



Cosel CBS-series Converters Bus Converter Power Module Type Owner's Manual

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Cosel CBS-series Converters Bus Converter Power Module Type



Product Information

The DC-DC Converters Bus Converter is a low-profile isolated power module type. It is a compact HALF BRICK converter that is commonly used in the telecommunication market. The converter offers high efficiency, high density, and high reliability. It does not have built-in aluminum and tantalum electrolytic capacitors, and it features built-in overcurrent, overvoltage, and thermal protection circuits. The converter also has a remote ON/OFF function and a mounting hole (M3 tapped). It is compliant with CE marking, Low Voltage Directive, RoHS Directive, UKCA marking, Electrical Equipment Safety Regulations, and RoHS Regulations. The safety agency approvals include UL60950-1, C-UL recognized, and TuV approved. The converter comes with a 5-year warranty and optional parts such as a heat sink.

Product Usage Instructions

1. Ensure that the input voltage of the DC-DC converter is within the specified range. The available input voltage options are DC18 – 36V or DC36 – 76V.
2. Select the desired output voltage from the available options: 1.8V, 2.5V, 3.3V, 5V, or 12V.
3. Refer to the model specifications to determine the maximum output wattage for the selected output voltage.
4. If required, choose optional features such as remote ON/OFF or mounting hole.
5. If additional cooling is needed, consider adding a heat sink as an optional part.
6. Based on the chosen specifications, refer to the model number table to find the appropriate model code.
7. Ensure that the DC-DC converter is properly installed and connected according to the provided guidelines.
8. Verify that the output voltage of the converter is adjusted within the specified range, if necessary.
9. Take note of the overcurrent protection, overvoltage protection, and other safety features provided by the converter.
10. If remote sensing or remote ON/OFF functionality is required, follow the instructions provided to enable and control these features.

For more detailed information and technical specifications, please refer to the product manual available at <http://www.cosel.co.jp/en/>.

Feature

- Compact DC-DC Converter, "HALF BRICK" which has been standard size for Telecommunication Market
- High efficiency
- High density
- High reliability : not built-in aluminum and tantalum electrolytic capacitor
- Built-in overcurrent, overvoltage and thermal protection circuits
- Built-in remote ON/OFF
- Mounting hole (M3 tapped)

CE marking

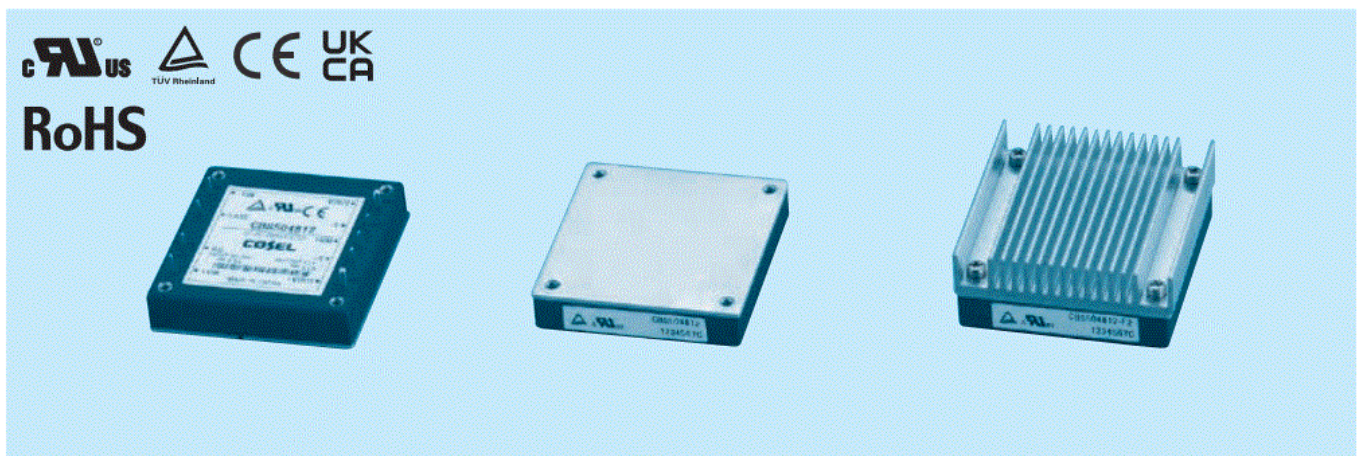
- Low Voltage Directive
- RoHS Directive
- UKCA marking
- Electrical Equipment Safety Regulations
- RoHS Regulations
- Safety agency approvals
- UL60950-1, C-UL recognized, TuV approved
- 5-year warranty

Optional parts

Optional parts	Model
Heat sink	CBS50, CBS100, CBS200

DC-DC Converters Bus Converter.Power Module Type

CBS50



Ordering information



1. Series name
2. Single output
3. Output wattage
4. Input voltage
 - 24 : DC18 – 36V
 - 48 : DC36 – 76V
5. Output voltage
6. Optional
7. R: with Remote ON/OFF
8. Positive logic control
9. T: with Mounting hole
10. f3.4 thru
11. FO: with Additio Heat sink

MODEL	CBS50 241R8	CBS50 242R5	CBS50 2403	CBS50 2405	CBS50 2412	CBS50 2415	CBS50 2424	CBS50 2428
MAX OUTPUT WATTAGE[W]	21.06	29.25	38.6	50.0	50.4	51.0	50.4	50.4
DC OUTPUT	1.8V 11 .7A	2.5V 11 .7A	3.3V 11 .7A	5V 10A	12V 4.2 A	15V 3.4 A	24V 2.1 A	28V 1.8 A

SPECIFICATIONS

	MODEL	CBS50 241R8	CBS50 242R5	CBS50 2403	CBS50 2405	CBS50 2412	CBS50 2415	CBS50 2424	CBS50 2428
INPUT	VOLTAGE[V]	DC18 – 36							
	CURRENT[A] *1	1.24typ	1.58typ	2.04typ	2.48typ	2.39typ	2.44typ	2.41typ	2.41typ
	EFFICIENCY[%] *1	71typ	77typ	79typ	84typ	88typ	87typ	87typ	87typ
	VOLTAGE[V]	1.8	2.5	3.3	5	12	15	24	28
	CURRENT[A]	11.7	11.7	11.7	10	4.2	3.4	2.1	1.8
	LINE REGULATION[mV]	10max	10max	10max	10max	24max	30max	48max	56max
	LOAD REGULATION[mV]	10max	10max	10max	10max	24max	30max	48max	56max

OUTP UT	RIPPLE[mV p-p]	-20 to +10 0C* 2	80max	80max	80max	80max	120max	120max	120max	120max
		-40 to -20 C*2	120max	120max	120max	120max	150max	150max	150max	150max
	RIPPLE NOI SE[mVp-p]	-20 to +10 0C* 2	120max	120max	120max	120max	150max	150max	150max	150max
		-40 to -20 C*2	200max	200max	200max	200max	200max	200max	250max	250max
	TEMPERAT URE REGUL ATION[mV]	0 t o + 65 C	35max	35max	35max	50max	120max	150max	240max	280max
		-40 to +10 0C	66max	66max	66max	100max	240max	300max	480max	560max
	DRIFT[mV] *3		16max	16max	16max	20max	40max	60max	90max	90max
	START-UP TIME[ms]		200max (DCIN 24V, Io=100%)							
	OUTPUT VOLTAG E ADJUSTMENT RANGE[V] *4		Fixed (TRM pin open), adjustable by external resistor							
			1.70 – 1.98	1.98 – 2.75	1.98 – 3.63	3.0 – 5. 5	7.2 – 13.2	9.0 – 16.5	14.4 – 2 6.4	16.8 – 3 0.8
	OUTPUT VOLTAG E SETTING[V]		1.77 – 1.88	2.46 – 2.61	3.25 – 3.45	4.90 – 5.20	11.74 – 12.46	14.55 – 15.45	23.28 – 24.72	27.16 – 28.84
PROT ECTIO N CIR CUIT AND OTHE RS	OVERCURRENT P ROTECTION		Works over 105% of rating and recovers automatically							
	OVERVOLTAGE P ROTECTION[V]		2.16 – 2.88	3.00 – 4.00	4.00 – 5.50	5.75 – 7.00	13.80 – 16.80	17.25 – 21.00	27.60 – 33.60	32.20 – 39.20
	REMOTE SENSIN G		Provided							
	REMOTE ON/OFF		Provided (Negative logic L : ON, H : OFF)							

	MODEL	CBS50 241R8	CBS50 242R5	CBS50 2403	CBS50 2405	CBS50 2412	CBS50 2415	CBS50 2424	CBS50 2428
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INPUT	VOLTAGE[V]		DC18 – 36							
	CURRENT[A] *1		1.24typ	1.58typ	2.04typ	2.48typ	2.39typ	2.44typ	2.41typ	2.41typ
	EFFICIENCY[%] *1		71typ	77typ	79typ	84typ	88typ	87typ	87typ	87typ
OUTPUT	VOLTAGE[V]		1.8	2.5	3.3	5	12	15	24	28
	CURRENT[A]		11.7	11.7	11.7	10	4.2	3.4	2.1	1.8
	LINE REGULATION[mV]		10max	10max	10max	10max	24max	30max	48max	56max
	LOAD REGULATION[mV]		10max	10max	10max	10max	24max	30max	48max	56max
	RIPPLE[mV p-p]	-20 to +10 0C*2	80max	80max	80max	80max	120max	120max	120max	120max
		-40 to -20 0C*2	120max	120max	120max	120max	150max	150max	150max	150max
	RIPPLE NOISE[mVp-p]	-20 to +10 0C*2	120max	120max	120max	120max	150max	150max	150max	150max
		-40 to -20 0C*2	200max	200max	200max	200max	200max	200max	250max	250max
	TEMPERATURE REGULATION[mV]	0 to +65 0C	35max	35max	35max	50max	120max	150max	240max	280max
		-40 to +10 0C	66max	66max	66max	100max	240max	300max	480max	560max
	DRIFT[mV] *3		16max	16max	16max	20max	40max	60max	90max	90max
	START-UP TIME[ms]		200max (DCIN 24V, Io=100%)							
	OUTPUT VOLTAGE ADJUSTMENT RANGE[V] *4		Fixed (TRM pin open), adjustable by external resistor							
1.70 – 1.98			1.98 – 2.75	1.98 – 3.63	3.0 – 5.5	7.2 – 13.2	9.0 – 16.5	14.4 – 26.4	16.8 – 30.8	

