

V3-2W Series

2W Unregulated Single & Dual output



Features

- 7 Pin SIL / 14 Pin DIL Package
- 1000 VDC Isolation
- Up to 6000 VDC Isolation
- Low Ripple and Noise
- Efficiency up to 86%
- -40 ~ 85°C Operation Temperature Range
- Non-Conductive Black Plastic Case



The V3 series is a family of cost effective 2W single & dual output DC-DC converters. These converters achieve low cost and ultra-miniature SIP 7 pin or DIP 14 pin size. Devices are encapsulated using flame retardant resin. The models operate from input voltage of 3.3, 5, 12, 15, 24, 48 Vdc with output voltage of 3.3, 5, 7.2, 9, 12, 15, 18, 24, ± 3.3 , ± 5 , ± 7.2 , ± 9 , ± 12 , ± 15 , ± 18 , ± 24 Vdc. High performance features include 1000Vdc~6000Vdc input/output isolation, high efficiency operation and output voltage accuracy of $\pm 3\%$ maximum. Standard features include an input range of $\pm 10\%$ tolerance and low output noise and ripple.

All specifications typical at Ta=25°C, nominal input voltage and full load unless otherwise specified

OUTPUT SPECIFICATIONS	
Voltage accuracy	$\pm 3\%$
Line regulation	$\pm 1.2\%$ / Per 1% Vin Change
Load regulation	(From 20% to 100% Load) $\pm 10\%$ (Output 3.3V Model) $\pm 20\%$
Ripple & noise (20 MHz bandwidth)(1)	75mVpk-pk
Temperature coefficient	$\pm 0.02\%/^{\circ}\text{C}$
Capacitor load(2)	See table
INPUT SPECIFICATIONS	
Voltage Range	$\pm 10\%$
Max. Input Current	See table
No-Load Input Current	See table
Input Filter	Capacitors
Input Reflected Ripple Current(3)	20mA _{pk-pk}
ENVIRONMENT SPECIFICATIONS	
Operating Temperature	-40°C~85°C(See Derating Curve)
Maximum Case Temperature	100°C
Storage Temperature	-40°C~125°C
Cooling	Nature Convection
GENERAL SPECIFICATIONS	
Efficiency	See table
I/O Isolation Voltage(60 sec)	
Input/Output	1000~6000Vdc
I/O Isolation Capacitance	60 pF Typ.
I/O Isolation Resistance	1000M Ohm, min
Switching Frequency	Variable 80kHz
Humidity	95% rel H
Reliability Calculated MTBF(MIL-HDBK-217 F)	>1.121 Mhrs
Safety Standard : (designed to meet)	IEC 60950-1

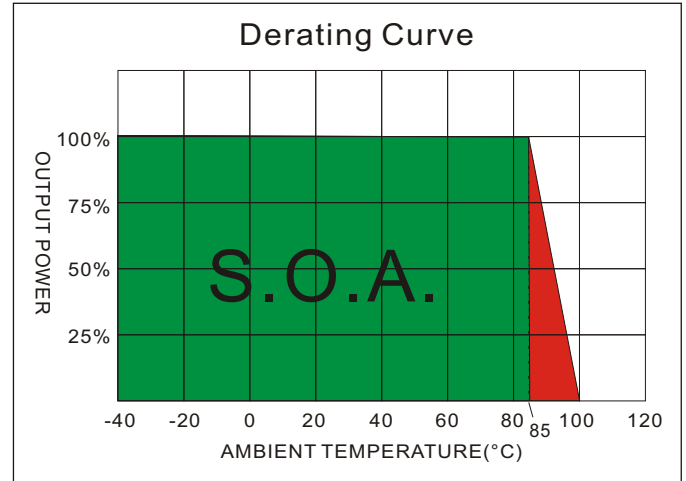
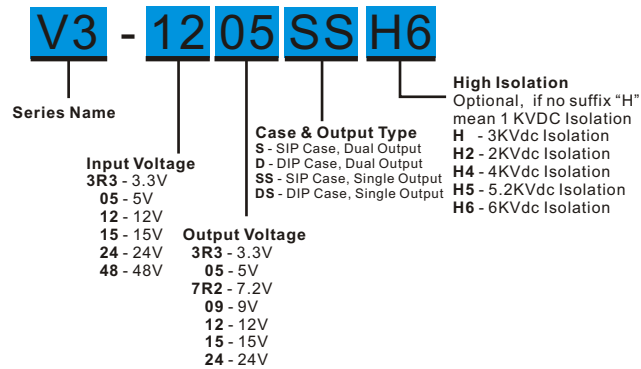
EMC SPECIFICATIONS		
Radiated Emissions	EN55032	CLASS B
Conducted Emissions (4)	EN55032	CLASS B
ESD	IEC 61000-4-2	Perf. Criteria A
RS	IEC 61000-4-3	Perf. Criteria A
EFT (5)	IEC 61000-4-4	Perf. Criteria A
Surge (5)	IEC 61000-4-5	Perf. Criteria A
CS	IEC 61000-4-6	Perf. Criteria A
PFMF	IEC 61000-4-8	Perf. Criteria A

