

YPM100 Series – Isolated DC/DC Converters
48V, 72V, 96V Input, Maximum Power: 100WData Sheet
Oct 25, 2013**YPM100 Series 100W isolated DC/DC converters****Features**

- High Efficiency
- Wide operating temperature range
(-40°C to +85°C)
- Wide 2:1 input range
- Input – Output Isolated
- Built-in over temperature protection circuit
- Output over voltage protection
- Over current protection
- Input under voltage lock out
- Remote on/off control
- Safety agency approval
UL (UL 60950-1, CSA C22.2 NO.60950-1):
pending
CE (EN 60950): pending
- RoHS directive

**Applications**

- Telecommunication
- Datacom
- Instrumentation/ Equipments
- Distributed Power Systems
- Railway

Description

YPM100 Series is a high efficiency isolated DC/DC converter provide up to 100 watt output power. This module achieved a high efficiency by employing an active clamp and synchronous rectification topology. It has a wide operating temperature from -40°C to +85°C. This module has a precise thermal protection circuit and it gives a high reliability.

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Oct 25, 2013**Absolute Maximum Ratings**

Parameter	Min	Typ	Max	Unit	Notes
Input Voltage Continuous				Vdc	
YPM100-48-XX	36	-	72		
YPM100-72-XX	50		100		
YPM100-96-XX	65		120		
Operating Ambient Temperature	-40	-	85	°C	
Storage Temperature	-40	-	100	°C	
I/O Isolation Voltage	-	-	1500	VAC	

Stresses in excess of the absolute maximum ratings can cause permanent damage to the device

Electrical Specifications**Input Characteristics**

Parameter	Symbol	Min	Typ	Max	Unit
Operating voltage Range					Vdc
YPM100-48-XX		36		72	
YPM100-72-XX		50		100	
YPM100-96-XX		65		120	
No load input current					mA
Input reflected ripple current (At rated input voltage and Maximum Output Power)					mA
Input Ripple Rejection voltage (pk to pk)	Vjac				Vdc
Inrush current(peak)	Vp-p				A
Disabled input current (Remote on/off control)					mA

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Output Characteristics

 T_A = +25°C, V_{in} = 36 ~ 72V unless otherwise specified

Parameter	Sym bol	Min	Typ	Max	Unit
Output Voltage tolerance	V _o	-	-	±2	%
Output Current	I _o				
V _o =5V				20	A
V _o =12V				8.3	A
V _o =15V				6.6	A
V _o =24V				4.2	A
Output Regulation;					
- Line Regulation (From Min V _{in} to Max V _{in} , constant load)		-	-	±0.5	%
- Load Regulation (From 10% load to maximum load)		-	-	±1	%
Output current limit (Automatic recovery)		>105			%
Output Ripple and noise (V _{in} = Nominal input, and I _o =Max output current. Bandwidth 20MHz, 15uF Tantal cap and 1uF Ceramic cap)	mVp- p	-	-	75@5V 120@12V 150@15V 240@24V	mV
Efficiency					
YPM100-48-5			87		
YPM100-48-12			88		
YPM100-48-15			88		
YPM100-48-24			89		
YPM100-72-5			83		
YPM100-72-12			83.5		%
YPM100-72-15			85		
YPM100-72-24			88		
YPM100-96-5			82.5		
YPM100-96-12			85		
YPM100-96-15			85		
YPM100-96-24			86		
(100% of max I _o , V _{in} = Nominal input)					

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Dynamic Load Response (10uF Tantal Capacitor) 25% to 50 %, 50% to 25%, Slew rate = 0.05A/uS)			±		mV
Recovery Time (with in 1% Nominal Vo)					us
Start – Up Time		-	-	-	ms
Turn – on overshoot		-	-	5	%
Maximum output capacitance (@5V)					μF

Isolation Specifications

Parameter	Symbol	Min	Typ	Max	Unit
I/O Isolation Voltage (AC1500V, 1 Min) - Input-Output: - Input-Case: - Output-case:			-	1500	VDC
			-	1500	VDC
			-	1500	VDC
Isolation Resistance - Output-Case (at DC500V at 25°C And 70%RH for 1 min)	RISO	>100	-	-	MΩ
Isolation Capacitance	CISO				pF

General Specifications

Parameter	Symbol	Min	Typ	Max	Unit
Switching Frequency			300		KHz
Remote ON/OFF control On = short to - Vin Off = open					Vdc
Output voltage trim range					%

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MTBF		$\times 10^5$			hrs
Dimensions (W.H.L)		100 x 16.5 x 53 (3.94 x 0.65 x 2.09))			mm (inches)
Weight		-		-	Grams

Environmental

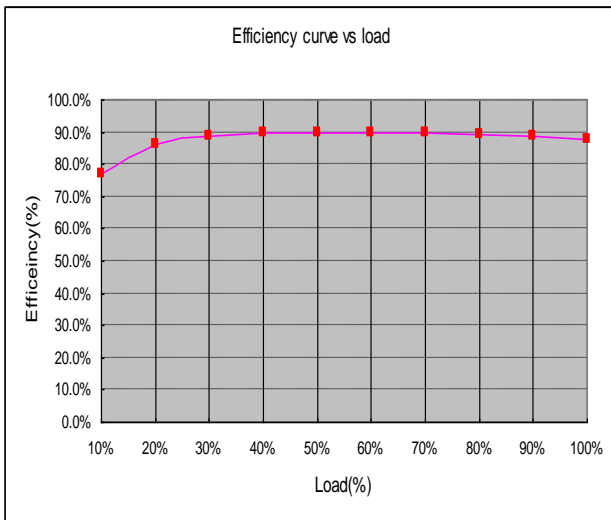
Parameter	Symbol	Min	Typ	Max	Unit
Operating Temperature		-40		85	°C
Operating Humidity (RH non-condensing)		5		95	%
Storage Temperature		-40		105	°C
Shock					
Vibration					

