6S8W_1.6RPR series

6W - Single/Dual Output DC-DC Converter - Wide Input - Isolated & Regulated

DC-DC Converter 6 Watt

- SIP8 housing
- 2:1 input range
- Operating temperature range: -40°C to +85°C
- 1600VDC isolation
- Up to 88% efficiency
- Short circuit protection (SCP)
- Input undervoltage protection
- Output and overcurrent protection

Introducing our new high-performance DC-DC converter 6S8W_1.6RPR series in compact SIP8 housing. Designed for versatility and reliability, this converter features a 2:1 input range and operates seamlessly across a wide temperature span from -40°C to +85°C. With 1600VDC isolation and up to 88% efficiency, it's built for demanding applications where space and performance matter. Integrated protection functions include short circuit protection (SCP), input undervoltage lockout, and output overcurrent protection—ensuring stable, safe operation at all times.

Common specifications

Short circuit protection	Continuous, self recovery
Over-current protection	110 (min.) 160 (typ.) 230 (max.) %Io input voltage range
Switching frequency	500 KHz (typ.) full load, nominal input voltage
Operation temperature	-40°C ~+105°C (with derating)
Storage temperature	-55°C ~+125°C
Pin welding withstand temperature	+300°C (soldering spot is 1.5mm away from case for 10 seconds)
Storage humidity	5-95% RH (non-condensing)
MTBF: (MIL-HDBK-217F@25°C)	> 1,000,000 hours
Input filter	Capacitance filter
Hot plug	Unavailable
Case Material	Black plastic; flame-retardant and heat-resistant (UL94V-0)
Package Dimensions	22.00 x 9.50 x 12.00 mm
Weight	4.6g (typ.)
Cooling Method	Free air convection

Input specifications

Item	Test condition	Min	Typ	Max	Units
Input current (full load/no load)	• 5VDC nominal input series, nominal input voltage		1538/28	1579/45	mA
	12VDC nominal input series, nominal input voltage				
	• 3.3VDC output		489/12	502/18	
	• Other output		625/12	641/18	
	24VDC nominal input series, nominal input voltage				
	• 3.3VDC output		238/5	245/12	
	• 5VDC output		305/5	313/12	
	• Other output		298/10	313/16	
	• 48VDC nominal input series, nominal input voltage		156/5	160/12	
Reflected ripple current			50		
Impulse voltage	5VDC nominal input	-0.7		12	VDC
	12VDC nominal input	-0.7		25	
	24VDC nominal input	-0.7		50	
	48VDC nominal input	-0.7		100	
Starting voltage	5VDC nominal input			4.5	VDC
	12VDC nominal input			9	
	24VDC nominal input			18	
	48VDC nominal input			36	
Undervoltage protection	5VDC nominal input series	--	--	4.5	VDC
	12VDC nominal input series	5.5	6.5	--	
	24VDC nominal input series	12	15.5	--	
	48VDC nominal input series	26	30	--	
CTRL	Module off 0-1.2V turn off Module on no connect or 3.5-12V on				

Output specifications

Item	Test condition	Min	Typ	Max	Units
Output Voltage Accuracy (5% - 100% Load)	Vo1 Vo2		±1.0 ±3.0	±3.0 ±5.0	%
Linear Regulation (Full load,Input voltage from low limit to high limit)	Vo1 Vo2		±0.5 ±0.4	±1.0 ±1.0	%
Load Regulation (5% - 100% Load)	Vo1 Vo2		±0.5 ±1.0	±1.5 ±1.5	%
Transient Recovery Time	25% load step change		0.3	0.5	ms
Transient Response Deviation (25% load step change)	3.3V, 5V output Other voltage output		±5 ±3	±8 ±5	%
Temperature Coeffcient	Full Load			±0.03	%/°C
Ripple & Noise	20MHz Bandwidth,5% - 100% Load, Parallel line test method		50	100	mVp-p

Isolation specifications

Item	Test condition	Min	Typ	Max	Units
Insulation Voltage	Input-output, test time 1 minute, leakage current less than 1mA	1600			VDC
Insulation Resistance	Input-output, insulated voltage 500VDC	1000			MΩ
Isolation Capacitance	Input-output, 100KHz/0.1V		1000		pF

