



Features:

- 5W Small Compact SIP style AC-DC converter
- Ultra Wide AC & DC Input 90V to 528VAC,
- 100-745VDC
- Temperature Range -40°C to +85°C
- Output Range: 3.3V - 24VDC
- Low Standby Power 0.1W
- Fully Isolated Pri - Sec >4000Vrms
- Safety: Class II
- Materials: UL94-V0
- IEC/EN/UL62368, IEC/EN61558, IEC/EN60335
- 3 Year Warranty



Description

VTX-215-005-1## is a compact SIP style AC-DC power converter. They feature wide input range accepting either AC or DC voltage, high efficiency, low power consumption and CLASS II reinforced insulation. All models are particularly suitable for industrial control, electric power, instrumentation and smart home applications which don't have high requirement for dimension. A variety of EMC external circuits meet the needs of multiple industries we recommend using the application circuit show in this Datasheet or contact our Technical team for further support.

Selection Guide

Part Number	Power Rating Watts	Output Voltage (VDC)	Output Cur- rent (mA)	Capacitive Load (uF)	Ambient Temp. (°C)	Efficiency Typical	Input Range
VTX-215-005-103	3.3	3.3	1000	2200	85°C	>70%	90 - 528VAC (100 - 745VDC)
VTX-215-005-105	5	5	1000	1500			
VTX-215-005-109	5	9	560	680			
VTX-215-005-112	5	12	420	470			
VTX-215-005-115	5	15	340	330			
VTX-215-005-124	5	24	210	100			
Note: Other output voltages are available upon request.							

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Input Specification					
Item	Conditions	Min	Typical	Max	Unit
Input Voltage	AC Input	90	-	528	VAC
	DC Input	100	-	745	VDC
Input Frequency		47	-	63	Hz
Input Current	115VAC	-	-	0.2	A
	230VAC	-	-	0.1	
	480VAC	-	-	0.07	
Inrush Current	115VAC	-	10	-	
	230VAC	-	17	-	
	480VAC		28		
Leakage Current	480VAC/ 50Hz	0.6mA RMS Max.			
External Input Fuse		1Amp Slow Blow Fuse			

Output Specification					
Item	Conditions	Min	Typical	Max	Unit
Output Voltage	0 - 100% Load	-	+/-3	-	%
Line Regulation	Full Load	-	+/-1.5	-	
Load Regulation	10% - 100% Load	-	+/-3	-	
Ripple / Noise	20MHz Bandwidth (Peak to Peak Value)	-	100	180	mV
Stand by Power	380VAC	-	0.3	0.5	W
Temp. Coefficient		-	+/-0.2	-	%/°C
Short Circuit Protection		Hiccup, Continuous, Self-recovery			
Over Current Protection		>120% Load, Self-recovery			
Minimum Load		10	-	-	%
Hold-up Time	230VAC Input	-	35	-	mS

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General Specification					
Item	Conditions	Min	Typical	Max	Unit
Dielectric Strength	Input to Output (1Min, <5mA)	4000	-	-	VAC
Insulation Resistance	Input to Output (500VDC)	100			M.Ohm
Operating Temperture		-40	-	+85	°C
Storage Temperture		-40	-	+105	
Storage Humidity		-	-	+95	%RH
Switching Frequency		-	-	-	KHz
Safety Class		CLASS II			
MTBF		>500KHrs @ 25°C (MIL-HDBK-217F)			
Safety Approvals		IEC/EN/UL62368 Compliant: IEC/EN61558, IEC/EN60335			
Cooling Method		Free air convection			
Dimensions		33.50 x 17.20 x 13.00mm			
Weight		6.2g			

