated lines include the latest fast SMD pick and place machines, automatic pin insertion tools and automatic potting machines. The extensive use of statistical methods guarantees high quality products.

www.gaia-converter.com
LEADING SUPPLIER OF HI-REL POWER CONVERSION PRODUCTS

GAIA Converter products have a long and successful record of projects around the world from Aerospace, Military, Transportation and Hi-End Industrial applications and among them:

AEROSPACE/MILITARY APPLICATIONS INCLUDE :

- Commercial aircrafts :
  - Airbus : A320/A330/A340/A380/A350 XWB
  - Boeing : B737NG/B777/B787
  - Bombardier : CRJ 100/200/700/900
  - Embraer : ERJ 135/140/145/170/190/195
  - Dassault : F50/F900/F2000/F7X/F5X
  - Various : Learjet 60/85, Gulfstream G550/650
- Military aircrafts :
  - Fighters : M2000, Rafale, Typhoon, JAS39, Tornado, F-16 Falcon, F/A-18 Hornet, F-35 JSF
  - Cargos : C130 Hercules, C160, C27J, A400M
  - Missions : Awacs, Nimrod MR4A, P3C Orion
- Commercial & military helicopters :
  - Eurocopter : HAP, EC120/135/155/175, NH-90
  - AgustaWestland : A109/129, AW139, EH101
  - Bell : B206/212, V22, B407/427/430, AH-64
  - sikorsky : S76, S92, UH-60, RAH-66
- Military Ground Borne :
  - Tanks : Leclerc, Leopard, Puma, Bradley
  - Vehicles : LandWarrior, Humvee, VBCI
  - Groundborne : COMM, MMR, MLS...
- Naval :
  - PAN, SNLE, FREMM Fregate, Aegis Destroyer
- Missiles, Torpedoes & UAV’s :
  - Milan, Eryx, Stinger, Crotale, MLRS, Aster, Exocet, Marte, Sea Wolf, Meteor, Taurus KEPD, Stingray, MU90

TRANSPORTATION APPLICATIONS INCLUDE :

- Intercity trains and locomotives :
  - Alstom : TGV, TGV2N, KTX, ET423, AGV
  - Siemens : ICE2, ICE3, ES64, S252
  - Ansaldo : ETR400/500, E402, TAF
  - Bombardier : AGC, Talent, ICN
  - GE Transport : AC6000, Dash
  - Various: locomotives T13, ES65, Euro4000
- Urban subways & tramways :
  - Subways : Meteor, MF77, MF2000, M7, Lisboa, NY
  - Tramways : Citadis, Combino, Sirio, Flexity C/E, Icentro, Eurotram
- Local Rolling stock :
  - LRV : Arlanda, Gatwick, Frankfurt, OrlyVal
  - Buses/trolleys : Civis, Cristalis, Cito, Agera, Ares
- Signaling equipments :
  - Positioning systems, TPWS, ETCS
  - ERTMS, Video, Data transmission, GPS-R

INDUSTRIAL APPLICATIONS INCLUDE :

- Power station & energy controls :
  - Power generation : VHV, MHV, LV
  - Propulsion node, Heat exchangers
- Security systems
  - Pumps and valves controls, gas and stream controls, petrochemical regulators
- Environmental control systems :
  - Seismic acquisition, hydro controls
  - Oil drilling, down hole instrumentation
  - Deep sea exploration

www.gaia-converter.com
GAIA Converter has always operated a quality system in accordance to ISO 9001 standards and has been certified to the latest ISO 9001 v2008 standard. This standard is now used as a platform for developing a greater appreciation of the quality required by our customers. Our success in this area is recognized by independent approval Authorities such as Underwriters Laboratories (UL) and has resulted in approved and preferred supplier status at major electronics companies. However quality is not a static objective and GAIA Converter is continuously improving in this field and is particularly active with:

Design for Product Reliability:

In order to provide reliable products, GAIA Converter has always maintained stringent specifications with the aid of the most advanced theoretical and experienced feedback tools including:

- **Stress analysis**: GAIA Converter products undergo stress analysis and charged factors for each single component used in our products.
- **MTBF**: GAIA Converter calculations are done according to the MIL-HDBK-217F, RDF 2000, IEC-6280-TR methods with conservative quality and environmental factors.
- **Accelerated stress analysis**: all GAIA Converter's new designs are submitted to accelerate stress (thermal and shocks, thermal cycling and humidity) to analyze reliability.
- **Failure Analysis**: every product returned for failure during operation is carefully analyzed and failure root causes are monitored.

Manufacturing with Statistical Method for Prevention:

To manufacture high-quality products, the monitoring at the end of the production process is not enough. Quality has also to be "designed-in" during process and production process. This is achieved by means of appropriate measurements and tools; among them GAIA Converter has implemented:

- **Statistical Process Control (SPC)**: for key process parameters all along the manufacturing flow GAIA Converter can establish very quickly deviations from process goal. This allows control over parameters and ensures process durability.
- **Average Outgoing Quality (AOQ)**: All products manufactured are 100% tested for acceptance or rejection. The results of this inspection are recorded and monitored carefully.
- **Statistical Product Monitoring (SPM)**: All product parameters are recorded to statistically monitor the average deviation.

Customer Audit Quality:

GAIA Converter welcomes customer quality audits or independent quality audits on behalf of customers. We have already been audited by independent organization such as Qualifas acting for European Aerospace companies, LCIE acting for UL approval, and major electronics companies from around the world.
GAIA Converter Technical Support Centers are fully equipped and staffed to provide product information and technical assistance concerning GAIA Converter products and power solutions. These facilities house electronic laboratories where GAIA Converter application engineers evaluate specific customer design issues as well as offer a wide range of component-based power solutions that include distributed power, current sharing, N+1 redundancy, thermal management, compliance with safety and performance standards, and more.

Application engineers:
- Answer technical questions by phone, fax, e-mail, or directly by the GAIA Converter website.
- Assist with component-based power system design.
- Support user needs through visits to GAIA Converter and customer facilities.

Customer service representatives:
- Provide product price and delivery information.
- Help select the most appropriate product for your application.
- Can arrange a visit to your site by a GAIA Converter application engineer or sales representative.

Contact the GAIA Converter location nearest you to get the answers you need, or submit your inquiry on our website.
- MIL-STD-461C/D/E/F compliant
- DO-160C/D/E/F/G compliant
- Wide input range 9–50 Vdc
- Input immunity to MIL-STD-1275A/B/C/D
- Input immunity to MIL-STD-704A/D/F

**Input Specifications**

**Input Range**

- 9-50 Vdc transient 80 Vdc / 100 ms
- 100 Vdc / 50 ms

Option [ ]: Screening -55°C start-up temperature
Option [ ]: Screening and serialization

**Input Current**

2A

Compatible with all GAÏA Converter input range modules

**Part Numbering**

<table>
<thead>
<tr>
<th>Grade</th>
<th>Single Output</th>
<th>Case Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hi-Rel</td>
<td>FGDS-2A - 50V</td>
<td>-40°C / +105°C</td>
</tr>
</tbody>
</table>

**Dimensions and Pin-out**

Dimensions in mm and (inches)

- Pin dimensions: 0.73 mm (0.029")
- Plastic case black solder plated pin

<table>
<thead>
<tr>
<th>Pin</th>
<th>Single Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>+Input (Vi)</td>
</tr>
<tr>
<td>2</td>
<td>+Output (Vo)</td>
</tr>
<tr>
<td>3</td>
<td>Ground (Gnd)</td>
</tr>
<tr>
<td>4</td>
<td>-Output (Go)</td>
</tr>
<tr>
<td>5</td>
<td>-Input (Gi)</td>
</tr>
</tbody>
</table>
- MIL-STD-461D/E/F compliant
- DO-160C/D/E/F/G compliant
- Wide input range 9–50 Vdc
- Input immunity to MIL-STD-1275A/B/C/D
- Input immunity to MIL-STD-704A/D/F

**Input Specifications**

**Input Range**

9-50 Vdc transient 80 Vdc / 100 ms
100 Vdc / 50 ms

Option : Screening-55°C start-up temperature
Option : Screening and serialization

**Input Current**

10A

Compatible with all GAÏA Converter H J O M input range modules

**Part Numbering**

<table>
<thead>
<tr>
<th>Grade</th>
<th>Single Output</th>
<th>Case Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hi-Rel</td>
<td>FGDS-10A-50V</td>
<td>-40°C / +105°C</td>
</tr>
</tbody>
</table>

**Dimensions and Pin-out**

Dimensions in mm and (inches)

Pin dimensions : 1, 2, 3, 4: Ø 1.29 mm (0.05")
Pin dimensions : 5, 6 : Ø 0.73 mm (0.028")

Metallic case black anodized coating solder plated pin

Bottom view
• MIL-STD-461D/E/F compliant
• DO-160C/D/E/F/G compliant
• Wide input range 9–50 Vdc
• Input immunity to MIL-STD–1275A/B/C/D
• Input immunity to MIL-STD–704A/D/F

Input Specifications

Input Range

9–50 Vdc transient 80 Vdc / 100 ms
100 Vdc / 50 ms

Option 1: Screening-55°C start-up temperature
Option 2: Screening and serialization

Input Current

20A

Compatible with all GAÏA Converter H J O M input range modules

Part Numbering

<table>
<thead>
<tr>
<th>Grade</th>
<th>Single Output</th>
<th>Case Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hi-Rel</td>
<td>FGDS-20A – 50V</td>
<td>-40°C / +105°C</td>
</tr>
</tbody>
</table>

Dimensions and Pin-out

Dimensions in mm and (inches)

Pin dimensions: 1, 2, 3, 4: Ø 1.29 mm (0.05”)
Pin dimensions: 5, 6: Ø 0.73 mm (0.028”)

Metallic case black anodized coating solder plated pin
**Input Specifications**

- Dedicated for Avionics/Military Applications
- Transient suppressor module 60 Vdc, 80 Vdc, 100 Vdc
  - DO160C/D/E/F cat A, B and Z
  - MIL-STD-1275A/B/C/D
- Extended operation for voltage drop out
- Power range: from 4 W to 50 W
- Inhibition function