Example:
6S8W_2405S1.6RPR
6 = 6Watt; S8 = SIP8; W = Wide input; 24 = 24Vin; 05 = 5Vout; S = Single Output; 1.6 = 1600VDC isolation; R = Regulated Output; P = Short circuit protection; R = Revised version

1. The input voltage should not exceed the specified range value, otherwise it may cause permanent and irreparable damage;
2. It is recommended to use at a load of over 5%. If the load is below 5%, the ripple index of the product may exceed the specifications, but it does not affect the reliability of the product;
3. Suggested dual output module load imbalance: ≤ ± 5%. If it exceeds ± 5%, it cannot be guaranteed that the product performance meets all performance indicators in this datasheet;
4. The maximum capacitive load is tested within the input voltage range and under full load conditions;
5. Unless otherwise specified, all indicators in this manual are measured at Ta = 25 °C, humidity <75% RH, nominal input voltage, and output rated load;
6. All indicator testing methods in this manual are based on our standards;
7. Product specifications are subject to change without prior notice.

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EMC specifications					
EMC	EMI	CE	CISPR32/EN55032 CLASS B (the recommended circuit is shown in Figure 3-2)		
EMC	EMI	RE	CISPR32/EN55032 CLASS B (the recommended circuit is shown in Figure 3-2)		
EMC	EMS	ESD	IEC/EN61000-4-2	Contact ±4kV	perf. Criteria B
EMC	EMS	RS	IEC/EN61000-4-3	10V/m	Perf. Criteria A
EMC	EMS	EFT	IEC/EN61000-4-4	±2kV (the recommended circuit is shown in Figure 3-①)	Perf. Criteria B
EMC	EMS	Surge	IEC/EN61000-4-5	line to line ±2kV (the recommended circuit is shown in Figure 3-①)	Perf. Criteria B
EMC	EMS	CS	IEC/EN61000-4-6	3 Vr.m.s	Perf. Criteria A

Product Selection Guide

Approval	Part number	Input Voltage (VDC), Nominal; Range	Input Voltage Max. (VDC)	Output Voltage (VDC)	Output Current (mA) Max.	Efficiency (%) full load, (typ.)	Max. Capacitive Load (uF) max.
	6S8W_0505S1.6RPR	5 (4.5-9)	12	5	1200/0	80	1000
	6S8W_0512S1.6RPR	5 (4.5-9)	12	12	500/0	84	470
	6S8W_0515S1.6RPR	5 (4.5-9)	12	15	400/0	84	220
	6S8W_0524S1.6RPR	5 (4.5-9)	12	24	250/0	84	100
	6S8W_1203S1.6RPR	12 (9-18)	20	3.3	1350/0	76	1800
	6S8W_1205S1.6RPR	12 (9-18)	20	5	1200/0	80	1000
	6S8W_1209S1.6RPR	12 (9-18)	20	9	667/0	82	470
	6S8W_1212S1.6RPR	12 (9-18)	20	12	500/0	84	470
	6S8W_1215S1.6RPR	12 (9-18)	20	15	400/0	84	220
	6S8W_1224S1.6RPR	12 (9-18)	20	24	250/0	84	100
	6S8W_2403S1.6RPR	24 (18-36)	40	3.3	1350/0	78	1800
	6S8W_2405S1.6RPR	24 (18-36)	40	5	1200/0	82	1000
	6S8W_2409S1.6RPR	24 (18-36)	40	9	667/0	84	470
	6S8W_2412S1.6RPR	24 (18-36)	40	12	500/0	86	470
	6S8W_2415S1.6RPR	24 (18-36)	40	15	400/0	87	220
	6S8W_2424S1.6RPR	24 (18-36)	40	24	250/0	85	100
	6S8W_4805S1.6RPR	48 (36-75)	80	5	1200/0	81	1000
	6S8W_4809S1.6RPR	48 (36-75)	80	9	667/0	83	470
	6S8W_4812S1.6RPR	48 (36-75)	80	12	500/0	85	470
	6S8W_4815S1.6RPR	48 (36-75)	80	15	400/0	86	330
	6S8W_4824S1.6RPR	48 (36-75)	80	24	250/0	84	100

