

CERTIFICATE OF COMPLIANCE

Certificate Number 20161109-E135493
Report Reference E135493-A24-UL
Issue Date 2016-NOVEMBER-09

Issued to: VICOR CORP
25 FRONTAGE RD
ANDOVER, MA 01810-5424 USA

This is to certify that representative samples of Power Supplies, Information Technology Equipment Including Electrical Business Equipment - Component DC/DC Converter: VICHIP Panel Mold DCM Series

Have been investigated by UL in accordance with the Standard(s) indicated on this Certificate.

Standard(s) for Safety: UL 60950-1 & CSA C22.2 No. 60950-1-07, Information Technology Equipment - Safety - Part 1: General Requirements

Additional Information: See the UL Online Certifications Directory at www.ul.com/database for additional information

Only those products bearing the UL Certification Mark should be considered as being covered by UL's Certification and Follow-Up Service.

Recognized components are incomplete in certain constructional features or restricted in performance capabilities and are intended for use as components of complete equipment submitted for investigation rather than for direct separate installation in the field. The final acceptance of the component is dependent upon its installation and use in complete equipment submitted to UL LLC.

Look for the UL Certification Mark on the product.



Bruce Mahrenholz, Assistant Chief Engineer, Global Inspection and Field Services

UL LLC

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UL TEST REPORT AND PROCEDURE

Standard:	UL 60950-1, 2nd Edition, 2019-05-09 (Information Technology Equipment - Safety - Part 1: General Requirements) CAN/CSA C22.2 No. 60950-1-07, 2nd Edition, 2014-10 (Information Technology Equipment - Safety - Part 1: General Requirements)
Certification Type:	Component Recognition
CCN:	QQGQ2, QGGQ8 (Power Supplies for Information Technology Equipment Including Electrical Business Equipment)
Product:	DC/DC Converter
Model:	VICHIP Panel Mold DCM Series See Miscellaneous Enclosure for model details.
Rating:	Rated Input Voltage: 70Vdc maximum Rated Output Voltage: 54 Vdc maximum Rated Output Power: 320W maximum See Miscellaneous Enclosure for additional model details and electrical ratings.
Applicant Name and Address:	VICOR CORP 25 FRONTAGE RD ANDOVER MA 01810-5424 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.

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Prepared by: Warren Fields / Project Handler

Reviewed by: Lesley Green / Reviewer

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 VICHIP Panel Mold 3623 DCMs are a family of isolating DC-DC converters that are designed for building-in. The output is considered SELV.

Model Differences

See Miscellaneous Enclosure for model nomenclature.

Technical Considerations

- Equipment mobility : for building-in
- Connection to the mains : not directly connected to the mains
- Operating condition : continuous
- Access location : for building-in
- Over voltage category (OVC) : OVC II
- Mains supply tolerance (%) or absolute mains supply values : 10-75Vdc
- Tested for IT power systems : No
- IT testing, phase-phase voltage (V) : -
- Class of equipment : Not classified
- Considered current rating of protective device as part of the building installation (A) : N/A
- Pollution degree (PD) : PD 2
- IP protection class : IP X0
- Altitude of operation (m) : <5000
- Altitude of test laboratory (m) : <2000
- Mass of equipment (kg) : 0.025
- The VICHIP Panel Mold DCMs are a family of DC-DC converters are designed for building-in.
- MNL = 320W for a single chip, MNL = 390W per chip when used in an Array

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 following secondary output circuits are SELV: All outputs
- The following secondary output circuits are at hazardous energy levels: Outputs above 240W
- The investigated Pollution Degree is: 2
- The following end-product enclosures are required: Fire, Mechanical
- See de-rating curves for maximum output power, case temperature, and input voltage. Some model numbers may be rated less than the maximum operating conditions.
- The output is separated from the input by Basic Insulation.
- The DCMs were evaluated with a Bussmann ABC-30 and a Littelfuse nano2 fuse rated 30A
- Through hole DCMS to be mounted on minimum V-1 rated PCB

Additional Information

Testing of the DC/DC Converter, VICHIP Panel Mold DCM Series was not considered necessary based upon previous evaluation under the CB scheme. The CB Scheme Test Certificate DE 3 - 502103 and Report Ref. No. D11407846-300 dated 2016-10-03 was prepared by TÜV SUD Product Service GmbH, Ridlerstr. 65, D-80339 Munich, Germany. As a result, the clause verdicts and test results for this report were noted as N/A and have been referred to the TUV CB Report for details.

Markings and instructions

Clause Title	Marking or Instruction Details
1.7.1 Power rating - Company identification	Listee's or Recognized company's name, Trade Name, Trademark or File Number
1.7.1 Power rating - Model	Model Number

Special Instructions to UL Representative

Optional - UR logo may appear on packaging.