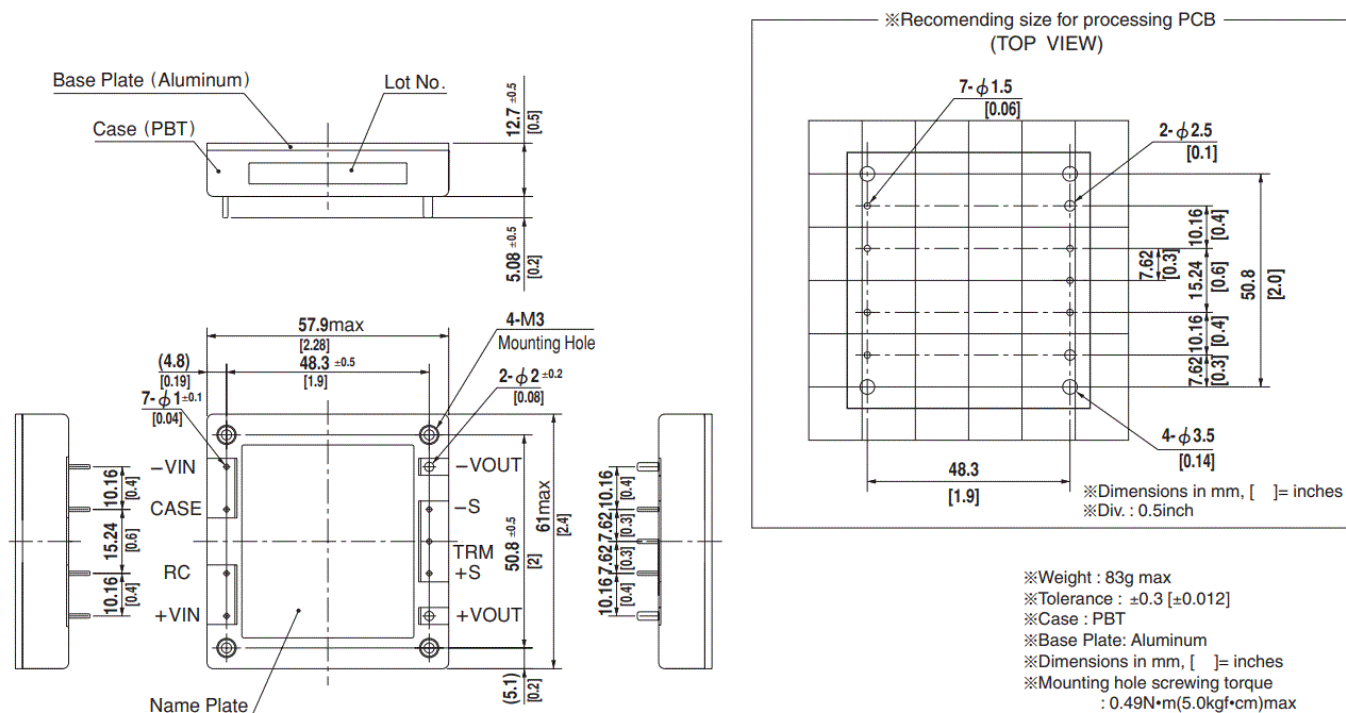
OUTP UT	TEMPERAT URE REGUL ATION[mV]	0 to +65 C	35max	35max	35max	50max	120max	150max	240max	280max
		-40 to +10 0C	66max	66max	66max	100max	240max	300max	480max	560max
	DRIFT[mV] *3		16max	16max	16max	20max	40max	60max	90max	90max
	START-UP TIME[ms]		200max (DCIN 48V, Io=100%)							
	OUTPUT VOLTAGE ADJUSTMENT RANGE[V] *4		Fixed (TRM pin open), adjustable by external resistor							
			1.70 – 1.98	1.98 -2. 75	1.98 – 3.63	3.0 – 5. 5	7.2 – 13.2	9.0 – 16.5	14.4 – 2 6.4	16.8 – 3 0.8
PROT ECTION CIR CUIT AND OTHERS	OVERCURRENT PROTECTION		Works over 105% of rating and recovers automatically							
	OVERVOLTAGE PROTECTION[V]		2.16 – 2.88	3.00 – 4.00	4.00 – 5.50	5.75 – 7.00	13.80 – 16.80	17.25 – 21.00	27.60 – 33.60	32.20 – 39.20
	REMOTE SENSING		Provided							
	REMOTE ON/OFF		Provided (Negative logic L : ON, H : OFF)							

GENERAL SPECIFICATIONS

ISOLATION	INPUT-OUTPUT	DC1,500V or AC1,000V 1minute, Cutoff current = 10mA, DC500V 50MW min(20t15C)
	INPUT-CASE PIN, BASE PLATE	DC1,500V or AC1,000V 1minute, Cutoff current = 10mA, DC500V 50MW min(20t15C)
	OUTPUT-CASE PIN, BASE PLATE	AC500V 1minute, Cutoff current = 100mA, DC500V 50MW min (20t15C)
ENVIRONMENT	OPERATING TEMP., HUMID. AND ALTITUDE	-40 to +100C (On aluminum base plate), 20 – 95%RH (Non condensing) (Refer to “Derating”), 3,000m (10,000feet) max
	STORAGE TEMP., HUMID. AND ALTITUDE	-40 to +100C, 20 – 95%RH (Non condensing), 9,000m (30,000feet) max
	VIBRATION	10 – 55Hz, 49.0m/s ² (5G), 3minutes period, 60minutes each along X, Y and Z axis
	IMPACT	196.1m/s ² (20G), 11ms, once each along X, Y and Z axis
SAFETY	AGENCY APPROVALS	UL60950-1, C-UL, EN62368-1
OTHERS	CASE SIZE/WEIGHT	57.9X12.7X61.0mm [2.28X0.5X2.4 inches](WXHxD) / 83g max
	COOLING METHOD	Conduction cooling (e.g. heat radiation from the aluminum base plate to the attached heat sink)

1. At rated input(DC24V,DC48V) and rated load.
2. Ripple and ripple noise is measured by using measuring board with recommended capacitor Co & the film capacitor 0.1mF.
Measured by 20MHz oscilloscope or Ripple-Noise meter (Equivalent to KEISOKU-GIKEN:RM101).
3. Drift is the change in DC output for an eight hour period after a half-hour warm-up at 25C, with the input voltage held constant at the rated input/output.
4. When the input voltage is in the range of DC18 – 20V, DC36 – 40V, output voltage adjustment range is 60 – 105% (except for 1R8/2R5).

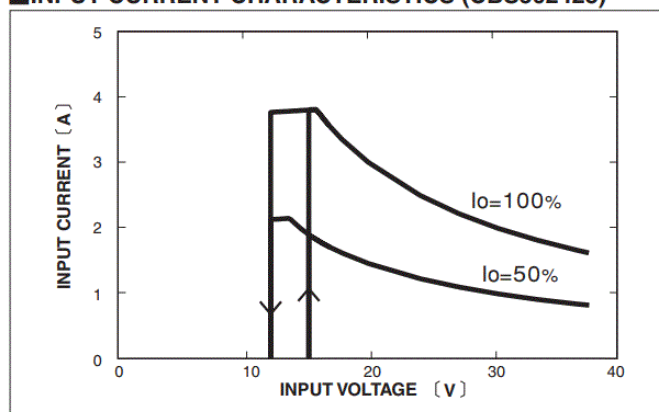
External view



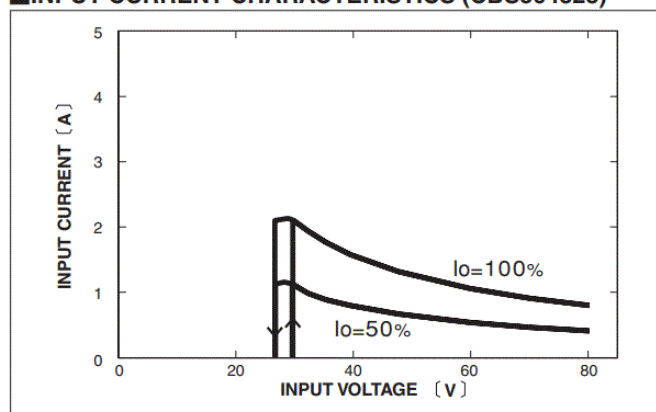
- Weight : 83g max
- Tolerance : 0.3 [± 0.012]
- Case : PBT
- Base Plate: Aluminum
- Dimensions in mm, []= inches
- Mounting hole screwing torque
 - 0.49N·m(5.0kgf·cm)max

Performance data

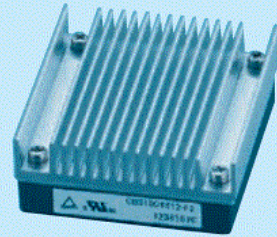
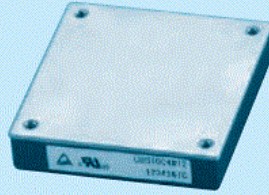
■ INPUT CURRENT CHARACTERISTICS (CBS502428)



