

QUINT4-PS/12-24DC/5-15DC/2.5/PT - DC/DC converter



1066704

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Primary-switched DC/DC converter, QUINT POWER, DIN rail mounting, input: 12 V DC - 24 V DC, output: 12 V DC / 2.5 A

Product description

In the power range of up to 100 W, QUINT POWER provides superior system availability in the smallest size. Preventative function monitoring and exceptional power reserves are available for applications in the low-power range.

Your advantages

- Most powerful output side: easy system expansion, reliable heavy load startup and miniature circuit breaker tripping
- Most comprehensive signaling: preventive function monitoring reports critical operating states before errors occur
- Free selection between Push-in and screw connection

Commercial data

| | |
|--------------------------------------|---------------|
| Item number | 1066704 |
| Packing unit | 1 pc |
| Minimum order quantity | 1 pc |
| Sales key | CM01 |
| Product key | CMDI43 |
| GTIN | 4055626734255 |
| Weight per piece (including packing) | 227.9 g |
| Weight per piece (excluding packing) | 172 g |
| Customs tariff number | 85044095 |
| Country of origin | CN |

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Technical data

Input data

| | |
|--|---|
| Nominal input voltage range | 12 V DC ... 24 V DC |
| Input voltage range | 12 V DC ... 24 V DC -25 % ... +33 % (SELV) |
| Wide-range input | yes |
| Electric strength, max. | 35 V DC (60 s) |
| Inrush current | typ. 1.5 A |
| Inrush current integral (I^2t) | typ. 0.05 A ² s |
| Inrush current limitation | typ. 1.5 A |
| Mains buffering time | typ. 20 ms (24 V DC) |
| Current consumption | typ. 3.55 A (12 V DC) typ. 1.75 A (24 V DC) |
| Switch-on time | < 1 s |
| Input fuse | 15 A (fast blow, internal) |
| Recommended breaker for input protection | 10 A ... 16 A (Characteristic B, C, D, K or comparable) |

Output data

| | |
|--|---|
| Efficiency | typ. 92.2 % (12 V DC) |
| Output characteristic | U/I Advanced Smart HICCUP FUSE MODE |
| Nominal output voltage | 12 V DC |
| Setting range of the output voltage (U_{Set}) | 5 V DC ... 15 V DC (> 12 V DC, constant capacity) |
| Nominal output current (I_N) | 2.5 A |
| Static Boost ($I_{Stat.Boost}$) | 3.125 A (≤ 40 °C) |
| Dynamic Boost ($I_{Dyn.Boost}$) | 5 A (≤ 60 °C (4.9 s)) |
| Short-circuit-proof | yes |
| No-load proof | yes |
| Derating | > 60 °C (2.5%/K of P_{Out} nom.) |
| Output power (P_N) | 30 W |
| Output power ($P_{Stat. Boost}$) | 37.5 W |
| Output power ($P_{Dyn. Boost}$) | 60 W |
| Feedback voltage resistance | ≤ 25 V DC |
| Protection against overvoltage at the output (OVP) | ≤ 18 V DC |
| Residual ripple | < 20 mV _{PP} |
| Control deviation | < 1 % (change in load, static 10 % ... 90 %) |
| Control deviation | < 1 % (change in load, static 10 % ... 90 %) |
| Control deviation | < 1 % (change in load, static 10 % ... 90 %) |
| Rise time | < 1 s (U_{OUT} (10 % ... 90 %)) |
| Connection in series | yes |
| Maximum no-load power dissipation | < 0.5 W |
| Power loss nominal load max. | < 2.7 W |

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| | |
|------------------------|--|
| Connection in parallel | yes, for redundancy and increased capacity |
| Signal (configurable) | |
| Digital | 0 V DC |
| | 24 V DC |
| | 22 mA |
| Default | 24 V DC |
| | 22 mA |
| | 24 V DC for $U_{Out} > 0.9 \times U_{Set}$ |

