TECHNICAL DATA
DATA SHEET 1103, REV. E

DC-DC Converters

Wide Input (2:1), 1000V Isolation, Regulated, Single Output

FEATURES:

- **Isolation Voltage:** **1000Vdc**
- **Isolation Resistance (1):** **1000MΩ**
- **Short-Circuit Duration:** **Continuous**
- **Case Temperature Rise:** **Max. 25°C, Typ. 15°C**
- **Cooling Method:** **Free-Air Cooling**
- **Operating Temp.:** **-40°C ~ + 85°C**
- **Storage Temp.:** **-50°C ~ + 125°C**
- **Humidity:** **≤ 95%**
- **Soldering Temp. (2):** **300°C**
- **Case Material:** **Non-Flammable Material (UL94-V0)**
- **Mean Time Before Failure:** **> 1,090,000 hours (Operating Temp. 25°C)**

W-1W/2W Single Output Series Input Characteristics

Part Number	Nominal Input Voltage	Input Voltage Range	Maximum Input Voltage*
W05XXHS1/2	5Vdc	4.5~9Vdc	11Vdc
W12XXHS1/2	12Vdc	9~18Vdc	22Vdc
W15XXHS1/2	12Vdc	12~24Vdc	30Vdc
W24XXHS1/2	24Vdc	18~36Vdc	40Vdc
W48XXHS1/2	48Vdc	36~72Vdc	80Vdc

* Voltage above this value may cause permanent damage to the device.

W-1W/2W Single Output Series Output Characteristics

Parameter	MIN	TYP	MAX	Units
1W Output Power	0.25		1	W
2W Output Power	0.5		2	W
Vout1 Output Voltage Accuracy		± 0.5	± 2	%
Vout2 Output Voltage Accuracy		± 1	± 3	%
Efficiency at 25% Load	60	65	70	%
Efficiency at 100% Load	65	75	83	%
Voltage Regulation		0.1	0.2	%
Vout (+) Load Regulation		0.2	0.5	%
Vout (-) Load Regulation		3	5	%
Temperature Coefficient			0.02	%/°C
Ripple		10	20	mVp-p
Noise		50	100	mVp-p
Switching Frequency at 100% Load	80		200	kHz
Switching Frequency at 25% Load	250		550	kHz

1. All specifications at T_A=25°C, 75% of the humidity, Nominal input voltage, full output load unless otherwise specified.
2. Soldering for 10 seconds at 1.5mm away from the edge.

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W-1W/2W Single Output Series Part Number List

Input	Output	Power	Single-1W	Single-2W
5Vdc	3.3V/300m A	1.00W	W0503HS1	W0503HS2
	5V/200m A	1.00W	W0505HS1	W0505HS2
12Vdc	9V/110m A	1.00W	W0509HS1	W0509HS2
	12V/80m A	1.00W	W0512HS1	W0512HS2
	15V/66m A	1.00W	W0515HS1	W0515HS2
	±3.3V/150m A	1.00W	W1203HS1	W1203HS2
	±5V/100m A	1.00W	W1205HS1	W1205HS2
15Vdc	±9V/55m A	1.00W	W1209HS1	W1209HS2
	±12V/40m A	1.00W	W1212HS1	W1212HS2
	±15V/33m A	1.00W	W1215HS1	W1215HS2
	3.3V/600m A	2.00W	W1503HS1	W1503HS2
	5V/400m A	2.00W	W1505HS1	W1505HS2
24Vdc	9V/220m A	2.00W	W1509HS1	W1509HS2
	12V/160m A	2.00W	W1512HS1	W1512HS2
	15V/133m A	2.00W	W1515HS1	W1515HS2
	±3.3V/300m A	2.00W	W2403HS1	W2403HS2
	±5V/200m A	2.00W	W2405HS1	W2405HS2
48Vdc	±9V/110m A	2.00W	W2409HS1	W2409HS2
	±12V/80m A	2.00W	W2412HS1	W2412HS2
	±15V/66m A	2.00W	W2415HS1	W2415HS2
			W4803HS1	W4803HS2
			W4805HS1	W4805HS2
			W4809HS1	W4809HS2
			W4812HS1	W4812HS2
			W4815HS1	W4815HS2

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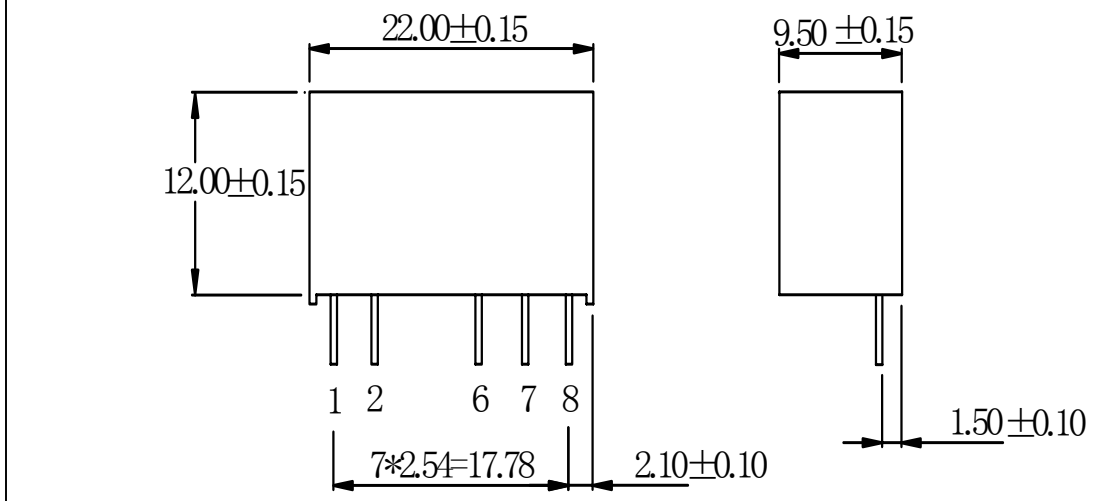
Mechanical Dimension: in mm & Pin Configuration

