



America

# CERTIFICATE

No. U8V 17 11 21433 561

**Holder of Certificate:** Vicor Corporation

25 Frontage Road  
Andover MA 01810  
USA

**Production Facility(ies):**

67768

**Certification Mark:**



**Product:**

Converter  
DC to DC Converter

**Model(s):**

VI Chip VTM  
Model: V048F480T006  
(see attachment for model nomenclature and License Conditions)

**Parameters:**

Rated Input Voltage:	48 V DC
Rated Output Voltage:	48 V DC
Rated Output Current:	6.25 A Max
Rated Output Power:	300 W Max
Degree of Protection:	IPX0

**Tested according to:**

CAN/CSA C22.2 No.60950-1:2007/A2:2014  
UL 60950-1:2007/A2:2014  
EN 60950-1:2006/A2:2013

The product was voluntarily tested according to the relevant safety requirements noted above. It can be marked with the certification mark above. The mark must not be altered in any way. This product certification system operated by TÜV SÜD America Inc. most closely resembles system 3 as defined in ISO/IEC 17067. Certification is based on the TÜV SÜD "Testing and Certification Regulations". TÜV SÜD America Inc. is an OSHA recognized NRTL and a Standards Council of Canada accredited certification body.

**Test report no.:** 72131876-000

**Date,** 2017-11-22

Page 1 of 5



## Attachment to Certificate U8V 17 11 21433 561



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VI Chip VTM

Model Number Matrix: Vbbbcdddefffx

Sample model number: V048F480T006A

V = Constant

VTM series: Voltage Transformation Module	
V	Standard VTM
MV	Mil-COTS version

bbb = 048

Input Voltage	Nominal (range)
036	36 Vdc (26-50)
048	48 Vdc (26-55)

c = F

Package Size	In Board BGA	On Board J-Lead	Through Hole
Full VIC	K	F	T

ddd = 480

Output Voltage Designator (Vdc)			
010	1.0	072	7.2
011	1.1	080	8.0
015	1.5	090	9.0
020	2.0	096	9.6
022	2.2	120	12.0
024	2.4	160	16.0
030	3.0	180	18.0
033	3.3	240	24.0
040	4.0	320	32.0
045	4.5	360	36.0
060	6.0	480	48.0

e = T

Product Grade	
T	-40 to 125°C
M	-55 to 125°C

fff = 006

Output Current Designator (Amps)					
003	3 A	013	13 A	040	40 A
005	5 A	015	15 A	050	50 A
006	6 A	017	17 A	055	55 A
007	7 A	020	20 A	060	60 A
009	9 A	025	25 A	070	70 A
010	10 A	027	27 A	080	80 A
012	12 A	030	30 A	100	100 A

x = A

Revision (optional non-safety related)	
x	Any alphanumeric character

Test Report No: 72131876-000

Date, 2017-11-22

U8V 17 11 21433 561



Page 2 of 5

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## Attachment to Certificate U8V 17 11 21433 561



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## Customer Special Models:

Customer Special Model Numbers	Equivalent Standard Model Numbers
MV036F011M100x	V036F011M100
MV036F015M080x	V036F015M080
MV036F022M055x	V036F022M055
MV036F030M040x	V036F030M040
MV036F045M027x	V036F045M027
MV036F060M020x	V036F060M020
MV036F072M017x	V036F072M017
MV036F090M013x	V036F090M013
MV036F120M010x	V036F120M010
MV036F180M007x	V036F180M007
MV036F240M005	V036F240M005
MV036F360M003	V036F360M003
VIZ0033, VIZ0033x	V048F120T025
VIZ0034, VIZ0034x	V048F040T050
VIZ0039, VIZ0039x	V048F020T080
VIZ0040, VIZ0040x	V048F030T070
VIZ0041, VIZ0041x	V048F040T050
VIZ0042, VIZ0042x	V048F120T025
VIZ0052, VIZ0052x	V048F120T025
VIZ0068, VIZ0068x	V048F080T030
VIZ0069, VIZ0069x	V048F060T040
VIZ0077, VIZ0077x	V048F020T080
VIZ0078, VIZ0078x	V048F096T025
F = J Lead, F may be replace by T for thru-hole	
x = revision, optional, any letter A through Z, non-safety related	

Test Report No: 72131876-000

Date, 2017-11-22

U8V 17 11 21433 561



Page 3 of 5

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## Attachment to Certificate U8V 17 11 21433 561