Connection data

Input

| | |
|----------|-----|
| Position | 1.x |
|----------|-----|

Conductor connection

| | |
|--|---|
| Connection method | Push-in connection |
| rigid | 0.5 mm ² ... 2.5 mm ² |
| flexible | 0.5 mm ² ... 2.5 mm ² |
| flexible with ferrule without plastic sleeve | 0.5 mm ² ... 2.5 mm ² |
| flexible with ferrule with plastic sleeve | 0.5 mm ² ... 2.5 mm ² |
| rigid (AWG) | 22 ... 14 |
| Stripping length | 10 mm |

Output

| | |
|----------|-----|
| Position | 2.x |
|----------|-----|

Conductor connection

| | |
|--|--|
| Connection method | Push-in connection |
| rigid | 0.2 mm ² ... 2.5 mm ² |
| flexible | 0.25 mm ² ... 2.5 mm ² |
| flexible with ferrule without plastic sleeve | 0.25 mm ² ... 2.5 mm ² |
| flexible with ferrule with plastic sleeve | 0.25 mm ² ... 2.5 mm ² |
| rigid (AWG) | 20 ... 14 |
| Stripping length | 10 mm |

Signal

| | |
|----------|-----|
| Position | 3.x |
|----------|-----|

Conductor connection

| | |
|--|--|
| Connection method | Push-in connection |
| rigid | 0.2 mm ² ... 2.5 mm ² |
| flexible | 0.25 mm ² ... 2.5 mm ² |
| flexible with ferrule without plastic sleeve | 0.25 mm ² ... 2.5 mm ² |
| flexible with ferrule with plastic sleeve | 0.25 mm ² ... 2.5 mm ² |
| rigid (AWG) | 24 ... 14 |
| Stripping length | 10 mm |

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Signaling

LED signaling

| | |
|------------------|--|
| Signal threshold | > P_{Thr} (LED lights up yellow, output power > P_{Thr} , depending on the rotary selector switch setting) |
| | > $0.9 \times U_{Set}$ (LED lights up green) |
| | < $0.9 \times U_{Set}$ (LED flashes green) |

Electrical properties

| | |
|---------------------------------|---|
| Number of phases | 1.00 |
| Insulation voltage input/output | 2.6 kV DC (type test) 1.2 kV DC (routine test) |
| Switching frequency | 4.00 kHz ... 70.00 kHz (Auxiliary converter stage) 70.00 kHz ... 150.00 kHz (Main converter stage) |

Product properties

| | |
|----------------------------|--|
| Product type | DC/DC converters |
| Product family | QUINT POWER |
| MTBF (IEC 61709, SN 29500) | > 2804000 h (25 °C) > 1590000 h (40 °C) > 687000 h (60 °C) |

Insulation characteristics

| | |
|---------------------|----|
| Protection class | II |
| Degree of pollution | 2 |

Life expectancy (electrolytic capacitors)

| | |
|-----------------|----------|
| Current | 1.25 A |
| Temperature | 40 °C |
| Time | 422000 h |
| Additional text | 12 V DC |

Life expectancy (electrolytic capacitors)

| | |
|-----------------|----------|
| Current | 2.5 A |
| Temperature | 40 °C |
| Time | 226000 h |
| Additional text | 12 V DC |

Life expectancy (electrolytic capacitors)

| | |
|-----------------|----------|
| Current | 2.5 A |
| Temperature | 30 °C |
| Time | 452000 h |
| Additional text | 12 V DC |

Dimensions

Item dimensions

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| | |
|--------|---------|
| Width | 22.5 mm |
| Height | 106 mm |
| Depth | 90 mm |

Installation dimensions

| | |
|--|---------------------------------------|
| Installation distance right/left (active) | 15 mm / 15 mm ($P_{Out} \geq 50\%$) |
| Installation distance right/left (passive) | 5 mm / 5 mm ($P_{Out} \geq 50\%$) |
| Installation distance right/left (active, passive) | 0 mm / 0 mm ($P_{Out} \leq 50\%$) |
| Installation distance top/bottom (active) | 30 mm / 30 mm ($P_{Out} \geq 50\%$) |
| Installation distance top/bottom (passive) | 30 mm / 30 mm ($P_{Out} \geq 50\%$) |
| Installation distance top/bottom (active, passive) | 30 mm / 30 mm ($P_{Out} \leq 50\%$) |

