CFBW-2W Series

2W 4:1 Regulated Single & Dual output

Features

- SMD 12PIN Package
- Wide 4:1 Input Range
- Full SMD Technology
- 3000 VDC Isolation
- Continuous Short Circuit Protection
- Operation Temperature Range -40 ~ 83°C max.
- Remote ON/OFF Control
- Tape & Reel Package Available
- Under Voltage Lockout

PART NUMBER STRUCTURE

CFBW - 24 05 S 2 - R

(1) (2) (3) (4) (5) (6)

(1) Series

(2) Input Voltage Range

12 - 4.5-18 V

24 - 9-36 V

(3) Output Voltage

05 - 5.0 V

12 - 12 V

15 - 15 V

(4) Output Type

S - Single Output

D - Dual Output

(5) Watt

(6) Packing (Optional)

Blank - Standard Tube Packing

R - Tape & Reel Packing

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ALL SPECIFICATIONS ARE TYPICAL AT 25°C, NOMINAL INPUT AND FULL LOAD UNLESS OTHERWISE NOTED

Model Number	Input Voltage Range (VDC)	Input Current		Output Voltage (VDC)	Output Current		Efficiency @FL (%, typ.)	Capacitive Load (μF, max.)
		No-Load (mA, max.)	Full Load (mA, typ.)		Min. load (mA)	Full load (mA)		
CFBW-1205S2	4.5-18	50	214	5	0	400	78	1000
CFBW-1212S2	4.5-18	50	211	12	0	166.7	79	220
CFBW-1215S2	4.5-18	50	206	15	0	133.3	81	100
CFBW-1212D2	4.5-18	50	211	±12	0	±83.3	79	±100
CFBW-1215D2	4.5-18	50	206	±15	0	±66.7	81	±47
CFBW-1205S2-R	4.5-18	50	214	5	0	400	78	1000
CFBW-1212S2-R	4.5-18	50	211	12	0	166.7	79	220
CFBW-1215S2-R	4.5-18	50	206	15	0	133.3	81	100
CFBW-1212D2-R	4.5-18	50	211	±12	0	±83.3	79	±10
CFBW-1215D2-R	4.5-18	50	206	±15	0	±66.7	81	±47
CFBW-2405S2	9-36	30	107	5	0	400	78	1000
CFBW-2412S2	9-36	30	105	12	0	166.7	79	220
CFBW-2415S2	9-36	30	103	15	0	133.3	81	100
CFBW-2412D2	9-36	30	105	±12	0	±83.3	79	±100
CFBW-2415D2	9-36	30	103	±15	0	±66.7	81	±47
CFBW-2405S2-R	9-36	30	107	5	0	400	78	1000
CFBW-2412S2-R	9-36	30	105	12	0	166.7	79	220
CFBW-2415S2-R	9-36	30	103	15	0	133.3	81	100
CFBW-2412D2-R	9-36	30	105	±12	0	±83.3	79	±100
CFBW-2415D2-R	9-36	30	103	±15	0	±66.7	81	±47

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INPUT SPECIFICATIONS

Parameter	Conditions		Min.	Typ.	Max.	Unit
Input Voltage Range	12V Input		4.5	12	18	VDC
	24V Input		9	24	36	
Under Voltage Protection	12V Input	Module ON		4.1		VDC
		Module OFF		3.5		
	24V Input	Module ON		8.5		
		Module OFF		7.0		
Input Filter			Capacitor			
Input Reflected Ripple Current (1)				20		mApk-pk
Start up Time	Nominal Vin and constant resistive load			30		ms
Remote ON/OFF Control	Module ON		open or high impedance			
	Module OFF		2-4mA input current (via 1kΩ)			
	OFF idle current (2)				3.0	mA
Recommended input fuse (slow blow)	12V Input		1.25			A
	24V Input		0.6			

Note：
1. Measured with a simulated source inductance of 12μH and a source capacitor Cin (47μF, ESR<1.0Ω at 100kHz).
2. Stand by input current (Nominal Vin).

