Ref. Certif. No.

NO111617

IEC SYSTEM FOR MUTUAL RECOGNITION OF TEST CERTIFICATES FOR ELECTRICAL EQUIPMENT (IECEE) CB SCHEME

SYSTEME CEI DACCEPTATION MUTUELLE DE CERTIFICATS DESSAIS DES EQUIPEMENTS ELECTRIQUES (IECEE) METHODE OC

CB TEST CERTIFICATE CERTIFICAT D'ESSAI OC

Product Produit	DC-DC Converter
Name and address of the applicant Nom et adresse du demandeur	Bel Fuse Inc. 206 Van Vorst St. Jersey City, NJ 07302 USA
Name and address of the manufacturer Nom et adresse du fabricant	Bel Fuse Inc. 206 Van Vorst St. Jersey City, NJ 07302 USA
Name and address of the factory Nom et adresse de l'usine Note: When more than one factory, please report on page 2 Note: Lorsque il y plus d'une usine, veuillez utiliser la deuxième page	☑ Additional information on page 2
Ratings and principal characteristics Valeurs nominales et caractéristiques principales	Input: 9 - 36 Vdc, 20 A
Trademark (if any) Marque de fabrique (si elle existe)	bel
Type of Manufacturer's Testing Laboratories used Type de programme du laboratoire d'essais constructeur	
Model / Type Ref. Ref. De type	0RQB-C2Q12X series
Additional information (if necessary may also be reported on page 2) Les informations complémentaires (si nécessaire, peuvent être indiqués sur la deuxième page	Output: 12Vdc, 13A max ☐ Additional information on page 2
A sample of the product was tested and found to be in conformity with Un échantillon de ce produit a été essayé et a été considéré conforme à la	IEC 62368-1:2018
As shown in the Test Report Ref. No. which forms part of this Certificate Comme indiqué dans le Rapport dessais numéro de référence qui constitue partie de ce Certificat	397436

This CB Test Certificate is issued by the National Certification Body
Ce Certificat dessai OC est établi par l'Organisme **National de Certification**

Nemko

Philip Pedersen vei 11,
NO-1366 Lysaker, Norway

Date: 21-04-2020

Signature: Juan Z. Saussey
Certification Department

BPS Asia Pacific Electronics (Shenzhen) Co., Ltd.
Building# 6, Nanming Road, Gongming Town Huahong
Xintong Industrial Park, Guangming District
Shenzhen 518108
China

Zhongshan Wing Ming Electronic Limited
86 Du Xing Dong Road,, Du Tou, South District
Zhongshan City Guangdong Province 528455
China

Nemko
Philip Pedersen vei 11,
NO-1366 Lysaker, Norway

Date: 21-04-2020

Signature: Juan Z. Saussey
Certification Department

TEST REPORT
IEC 62368-1
Audio/video, information and communication technology equipment
Part 1: Safety requirements

Report Number..... :	397436
Date of issue ..... :	20 April, 2020
Total number of pages..... :	65
Name of Testing Laboratory preparing the Report..... :	Nemko USA Inc.
Applicant's name ..... :	Bel Fuse Inc.
Address ..... :	206 Van Vorst St., Jersey City, NJ 07302, USA
Test specification:	
Standard..... :	IEC 62368-1: 2018
Test procedure..... :	CB Scheme
Non-standard test method..... :	N/A
Test Report Form No. ..... :	IEC62368_1C
Test Report Form(s) Originator.... :	UL(US)
Master TRF..... :	Dated 2019-01-17

If this Test Report Form is used by non-IECEE members, the IECEE/IEC logo and the reference to the CB Scheme procedure shall be removed.

This report is not valid as a CB Test Report unless signed by an approved CB Testing Laboratory and appended to a CB Test Certificate issued by an NCB in accordance with IECEE 02.

General disclaimer:

The test results presented in this report relate only to the object tested.
This report shall not be reproduced, except in full, without the written approval of the Issuing CB Testing Laboratory. The authenticity of this Test Report and its contents can be verified by contacting the NCB, responsible for this Test Report.

