DC/DC Converter
CBXT-2W Series

Features

- Compact SMD package
- Input / Output Isolation Voltage: 1.5K Vdc or 3K Vdc
- High Efficiency
- Lead Free Design, RoHS Compliant
- Operating temperature: -40°C to +105°C
- Continuous Short -Circuit Protection
- Meet Safety Standard / Approval: IEC / EN60950-1

Applications

These converters are well suitable for battery operated equipment, measurement equipment, telecom, wireless network, Industry control system, everywhere where isolated, tightly regulated voltages and compact size are required.

Technical Specification All specifications are typical at nominal input, full load and 25°C unless otherwise stated.

Model Number	Input Voltage Range(V)	Output Voltage (V)	Output Current (mA) (1)	Input Current (mA) Typ.		Eff .(%) (2) Typ.	Capacitive Load, max. (3) (uF)
			Full Load	No Load	Full Load		
Single Output Series (1.5 KVdc)							
CBXT0303-2W	2.97-3.63 Nominal:3.3	3.3	700	6	713	84	220
CBXT0305-2W		5	400		713	85	
CBXT0503-2W	4.5-5.5 Nominal:5	3.3	700	5	470	85	
CBXT0505-2W		5	400		465	86	
CBXT0509-2W		9	223		460	87	
CBXT0512-2W		12	167		460	87	
CBXT0515-2W		15	133		460	87	
CBXT1203-2W	10.8-13.2 Nominal:12	3.3	700	3	196	85	
CBXT1205-2W		5	400		193	86	
CBXT1209-2W		9	223		191	87	
CBXT1212-2W		12	167		191	87	
CBXT1215-2W		15	133		191	87	
CBXT1503-2W	13.5-16.5 Nominal:15	3.3	700	3	156	85	
CBXT1505-2W		5	400		155	86	
CBXT1509-2W		9	223		153	87	
CBXT1512-2W		12	167		153	87	
CBXT1515-2W		15	133		153	87	
CBXT2403-2W	21.6-26.4 Nominal:24	3.3	700	3	98	85	
CBXT2405-2W		5	400		97	86	
CBXT2409-2W		9	223		95	87	
CBXT2412-2W		12	167		95	87	

Dual Output Series (1.5 KVdc)							
CAXT0303-2W	2.97-3.63 Nominal:3.3	±3.3	±300	6	750	80	100/100
CAXT0305-2W		±5	±200		750	80	
CAXT0503-2W	4.5-5.5 Nominal:5	±3.3	±300	5	495	80	
CAXT0505-2W		±5	±200		495	80	
CAXT0509-2W		±9	±111		500	80	
CAXT0512-2W		±12	±84		495	81	
CAXT0515-2W		±15	±67		495	81	
CAXT1203-2W	10.8-13.2 Nominal:12	±3.3	±300	3	210	80	
CAXT1205-2W		±5	±200		210	80	
CAXT1209-2W		±9	±111		210	78	
CAXT1212-2W		±12	±84		208	80	
Dual Output Series (3KVdc)							
CEXT1205-2W	4.5-5.5 Nominal:5	±12	±200	**3**	208	80	100/100