**Output Specifications**

- **Input Range**
  - N: 17-37 Vdc
    - brown out: 10 Vdc / 15 s
    - transient: 80 Vdc / 100 ms
  - O: 12-37 Vdc
    - brown out: 6 Vdc / 1 s
    - transient: 100 Vdc / 50 ms

  *Option*: Screening-35°C start-up temperature
  *Option*: Screening and serialization

- **Output Voltage**
  - K: 28 Vdc

**Part Numbering**

<table>
<thead>
<tr>
<th>Grade</th>
<th>Single Output</th>
<th>Case Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hi-Rel</td>
<td>PGDS-50</td>
<td>-40°C / +105°C</td>
</tr>
</tbody>
</table>

For leaded process add - L after reference - Contact factory for availability

**Dimensions and Pin-out**

- **Pin Dimensions**: Ø 0.73 mm (0.03”)
- **Metallic case black anodized coating solder plated pin**

**Bottom view**

- Pin 1
- Pin 2
- Pin 3
- Pin 4
- Pin 5

**Bottom view**
Front-End Modules
DC Transient Protection 100 Watt

- Dedicated for Avionics/Military Applications
- Transient suppressor module 60, 80, 100, 202 Vdc
  - DEF-STAN-61.5 issue 6
  - DO160C/D/E/F cat A, B and Z
  - MIL-STD-1275A/B/C/D
- Power range: from 4 W to 100 W

Input Specifications

P : 9-42 Vdc  transient : 202 Vdc / 350 ms
Option [ ] : Screening, 55°C start-up temperature
Option [ ] : Screening and serialization

Output Specifications

K : 28 Vdc

Part Numbering

<table>
<thead>
<tr>
<th>Grade</th>
<th>Single Output</th>
<th>Case temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hi-Rel</td>
<td>LGDS-100 -</td>
<td>-40°C / + 105°C</td>
</tr>
</tbody>
</table>

Dimensions and Pin-out

Dimensions in mm and (inches)

Pin dimensions: square pin 0.64 mm (0.025")

Metallic case black anodized coating solder plated pin

Bottom view
FRONT-END MODULES
DC TRANSIENT PROTECTION 300 WATT

- Dedicated for Avionics/Military Applications
- Transient suppressor module 60 Vdc, 80 Vdc, 100 Vdc
  - DO160C/D/E/F cat A, B and Z
  - MIL-STD-1275A/B/C/D
- Power range: from 4 W to 300 W

Input Specifications

<table>
<thead>
<tr>
<th>Input Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>9-42 Vdc transient: 100 Vdc / 50 ms</td>
</tr>
<tr>
<td>Option A: Screening-55°C start-up temperature</td>
</tr>
<tr>
<td>Option B: Screening and serialization</td>
</tr>
</tbody>
</table>

Output Specifications

<table>
<thead>
<tr>
<th>Output Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>K: 28 Vdc</td>
</tr>
</tbody>
</table>

Part Numbering

<table>
<thead>
<tr>
<th>Grade</th>
<th>Single Output</th>
<th>Case temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hi-Rel</td>
<td>LGDS-300 -</td>
<td>-40°C / + 105°C</td>
</tr>
</tbody>
</table>

Dimensions and Pin-out

- Pin dimensions: square pin 0.64 mm (0.025")
- Metallic case black anodized coating solder plated pin

Bottom view

<table>
<thead>
<tr>
<th>Pin</th>
<th>Single Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-3</td>
<td>Input (Vin)</td>
</tr>
<tr>
<td>4</td>
<td>Drive</td>
</tr>
<tr>
<td>5</td>
<td>Common (Gin)</td>
</tr>
<tr>
<td>6</td>
<td>Do not connect</td>
</tr>
<tr>
<td>7-9</td>
<td>Output (Vo)</td>
</tr>
</tbody>
</table>
Front-End Modules
DC Spike Protection 50 Watt

- Dedicated for Railway/Industrial Applications
- Spike suppressor module
  - EN61000-4-5 level 4
  - EN50155 level 1800V & 8400V
  - RIA 12
- Transient suppressor module
  - EN50155, IEC 571, RIA 12
- Input reverse polarity protection
- High efficiency (98%)
- Power range: from 4 W to 50 W
- Integrated EMI filter
- Inhibit function

Input Specifications

<table>
<thead>
<tr>
<th>Input Range</th>
<th>Power Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>J: 10-36 Vdc</td>
<td>transient: 40 Vdc/1s &amp; 85 Vdc/20 ms</td>
</tr>
<tr>
<td>Q: 36-154 Vdc</td>
<td>transient: 165 Vdc/1s &amp; 385 Vdc/20 ms</td>
</tr>
</tbody>
</table>

Part Numbering

<table>
<thead>
<tr>
<th>Grade</th>
<th>Single Output</th>
<th>Case Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industrial</td>
<td>LGDSI-50</td>
<td>-40°C / +95°C</td>
</tr>
</tbody>
</table>

Dimensions and Pin-out

Dimensions in mm and (inches)

Pin dimensions: Ø 0.73 mm (0.03")

Metallic case anodized coating solder plated pin

Bottom view

1. + Input (Vi)
2. On/Off
3. - Input (Gi)
4. Common (Go)
5. Output (Vo)
- Dedicated for Railway/Industrial Applications
- Spike suppressor module
  - EN61000-4-5 level 4
  - EN50155 level 1800V & 8400V
  - RIA 12
- Transient suppressor module
  - EN50155, IEC 571, RIA 12
- Input reverse polarity protection
- High efficiency (98%)
- Power range: from 4 W to 50 W
- Integrated EMI filter
- Inhibit function

**Input Specifications**

**Input Range**

- Q: 43-154 Vdc
- transient: 165 Vdc / 1s
- spike: 1800 Vdc / 50 µs

**Part Numbering**

<table>
<thead>
<tr>
<th>Grade</th>
<th>Single Output</th>
<th>Case Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industrial</td>
<td>LGDSI-75</td>
<td>-40°C / + 95°C</td>
</tr>
</tbody>
</table>

**Dimensions and Pin-out**

- Dimensions in mm and (inches)
- Pin dimensions: Ø 0.73 mm (0.03")
- Metallic case black anodized coating solder plated pin

Bottom view:

1. + Input (Vi)
2. On/Off
3. - Input (Gi)
4. Common (Go)
5. Output (Vo)
**Input Specifications**

- Unique product for hold-up solutions
- Compliant with DO-160, MIL-704
- Reduce capacitance size by 80%
- High efficiency (98%)
- Power range: from 4 W to 50 W
- Compatible with 9–36 or 16–40 Vdc converters
- Include monitoring signals
- Programmable inrush current limitation

**Input Range**

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>9-45 Vdc</td>
</tr>
</tbody>
</table>

**Part Numbering**

- Grade: Hi-Rel
- Single Output: HUGD-50
- Case Temperature: -40°C / +105°C

For leaded process add - L after reference - Contact factory for availability

**Dimensions and Pin-out**

- Dimensions in mm and (inches)

<table>
<thead>
<tr>
<th>Pin</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>+Input (Vi)</td>
</tr>
<tr>
<td>2</td>
<td>Power Fail Set (Vth)</td>
</tr>
<tr>
<td>3</td>
<td>Voltage Current Level (Vcl)</td>
</tr>
<tr>
<td>4</td>
<td>-Input (Gi)</td>
</tr>
<tr>
<td>5</td>
<td>Common (Go)</td>
</tr>
<tr>
<td>6</td>
<td>Output (Vo)</td>
</tr>
<tr>
<td>7</td>
<td>Voltage Capacitor</td>
</tr>
<tr>
<td>8</td>
<td>Power Fail Signal (PF)</td>
</tr>
<tr>
<td>9</td>
<td>Capacitor charged signal (CC)</td>
</tr>
<tr>
<td>10</td>
<td>Capacitor discharged signal (CD)</td>
</tr>
</tbody>
</table>

Dimensions in mm:
- 40,0 (1.58")
- 24,0 (0.94")
- 8,0 (0.32")

Dimensions in inches:
- 0.73 mm (0.03")

Metallic case black anodized coating solder plated pin

Pin dimensions: Ø 0,73 mm (0.03")
**Front-End Modules**

**DC Hold Up 300 Watt**

- Unique product for hold-up solutions
- Compliant with DO-160, MIL-704
- Reduce capacitance size by 80%
- Power range: from 4 W to 300 W
- Include monitoring signals
- Programmable capacitor charge voltage from 31 to 80 Vdc

### Input Specifications

**Input Range**

8-100 Vdc

Option [T]: Screening; 55°C start-up temperature
Option [S]: Screening and serialization

### Part Numbering

<table>
<thead>
<tr>
<th>Grade</th>
<th>Single Output</th>
<th>Case Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hi-Rel</td>
<td>HUGD-300</td>
<td>-40°C / +105°C</td>
</tr>
</tbody>
</table>

### Dimensions and Pin-out

**Dimensions in mm and inches**

Pin dimensions:
- Pins: 2, 3, 4, 5, 6, 7, 8: Ø 0.73 mm (0.03")
- Pins: 1, 9, 10: Ø 1.5 mm (0.06")

Metallic case black anodized coating solder-plated pin

Pin 1: Input (V1)
Pin 2: Power Fail Set (Vth)
Pin 3: Capacitor Charge Voltage Set (Vc)
Pin 4: Common (G)
Pin 5: Common (G)
Pin 6: Power Fail Signal (PF)
Pin 7: Capacitor discharged signal (CD)
Pin 8: Capacitor charged signal (CC)
Pin 9: Output (V0)
Pin 10: Voltage Capacitor (Vc)
HGMM-35 Series

- Dedicated for 115 Vac airborne applications
- Standard 3” x 2” package
- Active PFC : MIL-STD-704, DO-160, ABD100 compliant
- Nominal power up to 35 W without derating
- Wide input range 71–180 Vac
- Variable frequency 320–800 Hz
- Low input current harmonic distortion < 10%
- Integrated LC EMI filter
- Inrush current limitation
- Galvanic isolation 1500 Vrms

Input Specifications

Permanent Input Range

| W | 95-140 Vac transient 71-180 Vac / 100 ms frequency 320-800 Hz |

Option W : Screening-55°C start-up temperature
Option S : Screening and serialization