PHYSICAL SPECIFICATIONS	
Case Material	Non-conductive Black Plastic(UL94V-0 rated)
Pin Material	0.5mm Alloy42 Solder-coated
Potting Material	Epoxy (UL94V-0 rated)
Weight	(SIP/2.3g) (DIP/2.6g)
Dimensions	SIP Case 0.76"x0.24"x0.39" DIP Case 0.80"x0.40"x0.27"

ABSOLUTE MAXIMUM RATINGS(6)	
These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.	
Input Surge Voltage(100mS)	
3.3 Models	6 Vdc ,max.
5 Models	7 Vdc ,max.
12 Models	15 Vdc ,max.
15 Models	18 Vdc ,max.
24 Models	28 Vdc ,max.
48 Models	54 Vdc ,max.
Soldering Temperature (1.5mm from case 10 sec. max.)	260°C ,max.

V3 - 2W Unregulated Single & Dual output

PART NUMBER STRUCTURE



MODEL SELECTION GUIDE

MODEL NUMBER	INPUT	INPUT Current		OUTPUT	OUTPUT Current	EFFICIENCY @FL(%)	Capacitor Load(uF)
	Voltage Range (Vdc)	No-Load (mA)	Full Load (mA)	Voltage (Vdc)	Full load (mA)		
V3-3R33R3S	3.3	25	797	±3.3	±200	76	±220
V3-3R305S	3.3	40	777	±5	±200	78	±220
V3-3R37R2S	3.3	40	797	±7.2	±138.8	76	±220
V3-3R309S	3.3	40	797	±9	±111.1	76	±220
V3-3R312S	3.3	45	777	±12	±83.3	78	±220
V3-3R315S	3.3	45	777	±15	±66.67	78	±220
V3-3R318S	3.3	45	777	±18	±55.55	78	±220
V3-3R324S	3.3	45	767	±24	±41.67	79	±220
V3-053R3S	5	30	406	±3.3	±200	65	±220
V3-0505S	5	30	555	±5	±200	72	±220
V3-057R2S	5	30	555	±7.2	±138.8	72	±220
V3-0509S	5	30	519	±9	±111.1	77	±220
V3-0512S	5	30	512	±12	±83.3	78	±220
V3-0515S	5	30	500	±15	±66.67	80	±220
V3-0518S	5	30	500	±18	±55.55	80	±220
V3-0524S	5	30	500	±24	±41.67	80	±220
V3-123R3S	12	20	164	±3.3	±200	67	±220
V3-1205S	12	20	222	±5	±200	75	±220
V3-127R2S	12	20	219	±7.2	±138.8	76	±220
V3-1209S	12	20	216	±9	±111.1	77	±220
V3-1212S	12	20	203	±12	±83.3	82	±220
V3-1215S	12	20	203	±15	±66.67	82	±220
V3-1218S	12	20	203	±18	±55.55	82	±220
V3-1224S	12	20	203	±24	±41.67	82	±220
V3-243R3S	24	10	80	±3.3	±200	68	±220
V3-2405S	24	10	111	±5	±200	75	±220
V3-247R2S	24	10	111	±7.2	±138.8	75	±220
V3-2409S	24	10	104	±9	±111.1	80	±220
V3-2412S	24	10	101	±12	±83.3	82	±220
V3-2415S	24	10	101	±15	±66.67	82	±220
V3-2418S	24	10	101	±18	±55.55	82	±220
V3-2424S	24	10	101	±24	±41.67	82	±220

