VTW-30W Series

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

electronicpowersolutions

Features

- 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

CE

The VTW series is a family of cost effective 30W single & dual & Triple output DC-DC converters. These converters combine nickle-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, ±15Vdc, 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:** ±1% **Triple:** ±1% / ±5% (main / auxiliary)
Output Voltage Adjustability **(Single Output Only)**		±10%, max.
Maximum Output Current		See table
Line Regulation		**Single&Dual:** ±0.5%, max. **Triple:** ±1% / ±5% (main / auxilary), max.
Load Regulation		**Single (0% to 100%):** ±0.5%, max. **Dual (0% to 100%):** ±1%, max.(balanced load) **Triple (10% to 100%):** ±1% / ±5% (main / auxilary) ,max.
Cross Regulation **(1)**		**Dual:** ±5% **Triple:** ±5%
Ripple&Noise **(2)**		**Single&Dual :** 100mVpk-pk,max. **Triple :** 50 / 75mVpk-pk, max. (main / auxilary)
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
	±5V output	±6.2V
	±12V output	±15V
	±15V output	±18V
Over Load Protection		150% of FL, typ.
Short Circuit Protection		Indefinite(hiccup) (Automatic Recovery)
Temperature Coefficient		±0.02%/°C
Capacitive Load **(3)**		See table
Transient Recovery Time **(4)**		250us, typ.
Transient Response Deviation **(4)**		±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)**		20mApk-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)

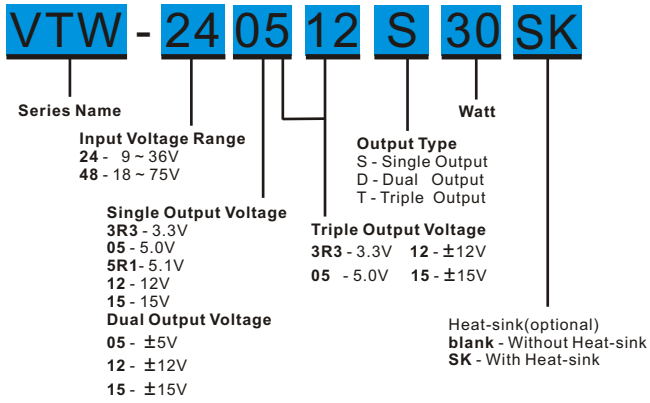
These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.

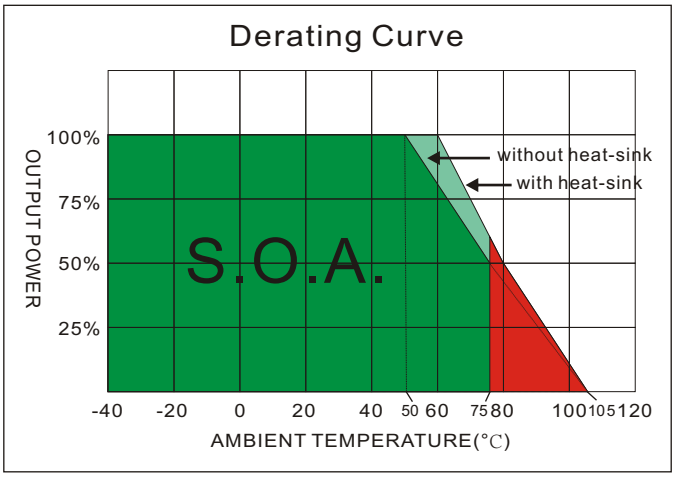
Input Surge Voltage(100mS)	
24 Models	50 Vdc, max.
48 Models	100 Vdc, max.
Soldering Temperature (1.5mm from case 10sec max.)	260°C, max.

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

PART NUMBER STRUCTURE





MODEL SELECTION GUIDE

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

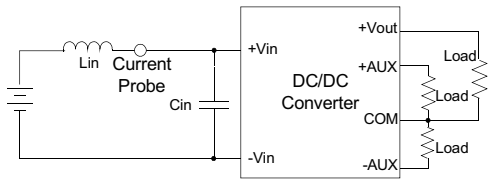
NOTE

1. 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% to100%.
2. Measured with 20MHz bandwidth and 1.0uF ceramic capacitor.
3. Tested by minimal Vin and constant resistive load.
4. Tested by normal Vin and 25% load step change (75%-50%-25% of Io).
5. Measured Input reflected ripple current with a simulated source inductance of 4.7uH and a source capacitor Cin(33uF, ESR<1.0Ω at 100KHz).
6. The remote on/off control pin is referenced to -Vin(pin2).
7. The VTW series can meet EN55032 Class A With an external filter in parallel with the input pins .
8. An external filter capacitor is required if the module has to meet IEC61000-4-4 and IEC61000-4-5.
   The filter capacitor Motien suggest: Nippon chemi-con KY series, 220uF/100V.
9. Exceeding the absolute ratings of the unit could cause damage.
   It is not allowed for continuous operating.
10. Nature Convection" is usually about 30-65 LFM but is not equal to still air (0 LFM).

