CFB600W-110S-CMFD SERIES
600 WATT 4:1 INPUT ISOLATED DC-DC CONVERTERS

Features

- Efficiency Up to 88%
- Fixed Switching Frequency
- Regulated Outputs
- Remote On/Off
- Fully Protected (OTP/OCP/OVP/UVLO)
- 2250Vdc I/O Isolation
- Operating Case Temperature -40 to +100℃
- UL 60950-1 2nd (Basic Insulation) Approval for DC Modules
- EN 50155 for EMC, Environmental and Characteristic
- Shock & Vibration (EN 61373) Compliant
- Fire & Smoke EN 45545-2 Compliant
- Safety Meets IEC/EN 62368-1
- Build-In EMI Filter
- Chassis Mount, Baseplate Cooled

MODEL NUMBER	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT		INPUT CURRENT		% EFF.	CAPACITOR LOAD MAX.
			MIN.	MAX.	NO LOAD	FULL LOAD		
CFB600W-110S12□-CMFD	43-160 VDC	12 VDC	0 mA	50 A	25 mA	6.3 A	87	10000uF
CFB600W-110S24□-CMFD	43-160 VDC	24 VDC	0 mA	25 A	25 mA	6.2 A	88	10000uF
CFB600W-110S28□-CMFD	43-160 VDC	28 VDC	0 mA	21.4 A	25 mA	6.2 A	88	10000uF
CFB600W-110S48□-CMFD	43-160 VDC	48 VDC	0 mA	12.5 A	25 mA	6.2 A	88	10000uF

NOTE:

1. Nominal input voltage 110 VDC.
2. □ = P or none.
3. VR1 is used for output voltage adjustment.
4. Refer to Application note for thermal resistance and derating information.
5. TVS is included for input surge voltage protection.
6. Recommend an external fuse for input reverse polarity protection (shunt diode is included inside).
7. Output connector CN3 wafer with CHIA-SOON TERMINAL B3B-PH-K-S series or equivalent.
8. CN1 wafer with TAIWAN KING PIN TERMINAL 8822-02 series or equivalent.
9. CN2 wafer with CHYAO SHIUNN TERMINAL JS-1001-04(K) series or equivalent.

PART NUMBER

Series	Nominal Input Voltage	Number of Outputs	Nominal Output Voltage	Remote On/Off Logic	Chassis Mount Type	
CFB600W-	II	O	XX	L	-YYY	Z
CFB600W	110：110 VDC	S：Single	12：12VDC 24：24VDC 28：28VDC 48：48VDC	None：Negative P：Positive	CMF：Chassis Mount Built in Filter	D： With Cover

Part Number Example:

CFB600W-110S12-CMFD: Chassis Mount, 600W, 4:1 43-160Vdc Input, Single 12Vdc Output, Negative Logic, With Cover

TECHNICAL SPECIFICATIONS

(All specifications are typical at nominal input, full load at 25℃ unless otherwise noted.)

ABSOLUTE MAXIMUM RATINGS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Input Voltage	Continuous	All	-0.3		160	V_{dc}
Input Surge Voltage	100ms max.	All			180	V_{dc}
Operating Case Temperature	At the center part of base plate	All	-40		100	℃
Storage Temperature		All	-40		105	℃

INPUT CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Operating Input Voltage		All	43	110	160	V_{dc}
Input Under Voltage Lockout						
Turn-On Voltage Threshold	Full load	All	41	42	43	V_{dc}
Turn-Off Voltage Threshold	Full load	All	38	40	41	V_{dc}
Lockout Hysteresis Voltage	Full load	All		2		V_{dc}
Maximum Input Current	V_{in}=43V_{dc}, Full load	All		17		A
No-Load Input Current	V_{in}=110V_{dc}, I_o=0A	See Model Number Table				mA