Output Specifications

Dual Output

| 17 | 2 x 17 Vdc / 2 x 1.05 A |

Part Numbering

<table>
<thead>
<tr>
<th>Grade</th>
<th>Dual Output</th>
<th>Case temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hi-Rel</td>
<td>HGMB-35 - ■ - ■ - ■</td>
<td>-40°C / +105°C</td>
</tr>
</tbody>
</table>

For leaded process add - L after reference – Contact factory for availability

Dimensions and Pin-out

Dimensions in mm and (inches)

Front-end Modules
AC ISOLATED PFC 35 WATT SERIES

- Bi Output
- Dimensions and Pin-out
- Input Specifications
- Output Specifications
- Part Numbering
- Front-end ModuleS
- ac iSolated Pfc 35 watt Series
- For leaded process add - L after reference – Contact factory for availability
- Dimensions in mm and (inches)
- Pin Bi-output
- 1 Phase
- 2 Neutral
- 3 On/Off
- 4 On/Off Ref
- 5 Common 1 (Go1)
- 6 Output 1 (Vo1)
- 7 Common 2 (Go2)
- 8 Output 2 (V02)

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HGMM-150 Series

**Input Specifications**

- Dedicated for 115 Vac applications
- Standard half brick package
- Active PFC: MIL-STD-704, DO-160, ABD100 MIL-STD-1399 compliant
- Nominal power up to 150W without derating
- Wide input range 71-180 Vac
- Variable frequency 320-800 Hz
- Low input current harmonic distortion < 10%
- Integrated LC EMI filter
- Inrush current limitation
- No galvanic isolation

**Input Range**

<table>
<thead>
<tr>
<th>W</th>
<th>95-140 Vac transient 71-180 Vac/100 ms frequency 320-800 Hz</th>
</tr>
</thead>
</table>

Option [ ]: Screening -55°C start-up temperature
Option [ ]: Screening and serialization

**Output Specifications**

- Single Output
  - T: 375 Vdc / 0.4 A

**Part Numbering**

<table>
<thead>
<tr>
<th>Grade</th>
<th>Single Output</th>
<th>Case Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hi-Rel</td>
<td>HGMS-150</td>
<td>-40°C / +105°C</td>
</tr>
</tbody>
</table>

For leaded process add – L after reference

**Dimensions and Pin-out**

- Dimensions in mm and (inches)
- Pin dimensions: Ø 1 mm (0.04")
- Metallic case aluminized coating solder plated pin
HGMM-350 Series

- Dedicated for 115 Vac applications
- Standard half brick package
- Active PFC: MIL-STD-704, DO-160, ABD100 MIL-STD-1399 compliant
- Nominal power up to 350W without derating
- Wide input range 71–180 Vac
- Variable frequency 47–440, 320–800 Hz
- Low input current harmonic distortion < 10%
- Integrated LC EMI filter
- Inrush current limitation
- No galvanic isolation

**Input Specifications**

**Input Range**

<table>
<thead>
<tr>
<th>Option</th>
<th>Input Range</th>
<th>Transient</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>W</td>
<td>95-140 Vac</td>
<td>71-180 Vac/100 ms</td>
<td>320-800 Hz</td>
</tr>
<tr>
<td>X</td>
<td>95-140 Vac</td>
<td>71-180 Vac/100 ms</td>
<td>47-440 Hz</td>
</tr>
<tr>
<td>Y</td>
<td>85-265 Vac</td>
<td></td>
<td>50/60 Hz</td>
</tr>
</tbody>
</table>

Option 1: Screening -55°C start-up temperature
Option 2: Screening and serialization

**Output Specifications**

**Single Output**

<table>
<thead>
<tr>
<th>Option</th>
<th>Output</th>
<th>Current</th>
<th>Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>T</td>
<td>375 Vdc</td>
<td>0.9 A</td>
<td>(420 Vdc for Y input)</td>
</tr>
</tbody>
</table>

**Part Numbering**

<table>
<thead>
<tr>
<th>Grade</th>
<th>Single Output</th>
<th>Case Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hi-Rel</td>
<td>HGMS-350</td>
<td>-40°C / +105°C</td>
</tr>
</tbody>
</table>

For leaded process add - L after reference

**Dimensions and Pin-out**

Dimensions in mm and (inches)

- Pin dimensions: Ø 1 mm (0.04")
- Metallic case alodized coating solder plated pin
DC/DC CONVERTERS
Input Specifications

- Low profile 0.3” package
- Nominal power of 4 W without derating
- High efficiency up to 85%
- Soft start
- Galvanic isolation 1500 Vdc
- Integrated LC EMI filter
- Permanent short circuit protection
- Standard pin out DIL24 8 pins
- No optocoupler for high reliability

Input Range

<table>
<thead>
<tr>
<th>Single Input</th>
<th>Bi Input</th>
<th>Wide Input</th>
</tr>
</thead>
<tbody>
<tr>
<td>C : 4.5-5.5 Vdc</td>
<td>C : ± 5 Vdc / ± 0.4 A</td>
<td>C : ± 5 Vdc &amp; ± 15 Vdc / 0.5 A &amp; ± 0.05 A</td>
</tr>
<tr>
<td>H : 9-36 Vdc transient 40 Vdc/100 ms</td>
<td>E : ± 12 Vdc / ± 0.165 A</td>
<td></td>
</tr>
<tr>
<td>J : 16-40 Vdc transient 50 Vdc/100 ms</td>
<td>F : ± 15 Vdc / ± 0.13 A</td>
<td></td>
</tr>
</tbody>
</table>

Option /S : Screening and serialization
Option /T : On/Off function

Output Specifications

- Single Output
  - B : 3.3 Vdc / 1 A
  - C : 5 Vdc / 0.8 A
  - D : 12 Vdc / 0.33 A
  - F : 15 Vdc / 0.26 A

- Bi Output
  - B : 3.3 Vdc / ± 3.3 Vdc
  - C : ± 5 Vdc / ± 0.4 A
  - D : ± 12 Vdc / ± 0.16 A
  - F : ± 15 Vdc / ± 0.13 A

- Triple Output
  - CF: 5 Vdc & ± 15 Vdc / 0.5 A & ± 0.05 A

Part Numbering

<table>
<thead>
<tr>
<th>Grade</th>
<th>Single Output</th>
<th>Bi Output</th>
<th>Triple Output</th>
<th>Case Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hi-Rel</td>
<td>MGDS-04 - ■-</td>
<td>MGDB-04 - ■-</td>
<td>MGDT-04 - ■-</td>
<td>-40°C / +105°C</td>
</tr>
<tr>
<td>Industrial</td>
<td>MGDSI-04 - ■-</td>
<td>MGDBI-04 - ■-</td>
<td>MGDTI-04 - ■-</td>
<td>-40°C / +95°C</td>
</tr>
</tbody>
</table>

Dimensions and Pin-out

- Pin dimensions: 0.53 mm (0.02”)
- Metallic case black anodized coating solder plated pin

For leaded process add - L after reference - Contact factory for availability
**Input Specifications**

- Ultra wide input 9-60 Vdc, 4.5-33 Vdc
- Small surface 1” x 0.75” package
- Low profile 0.33”
- Flexible isolated dual outputs
- Soft start
- No load to full load operation
- Trim adjustment
- No optocoupler for high reliability

**Ultra Wide Input**

- **N**: 9-60 Vdc  transient : 80 Vdc / 1 s
- **E**: 4.5-33 Vdc  transient : 45 Vdc / 0.1 s

  Option **E**: Screening -55°C start-up temperature
  Option **E**: Screening and serialization

**Output Specifications**

- **Dual Isolated Output**
  - **C**: 2 X 5 Vdc / 2 x 0.8 A
  - **E**: 2 x 12 Vdc / 2 x 0.33 A
  - **F**: 2 x 15 Vdc / 2 x 0.26 A
  - **I**: 2 x 24 Vdc / 2 x 0.16 A

  *Possible unbalanced power up to 10% / 90%*

**Part Numbering**

- Grade: Industrial
- Dual Output: MGDD-08

**Dimensions and Pin-out**

- **Pin dimensions**: square pin 0.64 mm (0.025”)
- **Metallic case black anodized coating gold plated pin**

<table>
<thead>
<tr>
<th>Pin</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Switch / Do Off</td>
</tr>
<tr>
<td>2</td>
<td>+ GND</td>
</tr>
<tr>
<td>3</td>
<td>- Input 1</td>
</tr>
<tr>
<td>4</td>
<td>+ VIF</td>
</tr>
<tr>
<td>5</td>
<td>- Input 2</td>
</tr>
<tr>
<td>6</td>
<td>+ Output 2 (Vo2)</td>
</tr>
<tr>
<td>7</td>
<td>- Output 2 (Go2)</td>
</tr>
<tr>
<td>8</td>
<td>+ Output 1 (Vo1)</td>
</tr>
<tr>
<td>9</td>
<td>- Output 1 (Go1)</td>
</tr>
<tr>
<td>10</td>
<td>Vtrim</td>
</tr>
</tbody>
</table>

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MGDI-10 Serie

- Low profile 0.33” package
- Nominal power of 10 W without derating
- High efficiency up to 86 %
- Soft start
- Galvanic isolation 1500 Vdc
- Integrated LC EMI filter
- Permanent short circuit protection
- No optocoupler for high reliability

MGDM-10 Serie

Input Specifications

<table>
<thead>
<tr>
<th>Input Range</th>
<th>Standard Input</th>
<th>Wide Input</th>
</tr>
</thead>
<tbody>
<tr>
<td>C: 4.5-5.5 Vdc</td>
<td>D: 4.7-16 Vdc</td>
<td>C: 4.5-5.5 Vdc</td>
</tr>
<tr>
<td>H: 9-36 Vdc transient 40 Vdc / 100 ms</td>
<td>I: 18-36 Vdc</td>
<td>H: 9-36 Vdc</td>
</tr>
<tr>
<td>J: 16-40 Vdc transient 50 Vdc / 100 ms</td>
<td>J: 16-40 Vdc</td>
<td>J: 16-40 Vdc</td>
</tr>
</tbody>
</table>

