PH300WR4-J Series
300W Wide Input DC-DC Converter

Features

- Wide 4:1 input range voltage
- 300W power in industrial standard half brick package
- Fixed switching frequency
- Continuous short circuit protection
- Over temperature protection, Over voltage protection, Over load protection, input under voltage lockout, and remote ON/OFF control function
- Design meet EN62368-1 standard

Application

- Industrial control
- Electric power
- Railway solution
- Battery management system
- Automation power application
- Datacom application

Selection Guide

Part Number	Input voltage	Output voltage	Output current @ full load	Ripple & Noise(1)	No-load Input current	Efficiency(2) (typ.)	Capacitive load(3) (max.)
PH300WR4-2412J	9-36Vdc Nom. 24Vdc	12Vdc	25000mA	120mVp-p	50mA	86.5%	8800μF
PH300WR4-2415J		15Vdc	20000mA	150mVp-p	50mA	87%	8800μF
PH300WR4-2424J		24Vdc	12500mA	300mVp-p	50mA	86%	4300μF
PH300WR4-2448J		48Vdc	6250mA	480mVp-p	70mA	87%	1500μF

1. (1) Ripple & Noise measured with 20MHZ BW at nominal input voltage 0%~100% load with E-cap 47μF/100V +X7R MLCC 0.47μF/100V.
2. (2) The efficiency is test by nominal input and max. full load @25°C.
3. (3)The capacitive load is tested by nominal input and constant resistive load.
4. Special input and output voltage combinations available by request, please check with our sales.

Part Number

P H 3 0 0 W R 4 – 2 4 1 5 J

Power	Wide input range	Input voltage	Output voltage

CTC is the professional and one among world's leading manufacturers of DC-DC/ AC-DC converters.
The products were used in Computers, Industrial controls, Medical equipment, Transportation, EV, ECO-power, Aero-space application and communication.

Specifications

	Parameter	Conditions	Min.	Typ.	Max.	Unit
Input	Input filter			LC type		
	Input voltage range		9		36	VDC
	Start-up time	100% load @ Nominal Vin			200	mS
	Under voltage lockout	0%~100% load		7.0		VDC
	Start-up voltage	0%~100% load		9.0		VDC
	Input surge voltage	1s. Max			50	VDC
	Remote ON/OFF	DC-DC on		Open or 3V < Vr < 12V		
		DC-DC off		Short or 0V < Vr < 1.2V		
Output	Voltage accuracy				±1	%
	Voltage adjustability (0%~100% load at Vin range Pout≦max rated power)	24Vout	-10		+10	%
		12V/ 15Vout at 12~36Vin range	-10		+10	%
		48Vout at 12~36Vin range	-10		+15	%
	Line regulation	LL-HL at 100% load			±0.2	%
	Load regulation	0%-100% load			±0.5	%
	Minimum load				0	%
	Temperature coefficient			0.05		%/˚C
	Transient response recovery time	25% load step change (75%-100% load)		500		μs
	Operating frequency	100% Load at Nominal Vin		250		KHz
Environment	Operating temperature		-40		100	˚C
	Storage temperature		-55		125	˚C
	Baseplate temperature				105	˚C
	Relative Humidity		5		95	%RH
	MTBF (MIL-HDBK-217F)	+25˚C	150			KHrs
	Vibration			MIL-STD-202G		
Function	Isolation voltage	60 sec., Input to output DC Isolation cut-off current: 1mA	3000			VDC
		AC Isolation cut-off current: 5mA	2000			VAC
		60 sec., Input (Output) to case DC Isolation cut-off current: 1mA	1600			VDC
		AC Isolation cut-off current: 5mA	1000			VAC
	Isolation resistance		1000			MΩ
	Isolation capacitance				4700	pF
	Over load protection			150		%
	Short Circuit Protection			Continuous, automatic recovery		
	Over voltage protection Shutdown	12Vout	13.4		19.2	VDC
		15Vout	16.8		24.0	VDC
		24Vout	26.9		38.4	VDC
		48Vout	56.2		67.2	VDC
	Over temperature protection	Tc (Case Temperature)			110	˚C
	Safety Standard			EN62368-1		

