1500W Ultra-small Intermediate Bus Converter

Description

YPM4812R0V-1K5 is a high efficiency non-isolated DC-DC power module with fixed 4:1 ratio, operating from 40-60V DC primary bus voltage to 10-15V output voltage and can deliver up to 1500W continuous power and 4000W of peak power at typical 54V input voltage.
It is designed to support Artificial Intelligence applications and can also be used for other high-power IBC requirements which have limited board space available.

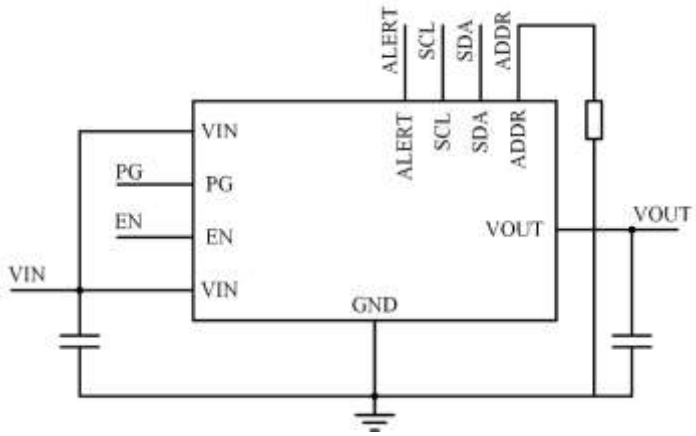
Features

Size: 22.85*17.35*7.55mm

- ✓ Horizontal mounting non-isolated DC/DC converter
- ✓ Ratio conversion 4:1,1.5KW continuously,4KW peak power
- ✓ Peak efficiency 98.5%
- ✓ High power density IBC up to 8196 W/in^3
- ✓ PMBus configuration

Applications

- ✓ Data center
- ✓ DC Power Distribution
- ✓ High end computing systems
- ✓ AI applications
- ✓ Super-computing center



Performance

Parameter	Values	Unit
Input range	38-60	V
Output voltage	10-15(Configurable)	V
Output current	112	A
Output power	1500	W
Peak Power	4000	W
Peak efficiency	98.5	%

Absolute Maximum Ratings

Stress in excess of our defined *absolute maximum ratings* may cause permanent damage to the converter. Absolute maximum ratings, also referred to as *non-destructive limits,* are normally tested with one parameter at a time exceeding the limits in the electrical specification.

Characteristics	Min	Max	Unit
Operating temperature	-20	125	°C
Storage temperature	-40	125	°C
Input voltage (Vin) continuous operation	-0.3	60	V
Input voltage transient	-0.3	68	V
Signal I/O voltage (EN, PG, ALERT, ADDR, SCL, SDA)	-0.3	3.7	V

Electrical characteristics

13.5 V, 112 A (296 A peak) / 1500 W (4000 W peak)

Min and max values are valid for: T_j = -20 to + 95 ºC, V_{in} = 38 to 60 V, I_{out} = 112 A, unless otherwise specified under conditions. Typical values given at: T_j = +25 °C, V_{in} = 54 V, max P_{out_TDP}, unless otherwise specified under conditions, see Note 1. Additional external C_{in} = 7*100 µF ceramic, C_{out} = 2 * 470 µF

Characteristics	Condition	Min.	Typ.	Max.	Unit
Key features					
Efficiency	Vin=54V Iout=56A		98.5		%
	Vin=54V Iout=112A		97.7		%
Pout_TDP thermal design power	See Note 1		1500		%
Pout_MAX peak power (t ≤ 0.05 s)	See Note 1		4000		W
Recommended capacitive load		40	470	6000	uF
Input characteristics					
Input voltage range		38		60	V
Input idling power	Pout = 0 W		5.4		W
Input OVP				64	V
Internal input capacitance			8.2		uF
Recommended external input capacitance	See Note 2	100	150		uF
Output characteristics					
Output voltage	Pout = 0 W		13.5		V
	Disabled, no load		2		V
Output current	Vin=38-60 V, PG asserted		112	296	A
Output ripple & noise	With 3000uF Cout, 20MHz BW		25		mV_{p-p}
Internal output capacitance	Vout = 0V		120		µF

