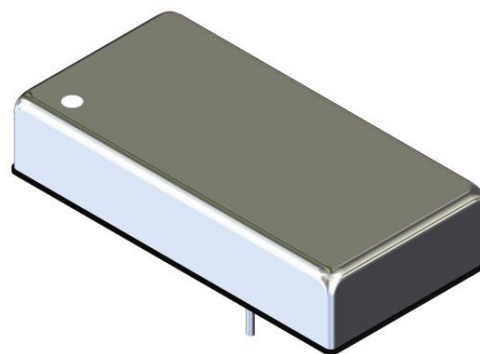


Features

- 40 Watts output power
- Efficiency up to 92%
- 4:1 Wide input voltage range
- -40C to +105C wide operating temperature with derating
- Low no-load power consumption_10mA with remote-on mode
- Continuous Short Circuit Protection
- Standard 2" x 1" Metal Package
- External ON/OFF control
- RoHS Compliant
- Built-in EMI filter to meet class A
- Designed to meet IEC 60950-1



Electrical Specifications: Regulated

INPUT SPECIFICATIONS

Measured at 25°C with the condition of V_{IN} = Nominal and Full Load. Specifications subject to change without notice.

PARAMETER	CONDITION / NOTE	MIN	TYP	MAX	UNIT
Input Voltage Range	4:1; See Model Selection Guide				
Input Filter	π				
Start Up Times	V_{IN} = Nominal Input, full output load		40		ms
Under Voltage Lockout			8		V
Remote ON/OFF	DC/DC Converter ON, leave open, See Note 1	3.0		12	V
Remote ON/OFF	DC/DC Converter OFF, short to ground, See Note 1	0		1.2	V

OUTPUT SPECIFICATIONS

PARAMETER	CONDITION / NOTE	MIN	TYP	MAX	UNIT
Output Voltage	See Model Selection Guide				
Output Current	See Model Selection Guide				
Output Voltage Accuracy				±1	%
Output Voltage Adjustment			±10		%
Ripple & Noise	@20MHz BW, see model selection guide, see note 2,5				mV _{pp}
Line Regulation	Single output, minimum V_{IN} to maximum V_{IN}			±0.2	%
Line Regulation	Dual output, minimum V_{IN} to maximum V_{IN}			±0.5	%
Load Regulation	Single models			±0.5	%
Load Regulation	Dual models (0% to 100% load)			±1	%
Cross Regulation	25% of FL to FL, dual models only, See Note 3			±5	%
Minimum Load	None, See Note 4				%
Over Load Protection	Nominal input		150		%
Short Circuit Protection	Continuous, Auto-Restarting				
Temperature Coefficient				±0.05	%/°C
Transient Response	75% of F.L to Full Load		500		μS

GENERAL SPECIFICATIONS

PARAMETER	CONDITION / NOTE	MIN	TYP	MAX	UNIT
Efficiency @ FL	See Model Selection Guide				
Isolation Voltage (1 min.), Input to Output		1600			Vdc
Isolation Resistance		1			GΩ
Isolation Capacitance				1500	pF
Operating Frequency	100% of Load at nominal input	220	250	285	kHz
Vibration	MIL-STD-202G				
Safety	Designed to meet IEC 60950-1				

ENVIRONMENTAL SPECIFICATIONS

PARAMETER	CONDITION / NOTE	MIN	TYP	MAX	UNIT
Operating Temperature Range	Ambient; V_{IN} = Nominal Input, see figure 3.	-40		+100	°C
Storage Temperature Range		-55		+125	°C
Case Temperature				105	°C
Humidity		5		95	%
MTBF	per MIL-HDBK-217F@25 °C		TBD		hrs

EMC

PARAMETER	CONDITION / NOTE	
EMI	EN55022,	CLASS A/B
ESD	EN61000-4-2, Air ± 8 kV; Contact ± 4 kV	Perf. Criteria A
Radiated Immunity	EN61000-4-3, 10V/M	Perf. Criteria A
Fast Transient	EN61000-4-4, ± 1 kV	Perf. Criteria A
Surge	EN61000-4-5, ± 1 kV	Perf. Criteria A
Conducted Immunity	EN61000-4-6, 10V _{RMS}	Perf. Criteria A
PMF	EN61000-4-8, 50Hz, 1A/m _{rms}	Perf. Criteria A