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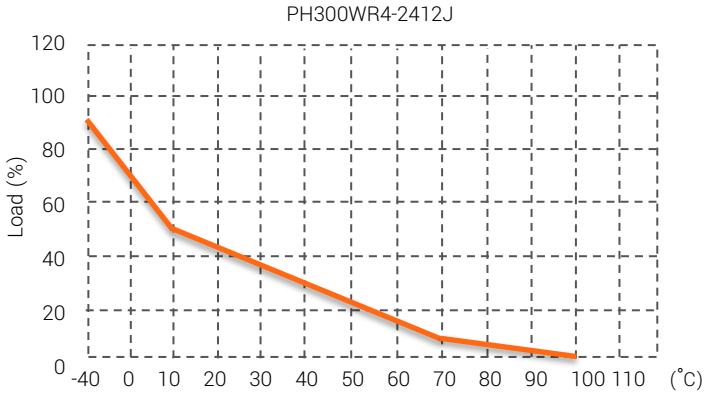
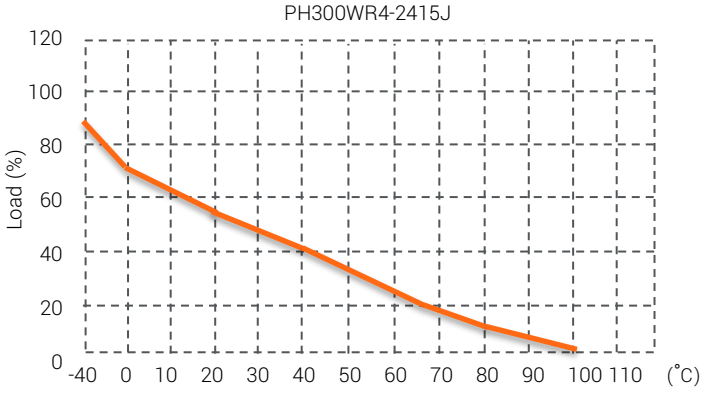
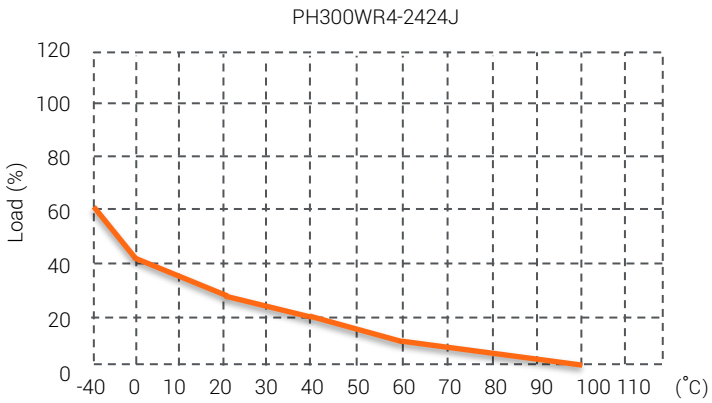
Physical	Dimension		57.9 (L) x 61.0 (W) x 12.7 (H) mm	
	Weight		120	g
	Case material		Aluminum Baseplate with Plastic Case	
	Potting material		Silicon	
	Cooling method		Nature Convection	
EMC	EMI	EN 55032	Class A/B with external circuit	
	ESD	EN61000-4-2, Air±8kV; Contact±6kV	Criteria A	
	Radiated immunity	EN61000-4-3, 10 V/m	Criteria A	
	Fast transient (1)	EN61000-4-4, ±2kV	Criteria A	
	Surge (1)	EN61000-4-5, ±2kV	Criteria A	
	Conducted immunity	EN61000-4-6, 10 V/rms	Criteria A	
	Magnetic field immunity	EN61000-4-8, 10 A/m	Criteria A	

