

Features & Benefits

- Three Phase Universal AC input
- Rugged Unit for Military Applications
- 90.8% Efficiency at Full Load
- Wide Input Voltage Range
- Built-in Active PFC Function
- Internal ORing Diode
- Multiple Units in a Redundant or Parallel System
- Droop Current Sharing
- IP67 Sealed
- RS485 Communication
- Temperature Sensor
- Power Good Signal
- Input Under Voltage Protection
- Input/Output Over Voltage Protection
- Input Over Current Protection
- Short Circuit Protection
- Over Temperature Protection
- Two Units can be Mounted in 2U Height 19" Rack
- On/Off Switch
- LED Indicators
- Grounding Interface
- Forced Air Cooled

Compliance

Module is designed to meet:

- MIL-STD-1399B
- MIL-STD-461G
- MIL-STD-810G
- MIL-STD-1275E
- EN IEC 62368-1:2023
- EN 55011 / EN 55032
- EN 61000-3-x
- EN 61000-4-x

For details, see page Compliance.

Typical Applications

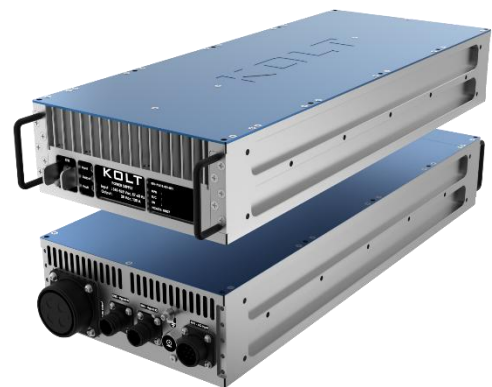
- Military/Defense Power Systems
- Armored Vehicles
- Land Platforms
- Marine Platforms
- Communications and Radar Systems

| Product Ratings | |
|-----------------|-------------------------------------|
| V_{IN} | 360–528 V_{LL_RMS} (Three-Phase) |
| V_{IN_NOM} | 440 V_{LL_RMS} |
| V_{OUT} | 28 V_{DC} |
| I_{OUT} | 100A |
| P_{OUT} | 2800 W |

Product Description

Power Supply is an advanced single-phase AC-DC power supply unit with active PFC function. It operates in constant current (CC) and constant voltage (CV) modes effectively, providing best-in-class regulation and dynamic performance.

The unit is designed to guarantee high performance under extreme environmental conditions with superior protection features against external faults and disturbances while meeting the major military standards. KOLT's innovative engineering has enabled a compact design of the converter with high efficiency.



Size: 530.00 x 215.90 x 87.75 mm
(19"/2 form factor, 2U height)

Weight: 13 ± 0.5 kg

Electrical Characteristics

| Input Characteristics | | | | | |
|-----------------------------|--|-----|-----|------|---------------------|
| Parameters | Notes & Conditions | Min | Typ | Max | Unit |
| Input Voltage | | 360 | 440 | 528 | V _{LL,RMS} |
| Input Voltage (non-working) | Withstanding input voltage | - | - | 595 | V _{LL,RMS} |
| Input Frequency | | 57 | 60 | 63 | Hz |
| Input Current THD | From half load to full load, nominal input voltage | 2.7 | - | 5 | % |
| No Load Input Power | Nominal input voltage | - | - | 50 | W |
| Inrush Current (peak) | Nominal input voltage | - | - | ±2.5 | A |
| Leakage Current to Ground | 10% load, nominal input voltage | - | - | 5 | mA _{RMS} |
| AC Input Quiescent Current | When input switch is OFF | - | - | 860 | mA _{RMS} |

| Output Characteristics | | | | | |
|---------------------------------|---|-----|------|------|-----------------|
| Parameters | Notes & Conditions | Min | Typ | Max | Unit |
| Output Voltage | | - | 28 | - | V _{DC} |
| Output Current | | - | - | 100 | A |
| Output Power | | - | - | 2800 | W |
| Output Ripple and Noise (pk-pk) | 20 MHz Bandwidth | - | - | 400 | mV |
| Line Regulation | Over the full range of line input voltage | - | ±0.1 | - | V |
| Load Regulation | From 10% load to full load, nominal input voltage | - | ±0.1 | - | V |

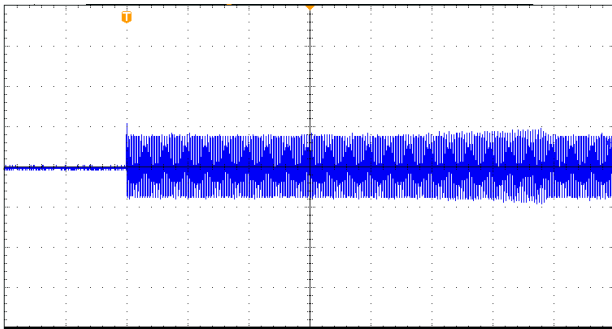
| General Characteristics | | | | | |
|-------------------------|--|------|-----|------|------|
| Parameters | Notes & Conditions | Min | Typ | Max | Unit |
| Efficiency | From half load to full load, nominal input voltage | 90.2 | - | 90.8 | % |
| Power Factor | From half load to full load, nominal input voltage | 0.96 | - | 0.99 | - |
| Soft-Start Time | | - | 1 | - | s |
| Hold-up Time | | 10 | 12 | - | ms |
| Weight | | - | - | 13 | kg |
| Cooling | Forced air by temperature-controlled fans | | | | |
| Built-in Test Feature | DC OK, Remote Error Sensing | | | | |