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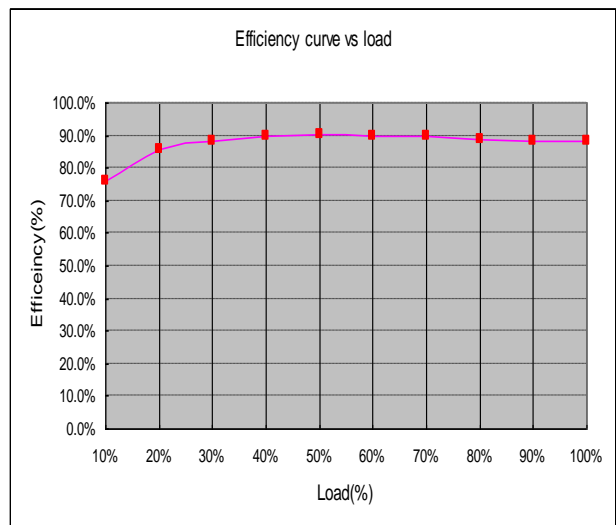
Characteristic Curves
Efficiency Curves

YPM100-48-5



Vin=48V, Vo=5V@20A , At 25°C

YPM100-48-12



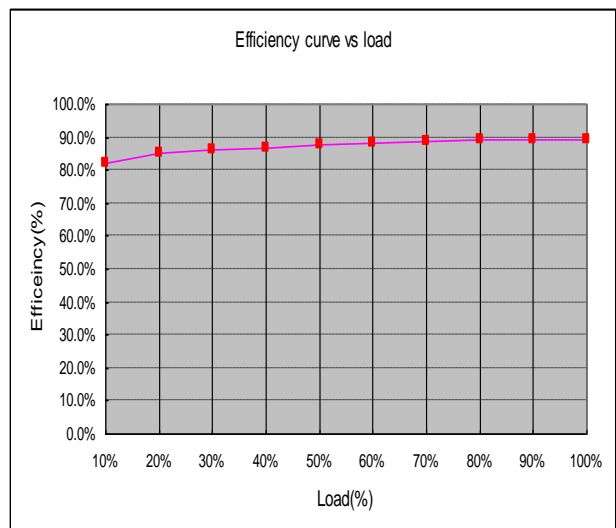
Vin=48V, Vo=12V@8.3A , At 25°C

YPM100-48-15



Vin=48V, Vo=15V@6.6A , At 25°C

YPM100-48-24



Vin=48V, Vo=24V@4.2A , At 25°C

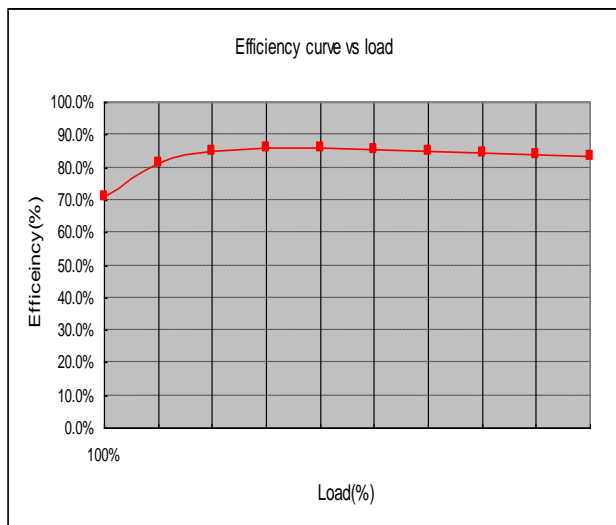
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Characteristic Curves

