

# VTW Series

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

勝特力材料 886-3-5753170  
 勝特力电子(上海) 86-21-34970699  
 勝特力电子(深圳) 86-755-83298787  
 Http://www.100y.com.tw



**MOTIEN**  
TECHNOLOGY

### 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



The VTW 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, ±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	<b>Single&amp;Dual:</b> ±1% <b>Triple:</b> ±1% / ±5% ( main / auxiliary )
Output Voltage Adjustability ( <b>Single Output Only</b> )	±10%, max
Maximum Output Current	See table
Line Regulation	<b>Single&amp;Dual:</b> ±0.5%, max <b>Triple:</b> ±1% / ±5% ( main / auxiliary ), max
Load Regulation	<b>Single ( 0% to 100% ):</b> ±0.5%, max <b>Dual ( 0% to 100% ):</b> ±1%, max(balanced load) <b>Triple ( 10% to 100% ):</b> ±1% / ±5% ( main / auxiliary ), max
Cross Regulation (1)	<b>Dual:</b> ±5% <b>Triple:</b> ±5%
Ripple&Noise (2)	<b>Single&amp;Dual :</b> 100mVp-p,max <b>Triple :</b> 50 / 75mVp-p, 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 ±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 ( <b>No-Load</b> )	See table, max
Input Current ( <b>Full-Load</b> )	See table, typ
Input Reflected Ripple Current (5)	20mA <sub>p-p</sub> , 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 ( 3 sec )	Input/Output 1600Vdc Case/Input & Output 1600Vdc
Isolation Resistance	1000 MΩ, min
Isolation Capacitance	1500 pF, typ
Switching frequency	330kHz, typ
Humidity	95% rel H
Reliability Calculated MTBF ( MIL-HDBK-217 F )	<b>Single&amp;Dual:</b> >435 khrs <b>Triple:</b> >320 khrs
Safety Standard (designed to meet)	IEC/EN 60950-1

EMC CHARACTERISTICS		
Radiated Emissions	EN55022	CLASS A
Conducted Emissions(7)	EN55022	CLASS A
ESD	EN61000-4-2	Perf. Criteria A
RS	EN61000-4-3	Perf. Criteria A
EFT(8)	EN61000-4-4	Perf. Criteria A
Surge (8)	EN61000-4-5	Perf. Criteria A
CS	EN61000-4-6	Perf. Criteria A
PFMF	EN61000-4-8	Perf. Criteria A

PHYSICAL SPECIFICATIONS	
Case Material	Nickel-coated Copper
Base Material	Non-conductive Black Plastic(UL94V-0 rated)
Pin Material	Ø1.0mm Brass Solder-coated
Potting Material	Epoxy (UL94V-0 rated)
Weight	31.0g
Dimensions	2.00"x1.00"x0.40"

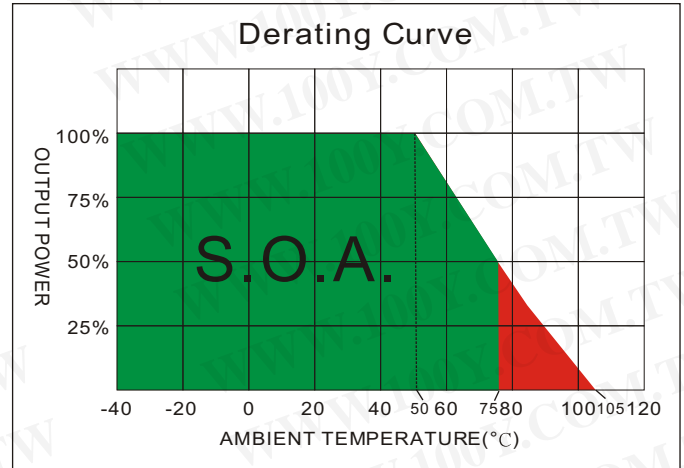
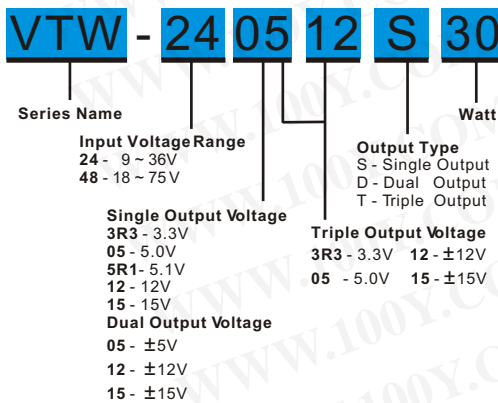
ABSOLUTE SPECIFICATIONS (9)	
These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.	
Input Voltage(100mS)	24 Models -0.7~50 Vdc 48 Models -0.7~100 Vdc
Soldering Temperature (1.5mm from case 10 sec. Max.)	260°C max.