■ INPUT CURRENT CHARACTERISTICS (CBS504828)



DC-DC Converters Bus Converter.Power Module Type



	MODEL	CBS10 0241R8	CBS10 0242R5	CBS10 02403	CBS10 02405	CBS10 02412	CBS10 02415	CBS10 02424	CBS10 02428
	VOLTAGE[V]	DC18 – 36							

INPUT	CURRENT[A] *1		2.47typ	3.17typ	4.07typ	5.02typ	4.77typ	4.81typ	4.83typ	4.83typ
	EFFICIENCY[%] *1		71typ	77typ	79typ	83typ	88typ	87typ	87typ	87typ
OUTPUT	VOLTAGE[V]		1.8	2.5	3.3	5	12	15	24	28
	CURRENT[A]		23.4	23.4	23.4	20	8.4	6.7	4.2	3.6
	LINE REGULATION[mV]		10max	10max	10max	10max	24max	30max	48max	56max
	LOAD REGULATION[mV]		10max	10max	10max	10max	24max	30max	48max	56max
	RIPPLE[mV p-p]	-20 to +10 OC*2	80max	80max	80max	80max	120max	120max	120max	120max
		-40 to -20 C*2	120max	120max	120max	120max	150max	150max	150max	150max
	RIPPLE NOISE[mVp-p]	-20 to +10 OC*2	120max	120max	120max	120max	150max	150max	150max	150max
		-40 to -20 C*2	200max	200max	200max	200max	200max	200max	250max	250max
	TEMPERATURE REGULATION[mV]	0 to +65 C	35max	35max	35max	50max	120max	150max	240max	280max
		-40 to +10 OC	66max	66max	66max	100max	240max	300max	480max	560max
	DRIFT[mV] *3		16max	16max	16max	20max	40max	60max	90max	90max
	START-UP TIME[ms]		200max (DCIN 24V, Io=100%)							
	OUTPUT VOLTAGE ADJUSTMENT RANGE[V] *4		Fixed (TRM pin open), adjustable by external resistor							
			1.70 – 1.98	1.98 – 2.75	1.98 – 3.63	3.0 – 5.5	7.2 – 13.2	9.0 – 16.5	14.4 – 26.4	16.8 – 30.8
	OUTPUT VOLTAGE SETTING[V]		1.77 – 1.88	2.46 – 2.61	3.25 – 3.45	4.90 – 5.20	11.74 – 12.46	14.55 – 15.45	23.28 – 24.72	27.16 – 28.84

PROTECTION CIRCUIT AND OTHERS	OVERCURRENT PROTECTION	Works over 105% of rating and recovers automatically							
	OVERVOLTAGE PROTECTION[V]	2.16 – 2.88	3.00 – 4.00	4.00 – 5.50	5.75 – 7.00	13.80 – 16.80	17.25 – 21.00	27.60 – 33.60	32.20 – 39.20
	REMOTE SENSING	Provided							
	REMOTE ON/OFF	Provided (Negative logic L : ON, H : OFF)							

MODEL	CBS10 0481R8	CBS10 0482R5	CBS10 04803	CBS10 04805	CBS10 04812	CBS10 04815	CBS10 04824	CBS10 04828
MAX OUTPUT WATTAGE[W]	42.12	58.50	77.2	100.0	100.8	100.5	100.8	100.8
DC OUTPUT	1.8V 23.4A	2.5V 23.4A	3.3V 23.4A	5V 20A	12V 8.4A	15V 6.7A	24V 4.2A	28V 3.6A

SPECIFICATIONS

	MODEL	CBS10 0481R8	CBS10 0482R5	CBS10 04803	CBS10 04805	CBS10 04812	CBS10 04815	CBS10 04824	CBS10 04828
INPUT	VOLTAGE[V]	DC36 – 76							
	CURRENT[A] *1	1.24typ	1.58typ	2.01typ	2.48typ	2.36typ	2.38typ	2.39typ	2.39typ
	EFFICIENCY[%] *1	71typ	77typ	80typ	84typ	89typ	88typ	88typ	88typ
	VOLTAGE[V]	1.8	2.5	3.3	5	12	15	24	28
	CURRENT[A]	23.4	23.4	23.4	20	8.4	6.7	4.2	3.6
	LINE REGULATION[mV]	10max	10max	10max	10max	24max	30max	48max	56max
	LOAD REGULATION[mV]	10max	10max	10max	10max	24max	30max	48max	56max
	RIPPLE[mV p-p]	-20 to +100C*2	80max	80max	80max	80max	120max	120max	120max
		-40 to -20C*2	120max	120max	120max	120max	150max	150max	150max

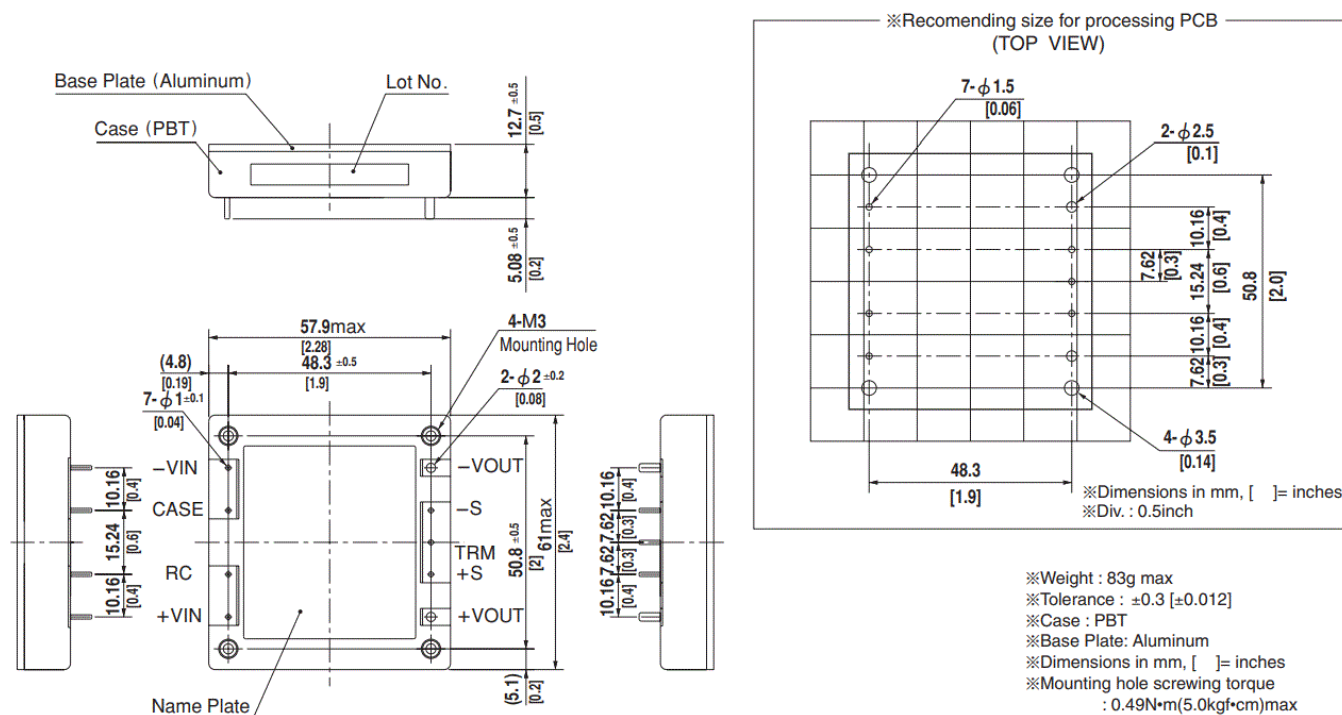
OUTP UT	RIPPLE NOISE[mVp-p]	-20 to +100C*2	120max	120max	120max	120max	150max	150max	150max	150max
		-40 to -20C*2	200max	200max	200max	200max	200max	200max	250max	250max
	TEMPERATURE REGULATION[mV]	0 to +65C	35max	35max	35max	50max	120max	150max	240max	280max
		-40 to +100C	66max	66max	66max	100max	240max	300max	480max	560max
	DRIFT[mV] *3		16max	16max	16max	20max	40max	60max	90max	90max
	START-UP TIME[ms]		200max (DCIN 48V, Io=100%)							
	OUTPUT VOLTAGE ADJUSTMENT RANGE[V] *4		Fixed (TRM pin open), adjustable by external resistor							
			1.70 – 1.98	1.98 -2.75	1.98 – 3.63	3.0 – 5.5	7.2 – 13.2	9.0 – 16.5	14.4 – 26.4	16.8 – 30.8
PROT ECTIO N CIR CUIT AND OTHE RS	OVERCURRENT PROTECTION		Works over 105% of rating and recovers automatically							
	OVERVOLTAGE PROTECTION[V]		2.16 – 2.88	3.00 – 4.00	4.00 – 5.50	5.75 – 7.00	13.80 – 16.80	17.25 – 21.00	27.60 – 33.60	32.20 – 39.20
	REMOTE SENSING		Provided							
	REMOTE ON/OFF		Provided (Negative logic L : ON, H : OFF)							