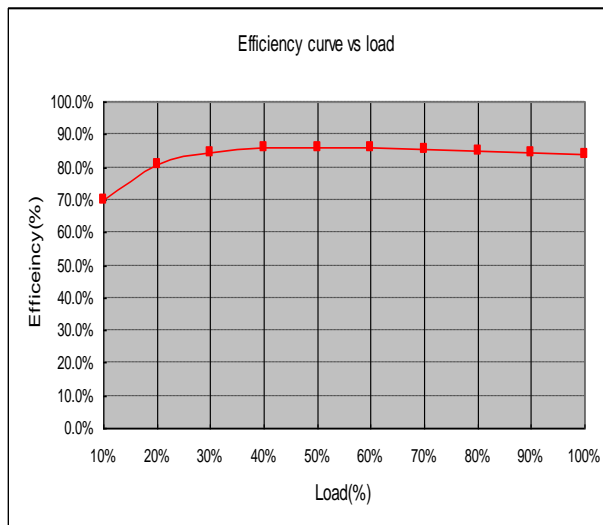
Efficiency Curves

YPM100-72-5



Vin=72V, Vo=5V@20A , At 25°C

YPM100-72-12



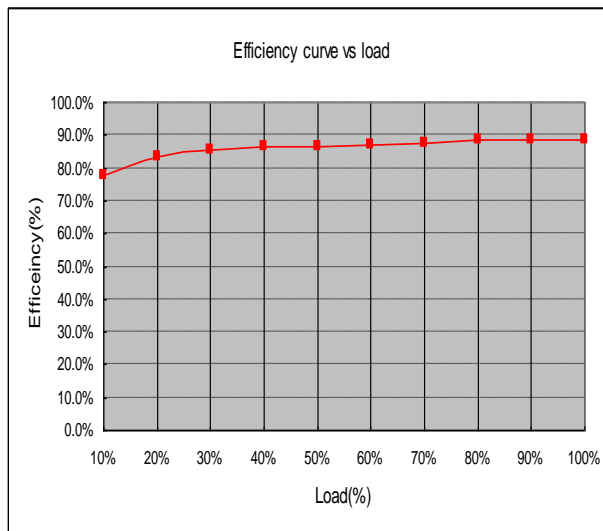
Vin=72V, Vo=12V@8.3A , At 25°C

YPM100-72-15



Vin=72V, Vo=15V@6.6A , At 25°C

YPM100-72-24



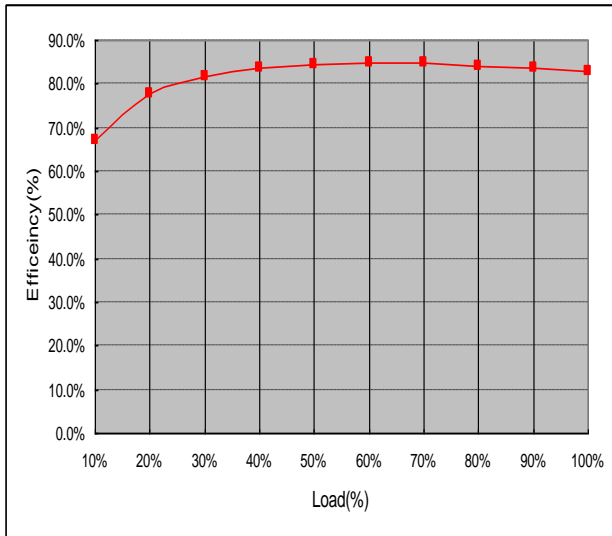
Vin=72V, Vo=24V@4.2A , At 25°C

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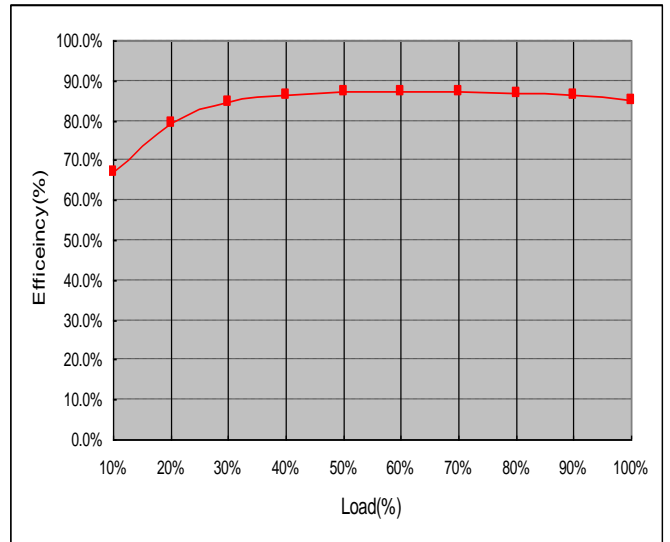
Characteristic Curves
Efficiency Curves

YPM100-96-5



Vin=96V, Vo=5V@20A , At 25°C

YPM100-96-12



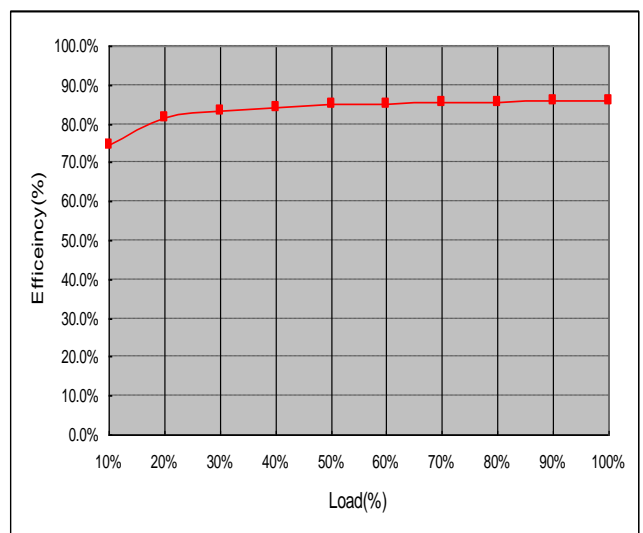
Vin=96V, Vo=12V@8.3A , At 25°C

YPM100-96-15



Vin=96V, Vo=15V@6.6A , At 25°C

YPM100-96-24



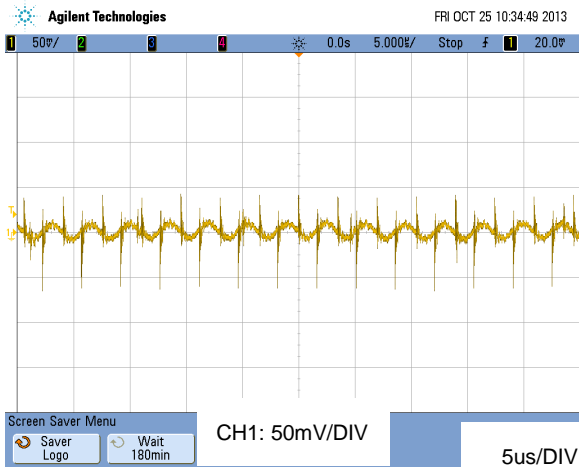
Vin=96V, Vo=24V@4.2A , At 25°C

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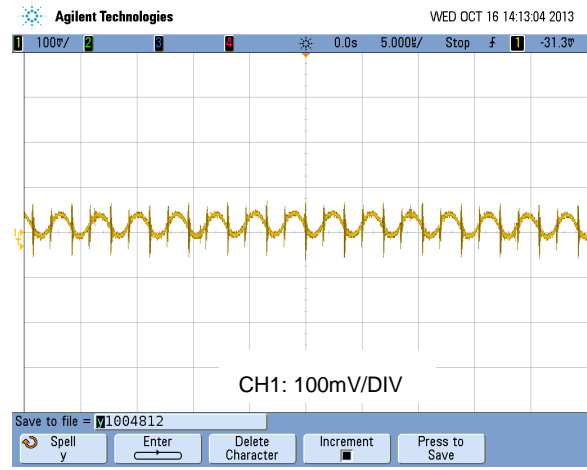
Output Ripple/Noise

