

V7 - 12W Series



12W 2:1 Regulated Single & Dual output

Features

- Wide 2:1 Input Range
- Full SMD Technology
- 1500~3500 VDC Isolation
- Continuous Short Circuit Protection
- Efficiency up to 86%
- -40 ~ 85°C Operation Temperature Range
- EMI Complies With EN55022 Class A



The V7 series is a family of cost effective 12W single & dual output DC-DC converters. These converters are made with nickle-coated brass case in a 2"x1" with high performance features such as 1500 VDC input/output isolation voltage, continuous short circuit protection with automatic restart and tight line / load regulation. Devices are encapsulated by using flame retardant resin. Input voltages of 12,24 and 48 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 high efficiency operation up to 86% and output voltage accuracy of ±1% maximum.

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

OUTPUT SPECIFICATIONS	
Voltage accuracy	±1%
Line regulation	±0.5%
Load regulation(0% to 100% Load)	(Single Output) ±0.5% (Dual Output) ±1.0%
Ripple & noise (20 MHz bandwidth)(1)	100mV pk-pk
Over-current protection	
Short circuit protection	140% of max. Iout
Temperature coefficient	Indefinite(Automatic Recovery)
Capacitor load(2)	±0.02%/°C
Transient Recovery Time(3)	See table
Transient Response Deviation(3)	250us, typ. ±3%, max.

INPUT SPECIFICATIONS	
Voltage Range	See table
Start up Time(Nominal Vin and constant resistive load)	20mS, typ.
Max. Input Current	See table
No-Load Input Current	See table
Input Filter	Pi Type
Input Reflected Ripple Current(4)	35mA pk-pk

GENERAL SPECIFICATIONS	
Efficiency	See table
I/O Isolation Voltage(60 sec)	
Input/Output	1500~3500Vdc
Case/Input & Output	1000Vdc
I/O Isolation Capacitance	500 pF Typ.
I/O Isolation Resistance	1000M Ohm
Switching Frequency	Typical 200kHz
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	EN55022	CLASS A
Conducted Emissions(5)	EN55022	CLASS A
ESD	IEC61000-4-2	Perf. Criteria A
RS	IEC61000-4-3	Perf. Criteria A
EFT	IEC61000-4-4	Perf. Criteria A
Surge (6)	IEC61000-4-5	Perf. Criteria A
CS	IEC61000-4-6	Perf. Criteria A
PFMF	IEC61000-4-8	Perf. Criteria A

PHYSICAL SPECIFICATIONS	
Case Material	Nickel-coated Brass
Pin Material	Φ1.0mm Brass Solder-coated
Potting Material	Epoxy (UL94V-0 rated)
Weight	30.0g
Dimensions	2.00"x1.00"x0.40"

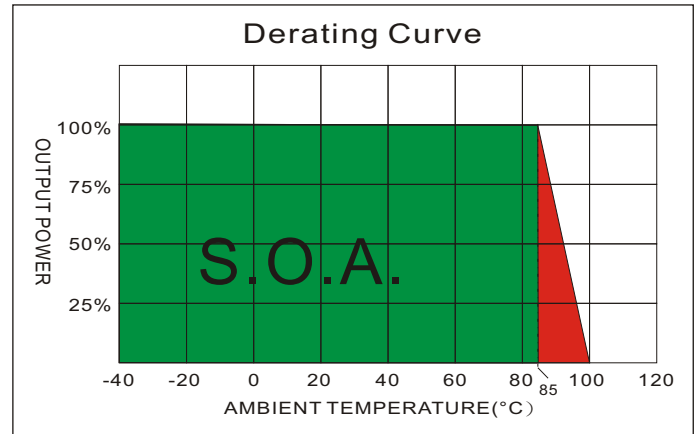
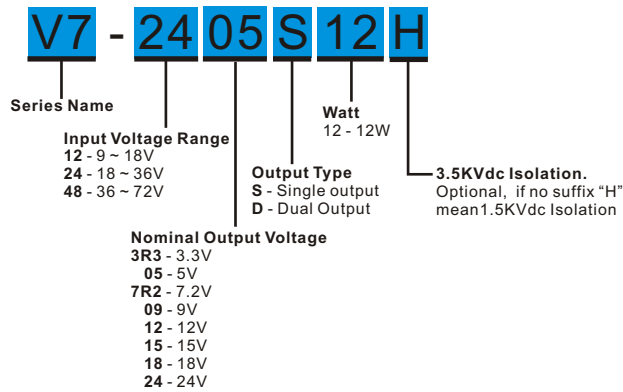
ENVIRONMENT SPECIFICATIONS	
Operating Temperature	-40°C~85°C(See Derating Curve)
Maximum Case Temperature	100°C
Storage Temperature	-40°C~125°C
Cooling	Nature Convection

