

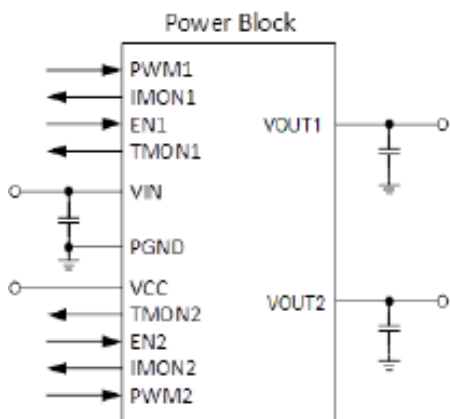
1. Features :

- 10 x 9 x 8 mm compact footprint.
- Maximum Peak Current: 140 A.
- Per phase 40 A, Dual output Maximum Continuous Current 80 A.
- Input Voltage Range from 5.0V to 16 V.
- Protections (OCP, UVP, OTP).
- Operating Temperature Range: -40°C to 125°C

2. Applications :

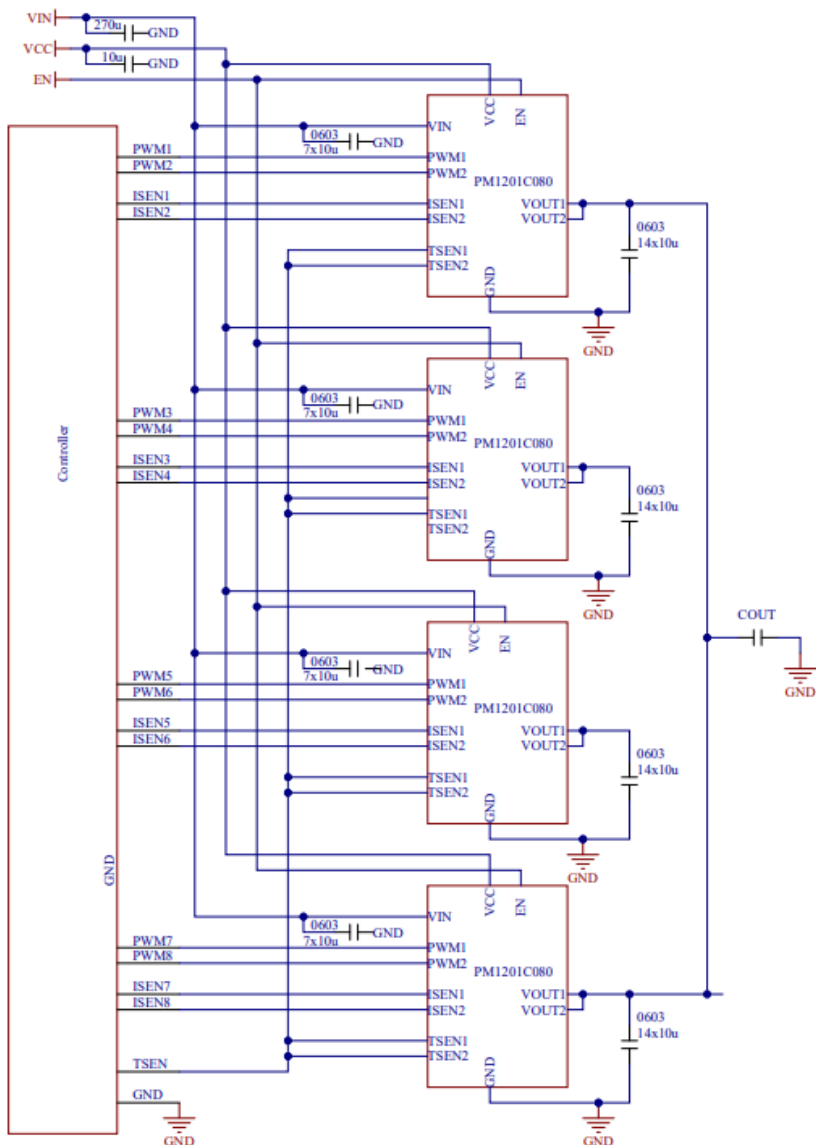
- High performance Computing.
- Data Center.
- Server System.
- Communications System.
- Artificial Intelligence.