Mounting

| | |
|-------------------------|---|
| Mounting type | DIN rail mounting |
| Assembly instructions | alignable: $P_N \geq 50\%$, 5 mm horizontally, 15 mm next to active components, 50 mm vertically alignable: $P_N < 50\%$, 0 mm horizontally, 40 mm vertically top, 20 mm vertically bottom |
| With protective coating | No |

Material specifications

| | |
|--|------------------------------|
| Flammability rating according to UL 94 (housing / terminal blocks) | V0 |
| Housing material | Plastic |
| Type of housing | Polycarbonate (PC), UL 94 V0 |

Environmental and real-life conditions

Ambient conditions

| | |
|--|--|
| Degree of protection | IP20 |
| Ambient temperature (operation) | -25 °C ... 70 °C (> 60 °C Derating: 2,5 %/K) |
| Ambient temperature (storage/transport) | -40 °C ... 85 °C |
| Ambient temperature (start-up type tested) | -40 °C |
| Maximum altitude | ≤ 5000 m (> 2000 m, observe derating) |
| Climatic class | 3K3 (in acc. with EN 60721) |
| Max. permissible relative humidity (operation) | ≤ 95 % (at 25 °C, non-condensing) |
| Shock | 18 ms, 30g, in each space direction (according to IEC 60068-2-27) |
| Vibration (operation) | < 15 Hz, ±2.5 mm amplitude; 15 Hz ... 100 Hz: 2.3 g 90 Min. (in accordance with IEC 60068-2-6) |

Standards and regulations

Overvoltage category

| | |
|------------|---------------|
| EN 61010-1 | II (≤ 5000 m) |
|------------|---------------|

Safety for measurement, control, and laboratory equipment

| | |
|----------------------|---|
| Standard designation | Electrical safety (of control and regulation devices) |
|----------------------|---|

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| | |
|------------------------------|------------------------------|
| Standards/specifications | IEC 61010-1 |
| Protective extra-low voltage | |
| Standard designation | Protective extra-low voltage |
| Standards/specifications | IEC 61010-1 (SELV) |
| Mains voltage dips | |
| Standard designation | Mains variation/undervoltage |
| Standards/specifications | EN 61000-4-29 |

Approvals

| | |
|--------------|--|
| SIQ | CB-Scheme (IEC 61010-1, IEC 61010-2-201) |
| UL approvals | UL Listed UL 61010-1 |
| | UL Listed UL 61010-2-201 |
| | ANSI/UL 121201 Class I, Division 2, Groups A, B, C, D (Hazardous Location) |

UL

| | |
|----------------|----------------------|
| Identification | UL Listed UL 61010-1 |
|----------------|----------------------|

UL

| | |
|----------------|------------------------------|
| Identification | CAN/CSA C22.2 No. 61010-1-12 |
|----------------|------------------------------|

UL

| | |
|----------------|--------------------------|
| Identification | UL Listed UL 61010-2-201 |
|----------------|--------------------------|

UL

| | |
|----------------|----------------------------------|
| Identification | CAN/CSA C22.2 No. 61010-2-201:18 |
|----------------|----------------------------------|

UL

| | |
|----------------|---|
| Identification | UL 121201 & CSA C22.2 No. 213-17 Class I, Division 2, Groups A, B, C, D T4 (Hazardous Location) |
|----------------|---|

CB scheme

| | |
|----------------|-------------|
| Identification | IEC 61010-1 |
|----------------|-------------|

CB scheme

| | |
|----------------|-----------------|
| Identification | IEC 61010-2-201 |
|----------------|-----------------|

Shipbuilding

| | |
|----------------|--------|
| Identification | DNV GL |
|----------------|--------|