Triple Serics - TEST CONFIGURATIONS

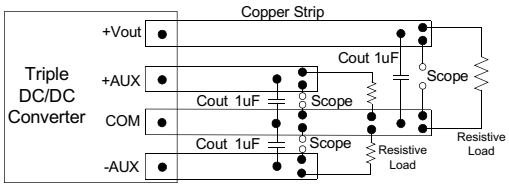
Input Reflected Ripple Current Test Step

Input reflected ripple current is measured through a source inductor Lin(4.7uH) and a source capacitor Cin(33uF, ESR<1.0Ω at 100KHz) at nominal input and full load.



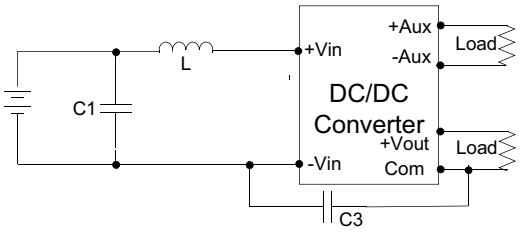
Output Ripple & Noise Measurement Test

Use a capacitor Cout(1.0uF) measurement.
The Scope measurement bandwidth is 0-20MHz.



EMI Filter

Input filter components (C1, C3, L) are used to helpmeet 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.

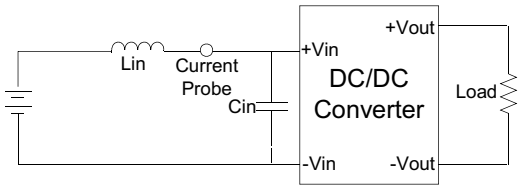


	C1	L	C3
VTW-24XXXXXXXX	100uF, 100V	12uH	1206,470PF, 2KV
VTW-48XXXXXXXX	100uF, 100V	12uH	1206,470PF, 2KV

Single & Dual Serics - TEST CONFIGURATIONS

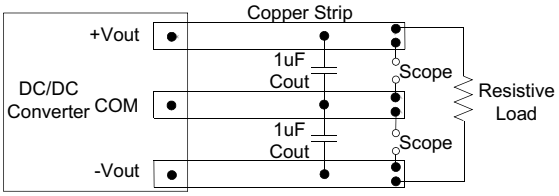
Input Reflected Ripple Current Test Step

Input reflected ripple current is measured through a source inductor Lin(4.7uH) and a source capacitor Cin(33uF, ESR<1.0Ω at 100KHz) at nominal input and full load.



Output Ripple & Noise Measurement Test

Use a capacitor Cout(1.0uF) measurement.
The Scope measurement bandwidth is 0-20MHz.



EMI Filter

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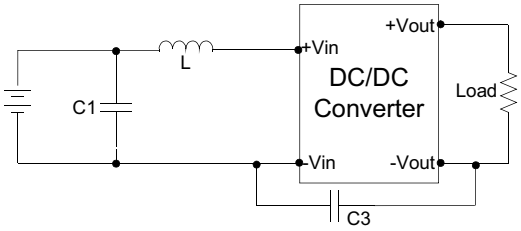
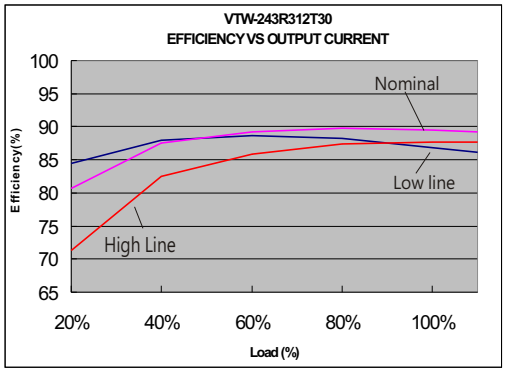
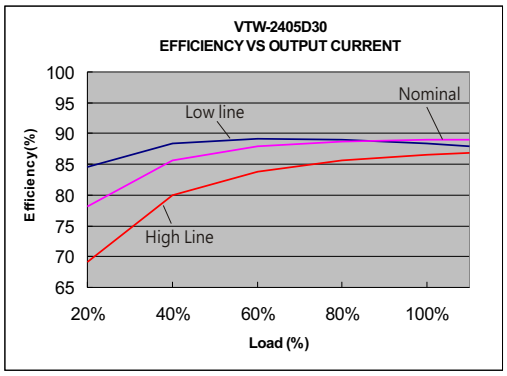
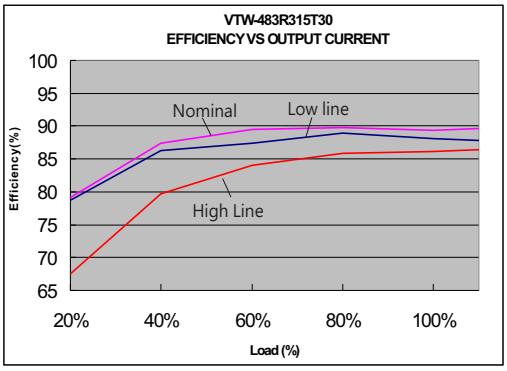