VICHIP DCM3623 Model Matrix: DCMbbbcddeffxyz

Example: DCM28AP280M320A50

DCM = Constant

DCM Family (DC Module)	
DCM	Standard version
MDCM	Military version

bbb = 28A

Input Voltage: Rated Nominal (range/tolerance)			
20A	20 Vdc (10-30)	30A	30 Vdc (9-50)
24A	24 Vdc (18-36)	48A	48 Vdc (36-75)
28A	28 Vdc (16-50)	70A	70 Vdc (64-75)

c = P

Package Type and Lead designator	
P	Panel Mold Through-hole
L / N	Panel Mold Lead-less

ddd = 280

Output Voltage Designator (can be any three digits 000 to 540, non-inclusive list of examples below)			
050	5.0V	480	48.0V
120	12.0V	528	52.8V
280	28.0V	540	54.0V

e = T

Product Grade	
T	-40 to 125C
M	-55 to 125C
C	0 to 85C

fff = 320

Output Power Designator (can be any three digits 000 to 320 non-inclusive list of examples below)	
180	180W
200	200W
320	320W

x = A

Revision (non-safety related)	
x	Any alphanumeric character

y = 5

Package Size	
5	3623

z = 0

Functionality (non-safety related), any alphanumeric character non-inclusive list of examples	
0	No communication
1	Communication enabled
R	Reversible

VICHIP DCM3623 Alternate Model Matrix: DCM3623bccwwxyzz

Example: DCM3623T75H53C2T00

DCM = Constant

Product Function	
DCM	DC-DC Converter Module

3623 = Constant

Package Dimensions (mm)	
3623	36 x 23

b = T

Lead Designator	
T	Through-Hole
L / N	Leadless

ccc = 75H

Nominal Input Voltage (range)	
36G	24V (18-36)
50M	28V (16-50)
50T	30V (9-50)
75H	48V (36-75)
75X	42V (9-75)

ww = 53

Nominal Output Voltage (Trim range = +10% / -15%)			
04	3.3V	26	24.0V
06	5.0V	31	28.0V
13	12.0V	40	36.0V
17	15.0V	53	48.0V