OUTPUT CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Voltage Set Point Accuracy	V_{in}=110V_{dc}, Full load, T_c=25℃	All	-1.0		+1.0	%
Output Voltage Regulation						
Load Regulation	Full load to no load	All			±2.0	%
Line Regulation	V_{in}=High line to low line, full load	All			±0.2	%
Temperature Coefficient	T_c=-40℃ to 100℃	All			±0.03	%/℃
Output Voltage Ripple and Noise (5Hz to 20MHz Bandwidth)						
Peak-to-Peak	Full load, 1uF ceramic capacitors	12Vo			120	mV
		24Vo			240	
		28Vo			280	
		48Vo			480	
RMS.		12Vo			60	mV
		24Vo			100	
		28Vo			100	
		48Vo			200	
Output Current Range	V_{in}= 43 to 160V_{dc}	See Model Number Table				A
Over Current Protection	Continuous current. Auto recovery	All	105	120	150	%
Over Voltage Protection	Limited voltage, % of nominal V_o	All	115	125	140	%
Short Circuit Protection		All	Continuous, Auto Recovery			
External Load Capacitance	Full load (resistive)	See Model Number Table				uF
Auxiliary Output Voltage		All	7	10	13	V
Auxiliary Output Current		All			20	mA
Power Good Signal (IOG)	V_{out} ready: Low level, sink current	All			20	mA
	V_{out} not ready: Open drain output, applied voltage				50	V
Output Voltage Trim Range	P_o≦max. rated power, I_o ≦ $I_{o\_max.}$ (by VR1)	All	-10		+10	%
	P_o≦max. rated power, I_o ≦ $I_{o\_max.}$		-40		+10	
Output Voltage Remote Sense Range	P_o≦max. rated power, I_o ≦ $I_{o\_max.}$ % of nominal V_o	All			+10	%
Load Share Accuracy (50%-100% Load)	The condition is to use two modules. If you use more modules, please contact cincon	All	-10		+10	%

EFFICIENCY

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
100% Load	V_{in}=110V_{dc}	See Model Number Table				%

DYNAMIC CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Output Voltage Current Transient						
Error Band	75% to 100% of $I_{o\_max.}$ Step load change d_i/d_t=0.1A/us (within 1% V_{out} nominal)	All			±5	%
Recovery Time		All			500	us
Turn-On Delay and Rise Time	Full load (constant resistive load)					
Turn-On Delay Time, From On/Off Control	$V_{on/off}$ to 10%V_{o_set}, Remote on	All		135		ms
Turn-On Delay Time, From Input	$V_{in\_min.}$ to 10%V_{o_set}, Power up	All		135		ms
Output Voltage Rise Time	10%V_{o_set} to 90%V_{o_set}	All		25		ms

ISOLATION CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Isolation Voltage (100% factory Hi-Pot tested @2sec.)	1 Minute; input to output	All			2250	V_{dc}
	1 Minute; input to case (base plate)				2250	V_{dc}
	1 Minute; output to case (base plate)				1500	V_{dc}
Isolation Resistance	Input to output	All	20			MΩ
Isolation Capacitance	Input to output	All		12000		pF
	Input to case (base plate)	All		14000		
	Output to case (base plate)	All		22000		

FEATURE CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Switching Frequency	Pulse width modulation (PWM), fixed	All	225	250	275	KHz
On/Off Control, Positive Remote On/Off Logic, Refer to -Vin Pin						
Logic Low (Module Off)	CN1 On/Off JP	All		Short		
Logic High (Module On)	CN1 On/Off JP	All		Open		
On/Off Control, Negative Remote On/Off Logic, Refer to -Vin Pin						
Logic High (Module Off)	CN1 On/Off JP	All		Open		
Logic Low (Module On)	CN1 On/Off JP	All		Short		
On/Off Current (for both remote on/off logic)	$I_{on/off}$ at $V_{on/off}$=0.0V	All			1.72	mA
Off Converter Input Current	Shutdown input idle current	All			50	mA
Over Temperature Shutdown	Temperature at the center part of base plate, non-latching (DC module)	All		110		℃
Over Temperature Recovery		All		90		℃

