

C1-S/D01 (02)-1W Series

1W Unregulated Single & Dual Separate output



Features

- SIP7 / DIP14 Package
- 1000 VDC Isolation
- Up to 3000 VDC Isolation
- Efficiency up to 82%
- Non-Conductive Black Plastic Case
- Operation Temperature Range -40 ~ 100°C max.



PART NUMBER STRUCTURE

C1 - **12** **05** **D** **01** **H**
(1) (2) (3) (4) (5) (6)

(1) Series

(2) Input Voltage Range

05 - 4.5-5.5 V
12 - 10.8-13.2 V
24 - 21.6-26.4 V

(4) Case & Output Type

S - SIP Case, Dual Output
D - DIP Case, Dual Output

(3) Dual Separate Output Voltage

3R3S/D01 - 5.0 V, 3.3 V
7R2S/D01 - 5.0 V, 7.2 V
09S/D01 - 5.0 V, 9.0 V
12S/D01 - 5.0 V, 12 V
15S/D01 - 5.0 V, 15 V

(5) Different output voltage

(6) Isolation Voltage (Optional)

Blank - 1 KVDC
H - 3 KVDC

05S/D02 - 5.0 V, 5.0 V
7R2S/D02 - 7.2 V, 7.2 V
09S/D02 - 9.0 V, 9.0 V
12S/D02 - 12 V, 12 V
15S/D02 - 15 V, 15 V

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ALL SPECIFICATIONS ARE TYPICAL AT 25°C, NOMINAL INPUT AND FULL LOAD UNLESS OTHERWISE NOTED

Model Number	Input Voltage Range (VDC)	Input Current		Output Voltage (VDC)	Output Current Full Load (mA)	Efficiency @FL (% , typ.)	Capacitive Load @ FL (μF, max.)
		No-Load (mA, max.)	Full Load (mA, typ.)				
C1-053R3S01	4.5-5.5	25	250	5 , 3.3	100 , 152	80	100
C1-057R2S01	4.5-5.5	25	267	5 , 7.2	100 , 69	75	100
C1-0509S01	4.5-5.5	20	263	5 , 9	100 , 56	76	100
C1-0512S01	4.5-5.5	20	263	5 , 12	100 , 42	76	100
C1-0515S01	4.5-5.5	25	267	5 , 15	100 , 33	75	100
C1-123R3S01	10.8-13.2	15	110	5 , 3.3	100 , 152	76	100
C1-127R2S01	10.8-13.2	15	110	5 , 7.2	100 , 69	76	100
C1-1209S01	10.8-13.2	15	110	5 , 9	100 , 56	76	100
C1-1212S01	10.8-13.2	15	107	5 , 12	100 , 42	78	100
C1-1215S01	10.8-13.2	17	110	5 , 15	100 , 33	76	100
C1-243R3S01	21.6-26.4	12	56	5 , 3.3	100 , 152	75	100
C1-247R2S01	21.6-26.4	15	56	5 , 7.2	100 , 69	75	100
C1-2409S01	21.6-26.4	15	56	5 , 9	100 , 56	75	100
C1-2412S01	21.6-26.4	15	56	5 , 12	100 , 42	75	100
C1-2415S01	21.6-26.4	15	56	5 , 15	100 , 33	75	100
C1-053R3D01	4.5-5.5	25	267	5 , 3.3	100 , 152	75	100
C1-057R2D01	4.5-5.5	25	267	5 , 7.2	100 , 69	75	100
C1-0509D01	4.5-5.5	25	267	5 , 9	100 , 56	75	100
C1-0512D01	4.5-5.5	25	267	5 , 12	100 , 42	75	100
C1-0515D01	4.5-5.5	25	267	5 , 15	100 , 33	75	100
C1-123R3D01	10.8-13.2	15	111	5 , 3.3	100 , 152	75	100
C1-127R2D01	10.8-13.2	15	111	5 , 7.2	100 , 69	75	100
C1-1209D01	10.8-13.2	15	111	5 , 9	100 , 56	75	100
C1-1212D01	10.8-13.2	15	111	5 , 12	100 , 42	75	100
C1-1215D01	10.8-13.2	15	111	5 , 15	100 , 33	75	100
C1-243R3D01	21.6-26.4	13	56	5 , 3.3	100 , 152	74	100
C1-247R2D01	21.6-26.4	15	56	5 , 7.2	100 , 69	75	100
C1-2409D01	21.6-26.4	15	56	5 , 9	100 , 56	75	100
C1-2412D01	21.6-26.4	15	56	5 , 12	100 , 42	75	100
C1-2415D01	21.6-26.4	15	56	5 , 15	100 , 33	75	100

