6S8W_1.5RP series

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

DC-DC Converter 6 Watt

- SIP8 package
- Wide 2:1 input range
- Isolation 1500VDC
- Continuous short circuit protection
- Efficiency up to 88%
- Operation temperature range -40 ~ 95°C max.
- Remote ON/OFF control (optional)

Introducing our advanced 6S8W_1.5RP series, in a compact SIP8 package, designed to deliver exceptional performance and versatility. With a wide 2:1 input range and isolation capabilities of up to 1500VDC, this device ensures reliable operation across diverse power environments. It features continuous short circuit protection, providing robust safety and stability.

Achieving an efficiency of up to 88%, our power supply is optimized for minimal energy loss and maximum performance. It operates within a temperature range of -40°C to 95°C, making it suitable for extreme conditions. Additionally, it offers optional remote ON/OFF control for enhanced flexibility and convenience in various applications.

SHORT CIRCUIT PROTECTED

100% RoHS compliant

c UL us
UL62368 - E347551

Common specifications

Short circuit protection:	Continuous (Automatic Recovery)
Input surge voltage (100 ms)*	05V Input 15 VDC 12V Input 25 VDC 24V Input 50 VDC 48V Input 100 VDC
Soldering temperature*	1.5mm from case; 10sec max. 260°C
Switching frequency	100 kHz
MTBF (MIL-HDBK-217 F @ 25°C)	770 k hours
Safety approval	IEC / EN / UL 62368-1 DK-63953-UL, E252573
Operating ambient temperature	-40°C - +95°C (see the derating curve)
Maximum case temperature	105°C
Thermal impedance	36.3°C/W
Storage humidity	95% rel. H
Storage temperature	-55°C - +125°C
Cooling	Natural Convection 30-65 LFM
Case material	Nonconductive Black Plastic (UL94V-0 rated)
Pin material	Tinned copper
Potting material	Epoxy (UL94V-0 rated)
Weight	4.5 g, typ.
Dimensions	0.86" x 0.36" x 0.44"

Note:These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.

Isolation specifications

Item	Test condition	Min	Typ	Max	Units
Isolation voltage (Input-output, and rated for 60sec)	Standard Type	1500			VDC
Isolation resistance	Input-output	1000			MΩ
Isolation capacitance	Input-output		50		pF

Example:
6S8W_0512D1.5RP
6 = 6Watt; S8 = SIP8; W = Wide input; 05 = 5Vin; 12 = 12Vout; D = Dual Output; 1.5 = 1.5kVDC isolation; R = Regulated Output; P = Short circuit protection

Output specifications

Item	Test condition	Min	Typ	Max	Units
Output voltage accuracy		-1.0		+1.0	%
Line regulation		-0.2		+0.2	%
Load regulation	From 0% to 100% Load	-1.0		+1.0	%
Cross regulation	Asymmetrical Load 25% / 100% for Dual Output	-5		+5	%
Ripple & noise*	20MHz bandwidth			75	mVpk-pk
Temperature coefficient		-0.02		+0.02	%/°C
Maximum capacitive load	Minimum Vin and constant resistive load		See Table		
Transient recovery time**	For All models		500		µs
Transient response deviation**	3.3V & 5V Output Other Output	-5 -3		+5 +3	%

Note: *Measured with a 0.1µF MLCC and 10µF electrolytic capacitor.

**Nominal Vin and 25% load step change (75%-50%-25% of Io)

Input specifications

Item	Test condition	Min	Typ	Max	Units
Voltage range	• 05V Input • 12V Input • 24V Input • 48V Input	4.5 9 18 36	5 12 24 48	9 18 36 75	VDC
Input filter	Capacitor				
Input reflected ripple current*			30		mApk-pk
Start up time	Nominal Vin and constant resistive load		30		ms
Remote on/off control	• Module ON • Module OFF • OFF idle current	open or high impedance 2-4mA input current (via 1kΩ) 2.5 mA			
Recommended input fuse (slow blow)	• 05V Input • 12V Input • 24V Input • 48V Input		3 1.6 1 0.5		A

Note: *Measured with a simulated source inductance of 12µH and a source capacitor; Cin (47µF, ESR<1.0Ω at 100kHz).