3. Typical Application Circuit:



Type	Vin Typical (V)	Suggested Fsw	Typical Application	Module Size L x W x H (mm)
TBD	12.0	400KHz-800KHz	GPU/CPU/Memory	10.0 x 9.0 x 8

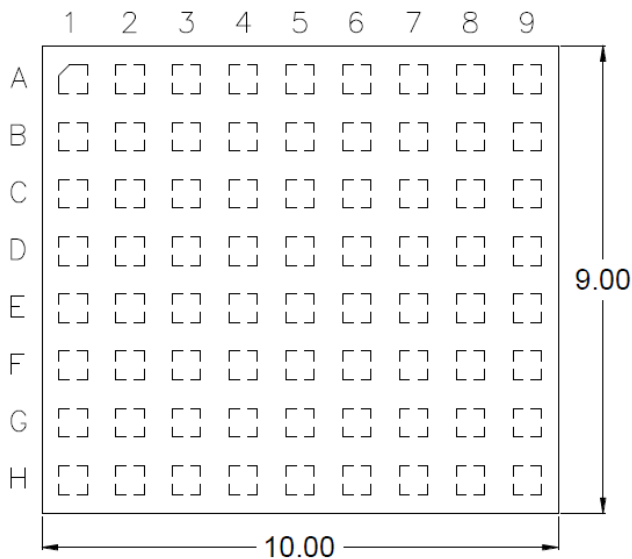
5. Typical Application Diagram



6. Order Number Examples

Part number	VIN	VOUT	Module Size L x W x H (mm)	Configuration
PM1201C080	12.0	0.5~1.8V	10.0 x 9.0 x 8.0	Standard 2 phases module, tape and reel Package

7. Pin Configuration:



Top View

8. Pin Description:

PIN NO.	NAME	DESCRIPTION
A1	PWM1	Buck1 pulse width modulation input support Tri-state Input
A2	IMON1	Buck1 current sense output. Use external resistor (1K Ω) to adjust the voltage proportional to the output current.
A3	EN1	Pull this pin to VCC to enable Buck 1
A4	TMON1	Buck1 temperature sense and fault reporting. This pin will be pull up to 3.3V when fault occurs
A5	VCC	External 5.5V power supply for driver
A6	TMON2	Buck2 temperature sense and fault reporting. This pin will be pull up to 3.3V when fault occurs
A7	EN2	Pull this pin to VCC to enable Buck 2
A8	IMON2	Buck2 current sense output. Use external resistor to adjust the voltage proportional to the output current.
A9	PWM2	Buck2 Pulse Width Modulation input. Support Tri-state input.
B1-B9	VIN	Power Input
C1-C9, D1-D9, E1-E9	PGND	Power Ground
F5-F9, G6-G9, H6-H9	VOUT 1	Power Output, phase1
F1-F4, G1-G5, H1-H5	VOUT 2	Power Output, phase2



Hologen Free

PM1201C080



9.1 Suggested Operating Conditions ⁽¹⁾:

- Supply Voltage VIN 5.0 V to 16.0 V
- Driver Voltage VCC 4.5 V to 5.5 V
- Single Output (2 phase) Maximum Continuous Current 80 A

9.2 Absolute Maximum Ratings ⁽²⁾:

- Supply Voltage VIN 18 V
- VCC - 0.3 V to + 6.5 V
- All Other Pins - 0.3 V to VCC + 0.3 V
- Instantaneous Current..... 140 A
- Junction Temperature 125 °C
- Storage Temperature - 55 °C to + 125 °C
- Twave Wave soldering temperature(Surface temperature of module body or pins(5 seconds maximum))
..... 260 °C
- Treflow Solder reflow temperature(Surface temperature of module body or pins) 260° C ⁽³⁾
- Flammability UL94V-0

Notes:

(1). Exceeding these ratings may damage the device.

(2). The device is not guaranteed to function outside of its operating conditions.

(3). During reflow of surface mount package version do not elevate peak temperature of the module, pins or internal components above the stated maximum.

