CTS-120

100 … 140W SINGLE OUTPUT DC/DC CONVERTERS

GENERAL FEATURES:

Designed according to EN50155
Fire and smoke: EN45545-2 approved
High input-output isolation
Standard size Eurocard 3U
Adjustable output voltage
Input voltage OK LED
Output voltage presence LED
Remote inhibit
Option: remote sensing or alarm
Efficiency up to 89 %



	24 V_{in} 14.4 V … 30 V	36 V_{in} 21.6 V … 47 V	48 V_{in} 28.8 V … 60 V	72 V_{in} 43.2 V … 90 V	110 V_{in} 66 V … 144 V
5 V_{out}	**CTS-120-6865** 100W	**CTS-120-6885** 100W	**CTS-120-6869** 100W	**CTS-120-6873** 100W	**CTS-120-6877** 100W
12 V_{out}	**CTS-120-6866** 120W	**CTS-120-6886** 120W	**CTS-120-6870** 120W	**CTS-120-6874** 120W	**CTS-120-6878** 120W
24 V_{out}	**CTS-120-6867** 120W	**CTS-120-6887** 140W	**CTS-120-6871** 140W	**CTS-120-6875** 140W	**CTS-120-6879** 140W
48 V_{out}	**CTS-120-6868** 120W	**CTS-120-6888** 140W	**CTS-120-6872** 140W	**CTS-120-6876** 140W	**CTS-120-6880** 140W
110 V_{out}	**TBD**	**TBD**	**TBD**	**TBD**	**CTS-120-6881** 140W

Several references are subjected to special MOQs and lead times. Please consult Premium's Sales Dept. and web site.

Specifications are subject to change without notice. These products are not intended for use as critical components in life support or nuclear systems.

INPUT	
Input voltage range	See table
Input undervoltage shutdown	55 % to 60 % $V_{in\ nom}$
Maximum allowed input ripple	15 % V_{in} nom (EN50155)
OUTPUT	
Output voltage	See table
Output voltage adjustment	
$V_{in\ min}$ = 60 % $V_{in\ nom}$	-10 % ... +0 % $V_{out\ nom}$
$V_{in\ min}$ = 70 % $V_{in\ nom}$	-10 % ... +15 % $V_{out\ nom}$
Line regulation (I_{out} = nom)	< 0,2 % (I_{out} = nom)
Load regulation (V_{in} = nom)	< 0,2 % (V_{in} = nom; I_{out}: 0…100%)
Ripple	< 50 mV_{pp}
Noise (BW = 20 MHz)	< 100 mV_{pp}
ENVIRONMENTAL	
Storage temperature	-40 ºC … 85 ºC
Operating temperature range at Io = 100 %	-25 ºC ... 60 ºC (-40 °C … 60 ºC, see note-1)
Operating temperature range at Io = 75 %	-25 ºC ... 70 ºC (-40 °C … 70 ºC, see note-1)
Operating temperature range at Io = 37.5 %	-25 ºC ... 85 ºC (-40 °C … 85 ºC, see note-1)
Maximum Relative humidity	95 % with no condensation
Shock and vibration	EN61373 Category 1 class B body mounted
MTBF	500.000 h at 40°C according to IEC61709
EMC	
Emission	EN50121-4, EN50121-3-2
Immunity	EN50121-4, EN50121-3-2
SAFETY	
Safety	EN60950-1, EN62368-1, EN50155
Dielectric strength Input / Output	3000 V_{ac}, 4200 V_{dc} 1 min.
Dielectric strength Input / Earth	1500 V_{ac}, 2100 V_{dc} 1 min.
Dielectric strength Output / Earth	1500 V_{ac}, 2100 V_{dc} 1 min.
Fire and smoke	EN45545-2:2013 +A1:2015
MECHANICAL	
Approximate weight	430 g
Dimensions	100 x 160 x 38.5 mm
CONTROL	
Remote inhibit range	5 V ... 24 V
Remote sense (option)	< 0.3 V per pole
Low output voltage alarm (option)	Threshold: 0.85…0.90 $V_{out\ nom}$. Open when alarm Isolated solid state relay: max. 100 mA, 160 V_{dc}
PROTECTIONS	
Against overloads and short-circuits	Current limiting
Against reverse input voltage.	Input fuse
Against input under-voltage.	Under-voltage lock-out
Against Input over-currents	Input fuse