xx = C2

Maximum Output Power			
80	80W	B0	200W
A2	120W	B4	240W
A6	160W	C2	320W
A8	180W		

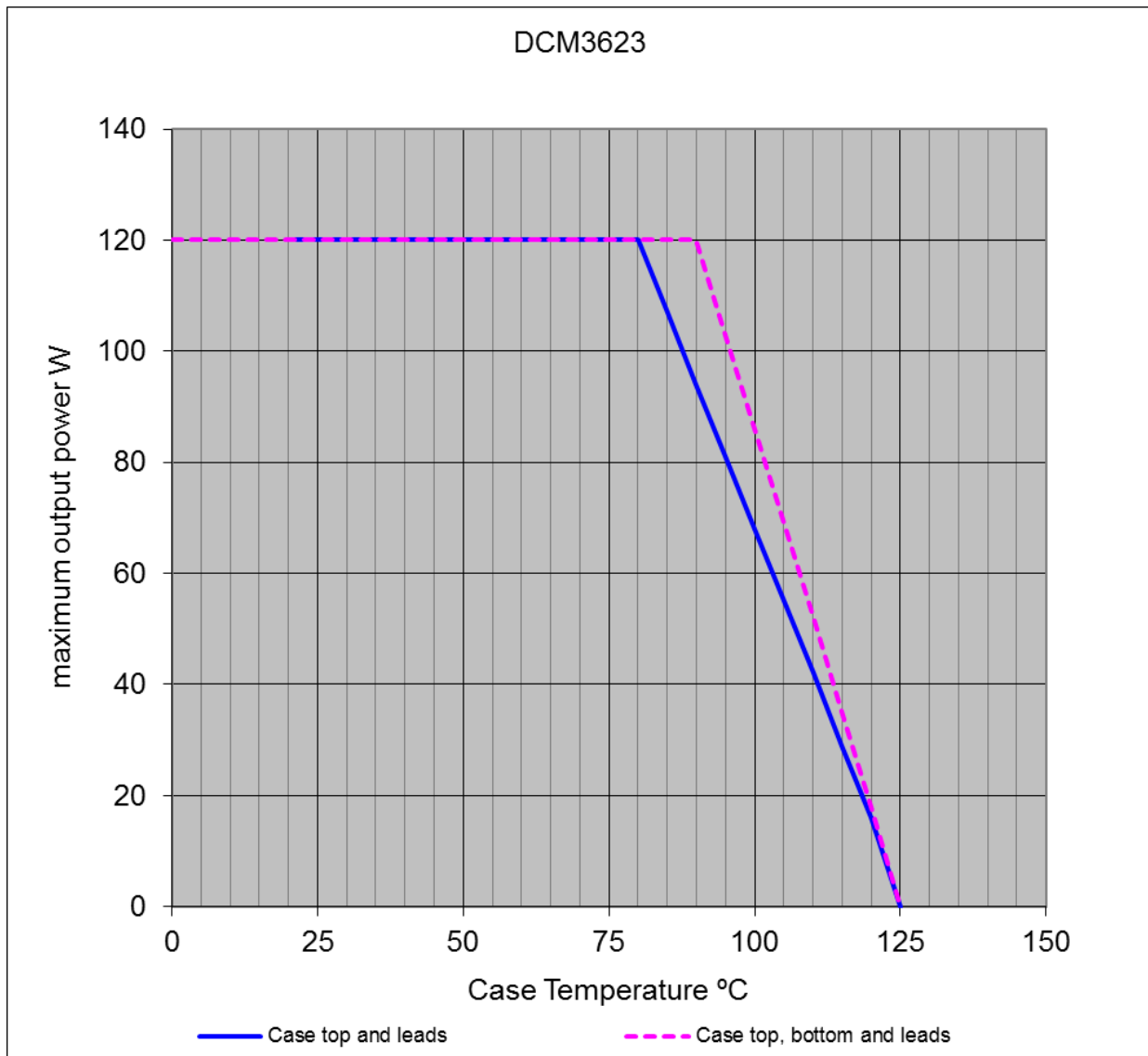
y = T

Product Grade (Tmax internal, see attachment for external Tcase max)			
C	0 to 125°C	T	-40 to 125°C
M	-55 to 125°C		