| Protections | | | | | |
|--|---|-----|------|-----|------------------|
| Parameters | Notes & Conditions | Min | Typ | Max | Unit |
| Input Under Voltage Protection | When the voltage returns within the normal limits, unit resumes operation automatically | 355 | 360 | 365 | V _{RMS} |
| Input Over Voltage Protection | | 520 | 528 | 536 | V _{RMS} |
| Output Over Current Protection | Fully electronic against over-load | - | 130 | - | A |
| Output Over Voltage Protection | - | - | 32.4 | - | V |
| Input Over Current Protection | Auto-retry | | | | |
| Output Short Circuit Protection | Fully electronic against over-load and continuous short-circuit conditions | | | | |
| Over Temperature Protection | Automatically resumes operation when temperature decreases | | | | |

| Isolation Characteristics | | | | | |
|------------------------------|--------------------|-----|------|-----|-----------------|
| Parameters | Notes & Conditions | Min | Typ | Max | Unit |
| Insulation Resistance | Input to Case | - | >100 | - | MΩ |
| | Output to Case | - | >100 | - | MΩ |
| Isolation Voltage | Input to Output | - | - | 750 | V _{DC} |
| | Input to Case | - | - | 750 | V _{DC} |
| | Output to Case | - | - | 750 | V _{DC} |

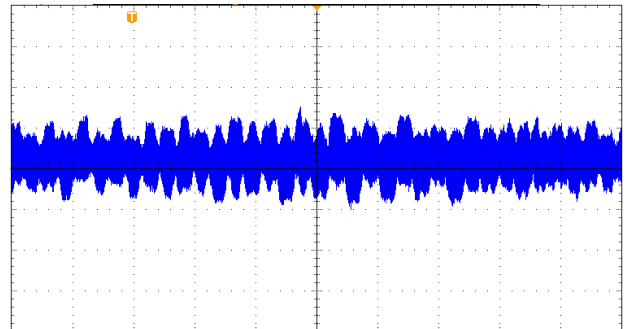
| Environmental Characteristics | | | | | | |
|----------------------------------|--|---|---|----------------|---|------------------|
| Parameters | Standard | Min | Typ | Max | Unit | Status |
| Operational Temperature | MIL-STD-810G_CHG-1 Method 501.6/502.6 Procedure II | -32 | - | +50 | °C | Passed |
| Storage / Transport Temperature | MIL-STD-810G_CHG-1 Method 501.6/502.6 Procedure I | -40 | - | +63 | °C | Passed |
| Operational Low Pressure | MIL-STD-810G_CHG-1 Method 500.6 Procedure II | - | - | 3000 | m | Similarity* |
| Storage / Transport Low Pressure | MIL-STD-810G_CHG-1 Method 500.6 Procedure I | - | - | 4500 | m | Designed to Meet |
| Parameters | Standard | Waveform | Peak Value | Pulse Duration | Axis | Status |
| Shock | MIL-STD-810G_CHG-1 Method 516.7 Procedure I | Sawtooth | 20g | 11 ms | ±X, ±Y, ±Z | Similarity* |
| | | Half-Sine | 10g | 11 ms | ±X, ±Y, ±Z | Similarity* |
| Parameters | Standard | Category | Figure | Platform | Vehicle | Status |
| Vibration | MIL-STD-810G_CHG-1 Method 514.7 Procedure I | Category 4 | 514.7C-2 | Secured Cargo | Truck Transportation and Composite Wheeled Vehicles | Similarity* |
| | | Category 8 | 514.7C-8 | Aircraft | Propeller | Similarity* |
| | | Category 11 | 514.7C-11 | Railroad | Train | Similarity* |
| | | Category 20 | 514.7C-4 | Ground | Wheeled Vehicles | Similarity* |
| | | Category 21 | 514.7D-9 | Watercraft | Marine Vehicles | Similarity* |
| Parameters | Standard | Condition | | | | Status |
| Salt Fog | MIL-STD-810G_CHG-1 Method 509.6 | 24 hours spray, 24 hours dry, applied 2 times | | | | Designed to Meet |
| Sand and Dust | MIL-STD-810G_CHG-1 Method 510.6 Procedure I/II | <150 µm Dust 150-850 µm Sand | | | | Similarity* |
| Fungus | MIL-STD-810G_CHG-1 Method 508.7 | Analysis of the degree of inertness to fungus growth of the components. | | | | Analysis |
| Solar Radiation | MIL-STD-810G_CHG-1 Method 505.6 Procedure I | A2 | | | | Designed to Meet |
| Humidity | MIL-STD-810G_CHG-1 Method 507.6 Procedure II | ≥ %95 Relative @30°C | | | | Similarity* |
| Impermeability | IP67 | Tested by immersion in 1 m water for 30 minutes | | | | Passed |
| Parameters | Standard | Test | | | | Status |
| EMI/EMC | MIL-STD-461G Ground Army | CE102 | CS101 CS114 CS115 CS116 CS118 | RE102 | RS103 | Similarity* |

* Verified on similar unit. Both units consist of identical converter modules.