Characteristics	Condition	Min.	Typ.	Max.	Unit
On/off control					
Logic high: trigger level	EN pin		0.4		V
Logic low: trigger level	EN pin		2.6		V
Source current	EN pin (Internal pull up)		5		mA
Sink current	EN pin		5		mA
Protection features					
Input Under Voltage fault limit (IUVP)	Latch		37		V
Input Over Voltage fault limit (IOVP)	Latch		64		V
Output undervoltage fault limit (UVP)	Latch		7.5		V
Output undervoltage warning limit			8.5		V
Output overvoltage fault limit (OVP)	Latch		16		V
Output overvoltage warning limit			15.5		V
Over temperature fault limit (OTP)	Latch		130		ºC
Over temperature warning limit			120		ºC
Monitoring & Control					
UVLOVI - Under Voltage Lock-Out	Vin rising threshold		8.5		V
	Hysteresis		2.5		V
Power Good Threshold	Low to high transition		100		% Vout
	High to low transition, Note 3				
VIL - Logic input low	SCL, SDA			1	V
VIL- Logic input high	SCL, SDA	2.1			V
VOL - Logic output low	SDA, ALERT, PG			0.4	V
IOL - Logic output low sink current	SDA, ALERT, PG		20		mA
ILEAK - Logic leakage current	SDA, SCL, ALERT, PG	-1		1	μA
CI_PIN - Logic input capacitance	SDA, SCL, EN		1.5		pF
Monitoring accuracy					
Input voltage READ_VIN			±1		%
Output voltage READ_OUT			±2		%
Output current READ_Iout	Vin = 54 V, Iout = 112 A		±5		%
Temperature READ_TEMPERATURE_1			±3		°C

Note 1: Max. output current is rated at 296 A.

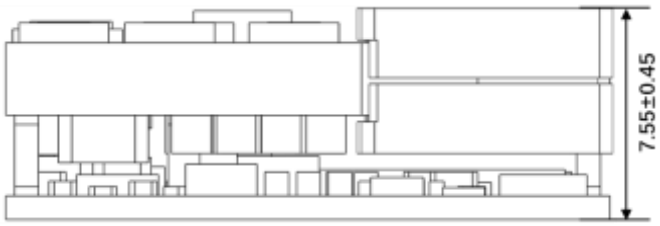
Max power is ≤ 4000 W and continuous power (thermal design power TDP) is ≤ 1500 Wdepending on thermal conditions.

*Note 2: Typical value (recommended) is 100 μF + 5*10 μF*

Note 3: Power Good is de-asserted when the output voltage is disabled, regardless of the output voltage level.

