



6S8W_3RP series

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

DC-DC Converter

6 Watt

- ⊕ SIP8 package
- ⊕ Wide 2:1 input range
- ⊕ Isolation , up to 3000VDC
- ⊕ Continuous short circuit protection
- ⊕ Efficiency up to 88%
- ⊕ Operation temperature range -40 ~ 95°C max.
- ⊕ Remote ON/OFF control (optional)

Introducing our advanced The 6S8W_3RP series, meticulously designed to provide exceptional performance for a variety of applications. The SIP8 package offers a wide 2:1 input range and ensures robust isolation with 1500 VDC, extendable up to 3000VDC. With continuous short circuit protection and an impressive efficiency of up to 88%, it operates reliably within a temperature range of -40°C to 95°C.

Additionally, the optional remote ON/OFF control feature enhances its versatility and ease of use.



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	3000			VDC
Isolation resistance	Input-output	1000			MΩ
Isolation capacitance	Input-output		50		pF

Example:

6S8W_0512D3RP

6 = 6Watt; S8 = SIP8; W = Wide input; 05 = 5Vin; 12 = 12Vout; D = Dual Output; 3 = 3kVDC 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_0503S3RP	4.5-9	15	1129	3.3	0	1300	76	6600
UL	6S8W_0505S3RP	4.5-9	15	1558	5	0	1200	77	3300
UL	6S8W_0509S3RP	4.5-9	25	1481	9	0	666	81	2000
UL	6S8W_0512S3RP	4.5-9	25	1446	12	0	500	83	1600
UL	6S8W_0515S3RP	4.5-9	30	1446	15	0	400	83	1400
UL	6S8W_0524S3RP	4.5-9	60	1429	24	0	250	84	680
UL	6S8W_1203S3RP	9-18	10	462	3.3	0	1300	77	6600
UL	6S8W_1205S3RP	9-18	15	610	5	0	1200	82	3300
UL	6S8W_1209S3RP	9-18	20	588	9	0	666	85	2000
UL	6S8W_1212S3RP	9-18	30	575	12	0	500	87	1600
UL	6S8W_1215S3RP	9-18	35	575	15	0	400	87	1400
UL	6S8W_1224S3RP	9-18	40	568	24	0	250	88	680
UL	6S8W_2403S3RP	18-36	10	226	3.3	0	1300	79	6600
UL	6S8W_2405S3RP	18-36	10	298	5	0	1200	84	3300
UL	6S8W_2409S3RP	18-36	15	291	9	0	666	86	2000
UL	6S8W_2412S3RP	18-36	15	284	12	0	500	88	1600
UL	6S8W_2415S3RP	18-36	15	284	15	0	400	88	1400
UL	6S8W_2424S3RP	18-36	20	284	24	0	250	88	680
UL	6S8W_4803S3RP	36-75	5	118	3.3	0	1300	76	6600
UL	6S8W_4805S3RP	36-75	5	154	5	0	1200	81	3300
UL	6S8W_4809S3RP	36-75	5	147	9	0	666	85	2000
UL	6S8W_4812S3RP	36-75	5	147	12	0	500	85	1600
UL	6S8W_4815S3RP	36-75	5	144	15	0	400	87	1400
UL	6S8W_4824S3RP	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_0503D3RP	4.5-9	25	1519	±5	0	±600	79	±2000
UL	6S8W_0512D3RP	4.5-9	40	1429	±12	0	±250	84	±900
UL	6S8W_0515D3RP	4.5-9	100	1429	±15	0	±200	84	±660
UL	6S8W_1203D3RP	9-18	25	617	±5	0	±600	81	±2000
UL	6S8W_1212D3RP	9-18	35	575	±12	0	±250	87	±900
UL	6S8W_1215D3RP	9-18	35	568	±15	0	±200	88	±660
UL	6S8W_2403D3RP	18-36	10	305	±5	0	±600	82	±2000
UL	6S8W_2412D3RP	18-36	20	294	±12	0	±250	85	±900
UL	6S8W_2415D3RP	18-36	20	294	±15	0	±200	85	±660
UL	6S8W_4803D3RP	36-75	10	154	±5	0	±600	81	±2000
UL	6S8W_4812D3RP	36-75	10	147	±12	0	±250	85	±900
UL	6S8W_4815D3RP	36-75	10	147	±15	0	±200	85	±660

