CQB75-300S-CMFC(D)
SERIES 50-75 WATT 2:1 INPUT ISOLATED DC-DC CONVERTERS

Features

- Efficiency Up to 90%
- Fixed Switching Frequency
- Regulated Outputs
- Remote On/Off
- Low No Load Power Consumption
- Fully protected (OTP/OCP/OVP/UVLO)
- 3000Vac I/O Isolation
- Operating Case Temperature -40 to +100℃
- EN55032/22 for EMC Characteristic
- Shock & Vibration Mil-STD-810F Compliant
- Fire & Smoke EN45545-2 Compliant
- Safety Meets IEC/EN/UL 62368-1
- Build-In EMI Filter
- Chassis Mount, Baseplate Cooled

CE

MODEL NUMBER	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT		INPUT CURRENT		% EFF.	CAPACITOR LOAD MAX.
			MIN.	MAX.	NO LOAD	FULL LOAD		
CQB75-300S05□-CMFC CQB75-300S05□-CMFD	180-450 VDC	5 VDC	0 mA	15.0 A	10 mA	305 mA	82	15000uF
CQB75-300S12□-CMFC CQB75-300S12□-CMFD	180-450 VDC	12 VDC	0 mA	6.25 A	10 mA	284 mA	88	6250uF
CQB75-300S15□-CMFC CQB75-300S15□-CMFD	180-450 VDC	15 VDC	0 mA	5.0 A	10 mA	284 mA	88	5000uF
CQB75-300S24□-CMFC CQB75-300S24□-CMFD	180-450 VDC	24 VDC	0 mA	3.12 A	10 mA	280 mA	90	3300μF
CQB75-300S48□-CMFC CQB75-300S48□-CMFD	180-450 VDC	48 VDC	0 mA	1.56 A	10 mA	281 mA	89	1000μF

NOTE:

1. Nominal Input Voltage 300 VDC
2. □ = N or none
3. VR 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 TAIWAN KING PIN TERMINAL P110I series and mate with JST housing PH series or equivalent.
8. CN1 connection: DINKLE 166-04P5 series or equivalent, suitable electric wire: 18~12AWG (IEC 0.5~4mm^2).
9. CN2 connection: DINKLE EK500V-04P series or equivalent, suitable electric wire: 24~12AWG (IEC 0.5~2.5mm^2).

PART NUMBER

Series	Nominal Input Voltage	Number of Outputs	Nominal Output Voltage	Remote On/Off Logic	Chassis Mount Type	
CQB75-	II	O	XX	L	-YYY	Z
CQB75	300: 300 VDC	S: Single	05: 5VDC 12: 12VDC 15: 15VDC 24: 24VDC 48: 48VDC	None: Positive N: Negative	CMF: Chassis Mount Built in Filter	C: Open Frame D: With Cover

Part Number Example:

CQB75-300S12N-CMFC: Chassis Mount, 75W, 2:1 180-450Vdc Input, Single 12Vdc Output, Negative Logic, Open Frame

TECHNICAL SPECIFICATIONS

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

ABSOLUTE MAXIMUM RATINGS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Input Voltage	Continuous	All	-0.3		450	V_{dc}
Input Surge Voltage	100ms max.	All			500	V_{dc}
Operating Case Temperature	At the Center Part of Base Plate	All	-40		100	°C
Storage Temperature		All	-40		105	°C

INPUT CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Operating Input Voltage		All	180	300	450	V_{dc}
Input Under Voltage Lockout						
Turn-On Voltage Threshold	Full Load	All	165	170	175	V_{dc}
Turn-Off Voltage Threshold	Full Load	All	155	160	165	V_{dc}
Lockout Hysteresis Voltage	Full Load	All		10		V_{dc}
Maximum Input Current	V_{in}=180V, Full Load	300S05 Other		520 477		mA
No-Load Input Current	V_{in}=300V, Io=0A	See Model Number Table				mA