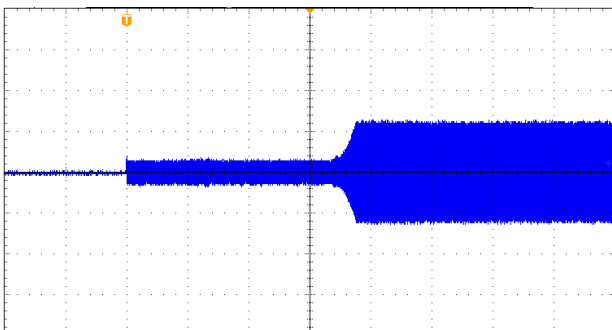
Input current (navy blue) (2 A/div) Time base: 400 ms/div

Figure 1. Inrush current at nominal input voltage



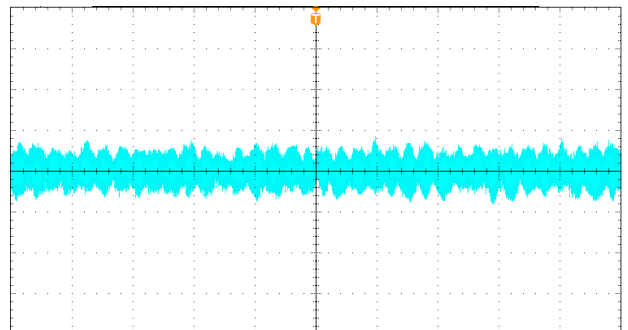
Leakage current (navy blue) (10 mA/div) Time base: 20 ms/div

Figure 4. Leakage current to ground at nominal input voltage and 10% load current



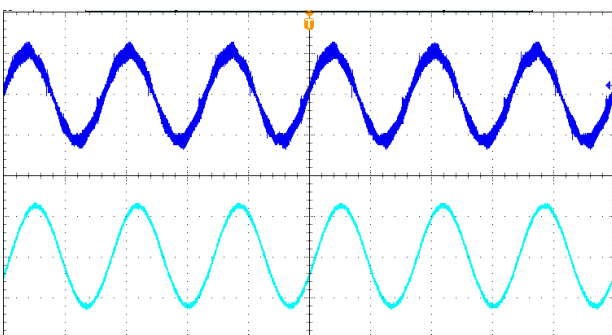
Input current (navy blue) (5 A/div) Time base: 2 s/div

Figure 2. Input current for inrush and start-up stages at nominal input voltage



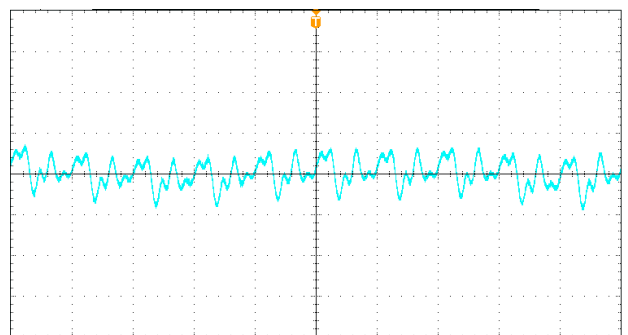
Output voltage (blue) (200 mV/div) Time base: 10 ms/div

Figure 5. Output voltage ripple at nominal input voltage and rated load current (AC Coupled), Bandwidth: 20 MHz



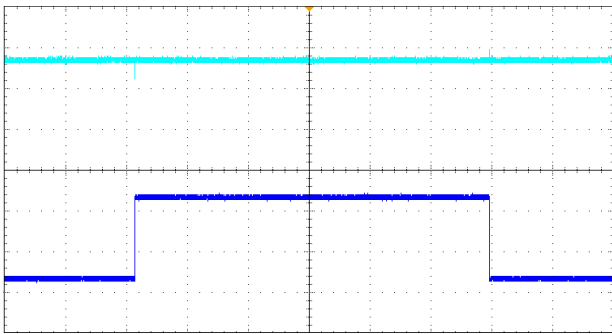
Input current (navy blue) (5 A/div) Time base: 10 ms/div
Input voltage (blue) (500 V/div)

Figure 3. Typical input voltage and current waveforms at rated load current



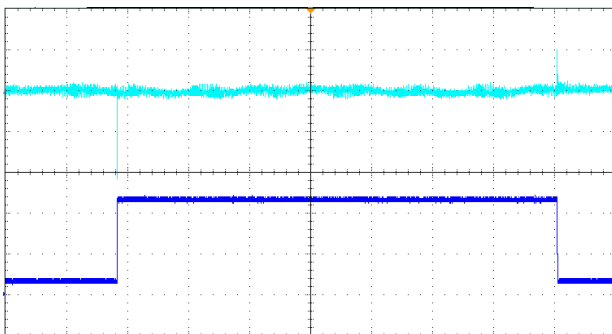
Output voltage (blue) (100 mV/div) Time base: 10 μ s/div

Figure 6. Zoomed in view of output voltage ripple at nominal input voltage and rated load current (AC Coupled), Bandwidth: 20 MHz



