VT15B
VTW15B SERIES

15 Watt DC/DC Converter
Single and Dual Output
1500 Vdc Isolation

vitec dc conversion

FEATURES AND APPLICATIONS

- 2:1 and 4:1 Input Range
- High Efficiency up to 91%
- DIL24 Package
- Low Ripple & Noise
- UL60950-1 certifed
- RoHS ✓

GENERAL DESCRIPTION

The VT15B and VTW15B series is a family of 15 Watt single and dual output DC-DC converters. These converters combine five side shielded nickel-coated copper package in a 24-pin DIL compatible case with high performance features such as 1500 Vdc input/output isolation voltage, continuous short circuit protection with automatic restart and tight line and load regulation.
Models operate from a 2:1 or a 4:1 input bus voltage of 12, 24 and 48 Vdc offering output voltage levels of 3.3, 5, 12, 15, ±5, ±12 and ±15 Vdc. Cooling is by free-air convention.

2:1 Input – Single and Dual Outputs

Type Number	Input Voltage [Vdc]	Output Voltage [Vdc]	Output Current [mA]	Input Current no load [mA] 12/24/48	Output Ripple & Noise [mVpp]	Efficiency [%] 12/24/48	max. Cap. Load [µF]
VT15B-xx3R3S	12 24 48	3.3	4000	10/6/4	60	87/88/88	4700
VT15B-xx05S		5.1	3000	10/6/4	60	90/90/90	3300
VT15B-xx12S		12.0	1250	5/4/4	60	90/91/90	600
VT15B-xx15S		15.0	1000	10/6/4	60	90/91/91	400
VT15B-xx05D		± 5.0	± 1500	10/4/4	60	86/87/87	± 1500
VT15B-xx12D		± 12.0	± 625	6/6/4	60	90/90/90	± 288
VT15B-xx15D		± 15.0	± 500	10/6/4	60	90/90/90	± 200

4:1 Input – Single and Dual Outputs

Type Number	Input Voltage [Vdc]	Output Voltage [Vdc]	Output Current [mA]	Input Current no load [mA] 24/48	Output Ripple & Noise [mVpp]	Efficiency [%] 24/48	max. Cap. Load [µF]
VTW15B-xx3R3S	24 48	3.3	4000	6/4	60	88/89	4700
VTW15B-xx05S		5.1	3000	6/4	60	90/89	3300
VTW15B-xx12S		12.0	1250	6/4	60	90/90	600
VTW15B-xx15S		15.0	1000	6/4	60	90/90	400
VTW15B-xx05D		± 5.0	± 1500	6/4	60	86/86	± 1500
VTW15B-xx12D		± 12.0	± 625	6/4	60	89/89	± 288
VTW15B-xx15D		± 15.0	± 500	6/4	60	90/90	± 200

xx … nominal Input voltage:

VT15B-Series: **12 (9 – 18 Vdc)**
24 (18 – 36 Vdc)
48 (36 – 75 Vdc)

VTW15B-Series: **24 (9 – 36 Vdc)**
48 (18 – 75 Vdc)

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ELECTRICAL SPECIFICATIONS

Specifications typical at +25°C, nominal Input voltage, rated output current unless otherwise specified.

Input Specifications

	2:1 input (VT15B-Series)	4:1 input (VTW15B-Series)
Input Voltage Range	12V: 9 to 18 Vdc 24V: 18 to 36 Vdc 48V: 36 to 75 Vdc	24V: 9 to 36 Vdc 48V: 18 to 75 Vdc
Input Filter	Pi type	
Input Surge Voltage	12V: 36 Vdc, 1 sec, max. 24V: 50 Vdc, 1 sec, max. 48V: 100 Vdc, 1 sec, max.	
Input Reflected Ripple Current	20 mApp	
Start Up time (nom. input, const. res. load)	60 mS, max.	

