CQB100W8 SERIES
100 WATT 8:1 INPUT ISOLATED DC-DC CONVERTER

Features

- Efficiency up to 91%
- 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 +105℃
- Quarter Brick Size Meet Industrial Standard 2.28"x1.45"x0.5"
- CB Meets IEC62368-1
- EN 55032/035/EN 50155 Compliant with External Circuits
- UL 62368-1 3rd (Reinforce Insulation) Approval
- Shock & Vibration EN 50155 (EN 61373) Compliant
- Fire & Smoke EN 45545-2 Compliant
- 5000m Operating Altitude
- Option Model with Bus & External UVLO Function

E176177

MODEL NUMBER	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT		INPUT CURRENT		% EFF.		CAPACITOR LOAD MAX.
			MIN.	MAX.	NO LOAD	FULL LOAD	(1)	(2)	
CQB100W8-36S05	9-75 VDC	5 VDC	0 mA	20000 mA	25 mA	3069 mA	90.5	90.5	40000uF
CQB100W8-36S12	9-75 VDC	12 VDC	0 mA	8300 mA	25 mA	3126 mA	88.5	88.5	8300uF
CQB100W8-36S15	9-75 VDC	15 VDC	0 mA	6700 mA	25 mA	3102 mA	90	89.5	6700uF
CQB100W8-36S24	9-75 VDC	24 VDC	0 mA	4200 mA	25 mA	3111 mA	90	89.5	4200μF
CQB100W8-36S28	9-75 VDC	28 VDC	0 mA	3600 mA	30 mA	3077 mA	91	90.5	3600μF
CQB100W8-36S48	9-75 VDC	48 VDC	0 mA	2100 mA	30 mA	3077 mA	91	90.5	1000μF
CQB100W8-36S54	9-75 VDC	54 VDC	0 mA	1850 mA	30 mA	3049 mA	91	91	1000μF

NOTE:

1. Nominal input voltage 36 VDC.
2. Measured at input voltage 48VDC.
3. An external input capacitor 470uF for all models are recommended to reduce input ripple voltage.

PART NUMBER

Series	Nominal Input Voltage	Number of Outputs	Nominal Output Voltage	Remote On/Off Logic	Mounting Inserts
CQB100W8-	II	O	XX	L	-Y (Option)
CQB100W8	36：36 VDC	S：Single	05：05VDC 12：12VDC 15：15VDC 24：24VDC 28：28VDC 48：48VDC 54：54VDC	None：Positive N：Negative	None：M3x0.5 Mounting Inserts -C：Clear Mounting Insert (3.2mm DIA.) -B：With Bus & External UVLO Function -C-B：Clear Mounting Insert (3.2mm DIA.) and with Bus & External UVLO Function

Part Number Example:

CQB100W8-36S12N-C: Quarter Brick, 100W, 8:1 9-75Vdc Input, Single 12Vdc Output, Negative Logic, Clear Mounting Insert

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		75	V_{dc}
Input Surge Voltage	1000 ms max.	All			100	V_{dc}
Operating Case Temperature	At the center part of case plate	All	-40		105	℃
Storage Temperature		All	-55		125	℃

INPUT CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Operating Input Voltage		All	9	36	75	V_{dc}
Input Under Voltage Lockout						
Turn-On Voltage Threshold	Full Load	All	8.0	8.5	8.8	V_{dc}
Turn-Off Voltage Threshold	Full Load	All	7.6	8.0	8.3	V_{dc}
Lockout Hysteresis Voltage	Full Load	All		0.5		V_{dc}
Maximum Input Current	V_{in}=9V to 75V, Full load	All			14	A
No-Load Input Current	V_{in}=36V, I_o=0A	See Model Number Table				mA
Input Filter	Pi filter	All				
Inrush Current (I^2t)	As per ETS300 132-2	All			0.1	A^2s
Input Reflected Ripple Current	P-P thru 12uH inductor, 5Hz to 20MHz	All		30		mA

OUTPUT CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Voltage Set Point Accuracy	V_{in}=36V, Full load, T_c=25℃	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	T_c=-40℃ to 105℃	All			±0.02	%/℃
Output Voltage Ripple and Noise (5Hz to 20MHz bandwidth)						
Peak-to-Peak	Full load, 10uF polymer tantalum and 1uF ceramic capacitors	5Vo			150	mV
		12Vo			150	
		15Vo			150	
		24Vo			240	
		28Vo			240	
		48Vo			480	
		54Vo			480	
RMS.		5Vo			80	mV
		12Vo			80	
		15Vo			80	
		24Vo			120	
		28Vo			120	
		48Vo			220	
		54Vo			220	
Output Current Range	V_{in}= 9 to 75V	See Model Number Table				A
Over Current Protection	Hiccup Mode. Auto recovery	All	110	150	180	%
Short Circuit Protection		All	Continuous, Auto Recovery			
External Load Capacitance	Full load (resistive)	See Model Number Table				uF