ENVIRONMENTAL SPECIFICATIONS	
Operating Ambient Temperature	-40°C ~ +75°C(See Derating Curve) -40°C ~ +50°C(For 100% load)
Maximum Case Temperature	105°C
Storage Temperature	-40°C ~ +125°C
Over Temperature Protection ( Case )	115°C, typ
Cooling	Nature Convection

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

## PART NUMBER STRUCTURE



## MODEL SELECTION GUIDE

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current		OUTPUT Voltage (Vdc)	OUTPUT Auxiliary (Vdc)	OUTPUT Current		EFFICIENCY @FL(%)	Capacitor Load(μF)
		No-Load (mA)	Full Load (mA)			Min-Load (mA)	Full Load (mA)		
VTW-243R3S30	9-36	60	1185	3.3		0	7500	89	20000
VTW-2405S30	9-36	100	1420	5		0	6000	91	14000
VTW-245R1S30	9-36	90	1448	5.1		0	6000	91	14000
VTW-2412S30	9-36	30	1436	12		0	2500	90	2000
VTW-2415S30	9-36	30	1420	15		0	2000	91	2000
VTW-483R3S30	18-75	50	593	3.3		0	7500	89	20000
VTW-4805S30	18-75	60	702	5		0	6000	91	14000
VTW-485R1S30	18-75	60	724	5.1		0	6000	91	14000
VTW-4812S30	18-75	30	718	12		0	2500	90	2000
VTW-4815S30	18-75	30	710	15		0	2000	90	2000
VTW-2405D30	9-36	120	1437	±5		0	±3000	90	±3000
VTW-2412D30	9-36	30	1453	±12		0	±1250	89	±1300
VTW-2415D30	9-36	40	1437	±15		0	±1000	89	±1300
VTW-4805D30	18-75	70	710	±5		0	±3000	91	±3000
VTW-4812D30	18-75	30	718	±12		0	±1250	90	±1300
VTW-4815D30	18-75	40	718	±15		0	±1000	90	±1300
VTW-243R312T30	9-36	80	1287	3.3	±12	500 / ±42	5000 / ±420	89	15000 / ±220
VTW-243R315T30	9-36	90	1279	3.3	±15	500 / ±33	5000 / ±330	89	15000 / ±220
VTW-240512T30	9-36	100	1440	5	±12	400 / ±42	4000 / ±420	89	8000 / ±220
VTW-240515T30	9-36	110	1431	5	±15	400 / ±33	4000 / ±330	90	8000 / ±220
VTW-483R312T30	18-75	50	636	3.3	±12	500 / ±42	5000 / ±420	89	15000 / ±220
VTW-483R315T30	18-75	50	640	3.3	±15	500 / ±33	5000 / ±330	89	15000 / ±220
VTW-480512T30	18-75	60	712	5	±12	400 / ±42	4000 / ±420	91	8000 / ±220
VTW-480515T30	18-75	60	707	5	±15	400 / ±33	4000 / ±330	90	8000 / ±220

### NOTE

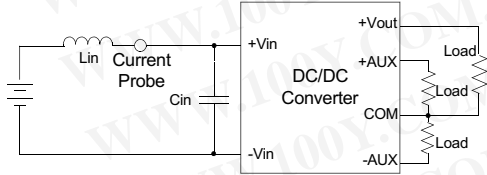
- Dual: One load is 25% to 100% load, the other load is 100% load, the output voltage variable rate is within ±5%.  
Triple: Main output 100% load, auxiliary 100%, other auxiliary 25% to 100%.  
Auxiliary outputs (+ Aux and -Aux) : main output 100% load, auxiliary 100%, other auxiliary 25% to 100% or 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 12uH.
- The remote on/off control pin is referenced to -Vin(pin2).
- The VTW 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 Motien 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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**Triple Series - TEST CONFIGURATIONS**

