

WAF 150

WAD150

APPLICATIONS

- Wireless Network
- Telecom/Datacom
- Industry Control System
- Distributed Power Architectures
- Semiconductor Equipment
- Battery charger

FEATURES

- 200 WATTS MAXIMUM OUTPUT POWER
- HIGH EFFICIENCY UP TO 87%
- 4:1 WIDE INPUT RANGE
- CV+CC MODE
- FIXED SWITCHING FREQUENCY
- SIX-SIDED METAL SHIELDING
- WALL MOUNT APPLICATION
- CE MARK MEETS 2006/95/EC, 93/68/EEC AND 2004/108/EC
- **DESIGN MEETS UL60950-1, EN60950-1 AND IEC60950-1**
- ISO9001 CERTIFIED MANUFACTURING FACILITIES
- COMPLIANT TO RoHS EU DIRECTIVE 2002/95/EC

OPTIONS

Negative remote ON/OFF control.

DESCRIPTION

WAF(D)150-SERIES DC/DC converters provide up to 200 watts of output power. All model features a wide input range, trimmable output voltage and constant current mode output limit. The WAF(D)150 Converters are especially suited to telecom, networking and industrial application.

TECHNICAL SPECIFICATION All specifications are typical at nominal input, full load and 25°C otherwise noted

OUTPUT SPECIFICATIONS		
Output power (Rated)	Normal Vout and Iout	150 Watts
Output power (Maximum)	Vout trim to maximum and CC mode Iout	200 Watts
Voltage accuracy	Full load and nominal Vin	± 1.0%
Minimum load		0%
Voltage adjustability (Note 9)		0% ~ +20%
Line regulation	LL to HL at FL	0.2%
Load regulation	No Load to Full Load	0.4%
Temperature coefficient		±0.02% / °C, max
Transient response recovery time	25% load step change	200µS
Over voltage protection threshold	Hiccup	125% ~ 140% of Vout(nom.)
Over Load protection threshold	CC Mode (Note 10)	105% ~ 120% of Full Load
Short circuit protection		Hiccup
GENERAL SPECIFICATIONS		
Efficiency		See table
Isolation voltage	Input to Output	2250 VDC, min.
	Input to Case	1600 VDC, min.
	Output to Case	1600 VDC, min.
Isolation resistance		10 ⁹ ohms, min.
Isolation capacitance		2500pF, max.
Switching frequency		220~330KHz, Fix Frequency.
Design meets safety standard IEC60950-1, UL60950-1, EN60950-1		
Case material		Metal
Base material		Metal
Potting material		Silicon. (UL94-V0)
Dimensions	WAF	3.86X2.56X0.67 Inch(98X65X17 mm)
	WAD	3.86X2.067X0.67 Inch (98X52.5X17 mm)
Weight	WAF	225g
	WAD	220g
MTBF (Note 1)	BELLCORE TR-NWT-000332	1.834 x 10 ⁶ hrs
	MIL-HDBK-217F	1.826 x 10 ⁵ hrs

INPUT SPECIFICATIONS		
Input voltage range	24V Nominal input	9 – 36VDC
	48V Nominal input	18 – 75VDC
Input filter		Common choke + PI type
Input surge voltage	24V input	50VDC
	48Vinput	100VDC
Start up time	Nominal Vin and constant resistive load	Power up Remote ON/OFF
Start-up voltage	24V input	8.8VDC typ.
	48V input	17.6VDC typ.
Shutdown voltage	24V input	8.2VDC typ.
	48V input	16.5VDC typ.
Remote ON/OFF (Note 5)		
Positive logic (standard)	DC-DC ON	Open or 3V < Vr < 12V
	DC-DC OFF	Short or 0V < Vr < 1.2V
Negative logic (option)	DC-DC ON	Short or 0V < Vr < 1.2V
	DC-DC OFF	Open or 3V < Vr < 12V
Input current of remote control pin	Nominal Vin	-0.5mA ~ 1.0mA
Remote off state input current	Nominal Vin	3.5mA
Input reverse polarity protection (Note 8)		Input Parallel diode
ENVIRONMENTAL SPECIFICATIONS		
Operating ambient temperature		-40°C to +85°C (with derating)
Maximum case temperature		+100°C
Storage temperature range		-55°C to +125°C
Over temperature protection (case temperature)		110°C, typ.
Thermal impedance (Note 11)	Only with baseplate	2.73°C/Watt
	With baseplate and 17mm heatsink	2.18°C/Watt
	With baseplate and 25mm heatsink	1.98°C/Watt
Thermal shock		MIL-STD-810F
Vibration		MIL-STD-810F
Humidity max, Non-condensing		5% ~ 95%
EMC CHARACTERISTICS		
EMI (Note 6)	EN55022	Class A
ESD	EN61000-4-2	Air ± 8KV
		Contact ± 6KV
Radiated immunity	EN61000-4-3	10 V/m Perf. Criteria A
Fast transient (Note 7)	EN61000-4-4	± 2KV Perf. Criteria A
Surge (Note 7)	EN61000-4-5	± 1KV Perf. Criteria A
Conducted immunity	EN61000-4-6	10 Vr.m.s Perf. Criteria A

