VCF600 series

600 WATT DC/DC CONVERTER
Railway Applications
2250 Vdc Isolation

vitec
dc conversion

FEATURES AND APPLICATIONS

- 43 - 160 Vdc Input for Railway Applications
- 600W regulated Output
- Efficiency up to 88%
- Isolated Remote On/Off
- Operating Temperature: -40°C to +100°C
- Full-Brick Size meet Industry Standard
- Over Temperature-, Over Voltage/Current Protection
- Meet EN50155 with External Circuits
- Meet Shock & Vibration EN50155
- Meet UL60950-1 2nd (Basic Insulation)
- Meet Fire & Smoke EN45545-2

GENERAL DESCRIPTION

The VCF600-Series is a family of cost effective 600 Watt single DC/DC converters designed for mobile and stationary railway applications in accordance to EN50155 standard. These converters achieve low cost in a full brick housing without compromising performance or field reliability.
Models operate from an input bus voltage of 110 Vdc offering output voltage levels of 12, 24, 28 or 48Vdc.

SELECTION GUIDE

Model No.	Input Voltage [Vdc]	Output Voltage [Vdc]	Output Current [A]		Input Current [mA]		Max. Capacitive Load [µF]	Efficiency (%) @Max. Load
	Nominal (Range)		Min.	Max	No Load	Full Load		
VCF600-11012S	110 (43~160)	12.0	0	50	25	6300	10000	87
VCF600-11024S		24.0		25	25	6200		88
VCF600-11028S		28.0		21.4	25	6200		88
VCF600-11048S		48.0		12.5	25	6200		88

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INPUT SPECIFICATIONS

Item	Conditions	Typ.	Max.	Unit
Maximum Input Current	5 Vdc Input, 100% Load	250	-	mA
	12 Vdc Input, 100% Load	110	-	
No-Load Input Current	5 Vdc Input	40	-	mA
	12 Vdc Input	15	-	
Inrush Current	All Inputs	-	0.01	A^2s

OUTPUT SPECIFICATIONS

Item	Test Conditions		Min.	Typ.	Max.	Unit
Line Regulation	For Vin change of ±1%		-	-	±1.2	%
Load Regulation	20% to 100% load		-	-	±10	
Temperature Coefficient	Ta=-40°C to 85°C		-	-	±0.05	%/°C
Output Voltage Balance	Vin= Nominal	Dual Outputs	-	-	±1.0	%
Short Circuit Protection			Momentary			
Ripple & Noise	Full Load, 20 MHz BW, Output with 0.33µF Ceramic Capacitor		-	-	120	mV

GENERAL SPECIFICATIONS

Item	Test Conditions	Min.	Typ.	Max.	Unit
Isolation Voltage	Input-Output, tested for 1 Minute and leakage current less than 1 mA	1500	-	-	Vdc
Isolation Resistance	Input-Output, test at 500 Vdc	1000	-	-	MΩ
Isolation Capacitance	Input-Output, 100kHz/0.1V	-	10	-	pF
Switching Frequency	Full Load, Nominal input	-	100	-	kHz
MTBF	MIL-HDFK-217F@25°C	-	1.5	-	M hours
Weight	all others	-	1.8	-	g

ENVIRONMENTAL SPECIFICATIONS

Item	Test Conditions	Min.	Typ.	Max.	Unit
Operating Temperature	Power derating (>85°C, see page 3)	-40	--	100	°C
Storage Temperature		-55	--	125	
Operating Case Temperature	Ta=25°C	-40	--	100	
Cooling	Free air convection				