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Model Number	Input Voltage Range (VDC)	Input Current		Output Voltage (VDC)	Output Current Full Load (mA)	Efficiency @FL (% , typ.)	Capacitive Load @ FL (μF, max.)
		No-Load (mA, max.)	Full Load (mA, typ.)				
C1-0505S02	4.5-5.5	22	278	5 , 5	100 , 100	72	100
C1-057R2S02	4.5-5.5	25	267	7.2 , 7.2	69 , 69	75	100
C1-0509S02	4.5-5.5	23	256	9 , 9	56 , 56	78	100
C1-0512S02	4.5-5.5	22	250	12 , 12	42 , 42	80	100
C1-0515S02	4.5-5.5	25	250	15 , 15	33 , 33	80	100
C1-1205S02	10.8-13.2	14	116	5 , 5	100 , 100	72	100
C1-127R2S02	10.8-13.2	10	105	7.2 , 7.2	69 , 69	79	100
C1-1209S02	10.8-13.2	12	108	9 , 9	56 , 56	77	100
C1-1212S02	10.8-13.2	15	110	12 , 12	42 , 42	76	100
C1-1215S02	10.8-13.2	16	111	15 , 15	33 , 33	75	100
C1-2405S02	21.6-26.4	7	58	5 , 5	100 , 100	72	100
C1-247R2S02	21.6-26.4	9	58	7.2 , 7.2	69 , 69	72	100
C1-2409S02	21.6-26.4	9	56	9 , 9	56 , 56	75	100
C1-2412S02	21.6-26.4	8	53	12 , 12	42 , 42	79	100
C1-2415S02	21.6-26.4	10	56	15 , 15	33 , 33	75	100
C1-0505D02	4.5-5.5	22	278	5 , 5	100 , 100	72	100
C1-057R2D02	4.5-5.5	25	267	7.2 , 7.2	69 , 69	75	100
C1-0509D02	4.5-5.5	25	267	9 , 9	56 , 56	75	100
C1-0512D02	4.5-5.5	23	267	12 , 12	42 , 42	75	100
C1-0515D02	4.5-5.5	28	253	15 , 15	33 , 33	79	100
C1-1205D02	10.8-13.2	15	111	5 , 5	100 , 100	75	100
C1-127R2D02	10.8-13.2	15	111	7.2 , 7.2	69 , 69	75	100
C1-1209D02	10.8-13.2	15	111	9 , 9	56 , 56	75	100
C1-1212D02	10.8-13.2	18	111	12 , 12	42 , 42	75	100
C1-1215D02	10.8-13.2	15	111	15 , 15	33 , 33	75	100
C1-2405D02	21.6-26.4	15	56	5 , 5	100 , 100	75	100
C1-247R2D02	21.6-26.4	15	56	7.2 , 7.2	69 , 69	75	100
C1-2409D02	21.6-26.4	15	56	9 , 9	56 , 56	75	100
C1-2412D02	21.6-26.4	15	56	12 , 12	42 , 42	75	100
C1-2415D02	21.6-26.4	10	52	15 , 15	33 , 33	80	100

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INPUT SPECIFICATIONS

Parameter	Conditions	Min.	Typ.	Max.	Unit
Input Voltage Range	5 V Input	4.5	5	5.5	VDC
	12 V Input	10.8	12	13.2	
	24 V Input	21.6	24	26.4	
Input Filter		Capacitor			
Input Reflected Ripple Current (1)			20		mApk-pk
Start up Time	Nominal Vin and constant resistive load		20		ms
Recommended input fuse (slow blow)	5 V Input	0.75			A
	12 V Input	0.3			
	24V Input	0.15			

Note :

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

OUTPUT SPECIFICATIONS

Parameter	Conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy		-3		+3	%
Line Regulation	For 1% Vin Change	-1.2		+1.2	%
Load Regulation	From 20% to 100% Load			+11	%
	Output 3.3V Model			+20	%
Ripple & Noise	20MHz bandwidth			75	mVpk-pk
Short Circuit Protection		Short Term (1sec)			
Temperature Coefficient		-0.02		+0.02	%/°C
Maximum Capacitive Load	Minimum Vin and constant resistive load	See Table			

ABSOLUTE MAXIMUM RATINGS

Parameter	Conditions	Min.	Typ.	Max.	Unit
Input Surge Voltage (100 ms)	5 V Input			7	VDC
	12 V Input			15	
	24 V Input			28	
Soldering Temperature	1.5mm from case 10sec max.			260	°C