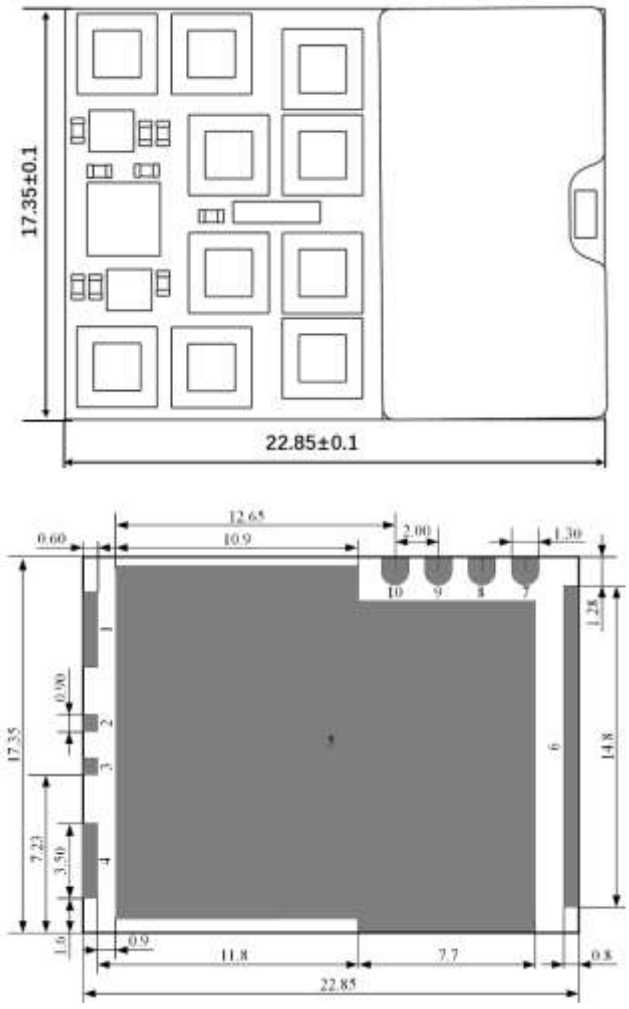
Mechanical information

Side view



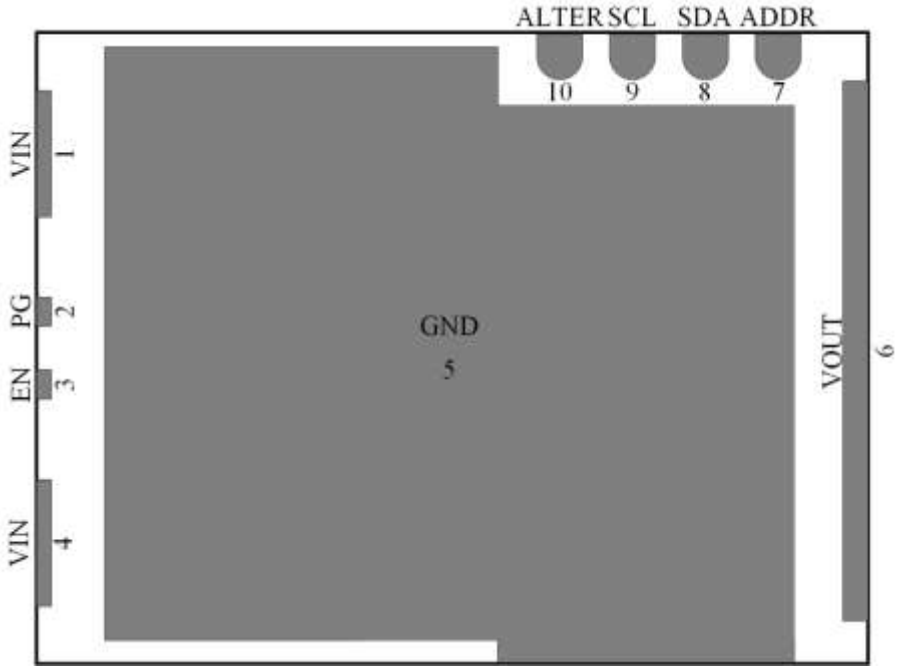
Top view

Product overall X/Y dimension including both top and bottom boards.



All component placements – whether shown as physical components or symbolical outline – are for reference only and are subject to change throughout the product's life cycle, unless explicitly describedand dimensioned in this drawing.

Package reference



Pin	Designation	Type	Function
1	+IN	Power	Input voltage
2	PG	Open Drain	Power good, active high
3	EN	Input	Enable, active high
4	+IN	Power	Input voltage
5	GND	Power	Power ground
6	VOUT	Power	Output voltage
7	ADDR	Input	PMBus address pin strap
8	SDA	Input/Output	PMBus data
9	SCL	Input	PMBus clock
10	ALERT	Open Drain	Alert signal, active low. Asserted when an over current warning condition or an over temperature warning condition occurs. Can be connected to GND if unused.

IMPORTANT NOTICE AND DISCLAIMER

YuanyiMicro provides technical and reliability data(including datasheets), design resource(including reference designs), application and other design material, web tools, safety information, and other resources "AS IS" and with all faults, and disclaims all warranties, express and implied, including without limitation any implied warranties of merchantability, fitness for a particular purpose or non-infringement of third party intellectual property rights.

These resources are intended for skilled developers designing with YuanyiMicro products. You are solely responsible for

(1) selecting the appropriate YuanyiMicro products for your application,

(2) designing, validating and testing your application, and

(3) ensuring your application meets applicable standards, and any other safety, security, regulatory or other requirements.

These resources are subject to change without notice. YuanyiMicro grants you permission to use these resources only for development of an application that uses the YuanyiMicro products described in the resource. Other reproduction and display of these resources are prohibited. No license is granted to any other YuanyiMicro intellectual property right or to any third party intellectual property right. YuanyiMicro disclaims responsibility for, and you fully indemnify YuanyiMicro and its representatives against any claims, damages, costs, losses, and liabilities arising out of your use of these resources.

YuanyiMicro products are provided subject to YuanyiMicro Terms of Sale, or other applicable terms provided in conjunction with such YuanyiMicro products. YunyiMicro provision of these resources does not expand or otherwise alter YuanyiMicro applicable warranties or warranty disclaimers for YuanyiMicro products. Unless YuanyiMicro explicitly designates a product as custom or customer-specified, YuanyiMicro products are standard, catalog, general purpose devices.

YuanyiMicro objects to and rejects any additional or different terms you may propose.

重要声明和免责声明

源易微"按原样"提供技术和可靠性数据（包括数据表）、设计资源（包括参考设计）、应用或其他设计建议、网络工具、安全信息和其他资源，不保证没有瑕疵且不做出任何明示或暗示的担保，包括但不限于对适销性、某特定用途方面的适用性或不侵犯任何第三方知识产权的暗示担保。

这些资源可供使用源易微产品进行设计的熟练开发人员使用。您将自行承担以下全部责任：

(1) 针对您的应用选择合适的源易微产品，

(2) 设计、验证并测试您的应用，

(3) 确保您的应用满足相应标准以及任何其他功能安全、信息安全、监管或其他要求。

这些资源如有变更，恕不另行通知。源易微授权您仅可将这些资源用于研发本资源所述的源易微产品的应用。严禁对这些资源进行其他复制或展示。您无权使用任何其他源易微知识产权或任何第三方知识产权。您应全额赔偿因在这些资源的使用中对源易微及其代表造成的任何索赔、损害、成本、损失和债务，源易微对此概不负责。

源易微提供的产品受源易微的销售条款或源易微产品随附的其他适用条款的约束。源易微提供这些资源并不会扩展或以其他方式更改源易微针对源易微产品发布的适用的担保或担保免责声明。

源易微反对并拒绝您可能提出的任何其他或不同的条款。