F23WH Series

Features

- 3 Watt Output Power
- Regulated Output
- 4:1 Wide Range Input Voltage
- Efficiency up to 83%
- Operating Temperature Range -40℃~75℃
  (See Derating Curve)
- 4000VAC/5600VDC Isolation Voltage
- EMI EN55022 Class A Approval
  (with external coupling capacitor Cio=1nF < B)
- Meets UL60601 Safety (Approved For Customer)
- Comply with Industrial & Medical Safety
- Dual-in-line package (DIP)
- UL94V-0 Package Material
- 3 Years Warranty

Description

F23WH series are isolated 3 Watt DC/DC converters in DIP-24pin packages, and allow a wide 4:1 input voltage range of 24V, 48V and 110V to convert to a standard output voltage of 5V, 12V, 15V, ±5V, ±12V and ±15V.

The output continuous short circuit protection, low isolation capacitance, and operating temperature -40℃ to +75℃(Non-Derating) are features of this converter.

Applications

- Automatic Control System
- Industry Computer
- Communication System
- Distribute Power System
- Movable/Portable Test Equipment
- Local Power System
- Medical System
- Other Applications meet Specifications.

General Specifications

Parameter	Condition	Min.	Typ.	Max.
Storage Temperature	Ambient	**-55**	**---**	**+125 ℃**
Operating Temperature	Ambient	**-40**	**---**	**+75 ℃**
	Case	**-40**	**---**	**+90 ℃**
Relative humidity		**---**	**---**	**95 %**
Isolation Voltage	Input to Output, 60 sec.	**5.6KVDC**	**---**	**---**
Isolation Resistance	Input to Output	**10 G ohm**	**---**	**---**
Isolation Capacitance	Input to Output	**---**	**7 pF**	**13 pF**
Switching Frequency	Max. Load	**110 KHz**	**130 KHz**	**150 KHz**
MTBF	Vin-N, Max. Load, 25℃	**---**	**1 MHrs**	**---**
Weight	Epoxy	**---**	**14 g**	**---**
Case Material	Non-Conductive Black Plastic (Meets UL94V-0)			
Dimensions	1.25 x 0.8 x 0.41 inch (31.8 x 20.3 x 10.4 mm)			

Selection Guide

Part Number	Input				Output			Efficiency	Cap. Load[8]
	Voltage	Current		Ref. Ripple[7]	Voltage	Current			
	Nominal (Low ~ High)	No Load	Max. Load	Max. Load	Typ.	Min.	Max.	Max. Load	Max.
		Typ.	Typ.	Typ.				Typ.	
	VDC	mA	mA	mA	VDC	mA	mA	%	μF
F23WH-2405S	24 (9 ~ 40)	15	157	20	5	60	600	80	1000
F23WH-2412S			153		12	25	250	82	470
F23WH-2415S			151		15	20	200	83	470
F23WH-2405D			155		± 5	± 30	± 300	81	470
F23WH-2412D			153		± 12	±12.5	± 125	82	220
F23WH-2415D			151		± 15	± 10	± 100	83	220
F23WH-4805S	48 (18 ~ 80)	10	80	10	5	60	600	79	1000
F23WH-4812S			78		12	25	250	81	470
F23WH-4815S			77		15	20	200	82	470
F23WH-4805D			79		± 5	± 30	± 300	80	470
F23WH-4812D			77		± 12	±12.5	± 125	82	220
F23WH-4815D			77		± 15	± 10	± 100	82	220
F23WH-11005S	110 (36 ~ 160)	5	35	5	5	60	600	78	1000
F23WH-11012S			34		12	25	250	80	470
F23WH-11015S			34		15	20	200	80	470
F23WH-11005D			35		± 5	± 30	± 300	79	470
F23WH-11012D			34		± 12	±12.5	± 125	80	220
F23WH-11015D			34		± 15	± 10	± 100	80	220

Note:

1) *All specifications are measured at nominal input voltage, constant resistive load between Min. and Max. output current, and probe bandwidth should be under 20MHz, Ta = +25℃.*
2) *When the Load is at No-Load or lower than Min. output current, the DC/DC converters will not be damaged; however, all the parameters may be not reaching all specifications listed.*
3) *Output Ripple & Noise Test please refer to E-Chin Technology Co., Ltd. proposed test-method.*
4) *Load Regulation and Line Regulation calculation please refer to E-Chin Technology Co., Ltd. proposed formula.*
5) *An external fuse is needed at the front end of DC/DC converters for a protection as a recommended settlement in order to avoid a surge current or a maximum input current.*
6) *"Vin-H" means "Vin-High", "Vin-N" means "Vin-Nominal", and "Vin-L" means "Vin-Low".*
7) *"Ref. Ripple" means "Reflected Ripple of Input Current".*
8) *The total Capacitive Loads of output should be lower than the value written above.*
9) *Other Input Voltages, Output Voltages and Specifications may be available, please contact us.*
10) *F23WH series meets EMI EN 55022 Class A with external coupling capacitor Cio=1 nF < B.*