EMC Specification		
Emissions	CE /RE	CISPR32 / EN55032 CLASS A/B EN55014-1
Immunity	ESD	IEC/EN 61000-4-2 CONTACT +/-6KV EN55014-2
	RS	IEC/EN 61000-4-3 10V/m EN55014-2
	EFT	IEC/EN 61000-4-4
	SURGE	IEC/EN 61000-4-5, EN55014-2
	CS	IEC/EN 61000-4-6 10V/r.m.s. EN55014-2
	Voltage Variation	IEC/EN 61000-4-11, EN55014-2

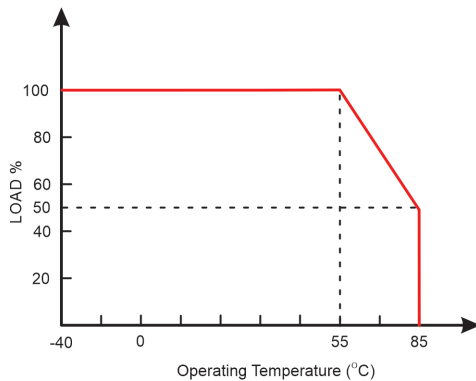
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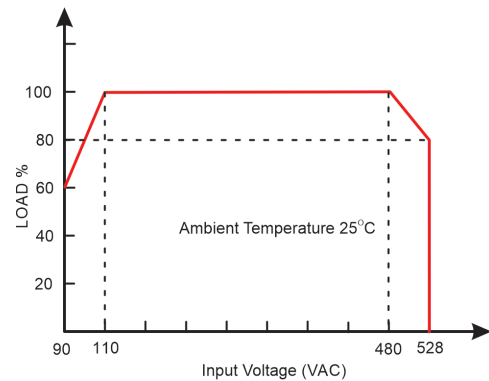
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Derating Graphs

Temperature Derating Graph

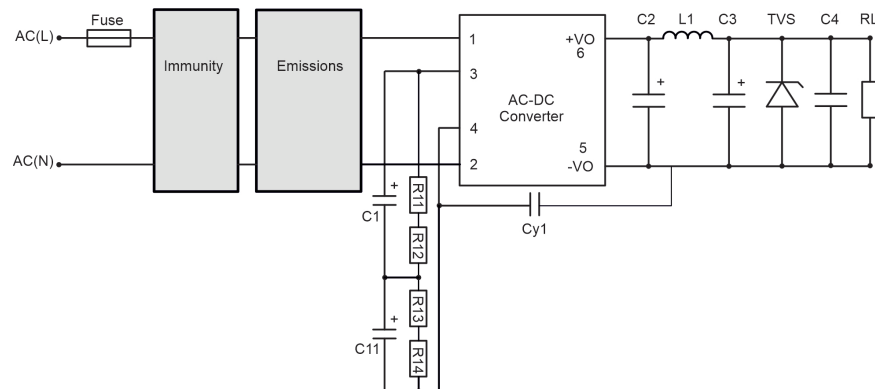


Input Voltage Derating Graph



Application Schematic for EMC

Typical Basic Application



Part Number	C2 (Solid State)	L1	C3	C4	CY1	TVS	Fuse	
VTX-215-005-103	470uF/16V	2.2uH Max 15 Ω 6.5Amp	150uF/ 35V	0.1uF/ 50V	1.0nF/ 400V	SMBJ7.0A	1Amp/ 500V Slow Blow	
VTX-215-005-105						SMBJ7.0A		
VTX-215-005-109	270uF/16V		100uF/35V			SMBJ12A		
VTX-215-005-112						SMBJ20A		
VTX-215-005-115	220uF/35V		47uF/ 35V			SMBJ20A		
VTX-215-005-124	150uF/35V							SMBJ30A
Note: For additional filtering requirements, contact technical support								

C1 / C11 Required			R11/R12/R13/R14
-	-25°C to +85°C	-40°C to +85°C	1MΩ/1206/(1/4W) (required)
90VAC - 528VAC	33uF/400V	47uF/400V	
165VAC - 528VAC	22uF/400V	33uF/400V	
90VAC - 305VAC	C1: 10uF/450V C11: Wire	C1: 22uF/450V C11: wire	