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Product Selection Guide - Single output

Approval	Part Number	Input Voltage Range [VDC]	INPUT Current No-Load [mA, max.]	INPUT Current Full Load [mA, typ.]	Output voltage [VDC]	Output current [Min. load, mA]	Output current [Full load, mA]	Efficiency @FL [%, Typ.]	Capacitive Load (µF, max.)
UL	6S8W_0503S1.5RP	4.5-9	15	1129	3.3	0	1300	76	6600
UL	6S8W_0505S1.5RP	4.5-9	15	1558	5	0	1200	77	3300
UL	6S8W_0509S1.5RP	4.5-9	25	1481	9	0	666	81	2000
UL	6S8W_0512S1.5RP	4.5-9	25	1446	12	0	500	83	1600
UL	6S8W_0515S1.5RP	4.5-9	30	1446	15	0	400	83	1400
UL	6S8W_0524S1.5RP	4.5-9	60	1429	24	0	250	84	680
UL	6S8W_1203S1.5RP	9-18	10	462	3.3	0	1300	77	6600
UL	6S8W_1205S1.5RP	9-18	15	610	5	0	1200	82	3300
UL	6S8W_1209S1.5RP	9-18	20	588	9	0	666	85	2000
UL	6S8W_1212S1.5RP	9-18	30	575	12	0	500	87	1600
UL	6S8W_1215S1.5RP	9-18	35	575	15	0	400	87	1400
UL	6S8W_1224S1.5RP	9-18	40	568	24	0	250	88	680
UL	6S8W_2403S1.5RP	18-36	10	226	3.3	0	1300	79	6600
UL	6S8W_2405S1.5RP	18-36	10	298	5	0	1200	84	3300
UL	6S8W_2409S1.5RP	18-36	15	291	9	0	666	86	2000
UL	6S8W_2412S1.5RP	18-36	15	284	12	0	500	88	1600
UL	6S8W_2415S1.5RP	18-36	15	284	15	0	400	88	1400
UL	6S8W_2424S1.5RP	18-36	20	284	24	0	250	88	680
UL	6S8W_4803S1.5RP	36-75	5	118	3.3	0	1300	76	6600
UL	6S8W_4805S1.5RP	36-75	5	154	5	0	1200	81	3300
UL	6S8W_4809S1.5RP	36-75	5	147	9	0	666	85	2000
UL	6S8W_4812S1.5RP	36-75	5	147	12	0	500	85	1600
UL	6S8W_4815S1.5RP	36-75	5	144	15	0	400	87	1400
UL	6S8W_4824S1.5RP	36-75	10	147	24	0	250	85	680