Input Specifications

Parameter	Condition	Min.	Typ.	Max.
Input Voltage Range	24VDC models	9	24	40 V
	48VDC models	18	48	80 V
	110VDC models	36	110	160 V
Power ON Voltage Range	24VDC models	8	8.5	9 V
	48VDC models	15	17	18 V
	110VDC models	30	33	36 V
Power OFF Voltage Range	24VDC models	---	---	8.5 V
	48VDC models	---	---	17 V
	110VDC models	---	---	34 V
Short Circuit Input Power	All models	---	---	2000 mW
Input Filter	Pi-Network	EMI EN55022 Class A Approval		

Output Specifications

Parameter	Condition		Min.	Typ.	Max.
Output Voltage Accuracy	Vin-N, Max. Load		---	± 0.5	± 1.0 %
Line Regulation	Vin-L to Vin-H @ Max. Load		---	± 0.3	± 0.5 %
Load Regulation	Io= 15% to 100% Load @ Vin-N		---	± 0.5	± 1%
Balance Regulation	Vin-N, Max. Load, Dual Output		---	± 0.5	± 2.0 %
Temperature Drift	Lowest to Highest Temp.		---	± 0.01	± 0.02 %/℃
Ripple & Noise	Peak to Peak, 20MHz	Single Output	---	30	50 mV
		Dual Output	---	50	75 mV
Transient Recovery Time	Vin-N, 25% load step change		---	200	500 µSec
Transient Response Deviation			---	± 3.0	± 6.0 %Vo

Protection Specifications

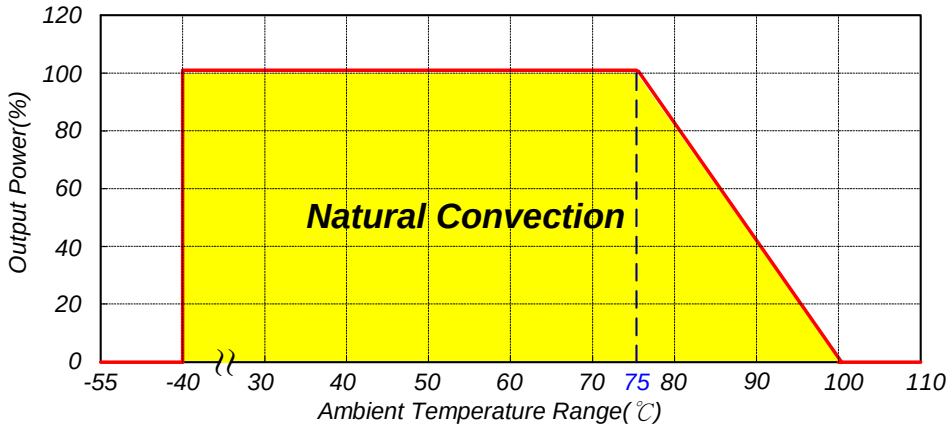
Parameter	Condition	Min.	Typ.	Max.
Over Power Protection	Vin-L to Vin-H	110%Io	---	---
Output Short Circuit Protection	Continuous, Auto-Recovery			

Input Fuse Selection Guide

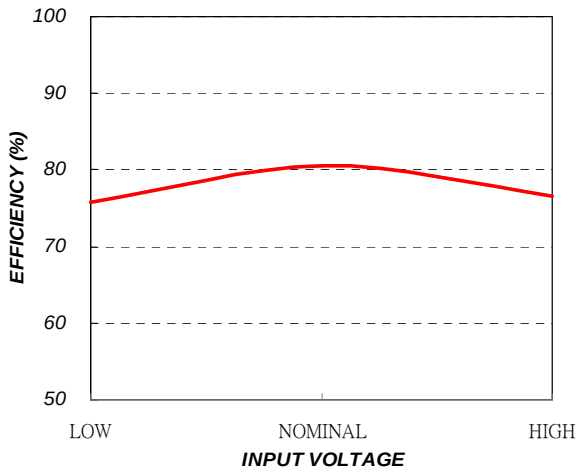
24VDC models	48VDC models	110VDC models
1000mA Slow - Blow Type	500mA Slow - Blow Type	250mA Slow - Blow Type