OUTPUT CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Voltage Set Point Accuracy	V_{in}=300V, Full Load, Tc=25°C	All	-1.0		+1.0	%
Output Voltage Regulation						
Load Regulation	Full Load to No Load	All			±0.2	%
Line Regulation	V_{in}=High Line to Low Line, Full Load	All			±0.2	%
Temperature Coefficient	Tc=-40°C to 100°C	All			±0.02	%/°C
Output Voltage Ripple and Noise (5Hz to 20MHz bandwidth)						
Peak-to-Peak	Full load, 1uF ceramic capacitors	05Vo 12Vo 15Vo 24Vo 48Vo			100 150 150 240 480	mV
RMS.		05Vo 12Vo 15Vo 24Vo 48Vo			60 60 60 100 200	mV
Output Current Range	V_{in}= 180 to 450V	See Model Number Table				A
Over Current Protection	Hiccup Mode. Auto Recovery.	All	110	135	160	%
Short Circuit Protection		All	Continuous, Auto Recovery.			
External Load Capacitance	Full load (resistive)	See Model Number Table				uF
Output Voltage Trim Range	Po≦max rated power, $I_o \leqq I_{o\_max}$	05Vo Other	-20 -20		+10 +20	%
Output Voltage Remote Sense Range	Po≦max rated power, $I_o \leqq I_{o\_max}$ % of nominal Vo	05Vo Other			+10 +20	%
Over Voltage Protection	Limited Voltage, % of Nominal Vo	All	117	125	140	%

EFFICIENCY

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
100% Load	Vin=300V	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% Vout nominal)	All			±5	%
Recovery Time		All			250	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		30		ms
Turn-On Delay Time, From Input	V_{in_min} to 10%V_{o_set}, Power Up	All		30		ms
Output Voltage Rise Time	10%V_{o_set} to 90%V_{Vo_set}	All		30		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			3000 4200	V_{ac} V_{dc}
	1 minute; Input to Case (Base Plate),	All			2500 3500	V_{ac} V_{dc}
	1 minute; Output to Case (Base Plate)	All			500 700	V_{ac} V_{dc}
Isolation Resistance	Input to Output	All	100			MΩ
Isolation Capacitance	Input to Output	All		333		pF
	Input to Case (Base Plate)	05Vo 12Vo 15Vo 24Vo 48Vo		2220 1880 1560 2000 2080		
	Output to Case (Base Plate)	All		18800		

FEATURE CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Switching Frequency	Pulse wide modulation (PWM), Fixed	All	270	300	330	KHz
On/Off Control, Positive Remote On/Off logic, Refer to –Vin pin.						
Logic Low (Module Off)	$V_{on/off}$ at $I_{on/off}$=0.0uA, Pin open=Off	All	0		1.2	V
Logic High (Module On)	$V_{on/off}$ at $I_{on/off}$=1.0mA	All	3.5		12	V
On/Off Control, Negative Remote On/Off logic, Refer to –Vin pin						
Logic High (Module Off)	$V_{on/off}$ at $I_{on/off}$=1.0mA	All	3.5		12	V
Logic Low (Module On)	$V_{on/off}$ at $I_{on/off}$=0.0uA, Pin open=On	All	0		1.2	V
On/Off Current (for both remote on/off logic)	$I_{on/off}$ at $V_{on/off}$=3.5-12V	All	0.3		2.1	mA
Off Converter Input Current	Shutdown input idle current	All		3	5	mA
Over Temperature Shutdown	Temperature at the Center Part of Base Plate, Non-Latching	All		110		°C
Over Temperature Recovery		All		100		°C

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°C	05Vo 12Vo 15Vo 24Vo 48Vo		466 566 607 700 650		K hours
Weight		-CMFC -CMFD		210 296		grams
Base plate Material	Aluminum					
Potting Material	UL 94V-0 (DC Module)					