GENERAL SPECIFICATIONS

ISOLATION	INPUT-OUTPUT	DC1,500V or AC1,000V 1minute, Cutoff current = 10mA, DC500V 50MW min(20t15C)
	INPUT-CASE PIN, BASE PLATE	DC1,500V or AC1,000V 1minute, Cutoff current = 10mA, DC500V 50MW min(20t15C)
	OUTPUT-CASE PIN, BASE PLATE	AC500V 1minute, Cutoff current = 100mA, DC500V 50MW min (20t15C)
ENVIRONMENT	OPERATING TEMP., HUMID. AND ALTITUDE	-40 to +100C (On aluminum base plate), 20 – 95%RH (Non condensing) (Refer to “Derating”), 3,000m (10,000feet) max
	STORAGE TEMP., HUMID. AND ALTITUDE	-40 to +100C, 20 – 95%RH (Non condensing), 9,000m (30,000feet) max
	VIBRATION	10 – 55Hz, 49.0m/s ² (5G), 3minutes period, 60minutes each along X, Y and Z axis
	IMPACT	196.1m/s ² (20G), 11ms, once each along X, Y and Z axis
SAFETY	AGENCY APPROVALS	UL60950-1, C-UL, EN62368-1
OTHERS	CASE SIZE/WEIGHT	57.9X12.7X61.0mm [2.28X0.5X2.4 inches] (WXHxD) / 83g max
	COOLING METHOD	Conduction cooling (e.g. heat radiation from the aluminum base plate to the attached heat sink)

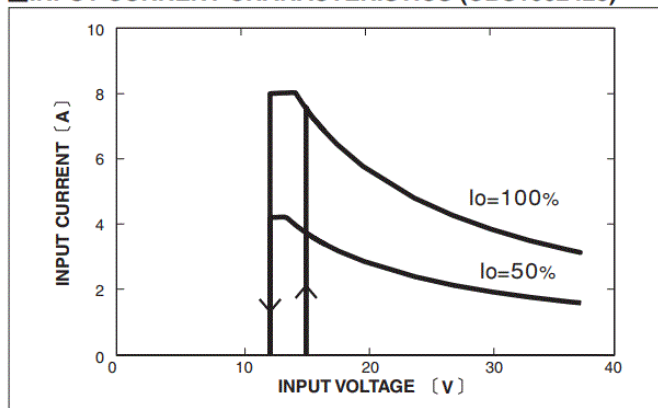
1. At rated input(DC24V,DC48V) and rated load.
2. Ripple and ripple noise is measured by using measuring board with recommended capacitor Co & the film capacitor 0.1mF.
Measured by 20MHz oscilloscope or Ripple-Noise meter (Equivalent to KEISOKU-GIKEN:RM101).
3. Drift is the change in DC output for an eight hour period after a half-hour warm-up at 25C, with the input voltage held constant at the rated input/output.
4. When the input voltage is in the range of DC18 – 20V, DC36 – 40V output voltage adjustment range is 60 – 105% (except for 1R8/2R5).

External view

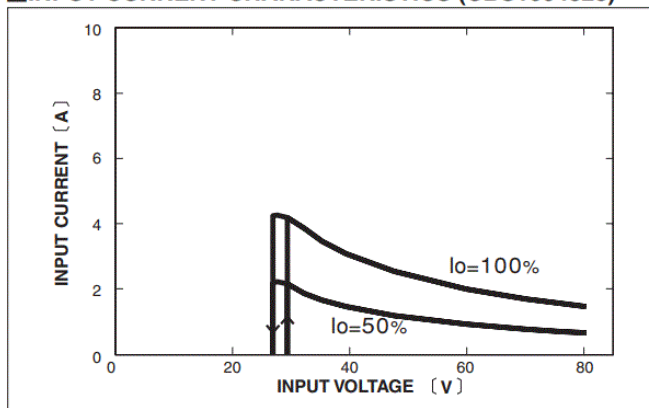


Performance data

■ INPUT CURRENT CHARACTERISTICS (CBS100428)

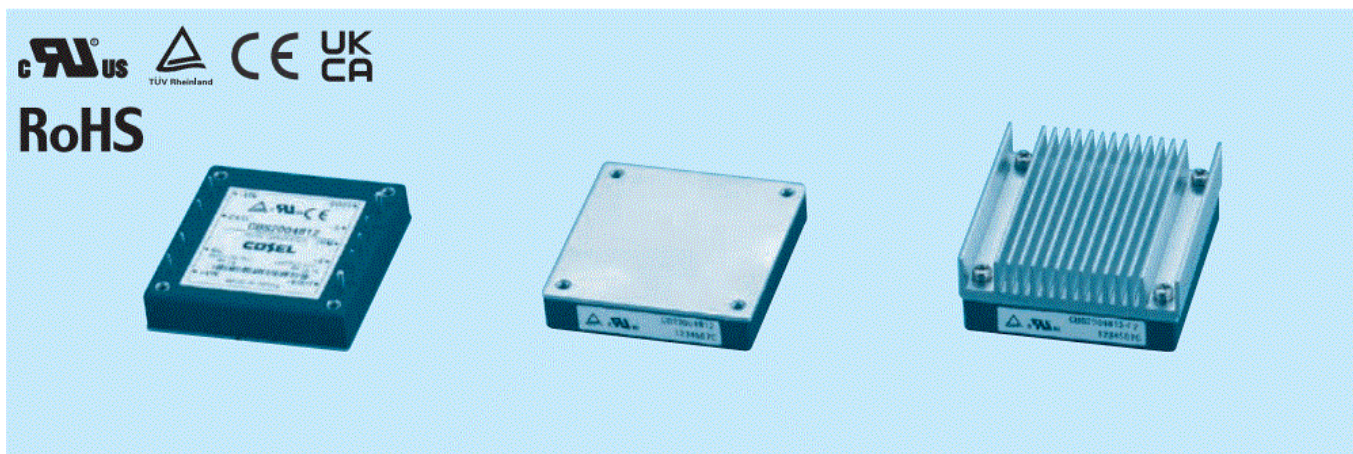


■ INPUT CURRENT CHARACTERISTICS (CBS1004828)



DC-DC Converters Bus Converter.Power Module Type

CBS200



Ordering information

①
②
③
④
⑤
⑥

CB S 200 48 12 - □

1. Series name
2. Single output
3. Output wattage
4. Input voltage
 - 24: DC18 – 36V
 - 48: DC36 – 76V
5. Output voltage
6. Optional
 - R : with Remote ON/OFF
 - Positive logic control
 - T : with Mounting hole
 - f3.4 thru
 - FO: with Addition of a Heat sink

MODEL	CBS20 0241R8	CBS20 0242R5	CBS20 02403	CBS20 02405	CBS20 02412	CBS20 02415	CBS20 02424	CBS20 02428
MAX OUTPUT WATTAGE[W]	63.00	87.50	115.5	150.0	200.4	201.0	201.6	201.6
DC OUTPUT	1.8V 3 5A	2.5V 3 5A	3.3V 3 5A	5V 30A	12V 16. 7A	15V 13. 4A	24V 8.4 A	28V 7.2 A

SPECIFICATIONS

	MODEL	CBS20 0241R8	CBS20 0242R5	CBS20 02403	CBS20 02405	CBS20 02412	CBS20 02415	CBS20 02424	CBS20 02428
INPUT	VOLTAGE[V]	DC18 – 36							
	CURRENT[A] *1	3.75typ	4.80typ	6.09typ	7.62typ	9.60typ	9.63typ	9.66typ	9.66typ
	EFFICIENCY[%] *1	70typ	76typ	79typ	82typ	87typ	87typ	87typ	87typ
	VOLTAGE[V]	1.8	2.5	3.3	5	12	15	24	28
	CURRENT[A]	35	35	35	30	16.7	13.4	8.4	7.2
	LINE REGULATION[mV]	10max	10max	10max	10max	24max	30max	48max	56max
	LOAD REGULATION[mV]	10max	10max	10max	10max	24max	30max	48max	56max

OUTPUT	RIPPLE[mVp-p]	-20to +100°C*2	80max	80max	80max	80max	120max	120max	120max	120max	
		-40to -20°C*2	120max	120max	120max	120max	150max	150max	150max	150max	
	RIPPLE NOISE[mVp-p]	-20to +100°C*2	120max	120max	120max	120max	150max	150max	150max	150max	
		-40to -20°C*2	200max	200max	200max	200max	200max	200max	250max	250max	
	TEMPERATURE REGULATION[mV]	0 to +65°C	35max	35max	35max	50max	120max	150max	240max	280max	
		-40to +100°C	66max	66max	66max	100max	240max	300max	480max	560max	
	DRIFT[mV] *3		16max	16max	16max	20max	40max	60max	90max	90max	
	START-UP TIME[ms]		200max (DCIN 24V, Io=100%)								
	OUTPUT VOLTAGE ADJUSTMENT RANGE[V] *4		Fixed (TRM pin open), adjustable by external resistor								
			1.70 – 1.98	1.98 – 2.75	1.98 – 3.63	3.0 – 5.5	7.2 – 13.2	9.0 – 16.5	14.4 – 26.4	16.8 – 30.8	
OUTPUT VOLTAGE SETTING[V]		1.77 – 1.88	2.46 – 2.61	3.25 – 3.45	4.90 – 5.20	11.74 – 12.46	14.55 – 15.45	23.28 – 24.72	27.16 – 28.84		
PROTECTION CIRCUIT AND OTHERS	OVERCURRENT PROTECTION		Works over 105% of rating and recovers automatically								
	OVERVOLTAGE PROTECTION[V]		2.16 – 2.88	3.00 – 4.00	4.00 – 5.50	5.75 – 7.00	13.80 – 16.80	17.25 – 21.00	27.60 – 33.60	32.20 – 39.20	
	REMOTE SENSING		Provided								
	REMOTE ON/OFF		Provided (Negative logic L : ON, H : OFF)								