Suffix "H" means 3 KVdc isolation
Suffix "H5" means 5.2 KVdc isolation

Suffix "H2" means 2 KVdc isolation
Suffix "H6" means 6 KVdc isolation

Suffix "H4" means 4 KVdc isolation

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V3 - 2W Unregulated Single & Dual output

MODEL NUMBER	INPUT	INPUT Current		OUTPUT	OUTPUT Current		EFFICIENCY @FL(%)	Capacitor Load(μF)
	Voltage Range	No-Load	Full Load	Voltage	Full load			
	(Vdc)	(mA)	(mA)	(Vdc)	(mA)			
V3-483R3S	48	6	45	±3.3	±200	60		±220
V3-4805S	48	6	57	±5	±200	73		±220
V3-487R2S	48	6	54	±7.2	±138.8	77		±220
V3-4809S	48	6	54	±9	±111.1	77		±220
V3-4812S	48	6	52	±12	±83.3	80		±220
V3-4815S	48	6	52	±15	±66.67	80		±220
V3-4818S	48	6	52	±18	±55.55	80		±220
V3-4824S	48	6	52	±24	±41.67	80		±220
V3-3R33R3D	3.3	25	808	±3.3	±200	75		±220
V3-3R305D	3.3	45	808	±5	±200	75		±220
V3-3R37R2D	3.3	40	797	±7.2	±138.8	76		±220
V3-3R309D	3.3	40	797	±9	±111.1	76		±220
V3-3R312D	3.3	45	777	±12	±83.3	78		±220
V3-3R315D	3.3	45	777	±15	±66.67	78		±220
V3-3R318D	3.3	45	777	±18	±55.55	78		±220
V3-3R324D	3.3	45	767	±24	±41.67	79		±220
V3-053R3D	5	30	406	±3.3	±200	65		±220
V3-0505D	5	30	555	±5	±200	72		±220
V3-057R2D	5	30	555	±7.2	±138.8	72		±220
V3-0509D	5	30	519	±9	±111.1	77		±220
V3-0512D	5	30	512	±12	±83.3	78		±220
V3-0515D	5	30	500	±15	±66.67	80		±220
V3-0518D	5	30	500	±18	±55.55	80		±220
V3-0524D	5	30	500	±24	±41.67	80		±220
V3-123R3D	12	20	164	±3.3	±200	67		±220
V3-1205D	12	20	222	±5	±200	75		±220
V3-127R2D	12	20	219	±7.2	±138.8	76		±220
V3-1209D	12	20	216	±9	±111.1	77		±220
V3-1212D	12	20	203	±12	±83.3	82		±220
V3-1215D	12	20	203	±15	±66.67	82		±220
V3-1218D	12	20	203	±18	±55.55	82		±220
V3-1224D	12	20	203	±24	±41.67	82		±220
V3-243R3D	24	10	80	±3.3	±200	68		±220
V3-2405D	24	10	111	±5	±200	75		±220
V3-247R2D	24	10	111	±7.2	±138.8	75		±220
V3-2409D	24	10	104	±9	±111.1	80		±220
V3-2412D	24	10	101	±12	±83.3	82		±220
V3-2415D	24	10	101	±15	±66.67	82		±220
V3-2418D	24	10	101	±18	±55.55	82		±220
V3-2424D	24	10	101	±24	±41.67	82		±220
V3-483R3D	48	6	45	±3.3	±200	60		±220
V3-4805D	48	6	57	±5	±200	73		±220
V3-487R2D	48	6	54	±7.2	±138.8	77		±220
V3-4809D	48	6	54	±9	±111.1	77		±220
V3-4812D	48	6	52	±12	±83.3	80		±220
V3-4815D	48	6	52	±15	±66.67	80		±220
V3-4818D	48	6	52	±18	±55.55	80		±220
V3-4824D	48	6	52	±24	±41.67	80		±220