Shock/Vibration	MIL-STD-810F Compliant		
Humidity	95% RH max. Non Condensing		
Altitude	3000m Operating Altitude, 12000m Transport Altitude		
Thermal Shock	MIL-STD-810F		
Fire & Smoke	EN45545-2 Compliant		
EMI	EN55032 & EN55022 Compliant		Class A
ESD	EN61000-4-2	Level 3: Air ±8kV, Contact ±6Kv	Perf. Criteria A
Radiated immunity	EN61000-4-3	Level 3: 80~1000MHz, 20V/m	Perf. Criteria A
Fast Transient	EN61000-4-4	Level 3: On power input port, ±2Kv	Perf. Criteria A
Surge	EN61000-4-5	Level 4: Line to earth, ±4kV, Line to line, ±2Kv	Perf. Criteria A
Conducted immunity	EN61000-4-6	Level 3: 0.15~80MHz, 10V	Perf. Criteria A
Power Frequency Magnetic Field immunity	EN61000-4-8	50/60Hz, 3A/m (r.m.s.)	Perf. Criteria A
Application Note Link			CQB75-300S CMFC(D) Series App Notes
Packaging Information Link			Packaging Information

Immunity to Environmental Conditions.

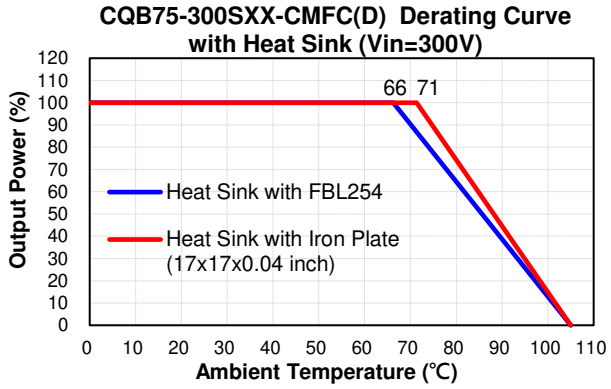
Phenomenon	Reference Clause(s)	Reference Standard	Test Conditions	Result
Vibration Test	MIL-STD-810F Table 514.5C-VIII Figure 514.5C-6	MIL-STD-810F	Unit are non-operating Vibration Waveform: Random Vibration Frequency: 15 ~ 2000 Hz Total Grms: 4.01997 grms Vibration axis: X、Y、Z axis Duration: 1hr/axis	Vibration Test
Shock Test	MIL-STD-810F 516.5 Table 516.5-I	MIL-STD-810F	Wave form: Sawtooth wave Test Category: Crash Hazard Test for Ground Equipment Duration: 10 ms Peak Acceleration: 75 G Cross-over Frequency: 80 Hz No. of Shock: Each axis 3 times Shock Direction: ±X, ±Y, ±Z axis	Shock Test
Thermal Shock Cycling Test	MIL-STD-810F 503.4 Figure 503.4-1	MIL-STD-810F	Temperature：-55℃to 105℃ Humidity: 95%RH Duration: 8hrs/ 3 times cycling& 4hrs dwell time	Thermal Shock Cycling Test
Thermal Humidity Cycling Test	MIL-STD-810F Notice 3 Method 507.4	MIL-STD-810F	Temperature: 60℃to 30℃ Humidity: 95%RH Duration: 240 hrs	Thermal Humidity Cycling Test

EN45545-2 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
	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	EN45545-2: 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