- C1/C11 is used as filter capacitor with AC input (must be connected externally) and as EMC filter capacitor with DC input (must be connected), and it is recommended to use the capacitor with ripple current >200mA@100KHz. It is recommended to use electrolytic capacitor C1/C11 with ESR ≤ 20Ω at low temperature.
- R11, R12, R13, R14 are the voltage equalizing resistors of C1, C11 electrolytic capacitors (must be connected), and SMD anodes can be used;
- We recommend using an electrolytic capacitor with high frequency and low ESR (ESR of C3 at low temperature of -40°C ≤ 1.1Ω) rating for C3 (refer to manufacture's datasheet), electrolytic capacitor can be used for C2 when applied in normal and high temperature environments. Combined with C2, L1, they form a pi-type filter circuit. Choose a capacitor voltage rating with at least 20% margin, in other words not exceeding 80%. C4 is a ceramic capacitor, used for filtering high frequency noise.
- A suppressor diode (TVS) is recommended to protect the application in case of converter failure and specification should be 1.2 times of the output voltage.

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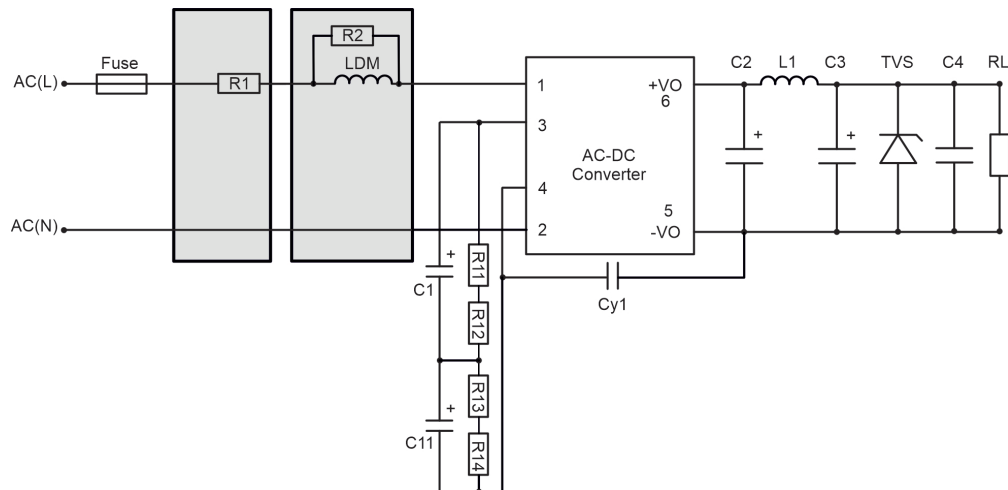
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Application EMC Solution

Recommended Circuit	Environmental	Typical industry	Input voltage range	Environment temperature	Emissions	Immunity
Circuit 1	Basic	None	90-528 VAC	-40°C to +85°C	Class A	Level 3
Circuit 2	Indoor general environment	Intelligent building, Workshop		-25°C to +55°C	Class B	Level 4
Circuit 3	Indoor/Outdoor industrial environment	ITS/Video monitoring/ Charging point/ Communication/ Security and protection		-40°C to +85°C	Class A	Level 4
Circuit 4	Strong lightning surge	Electricity dedicated		-40°C to +85°C	Class A	Level 4

Basic Application Circuit 1



Basic Application Circuit 1			
Application environmental	Ambient temperature range	Immunity level	Emissions class
Basic	-40°C to +85°C	Level 3	Class A
Fuse	1A/500V. Slow Blow		
R1 (wire wound resistor)	12Ω/3W		
R2 (SMD resistor)	VTX-215-005-105/109	20K/1206/(1/4W)	
	VTX-215-005-103/112	2K/1206/(1/4W)	
	VTX-215-005-115/124	15K/1206/(1/4W)	
LDM	VTX-215-005-105	1.2mH/Max: 2.5Ω/Min: 0.2A	
	VTX-215-005-109	2.2mH/Max: 15Ω/Min: 0.2A	
	VTX-215-005-103/12/15/24	4.7mH/Max: 15Ω/Min: 0.2A	