PHYSICAL CHARACTERISTICS

PARAMETER	CONDITION / NOTE	MIN	TYP	MAX	UNIT
Dimensions (L×W×H)	2.00 x 1.00 x 0.41 in. (50.80 × 25.40 × 10.50mm)				
Weight	0.95 oz. (27g)				
Case Material	Nickel Plated Copper				
Base Material	FR4 PCB				
Potting Material	Silicon (UL94V-0)				

MODEL SELECTION GUIDE

MODEL NUMBER	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT	EFFICIENCY	CAPACITIVE LOAD	RIPPLE & NOISE
	V _{dc}	V _{dc}	mA	%	μF	mV _{pp}
FW40S3.3/24	9-36	3.3	10000	88	26600	100
FW40S5/24	9-36	5	8000	90	20000	100
FW40S12/24	9-36	12	3333	92	3900	125
FW40S15/24	9-36	15	2666	92	2600	125
FW40D12/24	9-36	±12	±1666	90	±2600	125
FW40D15/24	9-36	±15	±1333	90	±1600	125
FW40D24/24	9-36	±24	±833	91	±650	200
FW40S3.3/48	18-75	3.3	10000	88	26600	100
FW40S5/48	18-75	5	8000	90	20000	100
FW40S12/48	18-75	12	3333	92	3900	125
FW40S15/48	18-75	15	2666	92	2600	125
FW40D12/48	18-75	±12	±1666	90	±2600	125
FW40D15/48	18-75	±15	±1333	90	±1600	125
FW40D24/48	18-75	±24	±833	91	±650	200

ORDERING GUIDE

FW40 **Power** **Number of Outputs (S = Single, D = Dual)** **Output Voltage** **Input Voltage**

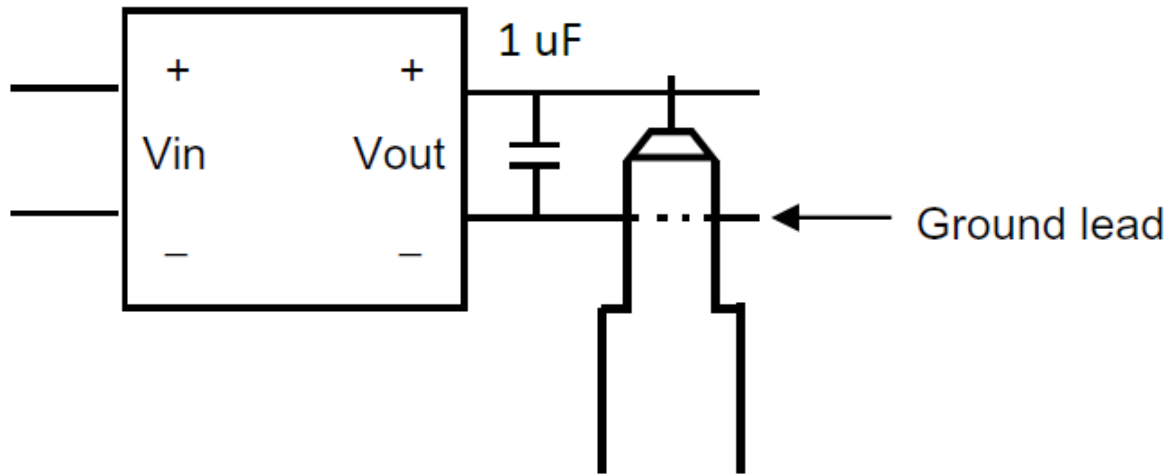
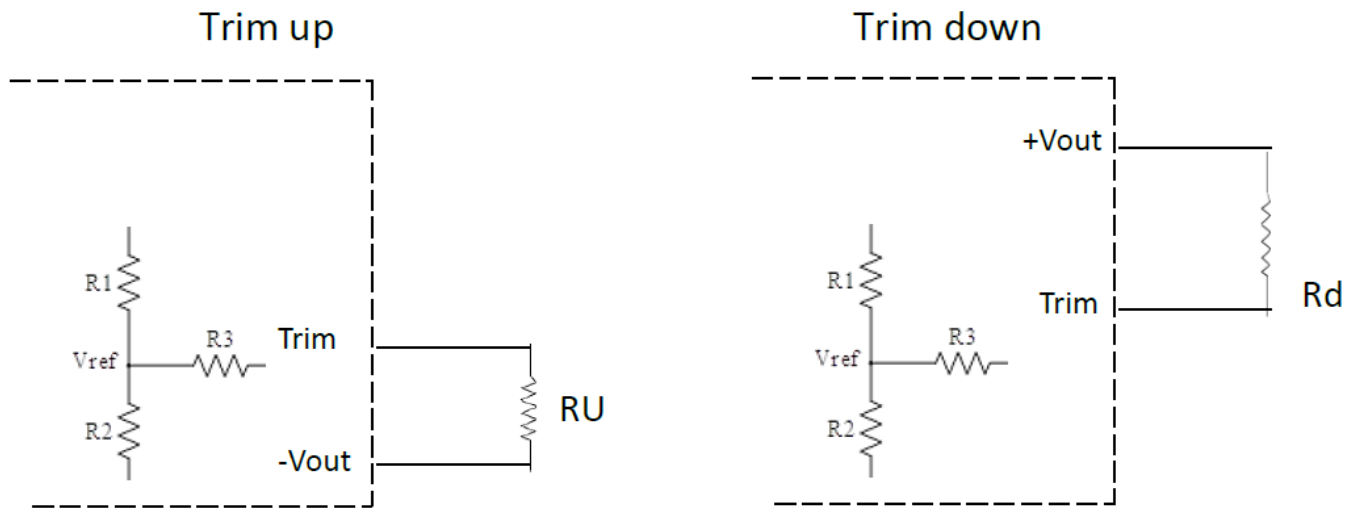