OUTPUT SPECIFICATIONS

Parameter	Conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy		-1.0		+1.0	%
Line Regulation		-0.2		+0.2	%
Load Regulation	From 0% to 100% Load	-0.5		+0.5	%
Cross Regulation	Asymmetrical Load 25% / 100% for Dual Output	-5		+5	%
Ripple & Noise (1)	20MHz bandwidth			100	mVpk-pk
Short Circuit Protection		Indefinite (Automatic Recovery)			
Temperature Coefficient		-0.02		+0.02	%/°C
Maximum Capacitive Load	Minimum Vin and constant resistive load	See Table			
Transient Recovery Time	Nominal Vin and 25% load step change (100%-25% of Io)		500		μs
Transient Response Deviation		-3		+3	%

Note：
1. Measured with a 0.1μF MLCC and 10μF Electrolytic capacitor.

ABSOLUTE MAXIMUM RATINGS

Parameter	Conditions	Min.	Typ.	Max.	Unit
Input Surge Voltage (100 ms)	12V Input			25	VDC
	24V Input			50	

Note：These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.

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GENERAL SPECIFICATIONS					
Parameter	**Conditions**	**Min.**	**Typ.**	**Max.**	**Unit**
Isolation Voltage	Input-output, and rated for 60sec	3000			VDC
Isolation Resistance	Input-output	1			GΩ
Isolation Capacitance	Input-output		25		pF
Switching Frequency		100			kHz
MTBF	MIL-HDBK-217 F @ 25°C	890			k hours
Safety Standard	IEC / EN / UL 62368-1	Designed to meet			
Environmental compliance		RoHS			

ENVIRONMENT SPECIFICATIONS					
Parameter	**Conditions**	**Min.**	**Typ.**	**Max.**	**Unit**
Operating Ambient Temperature	See the Derating Curve	-40		83	°C
Storage Humidity				95	% rel. H
Storage Temperature		-55		125	°C
Thermal Impedance		53.02			°C/W
Cooling	Natural Convection	30-65 LFM			
Lead-free Reflow Solder Process	IPC/JEDEC J-STD-020D.1				
Moisture Sensitivity Level (MSL)		Level 1			
Reflow Temperature		Peak 245°C (10 sec) ,max.			
Vibration		MIL-STD-810F			

EMC SPECIFICATIONS			
Parameter	**Standard**	**Condition**	Criterion
Conducted Emissions	EN55032	with external components	A
Radiated Emissions	EN55032	with external components	A
ESD	IEC 61000-4-2	Air: ±8kV / Indirect: ±4kV	A
RS	IEC 61000-4-3	10V/m	A
EFT	IEC 61000-4-4	±2kV with external components	A
Surge	IEC 61000-4-5	±2kV with external components	A
CS	IEC 61000-4-6	10Vrms	A
PFMF	IEC 61000-4-8	100A/m	A

PHYSICAL SPECIFICATIONS	
Parameter	**Value**
Base Material	Nonconductive Black Plastic (UL94V-0 rated)
Pin Material	Tinned copper
Weight	2.0 g, typ.
Dimensions	0.58" x 0.56" x 0.35”

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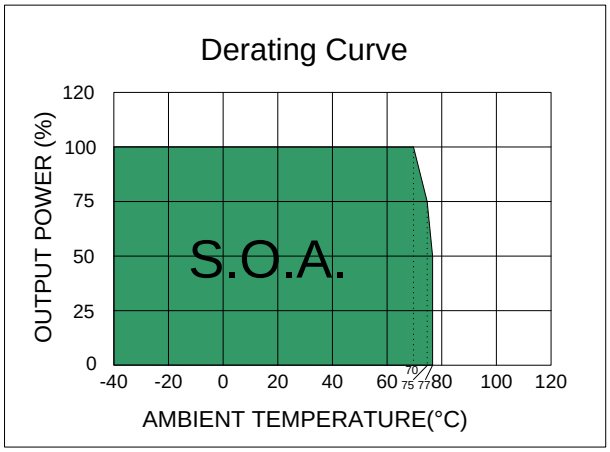
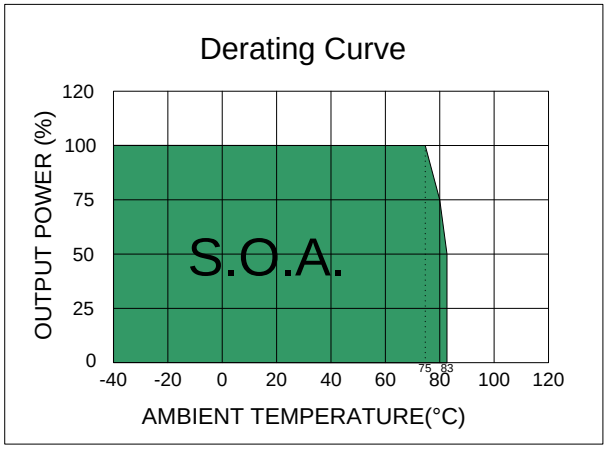
ELECTRICAL CHARACTERISTIC CURVES



