

# SCHMID-M

## SM Series

### 25/30W 2:1 Regulated Single & Dual output

#### Features

- Wide 2:1 Input Range
- Full SMD Technology
- 1500 VDC Isolation
- Efficiency up to 91%
- -40 ~ 85°C Operation Temperature Range
- Adjustable Output Voltage
- Remote On/Off Control (CTRL)
- Continuous Short Circuit Protection
- Over Current Protection
- Over Voltage Protection
- Over Temperature Protection
- Soft Start



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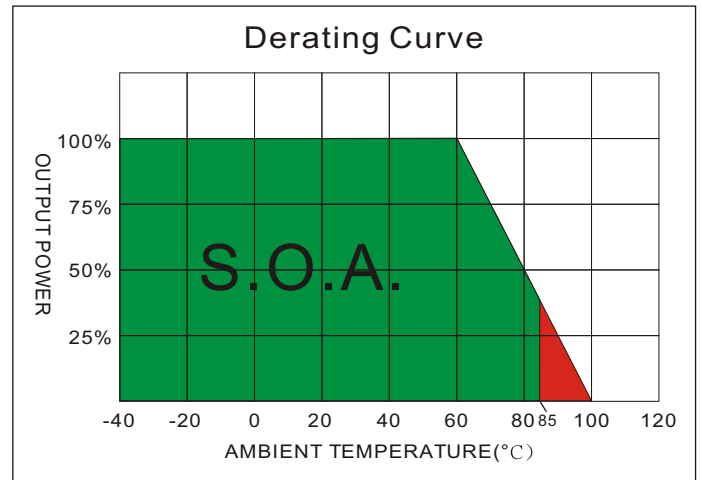
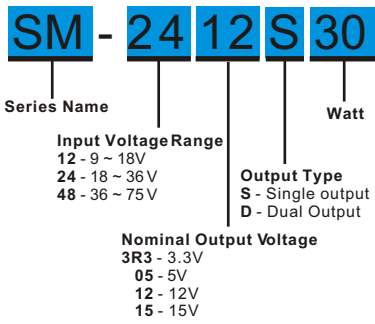
The SM series is a family of cost effective 25/30W single & dual output DC-DC converters. These converters combine nickel-coated copper package in a 2"x1.6" case with high performance features such as Active Clamp Technology, continuous short circuit protection with automatic restart and tight line / load regulation. Devices are encapsulated using flame retardant resin. Input voltages of 12, 24 and 48 with output voltage of 3.3, 5, 12, 15, ±12, ±15Vdc. High performance features include high efficiency operation up to 91% and output voltage accuracy of ±1% maximum.

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

OUTPUT SPECIFICATIONS		GENERAL SPECIFICATIONS	
Output Voltage Accuracy	±1%	Efficiency	See table, typ.
Output Voltage Adjustability(Trim)	±10%, max.	I/O Isolation Voltage(3 sec)	
Maximum Output Current	See table	Input/Output	1500Vdc
Line Regulation	±0.5%, max.	Case/Input & Output	1000Vdc
Load Regulation( I <sub>o</sub> =10% to 100%) (1)	±0.5%, max.	Isolation Resistance	1000 MΩ, min.
Cross Regulation (Dual Output) (2)	±5%	Isolation Capacitance	1200 pF, typ.
Ripple&Noise (3)	75mVpk-pk, max.	Switching frequency	270kHz, typ.
	3.3V output	Humidity	95% rel H
	5V output	Reliability Calculated MTBF(MIL-HDBK-217 F)	>1 Mhrs
Over Voltage Protection	12V output	Safety Standard	IEC/EN 60950-1
( Zener diode clamp)	15V output	Safety Approvals	TUV, CB
	±12V output		
	±15V output		
Over Current Protection	120% of FL, typ.	EMC CHARACTERISTICS	
Short Circuit Protection	Indefinite(hiccup) (Automatic Recovery)	Radiated Emissions	EN55022 CLASS A
Temperature Coefficient	±0.02%/°C	Conducted Emissions(7)	EN55022 CLASS A
Capacitive Load (4)	See table	ESD	IEC61000-4-2 Perf. Criteria A
Transient Recovery Time (5)	200us, typ.	RS	IEC61000-4-3 Perf. Criteria A
Transient Response Deviation(5)	±3%, max.	EFT(8)	IEC61000-4-4 Perf. Criteria A
		Surge (8)	IEC61000-4-5 Perf. Criteria A
		CS	IEC61000-4-6 Perf. Criteria A
		PFMF	IEC61000-4-8 Perf. Criteria A
INPUT SPECIFICATIONS		ENVIRONMENTAL SPECIFICATIONS	
Input Voltage Range	See table	Operating Ambient Temperature	-40°C ~ +85°C(See Derating Curve) -40°C ~ +60°C(For 100% load)
Under Voltage Lockout		Maximum Case Temperature	100°C
12V Models	Module ON / OFF	Storage Temperature	-55°C ~ +125°C
24V Models	Module ON / OFF	Over Temperature Protection (Case)	110°C, typ.
48V Models	Module ON / OFF	Cooling	Nature Convection
Start up Time	20mS, typ.	ABSOLUTE SPECIFICATIONS (9)	
(Nominal Vin and constant resistive load)		These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.	
Input Filter	Pi Type	Input Surge Voltage(100mS)	
Input Current(No-Load)	See table, typ.	12 Models	25 Vdc ,max.
Input Current(Full-Load)	See table, max.	24 Models	50 Vdc ,max.
Input Reflected Ripple Current(6)	20mApk-pk, typ.	48 Models	100 Vdc ,max.
Remote On/Off (CTRL)		Soldering Temperature	260°C max.
ON: 2.5 ... 5.5Vdc or open circuit		(1.5mm from case 10sec. Max.)	
OFF: -0.7 ... 0.8Vdc or Short circuit pin2 and pin 3			
OFF idle current: 2.5 mA, typ			
PHYSICAL SPECIFICATIONS			
Case Material	Nickel-coated Copper		
Pin Material	Ø1.0mm Brass Solder-coated		
Potting Material	Epoxy (UL94V-0 rated)		
Weight	48.0g		
Dimensions	2.00"x1.60"x0.40"		