YPM100-48-5



Vin=48V, Vo=5V@20A, At 25°C

YPM100-48-12



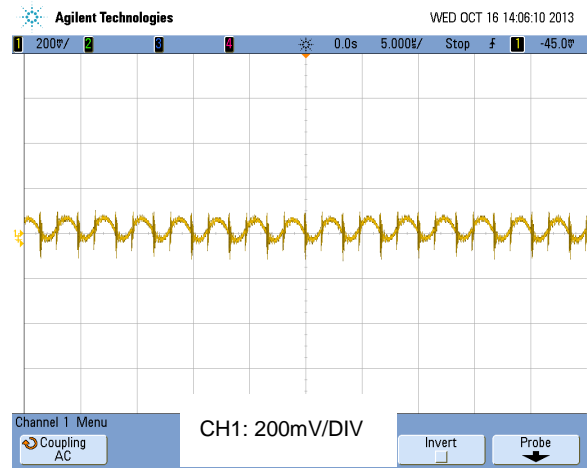
Vin=48V, Vo=12V@8.3A, At 25°C

YPM100-48-15



Vin=48V, Vo=15V@6.6A, At 25°C

YPM100-48-24



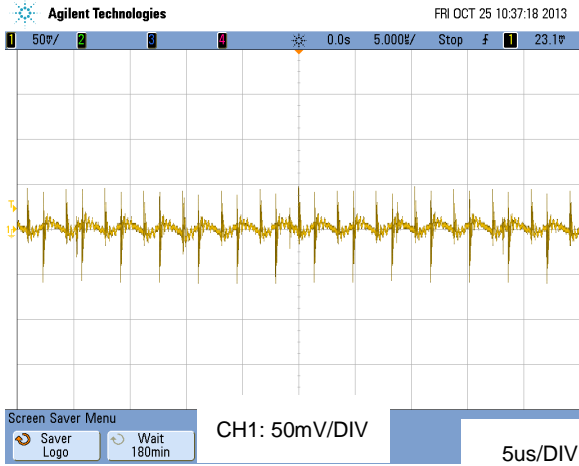
Vin=48V, Vo=24V@4.2A, At 25°C

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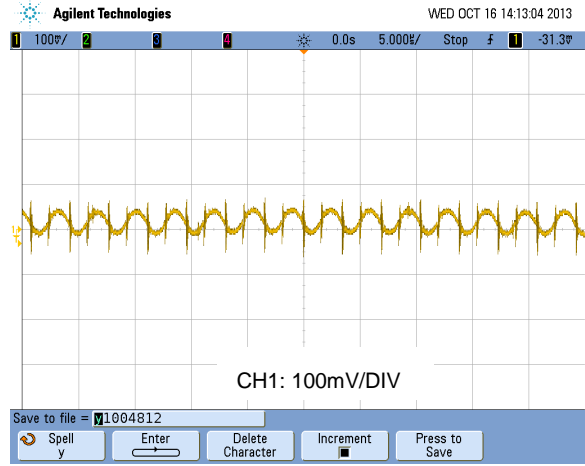
Output Ripple/Noise