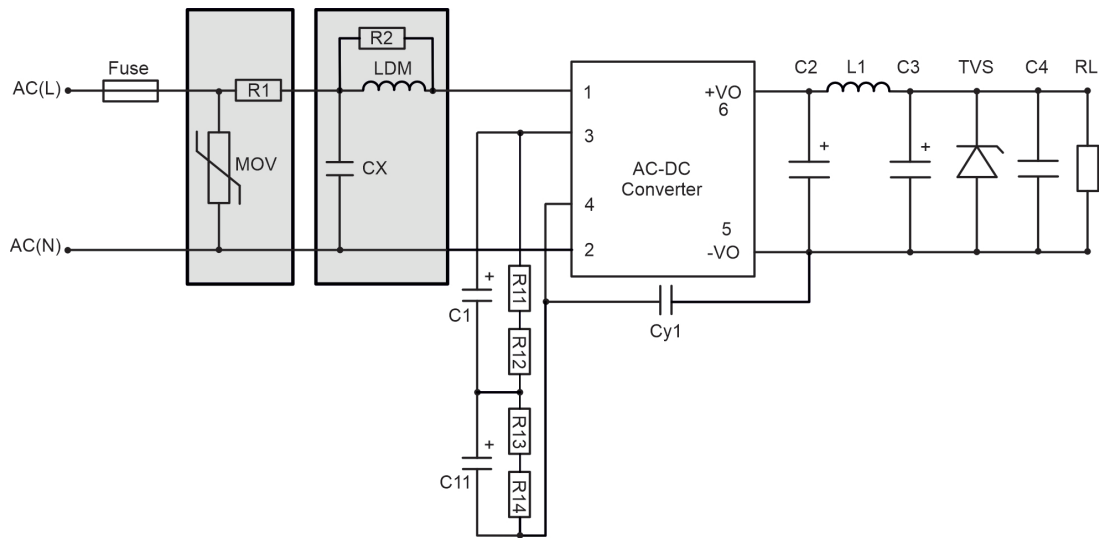
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Application EMC Solution