MODEL	CBS2 00481 R8	CBS2 00482 R5	CBS2 00480 3	CBS2 00480 5	CBS2 00481 2	CBS2 00481 5	CBS2 00482 4	CBS2 00482 8	CBS20 04848
MAX OUTPUT WATTAGE[W]	63.00	87.50	115.5	150.0	200.4	201.0	201.6	201.6	201.6
DC OUTPUT	1.8V 3 5A	2.5V 3 5A	3.3V 3 5A	5V 30 A	12V 1 6.7A	15V 1 3.4A	24V 8. 4A	28V 7. 2A	48V 4. 2A

SPECIFICATIONS

	MODEL	CBS2 00481 R8	CBS2 00482 R5	CBS2 00480 3	CBS2 00480 5	CBS2 00481 2	CBS2 00481 5	CBS2 00482 4	CBS2 00482 8	CBS20 04848	
INPUT	VOLTAGE[V]	DC36 – 76									
	CURRENT[A] *1	1.88typ	2.40typ	3.01typ	3.77typ	4.74typ	4.76typ	4.77typ	4.77typ	4.77typ	
	EFFICIENCY[%] *1	70typ	76typ	80typ	83typ	88typ	88typ	88typ	88typ	88typ	
	VOLTAGE[V]	1.8	2.5	3.3	5	12	15	24	28	48	
	CURRENT[A]	35	35	35	30	16.7	13.4	8.4	7.2	4.2	
	LINE REGULATION[mV]	10max	10max	10max	10max	24max	30max	48max	56max	96max	
	LOAD REGULATION[mV]	10max	10max	10max	10max	24max	30max	48max	56max	96max	
	RIPPLE[mV p-p]	-20 to +100 C* 2	80max	80max	80max	80max	120max	120max	120max	120max	200max
		-40 to -20 C* 2	120max	120max	120max	120max	150max	150max	150max	150max	250max
	RIPPLE NOISE[mVp-p]	-20 to +100 C* 2	120max	120max	120max	120max	150max	150max	150max	150max	250max
		-40 to -20 C* 2	200max	200max	200max	200max	200max	200max	250max	250max	400max

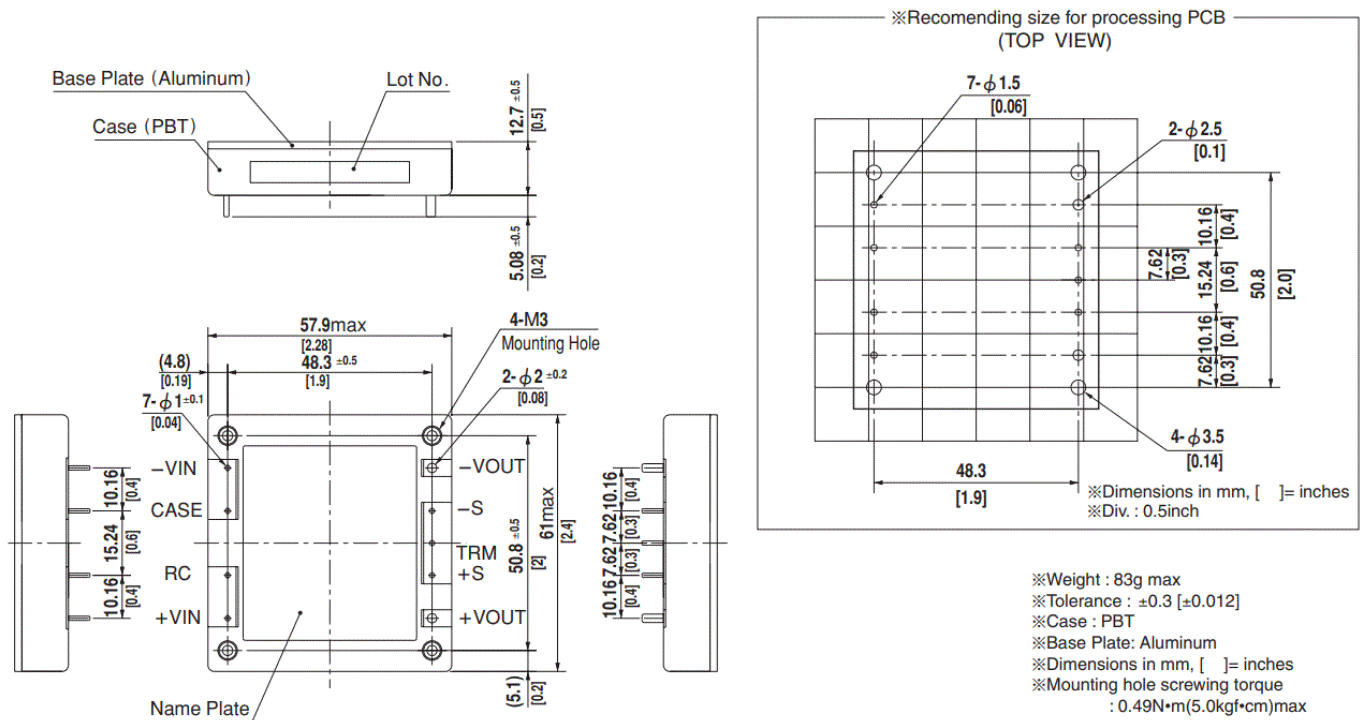
OUTPUT	TEMPERATURE REGULATION[mV]	0 to +65°C	35max	35max	35max	50max	120max	150max	240max	280max	480max
		-40 to +100°C	66max	66max	66max	100max	240max	300max	480max	560max	960max
	DRIFT[mV] *3		16max	16max	16max	20max	40max	60max	90max	90max	180max
	START-UP TIME[ms]		200max (DCIN 48V, Io=100%)								
	OUTPUT VOLTAGE ADJUSTMENT RANGE[V] *4		Fixed (TRM pin open), adjustable by external resistor								
			1.70 – 1.98	1.98 - 2.75	1.98 – 3.63	3.0 – 5.5	7.2 – 13.2	9.0 – 16.5	14.4 – 26.4	16.8 – 30.8	43.2 – 52.8
PROTECTION CIRCUIT AND OTHERS	OUTPUT VOLTAGE SETTING[V]		1.77 – 1.88	2.46 - 2.61	3.25 – 3.45	4.90 – 5.20	11.74 – 12.46	14.55 – 15.45	23.28 – 24.72	27.16 – 28.84	46.56 – 49.44
	OVERCURRENT PROTECTION		Works over 105% of rating and recovers automatically								
	OVERVOLTAGE PROTECTION[V]		2.16 – 2.88	3.00 – 4.00	4.00 – 5.50	5.75 – 7.00	13.80 – 16.80	17.25 – 21.00	27.60 – 33.60	32.20 – 39.20	55.20 – 67.20
	REMOTE SENSING		Provided								
	REMOTE ON/OFF		Provided (Negative logic L : ON, H : OFF)								

GENERAL SPECIFICATIONS

ISOLATION	INPUT-OUTPUT	DC1,500V or AC1,000V 1minute, Cutoff current = 10mA, DC500V 50MW min(20t15C)
	INPUT-CASE PIN, BASE PLATE	DC1,500V or AC1,000V 1minute, Cutoff current = 10mA, DC500V 50MW min(20t15C)
	OUTPUT-CASE PIN, BASE PLATE	AC500V 1minute, Cutoff current = 100mA, DC500V 50MW min (20t15C)
ENVIRONMENT	OPERATING TEMP., HUMID. AND ALTITUDE	-40 to +100C (On aluminum base plate), 20 – 95%RH (Non condensing) (Refer to “Derating”), 3,000m (10,000feet) max
	STORAGE TEMP., HUMID. AND ALTITUDE	-40 to +100C, 20 – 95%RH (Non condensing), 9,000m (30,000feet) max
	VIBRATION	10 – 55Hz, 49.0m/s ² (5G), 3minutes period, 60minutes each along X, Y and Z axis
	IMPACT	196.1m/s ² (20G), 11ms, once each along X, Y and Z axis
SAFETY	AGENCY APPROVALS	UL60950-1, C-UL, EN62368-1
OTHERS	CASE SIZE/WEIGHT	57.9X12.7X61.0mm [2.28X0.5X2.4 inches] (WXHxD) / 83g max
	COOLING METHOD	Conduction cooling (e.g. heat radiation from the aluminum base plate to the attached heat sink)

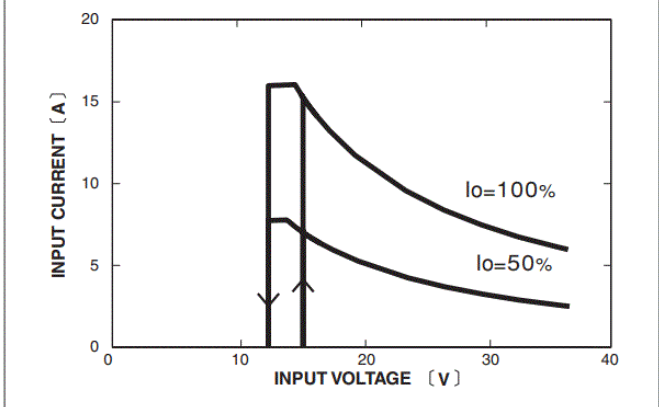
1. At rated input(DC24V,DC48V) and rated load.
2. Ripple and ripple noise is measured by using measuring board with recommended capacitor Co & the film capacitor 0.1mF.
Measured by 20MHz oscilloscope or Ripple-Noise meter (Equivalent to KEISOKU-GIKEN:RM101).
3. Drift is the change in DC output for an eight hour period after a half-hour warm-up at 25C, with the input voltage held constant at the rated input/output.
4. When the input voltage is in the range of DC18 – 20V, DC36 – 40V, output voltage adjustment range is 60 – 105% (except for 1R8/2R5/48).