YPM100-72-5



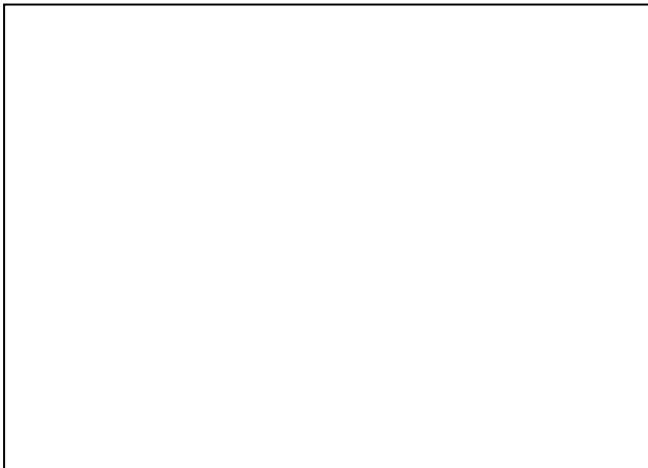
Vin=72V, Vo=5V@20A ,At 25°C

YPM100-72-12



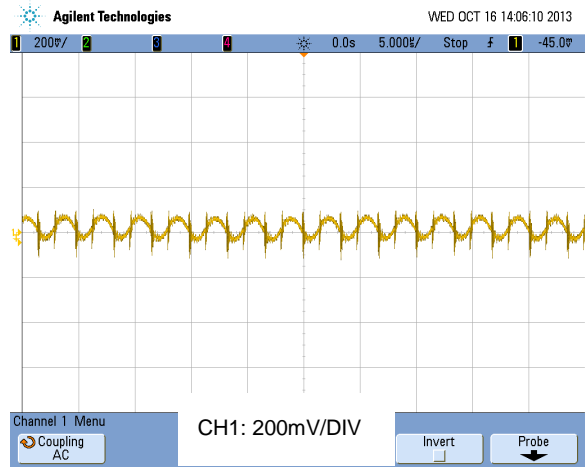
Vin=72V, Vo=12V@8.3A, At 25°C

YPM100-72-15



Vin=72V, Vo=15V@6.6A, At 25°C

YPM100-72-24



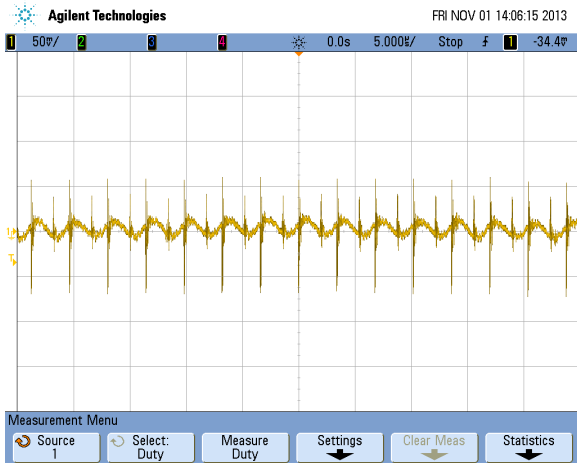
Vin=72V, Vo=24V@4.2A, At 25°C

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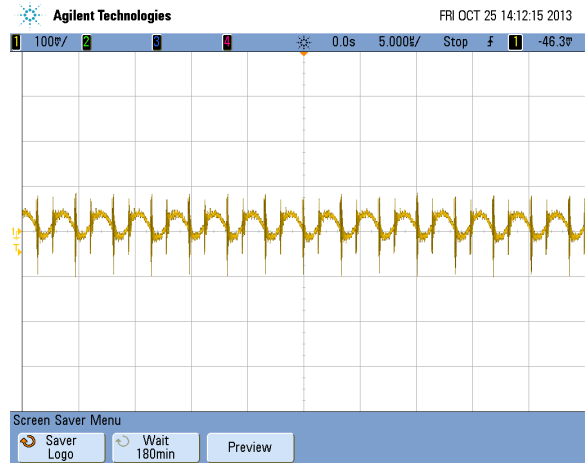
Output Ripple/Noise

YPM100-96-5



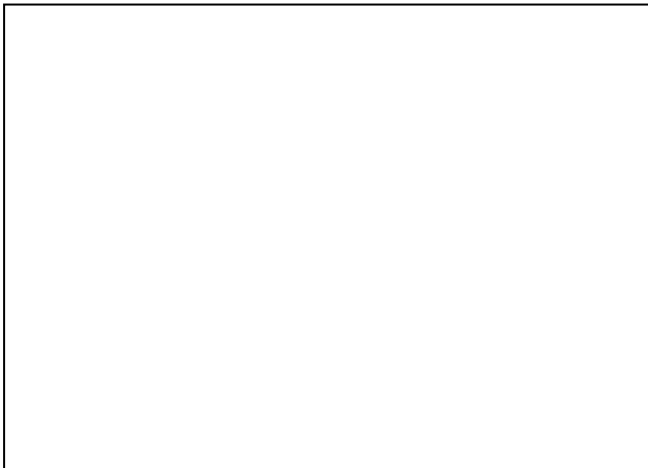
Vin=96V, Vo=5V@20A ,At 25°C

YPM100-96-12



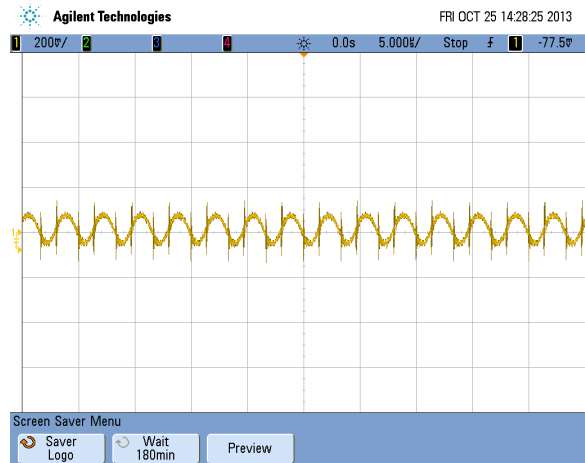
Vin=96V, Vo=12V@8.3A ,At 25°C

YPM100-96-15



Vin=96V, Vo=15V@6.6A, At 25°C

YPM100-96-24



Vin=96V, Vo=24V@4.2A, At 25°C

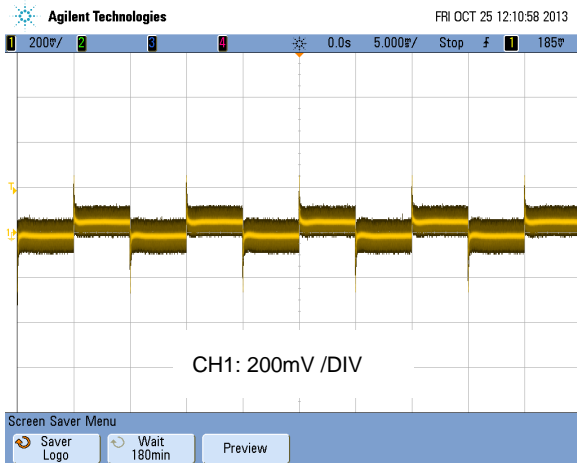
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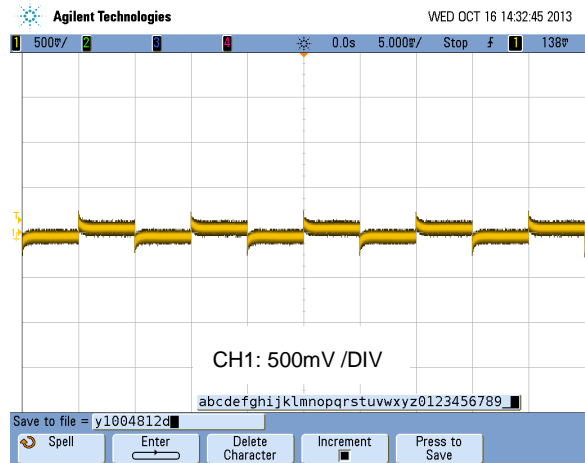
Output Load Transient Response

