

SM40A Series

40W 4:1 Regulated Single & Dual output

SCHMID-M[®]
DC/DC - Converter

Features

- Wide 4:1 Input Range
- Full SMD Technology
- 1600 VDC Isolation
- Efficiency up to 92%
- -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



The SM40A series is a family of cost effective 40W single & dual output DC-DC converters. These converters combine nickle-coated copper package in a 2"x2" 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 24 and 48 with output voltage of 3.3, 5, 12, 15, ±12, ±15Vdc. High performance features include high efficiency operation up to 92% and output voltage accuracy of ±1% maximum.

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

OUTPUT SPECIFICATIONS	
Output Voltage Accuracy	±1%
Output Voltage Adjustability (Trim) (1)	±10%, max
Maximum Output Current	See table
Line Regulation	±0.5%, max
Load Regulation(Single, I _o =0% to 100%)	±0.5%, max
Load Regulation(Dual, I _o =1% to 100%)	±1.0%, max
Cross Regulation (Dual Output) (2)	±5%
Ripple&Noise (3)	3.3V&5.0V output: 50mVpk-pk, max Dual output: 150mVpk-pk, max All other output: 75mVpk-pk, max
	3.3V output 3.9V
	5V output 6.2V
Over Voltage Protection (Zener diode clamp)	12V output 15V 15V output 18V ±12V output ±15V ±15V output ±18V
Over Load Protection	130% of FL, typ
Short Circuit Protection	Indefinite(hiccup) (Automatic Recovery)
Temperature Coefficient	±0.02%/°C
Capacitive Load (4)	See table
Transient Recovery Time (5)	250us, typ
Transient Response Deviation(5)	±3%, max

INPUT SPECIFICATIONS	
Input Voltage Range	See table
Under Voltage Lockout	
24V Modes	Module ON / OFF 8.6Vdc / 7.9Vdc, typ
48V Modes	Module ON / OFF 17.8Vdc / 16Vdc, typ
Start up Time (Nominal Vin and constant resistive load)	25mS, typ
Input Filter	Pi Type
Input Current(No-Load)	See table, typ
Input Current(Full-Load)	See table, max
Input Reflected Ripple Current(6)	20mA _{pk} -pk, typ
Remote On/Off (CTRL)(7)	
	ON: 3.0 ... 12Vdc or open circuit OFF: 0 ... 1.2Vdc or Short circuit pin2 and pin 3 OFF idle current: 5.0 mA, typ

GENERAL SPECIFICATIONS	
Efficiency	See table, typ
I/O Isolation Voltage(3 sec)	
Input/Output	1600Vdc
Case/Input & Output	1600Vdc
Isolation Resistance	1000 MΩ, min
Isolation Capacitance	2500 pF, max
Switching frequency	270kHz, typ
Humidity	95% rel H
Reliability Calculated MTBF(MIL-HDBK-217 F)	>151 khrs
Safety Standard (design to meet)	IEC/EN 60950-1

EMC CHARACTERISTICS		
Radiated Emissions	EN55022	CLASS A
Conducted Emissions(8)	EN55022	CLASS A
ESD	EN61000-4-2	Perf. Criteria A
RS	EN61000-4-3	Perf. Criteria A
EFT(9)	EN61000-4-4	Perf. Criteria A
Surge (9)	EN61000-4-5	Perf. Criteria A
CS	EN61000-4-6	Perf. Criteria A
PFMF	EN61000-4-8	Perf. Criteria A