External view

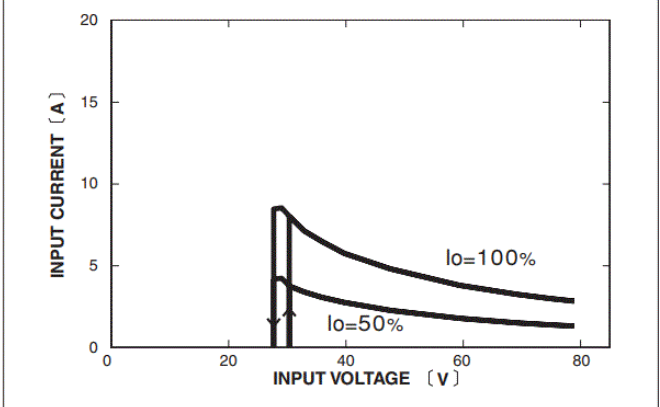


Performance data

■INPUT CURRENT CHARACTERISTICS (CBS2002428)



■INPUT CURRENT CHARACTERISTICS (CBS2004828)



DC-DC Converters Bus Converter.Power Module Type

CBS350



Ordering information

CB **S** **450** **48** **28** - ☐

① ② ③ ④ ⑤ ⑥

1. Series name
2. Single output
3. Output wattage
4. Input voltage
5. Output voltage
6. Optional
 - R : with Remote ON/OFF
 - Positive logic control
 - T : with Mounting hole
 - f3.4 thru

MODEL	CBS3 50241 2	CBS3 50242 4	CBS3 50242 8	CBS3 50243 2	CBS3 50244 8	CBS3 50481 2	CBS3 50482 4	CBS3 50482 8	CBS3 50483 2	CBS3 50484 8
MAX OUTPUT WATTAGE[W]	300	348	350	352	302	348	348	350	352	350
DC OUTPUT	12V 2 5A	24V 1 4.5A	28V 1 2.5A	32V 1 1A	48V 6 .3A	12V 2 9A	24V 1 4.5A	28V 1 2.5A	32V 1 1A	48V 7 .3A

SPECIFICATIONS

	MODEL	CBS3 50241 2	CBS3 50242 4	CBS3 50242 8	CBS3 50243 2	CBS3 50244 8	CBS3 50481 2	CBS3 50482 4	CBS3 50482 8	CBS3 50483 2	CBS3 50484 8
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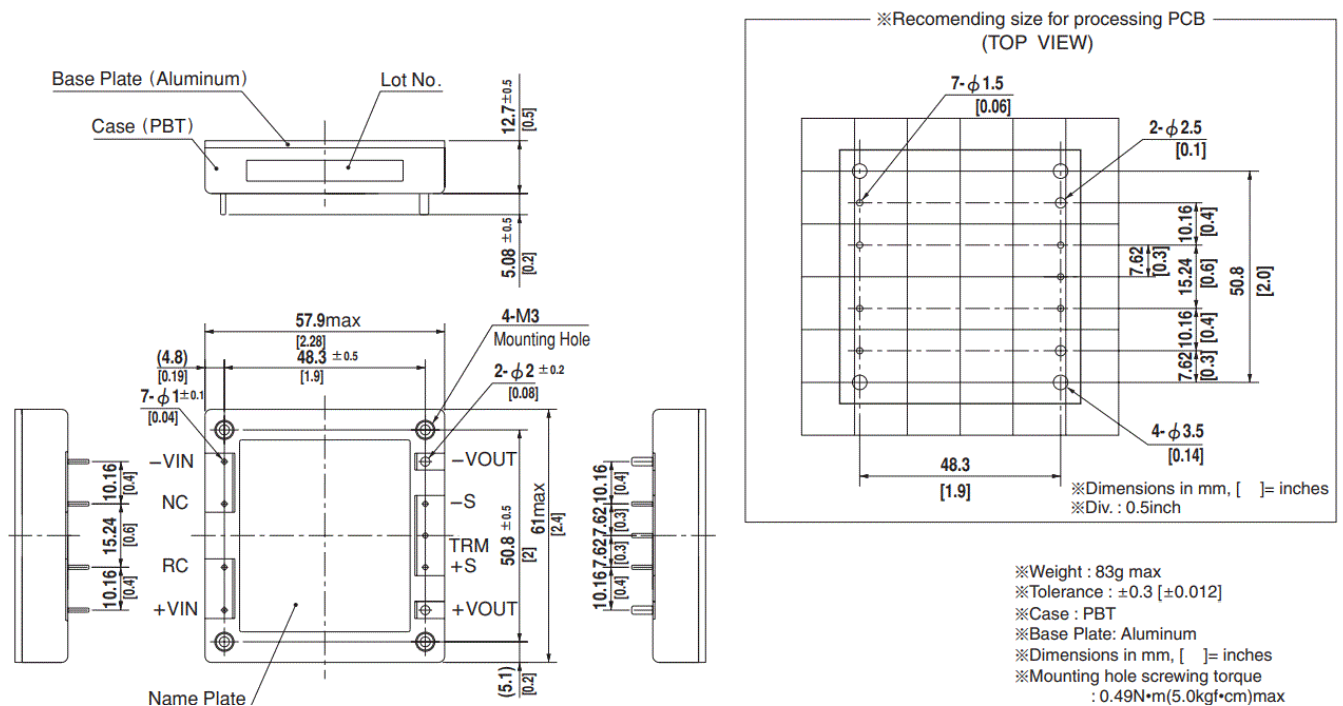
INPUT	VOLTAGE[V]		DC20 – 36					DC36 – 76				DC36 – 60
	CURRENT[A] *1		14.5typ	16.7typ	16.4typ	16.5typ	14.0typ	8.33typ	8.15typ	8.10typ	8.15typ	8.15typ
	EFFICIENCY[%] *1		86typ	87typ	89typ	89typ	90typ	87typ	89typ	90typ	90typ	91typ
OUTPUT	VOLTAGE[V]		12	24	28	32	48	12	24	28	32	48
	CURRENT[A]		25	14.5	12.5	11	6.3	29	14.5	12.5	11	7.3
	LINE REGULATION[mV]		24max	48max	56max	64max	96max	24max	48max	56max	64max	96max
	LOAD REGULATION[mV]		24max	48max	56max	64max	96max	24max	48max	56max	64max	96max
	RIPPLE[mV p-p]	-20 to +100°C*2	120max	150max	180max	180max	300max	120max	150max	180max	180max	300max
		-40 to -20°C*2	150max	180max	220max	220max	360max	150max	180max	220max	220max	360max
		0to 15%Load*2	240max	300max	360max	360max	600max	240max	300max	360max	360max	600max
	RIPPLE NOISE[mVp-p]	-20 to +100°C*2	150max	180max	220max	220max	360max	150max	180max	220max	220max	360max
		-40 to -20°C*2	200max	250max	280max	280max	500max	200max	250max	280max	280max	500max
		0to 15%Load*2	300max	360max	440max	440max	720max	300max	360max	440max	440max	720max
	TEMPERATURE		0 to +65°C	120max	240max	280max	320max	480max	120max	240max	280max	320max

	URE REGULATIO N[mV]	-40 to +1 00 C	240m ax	480m ax	560m ax	640m ax	960m ax	240m ax	480m ax	560m ax	640m ax	960m ax
	DRIFT[mV] *3		40ma x	90ma x	90ma x	120m ax	180m ax	40ma x	90ma x	90ma x	120m ax	180m ax
	START-UP TIME[ms]		200max (DCIN 24V, Io=100%)					200max (DCIN 48V, Io=100%)				
	OUTPUT VOLTAGE ADJUSTMENT RANGE[V] *4		Fixed (TRM pin open), adjustable by external resistor									
			7.2 – 13.2	14.4 – 26. 4	16.8 – 30. 8	25.6 – 35. 2	38.4 – 52. 8	7.2 – 13.2	14.4 – 26. 4	16.8 – 30. 8	25.6 – 35. 2	38.4 – 55.2
	OUTPUT VOLTAGE SETTING[V] *1		11.88 - 12.1 2	23.76 - 24.2 4	27.72 - 28.2 8	31.68 - 32.3 2	47.52 - 48.4 8	11.88 - 12.1 2	23.76 - 24.2 4	27.72 - 28.2 8	31.68 - 32.3 2	47.52 - 48.4 8
PROT ECTIO N CIR CUIT AND OTHE RS	OVERCURRENT PROTECTION		Works over 105% of rating and recovers automatically									
	OVERVOLTAGE P ROTECTION[V]		13.80 - 16.8 0	27.60 - 33.6 0	32.20 - 39.2 0	36.80 - 44.8 0	57.50 - 63.0 0	13.80 - 16.8 0	27.60 - 33.6 0	32.20 - 39.2 0	36.80 - 44.8 0	57.50 - 63.0 0
	REMOTE SENSIN G		Provided									
	REMOTE ON/OFF		Provided (Negative logic L : ON, H : OFF)									
ISOLA TION	INPUT-OUTPUT		DC1,500V or AC1,000V 1minute, Cutoff current = 10mA, DC500V 50MW min(20t15C)									
	INPUT-BASE PLA TE		DC1,500V or AC1,000V 1minute, Cutoff current = 10mA, DC500V 50MW min(20t15C)									
	OUTPUT-BASE P LATE		AC500V 1minute, Cutoff current = 100mA, DC500V 50MW min (20t15C)									
ENVIR ONME NT	OPERATING TEM P.,HUMID.AND AL TITUDE		-40 to +100C (On aluminum base plate), 20 – 95%RH (Non condensing) (Refer t o DERATING CURVE), 3,000m (10,000feet) max									
	STORAGE TEMP., HUMID.AND ALTI TITUDE		-40 to +100C, 20 – 95%RH (Non condensing), 9,000m (30,000feet) max									
	VIBRATION		10 – 55Hz, 49.0m/s2 (5G), 3minutes period, 60minutes each along X, Y and Z axis									
	IMPACT		196.1m/s2 (20G), 11ms, once each along X, Y and Z axis									
SAFE TY	AGENCY APPRO VALS		UL60950-1, C-UL, EN62368-1									
OTHE	CASE SIZE/WEIG HT		57.9X12.7X61.0mm [2.28X0.5X2.4 inches] (WXHxD) / 83g max									

RS	COOLING METHOD	Conduction cooling (e.g. heat radiation from the aluminum base plate to the attached heat sink)
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1. At rated input(DC24V,DC48V), rated load, and aluminum base plate temperature 25C.
2. Ripple and ripple noise is measured by using measuring board with recommended capacitor Co & the film capacitor 0.1mF. Refer to the manual.
3. Drift is the change in DC output for an eight hour period after a half-hour warm-up at 25C, with the input voltage held constant at the rated input/output.
4. When the input voltage is in the range of DC20 – 22V, DC36 – 40V, output voltage is limited. Refer to the manual.