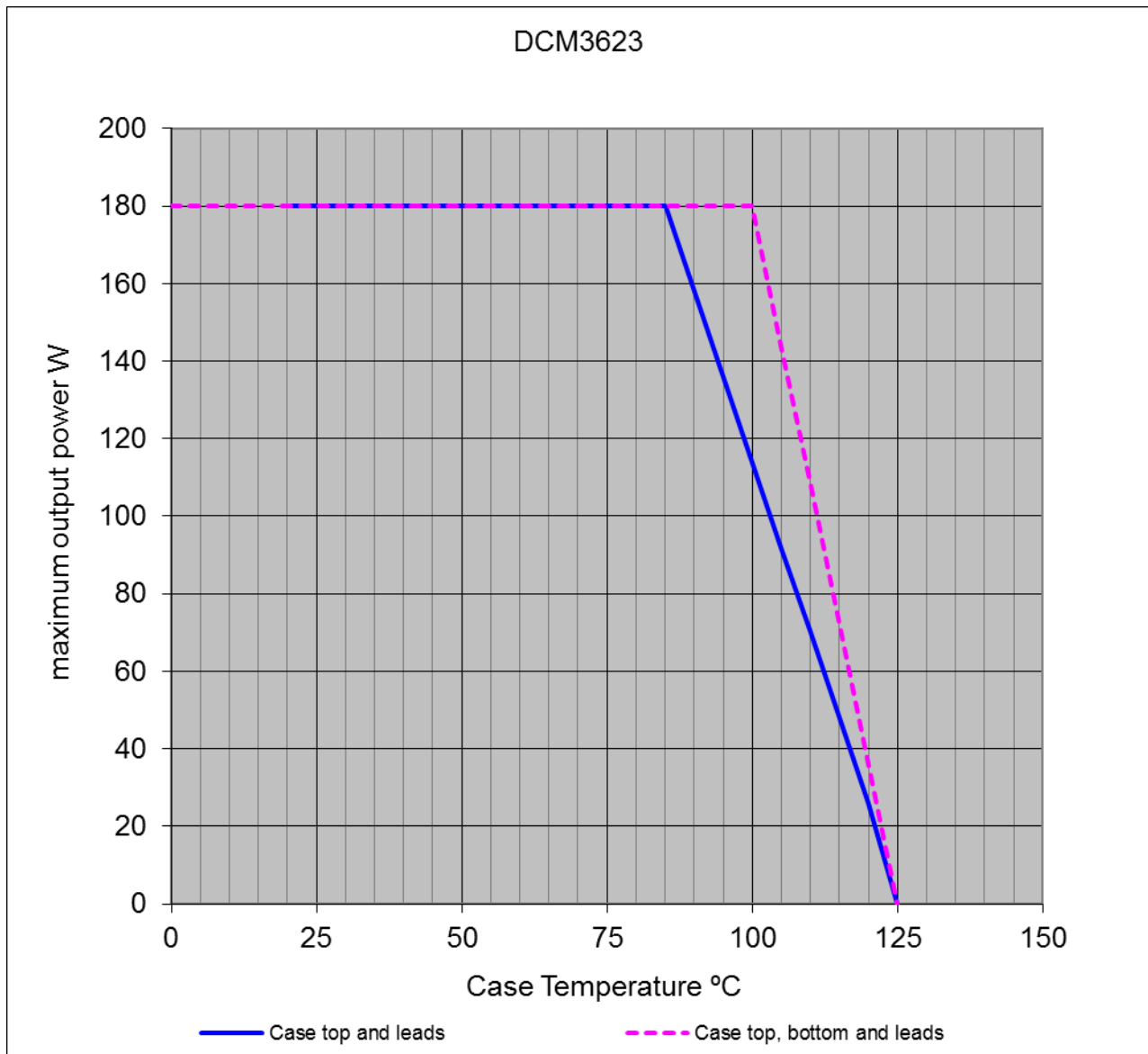
zz = 00

Options (non-safety related)	
00	Any alphanumeric

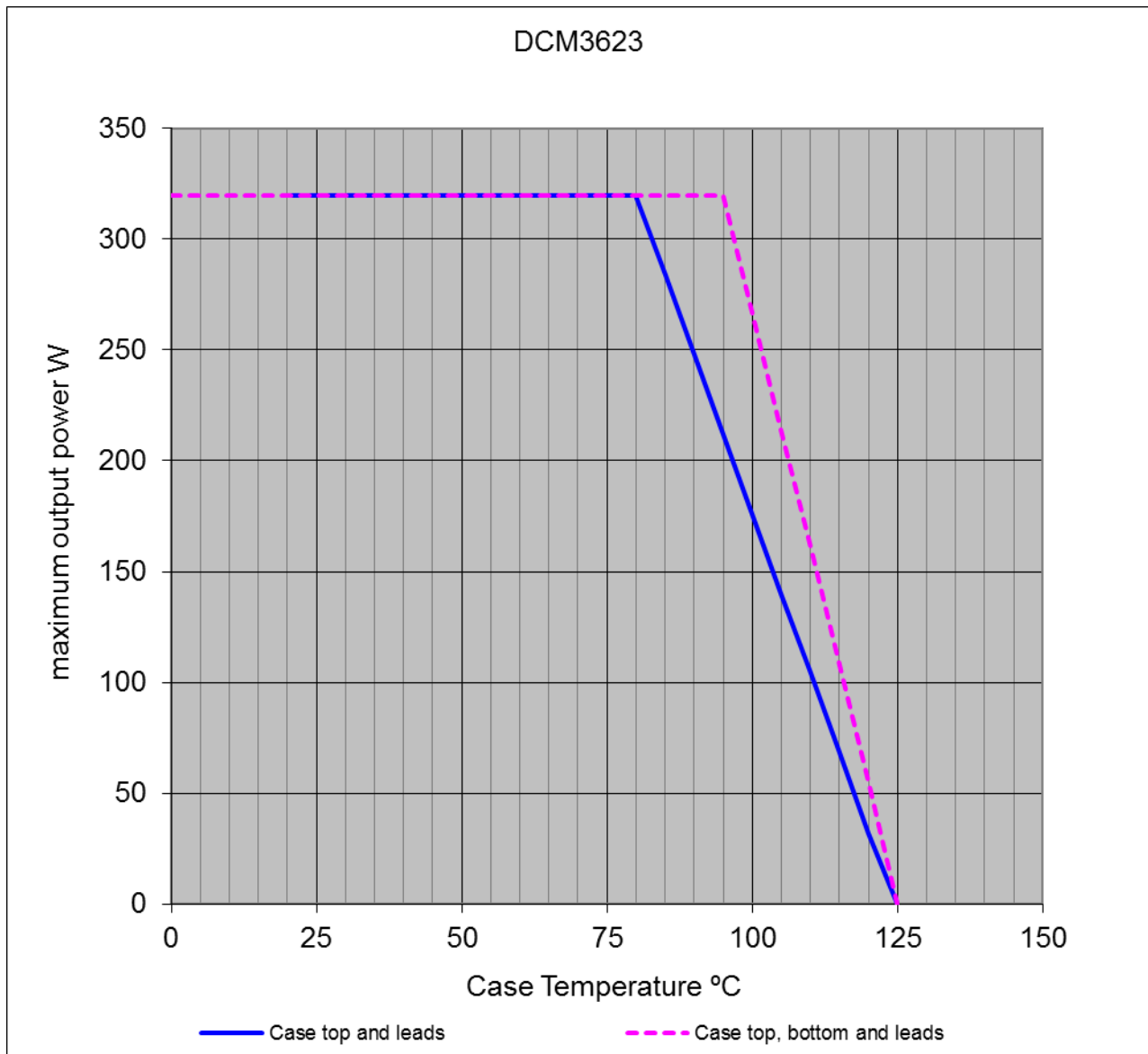
Power vs. Temperature	
Input Voltage Nominal (range)	24V (18-36) 28V (16-50)
Nominal Output Voltage (trim)	3.3V (+10% / -15%)
Maximum Output Power	120W
Model Variants: Input Voltage range may be narrowed and Output Power may be reduced.	



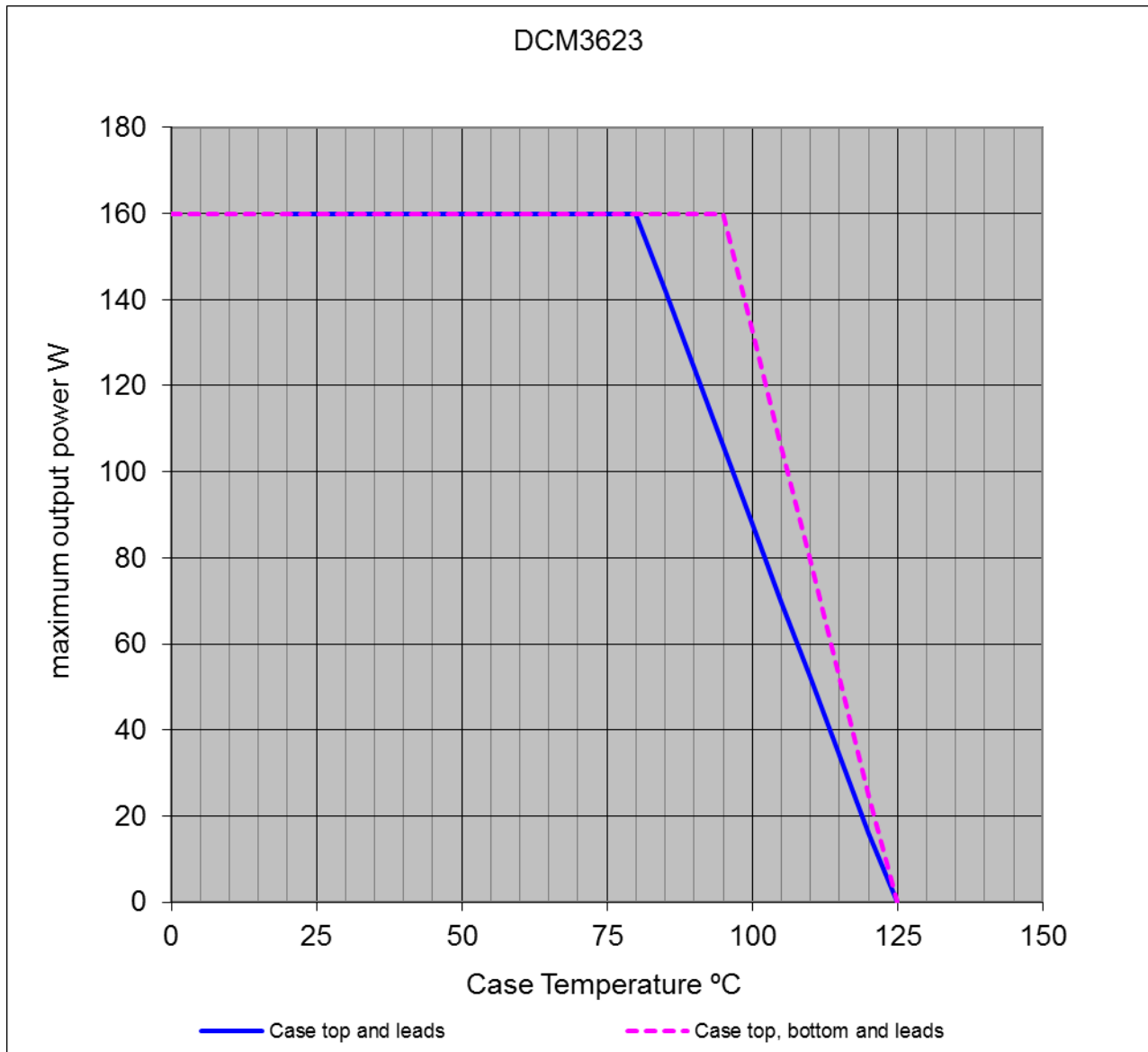
Power vs. Temperature	
Input Voltage Nominal (range)	24V (18-36) 28V (16-50)
Nominal Output Voltage (trim)	5V (+10% / -15%)
Maximum Output Power	180W
Model Variants: Input Voltage range may be narrowed and Output Power may be reduced.	



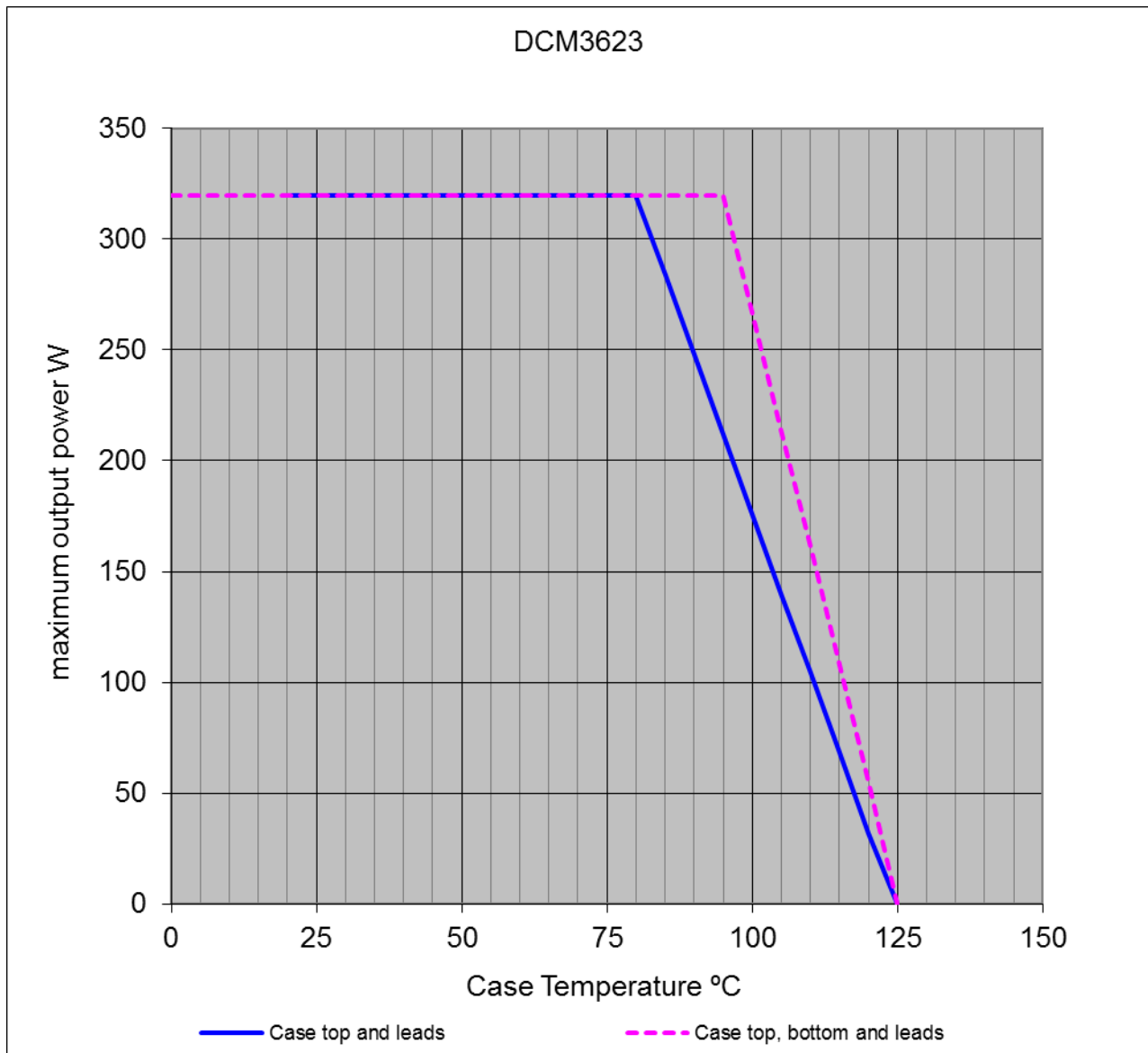
Power vs. Temperature	
Input Voltage Nominal (range)	24V (18-36) 28V (16-50)
Nominal Output Voltage (trim)	12, 15, 24, 28, 36 and 48V (+10% / -15%)
Maximum Output Power	320W
Model Variants: Input Voltage range may be narrowed and Output Power may be reduced.	



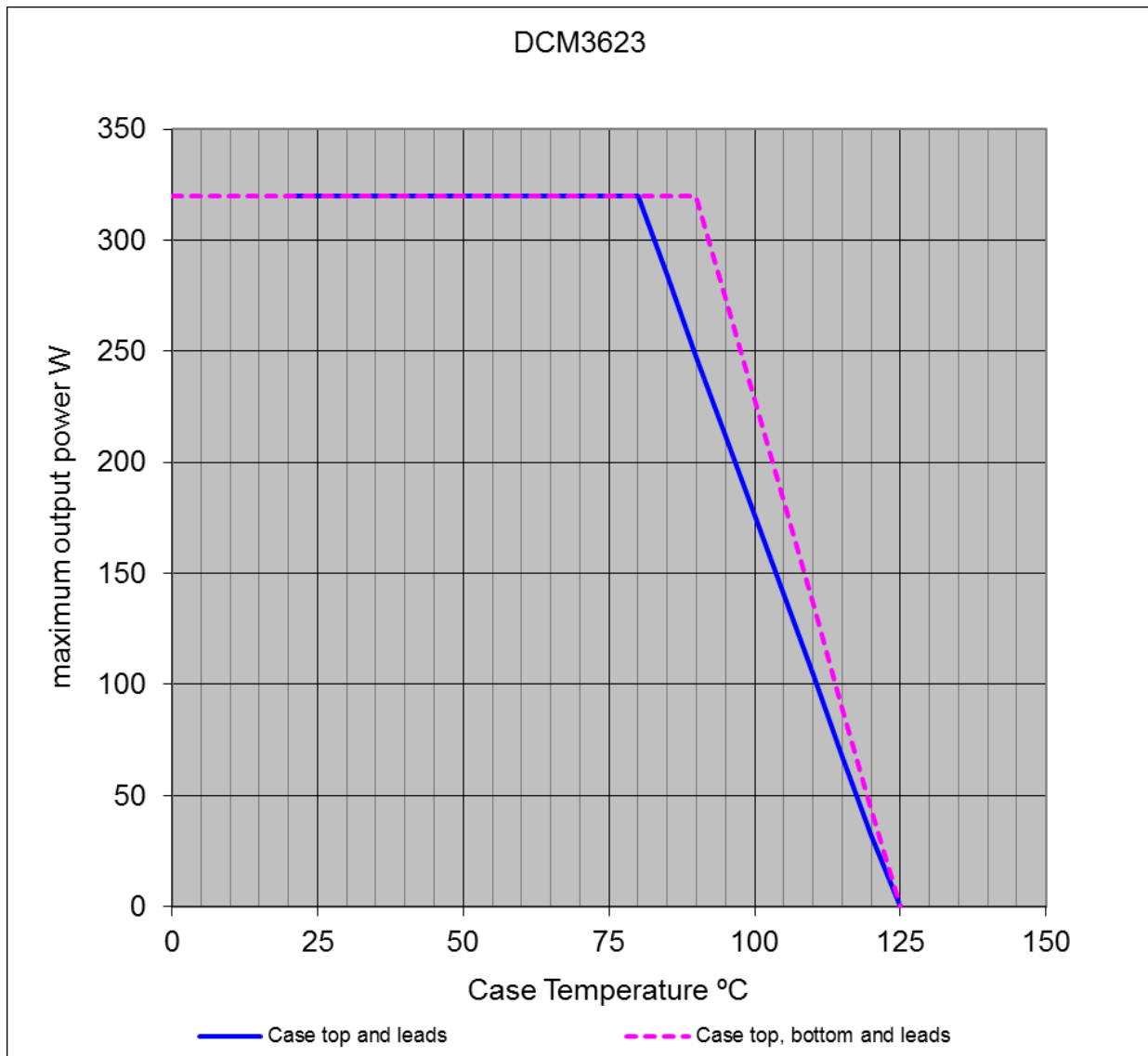
Power vs. Temperature	
Input Voltage Nominal (range)	48V (36-75)
Nominal Output Voltage (trim)	5V (+10% / -15%)
Maximum Output Power	160W
Model Variants: Input Voltage range may be narrowed and Output Power may be reduced.	



