

STW -30W Series

SCHMID-M

Features 30W 4:1 Regulated Single & Dual & Triple output

- Ultra Wide 4:1 Input Range
- Full SMD Technology
- 1600 VDC Isolation
- Efficiency up to 91%
- Extended Operating Temperature Range -40 ~ 75°C max.
- Adjustable Output Voltage
- Remote On/Off Control (CTRL)
- Continuous Short Circuit Protection
- Over Current Protection
- Over Voltage Protection
- Over Temperature Protection
- Soft Start
- Optional Heat-sink

The STW series is a family of cost effective 30W single & dual & Triple output DC-DC converters. These converters combine nickel-coated copper package in a 2"x1" 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, 5.1, 12, 15, ± 5 , ± 12 , ± 15 Vdc, 3.3/ ± 12 , 3.3/ ± 15 , 5/ ± 12 , 5/ ± 15 . High performance features include high efficiency operation up to 91%.

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

OUTPUT SPECIFICATIONS		
Output Voltage Accuracy		Single&Dual: $\pm 1\%$ Triple: $\pm 1\%$ / $\pm 5\%$ (main / auxiliary)
Output Voltage Adjustability (Single Output Only)		$\pm 10\%$, max.
Maximum Output Current		See table
Line Regulation		Single&Dual: $\pm 0.5\%$, max. Triple: $\pm 1\%$ / $\pm 5\%$ (main / auxiliary), max.
Load Regulation		Single (0% to 100%): $\pm 0.5\%$, max. Dual (0% to 100%): $\pm 1\%$, max.(balanced load) Triple (10% to 100%): $\pm 1\%$ / $\pm 5\%$ (main / auxiliary), max.
Cross Regulation (1)		Dual: $\pm 5\%$ Triple: $\pm 5\%$
Ripple&Noise (2)		Single&Dual : 100mVpk-pk,max. Triple : 50 / 75mVpk-pk, max. (main / auxiliary)
Over Voltage Protection (Zener diode clamp)	3.3V output	3.9V
	5V output	6.2V
	5.1V output	6.2V
	12V output	15V
	15V output	18V
	± 5 V output	± 6.2 V
	± 12 V output	± 15 V
	± 15 V output	± 18 V
Over Load Protection		150% of FL, typ.
Short Circuit Protection		Indefinite(hiccup) (Automatic Recovery)
Temperature Coefficient		$\pm 0.02\%/^{\circ}\text{C}$
Capacitive Load (3)		See table
Transient Recovery Time (4)		250us, typ.
Transient Response Deviation (4)		$\pm 3\%$, 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)		30mS, typ.
Input Filter		Pi Type
Input Current (No-Load)		See table, max.
Input Current (Full-Load)		See table, typ.
Input Reflected Ripple Current (5)		20mA _{pk-pk} , typ.
Remote On/Off (CTRL)(6)		
ON:		3.0 ... 12Vdc or open circuit
OFF:		0 ... 1.2Vdc or Short circuit pin2 and pin 3
OFF idle current:		5 mA, typ.