Note-1: The unit can start up and work at an ambient temperature of -40 °C with the following restrictions:

- Do not handle the connection terminals below -25 °C.
- The output ripple can rise up to 150 mV_{pp} at -40 °C

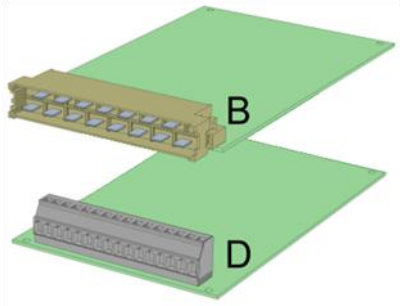
ORDERING CODES

Part Number	Input			Output			
	Nom voltage	Voltage range	Max current	Max Power	Nom Voltage	Max Current	Efficiency
	[V]	[V]	[A]	[W]	[V]	[A]	[%]
CTS-120-6865	24	14.4 - 30	8.90	100	5	20	78
CTS-120-6866	24	14.4 - 30	10.0	120	12	10	83
CTS-120-6867	24	14.4 - 30	9.92	120	24	5	84
CTS-120-6868	24	14.4 - 30	9.80	120	48	2.5	85
CTS-120-6885	36	21.6 - 47	5.86	100	5	20	79
CTS-120-6886	36	21.6 - 47	6.61	120	12	10	84
CTS-120-6887	36	21.6 - 47	7.54	140	24	5.83	86
CTS-120-6888	36	21.6 - 47	7.37	140	48	2.92	88
CTS-120-6869	48	28.8 - 60	4.40	100	5	20	79
CTS-120-6870	48	28.8 -60	4.96	120	12	10	84
CTS-120-6871	48	28.8 - 60	5.65	140	24	5.83	86
CTS-120-6872	48	28.8 - 60	5.52	140	48	2.92	88
CTS-120-6873	72	43.2 - 90	2.93	100	5	20	79
CTS-120-6874	72	43.2 - 90	3.31	120	12	10	84
CTS-120-6875	72	43.2 - 90	3.77	140	24	5.83	86
CTS-120-6876	72	43.2 - 90	3.68	140	48	2.92	88
CTS-120-6877	110	66 - 144	1.89	100	5	20	80
CTS-120-6878	110	66 - 144	2.14	120	12	10	85
CTS-120-6879	110	66 - 144	2.44	140	24	5.83	87
CTS-120-6880	110	66 - 144	2.38	140	48	2.92	89
CTS-120-6881	110	66 - 144	2.38	140	110	1.27	89

Several references are subjected to special MOQs and lead times. Please consult Premium's Sales Dept. and web site.

CTS–120–68_ _–_ _

- **B** DIN41612H15
- **D** Spring clamp terminal
- **M** IP30 case
- **H** With alarm (Optional)
- **G** With base NP-9124 (Optional)
- Model number



M

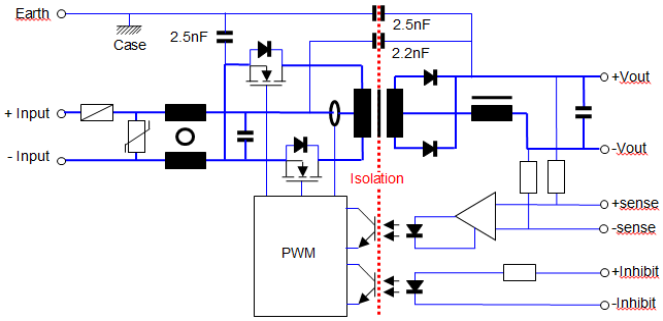


OPTION EN50155 S2 Class Interruptions of 10 ms Only input models 72 V or 110 V (Confirm MOQ)	**CTS–120–68 _ _.S2 - _ _**