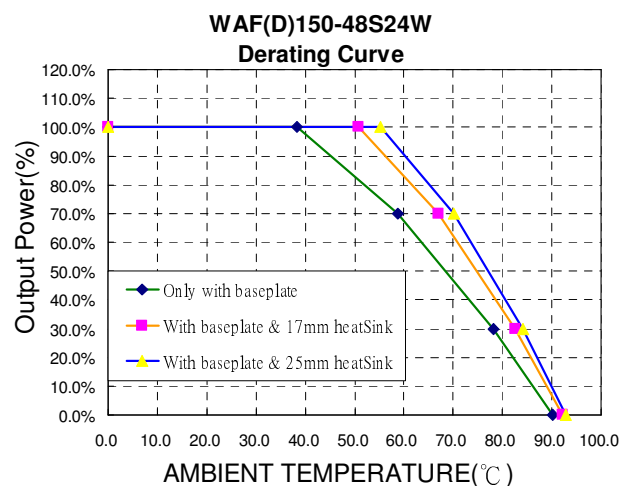
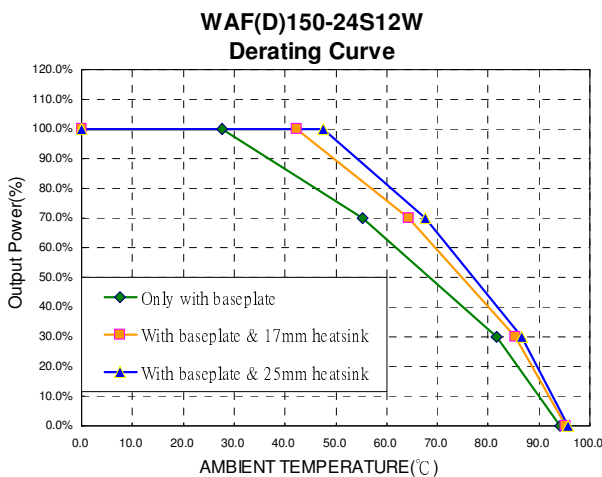




Model Number	Input Range	Output Voltage	Output Current		Output ⁽⁴⁾ Ripple & Noise	Input Current		Eff ⁽⁴⁾ (%)
			Min. load	Full load		No load ⁽³⁾	Full load ⁽²⁾	
WAF150-24S12W WAD150-24S12W	9 – 36 VDC	12 VDC	0mA	12.5 A	100mVp-p	80mA	7.62A	85
WAF150-24S15W WAD150-24S15W	9 – 36 VDC	15 VDC	0mA	10 A	100mVp-p	80mA	7.62A	85
WAF150-24S24W WAD150-24S24W	9 – 36 VDC	24 VDC	0mA	6.3 A	200mVp-p	95mA	7.59A	86
WAF150-24S28W WAD150-24S28W	9 – 36 VDC	28 VDC	0mA	5.4 A	200mVp-p	95mA	7.59A	86
WAF150-24S48W WAD150-24S48W	9 – 36 VDC	48 VDC	0mA	3.2 A	350mVp-p	95mA	7.71A	86
WAF150-48S12W WAD150-48S12W	18 – 75 VDC	12 VDC	0mA	12.5 A	100mVp-p	60mA	3.77A	86
WAF150-48S15W WAD150-48S15W	18 – 75 VDC	15 VDC	0mA	10 A	100mVp-p	60mA	3.77A	86
WAF150-48S24W WAD150-48S24W	18 – 75 VDC	24 VDC	0mA	6.3 A	200mVp-p	75mA	3.75A	87
WAF150-48S28W WAD150-48S28W	18 – 75 VDC	28 VDC	0mA	5.4 A	200mVp-p	75mA	3.75A	87
WAF150-48S48W WAD150-48S48W	18 – 75 VDC	48 VDC	0mA	3.2 A	350mVp-p	75mA	3.81A	87

