

# S7L - 20W Series

20W 2:1 Regulated Single & Dual output

# SCHMID-M

## Features

- Wide 2:1 Input Range
- Full SMD Technology
- 1500 VDC Isolation
- Continuous Short Circuit Protection
- Efficiency up to 87%
- -40 ~ 85°C Operation Temperature Range



The S7L series is a family of cost effective 20W single & dual output DC-DC converters. These converters are made with nickle-coated brass case in a 2"x2" 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,  $\pm 3.3$ ,  $\pm 5$ ,  $\pm 7.2$ ,  $\pm 9$ ,  $\pm 12$ ,  $\pm 15$ ,  $\pm 18$ ,  $\pm 24$  Vdc. High performance features include high efficiency operation up to 87% and output voltage accuracy of  $\pm 1\%$  maximum.

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

OUTPUT SPECIFICATIONS	
Voltage accuracy	$\pm 1\%$
Line regulation	$\pm 0.5\%$
Load regulation	Single (0% to 100% Load) $\pm 0.5\%$ Dual (10% to 100% Load) $\pm 0.5\%$
Ripple & noise(20 MHz bandwidth)(1)	100mV pk-pk
Over-current protection	140% of max. Iout
Short circuit protection	Indefinite(Automatic Recovery)
Temperature coefficient	$\pm 0.02\%/^{\circ}\text{C}$
Capacitor load(2)	See table

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	Capacitors
Input Reflected Ripple Current(3)	35mA pk-pk

GENERAL SPECIFICATIONS	
Efficiency	See table
I/O Isolation Voltage(3 sec)	
Input/Output	1500Vdc
Case/Input & Output	1000Vdc
I/O Isolation Capacitance	1000 pF typ.
I/O Isolation Resistance	1000M Ohm
Switching Frequency	Typical 125kHz
Humidity	95% rel H
Reliability Calculated MTBF(MIL-HDBK-217 F)	>1.121 Mhrs
Safety Standard : (designed to meet)	IEC 60950-1

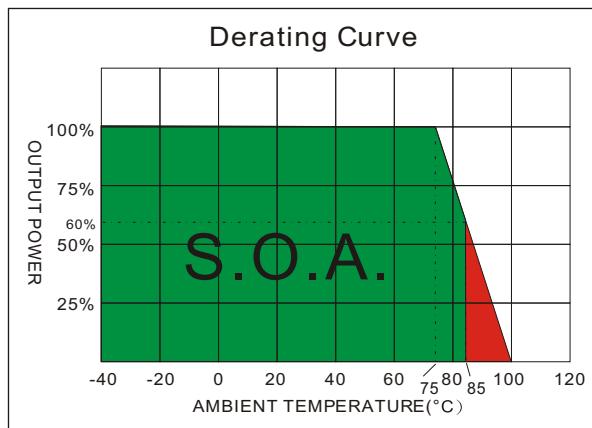
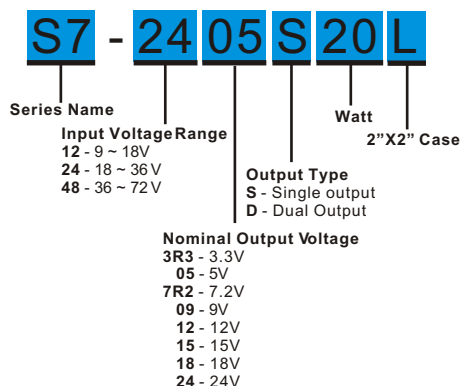
PHYSICAL SPECIFICATIONS	
Case Material	Nickel-coated Brass
Pin Material	$\varnothing 1.0\text{mm}$ Brass Solder-coated
Potting Material	Epoxy (UL94V-0-rated)
Weight	60.0g
Dimensions	2.00"x2.00"x0.40"

ENVIRONMENT SPECIFICATIONS	
Operating Temperature	-40°C~85°C(See Derating Curve)
Temperature	-40°C~75°C(For 100% load)
Maximum Case Temperature	100°C
Storage Temperature	-40°C~125°C
Cooling	Nature Convection

ABSOLUTE MAXIMUM RATINGS(4)	
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 10sec.max.)	

## S7L - 20W 2:1 Regulated Single & Dual output

### PARTNUMBER 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)		
S7-123R3 S20L	9-18	20	1375	3.3	0	4000	80	3300
S7-1205 S20L	9-18	20	2008	5	0	4000	83	3300
S7-127R2 S20L	9-18	20	1984	7.2	0	2777	84	2200
S7-1209 S20L	9-18	20	1984	9	0	2222	84	1000
S7-1212 S20L	9-18	30	1960	12	0	1666	85	1000
S7-1215 S20L	9-18	30	1937	15	0	1333	86	680
S7-1218 S20L	9-18	30	1937	18	0	1111	86	470
S7-1224 S20L	9-18	30	1915	24	0	833	87	470
S7-123R3D 20L	9-18	20	1375	±3.3	±0	±2000	80	±1000
S7-1205D2 0L	9-18	20	2032	±5	±0	±2000	82	±1000
S7-127R2D 20L	9-18	25	2008	±7.2	±0	±1388	83	±680
S7-1209D2 0L	9-18	25	1984	±9	±0	±1111	84	±470
S7-1212D2 0L	9-18	30	1984	±12	±0	±833	84	±330
S7-1215D2 0L	9-18	30	1960	±15	±0	±666	85	±330
S7-1218D2 0L	9-18	35	1960	±18	±0	±555	85	±330
S7-1224D2 0L	9-18	35	1960	±24	±0	±416	85	±330
S7-243R3 S20L	18-36	25	687	3.3	0	4000	80	3300
S7-2405 S20L	18-36	25	992	5	0	4000	84	3300
S7-247R2 S20L	18-36	25	992	7.2	0	2777	84	2200
S7-2409 S20L	18-36	25	968	9	0	2222	86	1000
S7-2412 S20L	18-36	25	957	12	0	1666	87	1000
S7-2415 S20L	18-36	25	957	15	0	1333	87	680
S7-2418 S20L	18-36	25	957	18	0	1111	87	470
S7-2424 S20L	18-36	25	957	24	0	833	87	470
S7-243R3D 20L	18-36	25	687	±3.3	±0	±2000	80	±1000
S7-2405D2 0L	18-36	25	992	±5	±0	±2000	84	±1000
S7-247R2D 20L	18-36	25	992	±7.2	±0	±1388	84	±680
S7-2409D2 0L	18-36	25	957	±9	±0	±1111	87	±470
S7-2412D2 0L	18-36	25	957	±12	±0	±833	87	±330
S7-2415D2 0L	18-36	25	957	±15	±0	±666	87	±330
S7-2418D2 0L	18-36	25	957	±18	±0	±555	87	±330
S7-2424D2 0L	18-36	30	957	±24	±0	±416	87	±330

## S7L - 20W 2:1 Regulated Single & Dual output

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)		
S7-483R3 S20L	36-72	20	343	3.3	0	4000	80	3300
S7-4805 S20L	36-72	20	502	5	0	4000	83	3300
S7-487R2 S20L	36-72	20	490	7.2	0	2777	85	2200
S7-4809 S20L	36-72	20	478	9	0	2222	87	1000
S7-4812 S20L	36-72	20	478	12	0	1666	87	1000
S7-4815 S20L	36-72	20	478	15	0	1333	87	680
S7-4818 S20L	36-72	20	478	18	0	1111	87	470
S7-4824 S20L	36-72	25	478	24	0	833	87	470
S7-483R3D 20L	36-72	20	343	±3.3	±0	±2000	80	±1000
S7-4805D2 0L	36-72	20	496	±5	±0	±2000	84	±1000
S7-487R2D 20L	36-72	20	490	±7.2	±0	±1388	85	±680
S7-4809D2 0L	36-72	20	478	±9	±0	±1111	87	±470
S7-4812D2 0L	36-72	20	478	±12	±0	±833	87	±330
S7-4815D2 0L	36-72	20	478	±15	±0	±666	87	±330
S7-4818D2 0L	36-72	20	478	±18	±0	±555	87	±330
S7-4824D2 0L	36-72	20	478	±24	±0	±416	87	±330

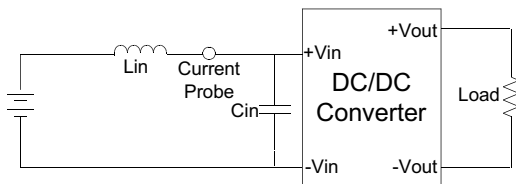
### NOTE

1. Ripple/Noise measured with 20MHz bandwidth and 1.0μF ceramic capacitor.
2. Tested by minimal  $V_{in}$  and constant resistive load.
3. Measured Input reflected ripple current with a simulated source inductance of 12μH.
4. Exceeding the absolute ratings of the unit could cause damage. It is not allowed for continuous operating.
5. 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

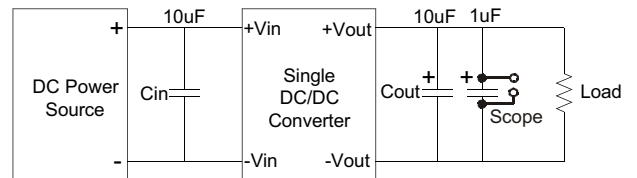
Input reflected ripple current is measured through a source inductor  $L_{in}$  (12μH) and a source capacitor  $C_{in}$  (47μF, ESR<1.0Ω at 100KHz) at nominal input and full load.



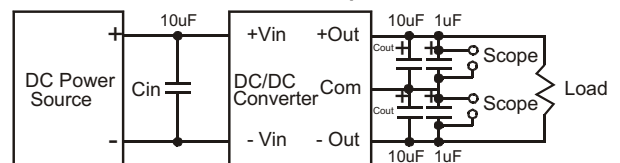
#### Output Ripple & Noise Measurement Test

To reduce ripple and noise, it is recommended to use a 1μF ceramic disk capacitor and a 10μF electrolytic capacitor to at the output.

##### Single Output

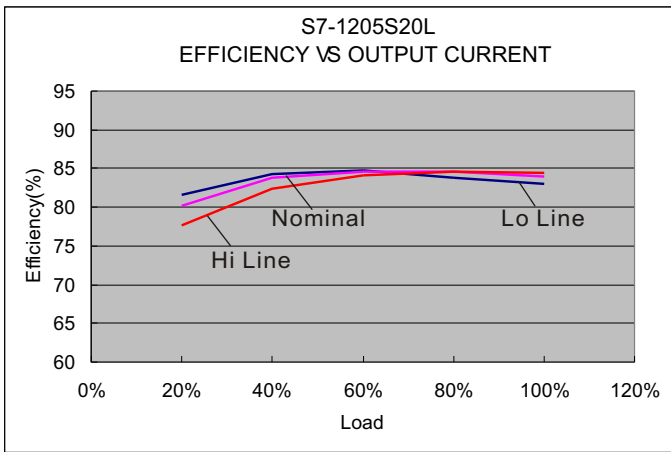


##### Dual Output

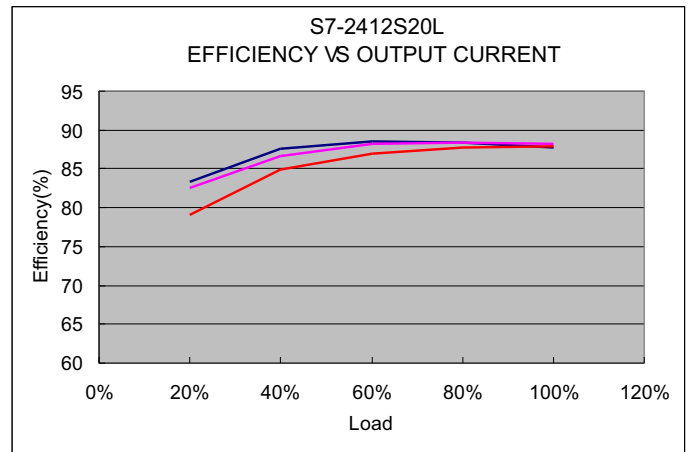


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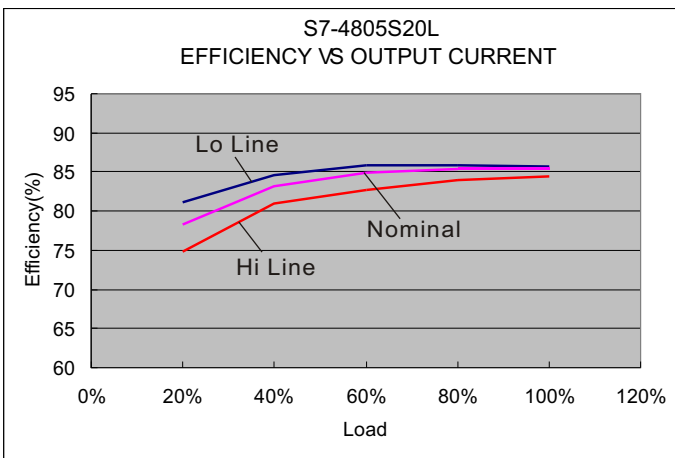
## ELECTRICAL CHARACTERISTIC CURVES



12 Models

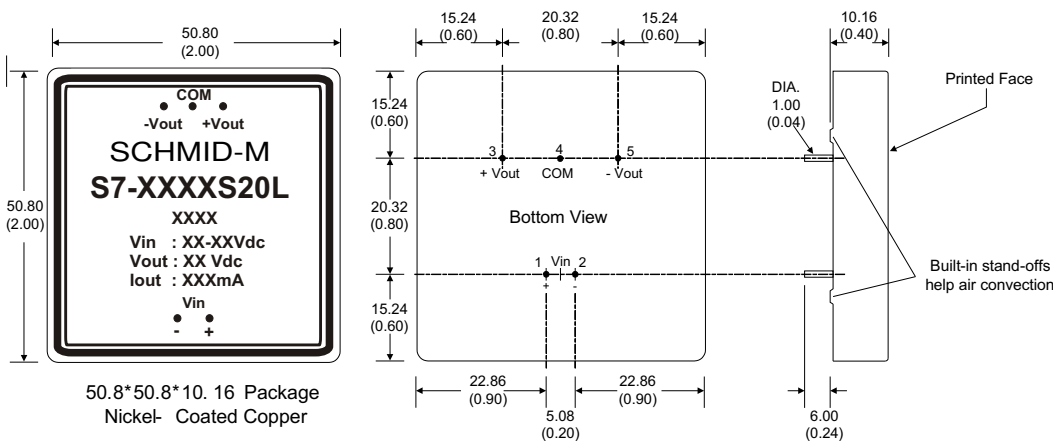


24 Models



48 Models

## 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

- All dimensions are typical in millimeters ( inches ).
1. Pin diameter: 1.00 ±0.05 ( 0.04 ±0.002 )
  2. Pin pitch and length tolerance: ±0.35 ( ±0.014 )
  3. Case Tolerance: ±0.5 ( ±0.02 )