Option: On/Off function

Output Specifications

<table>
<thead>
<tr>
<th>Single Output</th>
<th>Bi Output</th>
<th>Triple Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>B: 3.3 Vdc / 2 A</td>
<td>C: ± 5 Vdc / ± 1 A</td>
<td>C: ± 5 Vdc &amp; ± 12 Vdc / 1 A &amp; ± 0.2 A</td>
</tr>
<tr>
<td>C: 5 Vdc / 2 A</td>
<td>E: ± 12 Vdc / ± 0.4 A</td>
<td>E: ± 5 Vdc &amp; ± 15 Vdc / 1 A &amp; ± 0.15 A</td>
</tr>
<tr>
<td>E: 12 Vdc / 0.8 A</td>
<td>F: ± 15 Vdc / ± 0.325 A</td>
<td></td>
</tr>
<tr>
<td>F: 15 Vdc / 0.65 A</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Part Numbering

<table>
<thead>
<tr>
<th>Grade</th>
<th>Single Output</th>
<th>Bi Output</th>
<th>Triple Output</th>
<th>Case Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hi-Rel</td>
<td>MGDS-10</td>
<td>MGDB-10</td>
<td>MGDT-10</td>
<td>-40°C / + 105°C</td>
</tr>
<tr>
<td>Industrial</td>
<td>MGDSI-10</td>
<td>MGDBI-10</td>
<td>MGDTI-10</td>
<td>-40°C / + 95°C</td>
</tr>
</tbody>
</table>

Dimensions and Pin-out

Dimensions in mm and (inches)

Metallic case anodized coating solder plated pin

<table>
<thead>
<tr>
<th>Pin</th>
<th>Single Output</th>
<th>Bi Output</th>
<th>Triple Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Input (Vi)</td>
<td>Input (Vi)</td>
<td>Input (Vi)</td>
</tr>
<tr>
<td>2</td>
<td>Gate*</td>
<td>No pin</td>
<td>No pin</td>
</tr>
<tr>
<td>3</td>
<td>-Input (Gi)</td>
<td>-Input (Gi)</td>
<td>-Input (Gi)</td>
</tr>
<tr>
<td>4</td>
<td>Output (Vo)</td>
<td>Output+ (+Vo)</td>
<td>Output 1 (V1)</td>
</tr>
<tr>
<td>5</td>
<td>No Pin</td>
<td>Common (Go)</td>
<td>Output- (-Vo)</td>
</tr>
<tr>
<td>6</td>
<td>Common (Go)</td>
<td>No pin</td>
<td>Common (Go)</td>
</tr>
<tr>
<td>7</td>
<td>No pin</td>
<td>No pin</td>
<td>Output 2+ (+V2)</td>
</tr>
<tr>
<td>8</td>
<td>No pin</td>
<td>No pin</td>
<td>Output 2- (-V2)</td>
</tr>
<tr>
<td>A</td>
<td>On/Off function</td>
<td>On/Off (option)</td>
<td>On/Off (option)</td>
</tr>
</tbody>
</table>

Pin dimensions: Ø 0.73 mm (0.03")

Dimensions in mm and (inches)

40.0
(1.58")

26.0
(1.03")

8.0
(0.32")

26.0
(1.03")

For leaded process add - L after reference - Contact factory for availability

www.gaia-converter.com
Input Specifications

**MGDM-18 Series**
- Small surface 1” x 1.5” package
- Up to 20 W power
- High efficiency up to 86%
- Soft start
- Galvanic isolation 1500 Vdc
- Integrated LC EMI filter
- Permanent short circuit protection
- No optocoupler for high reliability

**MGDI-18 Series**

### Input Range

<table>
<thead>
<tr>
<th>Option</th>
<th>Input Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>4.5-5.5 Vdc</td>
</tr>
<tr>
<td>H</td>
<td>9-36 Vdc transient 40 Vdc / 100 ms</td>
</tr>
<tr>
<td>J</td>
<td>16-40 Vdc transient 50 Vdc / 100 ms</td>
</tr>
</tbody>
</table>

**Wide Input**

<table>
<thead>
<tr>
<th>Option</th>
<th>Input Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>D</td>
<td>4.7-16 Vdc</td>
</tr>
<tr>
<td>H</td>
<td>9-36 Vdc</td>
</tr>
<tr>
<td>J</td>
<td>16-40 Vdc</td>
</tr>
<tr>
<td>Q</td>
<td>36-140 Vdc</td>
</tr>
</tbody>
</table>

**Output Specifications**

**Single Output**

<table>
<thead>
<tr>
<th>Grade</th>
<th>Single Output</th>
<th>Case temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hi-Rel</td>
<td>MGDS-18</td>
<td>-40°C / +105°C</td>
</tr>
<tr>
<td>Industrial</td>
<td>MGDSI-18</td>
<td>-40°C / +95°C</td>
</tr>
</tbody>
</table>

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**Part Numbering**

**Dimensions in mm and (inches)**

Pin dimensions: Ø 0.73 mm (0.03 “)
Metallic case black anodized coating solder plated pin

*No Gate for Industrial grade*
**DC/DC CONVERTERS**

**20 WATT NEW GENERATION SERIES**

- Ultra wide input 12-160 Vdc
- Small Surface 1” x 1.5” package
- High efficiency over the entire range
- Flexible isolated dual outputs
- Soft start
- No load to full load operation
- Trim adjustment
- No optocoupler for high reliability

### Input Specifications

**Ultra Wide Input**

- : 12-160 Vdc

### Output Specifications

**Dual Isolated Output**

- C : 2 X 5 Vdc / 2 x 2 A
- E : 2 x 12 Vdc / 2 x 0.825 A
- F : 2 x 15 Vdc / 2 x 0.65 A
- I : 2 x 24 Vdc / 2 x 0.42 A

*Possible unbalanced power up to 10% / 90%*

### Part Numbering

<table>
<thead>
<tr>
<th>Grade</th>
<th>Dual Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industrial</td>
<td>MGDDI-20</td>
</tr>
</tbody>
</table>

### Dimensions and Pin-out

**Pin dimensions**

- Pin dimensions: square pin 0.64 mm (0.025")

**Metallic case black anodized coating gold plated pin**

- Bottom view

---

www.gaia-converter.com
DC/DC CONVERTERS
20 WATT SERIES

- Standard 2” x 2” package
- Nominal power up to 20 W without derating
- High efficiency up to 85 %
- Soft start
- Galvanic isolation 1500 Vdc
- Integrated LC EMI filter
- Permanent short circuit protection
- No optocoupler for high reliability

**Input Specifications**

**Input Range**
- **Basic : On/Off function**
  - **C**: 4.5-5.5 Vdc
  - **H**: 9-36 Vdc transient 40 Vdc / 100 ms
  - **J**: 16-40 Vdc transient 50 Vdc / 100 ms
- **Option**: Screening -55°C start-up temperature
- **Option**: Screening and serialization

**Standard Input**
- **C**: 4.5-5.5 Vdc
- **D**: 4.7-16 Vdc
- **I**: 18-36 Vdc
- **J**: 16-40 Vdc
- **K**: 36-140 Vdc

**Wide Input**
- **D**: 4.7-16 Vdc
- **H**: 9-36 Vdc
- **J**: 16-40 Vdc
- **Q**: 36-140 Vdc

**Output Specifications**

- **Single Output**
  - **B**: 3.3 Vdc / 4 A
  - **C**: ± 5 Vdc / ± 2 A
  - **E**: ± 12 Vdc / ± 0.8 A
  - **F**: ± 15 Vdc / ± 0.65 A
- **Bi Output**
  - **C**: ± 5 Vdc / ± 2 A
  - **D**: ± 12 Vdc / ± 0.8 A
  - **E**: ± 15 Vdc / ± 0.65 A
  - **G**: ± 20 Vdc / ± 0.5 A
- **Triple Output**
  - **B**: 3.3 Vdc & ± 12 Vdc / 2 A & ± 0.4 A
  - **C**: 5 Vdc & ± 12 Vdc / 2 A & ± 0.4 A
  - **F**: 15 Vdc & ± 15 Vdc / 2 A & ± 0.3 A
  - **G**: 30 Vdc & ± 15 Vdc / 2 A & ± 0.3 A

**Part Numbering**

<table>
<thead>
<tr>
<th>Grade</th>
<th>Single Output</th>
<th>Bi Output</th>
<th>Triple Output</th>
<th>Case Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hi-Rel</td>
<td>MGDS-20 - ■ - ■ / ■</td>
<td>MGDB-20 - ■ - ■ / ■</td>
<td>MGDT-20- ■ - ■ / ■</td>
<td>-40°C / +105°C</td>
</tr>
<tr>
<td>Industrial</td>
<td>MGDSI-20 - ■ - ■ / ■</td>
<td>MGDBI-20 - ■ - ■ / ■</td>
<td>MGDTI-20- ■ - ■ / ■</td>
<td>-40°C / +95°C</td>
</tr>
</tbody>
</table>

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**Dimensions and Pin-out**

- **Dimensions in mm and (inches)**
- Pin dimensions : 0.81 mm (0.031 “)
- Metallic case black anodized coating solder plated pin
**Input Specifications**

- Ultra wide input 9-60 Vdc, 4.5-33 Vdc
- Small surface 1” x 1.25” package
- Low profile 0.33”
- Flexible isolated dual outputs
- Soft start
- No load to full load operation
- Trim adjustment
- No optocoupler for high reliability

**Input Specifications**

**Ultra Wide Input**

- **N**: 9-60 Vdc  
  transient : 80 Vdc / 1 s
- **E**: 4.5-33 Vdc  
  transient : 45 Vdc / 0.1 s

Option **E**: Screening -55°C start-up temperature
Option **N**: Screening and serialization

**Output Specifications**

**Dual Isolated Output**

- **B**: 2 X 3.3 Vdc / 2 x 2 A
- **C**: 2 X 5 Vdc / 2 x 2 A
- **E**: 2 x 12 Vdc / 2 x 0.825 A
- **F**: 2 x 15 Vdc / 2 x 0.65 A
- **I**: 2 x 24 Vdc / 2 x 0.42 A