Suffix "H" means 3 KVdc isolation
 Suffix "H5" means 5.2 KVdc isolation

Suffix "H2" means 2 KVdc isolation
 Suffix "H6" means 6 KVdc isolation

Suffix "H4" means 4 KVdc isolation

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V3 - 2W Unregulated Single & Dual output

MODEL NUMBER	INPUT	INPUT Current		OUTPUT	OUTPUT Current		EFFICIENCY @FL(%)	Capacitor Load(μF)
	Voltage Range (Vdc)	No-Load (mA)	Full Load (mA)	Voltage (Vdc)	Full load (mA)			
V3-3R33R3SS	3.3	26	797	3.3	400	76		470
V3-3R305SS	3.3	30	797	5	400	76		470
V3-3R37R2SS	3.3	30	808	7.2	277.7	75		470
V3-3R309SS	3.3	30	758	9	222.2	80		470
V3-3R312SS	3.3	35	748	12	166.7	81		470
V3-3R315SS	3.3	40	777	15	133.3	78		470
V3-3R318SS	3.3	35	787	18	111.1	77		470
V3-3R324SS	3.3	35	767	24	83.3	79		470
V3-053R3SS	5	30	367	3.3	400	72		470
V3-0505SS	5	30	512	5	400	78		470
V3-057R2SS	5	30	500	7.2	277.7	80		470
V3-0509SS	5	30	500	9	222.2	80		470
V3-0512SS	5	30	487	12	166.7	82		470
V3-0515SS	5	30	487	15	133.3	82		470
V3-0518SS	5	30	487	18	111.1	82		470
V3-0524SS	5	30	487	24	83.3	82		470
V3-123R3SS	12	36	169	3.3	400	65		470
V3-1205SS	12	20	216	5	400	77		470
V3-127R2SS	12	20	208	7.2	277.7	80		470
V3-1209SS	12	20	208	9	222.2	80		470
V3-1212SS	12	20	203	12	166.7	82		470
V3-1215SS	12	20	203	15	133.3	82		470
V3-1218SS	12	20	208	18	111.1	80		470
V3-1224SS	12	20	208	24	83.3	80		470
V3-243R3SS	24	10	76	3.3	400	72		470
V3-2405SS	24	10	105	5	400	79		470
V3-247R2SS	24	10	104	7.2	277.7	80		470
V3-2409SS	24	10	104	9	222.2	80		470
V3-2412SS	24	10	102	12	166.7	80		470
V3-2415SS	24	10	101	15	133.3	82		470
V3-2418SS	24	10	101	18	111.1	82		470
V3-2424SS	24	10	104	24	83.3	80		470
V3-483R3SS	48	6	45	3.3	400	60		470
V3-4805SS	48	6	54	5	400	77		470
V3-487R2SS	48	6	54	7.2	277.7	77		470
V3-4809SS	48	6	54	9	222.2	77		470
V3-4812SS	48	6	53	12	166.7	78		470
V3-4815SS	48	6	53	15	133.3	78		470
V3-4818SS	48	6	53	18	111.1	78		470
V3-4824SS	48	6	55	24	83.3	75		470
V3-3R33R3DS	3.3	26	808	3.3	400	75		470
V3-3R305DS	3.3	40	819	5	400	74		470
V3-3R37R2DS	3.3	40	808	7.2	277.7	75		470
V3-3R309DS	3.3	45	808	9	222.2	75		470
V3-3R312DS	3.3	50	767	12	166.7	79		470
V3-3R315DS	3.3	47	767	15	133.3	79		470
V3-3R318DS	3.3	50	787	18	111.1	77		470
V3-3R324DS	3.3	47	797	24	83.3	76		470