Figure 1: Output ripple measured with 20MHz bandwidth and 1uF ceramic capacitor across the output



Formula for trim resistor:

$$\text{UP: } R_u = \frac{aR_2}{R_2 - a} - R_3 \quad a = \frac{V_{ref}}{V'_o - V_{ref}} \cdot R_1$$

$$\text{DOWN: } R_d = \frac{bR_1}{R_1 - b} - R_3 \quad b = \frac{V'_o - V_{ref}}{V_{ref}} \cdot R_2$$

V _{OUT}	3.3V	5V	12V	15V
R1	8.5K	15.47K	12.62K	15.1K
R2	5.1K	5.1K	3.3K	3K
R3	27K	33K	22K	22K
V _{REF}	1.24V	1.24V	2.5K	2.5K

RESISTOR NOTES:

1. R_u, R_d THE trim resistor, please check the formula
2. a & b are user defined parameter
3. V'_o is mean trim up/down voltage
4. Value for R1,R2,R3 and V_{REF} refer to table

Figure 2: Trim equations for output trim up/down resistor with resistor values and notes

Derating Curve of FW40

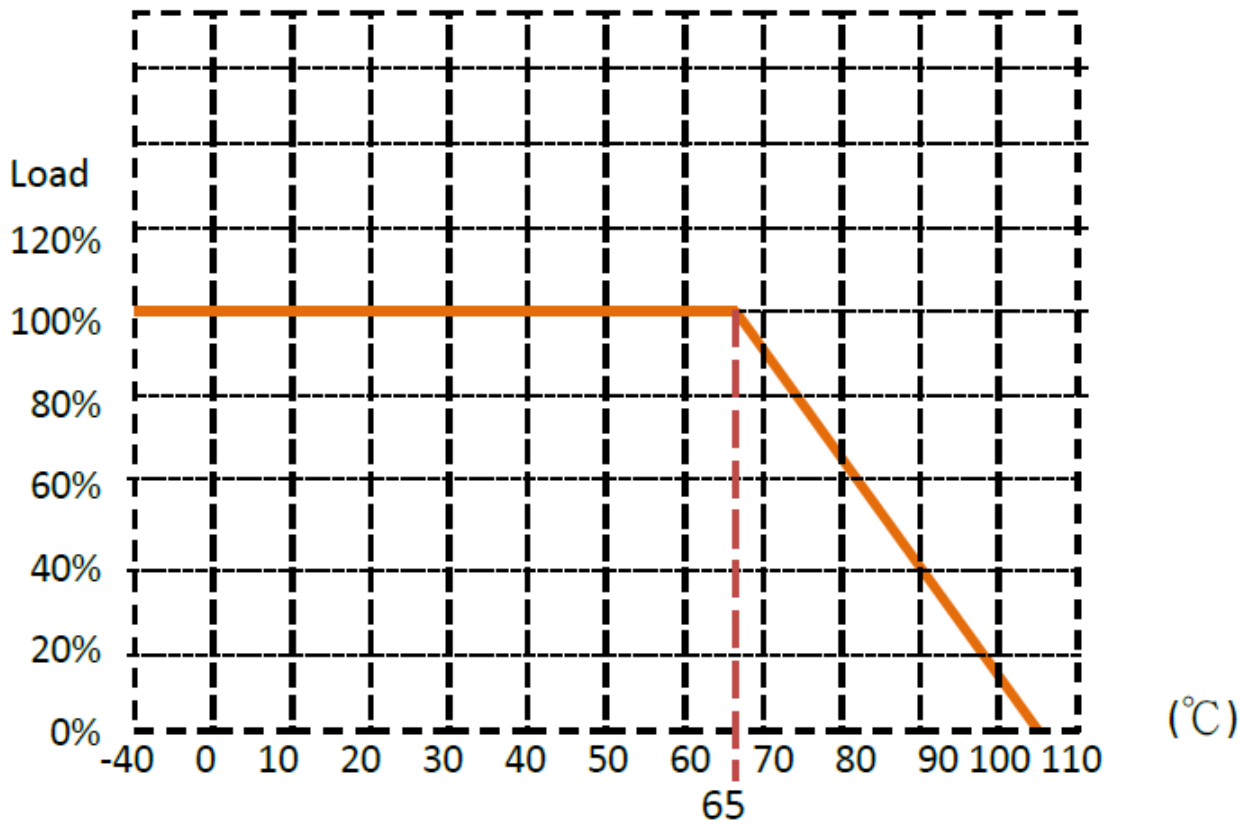
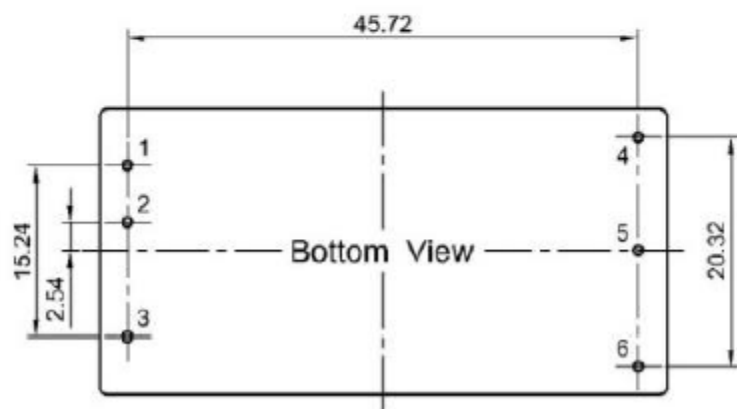
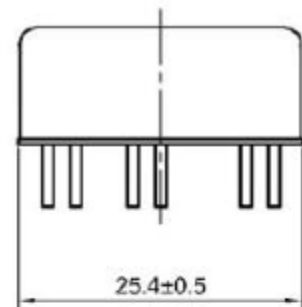