(Efficiency : 78 ~ 79%)

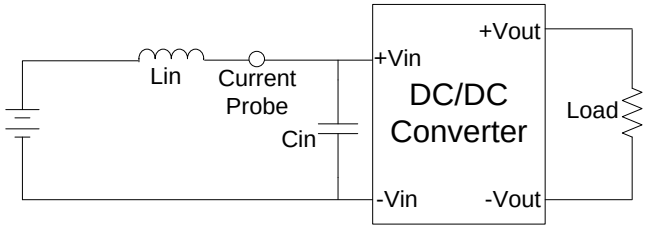


(Efficiency : 81%)

TEST CONFIGURATIONS

Input Reflected Ripple Current Test Step

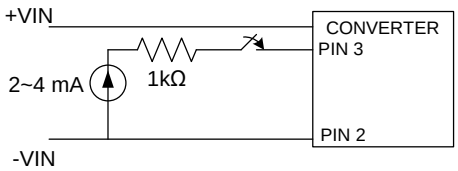
Input reflected ripple current is measured with a source inductor Lin (12μH) and a source capacitor Cin (47μF, ESR<1.0Ω at 100kHz) at nominal input and full load.



DESIGN & FEATURE CONFIGURATIONS

Remote Module ON / OFF

Input current (2~4mA) via 1kΩ to Pin3, converter OFF.
Open or high impedance, converter ON.



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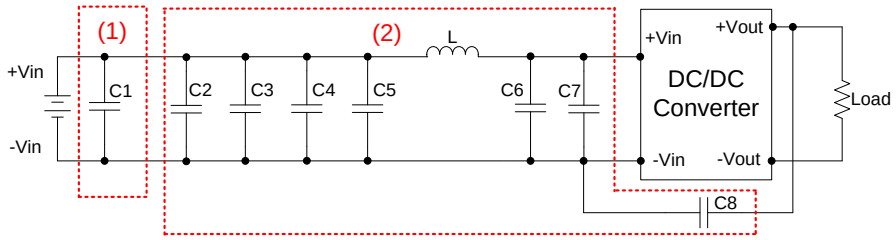
DESIGN & FEATURE CONFIGURATIONS

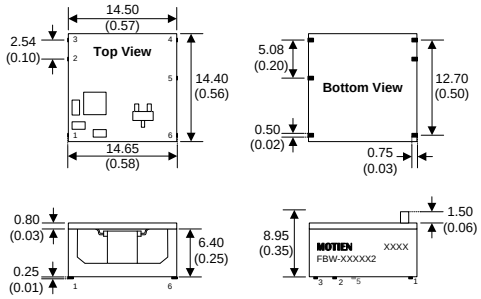
EMC Filter

The part (1) Circuit is used to meet Surge & EFT test, and the part (2) Circuit is used to meet EMI test.



	C1	C2	C3, C4, C5, C6, C7	L	C8
CFBW-12XXX2	NIPPON Chemi-con KY Series 330μF, 100V	MLCC 10μF, 50V		2.2μH	MLCC 100pF, 3kV
CFBW-24XXX2			MLCC 10μF, 50V	47μH	

MECHANICAL SPECIFICATIONS



SMD 12 Pin Package

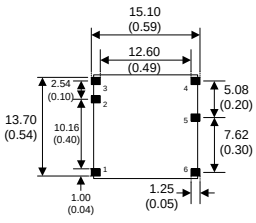
Notes : All dimensions are typical in millimeters (inches).