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Output Voltage Trim Range	$P_o \leqq$ max. rated power, $I_o \leqq I_{o\_max.}$	Others 54Vo	-20 -20		+15 +10	%
Output Voltage Remote Sense Range	$P_o \leqq$ max. rated power, $I_o \leqq I_{o\_max.}$ % of nominal V_o	Others 54Vo			+15 +10	%
Over Voltage Protection	Limited Voltage, % of Nominal V_o	Others 54Vo	117 112	125 117	140 140	%
Bus Pin Output Voltage	V_{in}= 24 to 75V, T_c=25℃	-B Only		24	26	V_{dc}

EFFICIENCY

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
100% Load	V_{in}=36V, 48V	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			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		50		ms
Turn-On Delay Time, From Input	$V_{in\_min.}$ to 10%V_{o_set}, Power up	All		50		ms
Output Voltage Rise Time	10%V_{o_set} to 90%V_{o_set}	All		50		ms

ISOLATION CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Isolation Voltage (100% factory Hi-Pot tested @2 sec.)	1 Minute; input to output	All			3000 4200	V_{ac} V_{dc}
	1 Minute; input to case (base plate)				2100 3000	V_{ac} V_{dc}
	1 Minute; output to case (base plate)				1500 2100	V_{ac} V_{dc}
Isolation Resistance	Input to output	All	100			MΩ
Isolation Capacitance	Input to output	All		1100		pF

FEATURE CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Switching Frequency	Output ripple frequency	All	180	200	220	KHz
On/Off Control, Positive Remote On/Off Logic, Refer to -Vin Pin						
Logic Low (Module Off)	$V_{on/off}$ at $I_{on/off}$=1.0mA	All	0		1.2	V
Logic High (Module On)	$V_{on/off}$ at $I_{on/off}$=0.0uA, Pin open=on	All	3.5 or Open Circuit		75	V
On/Off Control, Negative Remote On/Off Logic, Refer to -Vin Pin						
Logic High (Module Off)	$V_{on/off}$ at $I_{on/off}$=0.0uA, Pin open=off	All	3.5 or Open Circuit		75	V
Logic Low (Module On)	$V_{on/off}$ at $I_{on/off}$=1.0mA	All	0		1.2	V
On/Off Current (for Both Remote On/Off Logic)	$I_{on/off}$ at $V_{on/off}$=0V	All		0.4	1	mA
Leakage Current (for Both Remote On/Off Logic)	Logic high, $V_{on/off}$=15V	All			30	uA
Off Converter Input Current	Shutdown input idle current	-B Others		6 4	12 12	mA
Over Temperature Shutdown	Temperature at the center part of case, non-latching	All		110		℃
Over Temperature Recovery		All		100		℃

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℃	05Vo 12Vo 15Vo 24Vo 28Vo 48Vo 54Vo		587 760 863 871 825 991 893		K hours
Weight		All		66		grams
Potting Material	UL 94V-0					
Case Material	Plastic, DAP, UL 94V-0					
Base plate Material	Aluminum base plate					
Shock/Vibration	MIL-STD-810F/EN 61373 compliant					
Humidity	95% RH max. Non condensing					
Altitude	5000m Operating altitude, 12000m Transport altitude					
Thermal Shock	MIL-STD-810F					
Fire & Smoke	EN 45545-2 Compliant					

EMC SPECIFICATIONS (External components required, please refer to application note.)

EMI	Meets EN 55032 & EN 50155 Compliant (with external filter)		Class A
ESD	EN 61000-4-2	Level 3: Air ±8kV, Contact ±6kV	Perf. Criteria A
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 input capacitor required (EN50155)	Perf. Criteria A
Surge	EN 61000-4-5	Level 4: Line to earth, ±4kV, Line to line, ±2kV (EN50155)	Perf. Criteria A
Conducted immunity	EN 61000-4-6	Level 3: 0.15~80MHz, 10V	Perf. Criteria A
Interruptions of Voltage Supply	EN 50155	Class S3: 20ms interruptions	Perf. Criteria A
Supply Change Over	EN 50155	Class C2: During a supply break of 30 ms	Perf. Criteria A
Application Note Link			CQB100W8-36S 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 Test	13.4.4	EN 60068-2-1	Class OT6 Temperature: -40℃ Duration: 2 hrs	Pass
Dry Heat Test	13.4.5	EN 60068-2-2	Class OT6(Cycle A) Temperature: 85℃ Duration: 6 hrs	Pass
Low Temperature Storage Test	13.4.6	EN 60068-2-1	Temperature: -40℃ Duration: 16 hrs	Pass
Cyclic Damp Heat Test	13.4.8	EN 60068-2-30	Temperature: +25℃ and +55℃ Humidity: 90% RH Duration: 48 hrs	Pass
Random Vibration Test	13.4.10	EN 61373	Frequency range: 5 ~ 150 Hz Vertical: 0.988 m/s^2 Transverse: 0.441 m/s^2 Longitudinal: 0.683 m/s^2 Duration: 10 min / axis	Pass
Simulated Long Life Test at Increased Random Vibration Levels	13.4.10	EN 61373	Frequency range: 5 ~ 150 Hz Vertical: 5.59 m/s^2 Transverse: 2.49 m/s^2 Longitudinal: 3.87 m/s^2 Duration: 5 hrs / axis	Pass
Shock Test	13.4.10	EN 61373	±Vertical: 30 m/s^2 ±Transverse: 30 m/s^2 ±-Longitudinal: 50 m/s^2 Duration: 30ms x18 (Each axis 3 shocks)	Pass

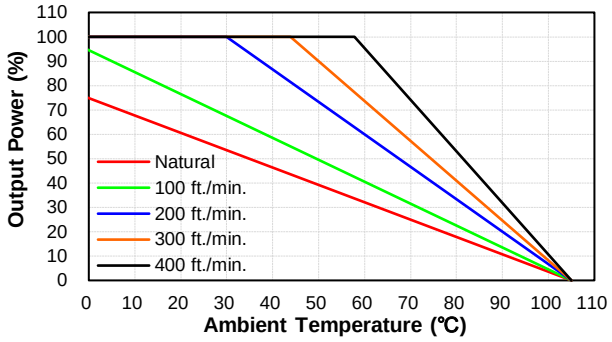
EN 45545-2 Fire & Smoke Test Conditions

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

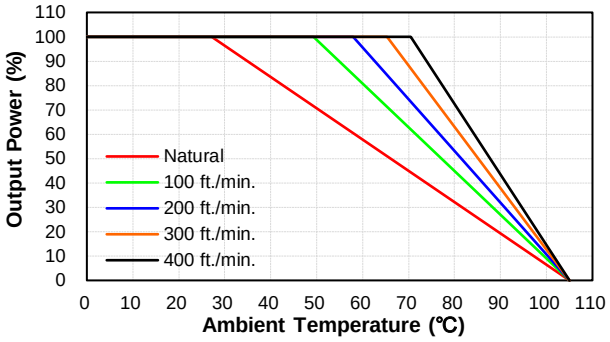
CHARACTERISTIC CURVE

Power Derating Curve

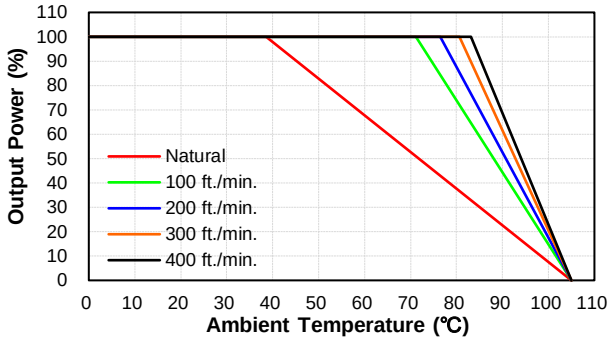
CQB100W8-36S05, 24 Derating Curve without Heatsink (Vin=36V)



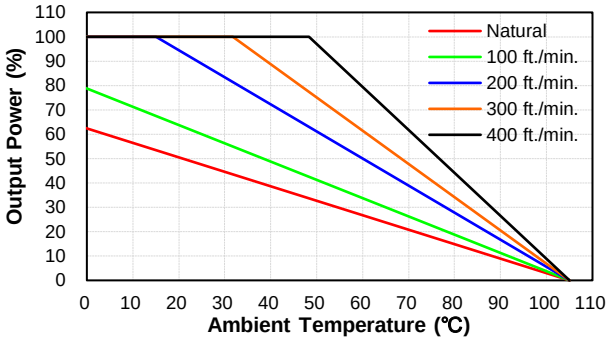
CQB100W8-36S05, 24 Derating Curve with Heatsink QBL127 (Vin=36V)