DC/DC Converter
CBXT-2W Series

Input Specifications		
	3.3V nominal input	2.97-3.63V
	5V nominal input	4.5-5.5V
	12V nominal input	10.8-13.2V
	15V nominal input	13.5-16.5V
Input filter		Capacitor
Environmental Specifications		
Operating ambient temperature		-40°C to +105°C
Maximum case temperature		+125°C
Storage temperature range		-55°C to +125°C
Relative humidity		95% RH max.
Output Specifications		
Output power		2Watts max.
Voltage accuracy	Nominal Vin and full load 3.3Vdc 5Vdc 9Vdc 12Vdc 15Vdc	 3.135-3.399V 4.75-5.15V 8.73-9.18V 11.64-12.24V 14.55-15.30V
Minimum load		10% load of full load
Line regulation	For Vin charge of 1%	±1.2% Typ.
Load regulation	Nominal Vin and 10%-100% load 3.3Vdc 5Vdc 9Vdc 12Vdc 15Vdc	 15% Typ. 13% Typ. 9% Typ. 8% Typ. 7% Typ.
Ripple and Noise (20MHz Bandwidth)		50mVp-p Typ. 100mVp-p Max.
Maximum capacitive load		See table
Output short circuit protection	B03_XT-2WR3	3S Max.
	Other models	Continuous, Automatic recovery
Temperature coefficient		±0.03%/°C Typ.
General Specifications		
Efficiency	Nominal input and full load	See table
Isolation voltage	Input to output	1500VDC/3000VDC (60 second)
Isolation resistance	500VDC	1000MΩ min.
Isolation capacitance		30pF typ.
Switching frequency		150kHz typ. 300kHz max.
Reliability, calculated MTBF		2×10^{6} Hrs

DC/DC Converter
CBXT-2W Series

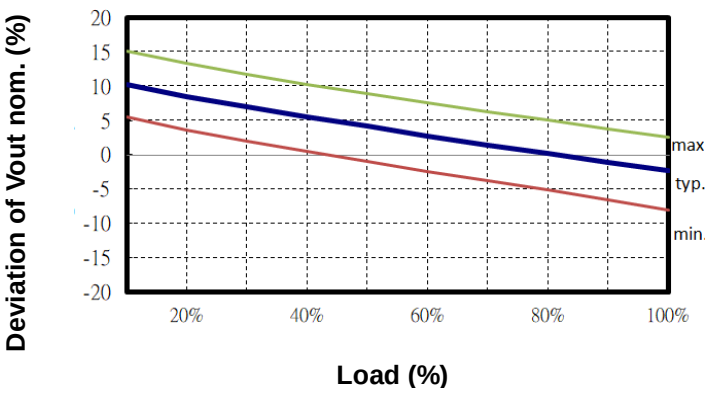
Physical Specifications	
Case material	Plastic (UL94 V-0)
Potting material	PU (UL94 V-0)
Dimensions（Single output）	13.3× 8.5× 7 mm
Dimensions（Dual output）	15.2× 8.4× 7.6 mm
Weight	2g Typ.

Note

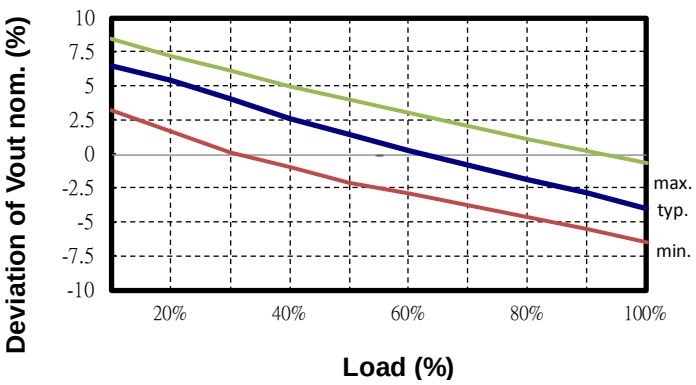
1. Io below this value will not damage these converters, however, they may not meet all listed specifications.
2. Typical value, tested at nominal input and full load.
3. In case of long input lines or hot plug-in requirements, we recommended to use an external low ESR capacitor (22uF) near to the converter's input pins.
4. Specifications subject to change without notice.