Product Selection Guide - Dual output

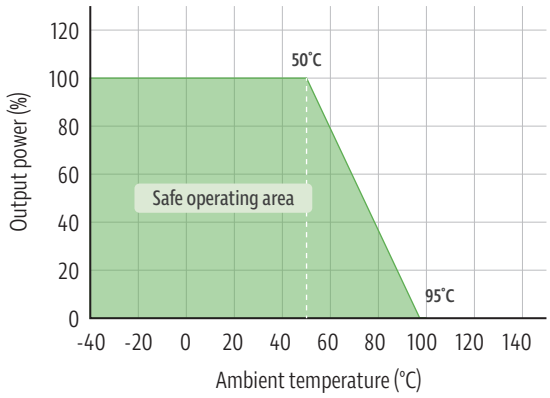
Approval	Part Number	Input Voltage Range [VDC]	INPUT Current No-Load [mA, max.]	INPUT Current Full Load [mA, typ.]	Output voltage [VDC]	Output current [Min. load, mA]	Output current [Full load, mA]	Efficiency @FL [%, Typ.]	Capacitive Load (µF, max.)
UL	6S8W_0503D1.5RP	4.5-9	25	1519	±5	0	±600	79	±2000
UL	6S8W_0512D1.5RP	4.5-9	40	1429	±12	0	±250	84	±900
UL	6S8W_0515D1.5RP	4.5-9	100	1429	±15	0	±200	84	±660
UL	6S8W_1203D1.5RP	9-18	25	617	±5	0	±600	81	±2000
UL	6S8W_1212D1.5RP	9-18	35	575	±12	0	±250	87	±900
UL	6S8W_1215D1.5RP	9-18	35	568	±15	0	±200	88	±660
UL	6S8W_2403D1.5RP	18-36	10	305	±5	0	±600	82	±2000
UL	6S8W_2412D1.5RP	18-36	20	294	±12	0	±250	85	±900
UL	6S8W_2415D1.5RP	18-36	20	294	±15	0	±200	85	±660
UL	6S8W_4803D1.5RP	36-75	10	154	±5	0	±600	81	±2000
UL	6S8W_4812D1.5RP	36-75	10	147	±12	0	±250	85	±900
UL	6S8W_4815D1.5RP	36-75	10	147	±15	0	±200	85	±660

Note: Please use suffix /NC for no control pin option: 6S8W_4815D1.5RP/NC

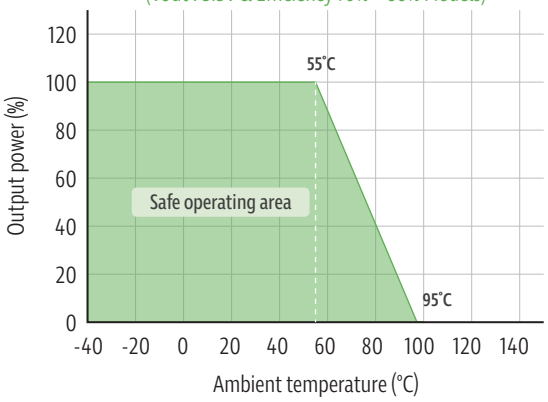
EMC specifications			
Conducted Emissions	EN55032	with external components	A
Radiated Emissions	EN55032		A
ESD	IEC 61000-4-2	Air: ±8kV / Indirect: ±6kV	A
RS	IEC 61000-4-3	10V/m	A
EFT	IEC 61000-4-4	±2kV with external components	A
Surge	IEC 61000-4-5	±1kV with external components	A
CS	IEC 61000-4-6	10Vrms	A
PFMF	IEC 61000-4-8	1A/m	A

Typical characteristics

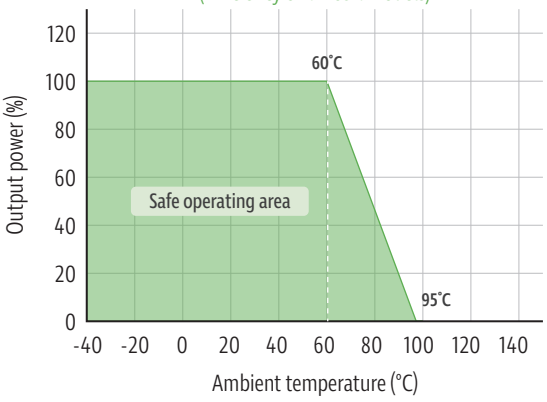
Temperature derating graph



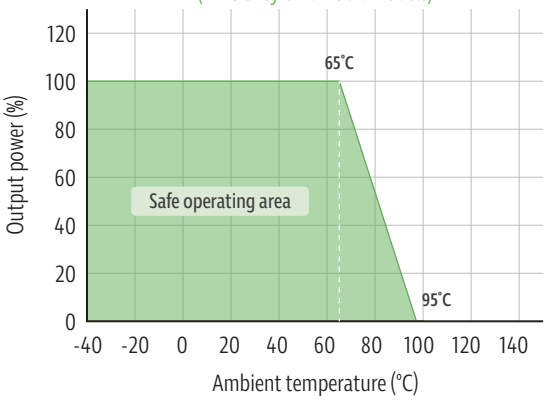
Temperature derating graph
(Vout : 3.3V & Efficiency 79% ~ 80% Models)