ABSOLUTE MAXIMUM RATINGS(7)	
These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.	
Input Surge Voltage(100mS)	
12 Models	25 Vdc, max.
24 Models	50 Vdc, max.
48 Models	100 Vdc, max.
Soldering Temperature	260°C
(1.5mm from case 10 sec.max.)	

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PART NUMBER STRUCTURE



MODEL SELECTION GUIDE

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current		OUTPUT Voltage (Vdc)	OUTPUT Current		EFFICIENCY @FL(%)	Capacitor Load(uF)
		No Load (mA)	Full Load (mA)		Min Load (mA)	Full Load (mA)		
V7-123R3S12	9-18	30	835	3.3	0	2400	79	3300
V7-1205S12	9-18	30	1219	5	0	2400	82	3300
V7-127R2S12	9-18	30	1204	7.2	0	1666	83	2200
V7-1209S12	9-18	30	1204	9	0	1333	83	1000
V7-1212S12	9-18	30	1190	12	0	1000	84	1000
V7-1215S12	9-18	30	1190	15	0	800	84	680
V7-1218S12	9-18	30	1176	18	0	666	85	470
V7-1224S12	9-18	30	1176	24	0	500	85	470
V7-123R3D12	9-18	30	835	±3.3	0	±1200	79	±1000
V7-1205D12	9-18	30	1219	±5	0	±1200	82	±1000
V7-127R2D12	9-18	30	1204	±7.2	0	±833	83	±680
V7-1209D12	9-18	30	1190	±9	0	±666	84	±470
V7-1212D12	9-18	30	1190	±12	0	±500	84	±470
V7-1215D12	9-18	30	1176	±15	0	±400	85	±330
V7-1218D12	9-18	30	1176	±18	0	±333	85	±220
V7-1224D12	9-18	30	1176	±24	0	±250	85	±220
V7-243R3S12	18-36	25	417	3.3	0	2400	79	3300
V7-2405S12	18-36	25	609	5	0	2400	82	3300
V7-247R2S12	18-36	25	602	7.2	0	1666	83	2200
V7-2409S12	18-36	25	595	9	0	1333	84	1000
V7-2412S12	18-36	25	595	12	0	1000	84	1000
V7-2415S12	18-36	25	588	15	0	800	85	680
V7-2418S12	18-36	25	588	18	0	666	85	470
V7-2424S12	18-36	25	581	24	0	500	86	470
V7-243R3D12	18-36	25	417	±3.3	0	±1200	79	±1000
V7-2405D12	18-36	25	609	±5	0	±1200	82	±1000
V7-247R2D12	18-36	25	602	±7.2	0	±833	83	±680
V7-2409D12	18-36	25	602	±9	0	±666	83	±470
V7-2412D12	18-36	25	595	±12	0	±500	84	±470
V7-2415D12	18-36	25	595	±15	0	±400	84	±330
V7-2418D12	18-36	25	588	±18	0	±333	85	±220
V7-2424D12	18-36	25	588	±24	0	±250	85	±220