* Possible unbalanced power up to 10% / 90%

**Part Numbering**

- **Grade**: Hi-Rel
- **Dual Output**: MGDD-21 -  -  -  /

**Dimensions and Pin-out**

- Pin dimensions: square pin 0.64 mm (0.025”)
- Metalic case black anodized coating gold plated pin

- Bottom view
DC/DC CONVERTERS
25 WATT SERIES

- Standard 2" x 2" package
- Nominal power up to 25 W without derating
- High efficiency up to 89%
- Soft start
- Galvanic isolation 1500 Vdc
- Integrated LC EMI filter
- Permanent short circuit protection
- No optocoupler for high reliability

Input Specifications

<table>
<thead>
<tr>
<th>Option</th>
<th>Input Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>MGDM-25 Series</td>
<td>H: 9-36 Vdc transient 40 Vdc / 100 ms</td>
</tr>
<tr>
<td>MGDI-25 Series</td>
<td>J: 16-40 Vdc transient 50 Vdc / 100 ms</td>
</tr>
</tbody>
</table>

Output Specifications

<table>
<thead>
<tr>
<th>Grade</th>
<th>Single Output</th>
<th>Bi Output</th>
<th>Triple Output</th>
<th>Case Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hi-Rel</td>
<td>MGDS-25 - ■ - ■ - ■</td>
<td>MGDB-25 - ■ - ■ / ■</td>
<td>MGDT-25- ■ - ■ / ■</td>
<td>-40°C / +105°C</td>
</tr>
<tr>
<td>Industrial</td>
<td>MGDSI-25 - ■ - ■ / ■</td>
<td>MGDBI-25 - ■ - ■ / ■</td>
<td>MGDTI-25- ■ - ■ / ■</td>
<td>-40°C / +95°C</td>
</tr>
</tbody>
</table>

Part Numbering

Dimensions and Pin-out

- Standard 2" x 2" package
- Nominal power up to 25 W without derating
- High efficiency up to 89%
- Soft start
- Galvanic isolation 1500 Vdc
- Integrated LC EMI filter
- Permanent short circuit protection
- No optocoupler for high reliability

www.gaia-converter.com
MGDI-26 Series

• Standard 2" x 2" package
• Nominal power up to 25 W without derating
• Soft start
• Galvanic isolation 1500 Vdc
• Integrated LC EMI filter
• No load to full load operation
• External synchronization
• Trim and sense adjustment
• Current sharing
• Permanent short circuit protection
• No optocoupler for high reliability

Input Specifications

<table>
<thead>
<tr>
<th>Input Range</th>
<th>Basic : On/Off function</th>
</tr>
</thead>
<tbody>
<tr>
<td>H : 9-36 Vdc translucent 40 Vdc / 100 ms</td>
<td></td>
</tr>
<tr>
<td>J : 16-40 Vdc translucent 50 Vdc / 100 ms</td>
<td></td>
</tr>
<tr>
<td>Option H : Screening -55°C start-up temperature</td>
<td></td>
</tr>
<tr>
<td>Option J : Screening and serialization</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Output Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>B : 3.3 Vdc / 6 A</td>
</tr>
<tr>
<td>C : 5 Vdc / 5 A</td>
</tr>
<tr>
<td>E : 12 Vdc / 2 A</td>
</tr>
<tr>
<td>F : 15 Vdc / 1.65 A</td>
</tr>
</tbody>
</table>

Part Numbering

<table>
<thead>
<tr>
<th>Grade</th>
<th>Single Output</th>
<th>Case Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hi-Rel</td>
<td>MGDS-26 - ■ - ■ / ■</td>
<td>-40°C / +105°C</td>
</tr>
<tr>
<td>Industrial</td>
<td>MGDSI-26 - ■ - ■ / ■</td>
<td>-40°C / +95°C</td>
</tr>
</tbody>
</table>

Dimensions and Pin-out

Dimensions in mm and (inches)

<table>
<thead>
<tr>
<th>Pin</th>
<th>Single Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Case</td>
</tr>
<tr>
<td>1</td>
<td>Input (V)</td>
</tr>
<tr>
<td>2</td>
<td>Input (G)</td>
</tr>
<tr>
<td>3</td>
<td>Control (Cont)</td>
</tr>
<tr>
<td>4</td>
<td>Sense + (S+)</td>
</tr>
<tr>
<td>5</td>
<td>Output (Vo)</td>
</tr>
<tr>
<td>6</td>
<td>Sense - (S-)</td>
</tr>
</tbody>
</table>

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DC/DC CONVERTERS
30 WATT SERIES

- Low profile 0.33” package
- Highly configurable DC/DC converter
- Up to 6 outputs and 3 independent line regulations
- Nominal Power of 30 W without derating
- Galvanic isolation 1500 Vdc
- Integrated LC EMI filter
- Permanent short circuit protection
- External trim and sense adjustment
- No optocoupler for high reliability

Input Specifications

<table>
<thead>
<tr>
<th>Input Range</th>
<th>Standard Input</th>
<th>Wide Input</th>
</tr>
</thead>
<tbody>
<tr>
<td>H : 9-36 Vdc transient 40 Vdc / 100 ms</td>
<td>I : 18-36 Vdc</td>
<td>D : 4.7-16 Vdc</td>
</tr>
<tr>
<td>J : 16-40 Vdc transient 50 Vdc / 100 ms</td>
<td></td>
<td>H : 9-36 Vdc</td>
</tr>
<tr>
<td></td>
<td></td>
<td>J : 16-40 Vdc</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Q : 36-140 Vdc</td>
</tr>
</tbody>
</table>

Output Specifications

<table>
<thead>
<tr>
<th>Output</th>
<th>Single Line</th>
<th>Dual Line</th>
<th>Triple Line</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 : 3.3 Vdc</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 : 5 Vdc</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12 : 12 Vdc</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15 : 15 Vdc</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Part Numbering

<table>
<thead>
<tr>
<th>Grade</th>
<th>Single Line Output</th>
<th>Dual Line Output</th>
<th>Triple Line Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hi-Rel</td>
<td>CGDM - ■ - ■ - 0 - 0 / ■</td>
<td>CGDM - ■ - ■ - 0 - 0 / ■</td>
<td>CGDM - ■ - ■ - 0 - 0 / ■</td>
</tr>
<tr>
<td>Industrial</td>
<td>CGDI - ■ - ■ - 0 - 0 / ■</td>
<td>CGDI - ■ - ■ - 0 - 0 / ■</td>
<td>CGDI - ■ - ■ - 0 - 0 / ■</td>
</tr>
</tbody>
</table>

Case Temperature

<table>
<thead>
<tr>
<th>Hi-Rel</th>
<th>Industrial</th>
</tr>
</thead>
<tbody>
<tr>
<td>-40°C / +105°C</td>
<td>-40°C / +95°C</td>
</tr>
</tbody>
</table>

Dimensions and Pin-out

For leaded process add - L after reference - Contact factory for availability

Dimensions in mm and (inches)

<table>
<thead>
<tr>
<th>Pin</th>
<th>Single Line</th>
<th>Dual Line</th>
<th>Triple Line</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Output (A)</td>
<td>Output 1+ (Vo1)</td>
<td>Output 1+ (Vo1)</td>
</tr>
<tr>
<td>2</td>
<td>Sense 1</td>
<td>Sense 1</td>
<td>Sense 1</td>
</tr>
<tr>
<td>3</td>
<td>Trim 1</td>
<td>Trim 1</td>
<td>Trim 1</td>
</tr>
<tr>
<td>4</td>
<td>Do not connect</td>
<td>Do not connect</td>
<td>Do not connect</td>
</tr>
<tr>
<td>5</td>
<td>Sense 1</td>
<td>Sense 1</td>
<td>Sense 1</td>
</tr>
<tr>
<td>6</td>
<td>Do not connect</td>
<td>Do not connect</td>
<td>Do not connect</td>
</tr>
<tr>
<td>7</td>
<td>Do not connect</td>
<td>Do not connect</td>
<td>Do not connect</td>
</tr>
<tr>
<td>8</td>
<td>Do not connect</td>
<td>Do not connect</td>
<td>Do not connect</td>
</tr>
<tr>
<td>9</td>
<td>Do not connect</td>
<td>Do not connect</td>
<td>Do not connect</td>
</tr>
<tr>
<td>10</td>
<td>Return 2</td>
<td>Return 2</td>
<td>Return 2</td>
</tr>
<tr>
<td>11</td>
<td>Do not connect</td>
<td>Do not connect</td>
<td>Do not connect</td>
</tr>
<tr>
<td>12</td>
<td>Do not connect</td>
<td>Do not connect</td>
<td>Do not connect</td>
</tr>
<tr>
<td>13</td>
<td>Input (B)</td>
<td>Input (B)</td>
<td>Input (B)</td>
</tr>
<tr>
<td>14</td>
<td>Return 3</td>
<td>Return 3</td>
<td>Return 3</td>
</tr>
<tr>
<td>15</td>
<td>Case</td>
<td>Case</td>
<td>Case</td>
</tr>
<tr>
<td>16</td>
<td>Dy/Off</td>
<td>Dy/Off</td>
<td>Dy/Off</td>
</tr>
</tbody>
</table>

www.gaia-converter.com
MGDI-35 Series

• Standard 3” x 2” package
• Nominal power up to 35 W without derating
• High efficiency up to 89 %
• Soft start
• Galvanic isolation 1500 Vdc
• Integrated LC EMI filter
• No load to full load operation
• External synchronization
• Trim adjustment
• Permanent short circuit protection
• No optocoupler for high reliability

Input Specifications

Input Range

Basic : On/Off function

H : 9-36 Vdc transient 40 Vdc / 100 ms
C : 16-75 Vdc transient 80 Vdc / 100 ms

Option 5 : Screening-55°C start-up temperature
Option 6 : Screening and serialization

Wide Input

H : 9-36 Vdc
C : 18-75 Vdc
Q : 36-140 Vdc

Output Specifications

Single Output

B : 3.3 Vdc / 7 A
C : 5 Vdc / 7 A
E : 12 Vdc / 2.9 A
F : 15 Vdc / 2.3 A

Bi Output

B : 3.3 Vdc / 12 Vdc / 4 A & ± 4 A*
C : ± 5 Vdc / ± 4 A*
E : ± 12 Vdc / ± 1.7 A*
F : ± 15 Vdc / ± 1.3 A*