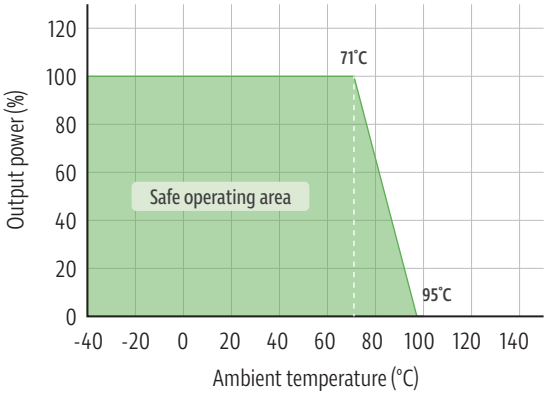
Temperature derating graph
(Efficiency 81% ~ 83% Models)



Temperature derating graph
(Efficiency 84% ~ 86% Models)

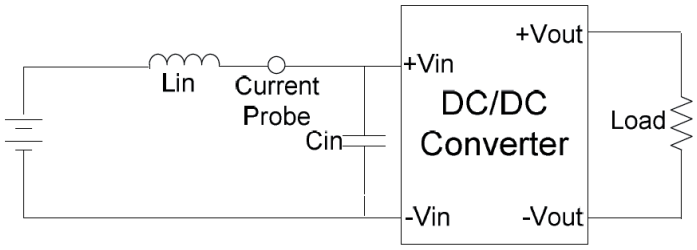


Temperature derating graph
(Efficiency 87% ~ 88% Models)

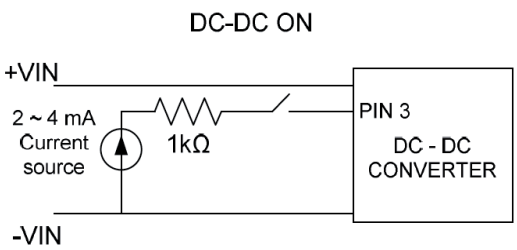


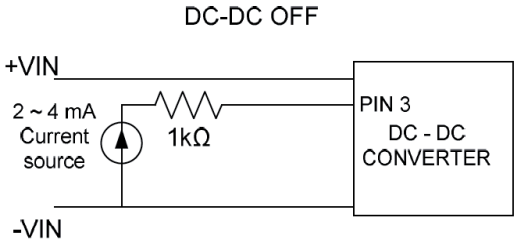
Input reflected ripple current test step

Input reflected ripple current is measured with a source inductor Lin (12µH) and a source capacitor Cin (47µF, ESR<1.0Ω at 100kHz) at nominal input and full load.



Remote module ON / OFF

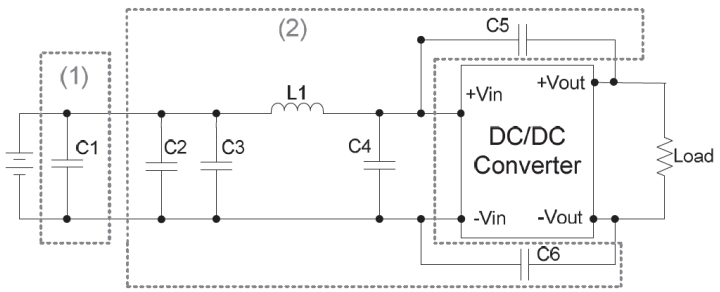




Remote fuction description				
	Remote	Ctrl pin applied current via 1kΩ	Output Voltage	Converter Input current
Converter on	Off	Open or High Impedance	See module	See module
Converter off	On	Input current (2 ~ 4 mA)	No Output Voltage	2.5mA, typ.