GENERAL SPECIFICATIONS		
Efficiency	See table, typ.	
I/O Isolation Voltage (60sec)		
Input/Output	1600Vdc	
Case/Input & Output	1600Vdc	
Isolation Resistance	1000 MΩ, min.	
Isolation Capacitance	1000 pF, typ.	
Switching frequency	330kHz, typ.	
Humidity	95% rel H	
Reliability Calculated MTBF (MIL-HDBK-217 F)	Single&Dual: >435 khrs Triple: >320 khrs	
Safety Standard	IEC/EN 60950-1 , 62368-1 UL/cUL 60950-1 , 62368-1	
Safety Approvals	EN 60950-1 , 62368-1	
EMC CHARACTERISTICS		
Radiated Emissions	EN55032	CLASSA
Conducted Emissions(7)	EN55032	CLASSA
ESD	IEC 61000-4-2	Perf. Criteria A
RS	IEC 61000-4-3	Perf. Criteria A
EFT(8)	IEC 61000-4-4	Perf. Criteria A
Surge (8)	IEC 61000-4-5	Perf. Criteria A
CS	IEC 61000-4-6	Perf. Criteria A
PFMF	IEC 61000-4-8	Perf. Criteria A
PHYSICAL SPECIFICATIONS		
Case Material	Nickel-coated Copper	
Base Material	Non-conductive Black Plastic(UL94V-0 rated)	
Pin Material	Φ1.0mm Brass Solder-coated	
Potting Material	Epoxy (UL94V-0 rated)	
Weight	35.0g(Without Heat-sink) / 46.3g(With Heat-sink)	
Dimensions	2.00"x1.00"x0.40"	
ABSOLUTE SPECIFICATIONS (9)		
These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.		
Input Surge Voltage(100mS)		
24 Models	50 Vdc, max.	
48 Models	100 Vdc, max.	
Soldering Temperature	260°C, max.	
(1.5mm from case 10sec max.)		
ENVIRONMENTAL SPECIFICATIONS		
Operating Ambient Temperature	-40°C ~ +75°C(See Derating Curve) -40°C ~ +50°C(For 100% load)	
Maximum Case Temperature	105°C	
Thermal Impedance (Nature Convection)	Without Heat-sink	12°C/W
	With Heat-sink	10°C/W
Storage Temperature	-55°C ~ +125°C	
Over Temperature Protection (Case)	115°C, typ.	
Cooling(10)	Nature Convection	

STW - 30W 4:1 Regulated Single & Dual & Triple output

PART NUMBER STRUCTURE

STW - 24 05 12 S 30 SK

Series Name

Input Voltage Range
24 - 9 ~ 36V
48 - 18 ~ 75V

Single Output Voltage

3R3 - 3.3V
05 - 5.0V
5R1 - 5.1V
12 - 12V
15 - 15V
Dual Output Voltage
05 - ±5V
12 - ±12V
15 - ±15V

Output Type

S - Single Output
D - Dual Output
T - Triple Output

Triple Output Voltage

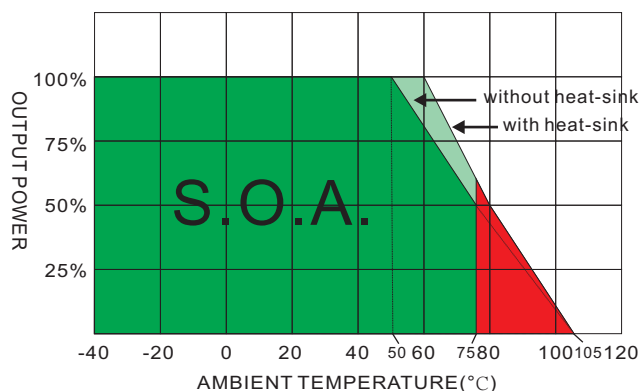
3R3 - 3.3V 12 - ±12V
05 - 5.0V 15 - ±15V

Heat-sink(optional)