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MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current		OUTPUT Voltage (Vdc)	OUTPUT Current		EFFICIENCY @FL(%)	Capacitor Load(uF)
		No Load (mA)	Full Load (mA)		Min Load (mA)	Full Load (mA)		
V7-483R3S12	36-72	20	208	3.3	0	2400	79	3300
V7-4805S12	36-72	20	301	5	0	2400	83	3300
V7-487R2S12	36-72	20	301	7.2	0	1666	83	2200
V7-4809S12	36-72	20	297	9	0	1333	84	1000
V7-4812S12	36-72	20	297	12	0	1000	84	1000
V7-4815S12	36-72	20	297	15	0	800	84	680
V7-4818S12	36-72	20	294	18	0	666	85	470
V7-4824S12	36-72	20	294	24	0	500	86	470
V7-483R3D12	36-72	20	208	±3.3	0	±1200	79	±1000
V7-4805D12	36-72	20	304	±5	0	±1200	82	±1000
V7-487R2D12	36-72	20	297	±7.2	0	±833	84	±680
V7-4809D12	36-72	20	297	±9	0	±666	84	±470
V7-4812D12	36-72	20	294	±12	0	±500	85	±470
V7-4815D12	36-72	20	294	±15	0	±400	85	±330
V7-4818D12	36-72	20	290	±18	0	±333	86	±220
V7-4824D12	36-72	20	290	±24	0	±250	86	±220

Suffix "H" means 3.5KVdc isolation

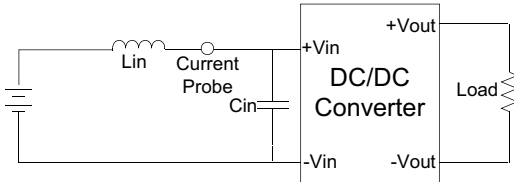
NOTE

1. Measured with 20MHz bandwidth and 1.0uF ceramic capacitor.
2. Tested by minimal Vin and constant resistive load.
3. Tested by normal Vin and 25% load step change (75%-50%-25% of Io).
4. Measured input reflected ripple current with a simulated source inductance of 12uH.
5. Input filter components (C1,L,C2,C3) are used to help meet conducted emissions requirement for the module, which application refer to the EMI Filter of design & feature configuration..
These components should be mounted as close as possible to the module; and all leads should be minimized to decrease radiated Noise.
6. An external filter capacitor is required if the module has to meet IEC61000-4-5.
The filter capacitor Motien suggest: Nippon chemi-con KY series, 220uF/100V.
7. Exceeding the absolute ratings of the unit could cause damage. It is not allowed for continuous operating.
8. Operation under no-load conditions will not damage these devices, however they may not meet all listed specifications.

TEST CONFIGURATIONS

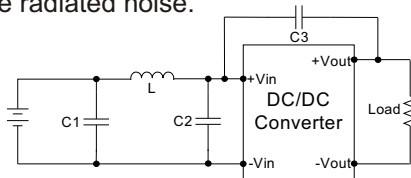
Input Reflected Ripple Current Test Step

Input reflected ripple current is measured through a source inductor L_{in} (12 μ H) and a source capacitor C_{in} (47 μ F, ESR<1.0 Ω at 100KHz) at nominal input and full load.



EMI Filter

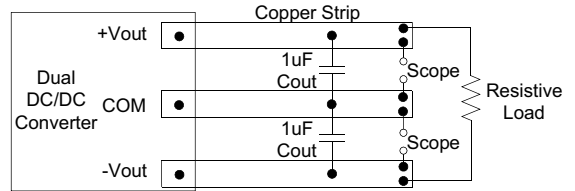
Input filter components (C_1, L, C_2, C_3) are used to help meet conducted emissions requirement for the module. These components should be mounted as close as possible to the module; and all leads should be minimized to decrease radiated noise.



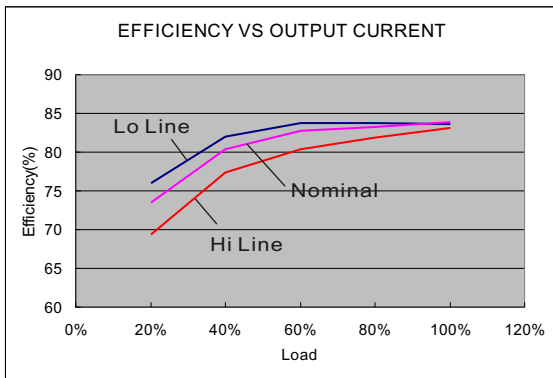
	C1	L	C2	C3
V7-12XXXXXX	330 μ F/100V	12 μ H	100 μ F/100V	1808,102K/3KV
V7-24XXXXXX	330 μ F/100V	12 μ H	100 μ F/100V	1808,102K/3KV
V7-48XXXXXX	330 μ F/100V	12 μ H	100 μ F/100V	1808,102K/3KV