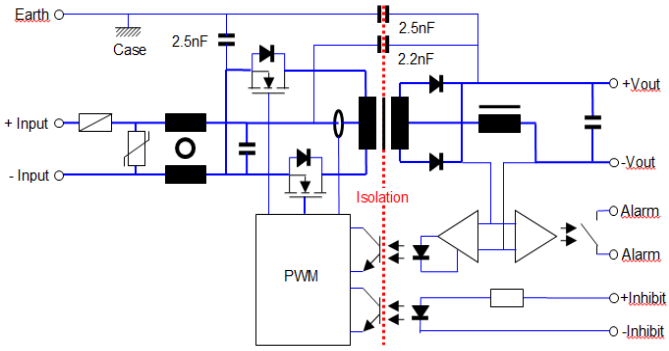
Accessories must be ordered in a separated order line

LOCKS DIAGRAM

Option: Remote sensing



Option: Alarm



DESCRIPTION

The CTS-120 series consists of DC-DC converters, with a galvanic isolation between input and output. The converters operate at a fixed switching frequency and use push-pull converter topology.

There are two options to choose:

1 - With remote sensing

2 - With low output voltage alarm

For maximum regulation, the remote sensing terminals can be connected to the load. This will allow a power cable voltage drop of up to 0.3 V on each cable to be offset.

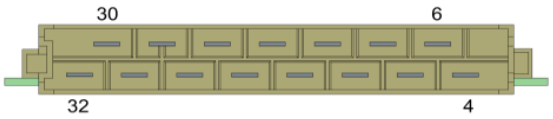
The device is protected against overload and short-circuits by means of a current limiting circuit.

The device is also protected against reverse polarity input voltage, and the input fuse blows if an improper connection is made.

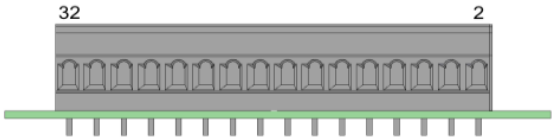
When a converter input undervoltage condition occurs, the converter is disabled, thus preventing the battery from becoming totally discharged. Once the input is within the range the unit restarts automatically.

CONNECTIONS

Connector DIN41612H15 (Max. 12A / terminal)



Spring clamp terminals (Max. 12A / terminal)



Option: Remote Sensing		
Terminal Function	PCB Marking	Terminal No.
-Input	-IN	(2), 4, 6
+Input	+IN	8,10
-Inhibit	-I	12
+Inhibit	+I	14
Earth	⏚	16
-Sense	-S	18
-Output	-OUT	20, 22, 24
+ Output	+OUT	26, 28, 30
+Sense	+S	32

Option: Alarm		
Terminal Function	PCB Marking	Terminal No.
-Input	-IN	(2), 4, 6
+Input	+IN	8,10
-Inhibit	-INH	12
+Inhibit	+INH	14
Earth	⏚	16
Alarm	+AL	18
Alarm	-AL	20
-Output	-OUT	22, 24, 26
+Output	+OUT	28, 30, 32

INSTALLATION

There are two connecting options:

- DIN-41612-H15 connector
- Spring clamp terminals

The product can be mounted:

- On a chassis by means of the 4 corner holes.
- In EUROCARD racks. For this application there is a standard 9Te front plate accessory reference **NP-9155**
- With the base reference **NP-9124.** This accessory can be mounted on a chassis or in DIN rail adding the clip accessory **NP-9135**.

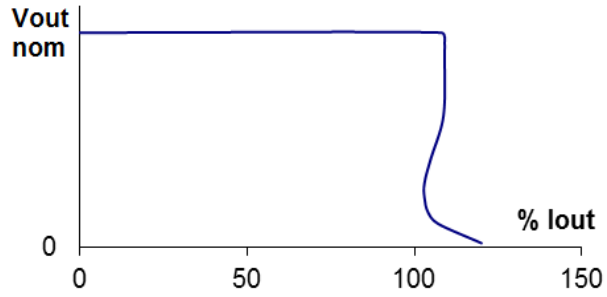
START-UP

Perform connection as per the table. Use of remote sensing is not absolutely necessary, but if this is required, use of a co-axial or a twisted-pair cable is recommended.