GENERAL SPECIFICATIONS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
MTBF	I_o=100% of $I_{o\_max.}$; MIL-HDBK - 217F_Notice 1, GB, 25℃	12Vo		296		K hours
		24Vo		292		
		28Vo		275		
		48Vo		281		
Weight		-CMFD		995		grams
Base plate Material	Aluminum					
Potting Material	UL 94V-0 (DC Module)					
Shock/Vibration	EN 50155 (EN 61373) Compliant					
Humidity	95% RH max. Non Condensing					
Altitude	2000m Operating Altitude, 12000m Transport Altitude					
Thermal Shock	MIL-STD-810F					

GENERAL SPECIFICATIONS

Fire & Smoke	EN 45545-2 Compliant	
EMI	EN 50155 (EN 50121-3-2) Compliant (with external output filter)	
ESD	EN 61000-4-2 Level 3: Air ±8kV, Contact ±6kV	Perf. Criteria B
Radiated Immunity	EN 61000-4-3 Level 3: 80~1000MHz, 20V/m	Perf. Criteria A
Fast Transient	EN 61000-4-4 Level 3: On power input port, ±2kV, external capacitor required	Perf. Criteria A
Surge	EN 61000-4-5 Level 2: Line to earth, ±2kV, Line to line, ±1kV	Perf. Criteria B
Conducted Immunity	EN 61000-4-6 Level 3: 0.15~80MHz, 10V	Perf. Criteria A
Interruptions of Voltage Supply	EN 50155 Class S2: 10ms interruptions, with external hold up circuit and capacitor required	Perf. Criteria A
Supply Change Over	EN 50155 Class C2: During a supply break of 30 ms, with external hold up circuit and capacitor required	Perf. Criteria A
Application Note Link	CFB600W-110S CMFD Series App Notes	
Packaging Information Link	Packaging Information	

Immunity to Environmental Conditions

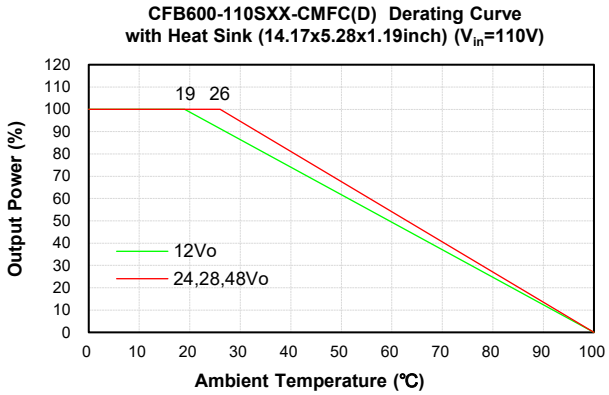
Phenomenon	EN 50155; 2021 Reference Clause(s)	Reference Standard	Test Conditions	Result
Low Temperature Start-up test	13.4.4	EN 60068-2-1	Class OT4 Temperature: -40℃ Duration: 2 hrs	Pass
Dry Heat Test	13.4.5	EN 60068-2-2	Class OT4 Temperature: 70℃ Dry heat thermal test Cycle A	Pass
Low Temperature Storage Test	13.4.6	EN 60068-2-1	Temperature: -40℃ Duration: 16 hrs	Pass
Cyclic Damp Heat Test	13.4.7	EN 60068-2-30	Temperature: +55℃ and +25℃ Humidity: 90~96% RH Duration: 48 hrs	Pass
Random Vibration Test	13.4.11	EN 61373	Temperature: 25℃±10℃ Humidity: 50% ±25% RH Frequency range: 5 ~ 150 Hz X axis: 0.45 m/s^2 Y axis: 0.70 m/s^2 Z axis: 1.01 m/s^2 Duration: 10 min / axis	Pass
Simulated Long Life Test at Increased Random Vibration Levels	13.4.11	EN 61373	Temperature: 25℃±10℃ Humidity: 50% ±25% RH Frequency range: 5 ~ 150 Hz X axis: 2.55 m/s^2 Y axis: 3.96 m/s^2 Z axis: 5.72 m/s^2 Duration: 5 hrs / axis	Pass
Shock Test	13.4.11	EN 61373	Temperature: 25℃±10℃ Humidity: 50% ±25% RH a.Test Condition 1 (±Y axes) Units are operating. Pulse shape: Half-sine waveform Impact acceleration: 50 m/s2 Duration Time: 30 ms Vibration Axial:3 Axis，6 Faces Shock Time :3 times Total Time:18 times b.Test Condition 2 (±X and ±Z axes) Units are non-operating. Pulse shape : Half-sine waveform Impact acceleration : 30 m/s2 Duration Time : 30 ms Vibration Axial:3 Axis，6 Faces Shock Time :3 times Total Time:18 times	Pass