Output Specifications

Output Power		15 Watts, max.
Output Voltage Accuracy		±1.0%
Min. Load for specified regulation		0%
Ripple and Noise (20 MHz BW)		see table
Line Voltage Regulation	Single:	±0.2% (LL to HL at full load)
	Dual:	±0.5% (LL to HL at full load)
Load Voltage Regulation	Single:	±0.5% (No load to full load)
	Dual:	±1% (No load to full load)
Cross Regulation (Dual)		±5% (Asym. load 25%/100% FL)
Temperature Coefficient		±0.02%/°C, max.
Over Load Protection		150% (of FL at nominal input)
Short Circuit Protection		Continuous (Hiccup)
Over Voltage Protection (Zener diode clamp, Single only)	3.3 Vout:	3.9 Vdc
	5.1 Vout:	6.2 Vdc
	12 Vout:	15 Vdc
	15 Vout:	18 Vdc
Transient response recovery time		250 µsec (25% load step change)

General Specifications

Efficiency	see table
Switching Frequency	330 kHz, ±10%
Isolation Voltage	1500 Vdc, min. (1 minute)
Isolation Resistance	10^9 Ohms, min.
Isolation Capacitance	2000 pF, max.
Approvals	UL60950-1certified (E352836) IEC/EN60950-1 (designed to meet)

Remote ON/OFF Control

Control Voltage referenced to negative (-) input (Positive logic)

ON-Control:	3.0 to 12 V or open
OFF-Control:	0 to 1.2 V or short

Input current of remote control pin -0.5 mA to 0.5 mA, max.

Remote off input current 2.5 mA

Environmental Specification

Operating Temperature	-40°C to +100°C with Derating
Storage Temperature	-55°C to +125°C
Max. Case Temperature	+105°C
Thermal Impedance	20°C/Watt (Natural Convection)
Cooling	Free-air Convection
MTBF	VT-Series / VTW-Series
MIL-HDBK-217F:	3.370 x 10^6 Hrs / 3.370x 10^6 Hrs *
Bellcore TR-NWT-000332:	4.640 x 10^5 Hrs / 4.130x 10^5 Hrs **
Thermal Shock	MIL-STD-810F
Vibration	MIL-STD-810F
Relative Humidity	5% to 95% RH

* Notice2 @25°C, FL, Ground, Benign, controlled environment
** Case1, 50% Stress, 40°C

Physical Characteristics

Dimensions	31.8 x 20.3 x 10.2 mm 1.25 x 0.80 x 0.40 inches
Case Material	Nickel-coated copper
Base Material	FR4 PCB
Potting Material	Silicon (UL94-V0)
Weight	14.4 g

EMC Characteristics

EMI	EN55022	Class A
ESD	EN61000-4-2	Perf. Criteria A (Air ±8 kV; Contact ±6 kV)
Radiated Im.	EN61000-4-3	Perf. Criteria A (10 V/m)
F. Transients.	EN61000-4-4	Perf. Criteria A (±2 kV)
Surge	EN61000-4-5	Perf. Criteria A (± 1 kV)

An external filter capacitor is required if the module has to meet EN61000-4-4 and EN61000-4-5. Recommended: 220 µF/100 V, ERS 48 mΩ

Conducted I.	EN61000-4-6	Perf. Criteria A (10 Vrms)

CAUTION: This power module is not internally fused. An input line fuse must always be used!

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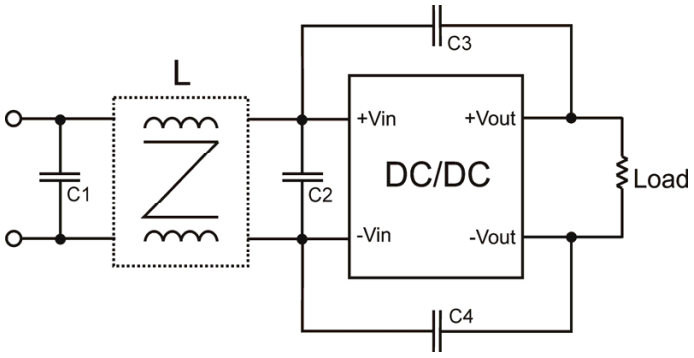
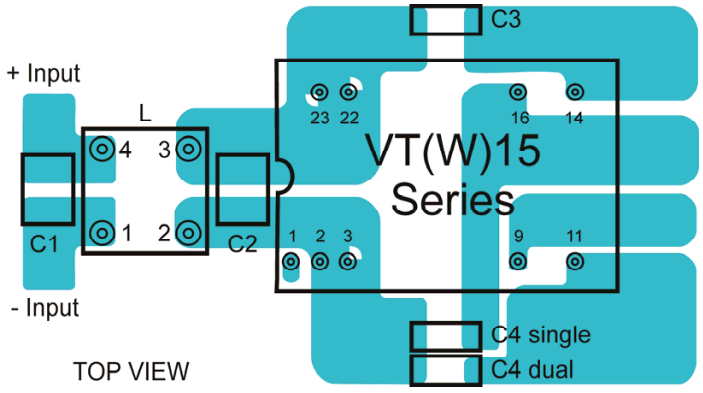
Recommended Filter for EN55022 Class B Compliance