External view



- Weight : 83g max
- Tolerance : ±0.3 [±0.012]
- Case : PBT
- Base Plate: Aluminum
- Dimensions in mm, []= inches
- Mounting hole screwing torque
 - : 0.49N•m(5.0kgf•cm)max

DC-DC Converters Bus Converter.Power Module Type

CBS450



Ordering information

CB **S** **350** **48** **12** **-** ☐

① ② ③ ④ ⑤ ⑥

1. Series name
2. Single output
3. Output wattage
4. Input voltage
5. Output voltage
6. Optional
 - R : with Remote ON/OFF
 - Positive logic control
 - T : with Mounting hole
 - f3.4 thru

MODEL	CBS4504824	CBS4504828	CBS4504832
MAX OUTPUT WATTAGE[W]	456	448	400
DC OUTPUT	24V 19A	28V 16A	32V 12.5A

SPECIFICATIONS

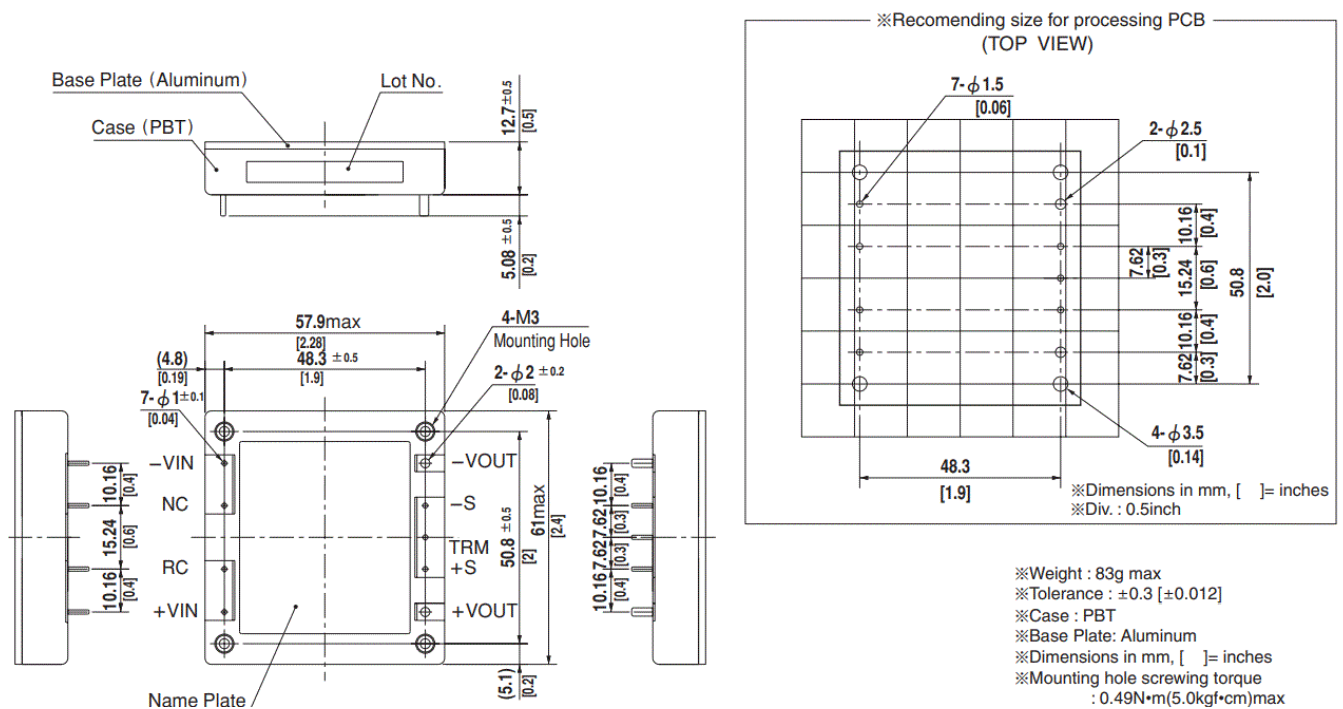
	MODEL	CBS4504824	CBS4504828	CBS4504832
INPUT	VOLTAGE[V]	DC38 – 60	DC36 – 76	DC36 – 76
	CURRENT[A] *1	10.6typ	10.5typ	9.3typ

OUTPUT	EFFICIENCY[%] *1		90typ	91typ	91typ
	VOLTAGE[V]		24	28	32
	CURRENT[A]		19	16	12.5
	LINE REGULATION[mV]		48max	56max	64max
	LOAD REGULATION[mV]		48max	56max	64max
	RIPPLE[mV p-p]	-20 to +10 OC* 2	180max	210max	210max
		-40 to -20 C*2	220max	260max	260max
		0to 15 %L load*2	360max	430max	430max
	RIPPLE NOISE[mVp-p]	-20 to +10 OC* 2	220max	260max	260max
		-40 to -20 C*2	280max	330max	330max
		0to 15 %L load*2	440max	520max	520max
	TEMPERATURE REGULATION[mV]	0 to +65 C	240max	280max	280max
		-40 to +10 OC	480max	560max	560max
	DRIFT[mV] *3		90max	90max	120max

	START-UP TIME[ms]	200max (DCIN 48V, Io=100%)		
	OUTPUT VOLTAGE ADJUSTMENT RANGE[V] *4	Fixed (TRM pin open), adjustable by external resistor		
		19.2 – 26.0	16.8 – 32.2	25.6 – 35.2
	OUTPUT VOLTAGE SETTING[V] *1	23.52 – 24.48	27.44 – 28.56	31.36 – 32.64
PROTECTION CIRCUIT AND OTHERS	OVERCURRENT PROTECTION	Works over 105% of rating and recovers automatically		
	OVERVOLTAGE PROTECTION[V]	27.60 – 33.60	32.20 – 39.20	36.80 – 44.80
	REMOTE SENSING	Provided		
	REMOTE ON/OFF	Provided (Negative logic L : ON, H : OFF)		
ISOLATION	INPUT-OUTPUT	DC1,500V or AC1,000V 1minute, Cutoff current = 10mA, DC500V 50MW min(20t15C)		
	INPUT-BASE PLATE	DC1,500V or AC1,000V 1minute, Cutoff current = 10mA, DC500V 50MW min(20t15C)		
	OUTPUT-BASE PLATE	AC500V 1minute, Cutoff current = 100mA, DC500V 50MW min (20t15C)		
ENVIRONMENT	OPERATING TEMP., HUMID. AND ALTITUDE	-40 to +100C (On aluminum base plate), 20 – 95%RH (Non condensing) (Refer to “Derating”), 3,000m (10,000feet) max		
	STORAGE TEMP., HUMID. AND ALTITUDE	-40 to +100C, 20 – 95%RH (Non condensing), 9,000m (30,000feet) max		
	VIBRATION	10 – 55Hz, 49.0m/s ² (5G), 3minutes period, 60minutes each along X, Y and Z axis		
	IMPACT	196.1m/s ² (20G), 11ms, once each along X, Y and Z axis		
SAFETY	AGENCY APPROVALS	UL60950-1, C-UL, EN62368-1		
OTHERS	CASE SIZE/WEIGHT	57.9X12.7X61.0mm [2.28X0.5X2.4 inches] (WXHxD) / 83g max		
	COOLING METHOD	Conduction cooling (e.g. heat radiation from the aluminum base plate to the attached heat sink)		

1. At rated input(DC48V), rated load, and aluminum base plate temperature 25C.
2. Ripple and ripple noise is measured by using measuring board with recommended capacitor Co & the film capacitor 0.1mF. Refer to the manual.
3. Drift is the change in DC output for an eight hour period after a half-hour warm-up at 25C, with the input voltage held constant at the rated input/output.
4. Refer to the manual for the input range.