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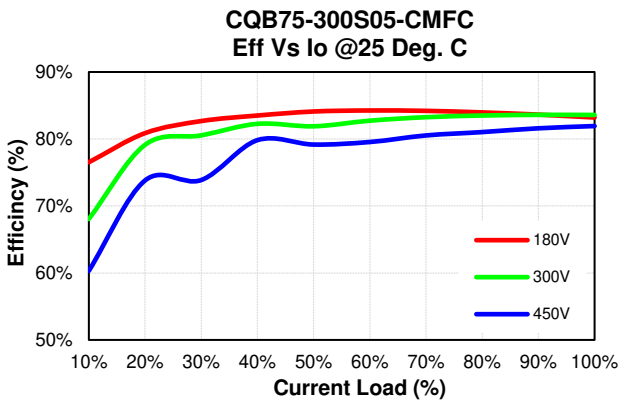
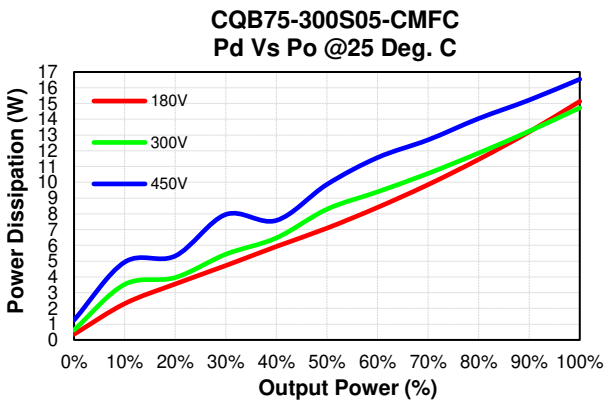
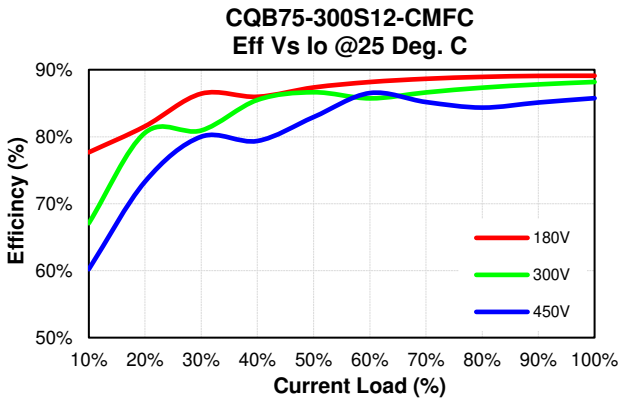
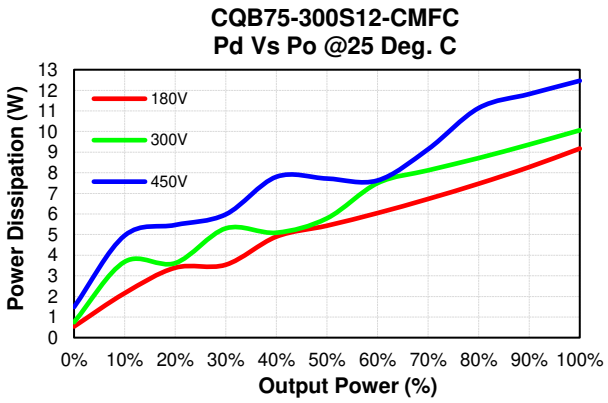
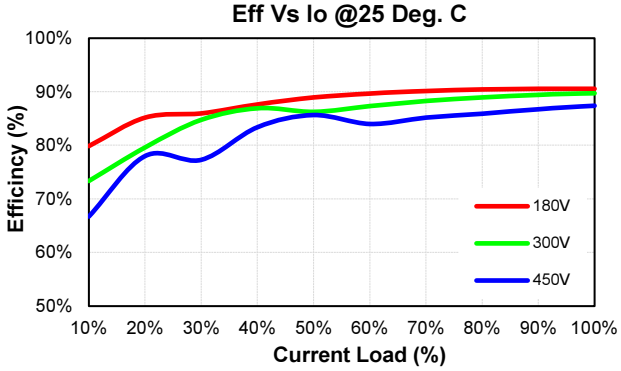