Characteristic Curve

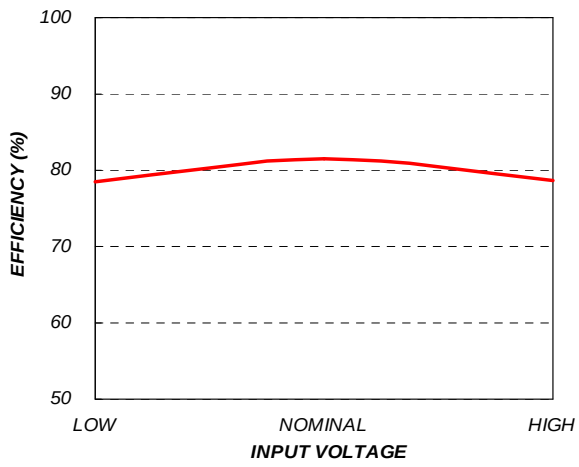
Derating Curve



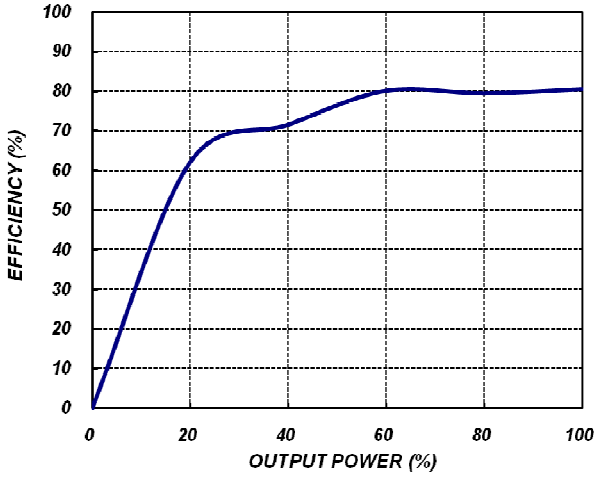
Efficiency-Curve



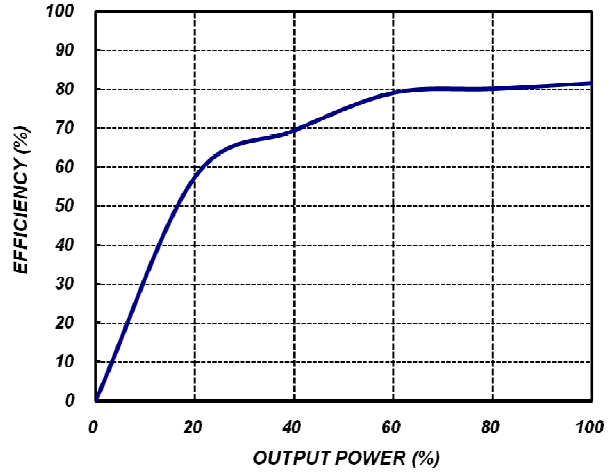
Input Voltage vs. Efficiency, Vo= 5V & ±5V



Input Voltage vs. Efficiency, Other Output Voltages



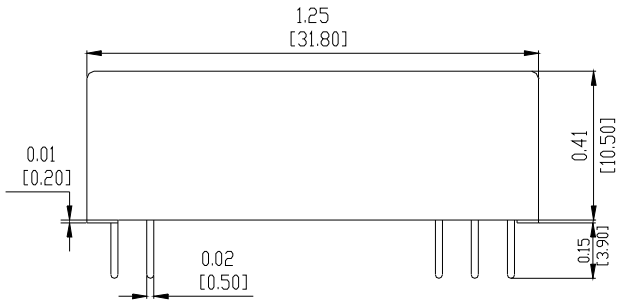
Output Power vs. Efficiency, Vo= 5V & ±5V



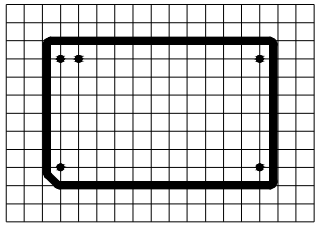
Output Power vs. Efficiency, Other Output Voltages

Package Dimension

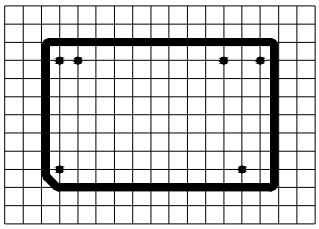
Front View



Recommend Footprint Details (Top View)



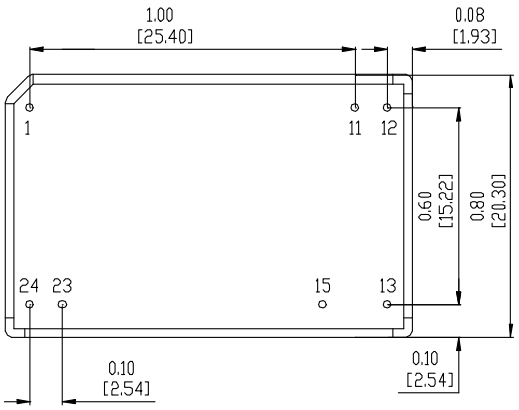
Single Output



Dual Output

Grid: 0.1 inch / 2.54 mm
Dot(Drill Hole): ⌀0.8 +0.2/-0 mm

Bottom View



Pin Functions

Pin No.	Single Output	Dual Output
1	+Vin	+Vin
11	No Pin	Common
12	-Vout	No Pin
13	+Vout	-Vout
15	No Pin	+Vout
23, 24	-Vin	-Vin

Note:

All dimensions in inch [mm]

Tolerance : XX.X± 0.01 [XX.X±0.25]

XX.XX± 0.01 [XX.XX±0.25]

Pin pitch tolerance ±0.01 [±0.25]

Pin dimension tolerance ±0.004 [±0.1]