

S7 - 10W Series

10W 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



SCHMID-M



The S7 series is a family of cost effective 10W 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	140% of max. Iout
Short circuit protection	Indefinite(Automatic Recovery)
Temperature coefficient	±0.02%/°C
Capacitor load(2)	See table
Transient Recovery Time(3)	250us, typ.
Transient Response Deviation(3)	±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(3 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(6)	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

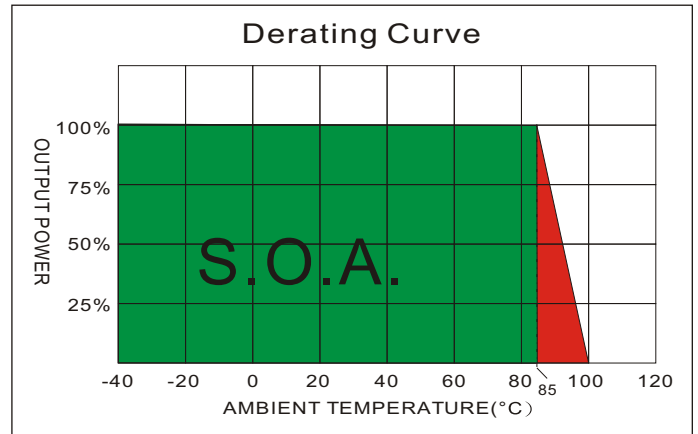
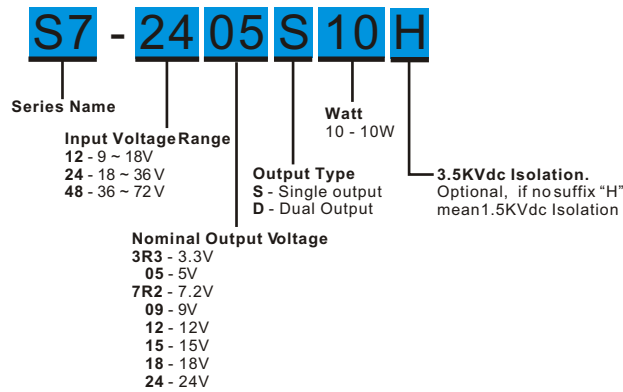
PHYSICAL SPECIFICATIONS	
Case Material	Nickel-coated Brass
Pin Material	Ø1.0mm Brass Solder-coated
Potting Material	Epoxy (UL94V-0 rated)
Weight	30.0g
Dimensions	2.00"x1.00"x0.40"

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 (1.5mm from case 10sec.max.)	260°C

S -10W 2:1 Regulated Single & Dualoutput

PARTNUMBER STRUCTURE



MODEL SELECTION GUIDE

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current		OUTPUT Voltage (Vdc)	OUTPUT Current		EFFICIENCY @FL(%)	Capacitor Load(µF)
		No Load (mA)	Full Load (mA)		Min Load (mA)	Full Load (mA)		
S7-123R3 S10	9-18	30	705	3.3	0	2000	78	2200
S7-1205 S10	9-18	30	1016	5	0	2000	82	2200
S7-127R2 S10	9-18	30	1004	7.2	0	1388	83	1000
S7-1209 S10	9-18	30	1004	9	0	1111	83	1000
S7-1212 S10	9-18	30	992	12	0	833	84	680
S7-1215 S10	9-18	30	992	15	0	666	84	470
S7-1218 S10	9-18	30	980	18	0	555	85	470
S7-1224 S10	9-18	30	980	24	0	416	85	330
S7-123R3D10	9-18	30	1068	±3.3	0	±1000	78	±1000
S7-1205D10	9-18	30	1016	±5	0	±1000	82	±1000
S7-127R2D10	9-18	30	1004	±7.2	0	±694	83	±680
S7-1209D10	9-18	30	992	±9	0	±555	84	±470
S7-1212D10	9-18	30	992	±12	0	±416	84	±470
S7-1215D10	9-18	30	980	±15	0	±333	85	±330
S7-1218D10	9-18	30	980	±18	0	±277	85	±220
S7-1224D10	9-18	30	980	±24	0	±208	85	±220
S7-243R3 S10	18-36	25	352	3.3	0	2000	78	2200
S7-2405 S10	18-36	25	508	5	0	2000	82	2200
S7-247R2 S10	18-36	25	502	7.2	0	1388	83	1000
S7-2409 S10	18-36	25	496	9	0	1111	84	1000
S7-2412 S10	18-36	25	496	12	0	833	84	680
S7-2415 S10	18-36	25	490	15	0	666	85	470
S7-2418 S10	18-36	25	490	18	0	555	85	470
S7-2424 S10	18-36	25	484	24	0	416	86	330
S7-243R3D10	18-36	25	352	±3.3	0	±1000	78	±1000
S7-2405D10	18-36	25	508	±5	0	±1000	82	±1000
S7-247R2D10	18-36	25	502	±7.2	0	±694	83	±680
S7-2409D10	18-36	25	502	±9	0	±555	83	±470
S7-2412D10	18-36	25	496	±12	0	±416	84	±470
S7-2415D10	18-36	25	496	±15	0	±333	84	±330
S7-2418D10	18-36	25	490	±18	0	±277	85	±220
S7-2424D10	18-36	25	490	±24	0	±208	85	±220