blank - Without Heat-sink
SK - With Heat-sink

Watt

Derating Curve



MODEL SELECTION GUIDE

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current		OUTPUT Voltage (Vdc)	OUTPUT Auxiliary (Vdc)	OUTPUT Current		EFFICIENCY @FL (% , typ.)	Capacitor Load @FL (μF , max.)
		No-Load (mA, max.)	Full Load (mA, typ.)			Min. load (mA)	Full load (mA)		
STW-243R3S30	9-36	100	1199	3.3		0	7500	89	20000
STW-2405S30	9-36	100	1437	5		0	6000	90	14000
STW-245R1S30	9-36	100	1465	5.1		0	6000	90	14000
STW-2412S30	9-36	50	1453	12		0	2500	89	2000
STW-2415S30	9-36	50	1453	15		0	2000	89	2000
STW-483R3S30	18-75	100	599	3.3		0	7500	89	20000
STW-4805S30	18-75	100	718	5		0	6000	90	14000
STW-485R1S30	18-75	100	732	5.1		0	6000	90	14000
STW-4812S30	18-75	50	718	12		0	2500	90	2000
STW-4815S30	18-75	50	710	15		0	2000	91	2000
STW-2405D30	9-36	100	1453	±5		0	±3000	89	±3000
STW-2412D30	9-36	50	1453	±12		0	±1250	89	±1300
STW-2415D30	9-36	50	1453	±15		0	±1000	89	±1300
STW-4805D30	18-75	100	718	±5		0	±3000	90	±3000
STW-4812D30	18-75	50	727	±12		0	±1250	89	±1300
STW-4815D30	18-75	50	727	±15		0	±1000	89	±1300
STW-243R312T30	9-36	100	1303	3.3	±12	500 / ±42	5000 / ±420	88	15000 / ±220
STW-243R315T30	9-36	100	1294	3.3	±15	500 / ±33	5000 / ±330	88	15000 / ±220
STW-240512T30	9-36	100	1457	5	±12	400 / ±42	4000 / ±420	89	8000 / ±220
STW-240515T30	9-36	100	1448	5	±15	400 / ±33	4000 / ±330	89	8000 / ±220
STW-483R312T30	18-75	50	644	3.3	±12	500 / ±42	5000 / ±420	89	15000 / ±220
STW-483R315T30	18-75	50	647	3.3	±15	500 / ±33	5000 / ±330	88	15000 / ±220
STW-480512T30	18-75	50	720	5	±12	400 / ±42	4000 / ±420	90	8000 / ±220
STW-480515T30	18-75	50	715	5	±15	400 / ±33	4000 / ±330	90	8000 / ±220

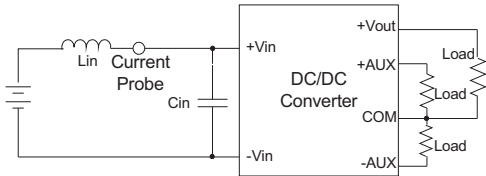
NOTE

- Dual: One load is 25% to 100% load, the other load is 100% load, the output voltage variable rate is within ±5%.
Triple: Main output 100% load, auxiliary 100%, other auxiliary 25% to 100%.
Auxiliary outputs (+ Aux and - Aux) : main output 100% load, auxiliary 100%, other auxiliary 25% to 100%
or main output 25%, auxiliary 25%, other auxiliary 25% to 100%.
- 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 4.7uH and a source capacitor Cin(33uF, ESR<1.0Ω at 100KHz).
- The remote on/off control pin is referenced to -Vin(pin2).
- The STW series can meet EN55032 Class A With an external filter in parallel with the input pins .
- 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, 220uF/100V.
- Exceeding the absolute ratings of the unit could cause damage.
It is not allowed for continuous operating.
- "Nature Convection" is usually about 30-65 LFM but is not equal to still air (0 LFM).

Triple Series - TEST CONFIGURATIONS

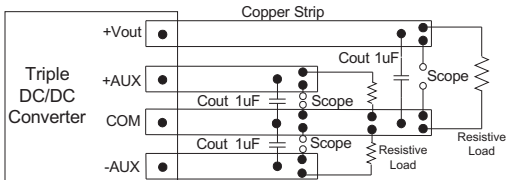
Input Reflected Ripple Current Test Step

Input reflected ripple current is measured through a source inductor $L_{in}(4.7\mu H)$ and a source capacitor $C_{in}(33\mu F, ESR<1.0\Omega \text{ at } 100KHz)$ at nominal input and full load.



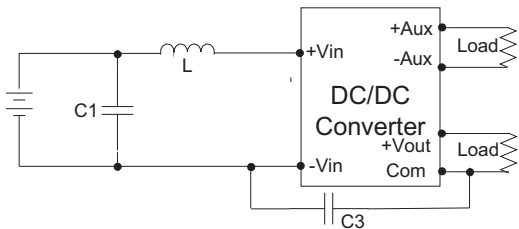
Output Ripple & Noise Measurement Test

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



EMI Filter

Input filter components ($C1, C3, L$) 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.