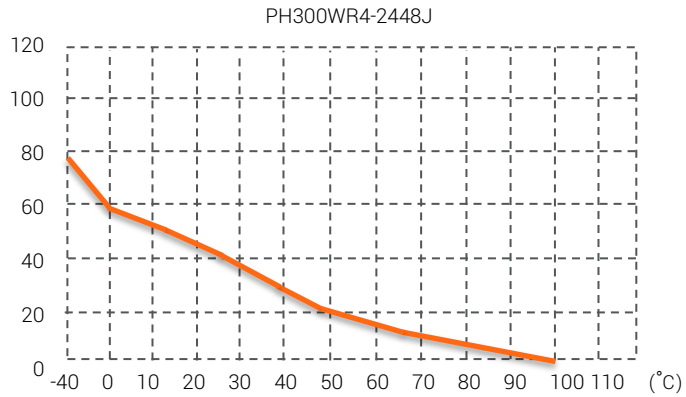
1. (1) External input capacitor required 1000μF/100V.
3. All specifications valid at nominal input voltage, full load and 25˚C after warm-up time unless otherwise stated.
4..The product information and specifications are subject to change without prior notice.

Derating curve









The derating curve was measured at nominal input voltage with natural convection.

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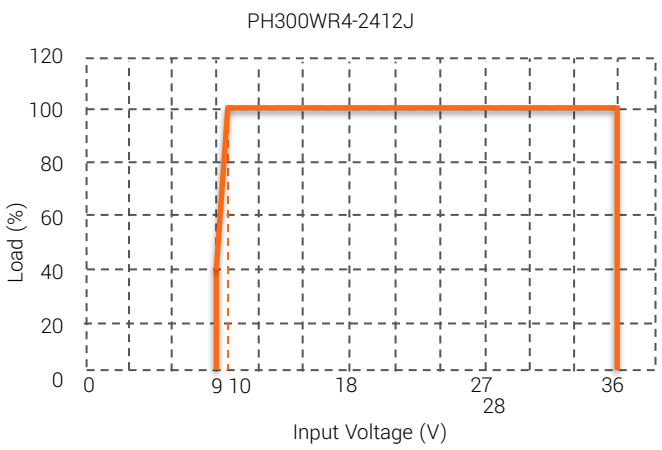
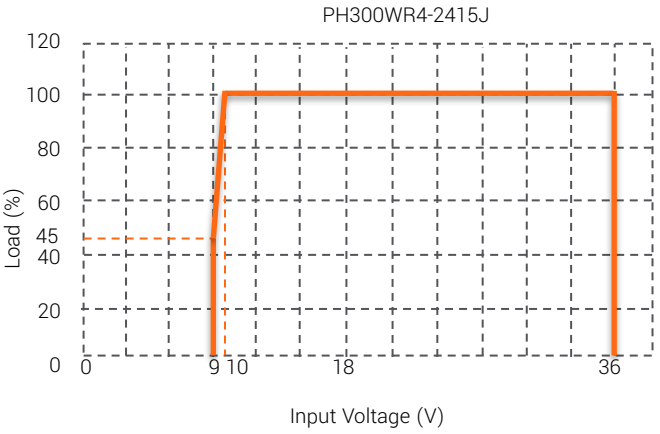
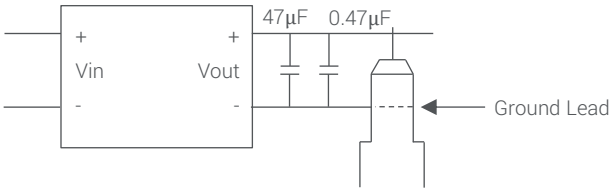
Derating curve for input voltage



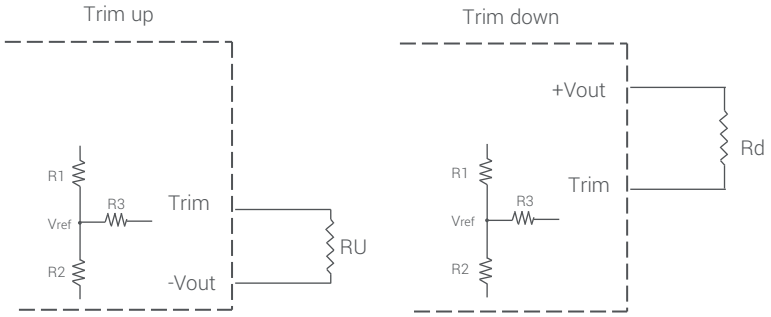


Ripple & Noise Measure Method



Measured with 20MHz bandwidth and E-Cap 47μF/100V +X7R MLCC 0.47μF/100V

External Output Trimming



Formula for trim resistor:

UP: $Ru=\frac{aR_2}{R_2-a}-R_3$ $a=\frac{V_{ref}}{V_o'-V_{ref}}\cdot R_1$

DOWN: $Rd=\frac{bR_1}{R_1-b}-R_3$ $b=\frac{V_o'-V_{ref}}{V_{ref}}\cdot R_2$

Note:

1.Ru, Rd is mean trim resistor, please check the formula.