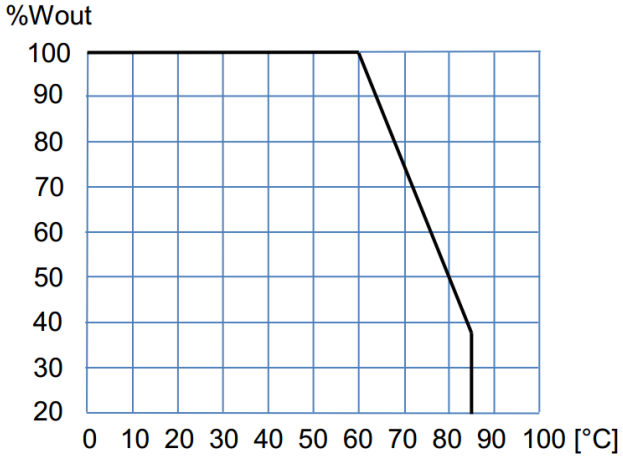
WARNING: If the load is connected to the tabs of remote sensing (+/-S) and the connection from the output to this load is missing the remote sensing function could make unusable due to the acting of the internal fuse of protection.

If power levels close to the maximum output are required,

TYPICAL OUTPUT CHARACTERISTIC



POWER DERATING vs AMBIENT TEMP.



make sure the assembly enhances cooling by natural convection and the card is placed in vertical position.

If several converters need to be connected in parallel, do the following:

Set the output voltage for all converters featuring a mutual difference as small as possible.

Join the load outputs by using cables with a cross-section no greater than the one required and of equal length.

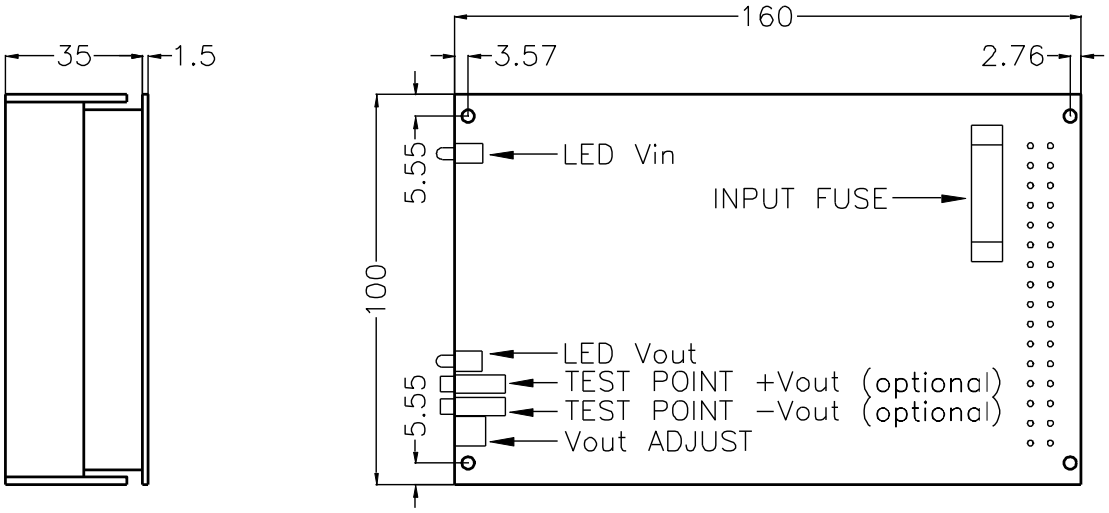
Do not use remote sensing.

For safety reasons, the following requirements must be complied with:

Provide the equipment with some kind of protective enclosure that complies with the electrical safety directives in effect within the country where the equipment is installed.

Only replace the fuse with another fuse of the same rating and type, and only after disconnecting the converter from DC power.