Triple Output

B : 3.3 Vdc & ± 12 Vdc / 4 A & ± 1.1 A*
C : 3.3 Vdc & ± 15 Vdc / 4 A & ± 0.9 A*
E : 5 Vdc & ± 12 Vdc / 4 A & ± 1.1 A*
F : 5 Vdc & ± 15 Vdc / 4 A & ± 0.9 A*

Part Numbering

<table>
<thead>
<tr>
<th>Grade</th>
<th>Single Output</th>
<th>Bi Output</th>
<th>Triple Output</th>
<th>Case Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hi-Rel</td>
<td>MGDS-35 - ■ - / ■</td>
<td>MGDB-35 - ■ - / ■</td>
<td>MGDT-35- ■ - / ■</td>
<td>-40°C / +105°C</td>
</tr>
<tr>
<td>Industrial</td>
<td>MGDSI-35 - ■ - / ■</td>
<td>MGDBI-35 - ■ - / ■</td>
<td>MGDTI-35- ■ - / ■</td>
<td>-40°C / +95°C</td>
</tr>
</tbody>
</table>

For leaded process add - L after reference - Contact factory for availability

Dimensions and Pin-out

Dimensions in mm and (inches)

Pin dimensions : 0.41 mm (0.016")
Notably case black anodized coating solder plated pin

Pin dimensions : square pin (0.49") emission (0.49")
**Input Specifications**

- Standard 3” x 2” package
- Nominal power up to 60 W without derating
- High efficiency up to 89 %
- Soft start
- Galvanic isolation 1500 Vdc
- Integrated LC EMI filter
- No load to full load operation
- External synchronization
- Trim adjustment
- Permanent short circuit protection
- No optocoupler for high reliability

**Output Specifications**

**Wide Input**

<table>
<thead>
<tr>
<th>Input Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 : 14-55 Vdc</td>
</tr>
<tr>
<td>5 : 36-175 Vdc</td>
</tr>
</tbody>
</table>

**Single Output**

<table>
<thead>
<tr>
<th>Output Range</th>
<th>Current</th>
</tr>
</thead>
<tbody>
<tr>
<td>B : 3.3 Vdc / 15 A</td>
<td></td>
</tr>
<tr>
<td>C : 5 Vdc / 12 A</td>
<td></td>
</tr>
<tr>
<td>D : 12 Vdc / 5 A</td>
<td></td>
</tr>
<tr>
<td>E : 15 Vdc / 4 A</td>
<td></td>
</tr>
<tr>
<td>F : 26 Vdc / 2.3 A</td>
<td></td>
</tr>
</tbody>
</table>

**Part Numbering**

<table>
<thead>
<tr>
<th>Grade</th>
<th>Single Output</th>
<th>Case Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industrial</td>
<td>MGDSI-60</td>
<td>-40°C / + 95°C</td>
</tr>
</tbody>
</table>

**Dimensions and Pin-out**

- Dimensions in mm and (inches)
  - Pin 1 to 18: 73.0 x 48.0 (2.88” x 1.89”)
  - Pin 18 to 20: 14.0 (0.55”)
  - Bottom view

- Pin dimensions: 0.8 x 1.0 mm / 0.03” x 0.04”

- Metallic case black anodized coating solder plated pin
DC/DC CONVERTERS
60 WATT NEW GENERATION SERIES

- Ultra wide input 12-160 Vdc
- Small Surface 1” x 1.5” package
- High efficiency over the entire range
- Flexible isolated dual outputs
- Soft start
- No load to full load operation
- Trim adjustment
- No optocoupler for high reliability

**Input Specifications**

- **Ultra Wide Input**
  - \( R : 12-160 \text{ Vdc transient} 10,5 \text{ Vdc/1 sec} \)
  - *Option \( R \): Screening-55°C start-up temperature
  - *Option \( R \): Screening and serialization

**Output Specifications**

- **Dual Isolated Output**
  - \( C : 2 \times 5 \text{ Vdc} / 2 \times 5 \text{ A} \)
  - \( E : 2 \times 12 \text{ Vdc} / 2 \times 2,5 \text{ A} \)
  - \( F : 2 \times 15 \text{ Vdc} / 2 \times 2 \text{ A} \)
  - \( I : 2 \times 24 \text{ Vdc} / 2 \times 1,25 \text{ A} \)

  *Possible unbalanced power up to 10% / 90%

**Part Numbering**

<table>
<thead>
<tr>
<th>Grade</th>
<th>Dual Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hi-Rel</td>
<td>MGDD-60 -</td>
</tr>
<tr>
<td>Industrial</td>
<td>MGDDI-60 -</td>
</tr>
</tbody>
</table>

**Dimensions and Pin-out**

- **Dimensions in mm and (inches)**
  - Pin dimensions (square pin): 0.91 mm (0.036”)
  - Pin dimensions (round pin): 2.54 mm (0.100”)
  - Pin configuration: 1-18

- **Metallic case black anodized coating gold plated pin**

- **Pin Dimensions**:
  - Pin 1: \( V_{LDO} \)
  - Pin 2: \( +\text{Input (Vi)} \)
  - Pin 3: \( 5V \)
  - Pin 4: \( -\text{Input (Gi)} \)
  - Pin 5: \( GIA \)
  - Pin 6: \( \text{Synchronization (Sync)} \)
  - Pin 7: \( V_{trim} \)
  - Pin 8: \( V_{i} \)
  - Pin 9: \( +\text{Output 1 (Vo1)} \)
  - Pin 10: \( +\text{Output 2 (Vo2)} \)
  - Pin 11: \( -\text{Output 1 (Go1)} \)
  - Pin 12: \( -\text{Output 2 (Go2)} \)
  - Pin 13: Do not connect
  - Pin 14: Do not connect
  - Pin 15: Do not connect
  - Pin 16: Do not connect
  - Pin 17: Do not connect
  - Pin 18: Do not connect
**Input Specifications**

- Standard quarter brick package
- Nominal power up to 75 W
- Soft start
- Galvanic isolation 1500 Vdc
- Integrated LC EMI Filter
- No load to full load operation
- External synchronization
- Trim and sense adjustment
- Under voltage / over voltage / over current protection
- No optocoupler for high reliability

**Input Range**

<table>
<thead>
<tr>
<th>Grade</th>
<th>Single Output</th>
<th>Case Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hi-Rel</td>
<td>MGDS-75</td>
<td>-40°C / +105°C</td>
</tr>
</tbody>
</table>

**Single Output**

<table>
<thead>
<tr>
<th>Option</th>
<th>Single Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hi-Rel</td>
<td>3.3 Vdc / 15 A</td>
</tr>
<tr>
<td></td>
<td>5 Vdc / 15 A</td>
</tr>
<tr>
<td></td>
<td>12 Vdc / 6.25 A</td>
</tr>
<tr>
<td></td>
<td>15 Vdc / 5 A</td>
</tr>
<tr>
<td></td>
<td>24 Vdc / 3.125 A*</td>
</tr>
<tr>
<td></td>
<td>26 Vdc / 2.85 A*</td>
</tr>
<tr>
<td></td>
<td>28 Vdc / 2.7 A*</td>
</tr>
</tbody>
</table>

* MGDM-75-S Series exist in 26 Vdc output while MGDM-75-H Series and MGDM-75-O Series exist in 24 Vdc and 28 Vdc output.

**Output Specifications**

**Part Numbering**

<table>
<thead>
<tr>
<th>Grade</th>
<th>Single Output</th>
<th>Case Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hi-Rel</td>
<td>MGDS-75</td>
<td>-40°C / +105°C</td>
</tr>
</tbody>
</table>

**Dimensions and Pin-out**

**Dimensions in mm and (inches)**

**Pin dimensions:**

- Pins: 1, 2, 3, 4, 6, 7, 8: Ø 1 mm (0.04”)
- Pins: 5, 9: Ø 1.5 mm (0.059”)

**Metallic case anodized coating solder plated pin**

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**DC/DC CONVERTERS**

**100 WATT SERIES**

- Standard 3” x 2” package
- Nominal power up to 100 W without derating
- High efficiency up to 89%
- Soft start
- Galvanic isolation 1500 Vdc
- Integrated LC EMI filter
- No load to full load operation
- External synchronization
- Trim adjustment
- Permanent short circuit protection
- No optocoupler for high reliability

**Input Specifications**

- **MGDM-100 Series**
- **MGDI-100 Series**

**Input Range**

- Basic: On/Off function
- Hi-Rel
  - M: 10.7-100 Vdc
  - Option M: Screening-55°C start-up temperature
  - Option M: Screening and serialization
- Industrial
  - C: 14-55 Vdc
  - C: 36-140 Vdc

**Output Specifications**

- **Single Output**
  - B: 3.3 Vdc / 20 A
  - C: 5 Vdc / 20 A
  - E: 12 Vdc / 8.5 A
  - F: 15 Vdc / 6.5 A
  - 26: 26 Vdc / 4 A

**Part Numbering**

<table>
<thead>
<tr>
<th>Grade</th>
<th>Single Output</th>
<th>Case Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hi-Rel</td>
<td>MGDS-100</td>
<td>-40°C / +105°C</td>
</tr>
<tr>
<td>Industrial</td>
<td>MGDSI-100</td>
<td>-40°C / +95°C</td>
</tr>
</tbody>
</table>

**Dimensions and Pin-out**

- Dimensions in mm and (inches)
- Pin dimensions: square pin 0.91mm (0.036”)
- Metallic case black anodized coating solder plated pin

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DC/DC CONVERTERS
150 WATT SERIES

- Standard half brick package
- Nominal power up to 150 W
- Soft start
- Galvanic isolation 1500 Vdc
- Integrated LC EMI filter
- No load to full load operation
- External synchronization
- Trim and sense adjustment
- Current sharing
- Under voltage / over voltage / over current protection
- No optocoupler for high reliability