WxxyyHS1/2 PACKAGE DIMENTIONS



PIN CONFIGURATION

Pin	Function
1	GND
2	Vin
6	+Vo
7	OV
8	CS

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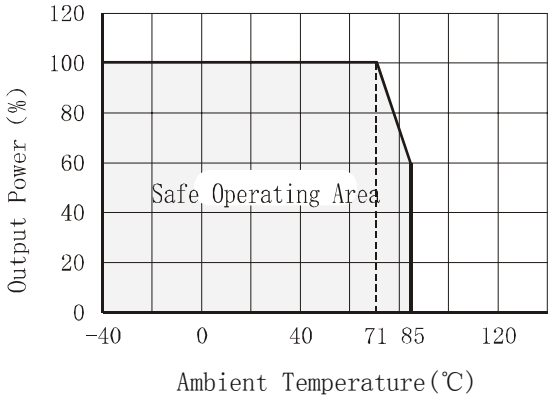
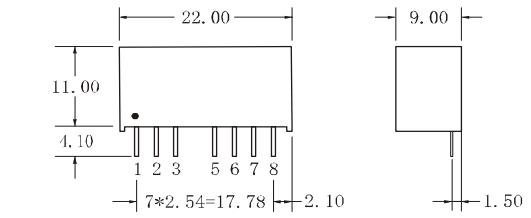
POWER DERATING



Outline Dimensions and Pin Functions

Pin	Function	Note
1	GND	Input ground
2	Vin	Input positive
3	NC	Suspend
5	NC	Suspend
6	+Vo	Output positive
7	0V	Output ground
8	CS	External capacitor



SIP-4
All dimension in mm
Tolerance: case +0.5
Tolerance: pin +0.25

APPLICATION NOTE

①、NC is for internal use of the DC/DC converter. Be sure to suspend it without connecting any peripheral circuits.

②、By connecting a low ESR capacitor between this terminal and the pin-7 (connecting to the anode of the capacitor), the output ripple and noise may be further improved.

③、 When the output power is down to 1W, it is suggested to connect a capacitor(Cs) between the CS and the 0V. Generally, the capacitance is no greater than 100uF (see Figure 1).

④、 When the output power is down to 1W, it is suggested to connect a capacitor(Cs) between the CS and the 0V, otherwise perpetual damage might be done. (See Table 1)

Table 1

V_{out}	5V	12V、15V
Cs	47uF-100uF	22uF-47uF

⑤、 **Recommended Circuit**

All DC/DC converters of this series have been tested. This product cannot be tested with no load. Be careful ***not to perform the test under no load!!!*** For further reducing the ripple, increase the capacitance of the output capacitor (C_{out}) appropriately (see Table 2).

⑥、 **Input Current**

Nominal input voltage range. The input current of the power supply must be sufficient to the startup current (Ip) of the DC/DC module (see Figure 2)

⑦、**Output Load**

In order to ensure the product operate efficiently and reliably, in addition to a max load (namely full load), a min load is specified for this kind of DC/DC converter. Make sure the specified range of input voltage is not exceeded, the minimum output load ***no less than 25% (namely: ≥100mA)*** ***full load, the product never work under no load!*** If the actual load is less than the specified min load, the output ripple will increase sharply while its efficiency and reliability will reduce greatly. If the actual output power is very small, a proper resistor is needed at the output end in order to increasing the load, or contact our

company for other lower output power products.

⑧、No parallel connection or plug and play.

Table 2：

Vin	C_{in}	C_{out} 0℃～+70℃)	C_{out} (-40℃～+85℃)
5V&12V	100uF/25V Philips No.03790047	100uF/25V Philips No.03790047	47uF/20V AVX Part No. TAJD476K020X
24V&48V	10uF/100V Philips No.03759109		
Note	To get more ideal ripple value under high/low temperatures, please select a low-ESR tantalum capacitor with a wider range of operating temperature or an OS-CON capacitor.		

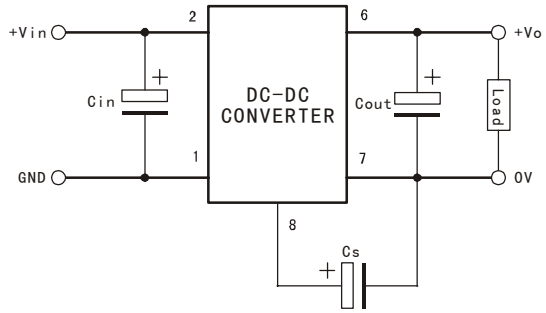


Figure 1

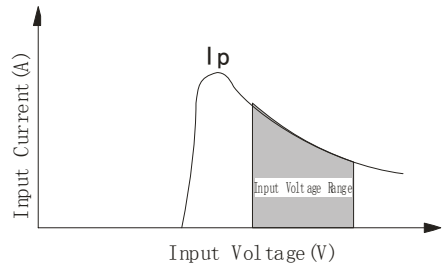


Figure 2

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