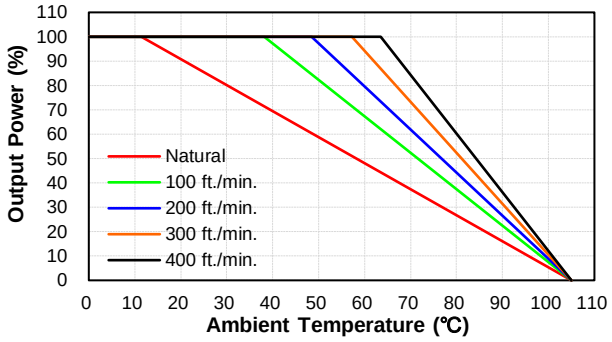
CQB100W8-36S05, 24 Derating Curve with Heatsink QBT210 (Vin=36V)



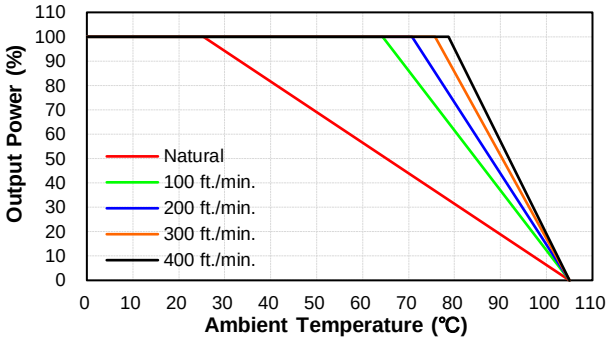
CQB100W18-36S12, 15 Derating Curve without Heatsink (Vin=36V)



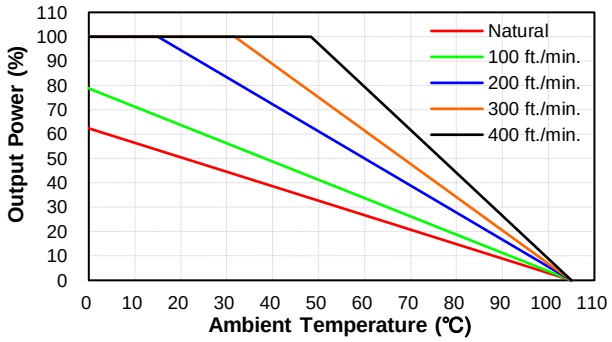
CQB100W8-36S12, 15 Derating Curve with Heatsink QBL127 (Vin=36V)



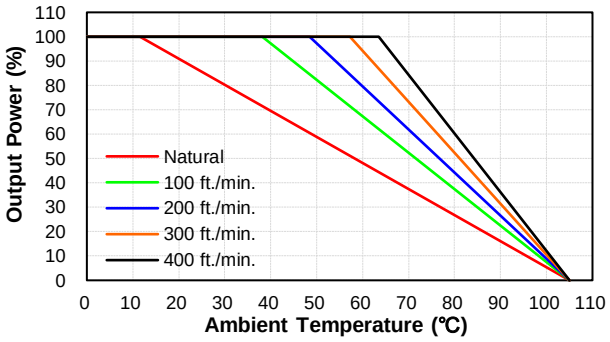
CQB100W8-36S12, 15 Derating Curve with Heatsink QBT210 (Vin=36V)

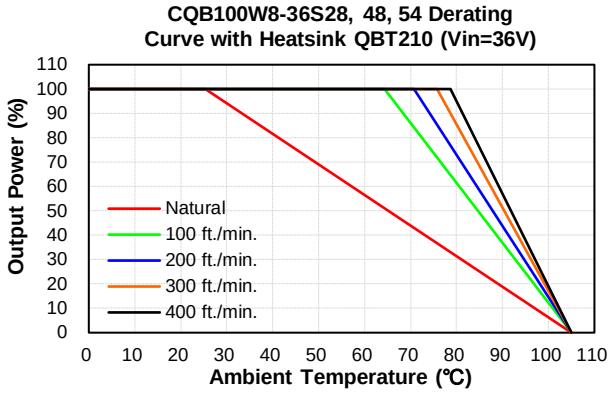


CQB100W18-36S28, 48, 54 Derating Curve without Heatsink (Vin=36V)