(Dynamic load change from 25% to 50% to 25%
of full load)

YPM100-48-5



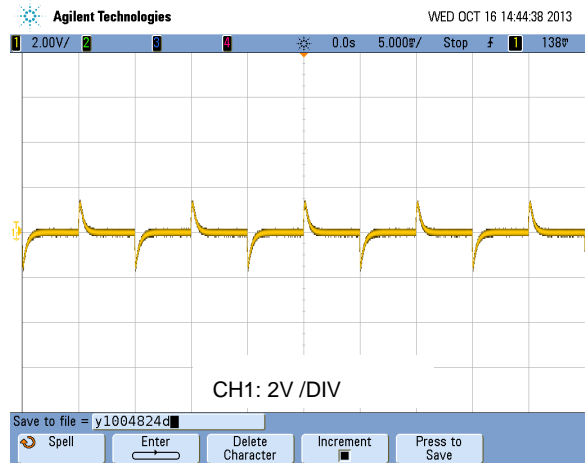
YPM100-48-12



YPM100-48-15



YPM100-48-24



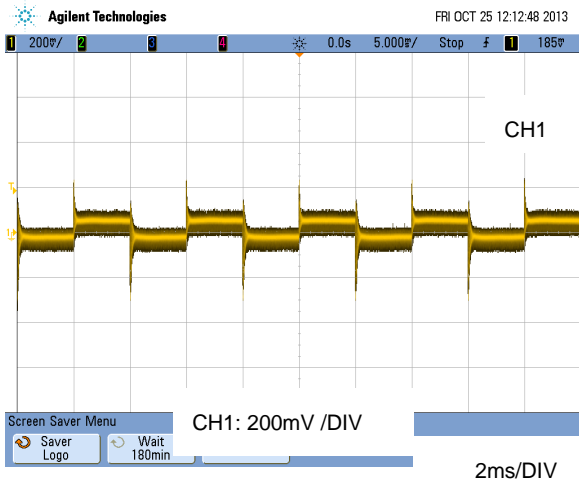
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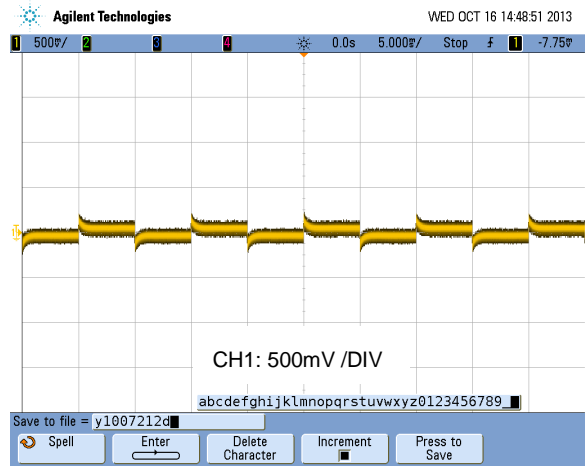
Output Load Transient Response

(Dynamic load change from 25% to 50% to 25%
of full load)

YPM100-72-5



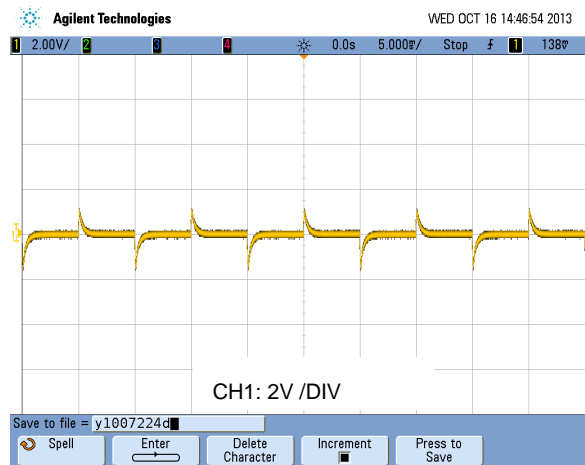
YPM100-72-12



YPM100-72-15



YPM100-72-24



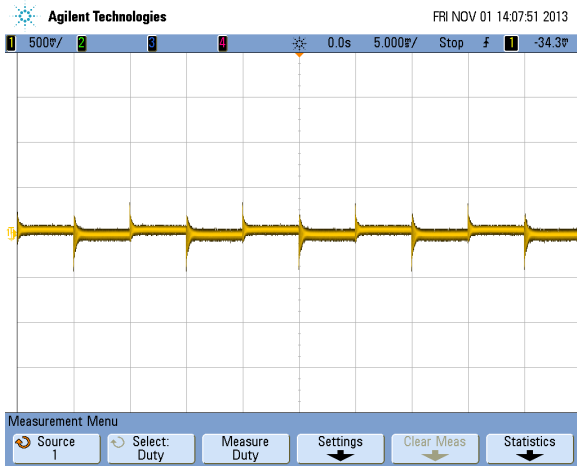
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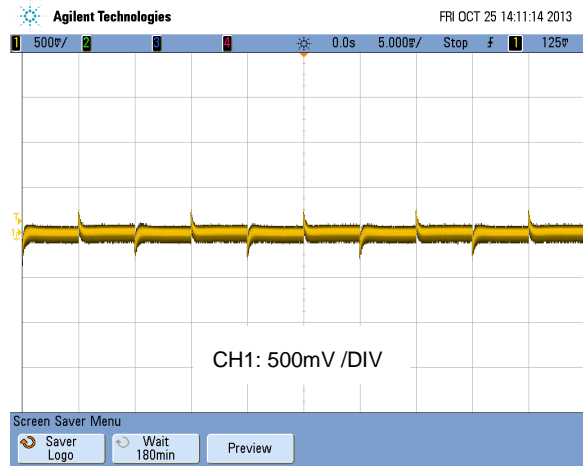
Output Load Transient Response