Suffix "H" means 3 KVdc isolation
 Suffix "H5" means 5.2 KVdc isolation

Suffix "H2" means 2 KVdc isolation
 Suffix "H6" means 6 KVdc isolation

Suffix "H4" means 4 KVdc isolation

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V3 - 2W Unregulated Single & Dual output

MODEL NUMBER	INPUT	INPUT Current		OUTPUT	OUTPUT Current		EFFICIENCY @FL(%)	Capacitor Load(uF)
	Voltage Range (Vdc)	No-Load (mA)	Full Load (mA)	Voltage (Vdc)	Full load (mA)			
V3-053R3DS	5	30	367	3.3	400	72		470
V3-0505DS	5	30	512	5	400	78		470
V3-057R2DS	5	30	500	7.2	277.7	80		470
V3-0509DS	5	30	500	9	222.2	80		470
V3-0512DS	5	30	487	12	166.7	82		470
V3-0515DS	5	30	487	15	133.3	82		470
V3-0518DS	5	30	487	18	111.1	82		470
V3-0524DS	5	30	487	24	83.3	82		470
V3-123R3DS	12	20	152	3.3	400	72		470
V3-1205DS	12	20	216	5	400	77		470
V3-127R2DS	12	20	208	7.2	277.7	80		470
V3-1209DS	12	20	208	9	222.2	80		470
V3-1212DS	12	20	208	12	166.7	80		470
V3-1215DS	12	20	208	15	133.3	80		470
V3-1218DS	12	20	208	18	111.1	80		470
V3-1224DS	12	20	208	24	83.3	80		470
V3-243R3DS	24	10	76	3.3	400	72		470
V3-2405DS	24	10	105	5	400	79		470
V3-247R2DS	24	10	115	7.2	277.7	72		470
V3-2409DS	24	10	104	9	222.2	80		470
V3-2412DS	24	10	104	12	166.7	80		470
V3-2415DS	24	10	104	15	133.3	80		470
V3-2418DS	24	10	104	18	111.1	80		470
V3-2424DS	24	10	104	24	83.3	80		470
V3-483R3DS	48	6	45	3.3	400	60		470
V3-4805DS	48	6	54	5	400	77		470
V3-487R2DS	48	6	54	7.2	277.7	77		470
V3-4809DS	48	6	54	9	222.2	77		470
V3-4812DS	48	6	53	12	166.7	78		470
V3-4815DS	48	6	53	15	133.3	78		470
V3-4818DS	48	6	53	18	111.1	78		470
V3-4824DS	48	6	55	24	83.3	75		470

Suffix "H" means 3 KVdc isolation
 Suffix "H5" means 5.2 KVdc isolation

Suffix "H2" means 2 KVdc isolation
 Suffix "H6" means 6 KVdc isolation

Suffix "H4" means 4 KVdc isolation

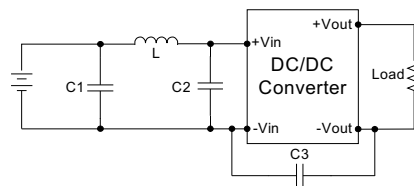
NOTE

1. Ripple/Noise measured with 20MHz bandwidth.
2. Tested by minimal Vin and constant resistive load.
3. Measured Input reflected ripple current with a simulated source inductance of 12uH.
4. Input filter components are required to help meet conducted emission class B, which application refer to the EMI Filter of design & feature configuration.
5. An external filter capacitor is required if the module has to meet IEC61000-4-4 and IEC61000-4-5.
 The filter capacitor Motien suggest: Nippon - chemi - con KY series, 470uF/100V.
6. Exceeding the absolute ratings of the unit could cause damage. It is not allowed for continuous operating.
7. Operation under no-load conditions will not damage these devices, however they may not meet all listed specifications.