Indoor/Industrial Application Circuit 2



Indoor / Industrial Application Circuit 2

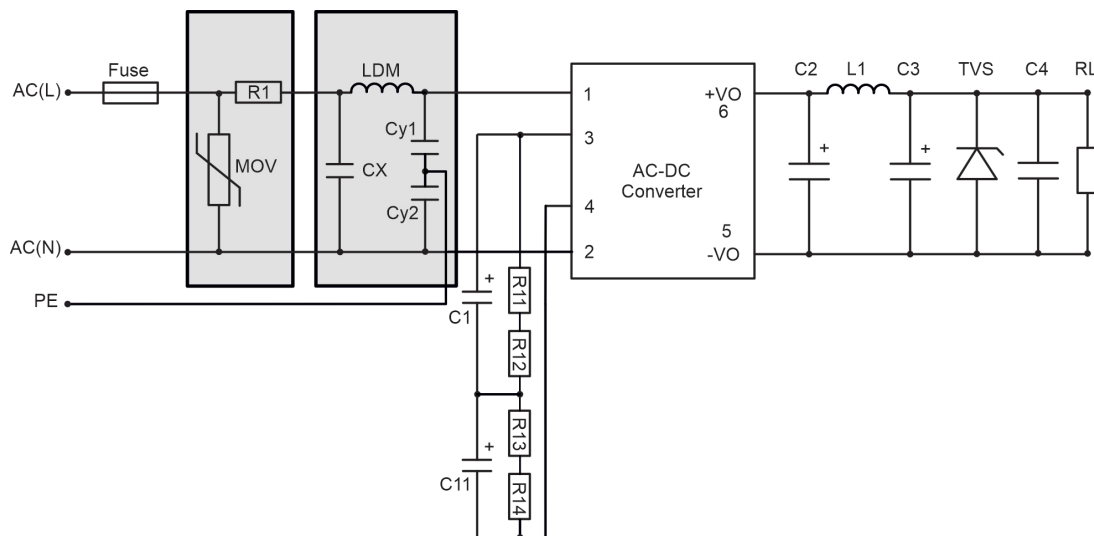
Application environmental	Ambient temperature range	Immunity level	Emissions class
Indoor industrial	-25°C to +55°C	Level 4	Class B
Fuse		2A/500V. Slow Blow	
R1 (wire wound resistor)		12Ω/3W	
MOV		S14K550	
CX		0.1uF/480VAC	
R2 (SMD resistor)	VTX-215-005-105/109	20K/1206/(1/4W)	
	VTX-215-005-103/112	2K/1206/(1/4W)	
	VTX-215-005-115/124	15K/1206/(1/4W)	
LDM	VTX-215-005-105	1.2mH/Max: 2.5Ω/Min: 0.2A	
	VTX-215-005-109	2.2mH/Max: 15Ω/Min: 0.2A	
	VTX-215-005-103/12/15/24	4.7mH/Max: 15Ω/Min: 0.2A	
1: According to the certification requirements, the X capacitor needs to be connected in parallel with the bleeder resistance, the recommended resistance value is less than 3.8MΩ, and the actual need to be selected according to the certification standard; 2: R1 is the input plug-in resistor, this resistor needs to be a wire-wound resistor (required), please do not select SMD resistor or carbon film resistor.			

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Indoor/Outdoor Industrial Application Circuit 3



Indoor / Industrial Application Circuit 3

Application environmental	Ambient temperature range	Immunity level	Emissions class
Indoor/Outdoor industrial	-40°C to +85°C	Level 4	Class A
Fuse		2A/500V. Slow Blow	
R1 (wire wound resistor)		12Ω/3W	
MOV		S14K550	
CX		0.1uF/480VAC	
Cy1 / Cy2		1.0nF/400VAC	
LDM	VTX-215-005-105	1.2mH/Max: 2.5Ω/Min: 0.2A	
	VTX-215-005-109	2.2mH/Max: 15Ω/Min: 0.2A	
	VTX-215-005-103/12/15/24	4.7mH/Max: 15Ω/Min: 0.2A	