(4). The specification values indicated "AC" is VSW to PGND -8V (< 20 ns, 10 μJ), min. and 30 V (< 50 ns), max.

10. Electrical Characteristics:

Conditions: Ta = 25°C for typical value

Parameter	Symbol	Condition	Min	Typ	Max	Units
Input Voltage	V _{IN}		5	12	16	V
VIN Under Voltage Lockout Threshold Rising	V _{INR}		-	4.2	-	v
VIN Under Voltage Lockout Threshold Hysteresis	V _{IN_HYS}		-	400	-	mV
VCC UVLO	V _{CC_UVLO}		3.7	3.9	4.1	V
VCC UVLO hysteresis	V _{CC_HYS}		-	200	-	mV
IVDRV Quiescent Current	I _{VDRV_Q}	EN=Low	-	1	-	mA
EN input low threshold	V _{EN_H}		-	-	0.9	V
EN input high threshold	V _{EN_L}		1.9	-	-	V
EN delay	T _{DELAY_EN}	EN high to TMON = 0.8V	-	4	-	us
PWM input low threshold	V _{PWML}		-	-	0.8	V
PWM input high threshold	V _{PWMH}		2.3	-	-	V
PWM tri-state region	V _{TRI}		1.2	-	1.8	V
PWM high impedance voltage	V _{PWM_HiZ}		1.3	1.5	1.7	V
PWM sink/source impedance	R _{PWM_SINK}	EN=High	-	20	-	kΩ
	R _{PWM_Source}	EN=High	-	46.7	-	kΩ
Minimum PWM Pulse Width	t _{PWM}		-	30	-	Ns

● New York 1 914 347 2474 ● Taipei 886 2 2698 8669 ● Kaohsiung 886 7 350 2275

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*Due to continuous product improvement, all specifications are subject to change without prior notice. Kindly contact an ITG field application engineer or a sales representative prior to purchase.

10. ELECTRICAL Characteristics (continue):

Conditions: Ta = 25°C for typical value

Parameter	Symbol	Condition	Min	Typ	Max	Units
Current sensing						
IMON Sense Gain Accuracy	IMONACC	IOUT < 20 A	-3	0	+3	%
IMON Sense Gain	IMON _{GAIN}	per phase	-	5	-	uA/A
Current Sense Offset	IMON _{OS}	Iout= 0A, per phase	-2.5	0	2.5	μA
IMON Voltage Range	V _{IMON}	per phase	1	-	2	V
Temperature reporting						
TMON Sense Gain	TMON _{GAIN}		-	8	-	mV/°C
TMON Sense Offset	TMON _{OS}	TJ=0°C	-	0.6	-	V
Temperature reporting accuracy	TMON _{ACC}		-3	-	3	%
TMON source current	I _{TMON}		5	-	-	mA
TMON when Fault	T _{MON_FLT}		2.6	-	3.6	V
Overcurrent protection						
Accurate positive OCP	I _{OCP_A_P}		100	110	120	A
Accurate negative OCP	I _{OCP_A_N}		-	-60	-	A
Crude positive OCP	I _{OCP_C_P}		-	150	-	A
Crude negative OCP	I _{OCP_C_N}		-	-100	-	A
OCP mask time	T _{MASK_OCP}		-	100	-	ns
Over temperature protection						
OTP rising threshold	T _{OTP_R}		-	150	-	°C
OTP threshold	T _{OPT_HYS}		-	10	-	°C
Module parameter						
Output current, peak	I _{OUT_PK}		-	-	140	A
Output current, continuous,(1)	I _{OUT_CONT}		-	80	-	A
Output voltage range	V _{OUT}		0.5	-	1.8	V
Output ripple & noise	V _{OAC}		-	5	-	mV
Internal input capacitance	C _I		-	2.2	-	uF
Internal output capacitance	C _O		-	28.2	-	uF
Output inductance	L _O		-	70	-	nH
Frequency of the PWM	F _{SW}		0.4	-	0.8	MHz

Note A: Not subject to production test – verified by design and/or characterization

(1): The maximum continuous output current will also be limited by the thermal conditions.