EN 45545-2 Fire & Smoke Test Conditions.

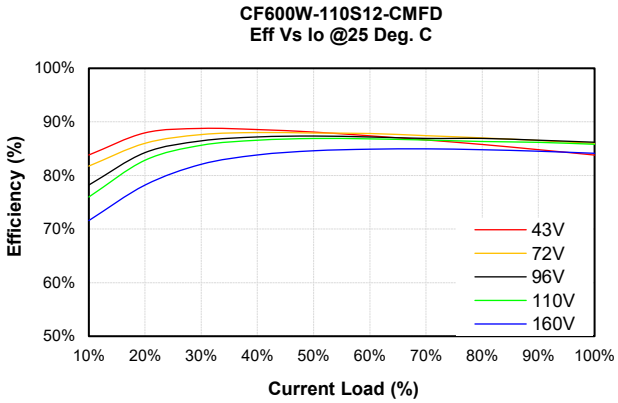
Item		Standard	Hazard Level
R22	Oxygen Index Test	EN 45545-2: 2013 EN ISO 4589-2: 2006	HL1, HL2, HL3
	Smoke Density Test	EN 45545-2: 2013 EN ISO 5659-2: 2013	HL1, HL2, HL3
	Smoke Toxicity Test	EN 45545-2: 2013 NF X70-100: 2006	HL1, HL2, HL3
R23	Oxygen Index Test	EN 45545-2: 2013 EN ISO 4589-2: 2006	HL1, HL2, HL3
	Smoke Density Test	EN 45545-2: 2013 EN ISO 5659-2: 2013	HL1, HL2, HL3
	Smoke Toxicity Test	EN 45545-2: 2013 NF X70-100: 2006	HL1, HL2, HL3
R24	Oxygen Index Test	EN 45545-2: 2013 EN ISO 4589-2	HL1, HL2, HL3
R25	Glow - Wire Test	EN 45545-2:2013 EN 60695-2-11:2001	HL1, HL2, HL3
R26	Vertical Flame Test	EN 45545-2: 2013 EN 60695-11-10: 2013	HL1, HL2, HL3