EMC data

| | |
|-------------------------------------|---|
| EMC requirements for noise emission | EN 61000-6-3 |
| | EN 61000-6-4 |
| EMC requirements for noise immunity | EN 61000-6-1 |
| | EN 61000-6-2 |
| Electromagnetic compatibility | Conformance with EMC Directive 2014/30/EU |
| EMC requirements, power plant | EN 61850-3 |

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| | |
|-------------------------------|--|
| | EN 61000-6-5 |
| Conducted noise emission | EN 55016 |
| | EN 61000-6-3 (Class B) |
| Noise emission | Additional basic standard EN 61000-6-5 (immunity in power station), IEC/EN 61850-3 (energy supply) |
| Noise emission | EN 55016 |
| | EN 61000-6-3 (Class B) |
| DNV GL conducted interference | Class B |
| Additional text | Bridge and deck area |
| DNV GL noise radiation | Class B |
| Additional text | Bridge and deck area |

Electrostatic discharge

| | |
|-----------------------|--------------|
| Standards/regulations | EN 61000-4-2 |
|-----------------------|--------------|

Electrostatic discharge

| | |
|-------------------|----------------------|
| Contact discharge | 8 kV (Test Level 4) |
| Discharge in air | 15 kV (Test Level 4) |
| Comments | Criterion A |

Electromagnetic HF field

| | |
|-----------------------|--------------|
| Standards/regulations | EN 61000-4-3 |
|-----------------------|--------------|

Electromagnetic HF field

| | |
|---------------------|-----------------------|
| Frequency range | 80 MHz ... 1 GHz |
| Test field strength | 20 V/m (Test Level 3) |
| Frequency range | 1 GHz ... 6 GHz |
| Test field strength | 10 V/m (Test Level 3) |
| Comments | Criterion A |

Fast transients (burst)

| | |
|-----------------------|--------------|
| Standards/regulations | EN 61000-4-4 |
|-----------------------|--------------|

Fast transients (burst)

| | |
|----------|------------------------------------|
| Input | 2 kV (Test Level 4 - asymmetrical) |
| Output | 2 kV (Test Level 4 - asymmetrical) |
| Signal | 2 kV (Test Level 4 - asymmetrical) |
| Comments | Criterion B |

Surge voltage load (surge)

| | |
|-----------------------|------------------------------------|
| Standards/regulations | EN 61000-4-5 |
| Input | 1 kV (Test Level 4 - symmetrical) |
| | 2 kV (Test Level 4 - asymmetrical) |
| Output | 1 kV (Test Level 3 - symmetrical) |
| | 2 kV (Test Level 3 - asymmetrical) |
| Signal | 1 kV (Test Level 4 - symmetrical) |
| | 2 kV (Test Level 4 - asymmetrical) |

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| | |
|----------|-------------|
| Comments | Criterion A |
|----------|-------------|

Conducted interference

| | |
|-----------------------|--------------|
| Standards/regulations | EN 61000-4-6 |
|-----------------------|--------------|

Conducted interference

| | |
|-----------------|---------------------|
| I/O/S | asymmetrical |
| Frequency range | 0.15 MHz ... 80 MHz |
| Comments | Criterion A |
| Voltage | 10 V (Test Level 3) |

Power frequency magnetic field

| | |
|-----------------------|-----------------|
| Standards/regulations | EN 61000-4-8 |
| Frequency | 16.67 Hz |
| | 50 Hz |
| | 60 Hz |
| Test field strength | 100 A/m |
| Additional text | 60 s |
| Comments | Criterion A |
| Frequency | 50 Hz |
| | 60 Hz |
| Frequency range | 50 Hz ... 60 Hz |
| Test field strength | 1 kA/m |
| Additional text | 3 s |
| Frequency | 0 Hz |
| Test field strength | 300 A/m |
| Additional text | DC, 60 s |