Test item description..... :	DC-DC Converter
Trade Mark..... :	bel
Manufacturer..... :	Same as Applicant
Model/Type reference..... :	0RQB-C2Q12 series (See General product information for model designations)
Ratings..... :	Input: 9 - 36 Vdc, 20 A Output: 12Vdc, 13A max (See General product information for ratings)

Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):			
☒	**CB Testing Laboratory:**	Nemko USA Inc.	
Testing location/ address..... :		2210 Faraday Ave. Suite 150, Carlsbad, CA 92008, USA	
Tested by (name, function, signature)..... :			
Approved by (name, function, signature).. :			
☐	**Testing procedure: CTF Stage 1:**		
Testing location/ address..... :			
Tested by (name, function, signature)..... :			
Approved by (name, function, signature).. :			
☐	**Testing procedure: CTF Stage 2:**		
Testing location/ address..... :			
Tested by (name + signature)..... :			
Witnessed by (name, function, signature). :			
Approved by (name, function, signature).. :			
☒	**Testing procedure: CTF Stage 3:**	BPS Asia Pacific Electronics (Shenzhen) Co., Ltd.	
☐	**Testing procedure: CTF Stage 4:**		
Testing location/ address..... :		Building#6, Nanming Road, Gongming Town Huahong Xintong Industrial Park Guangming District 518108 Shenzhen PEOPLE'S REPUBLIC OF CHINA	
Client Representative (name, function, signature) ..... :		Editha Vergara (Customer Representative)	
Project Engineer (name, function, signature) ..... :		Jeff Busch (Project Handler)	
Approved by (name, function, signature).. :		George Daverin (Verificator)	

List of Attachments (including a total number of pages in each attachment):

Attachment 1: Europe Group National Differences and National Differences according to EN 62368-1:2014 +A11:2017 (9 pages) (according to IEC 62368-1:2014)

Attachment 2: National Differences: USA and Canada (8 pages)

Attachment 3: Photos (4 pages)

Attachment 4: Miscellaneous Documentation, e.g. Constructions, PWB drawing, Schematic, etc. (7 pages)

(Not for publication – Engineering use only)

Summary of testing:

The equipment is a component, open frame brick switch mode power supply with secondary DC input (ES1/PS3) and DC voltage output (ES1/PS3) for building-in.

Intended location: The equipment is to be installed in the end product where the suitability of installation is to be evaluated in the end product.

Safety Instructions: Instructions shall be supplied in a language suitable for the country into which the product is to be sold.

Maximum operating temperatures: Equipment for building-in. Heating test was conducted monitoring the internal components temperature. Accessibility to high component temperature must be considered on end system equipment.

Equipment markings: Identification marking (trade-mark and model name) are marked on the equipment. However, the durability test was not considered because the equipment is a component level product for building-in. Therefore, the marked surface is not to be located in an external area where it is likely to be cleaned with cleaning solution, rubbed, etc.

The unit tested is prototype with all possible options and worst case of the family models when necessary. The following tests have been performed with acceptable results.

Tests performed (name of test and test clause):	**Testing location:**
5.4.1.8 Determination of working Voltage measurement 5.4.2, 5.4.3 Minimum clearances/creepage distances 5.4.8 Humidity 5.4.9 Electric Strength tests 6.2.2 Power source circuit classifications 5.4.1.4, 9.3, B.1.5, B.2.6 – Temperature measurements B.2.5 Input B.3, B.4 Abnormal operating and fault condition tests	BPS Asia Pacific Electronics (Shenzhen) Co., Ltd. Building#6, Nanming Road, Gongming Town Huahong Xintong Industrial Park Guangming District 518108 Shenzhen PEOPLE'S REPUBLIC OF CHINA

Summary of compliance with National Differences (List of countries addressed):

The list of countries recognizing the CB Scheme is actively updated on the iecee.org website.

All CENELEC members according to EN 62368-1:2014 +A11:2017.

All National Differences listed in the IECEE Online Bulletin are covered by the Common Modifications, Special National Conditions, National Differences, and the National Requirements noted above except for the following countries which are documented in National Differences Appendixes attached to this report.

Canada/USA

☒ **The product fulfils the requirements of IEC 62368-1:2018/EN 62368-1:2014 +A11:2017.**

Copy of marking plate:

The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs that own these marks.

Calibration	All instruments used in the tests given in this test report are calibrated and traceable to national or international standards. Further information about traceability will be given on request.
Measurement uncertainty	Measurement uncertainties are calculated for all instruments and instrument set-ups given in this report. Calculations are based on the principles given in the standard EA-4/02 (Dec. 1999), IEC Guide 115:2007, and other relevant internal Nemko-procedures. Further information about measurement uncertainties will be given on request.
Evaluation of results	If not explicitly stated otherwise in the standard, the test is passed if the measured value is equal to or below (above) the limit line, regardless of the measurement uncertainty. If the measured value is above (below) the limit line, the test is not passed - ref IEC Guide 115:2007. The instrumentation accuracy is within limits agreed by IECEE-CTL.