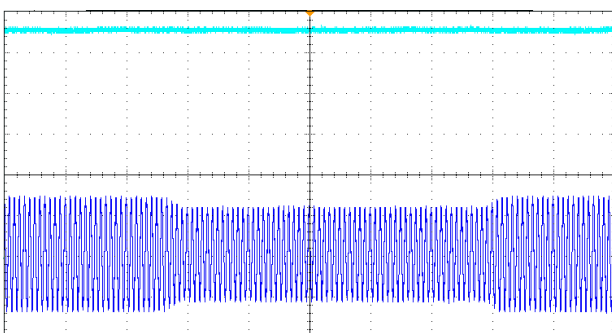
Output voltage (blue) (5 V/div) Time base: 200 ms/div
Output current (navy blue) (50 A/div)

Figure 7. Load transient response: from 10% to 100% and back to 10% at nominal output voltage (DC Coupled)



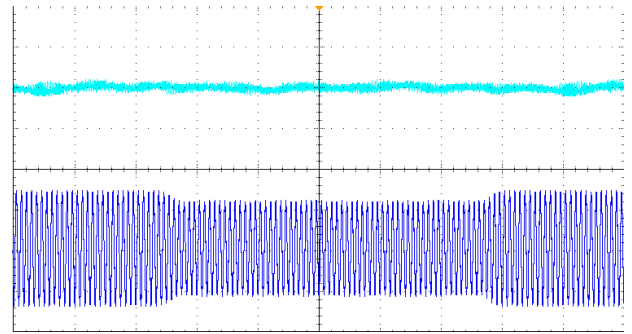
Output voltage (blue) (2 V/div) Time base : 200 ms/div
Output current (navy blue) (50 A/div)

Figure 8. Zoomed in view of load transient response: from 10% to 100% and back to 10% at nominal output voltage (AC Coupled)



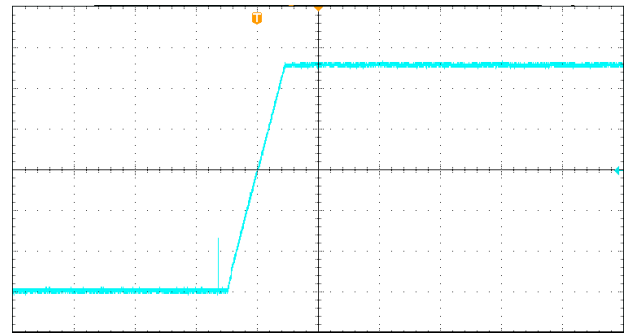
Output voltage (blue) (5 V/div) Time base: 200 ms/div
Input voltage (navy blue) (500 V/div)

Figure 9. Line transient response: from 485 $V_{LL,RMS}$ to 395 $V_{LL,RMS}$ and back to 485 $V_{LL,RMS}$ at nominal output voltage (DC Coupled)



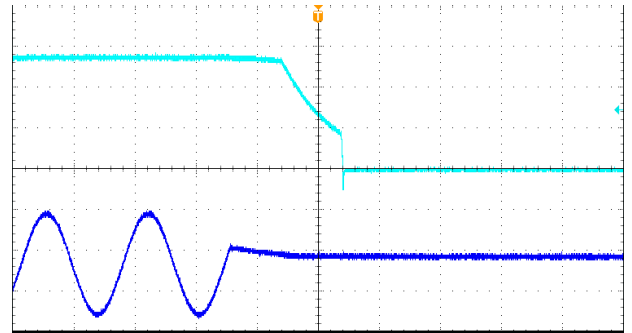
Output voltage (blue) (1 V/div) Time base : 200 ms/div
Input voltage (navy blue) (500 V/div)

Figure 10. Zoomed in view of line transient response: from 485 $V_{LL,RMS}$ to 395 $V_{LL,RMS}$ and back to 485 $V_{LL,RMS}$ at nominal output voltage (AC Coupled)



Output voltage (blue) (5 V/div) Time base: 1 s/div

Figure 11. Start-up waveform at rated load current and nominal output voltage



Output voltage (blue) (10 V/div) Time base: 10 ms/div
Input voltage (navy blue) (200 V/div)

