

UL TEST REPORT AND PROCEDURE

Standard:	UL 60950-1, 2nd Edition, 2011-12-19 (Information Technology Equipment - Safety - Part 1: General Requirements) CSA C22.2 No. 60950-1-07, 2nd Edition, 2011-12 (Information Technology Equipment - Safety - Part 1: General Requirements)
Certification Type:	Component Recognition
CCN:	QQGQ2, QQGQ8 (Power Supplies for Information Technology Equipment Including Electrical Business Equipment)
Product:	DC/DC Converter
Model:	VI Chip PFM Series VI Brick PFM Series
Rating:	See Miscellaneous Enclosure for model nomenclature. Input: 85-264V Output: 48V Power: 330W Max.
Applicant Name and Address:	VICOR CORP 25 FRONTAGE RD ANDOVER MA 01810-5499 UNITED STATES

This is to certify that representative samples of the products covered by this Test Report have been investigated in accordance with the above referenced Standards. The products have been found to comply with the requirements covering the category and the products are judged to be eligible for Follow-Up Service under the indicated Test Procedure. The manufacturer is authorized to use the UL Mark on such products which comply with this Test Report and any other applicable requirements of UL LLC ('UL') in accordance with the Follow-Up Service Agreement. Only those products which properly bear the UL Mark are considered as being covered by UL's Follow-Up Service under the indicated Test Procedure.

The applicant is authorized to reproduce the referenced Test Report provided it is reproduced in its entirety.

UL authorizes the applicant to reproduce the latest pages of the referenced Test Report consisting of the first page of the Specific Technical Criteria through to the end of the Conditions of Acceptability.

Any information and documentation involving UL Mark services are provided on behalf of UL LLC (UL) or any authorized licensee of UL.

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Supporting Documentation

The following documents located at the beginning of this Procedure supplement the requirements of this Test Report:

- A. Authorization - The Authorization page may include additional Factory Identification Code markings.
- B. Generic Inspection Instructions -
 - i. Part AC details important information which may be applicable to products covered by this Procedure. Products described in this Test Report must comply with any applicable items listed unless otherwise stated in the body of this Test Report.
 - ii. Part AE details any requirements which may be applicable to all products covered by this Procedure. Products described in this Test Report must comply with any applicable items listed unless otherwise stated in the body of each Test Report.
 - iii. Part AF details the requirements for the UL Certification Mark which is not controlled by the technical standard used to investigate these products. Products are permitted to bear only the Certification Mark(s) corresponding to the countries for which it is certified, as indicated in each Test Report.

Product Description

The PFM series is a front end AC-DC Power Factor Module. The unit requires an external fuse, input filter, rectifier, and output capacitor. With the use of these external components the PFM accepts a rectified AC input ranging from 85-264 Vrms and provides a nominal 48Vdc SELV output with a maximum rated output power of 330W.

Model Differences

See Miscellaneous Enclosure for model nomenclature.

Technical Considerations

- Equipment mobility : for building-in
- Connection to the mains : N/A
- Operating condition : continuous
- Access location : building-in
- Over voltage category (OVC) : OVC II
- Mains supply tolerance (%) or absolute mains supply values : 85-264 Vrms
- Tested for IT power systems : No
- IT testing, phase-phase voltage (V) : -
- Class of equipment : Class II (double insulated)
- Considered current rating of protective device as part of the building installation (A) : -
- Pollution degree (PD) : PD 2
- IP protection class : IP X0
- Altitude of operation (m) : 5000
- Altitude of test laboratory (m) : less than 2000
- Mass of equipment (kg) : VI Chip 0.032, VI Brick 0.057
- The product was submitted and evaluated for use at the maximum ambient temperature (Tma) permitted by the manufacturer's specification of: max. case temperature of 100°C
- The product is intended for use on the following power systems: TN

Engineering Conditions of Acceptability

For use only in or with complete equipment where the acceptability of the combination is determined by UL LLC. When installed in an end-product, consideration must be given to the following:

- The PFM was evaluated with an external fast acting 6.3A fuse (Littelfuse 216P series, Bussmann S501 Series, Schurter SA Series)
- Supplemental Insulation is provided from In to case / baseplate and Out to case / baseplate. The case / baseplate may be grounded in the end application.
- The PFM provides 3000 Vrms / 4242 Vdc of isolation from input to output.
- An external bridge rectifier is required in front of the PFM.
- The following Production-Line tests are conducted for this product: Electric Strength
- The end-product Electric Strength Test is to be based upon a maximum working voltage of: Primary-SELV: 262 Vrms, 366 Vpk
- The following secondary output circuits are SELV: All
- The following secondary output circuits are at non-hazardous energy levels: All
- The power supply terminals and/or connectors are: Not investigated for field wiring
- The investigated Pollution Degree is: 2
- The following end-product enclosures are required: Fire , Mechanical , Electrical

VI Chip PFM Model Number: PFMbbbWcccsxxxzz

Example: PFM175D480T330A00

PFM = Constant	Power Factor Module
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bbb = Input Voltage (range) Vac Rectified	
175 (85-264)	Universal
115 (85-132)	Low Range
230 (170-265)	High Range

W = Lead Style	
B	Bond wire pad
D	J-lead
E	Through-hole

ccc = Output Voltage	
480	48 Vdc

s =	Product Grade	Temp Range
C	Commercial	-20 - 100 C
T	Telecom	-40 - 100 C
M	Military	-55 - 100 C

xxx = Output Power Designator, any 3 digits below 330, non-inclusive list of examples below			
200	200 W	300	300 W
250	250 W	330	330 W

Revision (non-safety related)	
y	Any alphanumeric character

Customer Reference (non-safety related)	
zz	Any alphanumeric character

VI Brick PFM Model Number: PFbbbBcccsxxxxyy-zz

Example: PF175B480C033FP-00

PF = Constant	VI Brick PFM (Power Factor Module)
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bbb = Input Voltage (range) Vac Rectified	
175 (85-264)	Universal
115 (85-132)	Low Range
230 (170-265)	High Range

B = Constant	Package Size (Double)
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ccc = Output Voltage	
480	48 Vdc

s =	Product Grade	Temp Range
C	Commercial	-20 - 100 C
T	Telecom	-40 - 100 C
M	Military	-55 - 100 C

xxx = Output Power Designator, any 3 digits below 033, non-inclusive list of examples below			
020	200 W	030	300 W
025	250 W	033	330 W

yy = Package Style, defines Baseplate and Pin
Any alphanumeric character (non-safety related)

zz = Customer Special Designator
Any alphanumeric character (non-safety related)