See derating graphs and section Thermal Considerations.

11. Typical Performance Characteristics:

Single output, Vout 1 and Vout 2 in Parallel, Cin = 10u / 25V * 8pcs, Cout = 10u / 6.3V * 16 pcs Conditions: Ta= 25 °C

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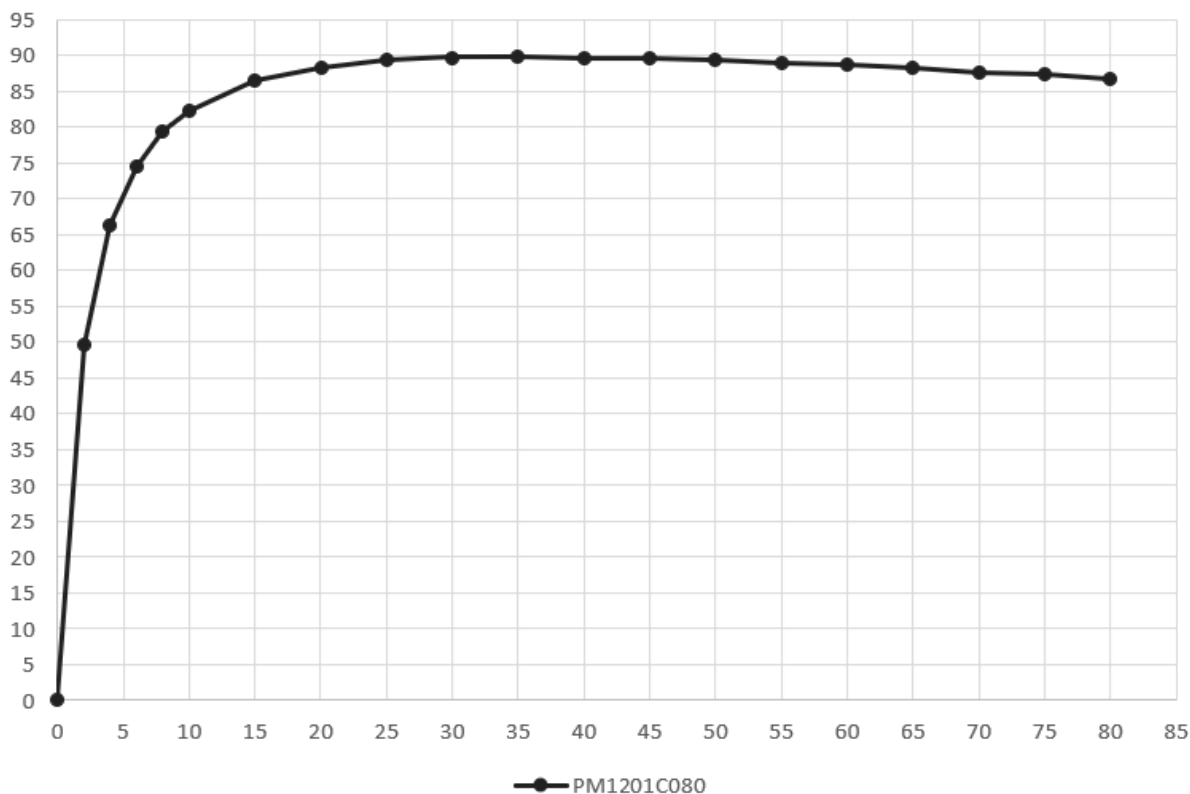


Fig.1 EFFICIENCY V.S. LOAD CURRENT
(VIN = 12V, VOUT = 1 V, FSW = 500 kHz)

12. Thermal Consideration:

Thermal management is an important part of the system design. To ensure proper, reliable operation, sufficient cooling of the power module is needed over the entire temperature range of the module. Convection cooling is usually the dominant mode of heat transfer. Hence, the choice of equipment to characterize the thermal performance of the power module is a wind tunnel.

Thermal Testing Setup: The DC/DC power modules are characterized in heated wind tunnels that simulate the thermal environments encountered in most electronics equipment. The following figure shows the wind tunnel characterization setup. The power module is mounted on a test board and is positioned at the middle of the wind tunnel. Note: (1) Test PCB Size: 10.0 mm x 9.0 mm x 8.0 mm;

Trace: 6 layers 2 oz.

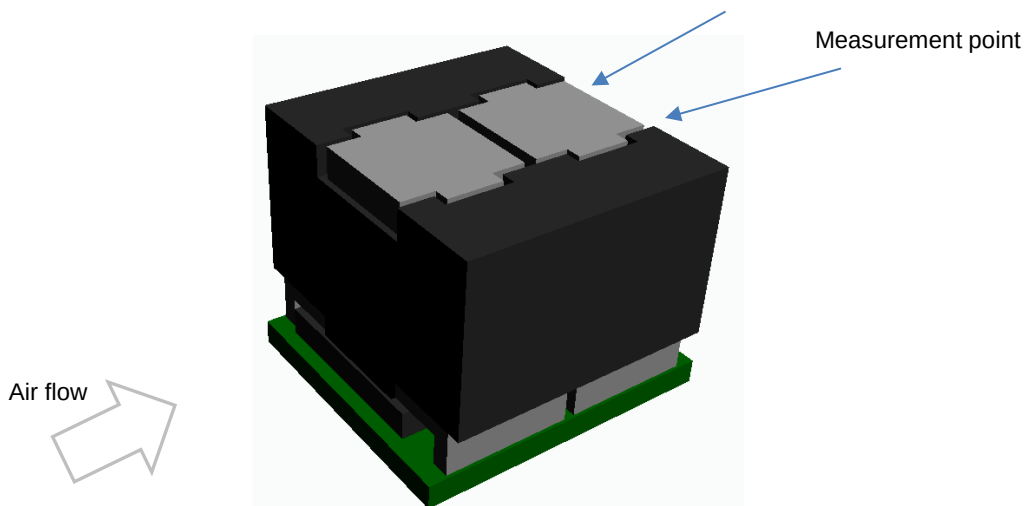
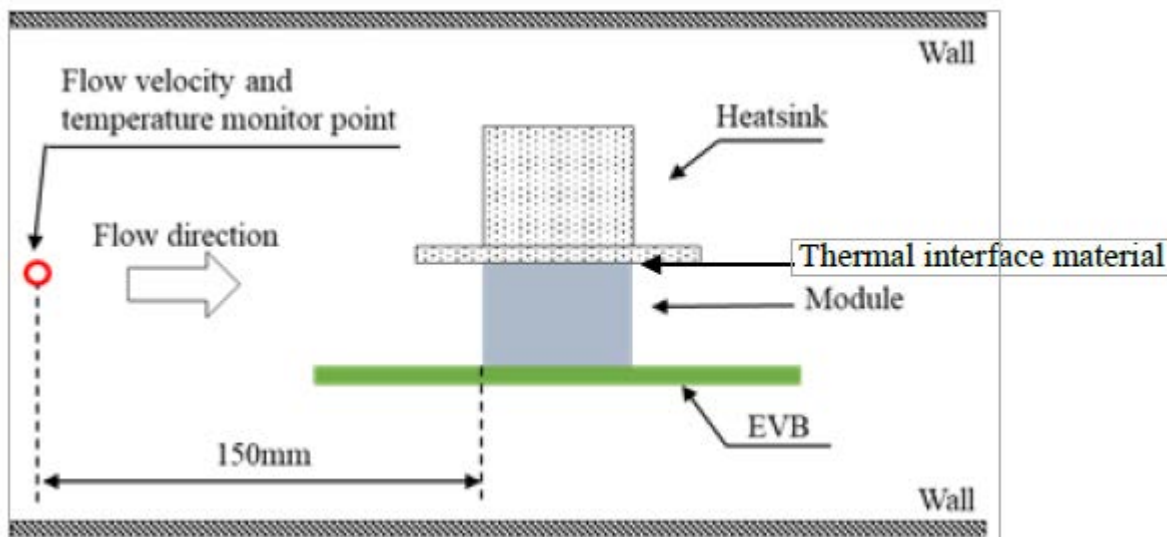
Note:

(1) Test PCB Size: 10.0 mm x 9.0 mm x 8.0 mm; Trace: 6 layers 2 oz.