## SM - 25/30W 2:1 Regulated Single & Dual output

### PART NUMBER STRUCTURE

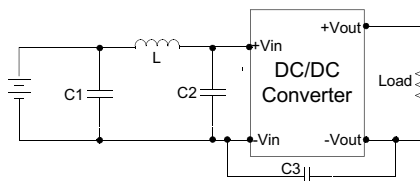


### MODEL SELECTION GUIDE

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)		
SM-123R3S25	9-18	30	1867	3.3	0	5500	83	15000
SM-1205S25	9-18	30	2480	5	0	5000	86	10000
SM-1212S30	9-18	30	2841	12	0	2500	90	2200
SM-1215S30	9-18	30	2841	15	0	2000	90	1000
SM-243R3S25	18-36	25	922	3.3	0	5500	84	15000
SM-2405S25	18-36	25	1225	5	0	5000	87	10000
SM-2412S30	18-36	25	1404	12	0	2500	91	2200
SM-2415S30	18-36	25	1404	15	0	2000	91	1000
SM-483R3S25	36-75	20	461	3.3	0	5500	84	15000
SM-4805S25	36-75	20	613	5	0	5000	87	10000
SM-4812S30	36-75	20	702	12	0	2500	91	2200
SM-4815S30	36-75	20	702	15	0	2000	91	1000
SM-1212D30	9-18	30	2841	±12	0	±1250	90	±1000
SM-1215D30	9-18	30	2841	±15	0	±1000	90	±680
SM-2412D30	18-36	25	1404	±12	0	±1250	91	±1000
SM-2415D30	18-36	25	1404	±15	0	±1000	91	±680
SM-4812D30	36-75	20	710	±12	0	±1250	90	±1000
SM-4815D30	36-75	20	710	±15	0	±1000	90	±680