Approval	Part number	Input Voltage (VDC)	Input Voltage Max. (VDC)	Output Voltage (VDC)	Output Current (mA) max.	Efficiency (%) full load, (typ.)	Max. Capacitive Load (uF) max.
	6S8W_0505D1.6RPR	5 (4.5-9)	12	±5	±500/0	80	500
	6S8W_0512D1.6RPR	5 (4.5-9)	12	±12	±208/0	84	220
	6S8W_0515D1.6RPR	5 (4.5-9)	12	±15	±167/0	84	100
	6S8W_0524D1.6RPR	5 (4.5-9)	12	±24	±104/0	84	50

Typical characteristics

Temperature derating graph

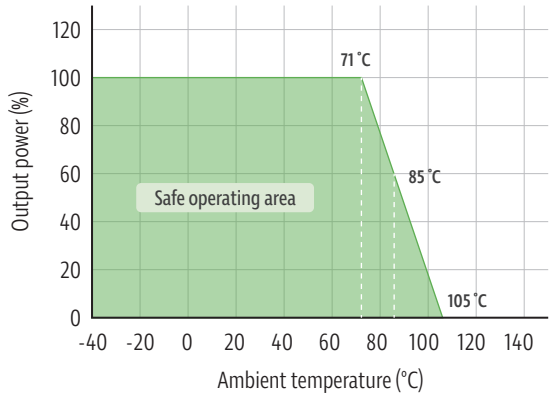
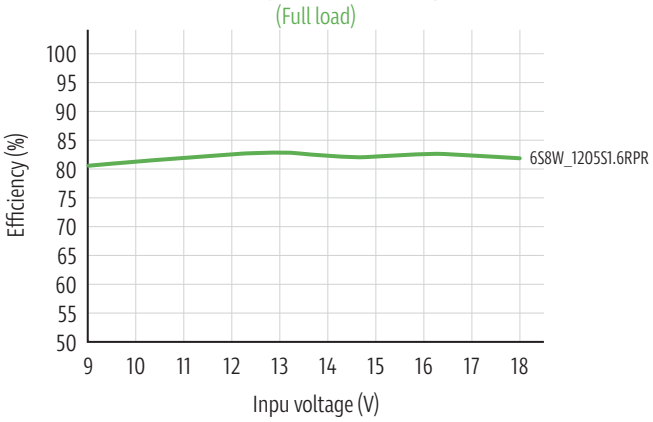
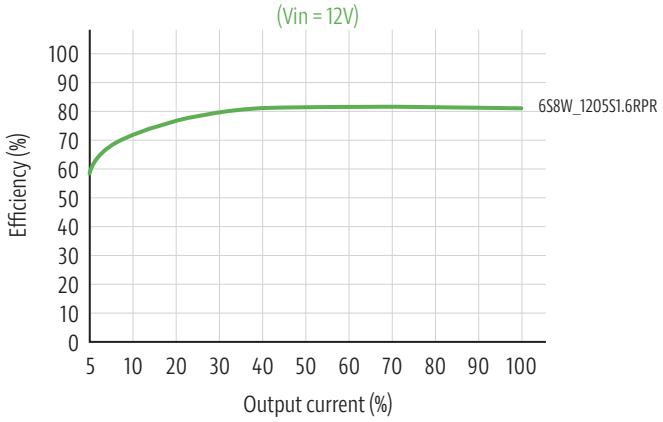


Figure1

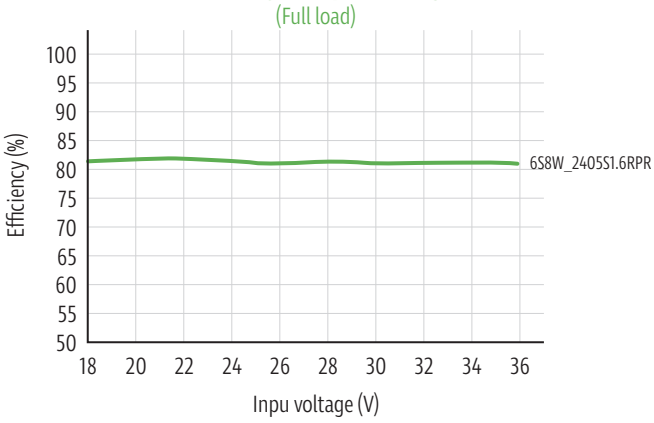
Efficiency vs input voltage
(Full load)