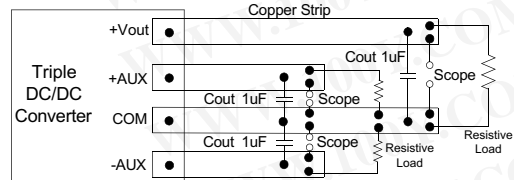
**Input Reflected Ripple Current Test Step**

Input reflected ripple current is measured through a source inductor  $L_{in}$ (4.7uH) and a source capacitor  $C_{in}$ (33uF, ESR<1.0Ω at 100KHz) at nominal input and full load.



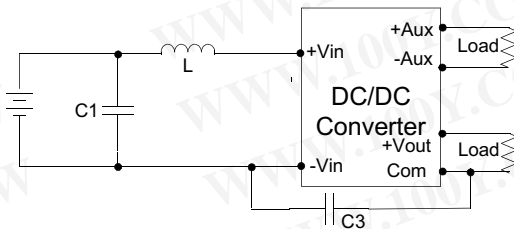
**Output Ripple & Noise Measurement Test**

Use a capacitor  $C_{out}$ (1.0uF) 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.

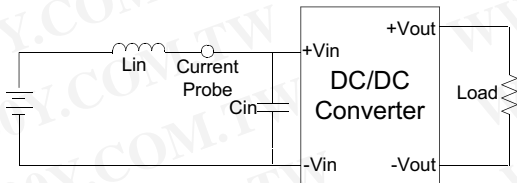


	C1	L	C3
VTW-24XXXXXXXXXX	100uF, 100V	12uH	1206,470PF, 2KV
VTW-48XXXXXXXXXX	100uF, 100V	12uH	1206,470PF, 2KV

**Single & Dual Series - TEST CONFIGURATIONS**

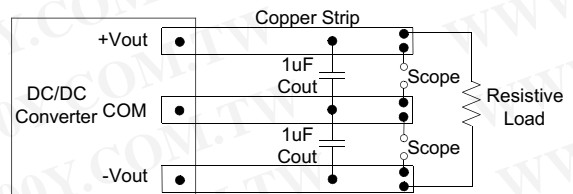
**Input Reflected Ripple Current Test Step**

Input reflected ripple current is measured through a source inductor  $L_{in}$ (4.7uH) and a source capacitor  $C_{in}$ (33uF, ESR<1.0Ω at 100KHz) at nominal input and full load.



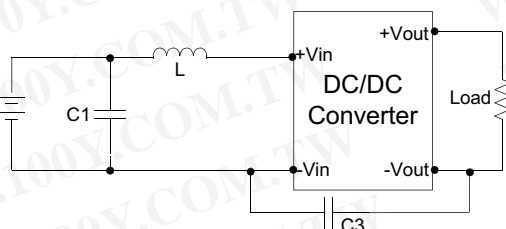
**Output Ripple & Noise Measurement Test**