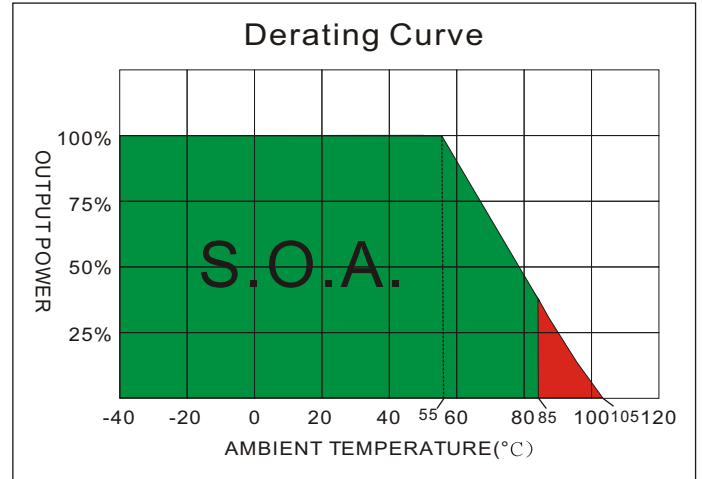
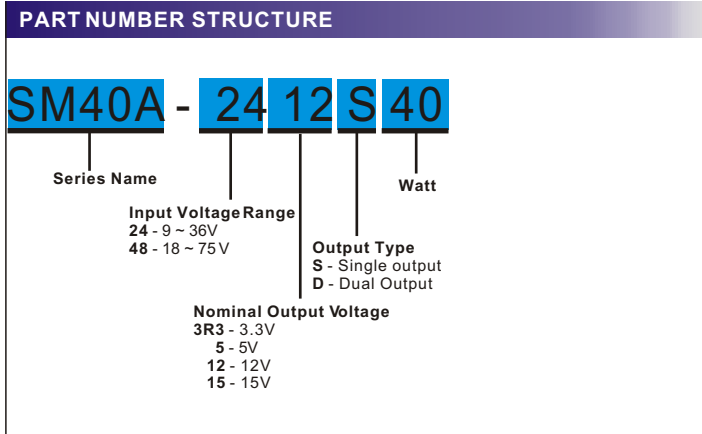
ENVIRONMENTAL SPECIFICATIONS	
Operating Ambient Temperature	-40°C ~ +85°C(See Derating Curve) -40°C ~ +55°C(For 100% load)
Maximum Case Temperature	105°C
Storage Temperature	-40°C ~ +125°C
Over Temperature Protection (Case)	110°C, typ
Cooling	Nature Convection

ABSOLUTE SPECIFICATIONS (10)	
These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.	
Input Voltage(100mS)	
24 Modes	-0.7~50 Vdc
48 Modes	-0.7~100 Vdc
Soldering Temperature (1.5mm from case 10sec. Max.)	260°C max.

PHYSICAL SPECIFICATIONS	
Case Material	Nickel-coated Copper
Pin Material	Ø1.0mm Brass Solder-coated
Potting Material	Epoxy (UL94V-0 rated)
Weight	60.0g
Dimensions	2.00"x2.00"x0.40"

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SM40A - 40W 4:1 Regulated Single & Dual output



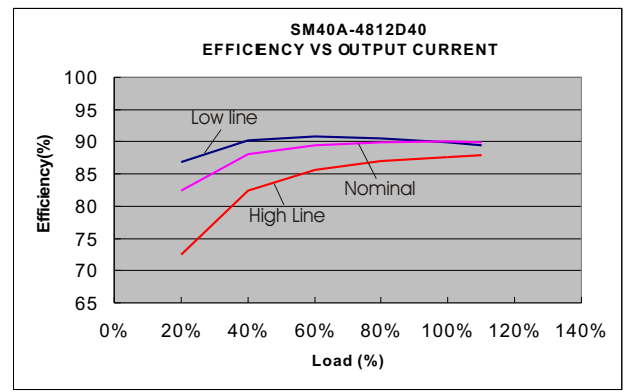
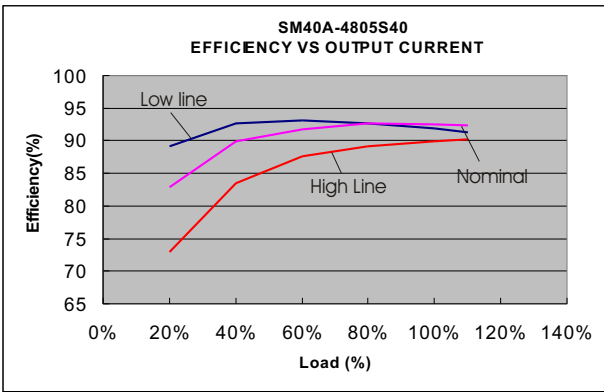
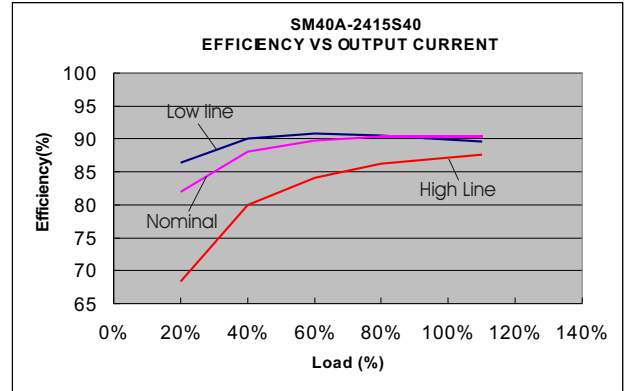
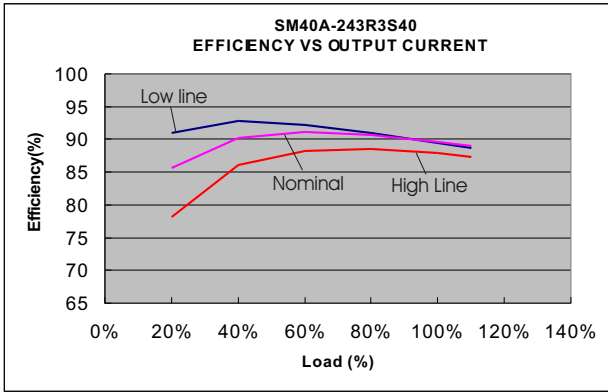
MODEL SELECTION GUIDE