2.a & b: user define parameter, no actual meanings.

3. V_o' is mean trim up/down voltage.

4. Value for R1, R2, R3 and Vref refer to below table.

Vout	Vref	R1	R2	R3
12V	2.50V	38.0KΩ	10.0KΩ	68.0KΩ
15V	2.50V	50.0KΩ	10.0KΩ	68.0KΩ
24V	1.24V	103.0KΩ	5.6KΩ	51.0kΩ
48V	2.50V	36.4KΩ	2.0KΩ	12.4kΩ

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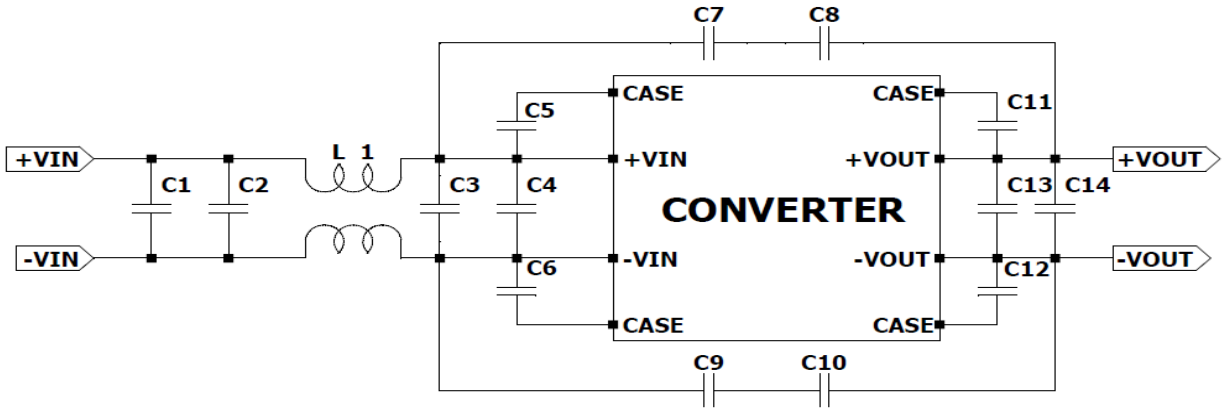
EMI Filtering-suggestion for EN55032



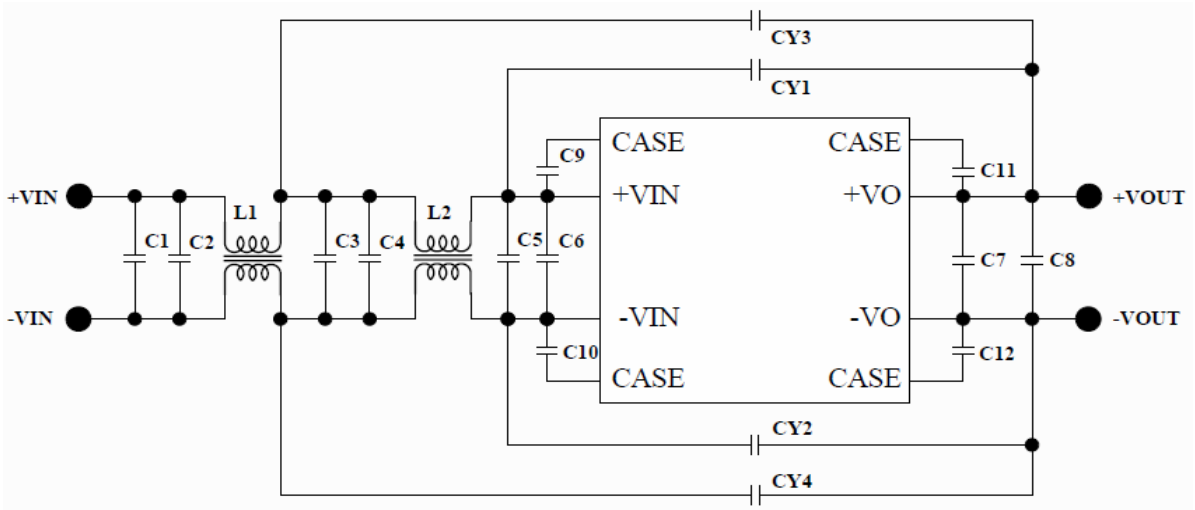
C1	C2	C3	C4	C5	C6	C7	C8
KYA 220μF/100VDC	MLCC 1μF/50VDC	KYA 220μF/100VDC	MLCC 1μF/50VDC	MLCC 4700PF/2KVDC X 4	MLCC 4700PF/2KVDC X 4	MLCC 4700PF/2KVDC	MLCC 4700PF/2KVDC
C9	**C10**	**C11**	**C12**	**C13**	**C14**	**L1**	
MLCC 4700PF/2KVDC	MLCC 4700PF/2KVDC	MLCC 4700PF/2KVDC X 4	MLCC 4700PF/2KVDC X 4	MLCC 47μF/50VDC	MLCC 0.1μF/50VDC	A10 T22X14X10 1.3mH	