Test item particulars:	
Product group ..... :	☐ end product ☒ built-in component
Classification of use by ..... :	☐ Ordinary person ☐ Children likely present ☒ Instructed person ☒ Skilled person
Supply connection ..... :	☐ AC mains ☐ DC mains (Secondary) (Regulated source) ☒ not mains connected: ☒ ES1 ☐ ES2 ☐ ES3
Supply tolerance ..... :	☐ +10%/-10% ☐ +20%/-15% ☐ + %/ - % ☒ None
Supply connection – type ..... :	☐ pluggable equipment type A - ☐ non-detachable supply cord ☐ appliance coupler ☐ direct plug-in ☐ pluggable equipment type B - ☐ non-detachable supply cord ☐ appliance coupler ☐ permanent connection ☐ mating connector ☒ other: component for building-in
Considered current rating of protective device ..... :	☒ Not applicable, component for building-in Location: ☐ building ☒ equipment ☐ N/A
Equipment mobility ..... :	☐ movable ☐ hand-held ☐ transportable ☐ direct plug-in ☐ stationary ☒ for building-in ☐ wall/ceiling-mounted ☐ SRME/rack-mounted ☒ other: component for building-in
Overvoltage category (OVC) ..... :	☐ OVC I ☐ OVC II ☐ OVC III ☐ OVC IV ☒ other:
Class of equipment ..... :	☐ Class I ☐ Class II ☐ Class III ☐ Not classified ☒ open frame unit intended for building-in
Special installation location ..... :	☒ N/A ☐ restricted access area ☐ outdoor location ☐
Pollution degree (PD) ..... :	☐ PD 1 ☒ PD 2 ☐ PD 3
Manufacturer's specified T_{ma} ..... :	Maximum 85 °C ☐ Outdoor: minimum °C
IP protection class ..... :	☒ IPX0 ☐ IP20
Power systems ..... :	☐ TN ☐ TT ☐ IT - V_{L-L} ☒ not AC mains
Altitude during operation (m) ..... :	☐ 2000 m or less ☒ 5000 m
Altitude of test laboratory (m) ..... :	☐ 2000 m or less ☒ 38 m
Mass of equipment (kg) ..... :	64 g

Possible test case verdicts:	
- test case does not apply to the test object ... :	N/A
- test object does meet the requirement ..... :	P (Pass)
- test object does not meet the requirement ... :	F (Fail)
Testing:	
Date of receipt of test item ..... :	2020-03-05
Date (s) of performance of tests..... :	2020-03-12 to 2020-03-26
General remarks:	
"(See Enclosure #)" refers to additional information appended to the report. "(See appended table)" refers to a table appended to the report. **Throughout this report a ☐ comma / ☒ point is used as the decimal separator.**	
Manufacturer's Declaration per sub-clause 4.2.5 of IECEE 02:	
The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided..... :	☒ **Yes** ☐ **Not applicable**
When differences exist; they shall be identified in the General product information section.	
Name and address of factory (ies) ..... :	BPS Pacific Electronics (Shenzhen) Co.,Ltd. Building# 6, Nanming Road, Gongming Town Huahong Xintong Industrial Park Guangming District 518108 Shenzhen PEOPLE'S REPUBLIC OF CHINA Zhongshan WING MING Electronic Limited 86 Du Xing Dong Road, Du Tou, South District Zhongshan City, Guangdong Province, China

General product information and other remarks:

The subject models are component type DC-DC converters, open frame constructions (no enclosure provided), intended for building-in, provided with input and output pins for solder mount on PWB or for plugging into special end-use sockets.
The input power is derived from an isolated secondary or battery.