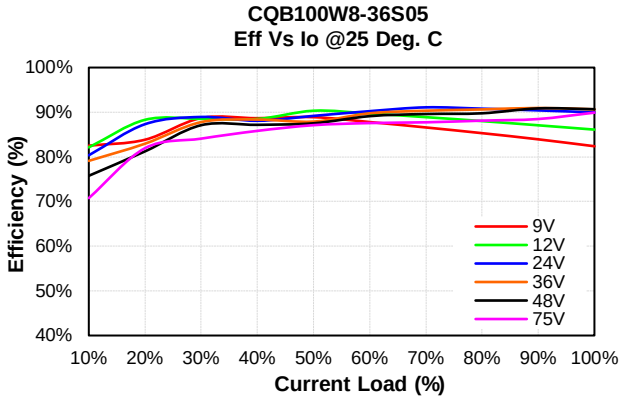


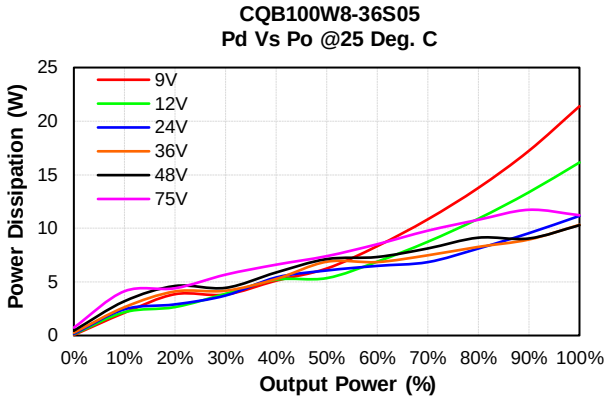
CQB100W8-36S28, 48, 54 Derating Curve with Heatsink QBL127 (Vin=36V)