(Dynamic load change from 25% to 50% to 25%
of full load)

YPM100-96-5



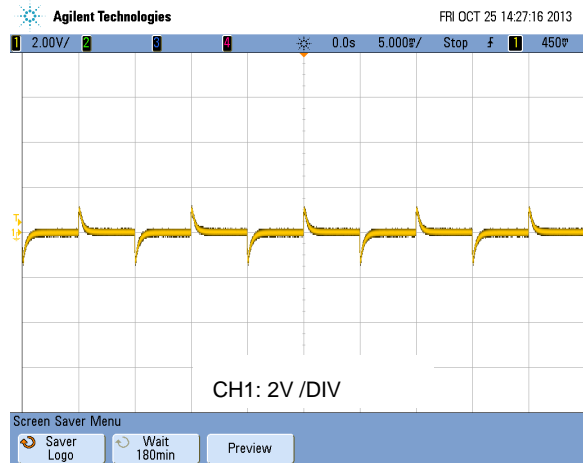
YPM100-96-12



YPM100-96-15



YPM100-96-24

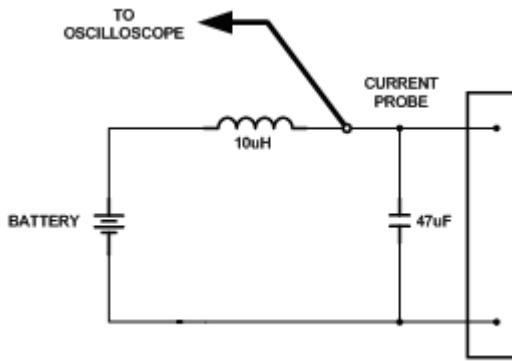


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TEST Configurations

Input Reflected Ripple Current Test



Efficiency

$$\eta = \left(\frac{[V_o(+)-V_o(-)] \times I_o}{[V_{in}(+)-V_{in}(-)] \times I_{in}} \right) \times 100\%$$

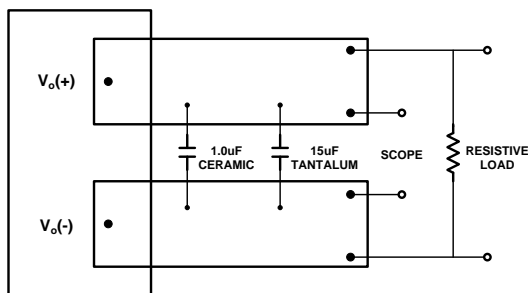
Thermal Considerations

YPM100 series has wide operating temperature range from -40°C to +85°C.

However, it should be required an enough air flow for more reliable operation. Output derating curve provide designers with a quantity of a current under the desired ambient temperature and velocity of a airflow

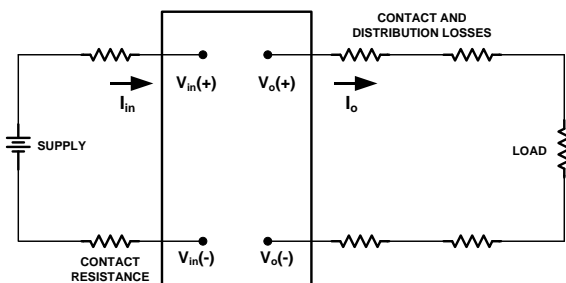
If the device is installed in a system, the device's temperature of point A should be checked if it does not exceed specified temperature as below. Please make sure that the temperature of point A does not exceed 100°C. YPM100 series has a precise thermal shunt down circuit. If the temperature of point A exceed a 100°C over temperature protection circuit will operate and output shunt down. As the temperature goes down the output will recover automatically.

Output ripple and noise Test

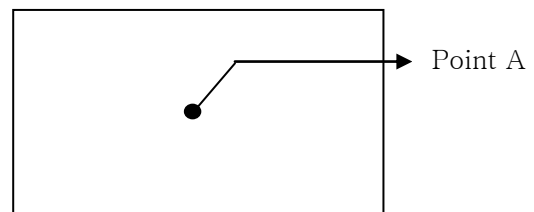


* Conductor from Vout-pins to capacitors = 50mm (1.97in)

Output Voltage and Efficiency Test



*All measurements are taken at the module terminals when Socketing, place Kelvin connections at module terminals to Avoid measurement errors due to socket contact resistance



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Feature Description

Input Fuse

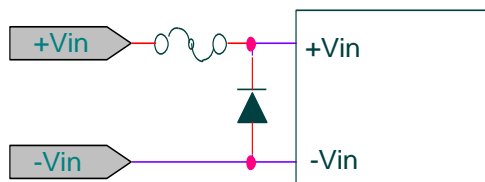
YPM100 series has not built in internal fuse. Therefore in order to ensure protection and safety fuses should be used at input line of converter

We recommend to use a slow blow type fuse with a typical value of about twice the maximum input current, calculated at low line with the converter minimum efficiency.

Input Reverse-polarity voltage protection

Input reverse voltage protection has not built in this product.

So, you can set up a circuit externally as described below if necessary



Input / Output Filter

YPM100 series have an internal input filter. To minimize the ripple and noise of the input voltage, additional external capacitor is required. To reduce an output ripple and noise, external capacitor is required at the output of the device.

Remote ON/OFF Control (CNT)

By using CNT pin you can control the output without turning the input power on or off.