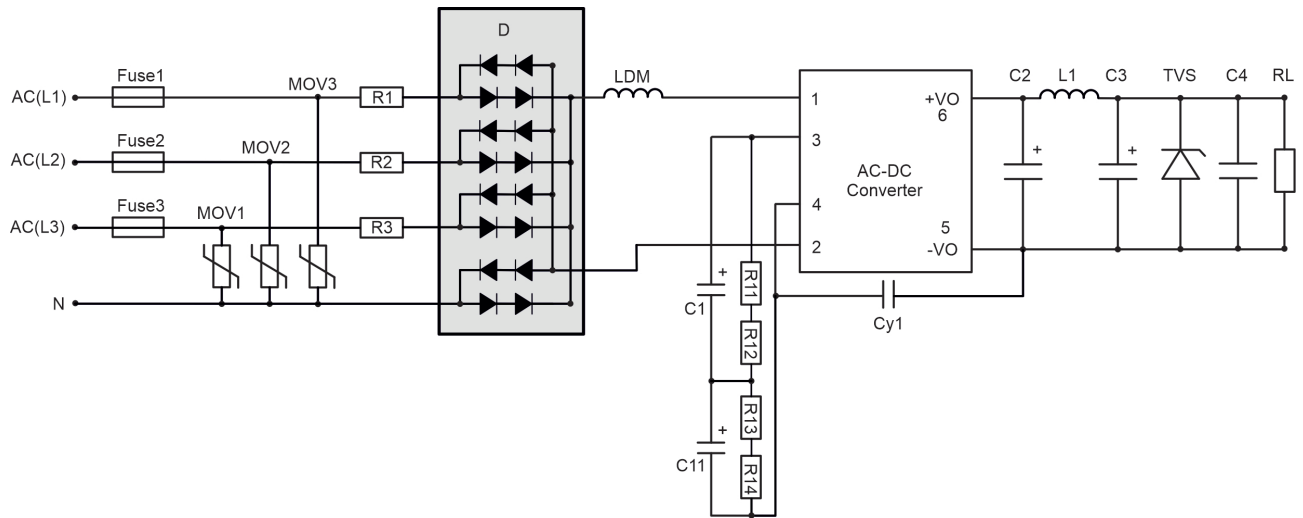
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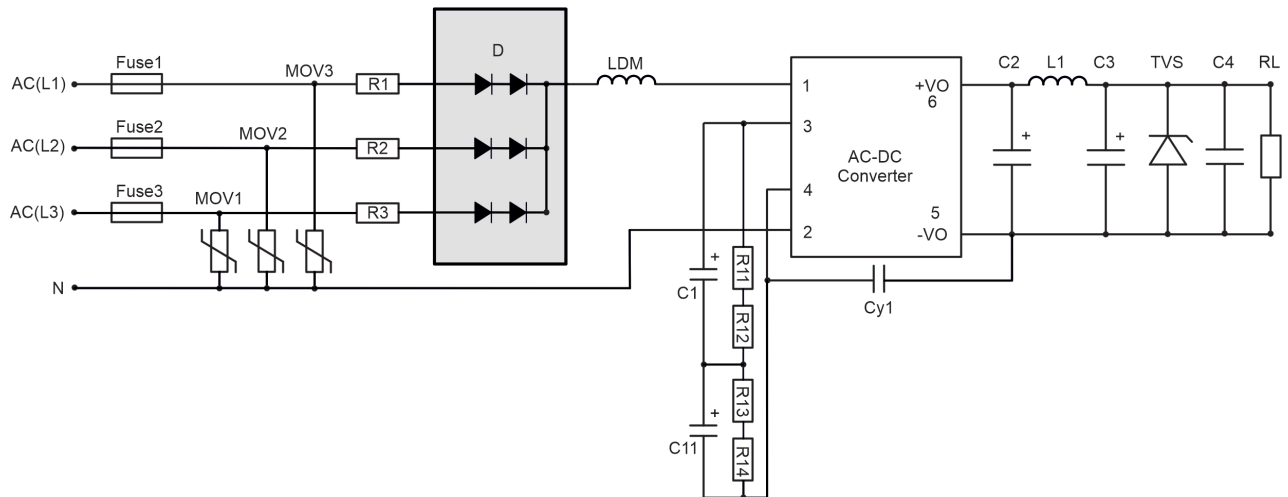
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Application EMC Solution

Strong lightning Surge Industrial Application Circuit 4



Recommended circuit for applications which require 4KV differential-mode surge standard (**full-wave rectification**)



Recommended circuit for applications which require 4KV differential-mode surge standard (**half-wave rectification**)