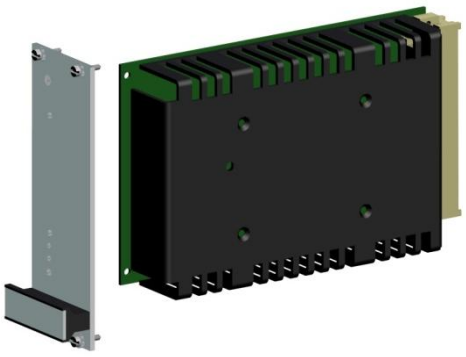
DIMENSIONS



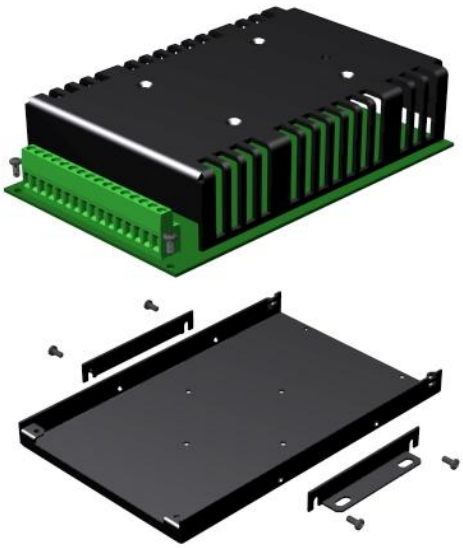
ACCESSORIES

ACCESSORIES	CODE
Rack 19'' frontal panel (3U 9TE)	NP-9155
Mounting base	NP-9124
Din rail clip for mounting base	NP-9135
Connector DIN 41612 H15 female for IP30 case	2601-379
Redundant connection for two units (ORing diodes + alarms contacts)	ACD-15, ACD-25

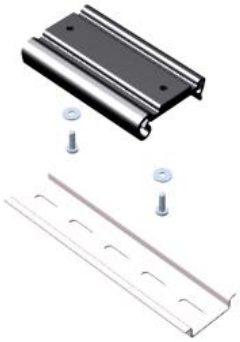
NP-9155



NP-9124



NP-9135



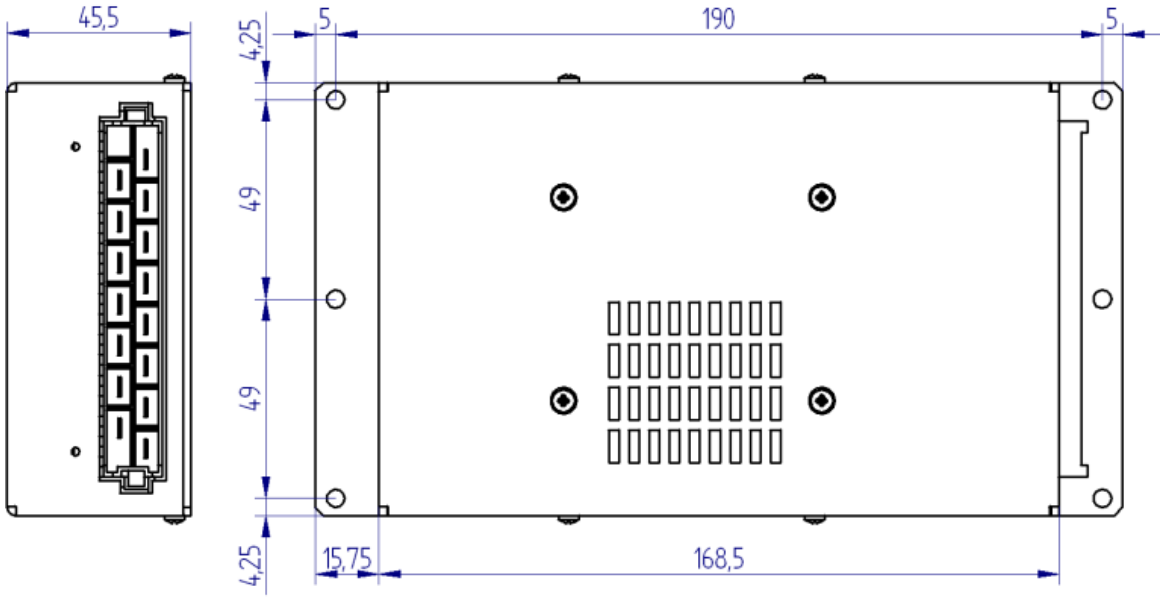
IP30 CASEwithDIN41612H15 male and Connector fastener