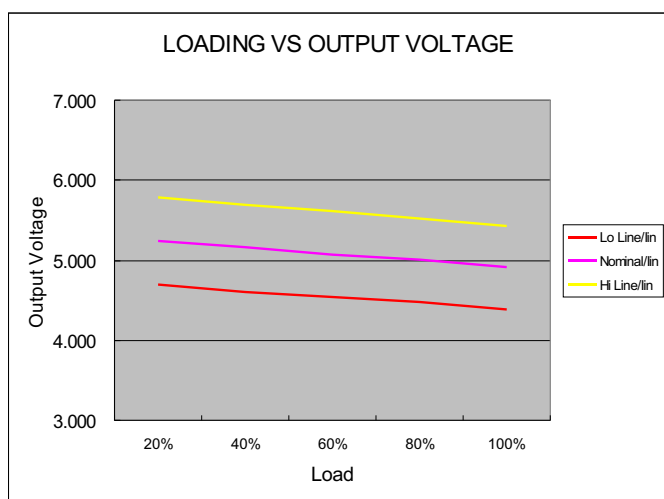
TEST CONFIGURATIONS

EMI Filter

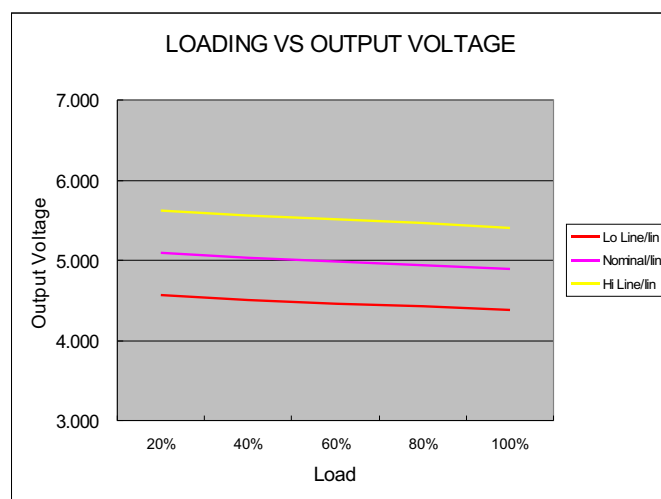
Input filter components (C1, L, C2, C3) are used to help meet conducted emissions requirement for the module. These components should be mounted as close as possible to the module; and all leads should be minimized to decrease radiated noise.



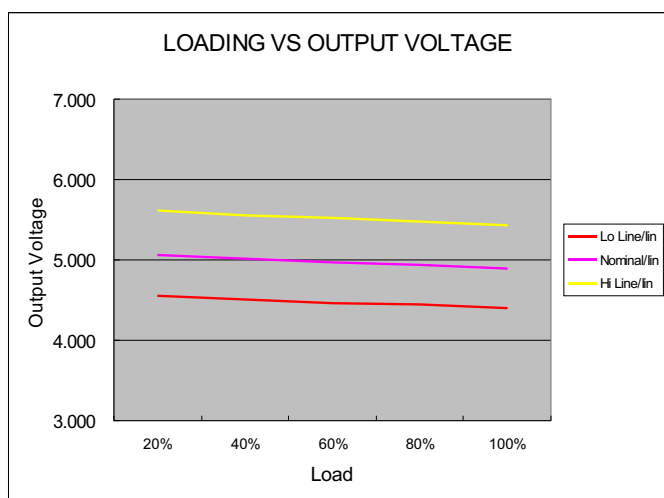
	C1	L	C2	C3
V3-3R3XXXXX	1210, 2.2uF/100V	18uH		
V3-05XXXXXX	1210, 2.2uF/100V	18uH		
V3-12XXXXXX	1210, 2.2uF/100V	18uH		
V3-15XXXXXX	1210, 2.2uF/100V	18uH		
V3-24XXXXXX	1210, 2.2uF/100V	18uH	1210, 2.2uF/100V	1206, 470pF/2KV
V3-48XXXXXX	Electrolytic capacitor, 10uF/100V	18uH	1210, 2.2uF/100V	1206, 470pF/2KV