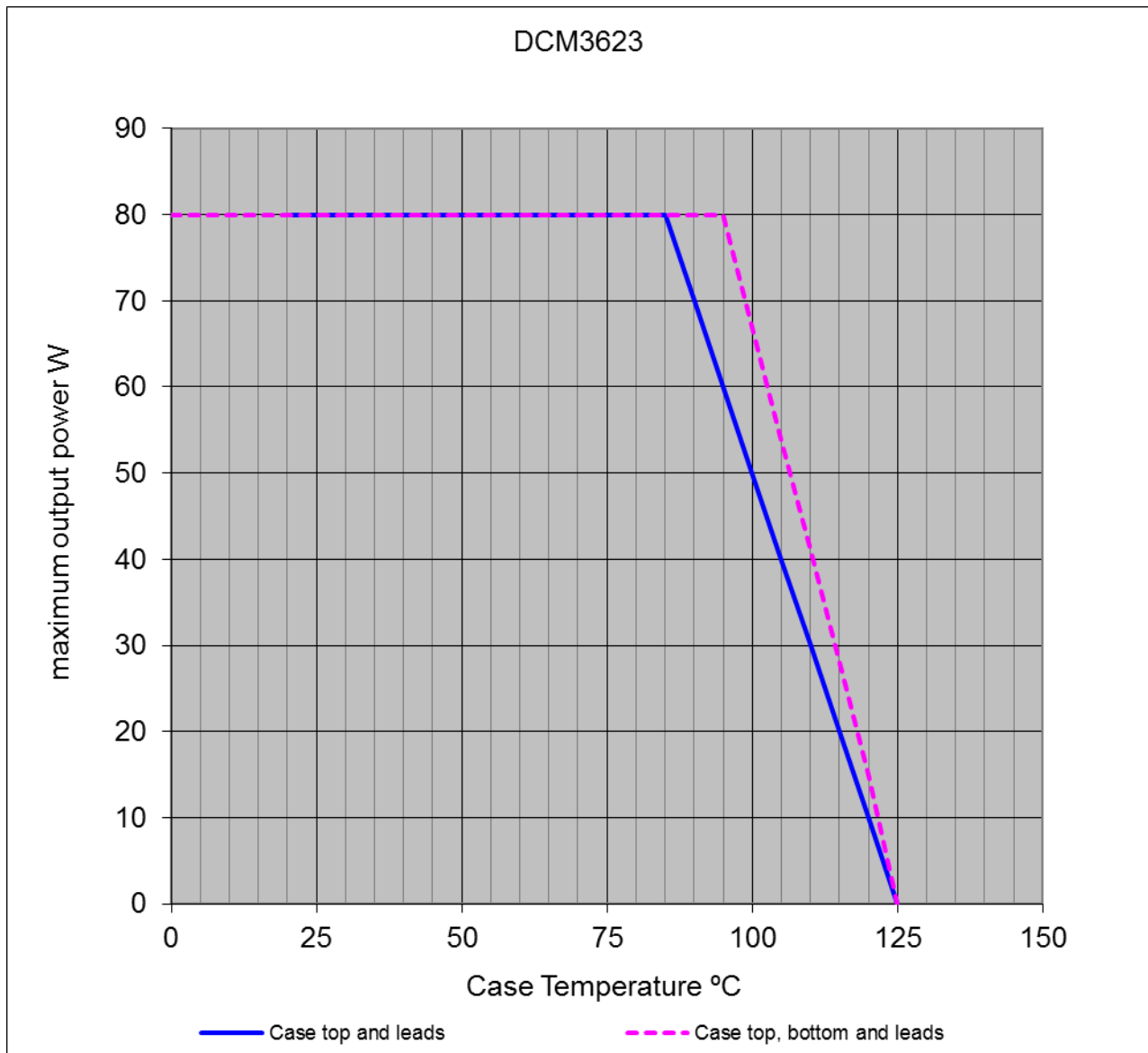
Power vs. Temperature	
Input Voltage Nominal (range)	48V (36-75)
Nominal Output Voltage (trim)	12V (+10% / -15%)
Maximum Output Power	320W
Model Variants: Input Voltage range may be narrowed and Output Power may be reduced.	