Note: Please use suffix /C for option: control pin: 6S8W_4815D3RP/C

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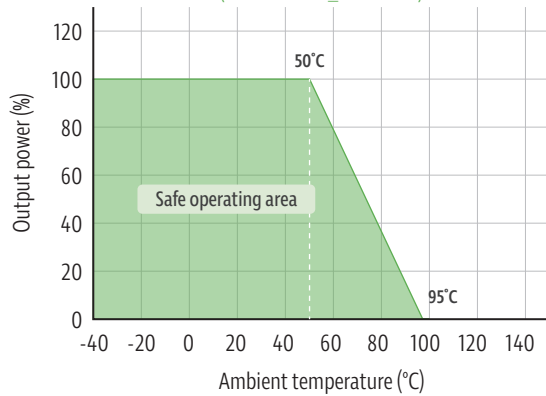
EMC specifications

Conducted Emissions	EN55032	with external components	A
Radiated Emissions	EN55032		A
ESD	IEC 61000-4-2	Air: $\pm 8\text{kV}$ / Indirect: $\pm 6\text{kV}$	A
RS	IEC 61000-4-3	10V/m	A
EFT	IEC 61000-4-4	$\pm 2\text{kV}$ with external components	A
Surge	IEC 61000-4-5	$\pm 1\text{kV}$ with external components	A
CS	IEC 61000-4-6	10Vrms	A
PFMF	IEC 61000-4-8	1A/m	A

Typical characteristics

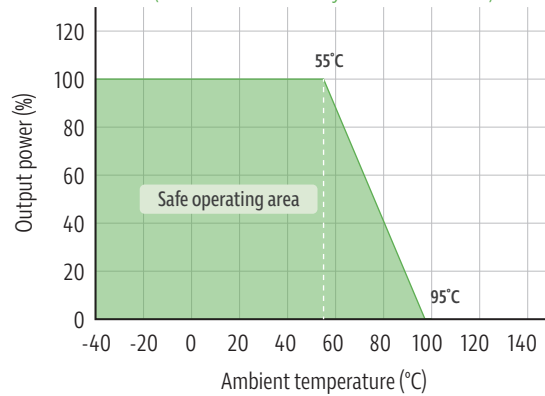
Temperature derating graph

(Model: 6S8W_0505S3RP)



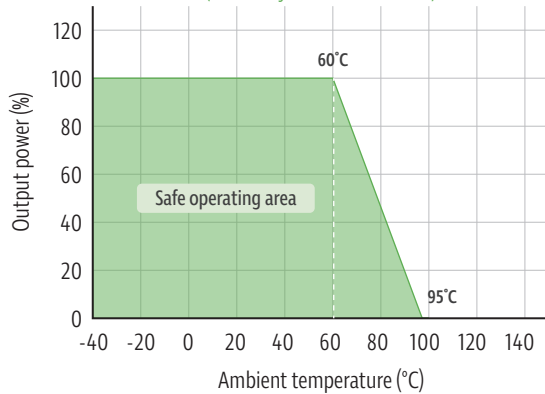
Temperature derating graph

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



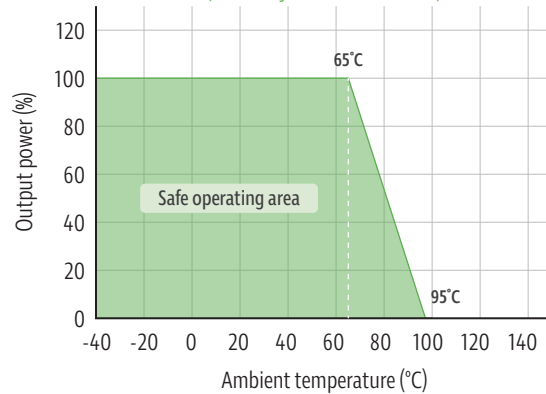
Temperature derating graph

(Efficiency 81% ~ 83% Models)



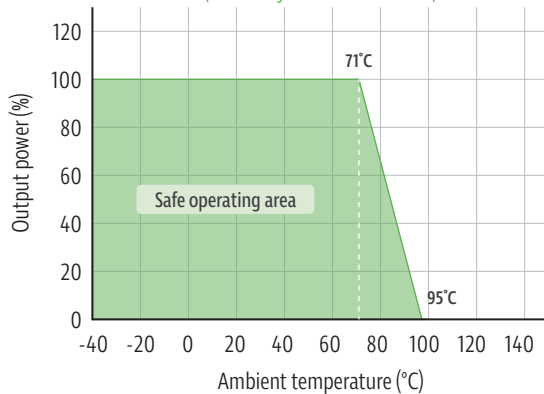
Temperature derating graph

(Efficiency 84% ~ 86% Models)



Temperature derating graph

(Efficiency 87% ~ 88% Models)

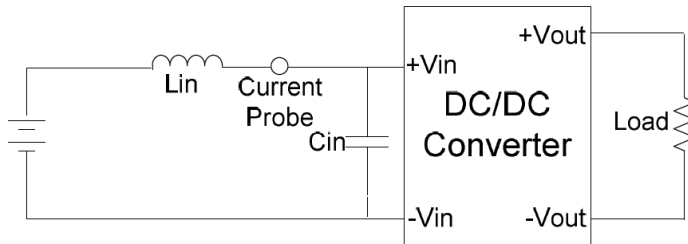


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Input reflected ripple current test step

Input reflected ripple current is measured with a source inductor L_{in} ($12\mu\text{H}$) and a source capacitor C_{in} ($47\mu\text{F}$, $\text{ESR}<1.0\Omega$ at 100kHz) at nominal input and full load.