Input Specifications

<table>
<thead>
<tr>
<th>Input Range</th>
<th>Wide Input</th>
</tr>
</thead>
<tbody>
<tr>
<td>H : 9-45 Vdc</td>
<td>H : 9-36 Vdc</td>
</tr>
<tr>
<td>O : 16-80 Vdc</td>
<td>O : 18-75 Vdc</td>
</tr>
</tbody>
</table>

Option [ ] : Screening-55°C start-up temperature
Option [ ] : Screening and serialization

Output Specifications

Single Output

<table>
<thead>
<tr>
<th>Grade</th>
<th>Single Output</th>
<th>Case Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hi-Rel</td>
<td>MGDS-150 -</td>
<td>-40°C / +105°C</td>
</tr>
</tbody>
</table>

Part Numbering

For ledged process add - L after reference

Dimensions and Pin-out

Dimensions in mm and (inches)

Pin dimensions:
- Pins : 1, 2, 3, 4, 5, 7, 9, 10: Ø 1 mm (0.04")
- Pins : 6, 8, 12: Ø 2 mm (0.08")

Metallic case alodined coating solder plated pin
MGDM-155 Series

*Only on high input Series

- Standard quarter brick package
- Nominal power up to 150 W
- Soft start
- Galvanic isolation 2200 Vdc
- Integrated LC EMI Filter
- No load to full load operation
- External synchronization
- Trim and sense adjustment
- Under voltage / over voltage / over current protection
- No optocoupler for high reliability

**Input Specifications**

**Input Range**

- **H**: 9-45 Vdc
- **J**: 16-80 Vdc
- **S**: 155-480 Vdc

*Option **T**: Screening-55°C start-up temperature
*Option **S**: Screening and serialization

**Output Specifications**

**Single Output**

- **B**: 3.3 Vdc / 20 A
- **C**: 5 Vdc / 20 A
- **E**: 12 Vdc / 12.5 A
- **F**: 15 Vdc / 10 A
- **26**: 26 Vdc / 5.8 A

**Part Numbering**

<table>
<thead>
<tr>
<th>Grade</th>
<th>Single Output</th>
<th>Case Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hi-Rel</td>
<td>MGDS-155 - ■ - ■</td>
<td>-40°C / +105°C</td>
</tr>
</tbody>
</table>

**Dimensions and Pin-out**

*Only on high input Series

Pin dimensions:
- Pins 1, 2, 3, 4, 5, 7, 8, 9: Ø 1 mm (0.04")
- Pins 6, 10: Ø 1.5 mm (0.059")

Metallic case aluminized coating gold plated pin
MGDM-200 Series

- Unique product with heat dissipation on side
- Nominal power up to 200 W
- Soft start
- Galvanic isolation 1500 Vdc
- Integrated LC EMI filter
- No load to full load operation
- External synchronization
- Trim and sense adjustment
- Current sharing
- Under voltage / over voltage / over current protection
- No optocoupler for high reliability

Input Specifications

Input Range

| H  | 9-45 Vdc                     |
| O  | 16-80 Vdc                   |
| Option | Screening-55°C start-up temperature |
| Option | Screening and serialization |

Output Specifications

Single Output

| B  | 3.3 Vdc / 35 A               |
| C  | 5 Vdc / 35 A                 |
| E  | 12 Vdc / 16.5 A              |
| F  | 15 Vdc / 13.3 A              |
| I  | 24 Vdc / 8.4 A               |

Part Numbering

Grade Single Output Case Temperature

| Hi-Rel | MGDS-200 | - | - | -40°C / +105°C |

Dimensions and Pin-out

Dimensions in mm and (inches)

Pin dimensions: 4.44 mm (0.175")

Metallic case oxidized coating gold plated pin

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### DC/DC Converters Selection Chart

**Grades**
- Hi-Rel (M)
- Industrial (I)

**Power references**

<table>
<thead>
<tr>
<th>Reference</th>
<th>Power (W)</th>
</tr>
</thead>
<tbody>
<tr>
<td>04</td>
<td>4 W</td>
</tr>
<tr>
<td>08</td>
<td>8 W</td>
</tr>
<tr>
<td>10</td>
<td>10 W</td>
</tr>
<tr>
<td>18</td>
<td>18 W</td>
</tr>
<tr>
<td>20</td>
<td>20 W</td>
</tr>
<tr>
<td>21</td>
<td>21 W</td>
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<tr>
<td>25</td>
<td>25 W</td>
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<td>26</td>
<td>26 W</td>
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<td>30</td>
<td>30 W</td>
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<td>35</td>
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<td>50</td>
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<td>150</td>
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<td>180</td>
<td>180 W</td>
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<td>200</td>
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<td>250</td>
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<td>1000</td>
<td>1000 W</td>
</tr>
<tr>
<td>1500</td>
<td>1500 W</td>
</tr>
<tr>
<td>2000</td>
<td>2000 W</td>
</tr>
</tbody>
</table>

**Input Voltage range reference**

- **Standard Input**
  - 4.5-5.5 Vdc
  - 18-36 Vdc
- **Wide Input**
  - 4.7-16 Vdc
  - 9-36 / 9-45 Vdc
  - 16-40 Vdc
- **Ultra Wide Input**
  - 18-75 / 18-80 Vdc
  - 36-140 / 36-175 Vdc
  - 120-480 Vdc
  - 155-480 Vdc

**Output references**

- A: 2.5 Vdc
- B: 3.3 Vdc
- C: 5 or +/- 5 Vdc
- D: 12 or +/- 12 Vdc
- E: 15 or +/- 15 Vdc
- F: 155-480 Vdc
- G: 10-60 Vdc
- H: 9-202 Vdc
- I: 10-60 Vdc

**Options**

- Option M: On/Off function
- Option T: high isolation 3000 Vdc
- Option S: screening and serialization

**Process**

- L: Leaded process
- RoHS process

### DC/DC Front-End Module Section Chart

**Type of module**

- EMI input filter module
- Transient/drop-out protection module 50 W
- Transient protection module 50 W / 300 W
- Hold-up module 50 W / 300 W

**Selection**

- FGDS - A - 50V
- PGDS - 50 - K
- LGDS - 50 - K
- HUGD -

### AC/DC Solutions

**Type of module**

- Isolated PFC Modules 35W series
- Non Isolated PFC Modules 350W series

**Power references**

<table>
<thead>
<tr>
<th>Reference</th>
<th>Power (W)</th>
</tr>
</thead>
<tbody>
<tr>
<td>35</td>
<td>35 W</td>
</tr>
<tr>
<td>150</td>
<td>150 W</td>
</tr>
<tr>
<td>350</td>
<td>350 W</td>
</tr>
</tbody>
</table>

**Input Voltage range reference**

- 95-140 Vac / frequency 320-800 Hz
- 95-140 Vac / frequency 47 - 440 Hz
- 85-265 Vac / frequency 50 - 60 Hz

**Output references**

- T: 17 Vdc
- T: 375 Vdc

**Options**

- Option M: -55° C start-up temperature
- Option N: screening and serialization

**Process**

- L: Leaded process
- RoHS process
GAIA Converter is a manufacturer of rugged and reliable products suitable for the harshest environments. To verify the suitability of GAIA Converter products to these harsh environments, the modules have been subjected to the environmental requirements of well-known and widespread standards. Many of these tests have been performed by independent laboratories.

<table>
<thead>
<tr>
<th>Specification</th>
<th>Standards</th>
<th>Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Life at high</td>
<td>per MIL-STD-202G Method 108A</td>
<td>Operation : 1 000 hrs @ +105°C case</td>
</tr>
<tr>
<td>temperature</td>
<td></td>
<td>Storage : 1 000 hrs @ +125°C ambient</td>
</tr>
<tr>
<td>Low temperature</td>
<td>per MIL-STD-810E/F/G Methods 502.3, 502.4, 502.5</td>
<td>Storage : 1 000 hrs @ -55°C ambient</td>
</tr>
<tr>
<td>Temperature cycling</td>
<td>per MIL-STD-202A/G Method 102A</td>
<td>Number of cycles : 200</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Temperature change : -40°C / +85°C</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Transfer time : 40 min. / steady state time : 20 min.</td>
</tr>
<tr>
<td>Thermal shock</td>
<td>per MIL-STD-202G Method 1076</td>
<td>Number of shocks : 100</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Temperature : -55°C to +105°C</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Transfer time : &lt; 10 s / steady state time : 20 min.</td>
</tr>
<tr>
<td>Altitude</td>
<td>per MIL-STD-810E/F/G Methods 500.3, 500.4, 500.5</td>
<td>40 000 ft, unit functioning</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 000 ft/min to 70 000 ft, unit functioning</td>
</tr>
<tr>
<td>Humidity cyclic</td>
<td>per MIL-STD-810E/F/G Methods 507.3, 507.4, 507.5</td>
<td>Damp heat : 60 % to 88 % relative humidity</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cycle 1 (31°C to 41°C) : 24 hrs</td>
</tr>
<tr>
<td>Humidity steady</td>
<td>per MIL-STD-202G Method 101B</td>
<td>Damp heat : 93 % relative humidity</td>
</tr>
<tr>
<td>state</td>
<td></td>
<td>Temperature : 40°C</td>
</tr>
<tr>
<td>Salt atmosphere</td>
<td>per MIL-STD-810E/F/G Methods 508.1, 508.4, 508.5</td>
<td>Temperature : 35°C</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Duration : 48 hrs</td>
</tr>
<tr>
<td>Vibration</td>
<td>per MIL-STD-810D/F/G Methods 514.3, 514.5, 514.6</td>
<td>10 cycles in each axis</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Frequency : 10 to 60Hz/60Hz to 2kHz</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Amplitude/acceleration : 0.7 mm/10 g</td>
</tr>
<tr>
<td>Shock</td>
<td>per MIL-STD-810D/F/G Methods 516.3, 516.5, 516.6</td>
<td>3 shocks in each axis</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Peak acceleration : 100 g</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Duration : 6 ms</td>
</tr>
<tr>
<td>Bumps</td>
<td>per MIL-STD-810D/F/G Methods 516.3, 516.5, 516.6</td>
<td>2 000 bumps in each direction</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Duration : 6 ms</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Peak acceleration : 40 g</td>
</tr>
<tr>
<td>Conducted emissions</td>
<td>per MIL-STD-461C/D/E/F CE01, CE02, CE03 CE04</td>
<td>with external filter</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(see technical datasheet for details)</td>
</tr>
<tr>
<td>Conducted</td>
<td>per MIL-STD-461C/D/E/F CS01, CS02, CS03 CS04</td>
<td>with external filter</td>
</tr>
<tr>
<td>Susceptibility</td>
<td></td>
<td>(see technical datasheet for details)</td>
</tr>
<tr>
<td>Radiated emissions</td>
<td>per MIL-STD-461C/D/E/F RE01, RE02, RE03 RE04</td>
<td>module stand alone</td>
</tr>
<tr>
<td>Radiated</td>
<td>per MIL-STD-461C/D/E/F RS01, RS02, RS03, RS04</td>
<td>module stand alone</td>
</tr>
<tr>
<td>Susceptibility</td>
<td></td>
<td>(see technical datasheet for details)</td>
</tr>
</tbody>
</table>