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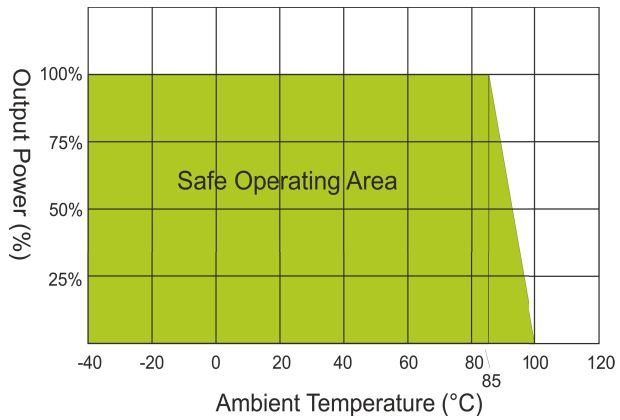
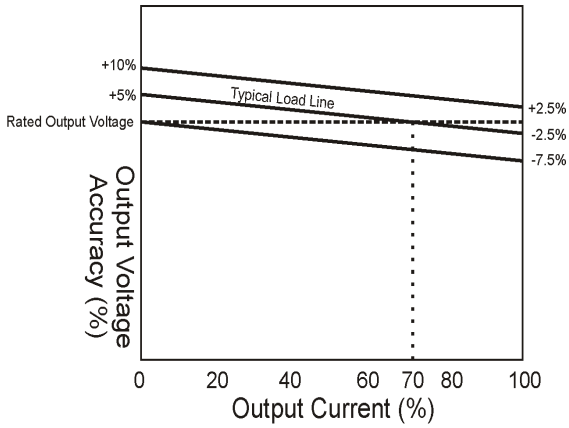
PRODUCT TYPICAL CURVES

Derating Curve

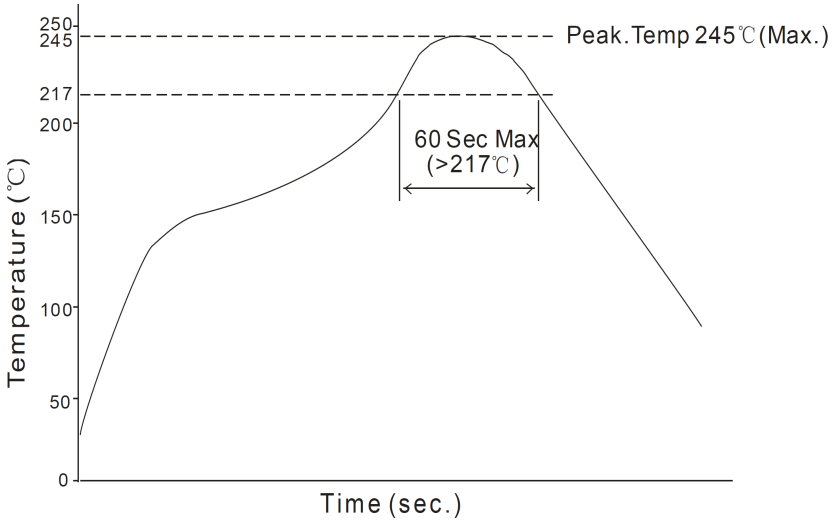


Tolerance Envelope Curve



SOLDERING INFORMATION

Recommended reflow soldering profile refer to IPC/JEDEC J-STD-020D standard.
Our products recommend reflow soldering profile as follows:



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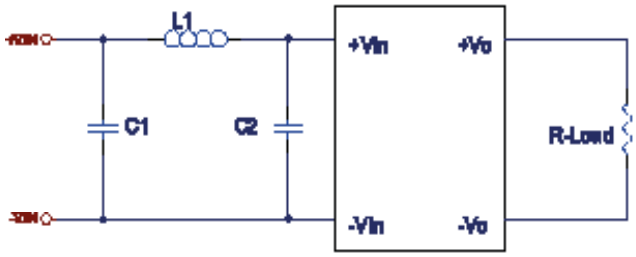
EMC SPECIFICATIONS

EMI	Conducted Emission	CISPR22/EN55022 Class B (with recommended Circuit below)

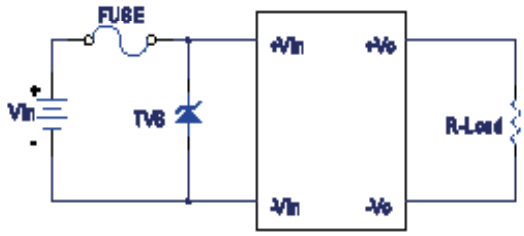
EMI Typical Recommended Circuit (Class B):



Recommended typical circuit parameters		
EMI	C1	4.7 µF / 25V
	C2	4.7 µF / 25V
	L1	10 µH