1. No marked Tolerance: ±0.25 (±0.01)

PIN CONNECTIONS		
PIN NUMBER	SINGLE	DUAL
1	+Vin	+Vin
2	-Vin	-Vin
3	CTRL	CTRL
4	+Vout	+Vout.
5	N.C.	COM
6	-Vout	-Vout

*N.C.：No Connection

RECOMMENDED FOOTPRINT DETAILS

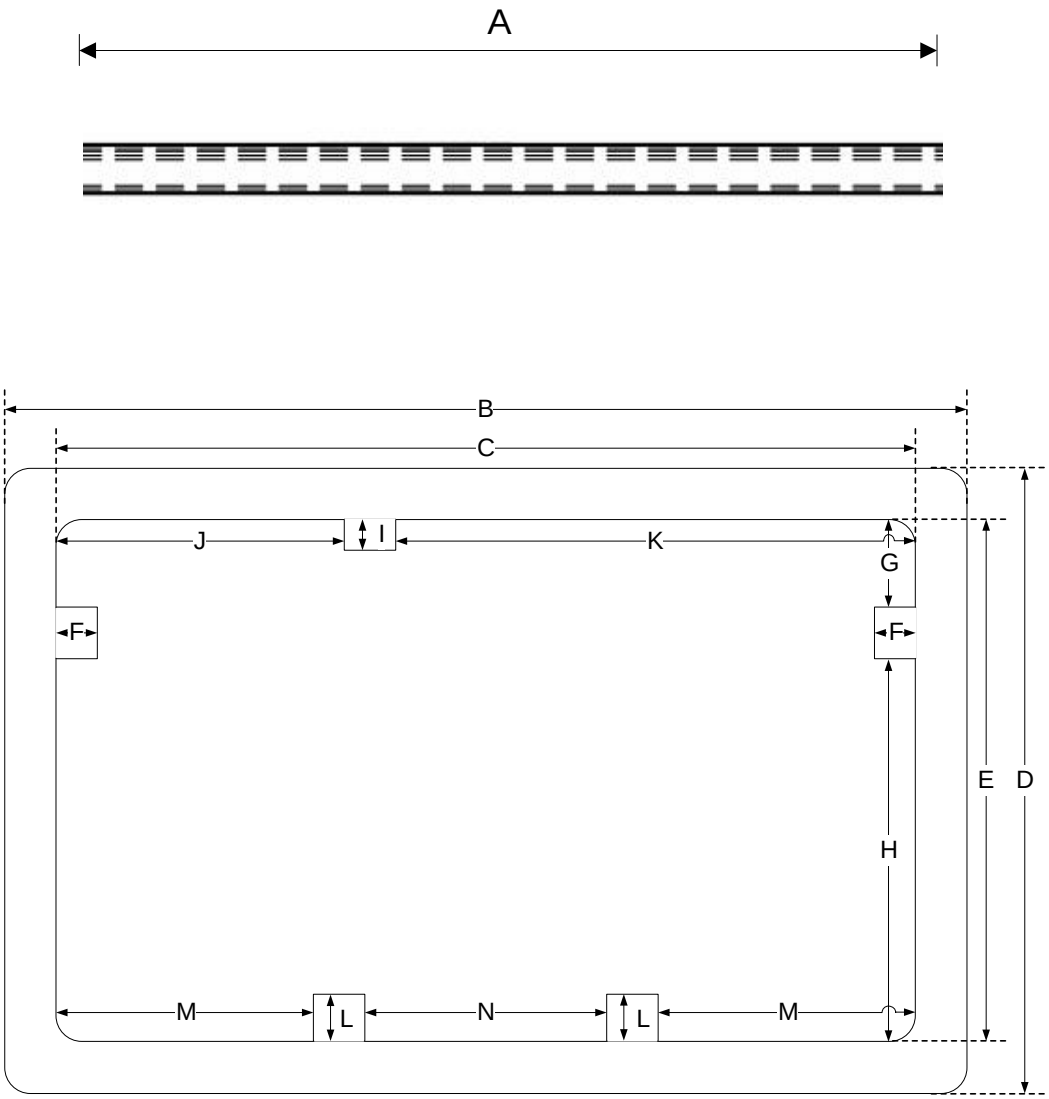


Solder Pad Dimension

TUBE DIMENSION

Standard packing - Tube

■ 1 Tube contains 30 converters



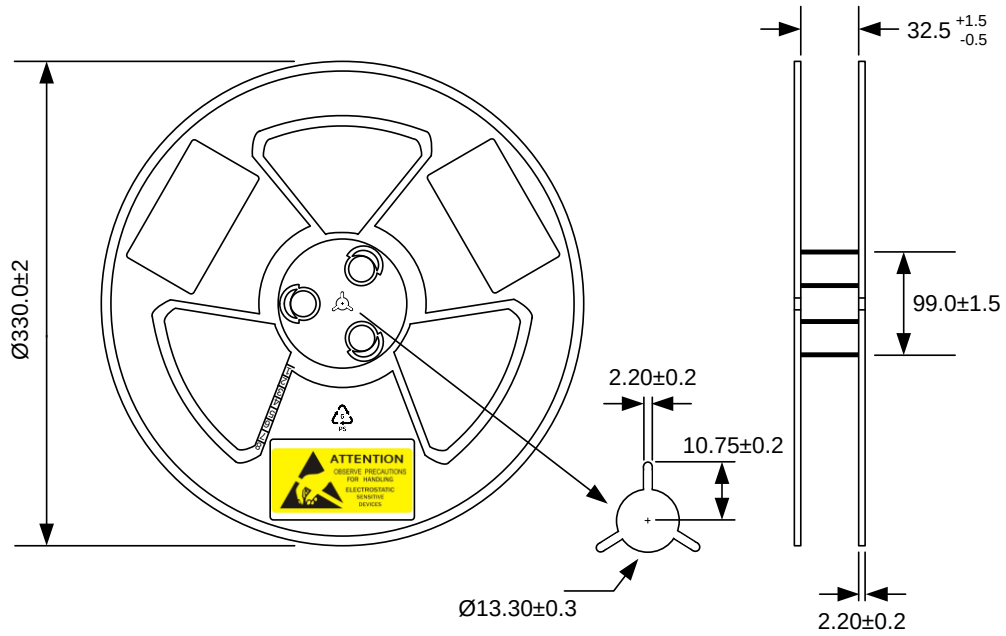
Dimensions in [mm]

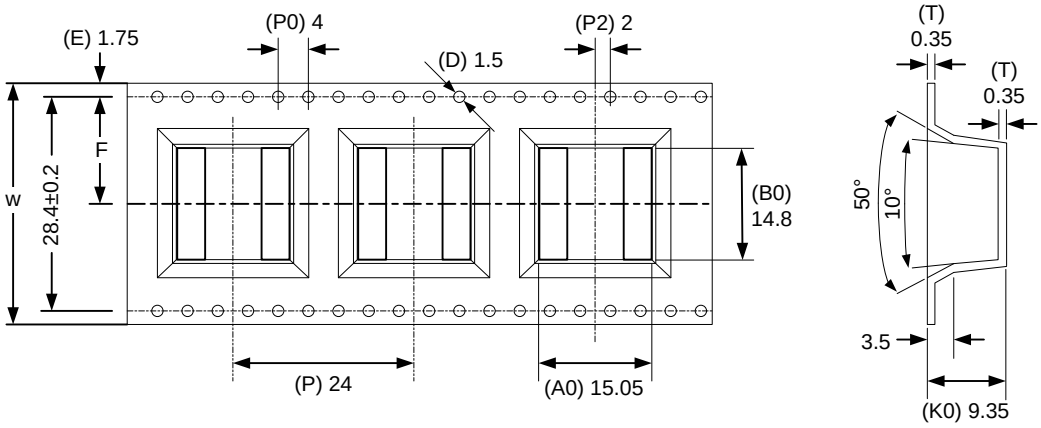
Tube Length : 465 1.0 mm														
ITEM	A		B		C		D		E		F		G	
DIM	465	+1.0 -1.0	18.7	+0.25 -0.25	16.7	+0.25 -0.25	12.1	+0.25 -0.25	10.1	+0.25 -0.25	0.8	+0.1 -0.1	1.7	+0.25 -0.25
ITEM	H		I		J		K		L		M		N	
DIM	7.4	+0.25 -0.25	0.6	+0.1 -0.1	5.6	+0.25 -0.25	10.1	+0.25 -0.25	0.9	+0.1 -0.1	5	+0.25 -0.25	4.7	+0.25 -0.25

TAPE & REEL DIMENSION

Optional packing – Tape & Reel

- Specifications shall conform with current EIA-481 standard
- 1 Reel contains 200 converters
- Use appendix <<-R>> on order code





Dimensions in [mm]

ITEM	W		A0		B0		K0		T		P		F		E		D		P0		P2	
DIM	32.0	+0.30 -0.30	15.05	+0.20 -0.10	14.8	+0.20 -0.10	9.35	+0.20 -0.10	0.35	+0.05 -0.05	24	+0.10 -0.10	14.2	+0.15 -0.15	1.75	+0.10 -0.10	1.50	+0.10 -0.00	4.00	+0.10 -0.10	2.00	+0.10 -0.10