EMI CLASS A - PH300WR4-2415

C1	C2	C3	C4	C5	C6	C7	C8
KYA 220μF/100VDC	MLCC 1μF/50VDC	KYA 220μF/100VDC	MLCC 1μF/50VDC	MLCC 4700PF/2KVDC X 6	MLCC 4700PF/2KVDC X 6	MLCC 4700PF/2KVDC	MLCC 4700PF/2KVDC
C9	**C10**	**C11**	**C12**	**C13**	**C14**	**L1**	
MLCC 4700PF/2KVDC	MLCC 4700PF/2KVDC	MLCC 4700PF/2KVDC X 6	MLCC 4700PF/2KVDC X 6	MLCC 4.7μF/100VDC	MLCC 0.1μF/100VDC	A10 T22X14X10 1.3mH	

EMI CLASS A - PH300WR4-2448

EMI CLASS A - PH300WR4-2424



C1	C2	C3	C4	C5	C6	C7	C8	C9
KYA 220μF/100VDC	MLCC 1μF/50VDC	KYA 220μF/100VDC	MLCC 1μF/50VDC	KYA 220μF/100VDC	MLCC 1μF/50VDC	MLCC 4.7μF/50VDC	MLCC 0.1μF/50VDC	MLCC 2200PF/3KVDC
C10	**C11**	**C12**	**CY1**	**CY2**	**CY3**	**CY4**	**L1**	**L2**
MLCC 2200PF/3KVDC	MLCC 2200PF/3KVDC	MLCC 2200PF/3KVDC	MLCC 2200PF/3KVDC X 5 parallel	MLCC 2200PF/3KVDC X 5 parallel	NC	NC	A10 T22X14X10 1.3mH	A10 T22X14X10 1.3mH