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

GENERAL SPECIFICATIONS

Parameter	Conditions		Min.	Typ.	Max.	Unit
Isolation Voltage	Input-output, and rated for 60sec	Standard Type	1000			VDC
		Suffix "H"	3000			
Isolation Resistance	Input-output		1000			MΩ
Isolation Capacitance	Input-output			60		pF
Switching Frequency				80		kHz
MTBF	MIL-HDBK-217 F @ 25°C		1.121			M hours
Safety Standard	IEC / EN / UL 62368-1		Designed to meet			
Environmental compliance			RoHS			

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ENVIRONMENT SPECIFICATIONS					
Parameter	Conditions	Min.	Typ.	Max.	Unit
Operating Ambient Temperature	See the Derating Curve	-40		100	°C
Maximum Case Temperature				100	°C
Thermal Impedance		57.09			°C/W
Storage Humidity				95	% rel. H
Storage Temperature		-55		125	°C
Cooling	Natural Convection	30-65 LFM			

PHYSICAL SPECIFICATIONS		
Parameter		Value
Case Material		Nonconductive Black Plastic (UL94V-0 rated)
Pin Material		Alloy 42
Potting Material		Epoxy (UL94V-0 rated)
Weight	SIP Case	2.3 g, typ.
	DIP Case	2.7 g, typ.
Dimensions	SIP Case	0.76" x 0.24" x 0.39"
	DIP Case	0.80" x 0.40" x 0.27"

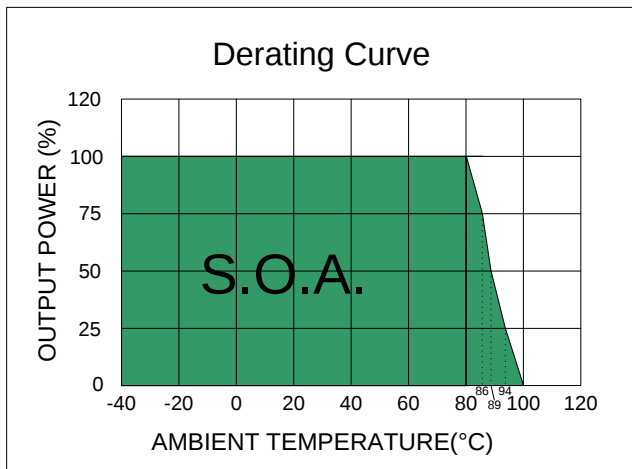
C1-S/D01 (02)-1W Series

1W Unregulated Single & Dual Separate output

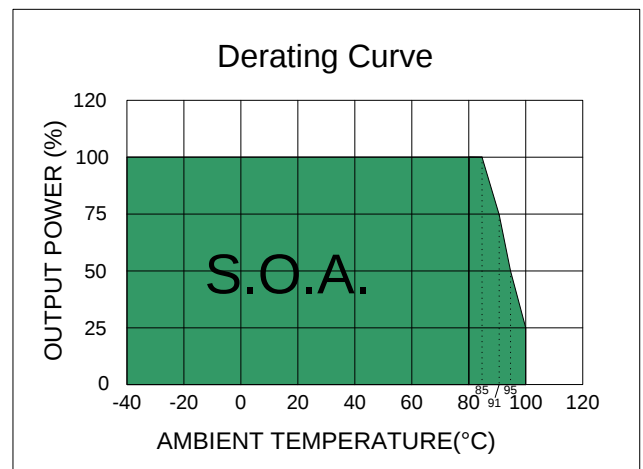


ELECTRICAL CHARACTERISTIC CURVES

C1-S01 /D01

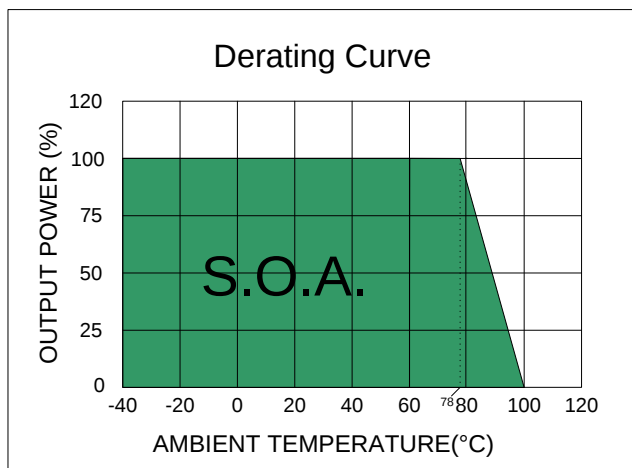


Efficiency : 74% ~ 79%

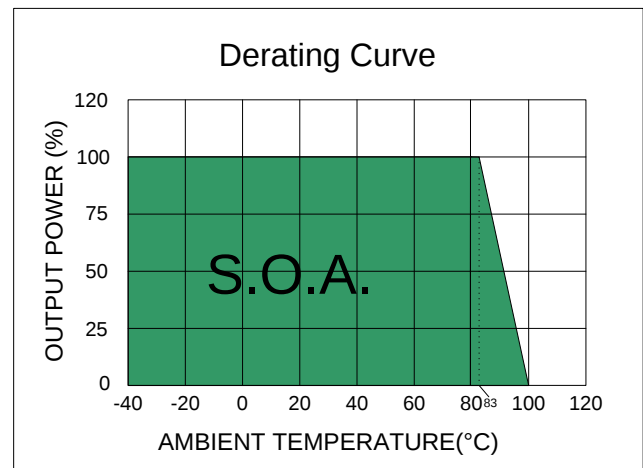


Efficiency : 80%

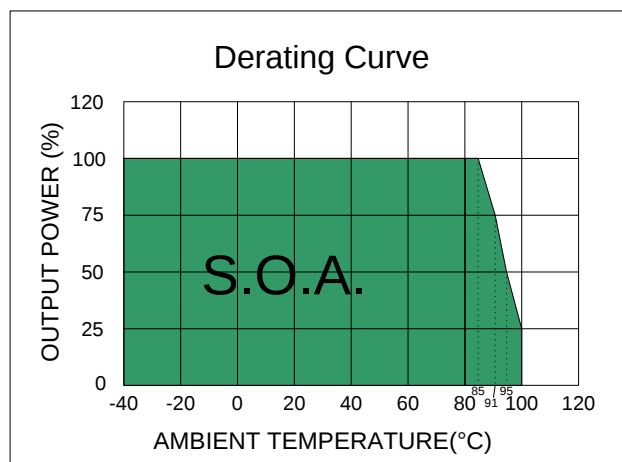
V1-S02 /D02



Efficiency : 72% ~ 76%



Efficiency : 77% ~ 79%



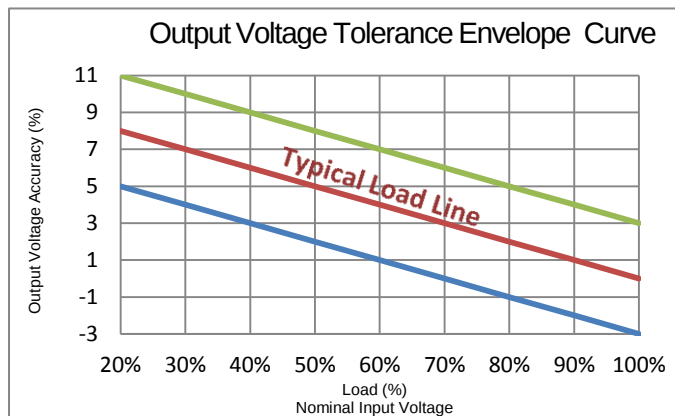
Efficiency : 80%

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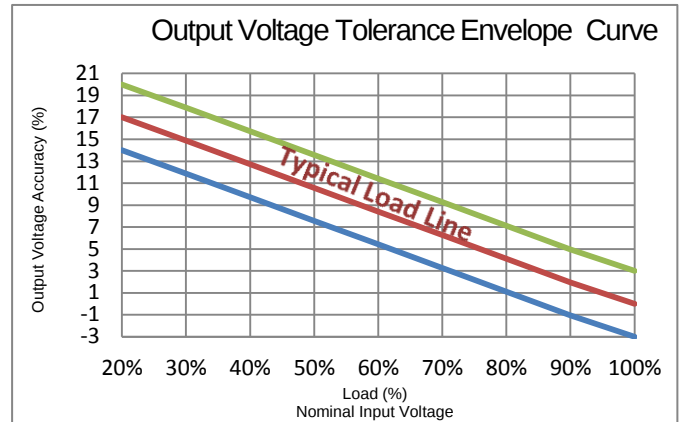
1W Unregulated Single & Dual Separate output



ELECTRICAL CHARACTERISTIC CURVES



From 20% to 100% Load

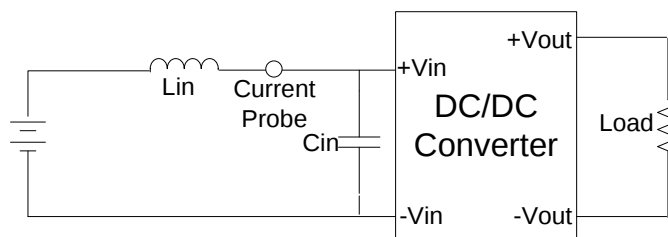


Output 3.3V Model

TEST CONFIGURATIONS

Input Reflected Ripple Current Test Step

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



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DESIGN & FEATURE CONFIGURATIONS

Isolation Voltage

This series is designed to meet the functional insulation of UL, both input and output should be maintained within SELV limits (less than 42.4V peak, or 60VDC).