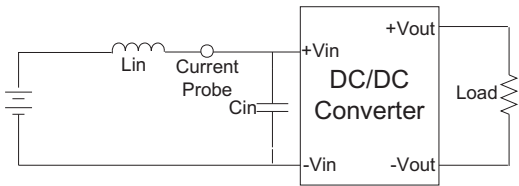


	C1	L	C3
STW-24XXXXXXXXXX	100uF, 100V	12uH	1206,470PF, 2KV
STW-48XXXXXXXXXX	100uF, 100V	12uH	1206,470PF, 2KV

Single & Dual Series - TEST CONFIGURATIONS

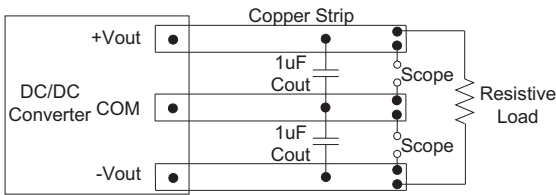
Input Reflected Ripple Current Test Step

Input reflected ripple current is measured through a source inductor $L_{in}(4.7\mu H)$ and a source capacitor $C_{in}(33\mu F, ESR<1.0\Omega \text{ at } 100KHz)$ at nominal input and full load.



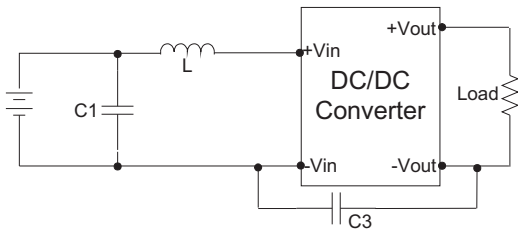
Output Ripple & Noise Measurement Test

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



EMI Filter

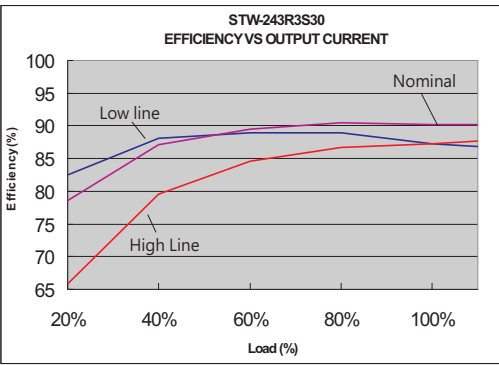
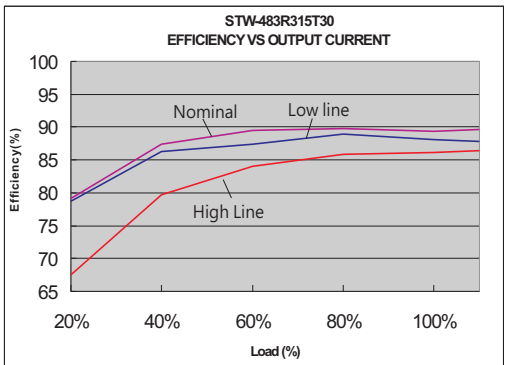
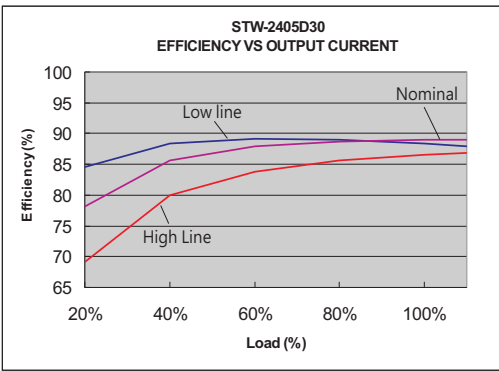
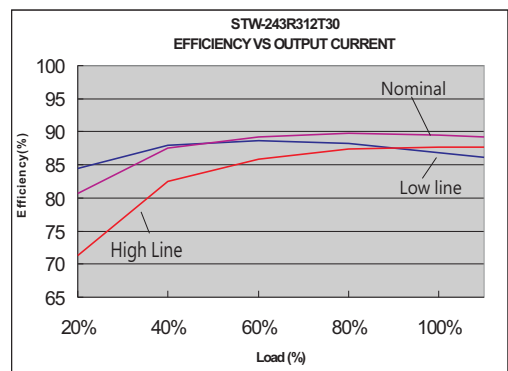
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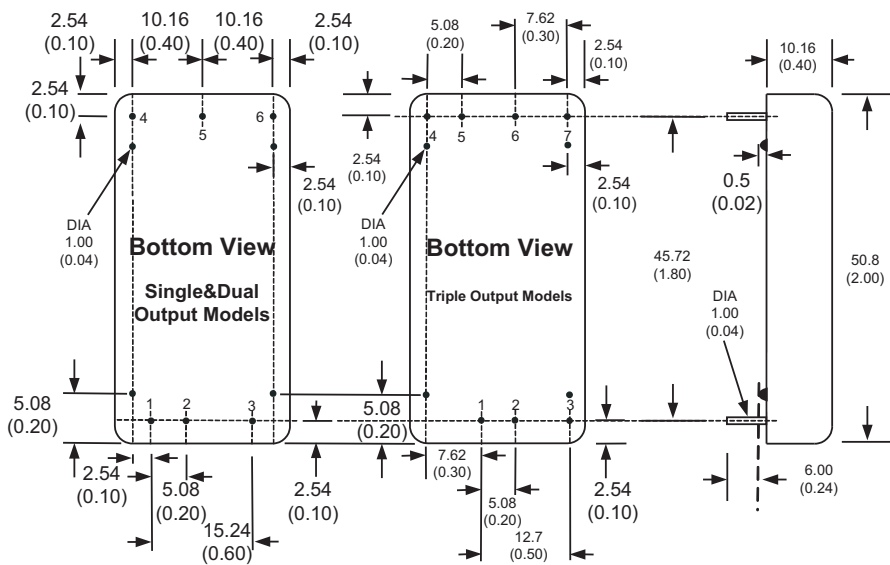
	C1	L	C3
STW-24XXXXXXXXXX	100uF, 100V	12uH	1206,470PF, 2KV
STW-48XXXXXXXXXX	100uF, 100V	12uH	1206,470PF, 2KV