If you need not this function open this pin

CNT Level for –Vin	OUTPUT
Open	OFF
Short	ON

Over current Protection (OCP)

YPM100 series built in over current protection circuit which operates when the output current is over 105% of rating and automatically recovers when over current condition is removed

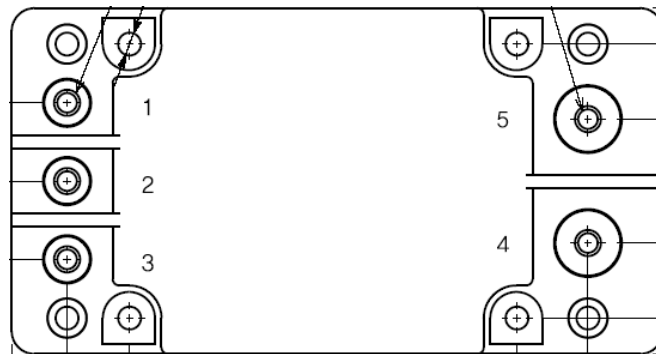
Over Voltage Protection (OVP)

YPM100 series built in over voltage protection circuit which operates when the output voltage within 115~140% of rating. When OVP is triggered, the input must be taken out for second and then reinputed manually.

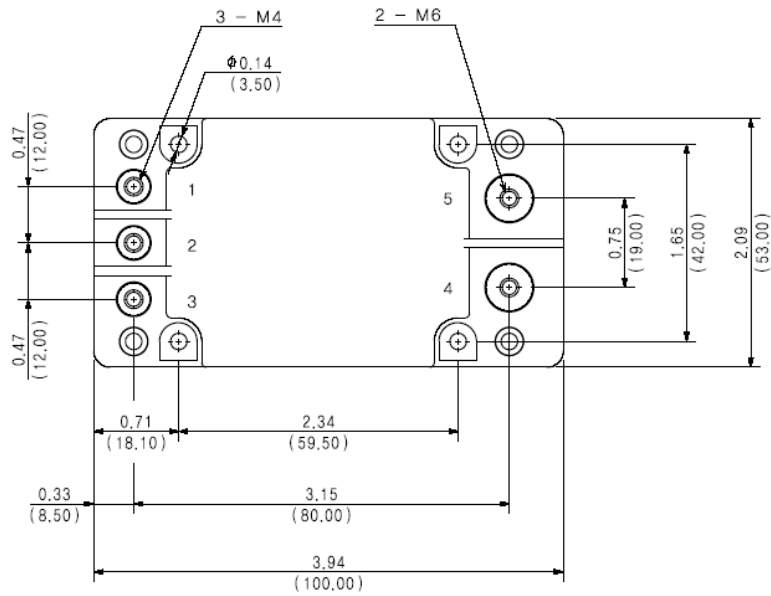
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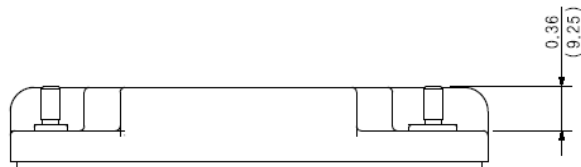
Pin assignments



PIN NO	NAME	FUNCTION
1	CNT	Logic signal reference to Vin to turn the converter ON/OFF
2	-Vin	Negative terminal for Vin
3	+Vin	Positive terminal for Vin
4	+Vout	Positive terminal for Vout
5	-Vout	Negative terminal for Vout

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Oct 25, 2013**Mechanical Specification**

TOP VIEW

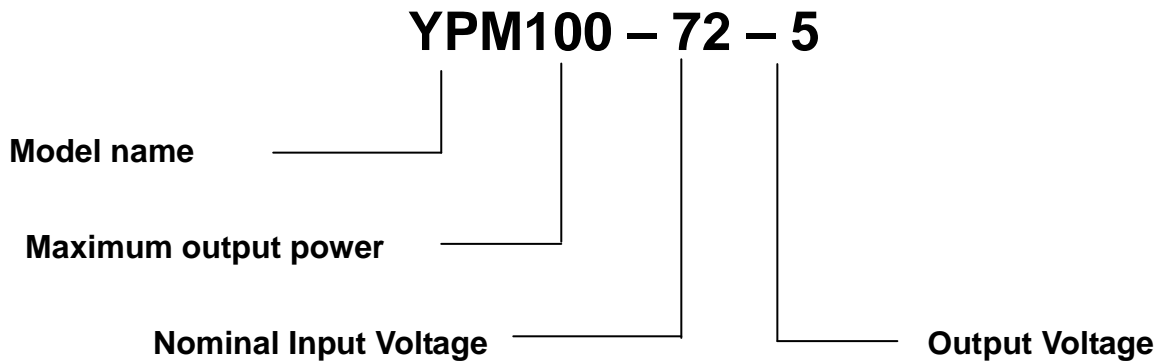


SIDE VIEW

All dimensions are inches and (mm)

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Oct 25, 2013**Ordering Information**

Input	Output1	Maximum Power	Ripple & Noise Typ.	Efficiency Typ.	Model Number
36 – 76V	5V@20A	100W	75mVp-p	87%	YPM100-48-5
	12V@8.3A	99.6W	120mVp-p	88%	YPM100-48-12
	15V@6.6A	99W	150mVp-p	88%	YPM100-48-15
	24V@4.2A	100.8W	240mVp-p	89%	YPM100-48-24
50 – 100V	5V@20A	100W	75mVp-p	83%	YPM100-72-5
	12V@8.3A	99.6W	120mVp-p	83.5%	YPM100-72-12
	15V@6.6A	99W	150mVp-p	85%	YPM100-72-15
	24V@4.2A	100.8W	240mVp-p	88%	YPM100-72-24
65 – 150V	5V@20A	100W	75mVp-p	82.5%	YPM100-96-5
	12V@8.3A	99.6W	120mVp-p	85%	YPM100-96-12
	15V@6.6A	99W	150mVp-p	85%	YPM100-96-15
	24V@4.2A	100.8W	240mVp-p	86%	YPM100-96-24

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Oct 25, 2013**Part number structure**

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GENERAL SALES INQUIRIES

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contact : sales@powerplaza.co.kr

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