Note

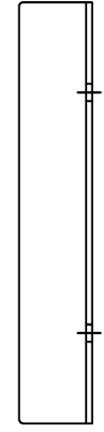
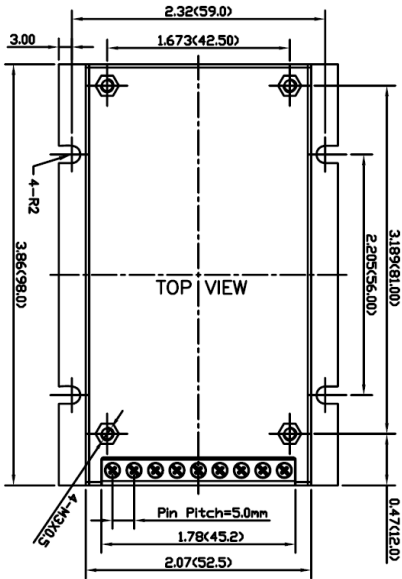
- BELLCORE TR-NWT-000332. Case 1: 50% Stress, Temperature at 40°C.
MIL-HDBK-217F Notice2 @Ta=40 °C, Full load , Air Flow = 400LFM (Ground, Benign, controlled environment).
- Maximum value at nominal input voltage and full load.
- Typical value at nominal input voltage and no load.
- Typical value at nominal input voltage and full load. (20MHZ BW.)
- The ON/OFF control pin voltage is referenced to -Vin.
- The WAF(D)150 series meets EN55022 class A.
- An external input filter capacitor is required if the module has to meet EN61000-4-4, EN61000-4-5.
- The function needs an external fuse in the input.
- Use a resistor across on the Trim1 and Trim2 to adjust the output voltage.
- The CC Mode is Constant Current Mode. And test by nominal input voltage.
- Thermal test with iron base-plate. (The base-plate dimension is 19" * 3.5" * 0.63" The height is EIA standard 2U.)





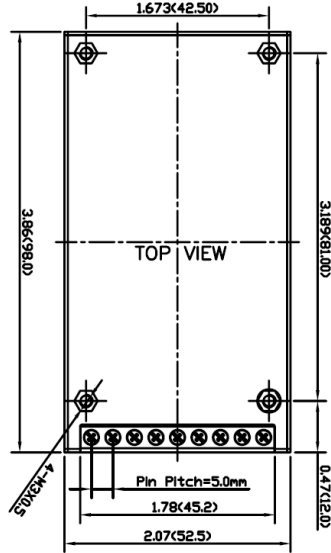
Mechanical Drawing

WAF150 DIMENSIONS

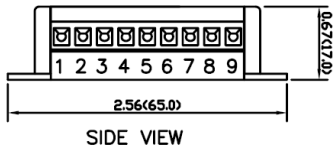


SIDE VIEW

WAD150 DIMENSIONS

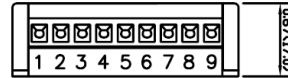


SIDE VIEW



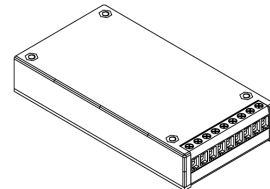
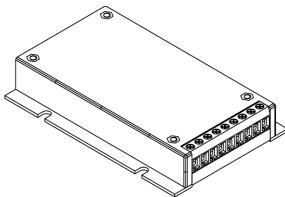
SIDE VIEW

- Note:1.All dimensions in Inches (mm)
 2.Pin pitch tolerance $\pm 0.25\text{mm}$
 3.Tolerance : $x.xx \pm 0.02(x.x \pm 0.5)$
 $x.xxx \pm 0.01(x.xx \pm 0.25)$
 4.Terminal Block Pin Pitch:5.0mm



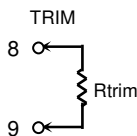
SIDE VIEW

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 2.Pin pitch tolerance $\pm 0.25\text{mm}$
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 $x.xxx \pm 0.01(x.xx \pm 0.25)$
 4.Terminal Block Pin Pitch:5.0mm



EXTERNAL OUTPUT TRIMMING

Output can be externally trimmed by using the method shown below.



PIN CONNECTION

PIN	Define	Recommend Matching Wire (AWG.)
1	+VIN	14~16AWG
2	+VIN	14~16AWG
3	-VIN	14~16AWG
4	-VIN	14~16AWG
5	CTRL	14~24AWG
6	+VOUT	14~16AWG
7	-VOUT	14~16AWG
8	TRIM 1	14~24AWG
9	TRIM 2	14~24AWG

PRODUCT OPTIONS TABLE

Option	Suffix
Positive remote ON/OFF logic	-
Negative remote ON/OFF logic	-N

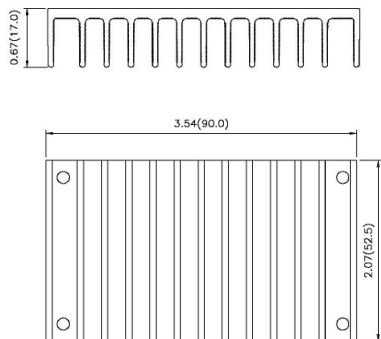
Example :

- WAF150-48S12W
- WAD150-48S28W
- WAF150-24S24W-N



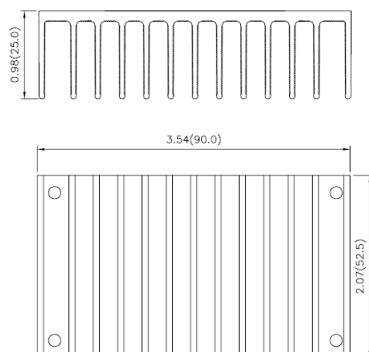


7G-0058A-F



unit: inch(mm)

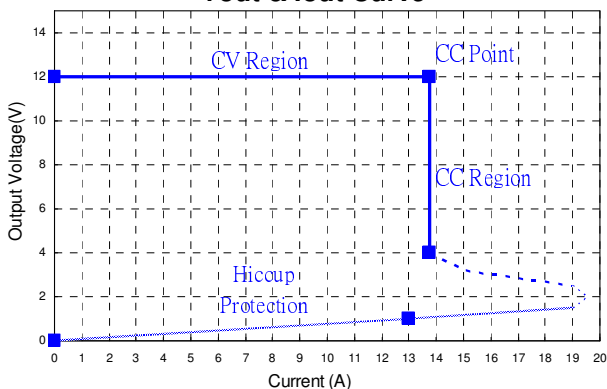
7G-0059A-F



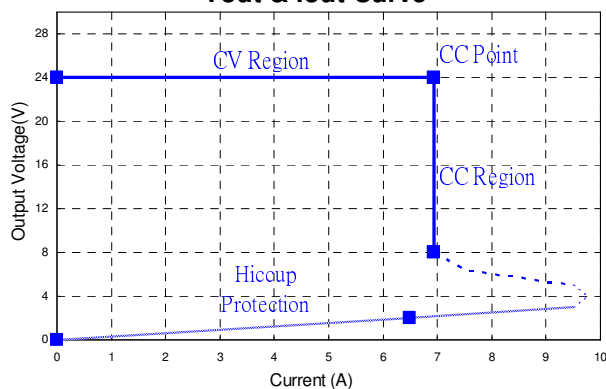
unit: inch(mm)

HEATSINK		P/N
Horizontal	H=0.670" (17mm)	7G-0058A-F
	H=0.984" (25mm)	7G-0059A-F

**WAF(D)150-24S12W
Vout & Iout Curve**



**WAF(D)150-48S24W
Vout & Iout Curve**



Notes:

- CV Region: In normal operation. The output current in spec.
Condition: Resistance Load > Vout / Iout (CC Point)
- CC Region: If the output load current are over rating. The output current will keep in a constant value. And output voltage will fall.
Condition: Resistance Load < Vout / Iout (CC Point)
- Hiccup Protection: If the output resistance is become short. It will operate in hiccup protection.
Condition: Vout < 4V to Output Short. (WAF(D)150-24S12W)
Vout < 8V to Output Short. (WAF(D)150-48S24W)