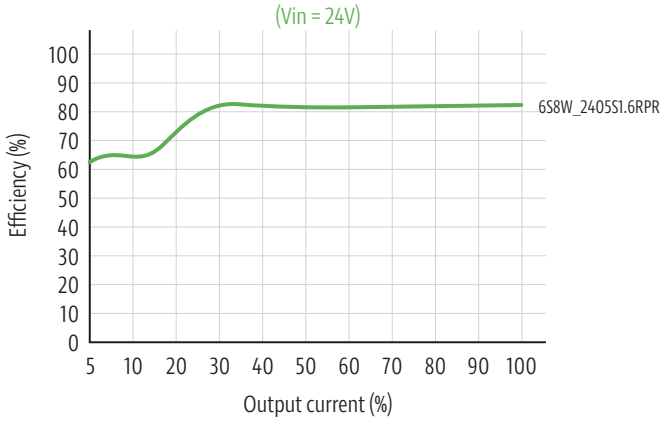
Efficiency vs output load
(Vin = 12V)



Efficiency vs input voltage
(Full load)



Efficiency vs output load
(Vin = 24V)



Typical circuit design and application

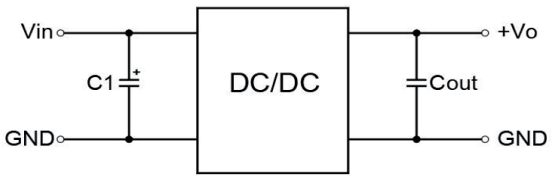


Figure2

Recommended Capacitive Load Value Table

Cin (μF)	Cout (μF)
100	22

EMI recommended component parameters

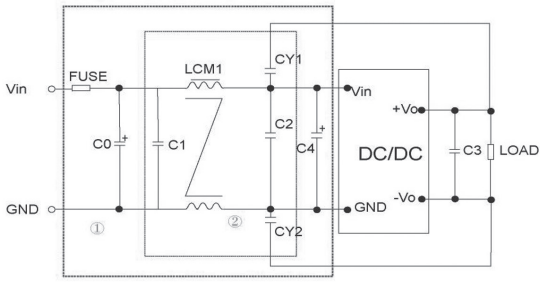


Fig 3

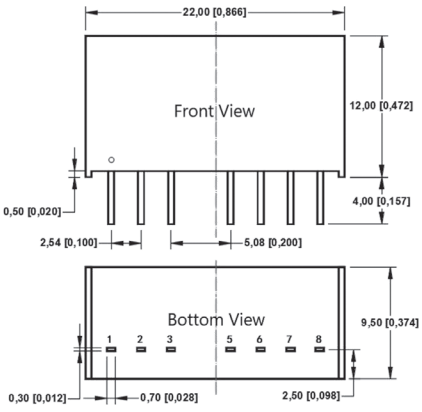
EMI recommended component parameters

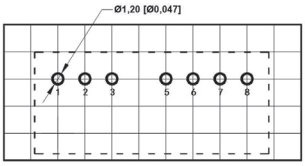
Vin	Vin: 12V	Vin: 24V
FUSE	Select according to the customer's actual input current	
C0, C4	330uF/35V	330uF/50V
C1, C2	10μF/50V	10μF/50V
LCM1	1.4-1.7mH	1.4-1.7mH
C3	22μF/50V	22μF/50V
CY1, CY2	1nF/400VAC	1nF/400VAC

Note: Part ① in Figure 3 is for EMC testing; Part ② is used for EMI filtering, which can be selected according to the demand.

Application Circuit Description:
1. The input voltage cannot exceed the specified range value, otherwise permanent and irreparable damage may be caused;
2. Unless otherwise specified, the parameters in this datasheet were measured at 25°C, humidity 40%~75%, input nominal voltage and output pure resistance mode under full load;
3. All index test methods are based on our standards.

Mechanical dimensions





Pin Definition Table		
Pin	**Single**	**Dual**
1	GND	GND
2	Vin	Vin
3	CTRL	CTRL
5	NC	NC
6	+Vo	+Vo
7	-Vo	COM
8	NC	-Vo

NC: Pin to be isolated from circuity

Note:
Unit: mm [inch]
Pin section tolerances: ±0.10 [±0.004]
General tolerances: ±0.5