Output Ripple & Noise Measurement Test

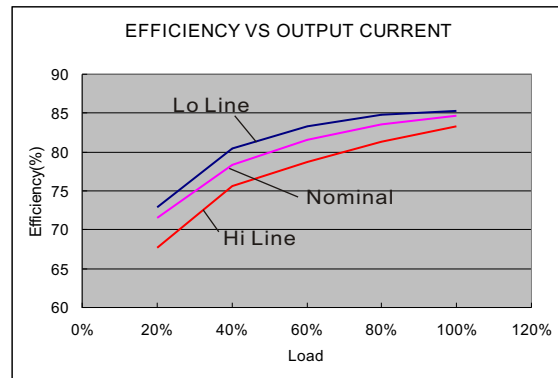
Use a capacitor C_{out} (1.0 μ F) measurement. The Scope measurement bandwidth is 0-20MHz.



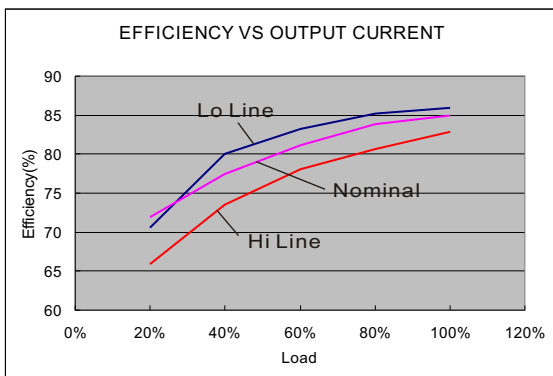
ELECTRICAL CHARACTERISTIC CURVES



12 Models



24 Models

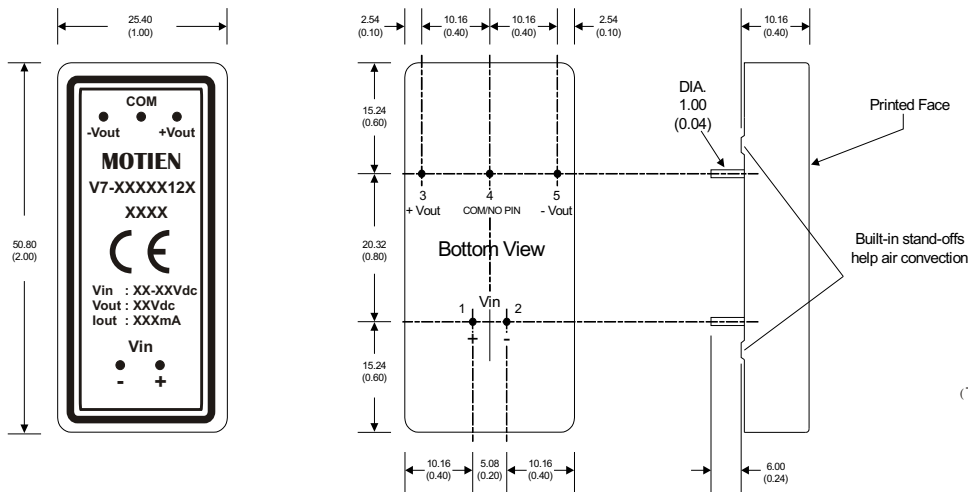


48 Models

The models listed above is just for standard type. If you need the special specification product, please contact our service member by telephone presented in shortform cover or e-mail to : sales@motien.com.tw

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MECHANICAL SPECIFICATIONS



PIN CONNECTIONS		
PIN NUMBER	SINGLE	DUAL
1	+V Input	+V Input
2	-V Input	-V Input
3	+V Output	+V Output
4	N.P.	Common
5	-V Output	-V Output

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

- All dimensions are typical in millimeters (inches).
1. Pin diameter: 1.0 ± 0.05 (0.04 ± 0.002)
 2. Pin pitch and length tolerance: ± 0.35 (± 0.014)
 3. Case Tolerance: ± 0.5 (± 0.02)