### Environmental Qualifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Standards</th>
<th>Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Life at high</td>
<td>per IEC 68-2-2</td>
<td>1 000 hours</td>
</tr>
<tr>
<td>temperature</td>
<td></td>
<td>95°C case</td>
</tr>
<tr>
<td>Humidity</td>
<td>per IEC 68-2-3 Test Ca</td>
<td>Damp heat : 93 % H.R. 56 days</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Temperature : 40°C</td>
</tr>
<tr>
<td>Temperature cycling</td>
<td>per IEC 68-2-14 Test N</td>
<td>Number of cycles : 200</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Temperature change : -40°C / +71°C</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Transfer time : 40 min. / steady state time : 20 min.</td>
</tr>
<tr>
<td>Vibration</td>
<td>per IEC 68-2-6 Test Eb</td>
<td>10 cycles in each axis</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Frequency : 10 to 60Hz/60Hz to 2kHz</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Amplitude/acceleration : 0.7 mm/10 g</td>
</tr>
<tr>
<td>Shock</td>
<td>per IEC 68-2-27 Test Ea</td>
<td>3 cycles in each axis</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Peak acceleration : 100 g</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Duration : 6 ms</td>
</tr>
<tr>
<td>Bumps</td>
<td>per IEC 68-2-29 Test Eb</td>
<td>2 000 bumps in each direction</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Duration : 6 ms</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Peak acceleration : 25 g</td>
</tr>
<tr>
<td>Electrical discharge</td>
<td>per EN50082-2 with EN61000-4-2 (IEC 801-2)</td>
<td>Air discharge level : 4 kV : sanction A</td>
</tr>
<tr>
<td>susceptibility</td>
<td></td>
<td>Contact discharge level : 2 kV : sanction A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Air discharge level : 8 kV : sanction B</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Contact discharge level : 4 kV : sanction B</td>
</tr>
<tr>
<td>Electrical field</td>
<td>per EN50082-2 with EN61000-4-3 (IEC 801-3)</td>
<td>Antenna at 1 m distance</td>
</tr>
<tr>
<td>susceptibility</td>
<td></td>
<td>Value applied : 10V/m</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Waveform : AM modulated 80 % 1 kHz test : 26 MHz to 1 GHz</td>
</tr>
<tr>
<td>Electrical fast</td>
<td>per EN50082-2 with EN61000-4-4 (IEC 801-4)</td>
<td>Level 1 : 0.5 kV sanction A : module stand alone</td>
</tr>
<tr>
<td>transient</td>
<td></td>
<td>Level 3 : 2 kV sanction B : module stand alone</td>
</tr>
<tr>
<td>susceptibility</td>
<td></td>
<td>Level 4 : 4 kV sanction A : with external filter Waveform : 5/50 μs impedance 50 Ohm</td>
</tr>
<tr>
<td>Surges</td>
<td>per EN50082-2 with EN61000-4-5 (IEC 801-5)</td>
<td>Level 4 : 4 kV sanction A : with external filter Waveform : 1.2/50 μs impedance 12 Ohm</td>
</tr>
<tr>
<td>transient</td>
<td>per EN500155</td>
<td>Level 1.8 : 4 kV sanction A : with external filter Waveform : 5/50 μs impedance 5 Ohm</td>
</tr>
<tr>
<td>susceptibility</td>
<td></td>
<td>Module stand alone</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Level 2 : 2 kV sanction B : module stand alone</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Level 3 : 4 kV sanction A : with external filter Waveform : 5/50 μs impedance 10 Ohm</td>
</tr>
</tbody>
</table>
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DEFINITION OF PART NUMBERS

ENVIRONMENTAL QUALIFICATIONS

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## DC/DC ProDuct line

<table>
<thead>
<tr>
<th>Model</th>
<th>Power/Current Grade</th>
<th>Part Number</th>
<th>Input</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>F6DS 1</td>
<td>- 2 A - 50 V</td>
<td>2 A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F6DS 2</td>
<td>- 10 A - 50 V</td>
<td>10 A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F6DS 3</td>
<td>- 20 A - 50 V</td>
<td>20 A</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## EMI FIltErs

<table>
<thead>
<tr>
<th>Model</th>
<th>Power/Current Grade</th>
<th>Part Number</th>
<th>Input</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>HUGD 1</td>
<td>- 50 W</td>
<td>1'' x 1,5''</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HUGD 2</td>
<td>- 300 W</td>
<td>1'' x 1,5''</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## AC / dC powEr FACtor

<table>
<thead>
<tr>
<th>Model</th>
<th>Power/Current Grade</th>
<th>Part Number</th>
<th>Input</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>HGMB 1</td>
<td>- 35 W</td>
<td>3'' x 2''</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HGMB 2</td>
<td>- 150 W</td>
<td>1/2 brick</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HGMB 3</td>
<td>- 350 W</td>
<td>1/2 brick</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## trAnsIent protECtIon

<table>
<thead>
<tr>
<th>Model</th>
<th>Power/Current Grade</th>
<th>Part Number</th>
<th>Input</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>PGDS 1</td>
<td>- 50 W</td>
<td>1'' x 1,5''</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LGDS 1</td>
<td>- 75 W</td>
<td>1'' x 1,5''</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LGDS 2</td>
<td>- 100 W</td>
<td>1'' x 1,5''</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LGDS 3</td>
<td>- 300 W</td>
<td>1'' x 1,5''</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Front End Modules

<table>
<thead>
<tr>
<th>Model</th>
<th>Power/Current Grade</th>
<th>Part Number</th>
<th>Input</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>MGdxx-04</td>
<td>0.4 W</td>
<td>Dil 24</td>
<td>4.5-5.5V, 18-36V, 9-36V, 16-40V, 36-140V</td>
<td>Single, Bi, Triple</td>
</tr>
<tr>
<td>MGdxx-08</td>
<td>0.8 W</td>
<td>1'' x 0.75''</td>
<td>4.5-33V, 9-60V</td>
<td>Dual</td>
</tr>
<tr>
<td>MGdxx-10</td>
<td>1 W</td>
<td>1'' x 1.5''</td>
<td>4.5-5.5V, 18-36V, 4.7-16V, 9-36V, 16-40V, 36-140V</td>
<td>Single, Bi, Triple</td>
</tr>
<tr>
<td>MGdxx-18</td>
<td>1.8 W</td>
<td>1'' x 1.5''</td>
<td>4.5-5.5V, 4.7-16V, 9-36V, 16-40V, 36-140V</td>
<td>Single</td>
</tr>
<tr>
<td>MGdxx-20</td>
<td>2 W</td>
<td>2'' x 2''</td>
<td>4.5-5.5V, 18-36V, 4.7-16V, 9-36V, 16-40V, 36-140V</td>
<td>Single, Bi, Triple</td>
</tr>
<tr>
<td>MGdxx-21</td>
<td>2 W</td>
<td>1'' x 1.25''</td>
<td>4.5-33V, 9-60V</td>
<td>Dual</td>
</tr>
<tr>
<td>MGdxx-25</td>
<td>2.5 W</td>
<td>2'' x 2''</td>
<td>9-36V, 16-75V, 18-75V</td>
<td>Single, Bi, Triple</td>
</tr>
<tr>
<td>MGdxx-30</td>
<td>3 W</td>
<td>3'' x 2''</td>
<td>18-36V, 4.7-16V, 9-36V, 16-40V, 36-140V</td>
<td>Up to Six</td>
</tr>
<tr>
<td>MGdxx-35</td>
<td>3.5 W</td>
<td>3'' x 2''</td>
<td>9-36V, 16-75V, 36-140V</td>
<td>Single, Bi, Triple</td>
</tr>
<tr>
<td>MGdxx-40</td>
<td>4 W</td>
<td>3'' x 2''</td>
<td>9-36V, 16-75V, 36-140V</td>
<td>Single, Bi, Triple</td>
</tr>
<tr>
<td>MGdxx-50</td>
<td>5 W</td>
<td>3'' x 2''</td>
<td>9-36V, 16-75V, 36-140V</td>
<td>Single, Bi, Triple</td>
</tr>
<tr>
<td>MGdxx-60</td>
<td>6 W</td>
<td>3'' x 2''</td>
<td>9-36V, 16-75V, 36-140V</td>
<td>Single, Bi, Triple</td>
</tr>
<tr>
<td>MGdxx-70</td>
<td>7 W</td>
<td>3'' x 2''</td>
<td>9-36V, 16-75V, 36-140V</td>
<td>Single, Bi, Triple</td>
</tr>
<tr>
<td>MGdxx-80</td>
<td>8 W</td>
<td>3'' x 2''</td>
<td>9-36V, 16-75V, 36-140V</td>
<td>Single, Bi, Triple</td>
</tr>
<tr>
<td>MGdxx-90</td>
<td>9 W</td>
<td>3'' x 2''</td>
<td>9-36V, 16-75V, 36-140V</td>
<td>Single, Bi, Triple</td>
</tr>
</tbody>
</table>

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Modular Power Converters

Quick Selection Guide

DC/DC CONVERTERS FOR HIGH RELIABILITY APPLICATIONS

For more detailed specifications and application information, contact:

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