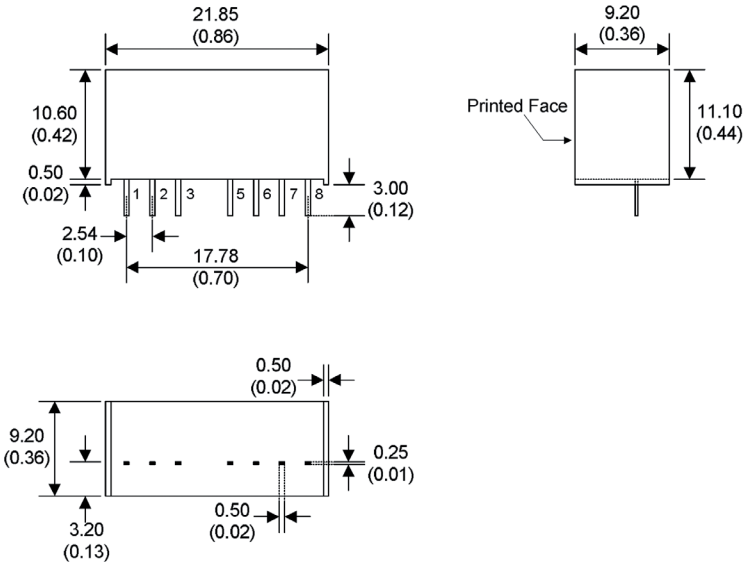
EMC Filter

The part (1) Circuit is used to meet Surge & EFT test, and the part (2) Circuit is used to meet EMI test.



	C1	C2	C3, C4	L1	C5, C6
6S8W_05XXX1.5RP	NIPPON Chemi-con KY series 330µF, 100V	NIPPON Chemi-con KY series 220µF, 100V	MLCC 22µF, 25V	10µH	MLCC 220pF, 3kV
6S8W_12XXX1.5RP			MLCC 10µF, 50V	10µH	MLCC 220pF, 3kV
6S8W_24XXX1.5RP			MLCC 10µF, 50V	10µH	MLCC 220pF, 3kV
6S8W_48XXX1.5RP			MLCC 2.2µF, 100V	15µH	MLCC 220pF, 3kV

Mechanical specifications



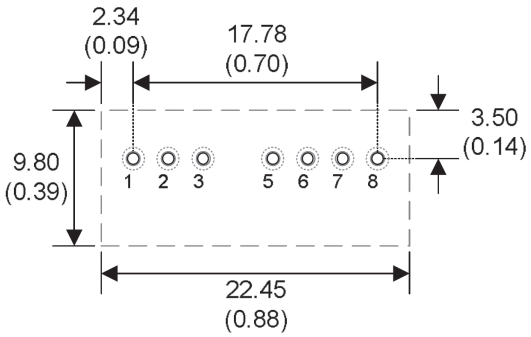
Pin connections				
Pin	Single	**Single: /C**	Dual	**Dual: /C**
1	-Vin	-Vin	-Vin	-Vin
2	+Vin	+Vin	+Vin	+Vin
3	NP	**CTRL**	N.C.	**CTRL**
5	N.C.	N.P.	N.C.	N.C.
6	+Vout	+Vout	+Vout	+Vout
7	-Vout	-Vout	COM	COM
8	N.C.	N.C.	-Vout	-Vout

Note:

/C = Option with control pin
N.P. = No PIN
N.C. = No Connection

Notes : All dimensions are typical in millimeters (inches).
1. Pin dimension tolerance: ±0.05 (±0.002)
2. Pin pitch and length tolerance: ±0.35 (±0.014)
3. Pin to case tolerance: ±0.5 (±0.02)
4. Case Tolerance: ±0.5 (±0.02)
5. Stand-off tolerance: ±0.1 (±0.004)

Mechanical specifications



Notes:

1. All dimensions are typical in millimeters (inches).
Through hole (black) 1 ~ 8: Ø0.80 (0.031)
Top view pad (green) 1 ~ 8: Ø1.00 (0.039)
Bottom view pad (pink) 1 ~ 8: Ø1.60 (0.063)