The isolation test voltage represents a measure of immunity to transient voltages and the part should never be used as an element of a safety isolation system. The part could be expected to function correctly with hundreds of volts offset applied continuously across the isolation barrier; but then the circuitry on both sides of the barrier must be regarded as operating at an unsafe voltage and further isolation/insulation systems must form a barrier between these circuits and any user-accessible circuitry according to safety standard requirements.

Repeated High-Voltage Isolation Testing

Repeated high-voltage isolation testing of a barrier component can actually degrade isolation capability, to a lesser or greater degree depending on materials, construction and environment.

This series has isolation transformers without additional insulation between primary and secondary windings of enameled wire.

While parts can be expected to withstand several times the stated test voltage, the isolation capability does depend on the wire insulation.

Any material including the enamel (typically polyurethane) is susceptible to eventual chemical degradation when subject to very high applied voltage, thus implying that the number of tests should be strictly limited.

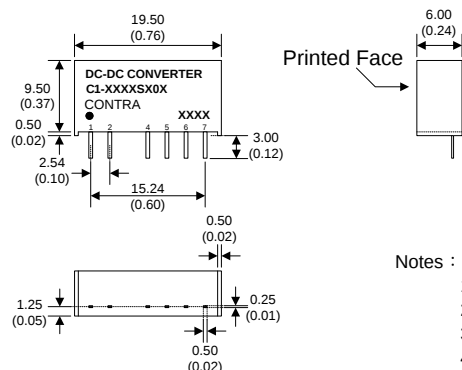
We strongly advise against repeated high voltage isolation testing, but if it is absolutely required, the isolation test voltage should be reduced by 20% from specified test voltage.

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MECHANICAL SPECIFICATIONS



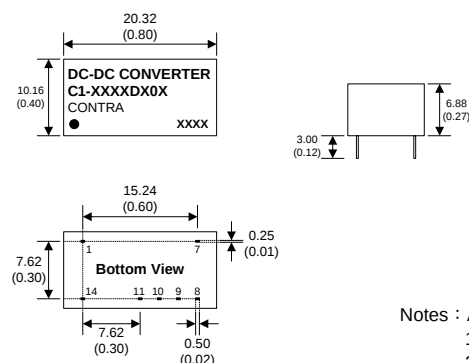
SIP7 Package

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)

PIN CONNECTIONS	
PIN NUMBER	Dual Separate
1	+Vin
2	-Vin
4	+V1 Output
5	-V1 Output
6	+V2 Output
7	-V2 Output

(The Pin Connection of high isolation one is the same with normal one.)



DIP14 Package

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)

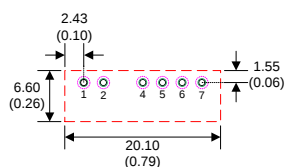
PIN CONNECTIONS	
PIN NUMBER	Dual Separate
1	-Vin
7	N.C
8	-V2 Output
9	+V2 Output
10	-V1 Output
11	+V1 Output
14	+Vin

*N.C. : No Connection

(The Pin Connection of high isolation one is the same with normal one.)

RECOMMENDED FOOTPRINT DETAILS

SIP7 Package



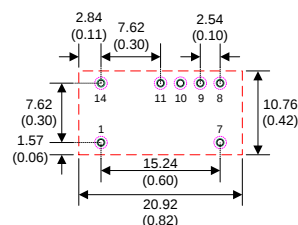
Notes : 1. All dimensions are typical in millimeters (inches).

Through hole (black) 1 ~ 7: $\varnothing 0.80$ (0.031)

Top view pad (green) 1 ~ 7: $\varnothing 1.00$ (0.039)

Bottom view pad (pink) 1 ~ 7: $\varnothing 1.60$ (0.063)

DIP14 Package



Notes : 1. All dimensions are typical in millimeters (inches).

Through hole (black) 1 ~ 14: $\varnothing 0.80$ (0.031)

Top view pad (green) 1 ~ 14: $\varnothing 1.00$ (0.039)

Bottom view pad (pink) 1 ~ 14: $\varnothing 1.60$ (0.063)