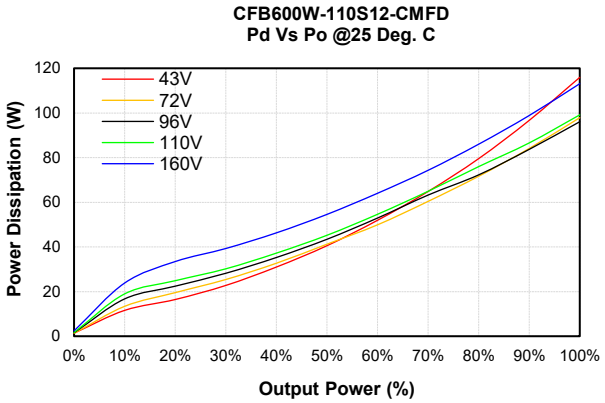
CHARACTERISTIC CURVE

Power Derating Curve

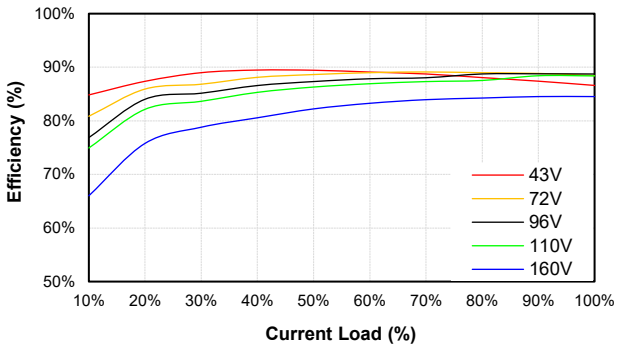


Performance Data

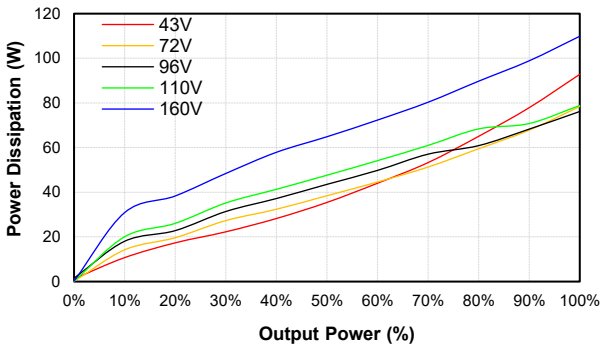




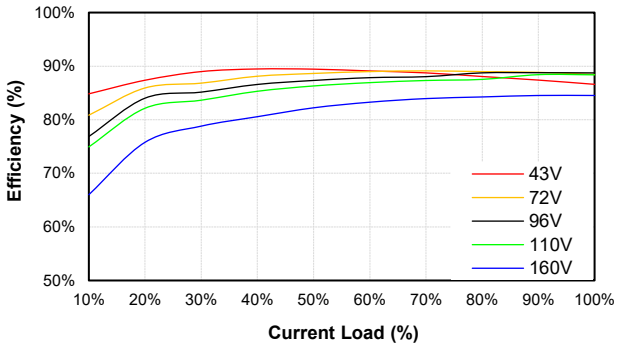
CF600W-110S24-CMFD
Eff Vs Io @25 Deg. C



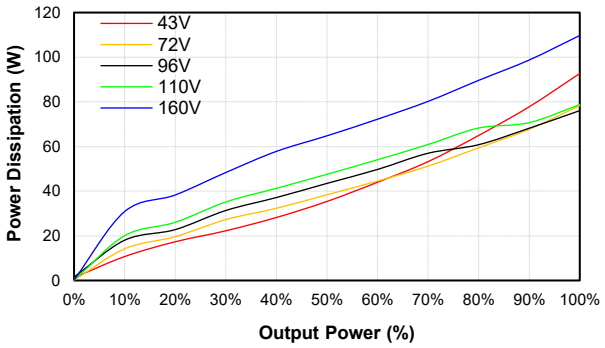
CFB600W-110S24-CMFD
Pd Vs Po @25 Deg. C



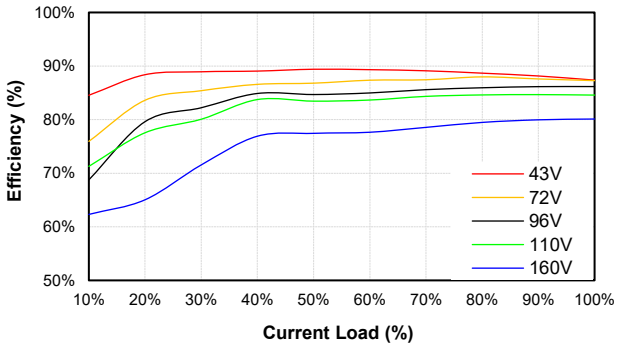
CF600W-110S28-CMFD
Eff Vs Io @25 Deg. C



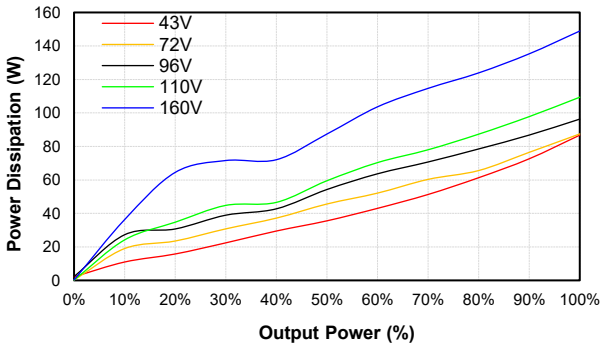
CFB600W-110S28-CMFD
Pd Vs Po @25 Deg. C



CF600W-110S48-CMFD
Eff Vs Io @25 Deg. C

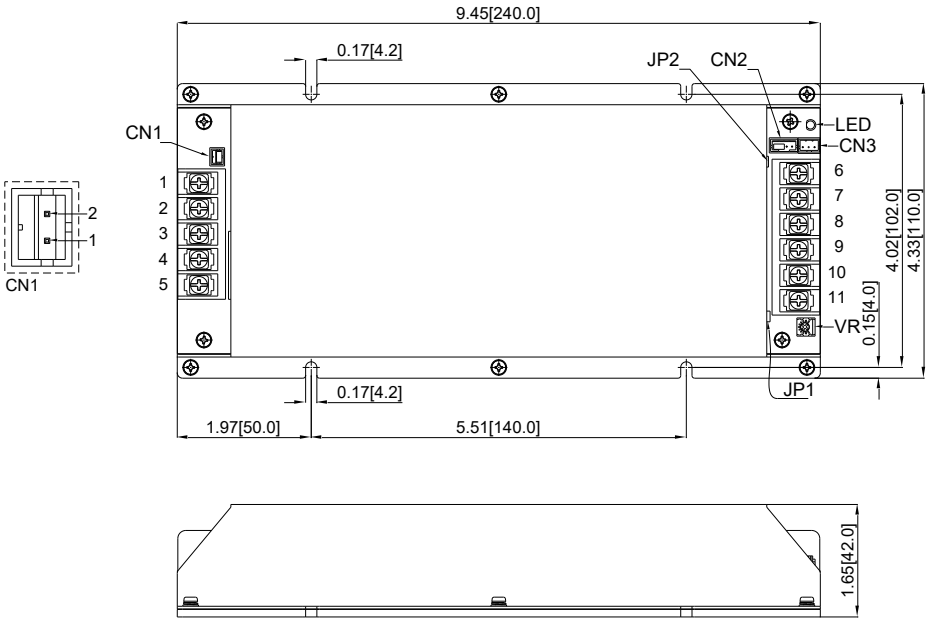


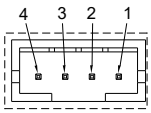
CFB600W-110S48-CMFD
Pd Vs Po @25 Deg. C

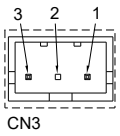


MECHANICAL SPECIFICATION

All Dimensions In Inches (mm)
Tolerance Inches: X.XX= ±0.02 , X.XXX= ±0.010
Millimeters: X.X= ±0.5 , X.XX=±0.25







PIN CONNECTION	
Pin	Function
1	PE
2,3	-V Input
4,5	+V Input
6,7,8	-V Output
9,10,11	+V Output
JP1	Short +S&+Vo
JP2	Short -S&-Vo

CN1 (On/Off JP)

PIN CONNECTIONS	
Pin	Function
1	-V Input
2	-On/Off

CN2 (Trim JP)

PIN CONNECTIONS	
Pin	Function
1	-Sense
2	+Sense
3	Trim
4	Rt

CN3 (PC JP)

PIN CONNECTIONS	
Pin	Function
1	AUX
2	IOG
3	PC

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