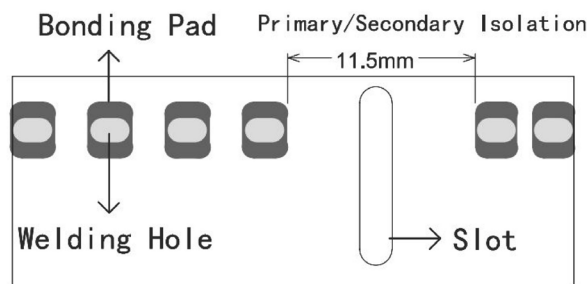
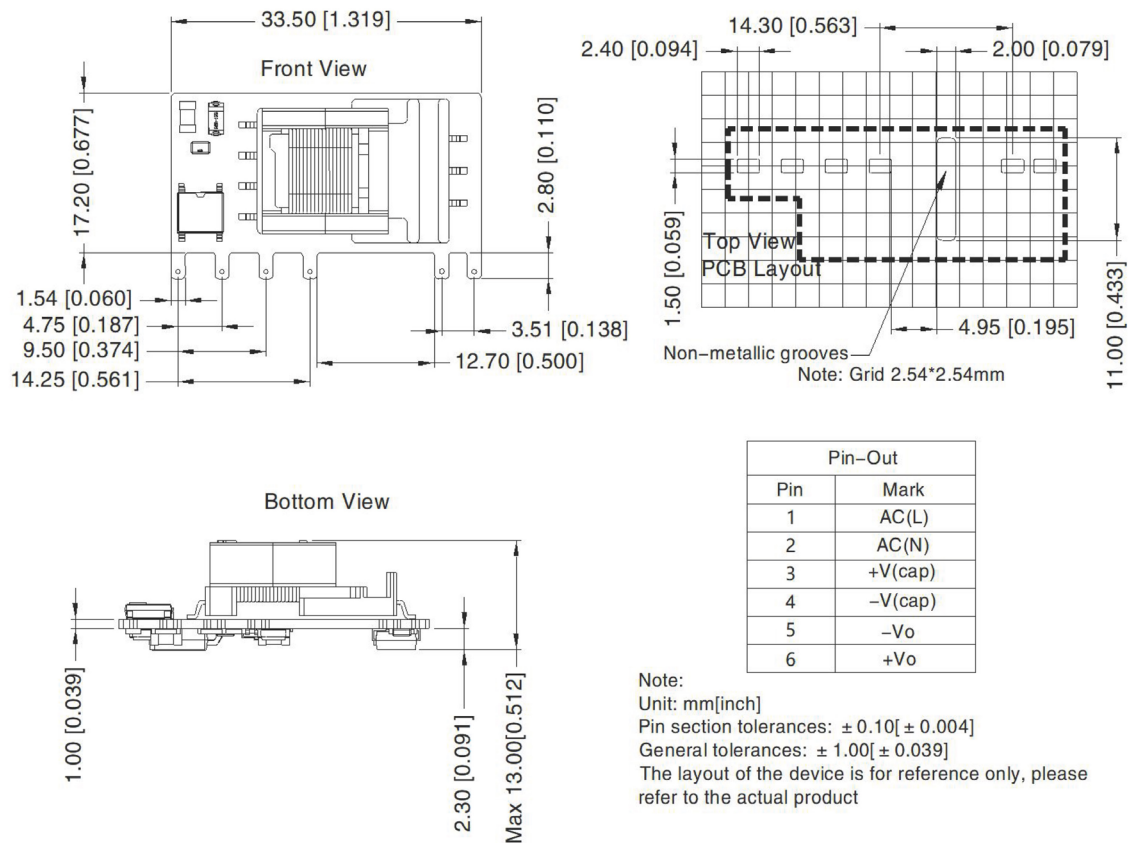
Indoor / Industrial Application Circuit 4			
Application environmental	Ambient temperature range	Immunity level	Emissions class
Lightning Surge industrial	-40°C to +85°C	Level 4	Class A
Fuse 1/2/3		3.15A/500V. Slow Blow	
R1/R2/R3 (wire wound resistor)		12Ω/5W	
MOV1/2/3		S14K550	
D		2A/1000V	
LDM	VTX-215-005-105	1.2mH/Max: 2.5Ω/Min: 0.2A	
	VTX-215-005-109	2.2mH/Max: 15Ω/Min: 0.2A	
	VTX-215-005-103/12/15/24	4.7mH/Max: 15Ω/Min: 0.2A	

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Dimensions



Note: There is a slot(non-metallic hole) between pin 4/5; For details, please refer to the recommended dimensions or pad.

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