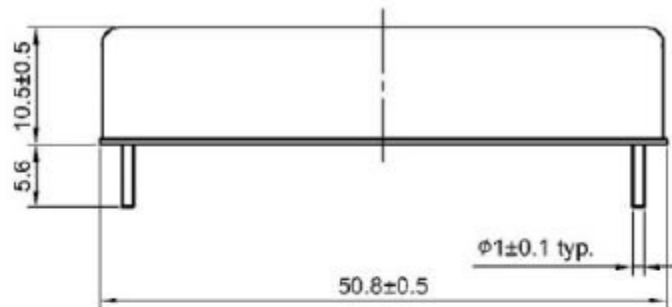


Figure 3: Derating curve of FW40S12/24 at nominal input with natural air convection

Notes

1. The ON/OFF pin voltage is referenced to negative input.
2. Measured with 20MHz bandwidth and 0.1uF ceramic capacitor
3. One load is 25% of full load to 100% of full load, while the other load is 100% of full load. The output voltage is within $\pm 5\%$.
4. The converter requires a minimum of 10% of full load to maintain specific regulation.
5. Requires external filter to meet EN55022 Class A.



Projection : Third angle projection
Unit : mm
Tolerance : $\pm 0.35\text{mm}$

Mechanical Specifications

Pin	Function	
	SINGLE	DUAL
1	$+V_{IN}$	$+V_{IN}$
2	$-V_{IN}$	$-V_{IN}$
3	$+V_{OUT}$	$+V_{OUT}$
4	Trim	COM
5	$-V_{OUT}$	$-V_{OUT}$
6	ON/OFF	ON/OFF

Unit: mm
Tolerance: $\pm 0.35\text{mm}$
Pin: $\pm 0.05\text{mm}$
Case Tolerance: $\pm 0.05\text{mm}$