Output voltage variation dependent on load (at nominal input voltage)

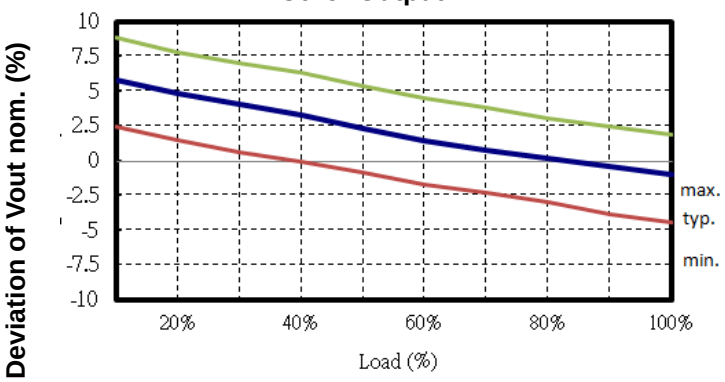
3.3VDC Output



5VDC Output

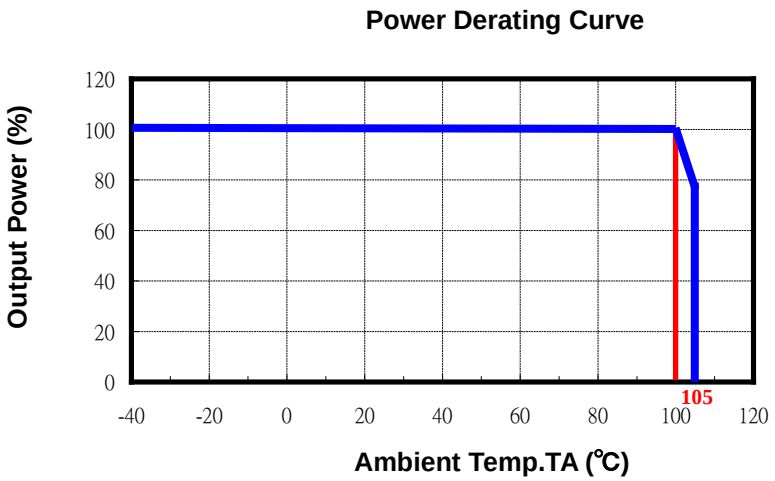


Other Output



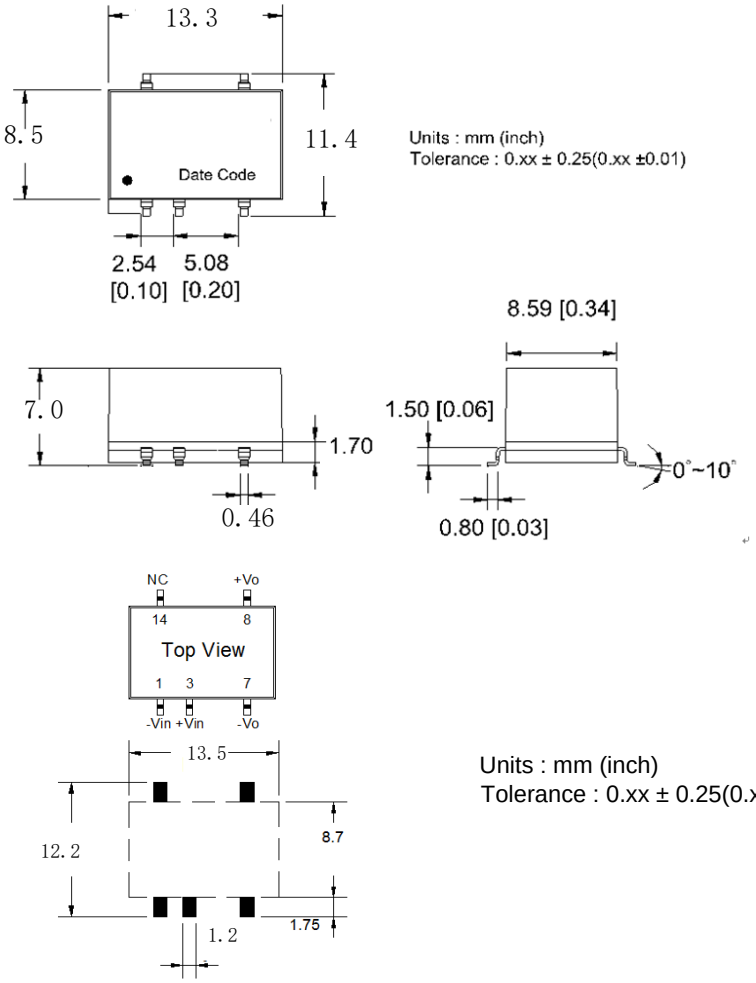
Load (%)