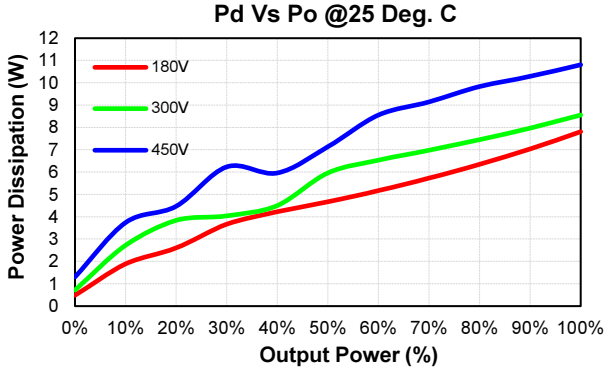




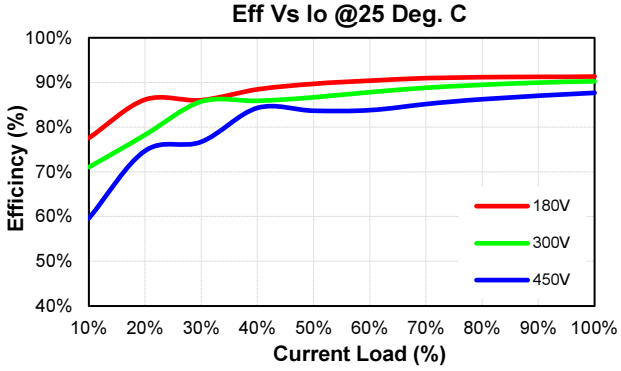
CQB75-300S15-CMFC
Eff Vs Io @25 Deg. C



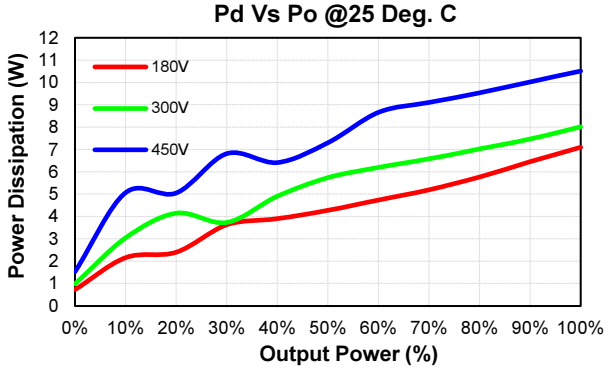
CQB75-300S15-CMFC
Pd Vs Po @25 Deg. C



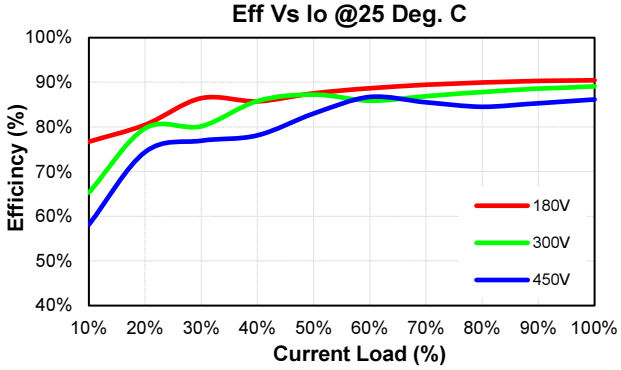
CQB75-300S24-CMFC
Eff Vs Io @25 Deg. C



CQB75-300S24-CMFC
Pd Vs Po @25 Deg. C



CQB75-300S48-CMFC
Eff Vs Io @25 Deg. C



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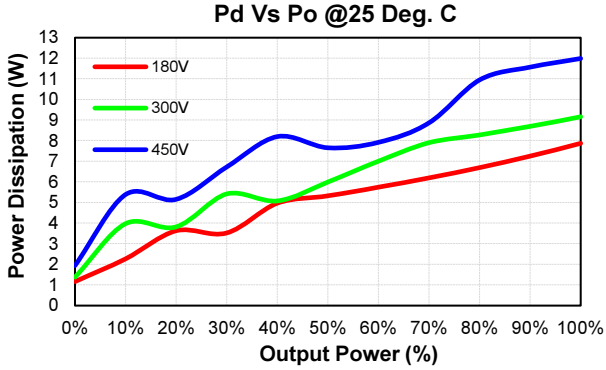
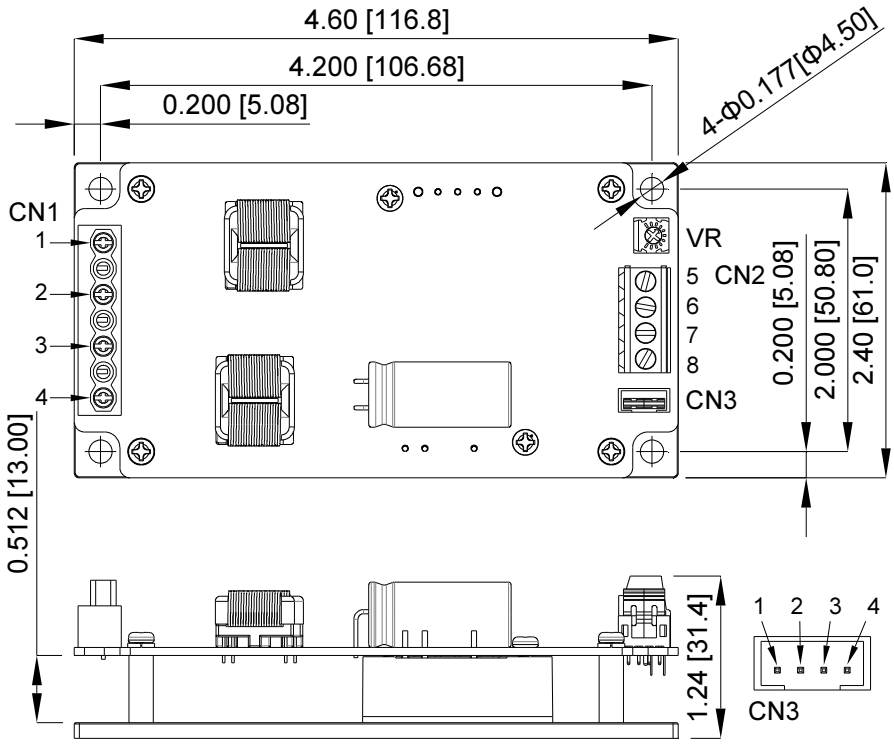
Pd Vs Po @25 Deg. C