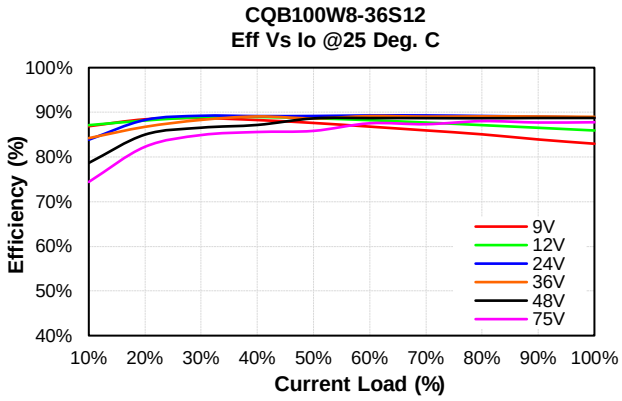


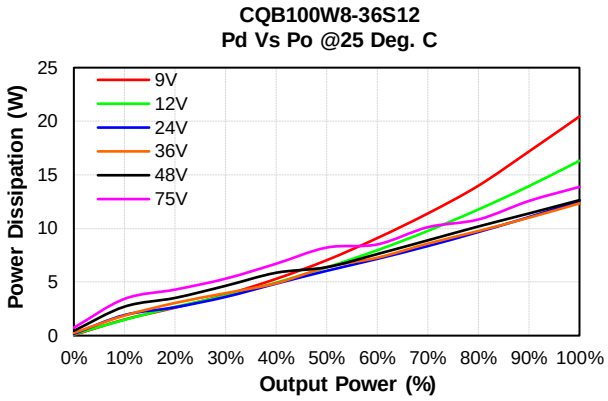


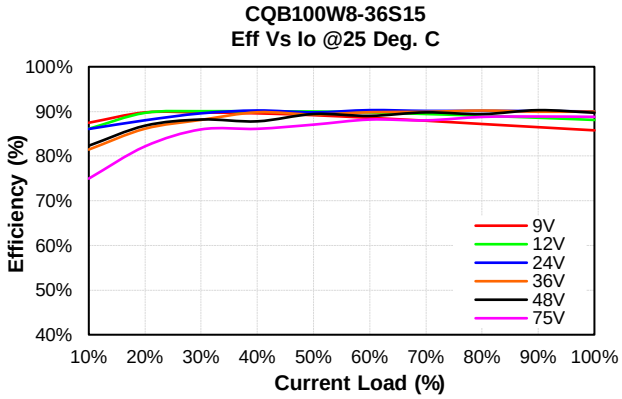
Performance Data

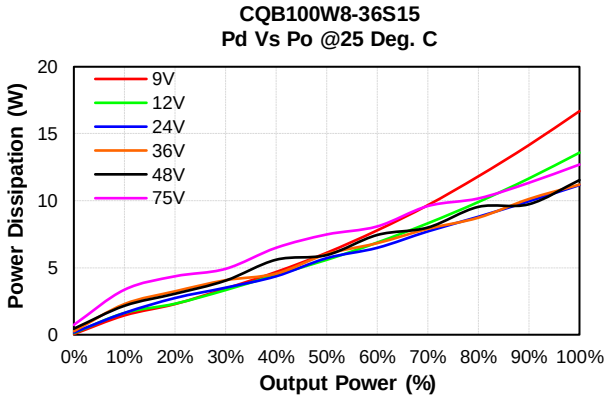






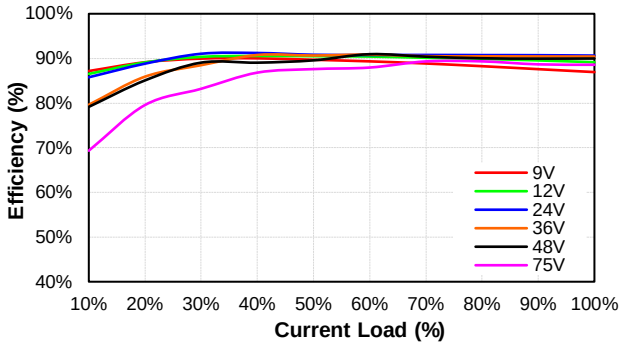




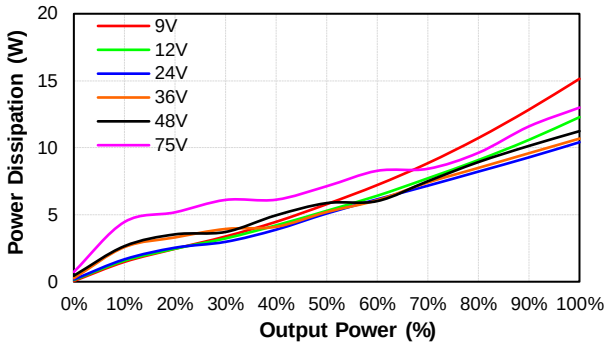


CQB100W8 Series

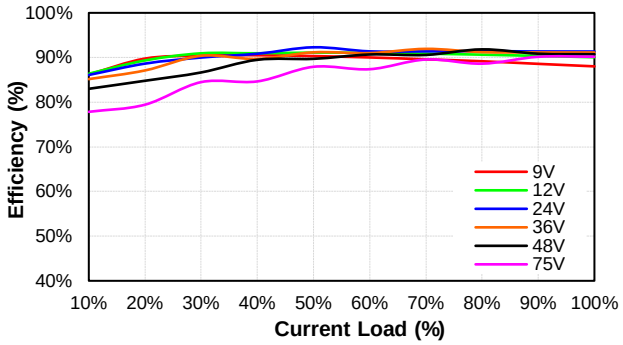
CQB100W8-36S24
Eff Vs Io @25 Deg. C



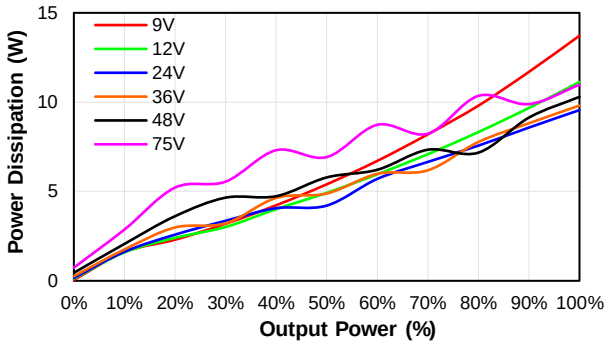
CQB100W8-36S24
Pd Vs Po @25 Deg. C



CQB100W8-36S28
Eff Vs Io @25 Deg. C



CQB100W8-36S28
Pd Vs Po @25 Deg. C



CQB100W8-36S48
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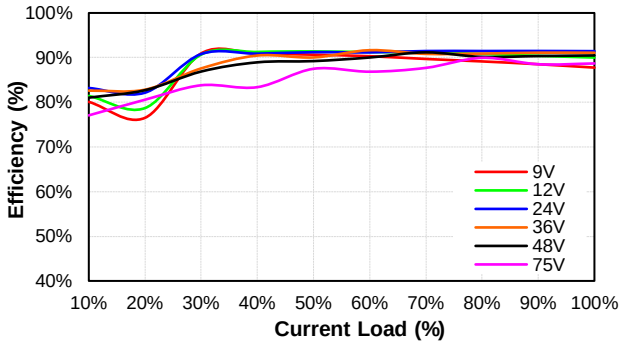

CQB100W8-36S48
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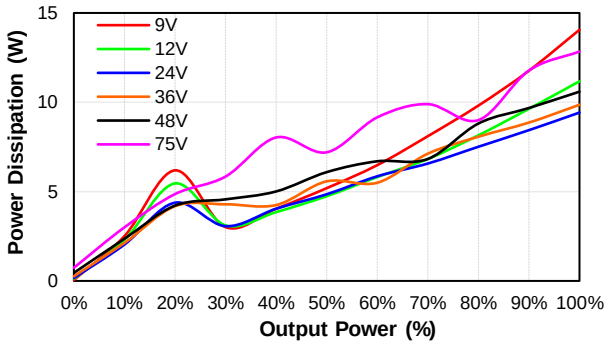