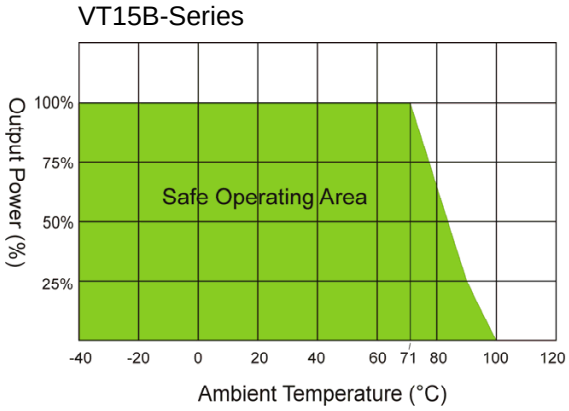
Recommended Components as follows:

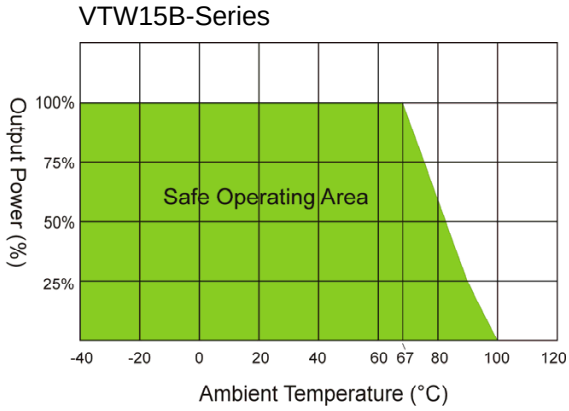
	Class B Compilance			
	C1	C2	C3, C4	L
VT15B-12xxS VT15B-24xxS VTW15B-24xxS	2.2 µF / 50V 1812 MLCC	-	-	325 µH Common Choke PMT-050
VT15B-48xxS VTW15B-48xxS	2.2 µF / 100V 1812 MLCC	-	-	325 µH Common Choke PMT-050
VT15B-12xxD VT15B-24xxD VTW15B-24xxD	2.2 µF / 50V 1812 MLCC	-	330 pF / 2kV MLCC	325 µH Common Choke PMT-050
VT15B-48xxD VTW15B-48xxD	2.2 µF / 100V 1812 MLCC	-	330 pF / 2kV MLCC	145 µH Common Choke PMT-050

Recommended EN55022 Class B Filter Circuit Layout:



Derating

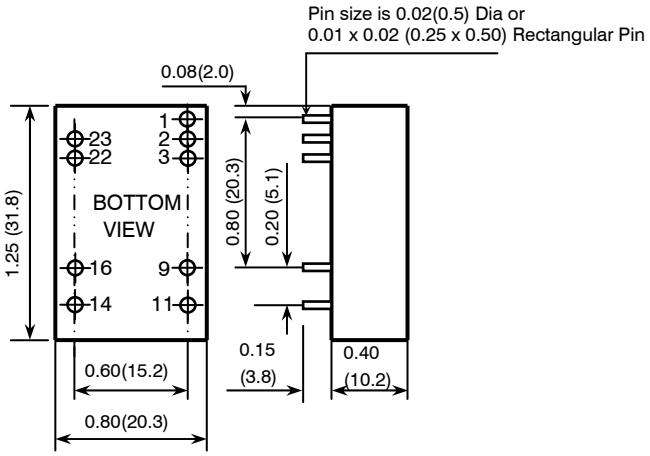




PIN Connections DIL 24 Package

Standard PIN Connections DIL24		
Pin	Single	Dual
1	ON/OFF	ON/OFF
2	-V Input	-V Input
3	-V Input	-V Input
9	NC	Common
11	NC	-V Output
14	+V Output	+V Output
16	-V Output	Common
22	+V Input	+V Input
23	+V Input	+V Input

NC … not connected



Notes: All dimensions in millimeters (inches). Tolerance ±0.25mm (0.01).

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