Figure 12. Hold-up waveform at rated load current and nominal output voltage

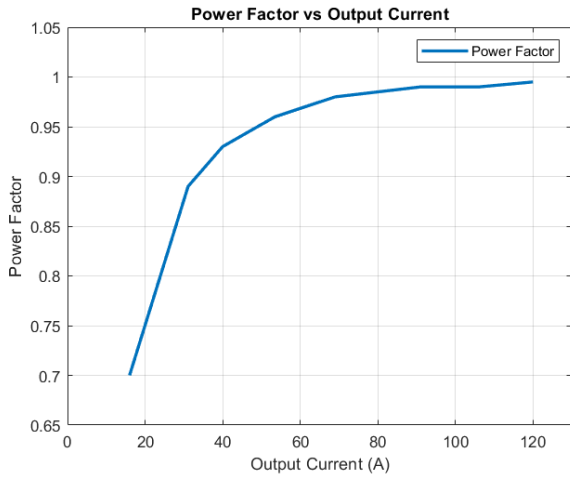


Figure 13. Power factor versus output current at nominal input voltage

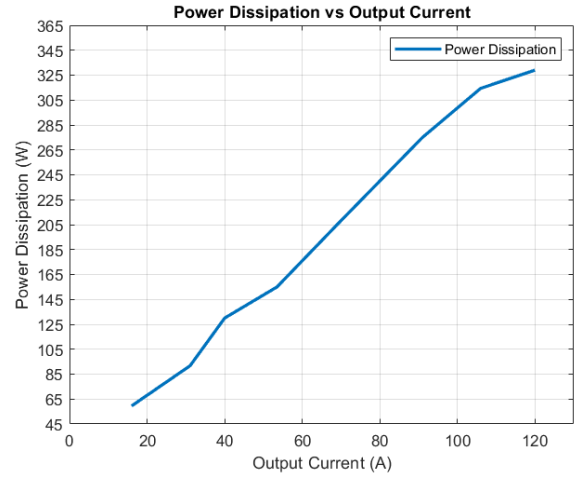


Figure 15. Power dissipation versus output current at nominal input voltage

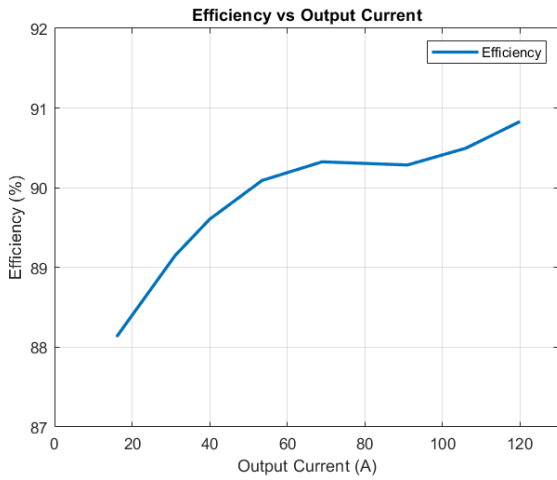


Figure 14. Efficiency versus output current at nominal input voltage

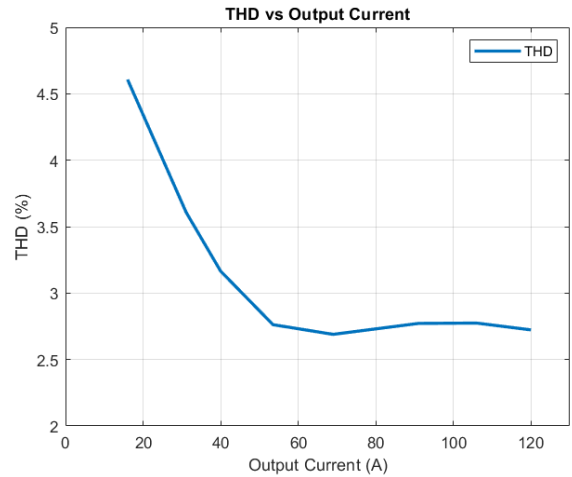


Figure 16. Total harmonic distortion (THD) versus output current at nominal input voltage

Connector Configuration



Figure 17. Connector Panel

AC Input Connector (KN1)

Part Numbers (interchangeable):

- Amphenol 97B-4102E-16S-1P
- ITT Cannon CA3102E16S-1P-B-F80

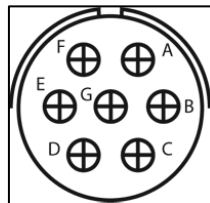


Figure 18. Input Connector View

| Pin | Signal Name | Function |
|-----|-------------|-----------------------|
| A | PHASE A | AC Line Input (PHASE) |
| B | PHASE A | AC Line Input (PHASE) |
| C | PHASE B | AC Line Input (PHASE) |
| D | PHASE B | AC Line Input (PHASE) |
| E | PHASE C | AC Line Input (PHASE) |
| F | PHASE C | AC Line Input (PHASE) |
| G | CHASSIS | AC Line Input (EARTH) |

DC Output Connector (KN2)

Part Numbers (interchangeable):

- Amphenol 97B-4102E-32-17S
- ITT Cannon CA3102E32-17S-B-F80

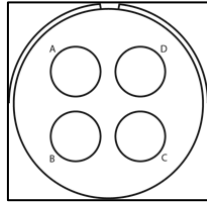


Figure 19. Output Connector View

| Pin | Signal Name | Function |
|-----|-------------|------------------|
| A | OUT | DC Output |
| B | OUT | DC Output |
| C | OUT_RTN | DC Output Return |
| D | OUT_RTN | DC Output Return |

Signal Connector #1 (KN3)

Part Numbers:

- D38999/20WB35SN

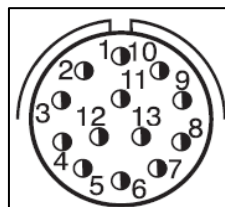


Figure 20. Signal Connector View

| Pin | Signal Name | Function |
|-----|-------------|-------------------------------|
| 1 | DATA+ | Factory service input |
| 2 | DATA- | Factory service input |
| 3 | DATA_RTN | Factory service return signal |
| 4 | - | - |
| 5 | ID0 | Identification input |
| 6 | ID1 | Identification input |
| 7 | ID2 | Identification input |
| 8 | ID3 | Identification input |
| 9 | ID_RTN | Identification return signal |
| 10 | - | - |
| 11 | CS_DATA+ | Current share input |
| 12 | CS_DATA- | Current share input |
| 13 | CS_DATA_RTN | Current share return signal |

Signal Connector #2 (KN4)

Part Numbers:

- D38999/20WB35SA

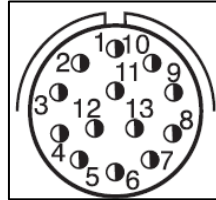


Figure 21. Signal Connector View

| Pin | Signal Name | Function |
|-----|-------------|----------------------------------|
| 1 | DATA+ | Factory service input |
| 2 | DATA- | Factory service input |
| 3 | DATA_RTN | Factory service return signal |
| 4 | - | - |
| 5 | NTC | Temperature sensor |
| 6 | NTC_RTN | Temperature sensor return signal |
| 7 | PGOOD | Power good signal |
| 8 | PGOOD_RTN | Power good return signal |
| 9 | - | - |
| 10 | - | - |
| 11 | CS_DATA+ | Current share input |
| 12 | CS_DATA- | Current share input |
| 13 | CS_DATA_RTN | Current share return signal |

LED Configuration

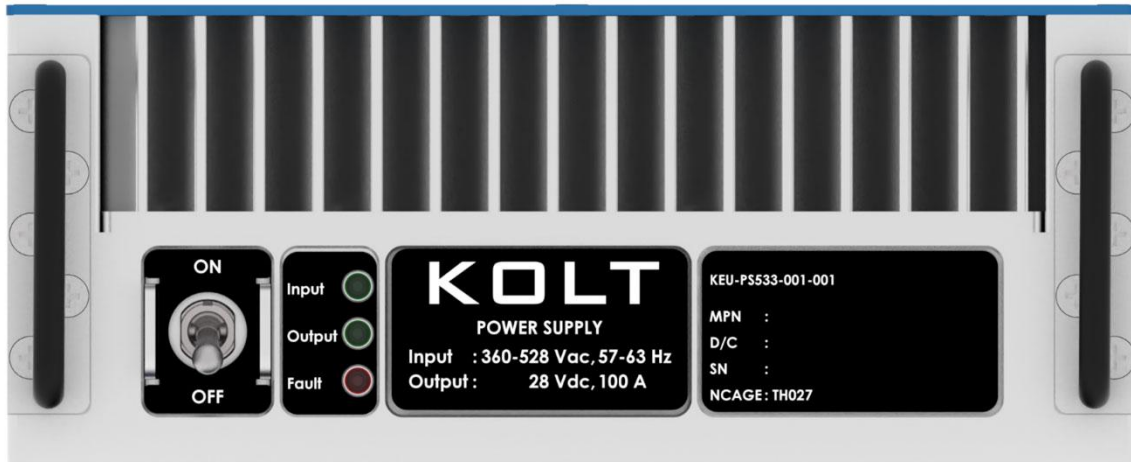


Figure 22. Front Panel

| LED Name | Status | Description | Function |
|----------|--------|------------------|--|
| Input | Off | AC Input Passive | AC input is below 150 V _{LL,RMS} |
| | Green | AC Input Active | AC input voltage is within the operating limit (360-528 V _{LL,RMS}) |
| | Red | AC Input Fault | <ul style="list-style-type: none"> Input Under Voltage / Over Voltage Input Over Current Line Frequency not within limits |

| LED Name | Status | Description | Function |
|----------|--------|-------------------|--|
| Output | Off | DC Output Passive | DC output is not active |
| | Green | DC Output Active | DC output is within the defined limits |
| | Red | DC Output Fault | <ul style="list-style-type: none"> Output Over Voltage / Short Circuit Output Regulation Error |

| LED Name | Status | Description | Function |
|----------|--------|--------------|---|
| Fault | Off | Device OK | No fault is present |
| | Red | Device Fault | <ul style="list-style-type: none"> Mid-Bus Over Voltage Temperature Critical Fault |

Label Configuration



Figure 23. Turkish Label Option Front View



Figure 24. Turkish Label Option Back View



Figure 25. English Label Option Front View



Figure 26. English Label Option Back View

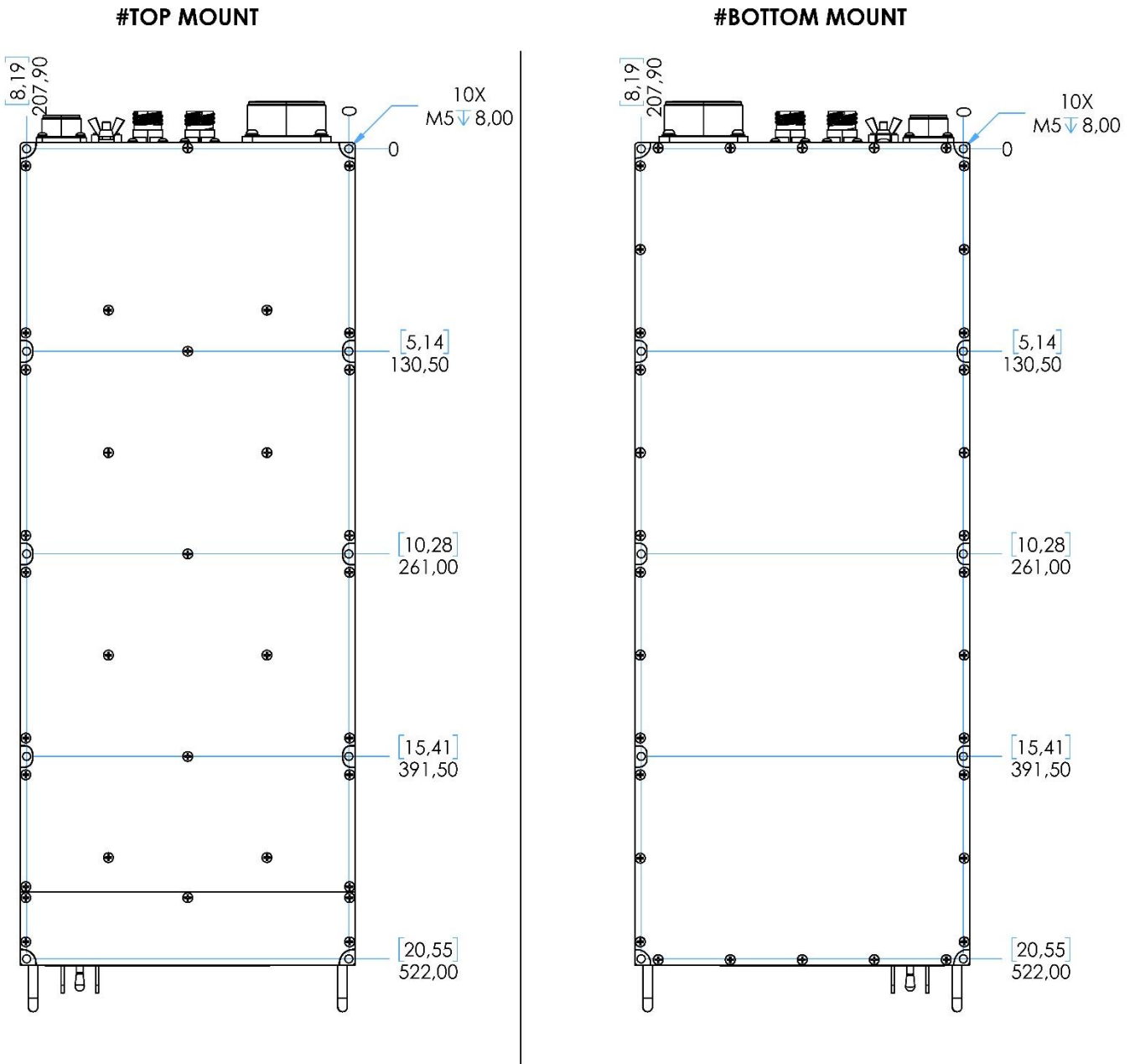


Figure 28. Mounting Details and Mounting Holes Coordinates

Material: Aluminum Alloy 6061-T6

Size: 530.00 x 215.90 x 87.75 mm
(19"/2 form factor, 2U height)

Weight: 13 ± 0.5 kg

Dimensions are in millimeters [inches].

Compliance

Safety (LVD)

- EN IEC 62368-1:2023 (Audio/video, information and communication technology equipment – Safety requirements)
- Class I equipment, protective earth required

For use only in or with complete equipment. The acceptability of the final combination is the responsibility of the manufacturer of the end product.

EMC

Emissions

- EN 55011 / EN 55032 – Conducted and radiated emissions, Class A, industrial environment
- EN 61000-3-2 – Harmonic current emissions, Class A
- EN 61000-3-3 – Voltage fluctuations and flicker

Immunity

- EN 61000-4-2 – ESD immunity
- EN 61000-4-3 – Radiated RF immunity
- EN 61000-4-4 – EFT/Burst immunity
- EN 61000-4-5 – Surge immunity
- EN 61000-4-6 – Conducted RF immunity
- EN 61000-4-8 – Power-frequency magnetic field immunity
- EN 61000-4-11 – Voltage dips and interruptions

Part Ordering Information

| Family | Product Variant | Option Variant | Compliance |
|-----------|-----------------|----------------|-----------------|
| KEU-PS533 | 001 | - | R: RoHS & REACH |

| Ordering Number | Color Option | Label Option | RoHS (Note*) |
|--------------------|--|--------------|----------------------------|
| KEU-PS533-001-001 | Blue Anodized Coated / MIL-C-5541E White Alodine | Turkish | RoHS 5/6 (Pb above limit)* |
| KEU-PS533-001-002 | RAL 6014 Yellow Olive | Turkish | RoHS 5/6 (Pb above limit)* |
| KEU-PS533-001-003 | RAL 9005 Jet Black | Turkish | RoHS 5/6 (Pb above limit)* |
| KEU-PS533-001-004 | FED-STD-595C 34094 Green 383 Camouflage | Turkish | RoHS 5/6 (Pb above limit)* |
| KEU-PS533-001-005 | FED-STD-595C 37030 Black Camouflage | Turkish | RoHS 5/6 (Pb above limit)* |
| KEU-PS533-001-006 | RAL 9016 Traffic White | Turkish | RoHS 5/6 (Pb above limit)* |
| KEU-PS533-001-007 | RAL 7001 Silver Grey | Turkish | RoHS 5/6 (Pb above limit)* |
| KEU-PS533-001-008 | FED-STD-595C 30315 Desert Sand Camouflage | Turkish | RoHS 5/6 (Pb above limit)* |
| KEU-PS533-001-009 | FED-STD-595C 33245 Earth Yellow Camouflage | Turkish | RoHS 5/6 (Pb above limit)* |
| KEU-PS533-001-010 | Blue Anodized Coated / MIL-C-5541E White Alodine | English | RoHS 5/6 (Pb above limit)* |
| KEU-PS533-001-011 | RAL 6014 Yellow Olive | English | RoHS 5/6 (Pb above limit)* |
| KEU-PS533-001-012 | RAL 9005 Jet Black | English | RoHS 5/6 (Pb above limit)* |
| KEU-PS533-001-013 | FED-STD-595C 34094 Green 383 Camouflage | English | RoHS 5/6 (Pb above limit)* |
| KEU-PS533-001-014 | FED-STD-595C 37030 Black Camouflage | English | RoHS 5/6 (Pb above limit)* |
| KEU-PS533-001-015 | RAL 9016 Traffic White | English | RoHS 5/6 (Pb above limit)* |
| KEU-PS533-001-016 | RAL 7001 Silver Grey | English | RoHS 5/6 (Pb above limit)* |
| KEU-PS533-001-017 | FED-STD-595C 30315 Desert Sand Camouflage | English | RoHS 5/6 (Pb above limit)* |
| KEU-PS533-001-018 | FED-STD-595C 33245 Earth Yellow Camouflage | English | RoHS 5/6 (Pb above limit)* |
| KEU-PS533-001-001R | Blue Anodized Coated / MIL-C-5541E White Alodine | Turkish | RoHS-3 & REACH compliant |
| KEU-PS533-001-002R | RAL 6014 Yellow Olive | Turkish | RoHS-3 & REACH compliant |
| KEU-PS533-001-003R | RAL 9005 Jet Black | Turkish | RoHS-3 & REACH compliant |
| KEU-PS533-001-004R | FED-STD-595C 34094 Green 383 Camouflage | Turkish | RoHS-3 & REACH compliant |
| KEU-PS533-001-005R | FED-STD-595C 37030 Black Camouflage | Turkish | RoHS-3 & REACH compliant |
| KEU-PS533-001-006R | RAL 9016 Traffic White | Turkish | RoHS-3 & REACH compliant |
| KEU-PS533-001-007R | RAL 7001 Silver Grey | Turkish | RoHS-3 & REACH compliant |
| KEU-PS533-001-008R | FED-STD-595C 30315 Desert Sand Camouflage | Turkish | RoHS-3 & REACH compliant |
| KEU-PS533-001-009R | FED-STD-595C 33245 Earth Yellow Camouflage | Turkish | RoHS-3 & REACH compliant |
| KEU-PS533-001-010R | Blue Anodized Coated / MIL-C-5541E White Alodine | English | RoHS-3 & REACH compliant |
| KEU-PS533-001-011R | RAL 6014 Yellow Olive | English | RoHS-3 & REACH compliant |
| KEU-PS533-001-012R | RAL 9005 Jet Black | English | RoHS-3 & REACH compliant |
| KEU-PS533-001-013R | FED-STD-595C 34094 Green 383 Camouflage | English | RoHS-3 & REACH compliant |
| KEU-PS533-001-014R | FED-STD-595C 37030 Black Camouflage | English | RoHS-3 & REACH compliant |
| KEU-PS533-001-015R | RAL 9016 Traffic White | English | RoHS-3 & REACH compliant |
| KEU-PS533-001-016R | RAL 7001 Silver Grey | English | RoHS-3 & REACH compliant |
| KEU-PS533-001-017R | FED-STD-595C 30315 Desert Sand Camouflage | English | RoHS-3 & REACH compliant |
| KEU-PS533-001-018R | FED-STD-595C 33245 Earth Yellow Camouflage | English | RoHS-3 & REACH compliant |

RoHS & REACH Compliance*

By default, KOLT products are manufactured using SnPb solder for high-reliability applications and therefore are **not** compliant with EU RoHS Directive 2011/65/EU (as amended by (EU) 2015/863). These products meet RoHS requirements for all substances except lead (Pb). **These products are NOT CE marked due to SnPb solder.**

A **lead-free** build that meets RoHS-3 requirements and is designed to be REACH compliant is available by adding the “-R” suffix to the part number. **Only these products are CE marked.**

Revision History

| Document Number | Revision | Date | Description | Page Number(s) |
|-----------------|----------|------------|----------------------|----------------|
| 109400 | 01 | 21.10.2024 | Initial Release | - |
| 109400 | 02 | 26.03.2025 | Second Release | - |
| 109400 | 03 | 07.08.2025 | Part Number updated. | - |
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Contact Us

KOLT Türkiye

salesturkiye@koltpower.com

KOLT Muhendislik A.S.

Saray OSB, G2 Cd. No:9
Kahramankazan, Ankara 06980

Türkiye

www.kolt.com.tr

KOLT Europe

saleseurope@koltpower.com

KOLT Power Ltd.

Fareham Innovation Centre, Merlin House, 4 Meteor Way,
Daedalus Drive, Lee-On-Solent, Fareham, PO13 9FU

United Kingdom

www.koltpower.com

 [/company/koltpower](https://www.linkedin.com/company/koltpower)

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