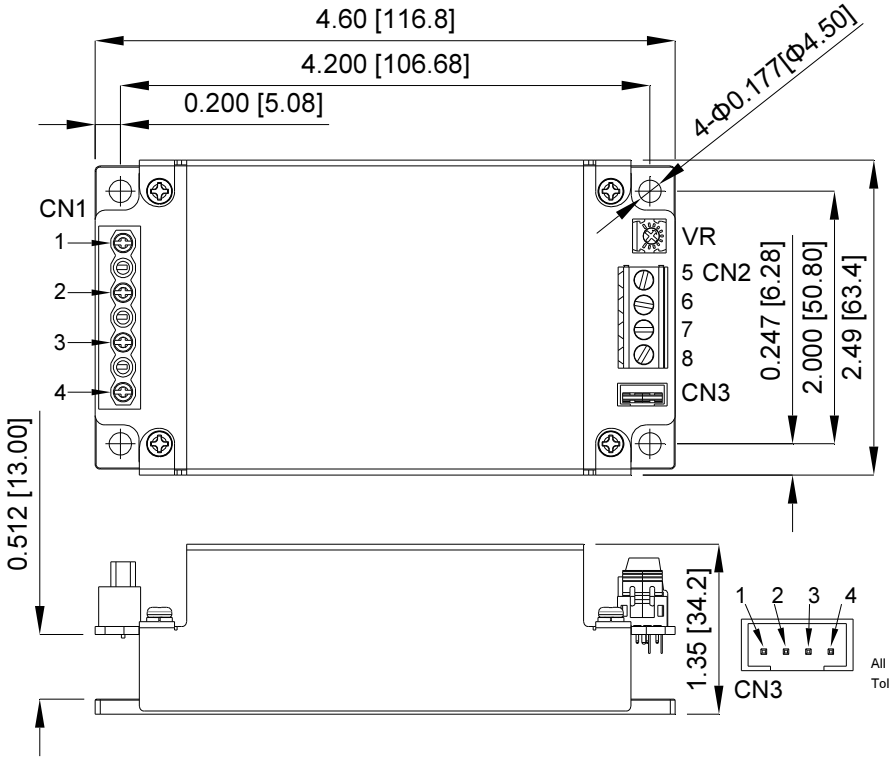


MECHANICAL SPECIFICATION

CMFC



CMFD with Cover



CN1 & CN2
PIN CONNECTION

PIN	Function
1	+V Input
2	-V Input
3	Remote
4	Case
5	+V Output
6	+V Output
7	-V Output
8	-V Output

CN3
PIN CONNECTION

PIN	Function
1	-V Output
2	-Sense
3	+Sense
4	+V Output

All Dimensions in Inches[mm]
Tolerance Inches: x.xx=±0.02, x .xxx=±0.010
Millimeters: x.x=±0.5, x.xx=±0.25

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