(2) Measurement point: Center of IC package surface.

(3) Air flow: 0, 200, 400, 600, 800 LFM.

(4) Thermal interface material, T=1mm, thermal conductivity=3.5W/m*K.

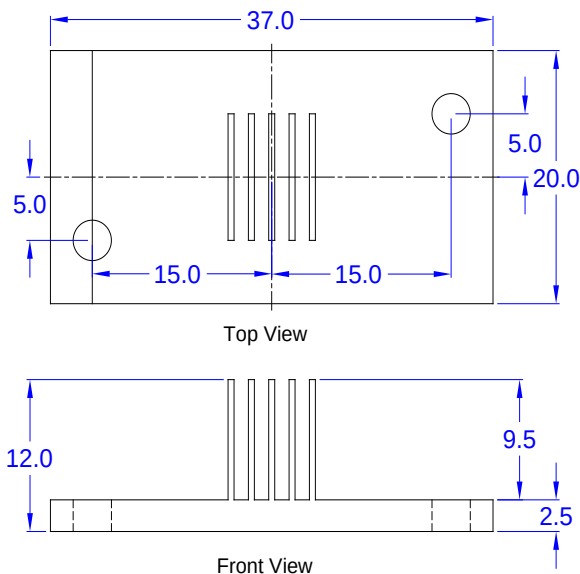


13. Thermal Consideration:

STANDARD Heat Sink Reference Drawing for De-rating Curve Testing:

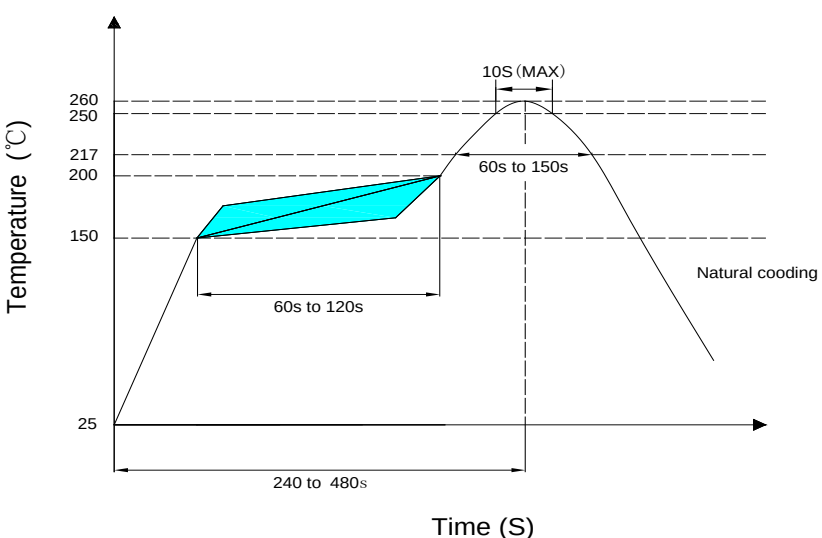
The following tightening sequence should be used:

- Lightly finger-tighten all screw.
- Pressure would between 25 psi to 60 psi.



Material: AL6061

Soldering Reflow Chart

Stage	Precaution	Recommended temperature profile
Reflow soldering	Temperature profile can be referenced after confirming of adhesion , temperature of resistance to soldering heat , component size , soldering etc. sufficient . Note: Please refer to the latest IPC/JEDEC J-STD-020: "Moisture/Reflow Sensitivity Classification for Nonhermetic Solid State Surface Mount Devices"	 The graph shows Temperature (°C) on the Y-axis (25 to 260) and Time (S) on the X-axis. The profile starts at 25°C, rises to 150°C (60s to 120s), then to 200°C (60s to 150s), peaks at 260°C (10S (MAX)), and finally cools down (Natural cooling). A shaded blue area indicates the recommended temperature range between 150°C and 200°C.



PM1201C080



14. Revision History

Revision table

Date	Version	Changes
20250218	Rev. P01	New document
20251022	Rev. P02	Modify Dimension