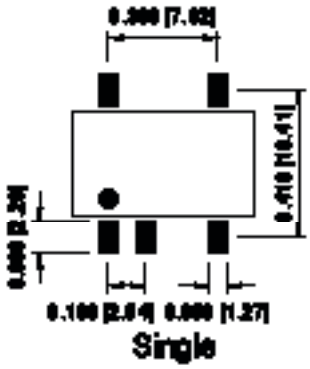
INPUT FUSING AND SAFETY CONSIDERATIONS

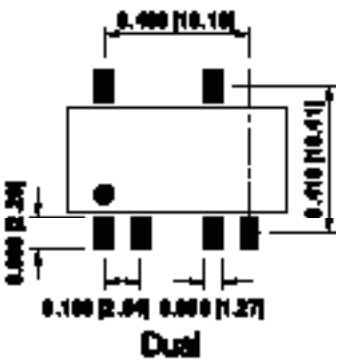
The VCE series converters have not an internal fuse. However, to achieve maximum safety and system protection, always use an input line fuse. We recommended a time delay fuse 0.5A for all models. The circuit beside is recommended by a Transient Voltage Suppressor diode across the input terminal to protect the unit against surge or spike voltage and input reverse voltage.



RECOMMENDED LAYOUT PCB FOOTPRINTS

TOP VIEW





Dimensions are in inches (millimeters)

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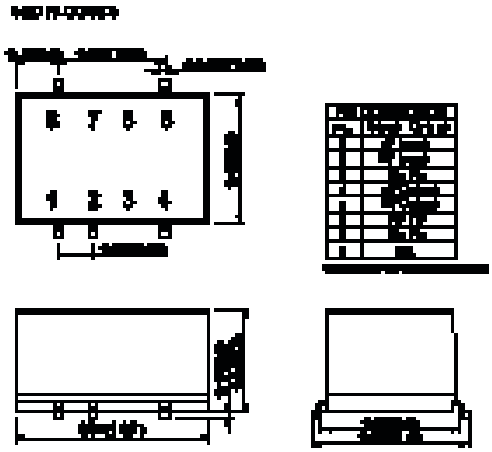
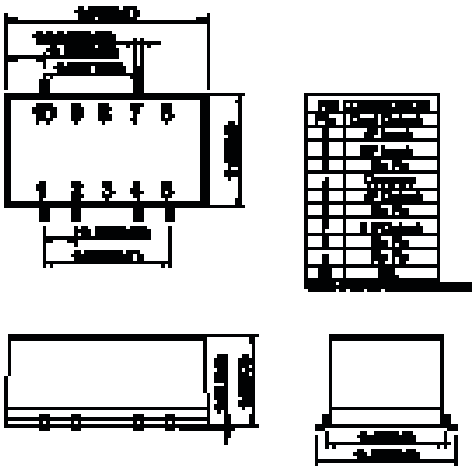
PINNING

Single Output Versions:

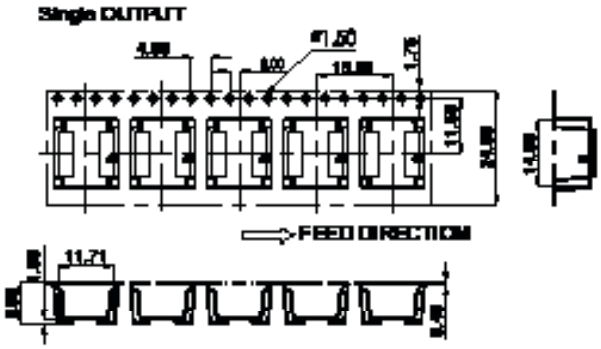


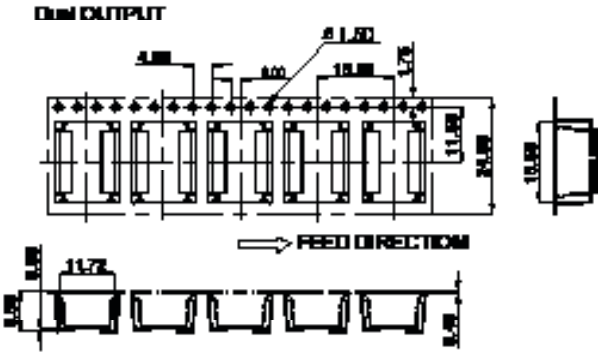
Dual Output Versions:



PACKAGING

The VCE series SMC converters are supplied in tape&reel as standard. Modules are shipped in quantities of 430 modules per reel. Details of tape&reel dimensions are shown below.





Note:
1. Operation under minimum load will not damage the converter, However, they may not meet all specifications.
2. Max. Capacitive Load is tested at nominal input voltage and full load.
3. Unless otherwise noted, All specifications are measured at Ta=25°C, humidity<75%, nominal input voltage and rated output load.
4. Specifications of this products are subject to changes without prior notice.

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