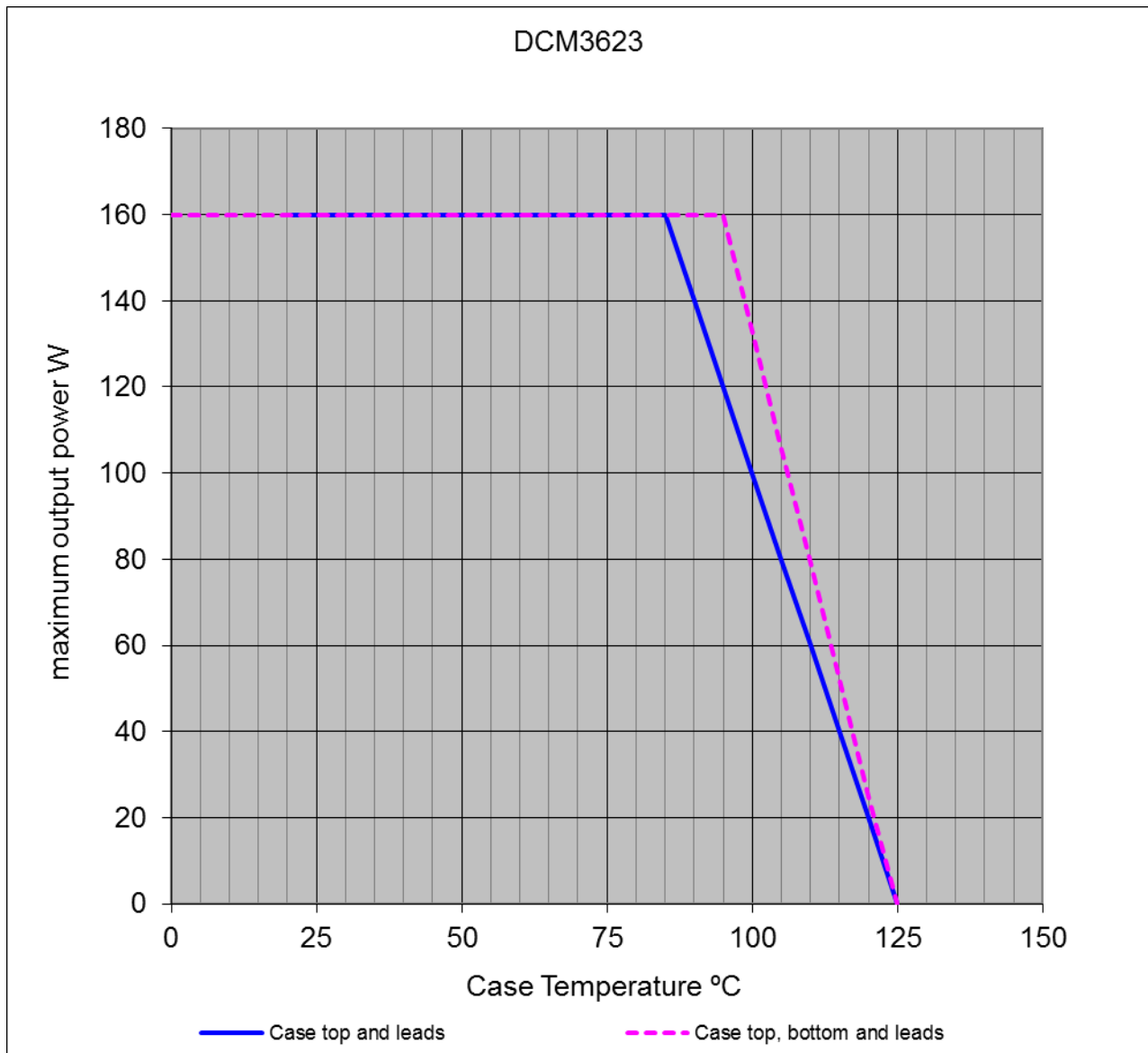
Power vs. Temperature	
Input Voltage Nominal (range)	48V (36-75)
Nominal Output Voltage (trim)	15, 24, 28, 36, and 48V (+10% / -15%)
Maximum Output Power	320W
Model Variants: Input Voltage range may be narrowed and Output Power may be reduced.	



Power vs. Temperature	
Input Voltage Nominal (range)	30V (9-50)
Nominal Output Voltage (trim)	3.3 and 5V (+10% / -15%)
Maximum Output Power	80W (Max)
Model Variants: Input Voltage range may be narrowed and Output Power may be reduced.	



Power vs. Temperature	
Input Voltage Nominal (range)	30V (9-50)
Nominal Output Voltage (trim)	12, 15, 24, 28 and 48V
Maximum Output Power	160W
Model Variants: Input Voltage range may be narrowed and Output Power may be reduced.	



Power vs. Temperature	
Input Voltage Nominal (range)	42V (9-75)
Nominal Output Voltage (trim)	15, 24, 28, 48V
Maximum Output Power	80W
Model Variants: Input Voltage range may be narrowed and Output Power may be reduced.	