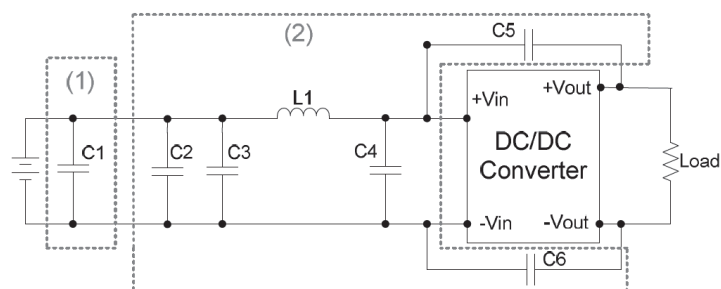
Remote module ON / OFF



Remote function description				
	Remote	Ctrl pin applied current via $1\text{k}\Omega$	Output Voltage	Converter Input current
Converter on	Off	Open or High Impedance	See module	See module
Converter off	On	Input current ($2 \sim 4 \text{ mA}$)	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.

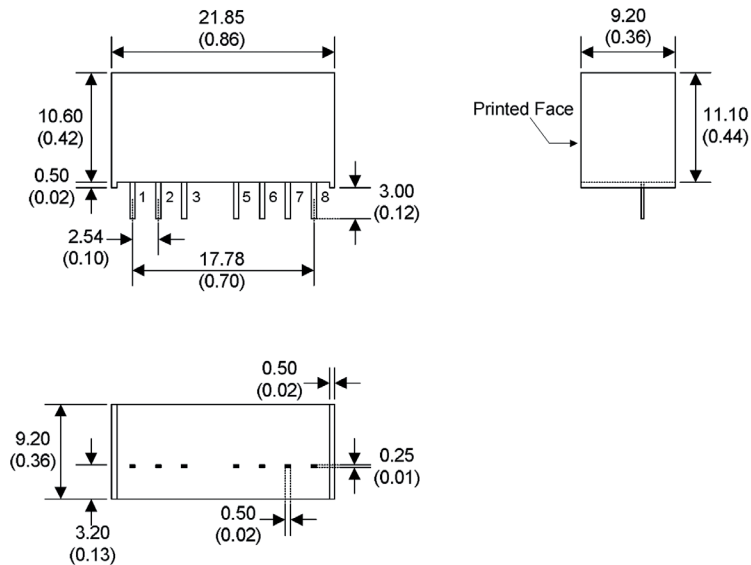


	C1	C2	C3, C4	L1	C5, C6
6S8W_05XXX3RP	NIPPON Chemi-con KY series $330\mu\text{F}$, 100V	NIPPON Chemi-con KY series $220\mu\text{F}$, 100V	MLCC $22\mu\text{F}$, 25V	$10\mu\text{H}$	MLCC 220pF , 3kV
6S8W_12XXX3RP			MLCC $10\mu\text{F}$, 50V	$10\mu\text{H}$	MLCC 220pF , 3kV
6S8W_24XXX3RP			MLCC $10\mu\text{F}$, 50V	$10\mu\text{H}$	MLCC 220pF , 3kV
6S8W_48XXX3RP			MLCC $2.2\mu\text{F}$, 100V	$15\mu\text{H}$	MLCC 220pF , 3kV

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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

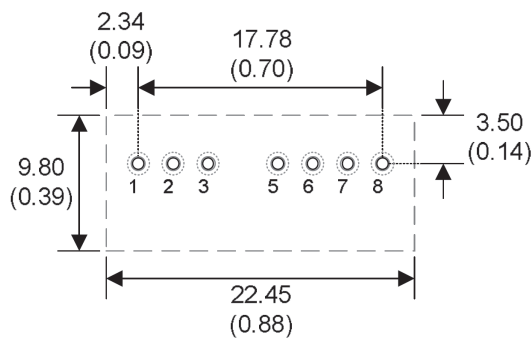
N.P. = No PIN

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: $\varnothing 0.80$ (0.031)
Top view pad (green) 1 ~ 8: $\varnothing 1.00$ (0.039)
Bottom view pad (pink) 1 ~ 8: $\varnothing 1.60$ (0.063)