CQB100W8-36S54
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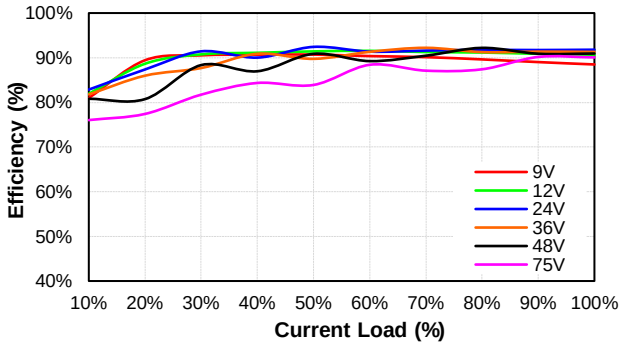
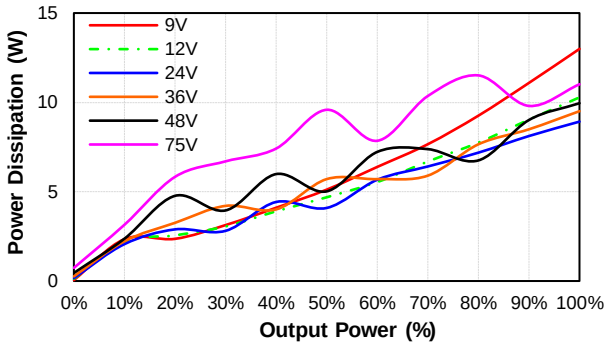
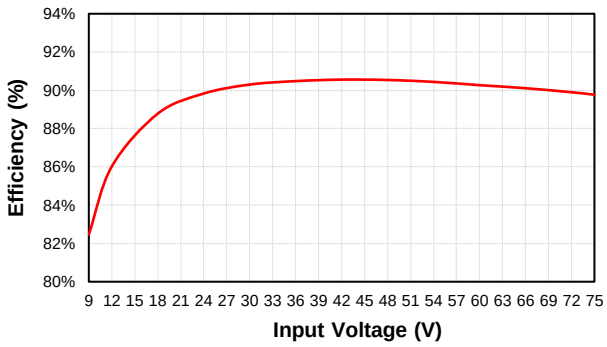


CQB100W8-36S54
Pd Vs Po @25 Deg. C



CQB100W8-36S05
Eff Vs Vin @25 Deg. C



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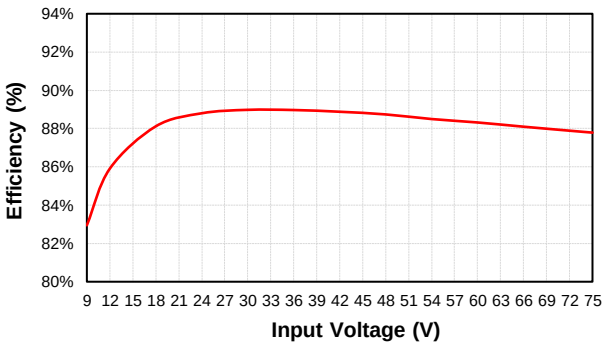
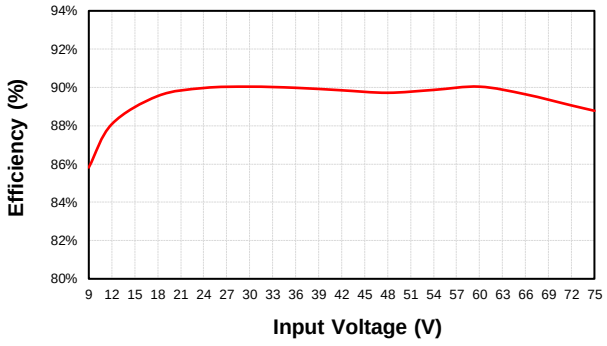
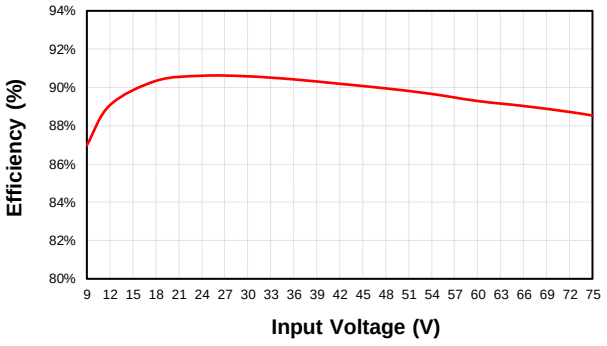