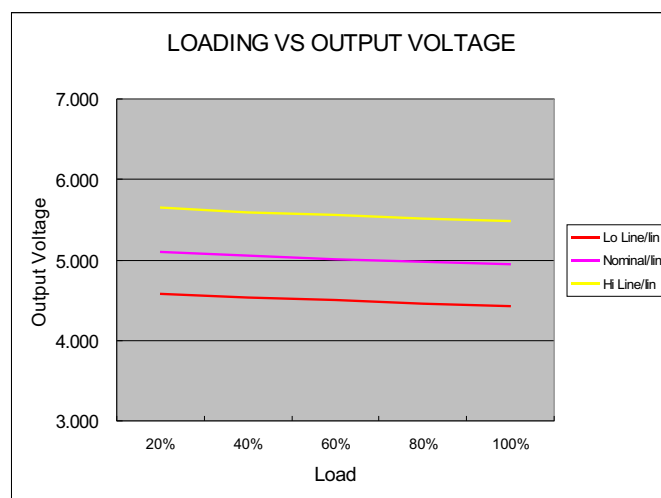
05 Models



12 Models

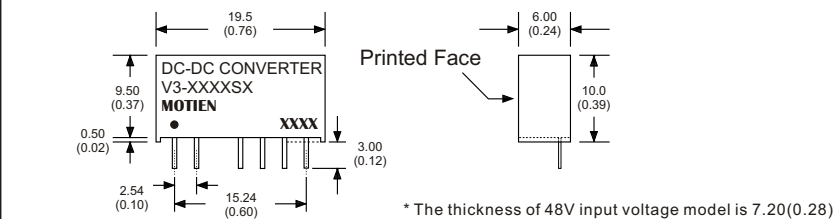


24 Models



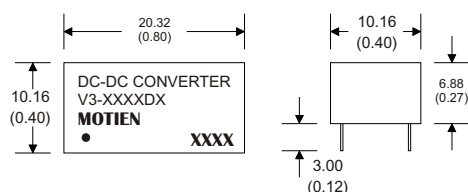
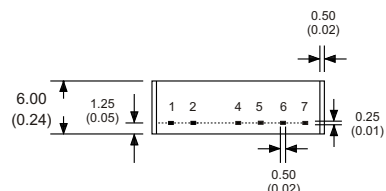
48 Models

MECHANICAL SPECIFICATIONS



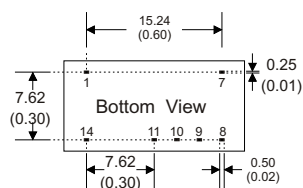
7 Pin SIL Package

Notes : All dimensions are typical in millimeters (inches).
 1. Pin diameter: 0.5 ± 0.05 (0.02 ± 0.002)
 2. Pin pitch and length tolerance: ± 0.35 (± 0.014)
 3. Case Tolerance: ± 0.5 (± 0.02)



14 Pin DIL Package

Notes : All dimensions are typical in millimeters (inches).
 1. Pin diameter: 0.5 ± 0.05 (0.02 ± 0.002)
 2. Pin pitch and length tolerance: ± 0.35 (± 0.014)
 3. Case Tolerance: ± 0.5 (± 0.02)



PIN CONNECTIONS

PIN NUMBER	SINGLE	DUAL	SINGLE-H	DUAL-H
1	+V Input	+V Input	+V Input	+V Input
2	-V Input	-V Input	-V Input	-V Input
4	-V Output	-V Output	N.P.	N.P.
5	N.P.	Common	-V Output	-V Output
6	+V Output	+V Output	N.P.	Common
7	N.P.	N.P.	+V Output	+V Output

PIN CONNECTIONS

PIN NUMBER	SINGLE	DUAL	SINGLE-H	DUAL-H
1	-V Input	-V Input	-V Input	-V Input
7	N.C.	N.C.	N.C.	N.C.
8	N.P.	Common	+V Output	+V Output
9	+V Output	+V Output	N.P.	Common
10	N.P.	N.P.	-V Output	-V Output
11	-V Output	-V Output	N.P.	N.P.
14	+V Input	+V Input	+V Input	+V Input