2601-379



Connector DIN 41612 H15 female
Cage Clamp terminal for cables up to 1.5 mm²
Model Harting 09 06 015 2813



CE EU DECLARATION OF CONFORMITY

The undersigned, representing the following:

Manufacturer: PREMIUM, S. A.,
Address: C/ Dolors Aleu 19-21, 08908 L'Hospitalet de Llobregat, SPAIN

herewith declares that the product:

Type:	**DC/DC Converter**
Brand:	**Premium**
Models:	**CTS-120-6865, CTS-120-6866, CTS-120-6867, CTS-120-6868, CTS-120-6885, CTS-120-6886, CTS-120-6887, CTS-120-6888, CTS-120-6869, CTS-120-6870, CTS-120-6871, CTS-120-6872, CTS-120-6873, CTS-120-6874, CTS-120-6875, CTS-120-6876, CTS-120-6877, CTS-120-6878, CTS-120-6879, CTS-120-6880, CTS-120-6881** with any of the suffixes **B**, **D**, **M** or **H**

is in conformity with the provisions of the following EU directive(s):

2014/35/EU	Low voltage / The electrical equipment (safety) regulations
2014/30/EU	EMC / Electromagnetic compatibility regulations
2011/65/EU Annex II and its amendment 2015/863/EU	RoHS / Restriction of the use of certain hazardous substances in electrical and electronic equipment

This declaration applies to all specimens manufactured identical to the samples submitted for testing/evaluation.

Assessment of compliance of the product with the requirements relating to aforementioned directives, was performed by Premium S.A. and is based on the following standards:

EN IEC62368-1:2024 A11:2024	Safety. Audio/video information and communication technology equipment
EN50121-3-2: 2016 A1:2019	Railway applications. EMC Rolling stock equipment
EN50121-4: 2016 A1:2019	Railway applications. EMC of the signalling and telecommunications apparatus
EN IEC63000:2018	Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances
EN50155: 2021	Railway applications. Electronic equipment used on rolling stock material

CE marking year: **2006**

Notes:
For the fulfilment of this declaration the product must be used only for the aim that has been conceived, considering the limitations established in the instructions manual or datasheet.

L'Hospitalet de Llobregat, 19-03-2025

Manuel Camacho
Technical Director

PREMIUM S.A. is an ISO9001and ISO14001 certified company by **Bureau Veritas**

UKCA DECLARATION OF CONFORMITY

The undersigned, representing the following:

Manufacturer:	PREMIUM, S. A.,
Address:	C/. Dolors Aleu 19-21, 08908 L'Hospitalet de Llobregat, SPAIN

herewith declares that the products:

Type:	**DC/DC Inverter**
Brand:	**Premium**
Models:	**CTS-120-6865, CTS-120-6866, CTS-120-6867, CTS-120-6868, CTS-120-6885, CTS-120-6886, CTS-120-6887, CTS-120-6888, CTS-120-6869, CTS-120-6870, CTS-120-6871, CTS-120-6872, CTS-120-6873, CTS-120-6874, CTS-120-6875, CTS-120-6876, CTS-120-6877, CTS-120-6878, CTS-120-6879, CTS-120-6880** with any of the suffixes **B**, **D**, **M** or **H**

Complies with the essential protection requirements of the following regulations:

SI 2016 No 1101	Low voltage / The electrical equipment (safety) regulations
SI 2016 No 1091	EMC / Electromagnetic compatibility regulations
SI 2012 No. 3032	RoHS / Restriction of the use of certain hazardous substances in electrical and electronic equipment

This declaration applies to all specimens manufactured identical to the samples submitted for testing/evaluation.