TYPICAL MODEL DESIGNATION:

0	R	QB	-	C2	Q	12	X	Y
I	II	III	-	IV	V	VI	VII	VIII

I – Mounting Type: 0 = Through hole mount

II – RoHS Status: R = RoHS

III – Series Name: QB = 1/4th Brick

IV – Output Power: C2 = 156 W

V – Input Range: Q = 9-36 VDC typical

VI – Output Voltage: 12 = 12 VDC

VII – Options suffix: Active Logic:

L = Active low, with baseplate

0 = Active high, with baseplate

VIII – Options suffix: Package Type:

G = Tray package

Or any other alphanumeric characters for non-safety changes

CONDITIONS OF ACCEPTABILITY (Considerations used to test a component or sub-assembly):

When installed in the end use equipment, the following are among the consideration to be made:

1) Equipment shall be installed only by trained service personnel, according to the manufacturer product specifications.
2) Unit is intended to be supplied from an isolated secondary circuit and has been evaluated for basic safeguard between the input and output circuits per manufacture specification.
3) The input and output connectors (pins) are suitable for factory wiring only.
4) The unit has been evaluated for use in a Pollution Degree 2 environment, the Creepage values of PSU have been evaluated for material group IIIb.
5) Abnormal and Component Failure Test were conducted with the power supply unit (PSU) input protected by an external fuse. External fuse is Fast blow, 30A, 500Vac. Additional testing maybe necessary if higher rating fuse is used.
6) The input/output of PSU is Electrical energy source class 1 (ES1), The output of PSU is Power source class 3 (PS3).
7) Installation instructions and equipment markings related to safety shall be provided in a language acceptable in the country in which the equipment is to be installed.
8) If the input meets all the requirements for ES1 the outputs may be considered ES1. Output voltage remain within ES1 limits, even with internally generated non-ES1 voltages.
9) The unit is tested for a manufacturer's recommended ambient maximum temperature as follows:

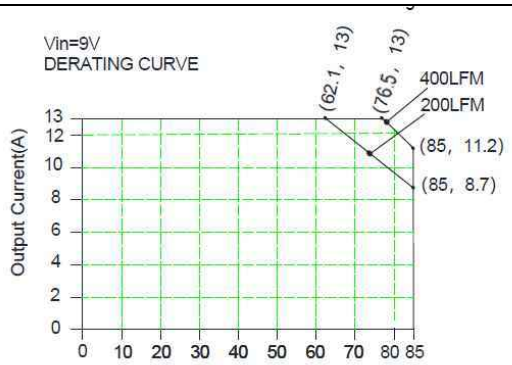

Figure 3. Derating curve @Vin=9V

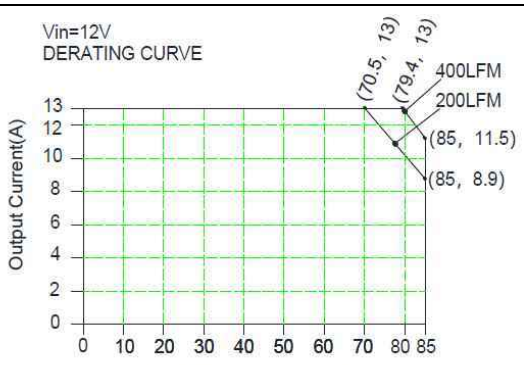

Figure 4. Derating curve @Vin=12V

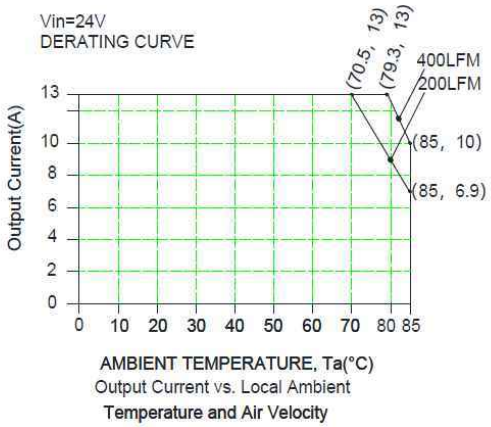

Figure 5. Derating curve @Vin=24V

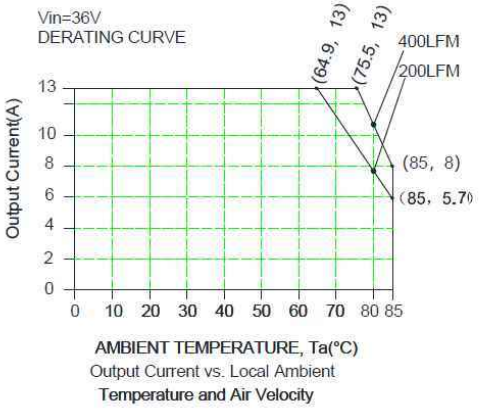

Figure 6. Derating curve @Vin=36V