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)		
SM40A-243R3S40	9-36	80	1598	3.3	0	10000	89	25000
SM40A-2405S40	9-36	100	1893	5	0	8000	91	13000
SM40A-2412S40	9-36	50	1925	12	0	3350	90	2300
SM40A-2415S40	9-36	50	1904	15	0	2650	90	1500
SM40A-483R3S40	18-75	60	799	3.3	0	10000	89	25000
SM40A-4805S40	18-75	60	936	5	0	8000	92	13000
SM40A-4812S40	18-75	30	963	12	0	3350	90	2300
SM40A-4815S40	18-75	30	941	15	0	2650	91	1500
SM40A-2412D40	9-36	60	1919	±12	0	±1650	89	±1200
SM40A-2415D40	9-36	60	1962	±15	0	±1350	89	±750
SM40A-4812D40	18-75	30	948	±12	0	±1650	90	±1200
SM40A-4815D40	18-75	30	970	±15	0	±1350	90	±750

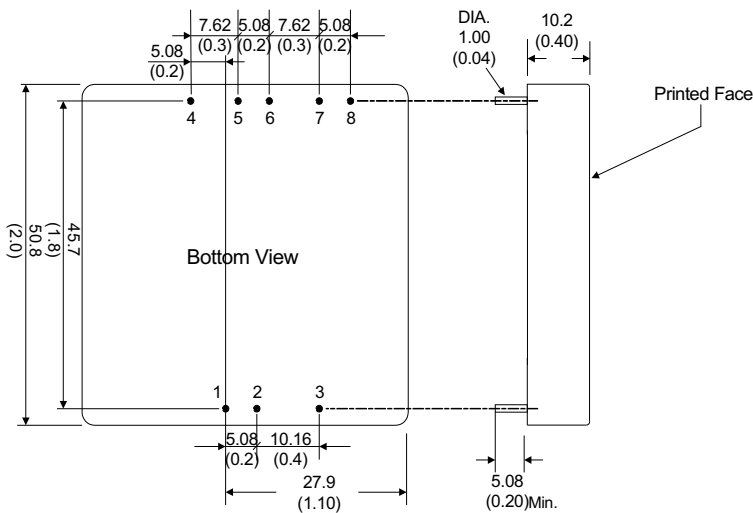
NOTE

- For the Single output: Maximum output deviation is 10% inclusive of remote sense and trim. If remote sense is not being used, the +sense should be connected to its corresponding +OUTPUT and likewise the -sense should be connected to its corresponding -OUTPUT.
- 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.
- The remote on/off control pin is referenced to -Vin(pin2).
- The SM40A-40W series can meet EN55022 Class A With an external filter in parallel with the input pins .
- An external filter capacitor is required if the module has to meet EN61000-4-4 and EN61000-4-5.
The filter capacitor Schmid-M suggest: Nippon chemi-con KY series, 220uF/100V.
- Exceeding the absolute ratings of the unit could cause damage.
It is not allowed for continuous operating.

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MECHANICAL SPECIFICATIONS



All dimensions are typical in millimeters (inches).

1. Pin diameter: 1.0 ± 0.05 (0.04 ± 0.002)
2. Pin pitch tolerance: ± 0.35 (± 0.014)
3. Case Tolerance: ± 0.5 (± 0.02)

PIN CONNECTIONS

PIN NUMBER	SINGLE	DUAL
1	+Vin	+Vin
2	-Vin	-Vin
3	CTRL	CTRL
4	-Sense	+Vout
5	+Sense	Com
6	+Vout	Com
7	-Vout	-Vout
8	Trim	Trim

EXTERNAL OUTPUT TRIMMING

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