Assessment of compliance of the product with the requirements relating to aforementioned regulations, was performed by Premium S.A. and is based on the following standards:

EN IEC62368-1:2024 + A11:2024	Safety. Audio/video information and communication technology equipment
EN50121-3-2: 2016 + A1:2019	Railway applications. EMC Rolling stock equipment
EN50121-4: 2016 + A1:2019	Railway applications. EMC of the signalling and telecommunications apparatus
EN IEC63000:2018	Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances
EN50155: 2021	Railway applications. Electronic equipment used on rolling stock material

UKCA marking year: **2021**

Notes:
For the fulfilment of this declaration the product must be used only for the aim that has been conceived, considering the limitations established in the instructions manual or datasheet.

L'Hospitalet de Llobregat, 19-03-2025

Manuel Camacho
Technical Director

PREMIUM S.A. is an ISO9001and ISO14001 certified company by **Bureau Veritas**

ANNEXE

<table>
<tr><th colspan="3">Applicable values for the different sections of the norm EN50155: 2017</th></tr>
<tr><td>4.4.1</td><td>Working altitude</td><td>Up to 2000m</td></tr>
<tr><td>4.4.2</td><td>Ambient temperature</td><td>Class OT1 (-25 to 55°C): load < 100%
Class OT2 (-40 to 55°C): load < 100% (Without connectors handling and output ripple <150mVpp)
Class OT3 (-25 to 70°C): load <75%
Class OT4 (-40 to 70°C): load <75% (Without Connectors handling and output ripple <150mVpp)
Class OT5 (-25 to 85°C): load <37.5%
Class OT6 (-40 to 85°C): load <37.5% (Without Connectors handling and output ripple <150mVpp)</td></tr>
<tr><td>4.4.3</td><td>Switch-on extended operating temp.</td><td>ST1</td></tr>
<tr><td>4.4.4</td><td>Rapid temperature variations</td><td>H1</td></tr>
<tr><td>4.4.5</td><td>Shocks and vibrations</td><td>According EN61373:2010 Category 1 class B</td></tr>
<tr><td>4.4.6</td><td>EMC Electromagnetic Compatibility