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MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current		OUTPUT Voltage (Vdc)	OUTPUT Current		EFFICIENCY @FL (%)	Capacitor Load(µF)
		No Load (mA)	Full Lo ad (mA)		Min Load (mA)	Full Load (mA)		
S7-483R3 S10	36-72	20	176	3.3	0	2000	78	2200
S7-4805 S10	36-72	20	251	5	0	2000	83	2200
S7-487R2 S10	36-72	20	251	7.2	0	1388	83	1000
S7-4809 S10	36-72	20	248	9	0	1111	84	1000
S7-4812 S10	36-72	20	248	12	0	833	84	680
S7-4815 S10	36-72	20	248	15	0	666	84	470
S7-4818 S10	36-72	20	245	18	0	555	85	470
S7-4824 S10	36-72	20	245	24	0	416	86	330
S7-483R3D10	36-72	20	176	±3.3	0	±1000	78	±1000
S7-4805D10	36-72	20	254	±5	0	±1000	82	±1000
S7-487R2D10	36-72	20	248	±7.2	0	±694	84	±680
S7-4809D10	36-72	20	248	±9	0	±555	84	±470
S7-4812D10	36-72	20	245	±12	0	±416	85	±470
S7-4815D10	36-72	20	245	±15	0	±333	85	±330
S7-4818D10	36-72	20	242	±18	0	±277	86	±220
S7-4824D10	36-72	20	242	±24	0	±208	86	±220

Suffix "H" means 3.5KVdc isolation

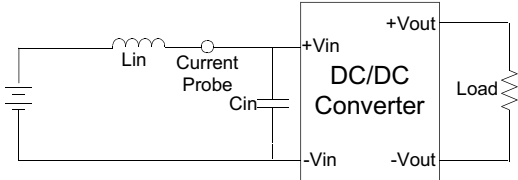
NOTE

- 1.Measured with 20MHz bandwidth and 1.0µF ceramic capacitor.
- 2.Tested by minimal V_{in} and constant resistive load.
- 3.Tested by normal V_{in} and 25% load step change (75%-50%-25% of I_o).
- 4.Measured Input reflected ripple current with a simulated source inductance of 12µH.
- 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 IEC61000-4-4 and IEC61000-4-5.
The filter capacitor SCHMID-M suggest: Nippon chemi-con KY series, 220µF/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

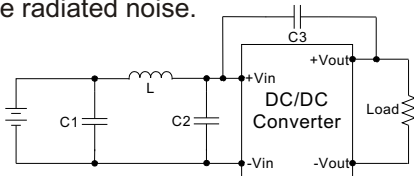
Input Reflected Ripple Current Test Step

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

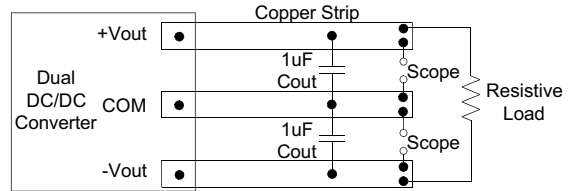
Input filter components (C_1, L, C_2, C_3) are used to help meet conducted emissions requirement for the module. These components should be mounted as close as possible to the module; and all leads should be minimized to decrease radiated noise.



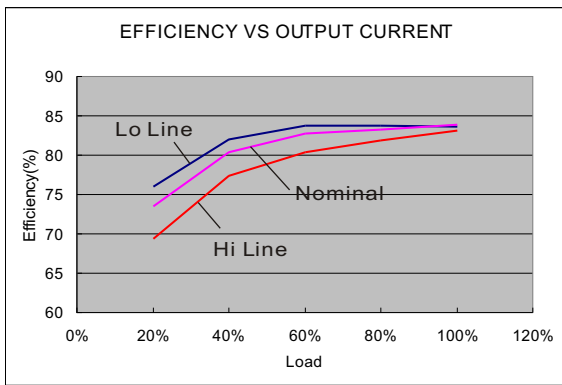
	C1	L	C2	C3
S7-12XXXXXX	330 μ F/100V	12 μ H	100 μ F/100V	1808, 102K/3KV
S7-24XXXXXX	330 μ F/100V	12 μ H	100 μ F/100V	1808, 102K/3KV
S7-48XXXXXX	330 μ F/100V	12 μ H	100 μ F/100V	1808, 102K/3KV

Output Ripple & Noise Measurement Test

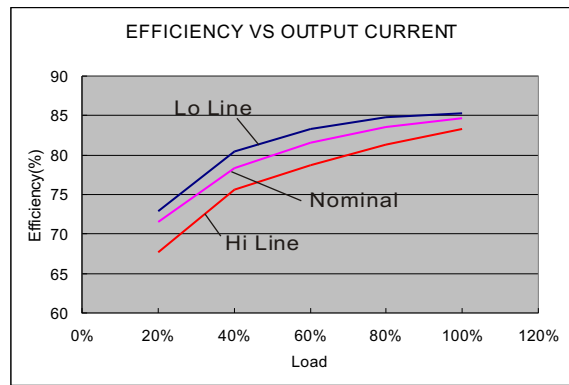
Use a capacitor C_{out} (1.0 μ F) measurement. The Scope measurement bandwidth is 0-20MHz.



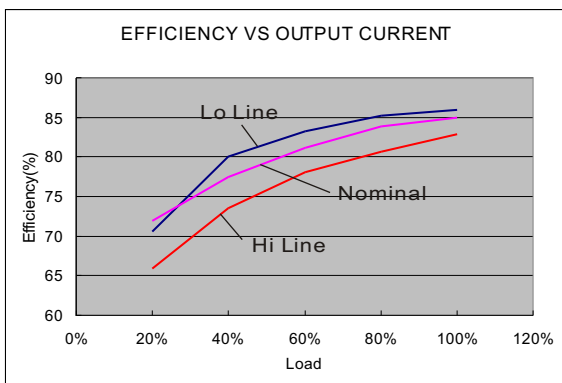
ELECTRICAL CHARACTERISTIC CURVES



12 Models



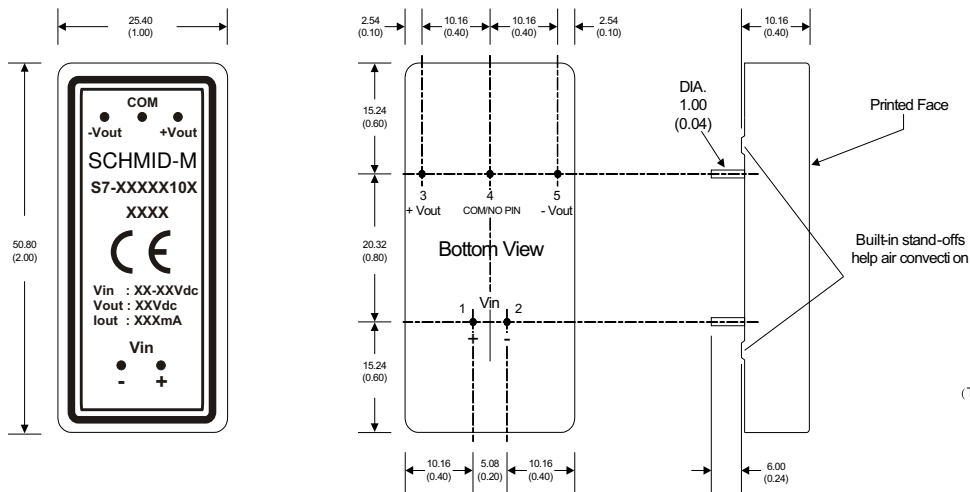
24 Models



48 Models

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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)