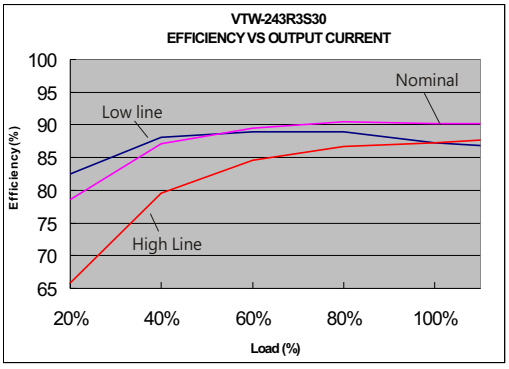
	C1	L	C3
VTW-24XXXXXXXX	100uF, 100V	12uH	1206,470PF, 2KV
VTW-48XXXXXXXX	100uF, 100V	12uH	1206,470PF, 2KV

ELECTRICAL CHARACTERISTIC CURVES

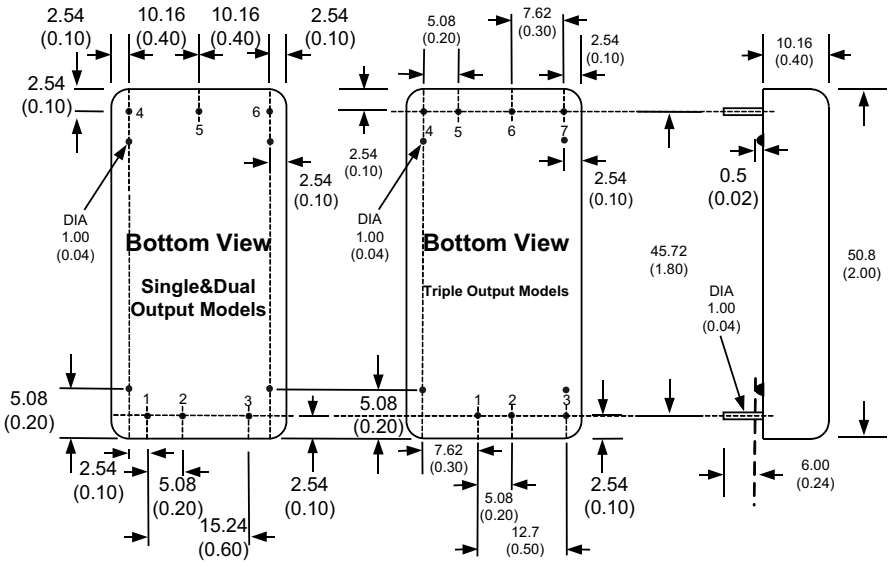








MECHANICAL SPECIFICATIONS



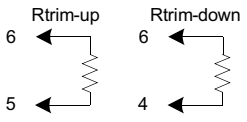
All dimensions are typical in millimeters (inches).

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

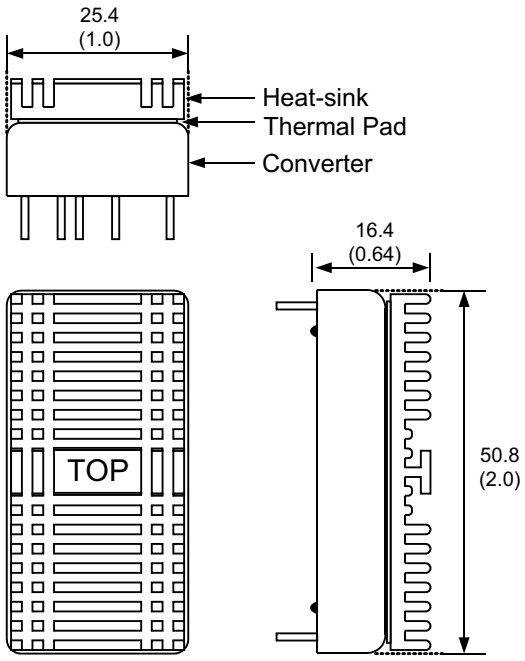
EXTERNAL OUTPUT TRIMMING

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



MECHANICAL SPECIFICATIONS

With Heat-sink



Order code:	VT-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.

ALL PSU LTD, Unit D6 Laser Quay, Culpeper Close
Medway City Estate, Rochester, Kent, ME2 4HU
Tel: 01634 725527, Email: sales@allpsu.co.uk, Web: www.allpsu.co.uk

DRAWING: APPROVED: