Certificate of Compliance

Certificate: 70025407 **Master Contract:** 170351

Project: 70025407 **Date Issued:** March 04, 2015

Issued to: **Bel Fuse Inc.**
206 Van Vorst St
Jersey City, New Jersey 07302
USA

Attention: Editha S. Vergara

The products listed below are eligible to bear the CSA Mark shown with adjacent indicators 'C' and 'US' for Canada and US or with adjacent indicator 'US' for US only or without either indicator for Canada only.

Issued by: Juan-Carlos Olivera
Juan-Carlos Olivera, MSc.

PRODUCTS

CLASS - C531111 - POWER SUPPLIES-Component Type(CSA 60950-1-07-2nd Ed)
CLASS - C531191 - POWER SUPPLIES-Component Type(UL 60950-1-2nd Ed)Certified to U.S.Stds

For details related to rating, size, configuration, etc. reference should be made to the CSA Certification Record or the descriptive report.

Component type power supplies intended for use with Information Technology and Business Equipment, where the suitability of the combination is to be determined by CSA Group.

DC-DC Power Supply, Model SSQL Series, rated Input: 36-75 V dc (48 V dc nominal), specified as follows:

SSQL	48	T	20	033	-X
I	II	III	IV	V	VI

I - Product Series, Eighth Brick Format: SQL

II - Input Voltage:

48 = 36 - 75 V dc: 48 V dc nominal

III - Mounting Scheme

T = Through Hole
S = Surface Mount

IV - Output Current Rating:

15 = 15 A
20 = 20 A

V - Output Voltage Rating:

033 = 3.3 Volts dc

VI - Optional Suffixes (denoting non-safety critical options)

APPLICABLE REQUIREMENTS

CAN/CSA-C22.2 No 60950-1-07, +Am.1:2011 +Am.2:2014	–	Information Technology Equipment - Safety - Part 1: General Requirements
ANSI/UL 60950-1-2014	–	Information Technology Equipment - Safety - Part 1: General Requirements

Supplement to Certificate of Compliance

Certificate: 70025407 **Master Contract:** 170351

The products listed, including the latest revision described below, are eligible to be marked in accordance with the referenced Certificate.

Product Certification History

Project	Date	Description
70025407	Mar 4 2015	DC to DC Converter, Model SSQL series. (C/US) (transferred from 173688 - 2393716 and upgraded to include Am1 and Am2)

CERTIFICATE

No. P15220497

Order No. 297540

Product	DC/DC Converter
Applicant	Bel Fuse Inc. 206 Van Vorst St. Jersey City, NJ 07302 USA
Manufacturer	Bel Fuse Inc. 206 Van Vorst St. Jersey City, NJ 07302 USA
Factory	BCM Electronics Corporation SDN BHD Kulim Hi-tech Park, Phase 1 Plot 21, Jalan Hi-Tech 4 Kulim, Kedah Darulaman 09000 Malaysia ☐ See next page(s)
Ratings	Input: 36-75 Vdc range, 48 Vdc nominal
Trade mark	bel
Model / Type Ref.	SSQL Series
Principal characteristics	Output rating see the test report. The model name followed by two digit numeric, one alpha character, five digit numeric and may or may not be followed by a dash and the letter 'G' or additional alpha/numeric characters denoting non-safety critical options. ☐ See next page(s)
A sample of the product was tested and found to be in conformity with	OFF EN 60950-1:2006;A11;A1;A12;A2
Validity	This certificate documents conformity with the standards shown, and also applies as license for use of Nemkos name and certification mark. The certificate and license is valid as long as the applicable conditions are complied with, and provided that any changes to the product are notified to Nemko for acceptance prior to implementation. New standards or amendments to the standards may imply that the product design must be updated and/or that re-testing and re-certification is necessary.
Additional information	☐ See next page(s) The abovementioned certified equipment complies with current regulatory requirements regarding electrical safety in Norway and other EU/EEA member states, as far as this can be checked. Compliance with requirements regarding building-in, protection against electric shock and Electromagnetic Compatibility (EMC) must be checked when the equipment is built-in a completed product or forms a part of a complete system.
Additional model(s)	☐ See next page(s)

Date of issue 24-11-2015

Juan Z. Kleppenes

Certification Department

Nemko AS
Gaustadalléen 30, P.O. Box 73 Blindern, 0314 Oslo, Norway
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ENTERPRISE NUMBER NO974404532

Ref. Certif. No.

NO89463

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	BCM Electronics Corporation SDN BHD Kulim Hi-tech Park, Phase 1 Plot 21, Jalan Hi-Tech 4 Kulim, Kedah Darulaman 09000 Malaysia ☐ Additional information on page 2
Ratings and principal characteristics Valeurs nominales et caractéristiques principales	Input: 36-75 Vdc range, 48 Vdc nominal
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	SSQL 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 rating see the test report. The model name followed by two digit numeric, one alpha character, five digit numeric and may or may not be followed by a dash and the letter 'G' or additional alpha/numeric characters denoting non-safety critical options. ☐ 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 60950-1(ed.2);am1;am2
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	297540

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

Nemko

Gaustadalléen 30
NO-0373 Oslo, Norway

Date: 24-11-2015

Signature: Juan Z. Kleppenes
Certification Department

TEST REPORT

IEC 60950-1

Information technology equipment – Safety – Part 1: General requirements

Report Number.....:	297540
Date of issue.....:	20 November, 2015
Total number of pages.....	42
Applicant's name.....:	Bel Fuse Inc.
Address .....:	206 Van Vorst St., Jersey City, NJ 07302
Test specification:	
Standard.....:	IEC 60950-1:2005 (Second Edition) + Am 1:2009 + Am 2:2013
Test procedure.....:	CB-Scheme
Non-standard test method .....:	N/A
Test Report Form No. .....:	IEC60950_1F
Test Report Form(s) Originator.....:	SGS Fimko Ltd
Master TRF.....:	Dated 2014-02

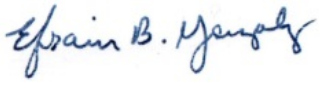
This report is not valid as a CB Test Report unless signed by an approved CB Testing Laboratory and appended to a CB Test Certificate issued by an NCB in accordance with IECEE 02.

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.....:	SSQL Series, (followed by two digit numeric, one alpha character, five digit numeric and may or may not be followed by a dash and the letter 'G' or additional alpha/numeric characters denoting non-safety critical options)
Ratings .....:	Input: 36 -75 Vdc range, 48 Vdc nominal Output: See General Product Information

Testing procedure and testing location:

CB Testing Laboratory:	**Nemko USA Inc.**	
Testing location/ address ..... :	**2210 Faraday Ave. Suite 150, Carlsbad, CA 92008, USA**	
Associated CB Testing Laboratory:		
Testing location/ address ..... :		
Tested by (name + signature) ..... :	Efrain Gonzalez	
Approved by (name + signature)..... :	Jeff Busch	

Report History:
Original report

List of Attachments (including a total number of pages in each attachment):	
Attachment 1:	European Group Differences and National Deviations .....74 pages Documented deviations contain individual national documents for several European countries that are included in the European Group Deviations. The European Group Difference: EN60950:2006/A11:2009/A:2010/A12:2011/A2:2013 are considered "Normative". The individual national documents (Denmark, Finland, Germany, Ireland, Norway, Spain, Sweden, Switzerland and United Kingdom) are considered "informative" and included at the manufacturer's request.
Attachment 2:	Miscellaneous Documentation, e.g. Photos, PWB Layout, Schematic etc. .....5 pages (Not for publication – Engineering use only)

Summary of testing:	
Tests performed (name of test and test clause)**:** 1) Input Test ..... 1.6.2 2) Durability Test ..... 1.17.11 3) SELV Reliability Test ..... 2.2 4) Humidity Test ..... 2.9.2 5) Working Voltage Measurement ..... 2.10.2 6) Hazardous Voltage Measurement ..... 2.10.2 7) Heating Test ..... 4.5.1 8) Electric Strength Test ..... 5.2.2 9) Component Failure Test ..... 5.3 10) Abnormal Operation Test ..... 5.3 11) PS Output Overload and Short Test 5.3	**Testing location:** **See page 2**

Summary of compliance with National Differences:

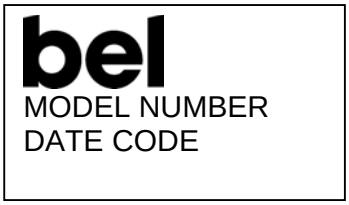
List of countries addressed

Austria (AT), Australia (AU), Canada (CA), Denmark (DK), Finland (FI), Germany (DE), Ireland (IE), Israel (IS), Korea (KR), Norway (NO), Slovenia (SI), Spain (ES), Sweden (SE), Switzerland (CH), United Kingdom (GB), United States of America (US)

☒**The product fulfils the requirements of :**

EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011 + A2:2013

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 Certification Bodies 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, Nemko routine L227 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, and Nemko routine L220. The instrumentation accuracy is within limits agreed by IECEE-CTL (ref. Nemko routine L227).

Test item particulars:	
Equipment mobility ..... :	[] movable [] hand-held [] transportable [] stationary [**X**] for building-in [] direct plug-in
Connection to the mains..... :	[] pluggable equipment [] type A [] type B [] permanent connection [] detachable power supply cord [] non-detachable power supply cord [**X**] not directly connected to the mains
Operating condition ..... :	[**X**] continuous [] rated operating / resting time:
Access location ..... :	[] operator accessible [] restricted access location
Over voltage category (OVC) ..... :	[] OVC I [] OVC II [**X**] OVC III [] OVC IV [] other:
Mains supply tolerance (%) or absolute mains supply values ..... :	37 to 75 Vdc
Tested for IT power systems ..... :	[] Yes [**X**] No
IT testing, phase-phase voltage (V) ..... :	—
Class of equipment ..... :	[] Class I [] Class II [] Class III [**X**] Not classified
Considered current rating of protective device as part of the building installation (A) ..... :	To be determined at end use
Pollution degree (PD) ..... :	[] PD 1 [**X**] PD 2 [] PD 3
IP protection class ..... :	IPX0
Altitude during operation (m) ..... :	2000 m
Altitude of test laboratory (m) ..... :	MSL
Mass of equipment (kg) ..... :	14 g without baseplate, 23 g with baseplate
Temperature, Ambient (°C)..... :	Tc is 105 °C at L501 body and 120 °C on PCB at Q500 drain on units without baseplate and 105 °C at center of Baseplate for units with Baseplate

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 ..... :	November 2015
Date (s) of performance of tests..... :	November 2015

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 6.2.5 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) .....:** BCM Electronics Corporation SDN BHD Kulim Hi-tech Park, Phase 1 Plot 21, Jalan Hi-Tech 4 09000 Kulim, Kedah Darulaman MALAYSIA	

General product information:

This test report is based on a TUV SUD test report Ref. No. 095-1100375105-000 with appended CB cert Ref. No. DE 3 -58952 evaluated to the requirements of IEC 60950-1:2005.
This report includes an additional evaluation to the requirements of IEC 60950-1:2005 (Second Edition) + Am 1:2009 + Am 2:2013..
For continuity, data from the original TUV report is included in this report, along with the additional evaluation referenced.

These models are component type switch mode type dc to dc converters designed to be soldered on to printed circuit boards or plugged into end-user sockets. These converters are designed to be connected to a source of supply which is an isolated secondary circuit or battery. The input should be either SELV or TNV-2 though other sources of input may be considered with further investigation in the end-use equipment.

TYPICAL MODEL DESIGNATION:

SSQL	48	T	20	033	-	X
I	II	III	IV	V		VI

I Model Series: SSQL

II Nominal Input Voltage:

48 = 36 - 75 Vdc range, 48 Vdc nominal

III Mounting Scheme:

S = Surface Mount
T = Through Hole

IV Output Current Rating:

15 = 15 A
20 = 20 A

V Output Voltage Rating:

033 = 3.3 Vdc

VI Options Suffix: - X = Maybe followed by a dash (-) and suffix letters and/or numbers denoting non-safety-critical options such as, but not limited to, open frame, positive or negative shutdown, Lucent compatible, non-standard pin configuration, increased electric strength, etc.

Special Considerations – The following items are considerations that were used when evaluating these products.

All models are intended for building-in, to be soldered onto a PWB or plugged in to special end-user socket.

CONDITIONS OF ACCEPTABILITY:

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

1) All models are intended to be supplied from an isolated secondary circuit and have been evaluated.
2) The power supplies have been evaluated for use in a Pollution Degree 2 environment.
3) Abnormal and Component Failure Tests were conducted with the power supply protected by an external fuse, fast blow rated 15 A. Additional testing maybe necessary if fuse greater than 15 A is used.
4) Subject models were tested for use at the maximum case temperature (Tc) permitted by the manufacturer's specification of 105 °C measured on L501 body and 120 °C measured on PWB at Q500 Drain for units without baseplate and 105 °C measured on the centre of baseplate for models with baseplate. The units were tested with air-cooling applied from +Vin to –Vin pins for all models. Temperature tests shall be considered for specification installation conditions in the end use application.
5) If the input meets all of requirements for SELV or TNV-2, the outputs may be considered SELV. Output voltages remain with SELV limits, even with internally-generated non-SELV voltages, if any. Single Component Failure and Basic Insulation Bypass Tests were performed on the power supply.
6) The units were tested for zero tolerance input voltage.
7) Special spacing consideration should be given to the end-use product as the spacings between the unit and mounting surface have not been evaluated.
8) Special enclosure consideration should be given to the end-use installation. Hazardous voltage is available on the surface of the PWB. The end-use product should be reviewed to determine whether accessibility requirements are met for the end-use product.
9) Outputs for all models are SELV operating at non-hazardous energy levels (<240 VA).
10) Output pins are to be connected only to internal wiring in the end system as per manufacturer specifications.

Abbreviations used in the report:

- normal conditions ..... N.C.
- functional insulation ..... OP
- double insulation ..... DI
- between parts of opposite polarity ..... BOP
- single fault conditions ..... S.F.C
- basic insulation ..... BI
- supplementary insulation ..... SI
- reinforced insulation ..... RI

Indicate used abbreviations (if any): ..... None