STW - 30W 4:1 Regulated Single & Dual & Triple output

ELECTRICAL CHARACTERISTIC CURVES



MECHANICAL SPECIFICATIONS



- 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)
 - 4. Stand-off tolerance: ±0.1 (±0.004)

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

EXTERNAL OUTPUT TRIMMING

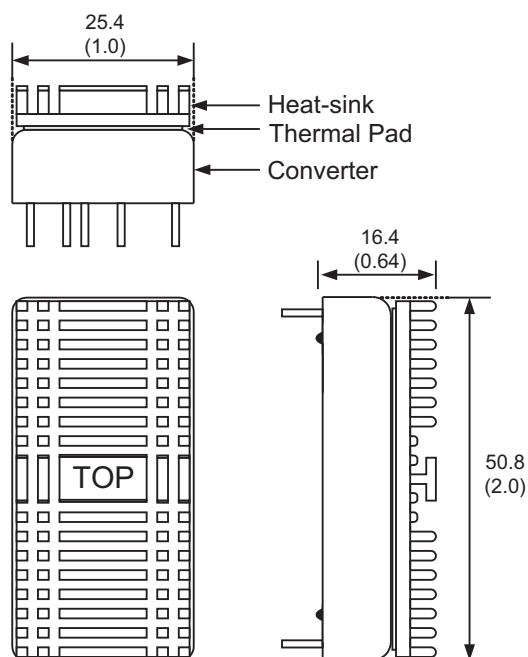
Output can be externally trimmed by using the method as below. (single output models only)

Rtrim-up

Rtrim-down

MECHANICAL SPECIFICATIONS

With Heat-sink



Order code: ST-XXXXS30SK(contain: heat-sink, thermal pad)
Material: Aluminum
Finish: Anodic treatment (black)
Weight: 11.3 g (0.40oz) (without converter)

Note:

1. Converters will be supplied with heat-sinks already mounted.
Please contact factory for quotation.