Voltage dips

| | |
|-----------------------|--------------------------|
| Standards/regulations | EN 61000-4-29 |
| Voltage | 24 V DC |
| Voltage dip | 70 % |
| Number of periods | 0.5 / 1 / 25 periods |
| Time | 100 ms |
| Additional text | Test Level 2 |
| Comments | Criterion A |
| Voltage dip | 40 % |
| Number of periods | 5 / 10 / 50 periods |
| Time | 100 ms |
| Additional text | Test Level 2 |
| Comments | Criterion A |
| Voltage dip | 0 % |
| Number of periods | 0.5 / 1 / 5 / 50 periods |
| Time | 50 ms |
| Additional text | Test Level 2 |
| Comments | Criterion B |

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Pulse-shape magnetic field

| | |
|-----------------------|--------------|
| Standards/regulations | EN 61000-4-9 |
| Test field strength | 1000 A/m |
| Comments | Criterion A |

Asymmetrical conducted disturbance variables

| | |
|-----------------------|--|
| Standards/regulations | EN 61000-4-16 |
| Test level 1 | 15 Hz 150 Hz (Test Level 3) |
| Voltage | 10 V 1 V (Permanent) |
| Test level 2 | 150 Hz 1.5 kHz (Test Level 3) |
| Voltage | 1 V |
| Test level 3 | 1.5 kHz 15 kHz (Test Level 3) |
| Voltage | 1 V 10 V |
| Test level 4 | 15 kHz 150 kHz (Test Level 3) |
| Voltage | 10 V |
| Test level 5 | 16.7 Hz 50 Hz 60 Hz 150 Hz 180 Hz (Test Level 3) |
| Voltage | 10 V (Permanent) |
| Test level 6 | 0 Hz 16.7 Hz 50 Hz 60 Hz (Test Level 3) |
| Voltage | 100 V (1 s) |
| Comments | Criterion A |

Alternating component of direct voltage

| | |
|-----------------------|----------------|
| Standards/regulations | EN 61000-4-17 |
| Alternating component | 10 % (U_N) |
| Frequency | 50 Hz |
| | 100 Hz |
| | 150 Hz |
| | 300 Hz |
| Comments | Criterion A |

Attenuated oscillating wave

| | |
|------------------------------|-------------------------------------|
| Standards/regulations | EN 61000-4-18 |
| Input, output (test level 1) | 1 MHz (Test Level 2 - symmetrical) |
| Voltage | 0.5 kV |
| Input, output (test level 2) | 1 MHz (Test Level 2 - asymmetrical) |
| Voltage | 1 kV |
| Signals (test level 1) | 1 MHz (Test Level 2 - symmetrical) |
| Voltage | 0.5 kV |
| Signals (test level 2) | 1 MHz (Test Level 2 - asymmetrical) |
| Voltage | 1 kV |
| Comments | Criterion A |

Attenuated oscillating magnetic field

| | |
|-----------------------|---------------|
| Standards/regulations | EN 61000-4-10 |
| Test field strength | 100 A/m |

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| | |
|---------------------|-------------|
| Test level 1 | 100 kHz |
| Test field strength | 100 A/m |
| Test level 2 | 1 MHz |
| Comments | Criterion A |

Criteria

| | |
|-------------|--|
| Criterion A | Normal operating behavior within the specified limits. |
| Criterion B | Temporary impairment to operational behavior that is corrected by the device itself. |
| Criterion C | Temporary adverse effects on the operating behavior, which the device corrects automatically or which can be restored by actuating the operating elements. |

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Classifications

ECLASS

| | |
|-------------|----------|
| ECLASS-11.0 | 27040701 |
| ECLASS-12.0 | 27040701 |
| ECLASS-13.0 | 27040701 |

ETIM

| | |
|----------|----------|
| ETIM 9.0 | EC002540 |
|----------|----------|

UNSPSC

| | |
|-------------|----------|
| UNSPSC 21.0 | 39121000 |
|-------------|----------|

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Environmental product compliance

| | |
|------------|--|
| REACH SVHC | Lead 7439-92-1 |
| China RoHS | Environmentally Friendly Use Period = 25; |
| | For information on hazardous substances, refer to the manufacturer's declaration available under "Downloads" |

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