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



**EMI Filter**

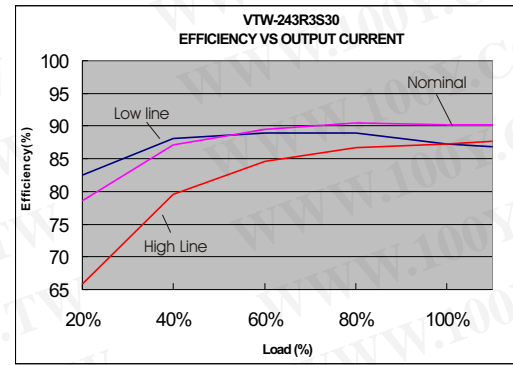
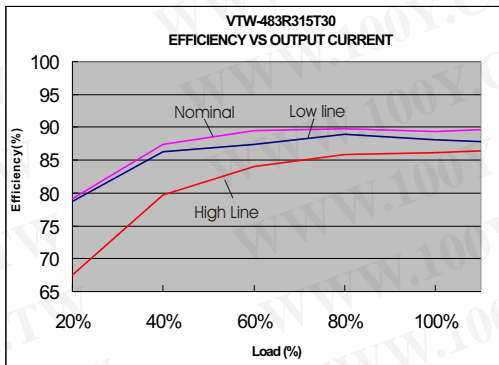
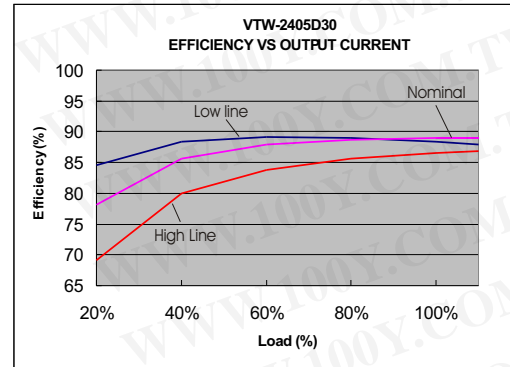
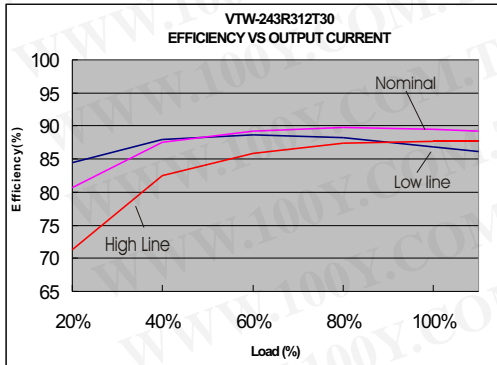
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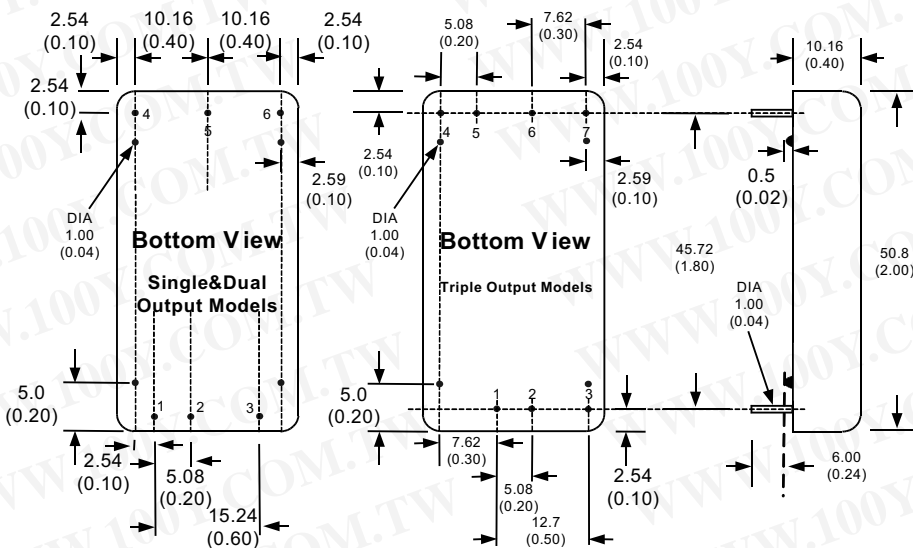
	C1	L	C3
VTW-24XXXXXXXXXX	100uF, 100V	12uH	1206,470PF, 2KV
VTW-48XXXXXXXXXX	100uF, 100V	12uH	1206,470PF, 2KV

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### ELECTRICAL CHARACTERISTIC CURVES



### MECHANICAL SPECIFICATIONS



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)

- 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 )



No. 9, Keji2nd Rd., Technology Industrial Park, Tainan City 70955, Taiwan  
 Tel: 886-6-384 2366 (Rep.) Fax: 886-6-384 2399  
 Website : [www.motien.com.tw](http://www.motien.com.tw) Email : [sales@motien.com.tw](mailto:sales@motien.com.tw)

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