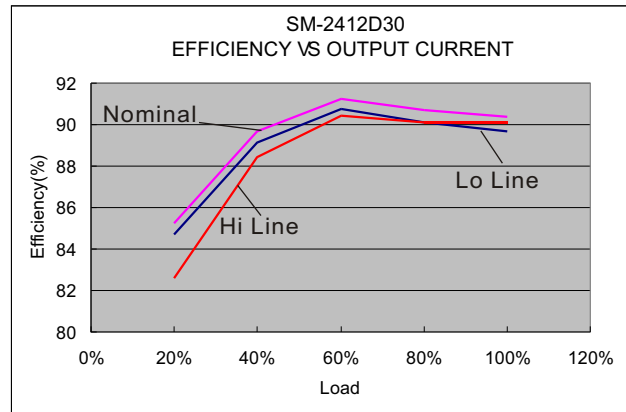
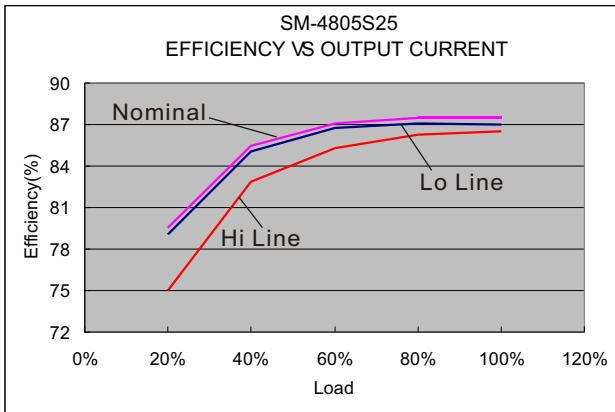
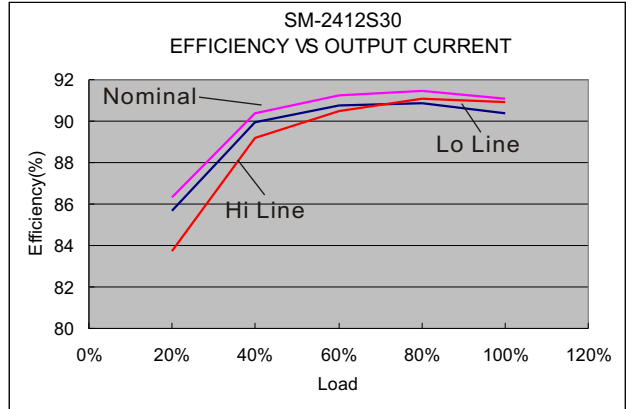
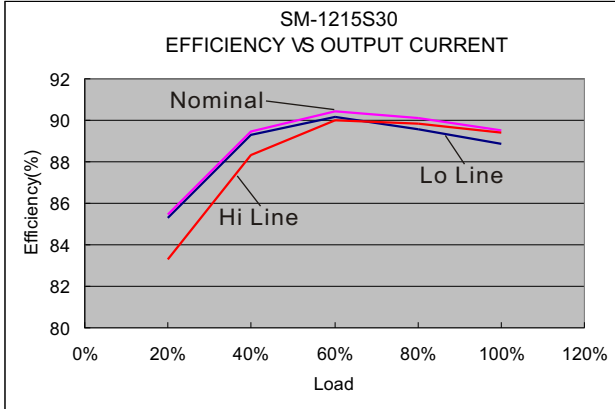
### NOTE

- Operation between no-load and 10% load conditions will not damage the module, but it may not meet all specifications listed.
- One load is 25% to 100% load, the other load is 100% load, the output voltage variable rate is within ±5%.
- Measured with 20MHz bandwidth and 1.0uF ceramic capacitor.
- Tested by minimal Vin and constant resistive load.
- Tested by normal Vin and 25% load step change ( 75%-50%-25% of Io ).
- Measured Input reflected ripple current with a simulated source inductance of 12uH.
- Input filter components (C1, C2, L) 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.
- 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: Nichicon FW series, 1000uF/100V.
- Exceeding the absolute ratings of the unit could cause damage.  
It is not allowed for continuous operating.

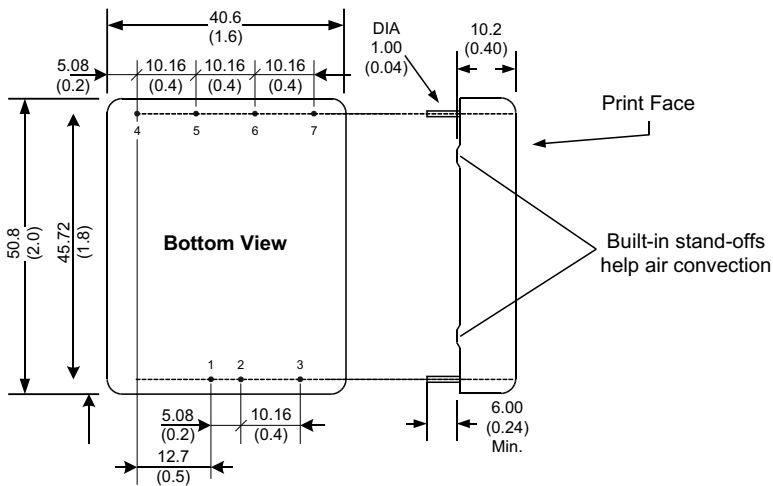


	C1	L	C2	C3
SM-12XXXXX	330uF, 100V	12uH	100uF, 100V	N/A
SM-24XXXXX	330uF, 100V	12uH	100uF, 100V	N/A
SM-48XXXXX	330uF, 100V	12uH	100uF, 100V	1000pF/2KV

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## MECHANICAL SPECIFICATIONS



All dimensions are typical in millimeters ( inches ).

1. Pin diameter:  $1.0 \pm 0.05$  (  $0.04 \pm 0.002$  )
2. Pin pitch and length tolerance:  $\pm 0.35$  (  $\pm 0.014$  )
3. Case Tolerance:  $\pm 0.5$  (  $\pm 0.02$  )

## PIN CONNECTIONS

PIN NUMBER	SINGLE	DUAL
1	+Vin	+Vin
2	-Vin	-Vin
3	CTRL	CTRL
4	No pin	+Vout
5	+Vout	Com
6	-Vout	-Vout
7	Trim	Trim

## EXTERNAL OUTPUT TRIMMING

Output can be externally trimmed by using the method as below. ( ) for dual output trim.