Power Derating Curve



Mechanical Dimensions

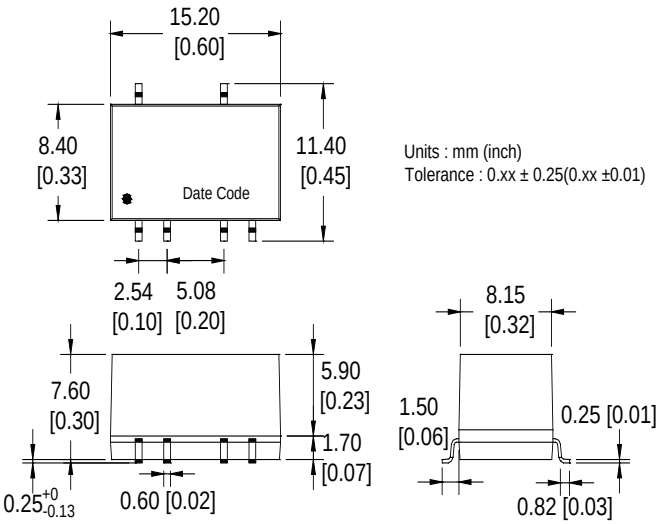
Single output



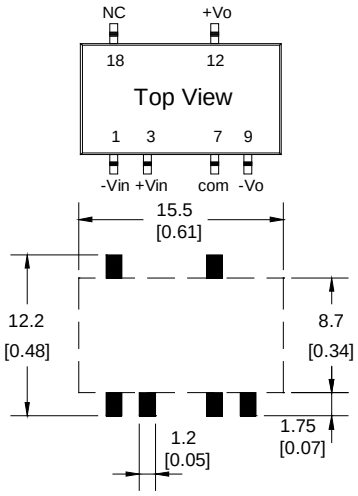
Pin	1.5KVdc - Single		Pin
1	-Vin	NC	14
3	+Vin	---	12
5	---	---	10
7	Vo (-)	Vo (+)	8

Unit: mm
Tolerance: 0.XX ±0.25

Dual output



Pin	1.5 KVdc /3KVdc - Dual		Pin
1	-Vin	N.C.	18
3	+Vin	---	16
5	---	---	14
7	Com	Vo (+)	12
9	Vo (-)	---	10

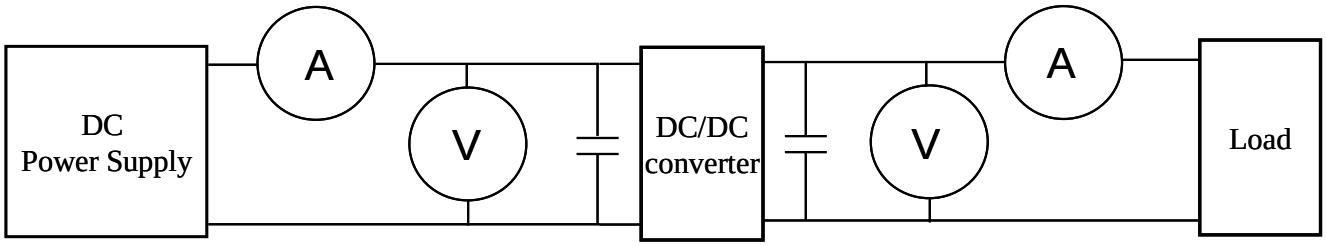


CAXTxx-2W

Units : mm (inch)
Tolerance : 0.xx ± 0.25 (0.xx ± 0.01)

Test Configurations

All specifications are typical at nominal input, full load and 25°C unless otherwise stated.



◎DC Power Supply: It offers a wide voltage and current range precisely.

◎Current meter (A): Accuracy➔ 200μA ~ 200mA 4 ranges±(0.2% rdg + 2 digits)

2000mA ~ 20A 2 ranges±(0.3% rdg + 2 digits).

◎Voltage meter (V): Accuracy➔ ±(0.03% rdg + 4 digits).

◎Load: At full load.

◎Wires: The resistance of the wires must be small.

1. Input voltage range: Narrow input voltage range（±10%）、wide input voltage range (2:1 and 4:1）。

EX: Narrow input voltage range（±10%）

5V nominal input	➔	4.5~5.5V
12V nominal input	➔	10.8~13.2V
24V nominal input	➔	21.6~26.4V

Wide input voltage range 2:1

5V nominal input	➔	4.5~9V
12V nominal input	➔	9~18V
24V nominal input	➔	18~36V
48V nominal input	➔	36~75V

Wide input voltage range 4:1 (W)

24V nominal input	➔	9~36V
48V nominal input	➔	18~75V

2. Input power :

Pin = Vin x Iin

Vin：Input voltage
Iin：Input current

3. Output power :

Pout = Vout x Iout

Vout：Output voltage
Iout：Output current

4. Efficiency :

$$\text{Efficiency} = \frac{\text{Pout}}{\text{Pin}} \times 100\%$$

Pout: Output power
Pin: Input power

5. Voltage accuracy:

$$\frac{|\text{Vout-Vout(nominal)}|}{\text{Vout}} \times 100\%$$

Vout：Output voltage

Vout(nominal)：Nominal output voltage

6. Line regulation:

Narrow input voltage range（±10%）and unregulated output voltage series.

$$\text{Line regulation} = \frac{\Delta \text{Vout}}{\Delta \text{Vin}}$$

$$\Delta \text{Vout} = \frac{\text{Vout(+10\%)-Vout(-10\%)}}{\text{Vout}} \times 100\%$$

Vout(+10%)：Output voltage at Vin = 1.1xVin(nominal)&full load

Vout(-10%)：Output voltage at Vin = 0.9xVin(nominal)&full load

Vout：Output voltage at Vin = Vin(nominal)&full load

$$\Delta \text{Vin} = \frac{\text{Vin(+10\%)-Vin(-10\%)}}{\text{Vin(nominal)}} \times 100\%$$

Vin(+10%)：Input voltage = 1.1xVin(nominal)

Vin(-10%)：Input voltage = 0.9xVin(nominal)

Vin(nominal)：Nominal Input voltage

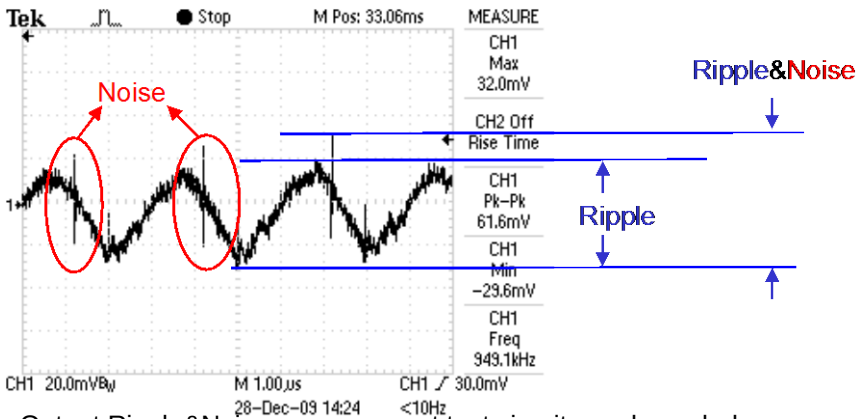
7. Load regulation :

$$\frac{|\text{Vout(FL)-Vout(NL)}|}{\text{Vout(FL)}} \times 100\%$$

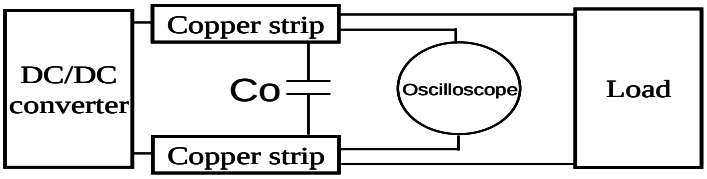
Vout(FL): Output voltage at full load

Vout(NL): Output voltage at 10% full load

8. Ripple and Noise: as shown below. The bandwidth is 0-20MHz.

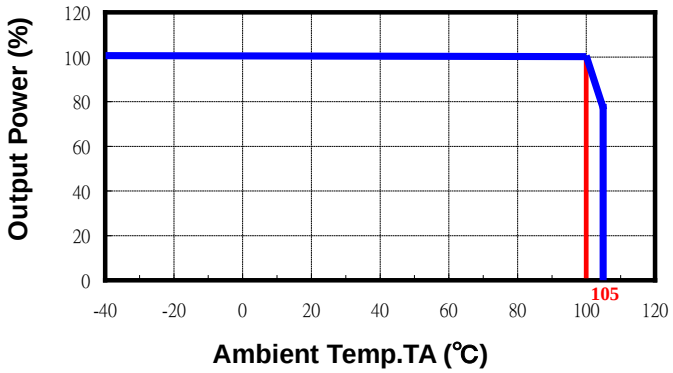


Output Ripple&Noise measurement test circuit: as shown below.



Co: usually 0.47uF.

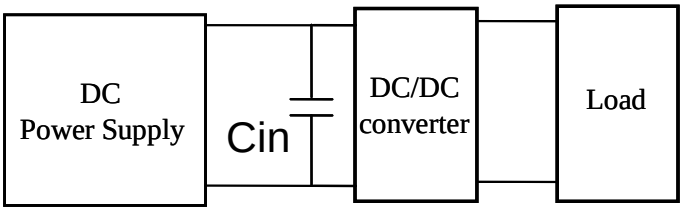
9. Temperature derating curve: The DC-DC converter will operate over a wider temperature range if less power is drawn from the output and the device is already running. The temperature derating curve shows the operating power-temperature range. As shown below.



10. Switching frequency: The nominal operating frequency of the DC-DC converters.

11. Input to output isolation: The dielectric breakdown strength test between input and output circuits. This is the isolation voltage the device is capable of withstanding for a specified time, usually 1 second or 1 minute.

12. Input souce impedance: The power module should be connected to low ac-impedance input souce. Highly inductive souce impedances can affect the stability of the power module. In applications where power is supplied over long lines and output loading is high , it maybe necessary to use a capacitor at the input to ensure startup. Capacitor mounted close to the power module helps ensure stability of the unit , it is commended to use a good quality low Equivalent Series Resistance (ESR < 0.1Ω at 100KHz) capacitor of a 22uF for the power module.



Pb-free SMD Peakage AIR Reflow Profile

Step#	Profile Feature	Condition / Duration
Step1	Ramp-up rate	3℃/sec max
Step2	Preheat : 150~200℃	Ta-Tb: 60-180 sec
Step3	Ramp-up rate (TL to Tp)	3℃/sec max
	Temperature maintained above217℃ (TL)	tL:60-150sec
Step4	Peak temperature (Tp)	245+0℃/-5℃
	The Time of Actual peak temperature	20-40sec
Step5	Ramp-down rate	6℃/sec max
Note1	All temperatures refer to topside of the package, measured on the package body surface.	
Note2	Time 25℃ to peak temperature: 8 minutes max	
Note3	It is not allowed to make a forced cooling in temperature falling range.