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VI CHIP VTM2

Model Number: VTMbbbcdddeffxzz

Example: VTM48EF240T009A00

VTM = Constant

Voltage Transformation Module	
VTM	Standard version
MVTM	Mil-COTS version

bbb = 48E

Input Voltage	Nominal (range)		
36B	36 Vdc (26-50)	48G	48 Vdc (26-53)
48E	48 Vdc (26-55)	48H	48 Vdc (32-55)
48F	48 Vdc (26-48)		

c = F

Package Size and Lead Designator	
F	Full VI Chip J-Lead
T	Full VI Chip Through-hole

ddd = 240

Output Voltage Designator (can be any three digits from 010 to 480) Vout = (designator / 10), non-inclusive list of examples below					
010	1.0 Vdc	030	3.0 Vdc	096	9.6 Vdc
011	1.1 Vdc	033	3.3 Vdc	120	12.0 Vdc
012	1.2 Vdc	040	4.0 Vdc	160	16.0 Vdc
015	1.5 Vdc	045	4.5 Vdc	240	24.0 Vdc
020	2.0 Vdc	072	7.2 Vdc	320	32.0 Vdc
022	2.2 Vdc	080	8.0 Vdc	360	36.0 Vdc
024	2.4 Vdc	090	9.0 Vdc	480	48.0 Vdc

e = T

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

fff = 009

Output Current Designator (can be any three digits from 001 to 100) non-inclusive list of examples below									
003	3 A	010	10 A	020	20 A	050	50 A	100	100 A
005	5 A	012	12 A	025	25 A	055	55 A		
006	6 A	013	13 A	027	27 A	060	60 A		
007	7 A	015	15 A	030	30 A	070	70 A		
009	9 A	017	17 A	040	40 A	080	80 A		

x = A

Revision (non-safety related)	
x	Any alphanumeric character

zz = 00

Customer reference (non-safety related)	
zz	Any alphanumeric character or Blank

VTM2 Customer Special Models:

Customer Special Model Numbers	Equivalent Standard Model Numbers
VIZ0080, VIZ0080x	VTM48EF020T070A00
VIZ0084, VIZ0084x	VTM48EF060T040A00
VIZ0085, VIZ0085x	VTM48EF080T030A00
VIZ0086, VIZ0086x	VTM48EF120T025A01
VIZ0087, VIZ0087x	VTM48EF040T050B00

x = revision, optional, any letter A through Z, non-safety related

Test Report No: 72131876-000

Date, 2017-11-22

U8V 17 11 21433 561

Page 4 of 5

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America

## License Conditions:

**Special Considerations** – The following items are considerations that were used when evaluating these products. The VTM family of DC-DC converters are designed for building-in.

1. The input to the VTM is intended to be supplied from the output of a VI Chip PRM, a TNV-2 circuit, or other non-hazardous secondary circuit.
2. The VTM provides 2250 Vdc of isolation from input to output.
3. The output of the VTM is considered SELV.
4. **Max Temperature:** Keep the maximum semiconductor junction temperature of the VI Chip at 125°C or less. There are three methods to demonstrate compliance.

**Method One:** Maintain the maximum Case temperature of the VI Chip. Do not exceed  $T_{\text{casemax}}$  100°C under any condition. This will guarantee the internal semiconductor junction temperature limit of 125°C is not exceeded.

**Method Two:** Maintain the internal semiconductor junction temperature at 125°C or less. This can be achieved by calculating the max Case temperature using

$$125^{\circ}\text{C} - (P_{\text{dissmax}} \times 1.5)$$

For all conditions where  $P_{\text{dissmax}}$  is the maximum power dissipation of the module, defined by  $P_{\text{Input\_max}} - P_{\text{Output\_max}}$ , where  $P_{\text{Output\_max}}$  is defined as the maximum output power in the application.

**Method Three:** Maintain the internal semiconductor junction temperature at  $T_j = 125^{\circ}\text{C}$  or less. This can be achieved by measuring the dc voltage at the TM (temperature monitor) lead and converting the voltage to temperature. The TM has a nominal +27C set point of 3.0 Vdc and a nominal gain of 10mV / °C.

Example; TM = 3.4Vdc,  $T_j = (27 + 40) 67^{\circ}\text{C}$

5. The VTM is designed to be used with a VI Chip PRM. The PRM / VTM combination should be protected by a Littelfuse Nano<sup>2</sup>Fuse rated 10A or less when the PRM is rated 320W or less.
6. The VTM is designed to be used with a VI Chip PRM. The PRM / VTM combination should be protected by a Littelfuse Nano<sup>2</sup>Fuse rated 15A or less when the PRM is rated 400W.
7. A standalone VTM used without a PRM should be protected by a Littelfuse Nano<sup>2</sup>Fuse rated 10A or less.

Test Report No: 72131876-000

Date, 2017-11-22  
U8V 17 11 21433 561

Page 5 of 5

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