EN50121-3-2:2016
EN50121-4:2016</td><td>
<table>
<tr><th>Test</th><th>Norm</th><th>Port</th><th>Frequency</th><th>Limits</th></tr>
<tr><td rowspan="4">Radiated emissions</td><td rowspan="4">IEC55016</td><td rowspan="4">Case</td><td>30MHz…230MHz</td><td>40dB(µV/m) Qpk at 10m</td></tr>
<tr><td>230MHz…1GHz</td><td>47dB(µV/m) Qpk at 10m</td></tr>
<tr><td>1…3GHz</td><td rowspan="2">Do not apply
Internal freq. < 108MHz</td></tr>
<tr><td>3…6GHz</td></tr>
<tr><td>Conducted emissions</td><td>IEC55016</td><td>Input</td><td>150kHz…500kHz</td><td>79dB(µV) Qpk, 66dB(µV) Av</td></tr>
<tr><td></td><td></td><td></td><td>500kHz…30MHz</td><td>79dB(µV) Qpk, 60dB(µV) Av</td></tr>
</table>
<table>
<tr><th>Test</th><th>Norm</th><th>Port</th><th>Severity</th><th>Conditions</th><th>P</th></tr>
<tr><td rowspan="2">Electrostatic discharge</td><td rowspan="2">IEC61000-4-2</td><td rowspan="2">Case</td><td>±8kV</td><td>Air (isolated parts)</td><td rowspan="2">B</td></tr>
<tr><td>±8kV</td><td>Contact (conductive parts)</td></tr>
<tr><td rowspan="4">Radiated high-frequency</td><td rowspan="4">IEC61000-4-3</td><td rowspan="4">X/Y/Z Axis</td><td>20V/m</td><td>0.08…1.0GHz M. 80% 1kHz</td><td rowspan="4">A</td></tr>
<tr><td>10V/m</td><td>1.4…2.1GHz M. 80% 1kHz</td></tr>
<tr><td>5V/m</td><td>2.1…2.5GHz M. 80% 1kHz</td></tr>
<tr><td>3V/m</td><td>5.1…6Ghz M. 80% 1kHz</td></tr>
<tr><td rowspan="4">Fast transients</td><td rowspan="4">IEC61000-4-4</td><td>Input</td><td rowspan="3">±2kV</td><td rowspan="3">Tr/Th: 5/50 ns</td><td rowspan="3">A</td></tr>
<tr><td>Output</td></tr>
<tr><td>Signal</td></tr>
<tr><td>PE</td><td>±1kV</td><td>A</td></tr>
<tr><td rowspan="2">Surge</td><td rowspan="2">IEC61000-4-5</td><td>Input L to L</td><td>±1kV</td><td rowspan="2">Tr/Th: 1.2/50µs</td><td rowspan="2">B</td></tr>
<tr><td>Input L to PE</td><td>±2kV</td></tr>
<tr><td rowspan="4">Conducted RF</td><td rowspan="4">IEC61000-4-6</td><td>Input</td><td rowspan="4">10V</td><td rowspan="4">0.15...80MHz M. 80% 1kHz</td><td rowspan="4">A</td></tr>
<tr><td>Output</td></tr>
<tr><td>Signal</td></tr>
<tr><td>PE</td></tr>
<tr><td>Magnetic field</td><td>IEC61000-4-8</td><td>X/Y/Z Axis</td><td>300A/m</td><td>0Hz, 16.7Hz, 50/60Hz</td><td>A</td></tr>
</table>
P= Performance criteria, L= Line, PE= Protective Earth
</td></tr>
<tr><td>4.4.7</td><td>Relative humidity</td><td>Up to 95%</td></tr>
<tr><td>5.2.2</td><td>DC power supply range</td><td>
<table>
<tr><td>From 0.60 to 0.70 Un 0.1s</td><td>Performance criteria A</td></tr>
<tr><td>From 0.70 to 1.25 Un continuous</td><td>Performance criteria A</td></tr>
<tr><td>From 1.25 to 1.40 Un 0.1s</td><td>Performance criteria A</td></tr>
<tr><td>From 1.25 to 1.40 Un 1s</td><td>Performance criteria C</td></tr>
</table>
</td></tr>
<tr><td>5.2.4</td><td>Interruptions of voltage supply</td><td>Class S2</td></tr>
<tr><td>5.2.5</td><td>Supply change-over</td><td>Class C1 (0.6 Un duration 100ms without interruptions. Performance criterion A)</td></tr>
<tr><td>5.2.7</td><td>Input ripple factor</td><td>10% peak to peak with a DC Ripple Factor of 5 %</td></tr>
<tr><td>7.2.7</td><td>Input reverse polarity protection</td><td>By fuse</td></tr>
<tr><td>10.7</td><td>Protective coating for PCB assemblies</td><td>Class PC2</td></tr>
<tr><td>13.3</td><td>Tests list</td><td>
<table>
<tr><td>1</td><td>Visual Inspection</td><td>Routine</td></tr>
<tr><td>2</td><td>Performance test</td><td>Routine</td></tr>
<tr><td>3</td><td>Power supply test</td><td>Type</td></tr>
<tr><td>4</td><td>Low temperature start-up test</td><td>Type</td></tr>
<tr><td>5</td><td>Dry heat test</td><td>Type</td></tr>
<tr><td>6</td><td>Low temperature storage test</td><td>-</td></tr>
<tr><td>7</td><td>Insulation test</td><td>Routine</td></tr>
<tr><td>8</td><td>Cyclic damp heat test</td><td>Type</td></tr>
<tr><td>9</td><td>EMC test</td><td>Type</td></tr>
<tr><td>10</td><td>Shocks and vibrations test</td><td>Type</td></tr>
<tr><td>11</td><td>Enclosure protection test (IP code)</td><td>-</td></tr>
<tr><td>12</td><td>Equipment stress screening test</td><td>Routine: 40°C and load 100%</td></tr>
<tr><td>13</td><td>Rapid Temperature variation test</td><td>-</td></tr>
<tr><td>14</td><td>Salt mist test</td><td>-</td></tr>
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