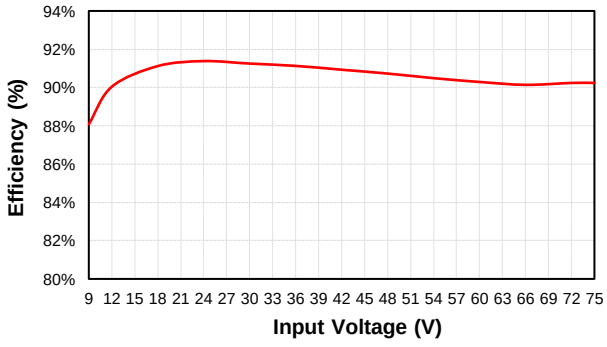
CQB100W8-36S15
Eff Vs Vin @25 Deg. C



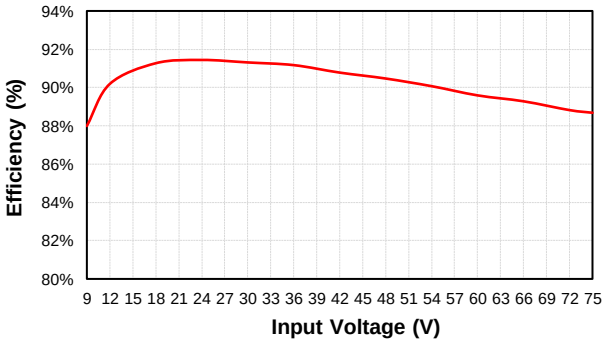
CQB100W8-36S24
Eff Vs Vin @25 Deg. C



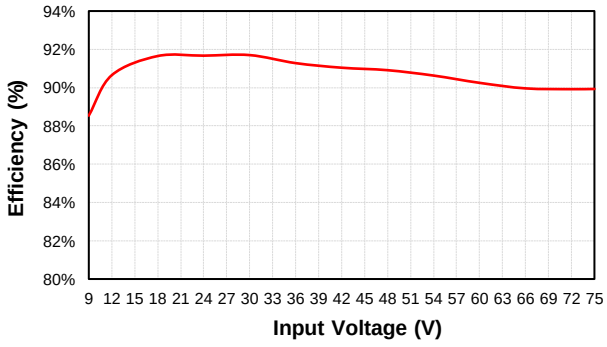
CQB100W8-36S28
Eff Vs Vin @25 Deg. C



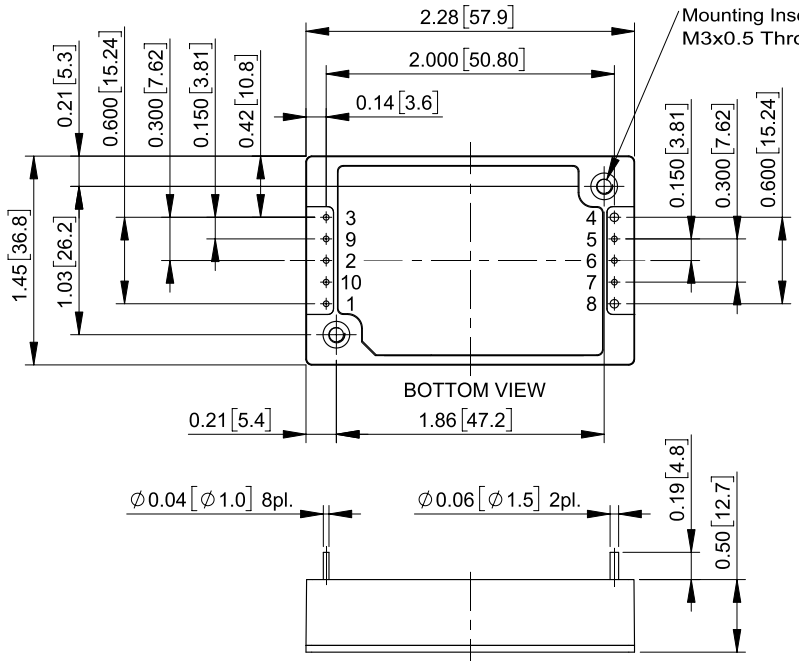
CQB100W8-36S48
Eff Vs Vin @25 Deg. C



CQB100W8-36S54
Eff Vs Vin @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

	Standard	Option -B
Pin	Function	
1	+V Input	+V Input
2	On/Off	On/Off
3	-V Input	-V Input
4	-V Output	-V Output
5	-Sense	-Sense
6	Trim	Trim
7	+Sense	+Sense
8	+V Output	+V Output
9	NP	Bus(Option)
10	NP	UVLO(Option)

Note:Pin Size is ∅0.04±0.004 Inch [∅1.0±0.1 mm]
Pin Size is ∅0.06±0.004 Inch [∅1.5±0.1 mm]
NP-No Pin