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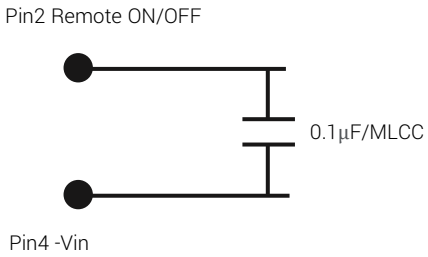
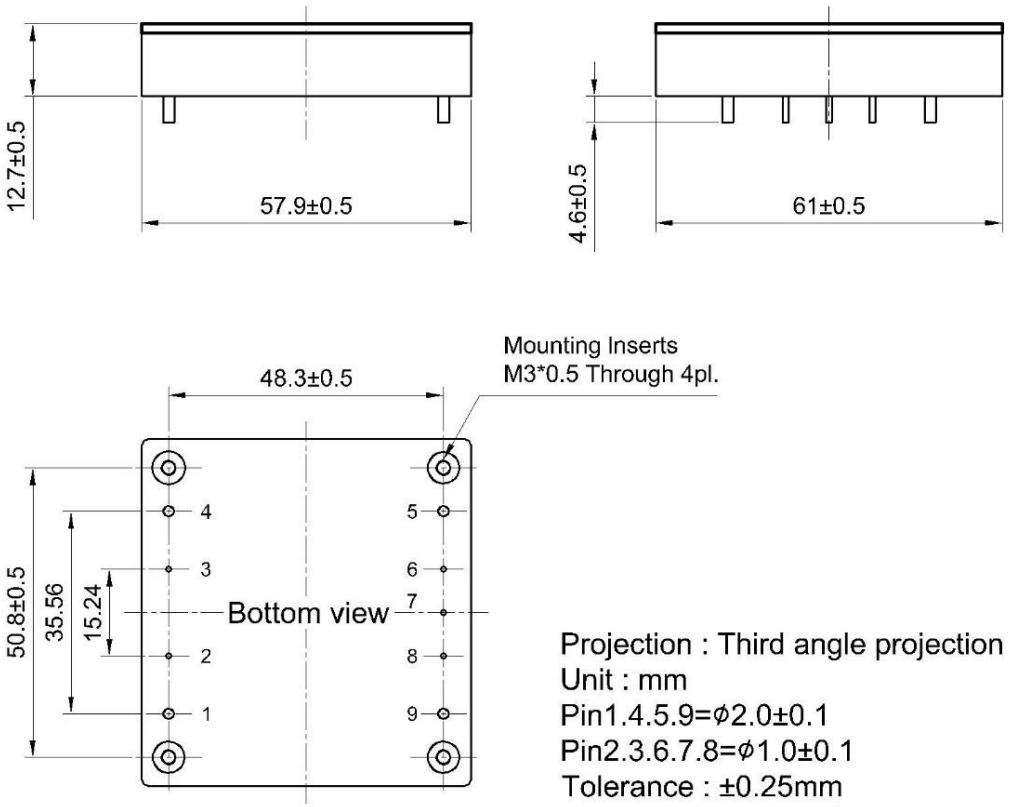
Remote ON/OFF control



Mechanical Dimension & Pinning



Pin	Function
1	+Vin
2	CTRL
3	Case
4	-Vin
5	-Vout
6	-Sense
7	Trim
8	+Sense
9	+Vout

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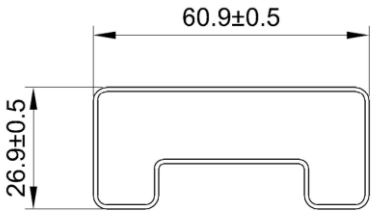
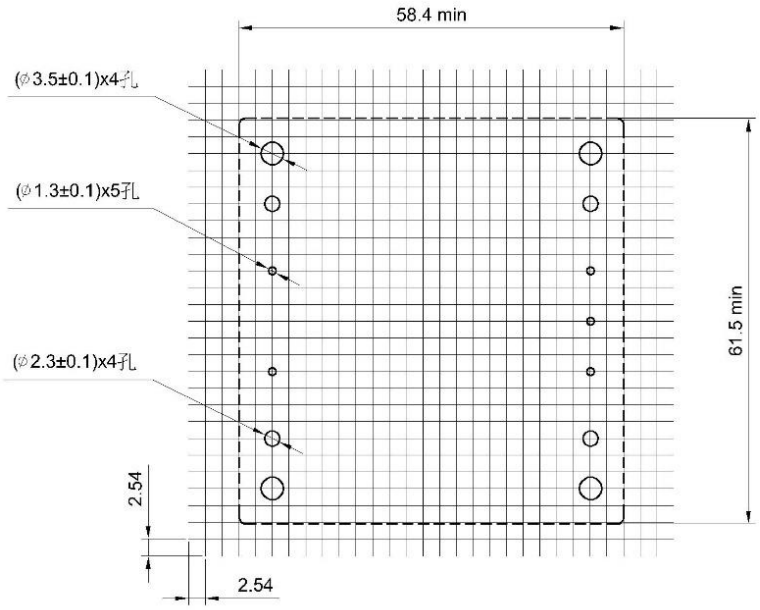
Package



UNIT:mm
1 Tube = 7 pcs
Length:520±2mm

Recommended Footprint



Footprint (Top view)