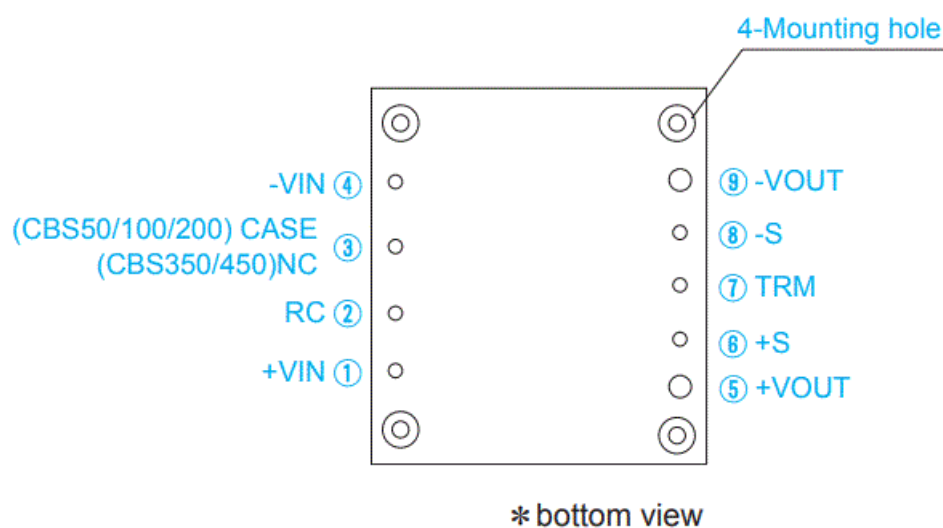
External view



- Weight : 83g max
- Tolerance : ±0.3 [±0.012]
- Case : PBT
- Base Plate: Aluminum
- Dimensions in mm, [] = inches
- Mounting hole screwing torque : 0.49N•m(5.0kgf•cm)max

CBS-series

Pin Configuration



No.	Pin Name	Function
1	+VIN	+DC input
2	RC	Remote ON/OFF
3	NC	No connection (CBS350/450)
	CASE	Wiring base plate (CBS50/100/200)
4	-VIN	-DC input
5	+VOUT	+DC output
6	+S	+Remote sensing
7	TRM	Adjustment of output voltage
8	-S	-Remote sensing
9	-VOUT	-DC output
	Mounting hole	Mounting hole

Implementation Mounting Method

Mounting method

When multiple power modules are used side by side, position them with sufficient spaces to allow adequate air ventilation so that the aluminum base plate temperature of each power module will remain within the temperature range shown in the "derating".

Do not pass the DC input pattern underneath the power module as this will increase conducted noise. Place the DC input pattern away from the power module. Do not pass the DC output pattern underneath the power module as this will increase output noise. Place the DC output pattern away from the power module.

High frequency noise is radiated from the power module. When mounting the power module on a PCB, leave a copper pattern on the PCB to let it act as a shield and connect this pattern to the CASE pin (CBS50/100/200) or the mounting hole.

When a heat sink cannot be fixed on the base plate side, order the power module with "-T" option. A heat sink can be mounted by affixing a M3 tap on the heat sink. In case of CBS350/450, make sure a mounting hole will be connected to a grounding capacitor CY.

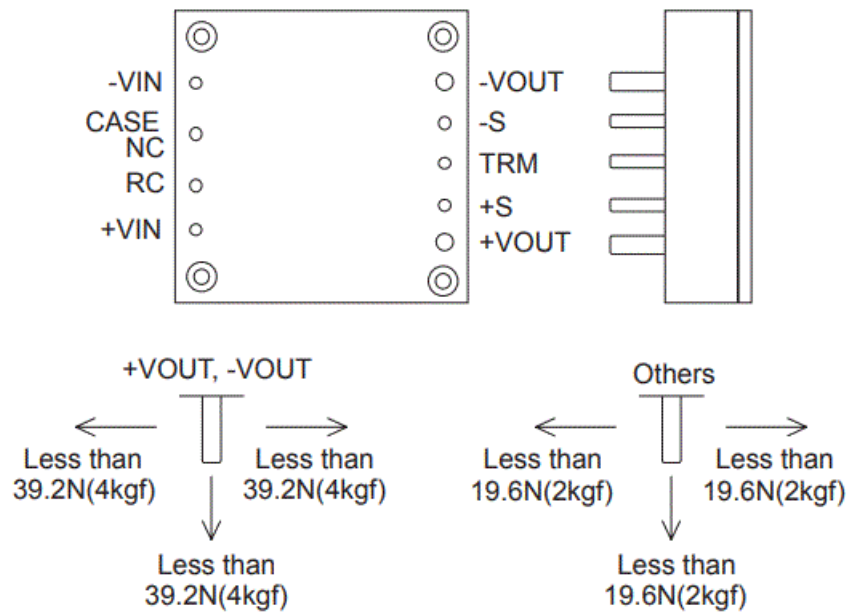
	Mounting hole
Standard	M3 tapped
Optional : -T	φ3.4 thru

Stress onto the pins

- Applying excessive stress to the input or output pins of the power module may damage internal connections. Avoid applying stress in excess of that shown in right figure.
- Input and output pins are soldered onto the internal PCB. Do not bend or pull the leads with excessive force.
- As unexpected stress may be applied to the pins, set the diameter of the PCB mounting hole at 3.5mm.
- As unexpected stress may be applied to the pins from vibration or shock, fix the power module by using the

mounting holes with screws to reduce stress.

- Fix the power module to the PCB with the screws before soldering the input and output pins to prevent the PCB pattern being damaged.



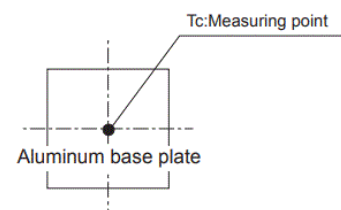
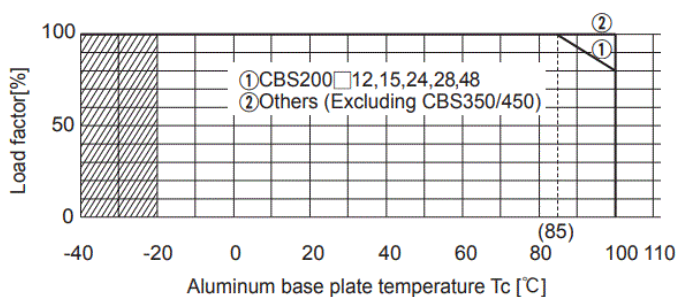
Soldering temperature

- Flow soldering: 260^a for up to 15 seconds.
- Soldering iron (26W) : 450^a for up to 5 seconds.

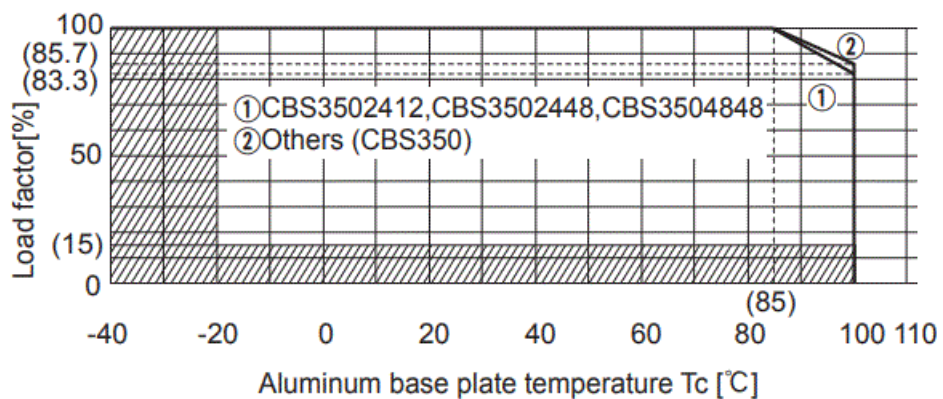
Derating

- Use the power modules with conduction cooling (e.g. heat dissipation from the aluminum base plate to the attached heat sink). Below shows the derating curves with respect to the aluminum base plate temperature. Note that operation within the hatched areas will cause a significant level of ripple and ripple noise. Contact us for more information on cooling methods.
- It is necessary to note thermal fatigue life by power cycle. Please reduce the temperature fluctuation range as much as possible when the up and down of temperature are frequently generated. Contact for more information on cooling methods.

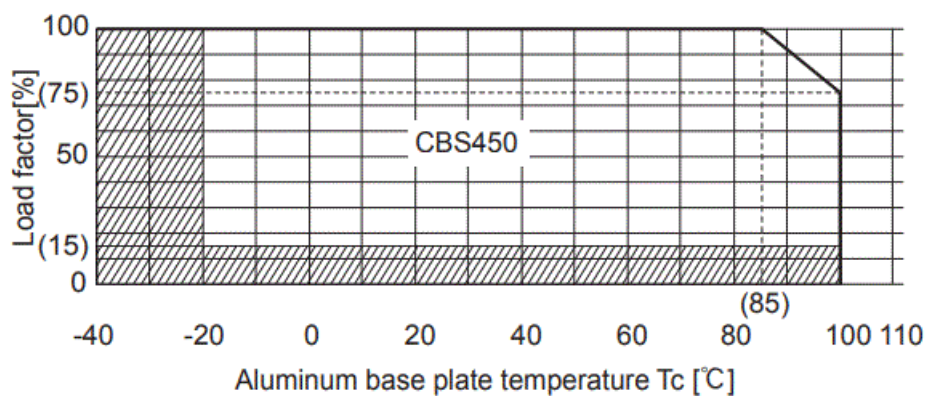
CBS50, CBS100, CBS200



CBS350



CBS400



Instruction Manual

It is necessary to read the "Instruction Manual" and "Before using our product" before you use our product.

Instruction Manual <https://www.cosel.co.jp/redirect/catalog/en/CBS/>

Before using our product <https://en.cosel.co.jp/technical/caution/index.html>

CBS



NOTICE



Basic Characteristics

Model	Circuit method	Switching frequency [kHz]	Input current [A]	Rated input fuse	Inrush current protection	PCB/Pattern			Series/Redundancy operation availability	
						Material	Single sided	Double sided	Series operation	Redundancy operation
CBS50	Forward converter	310	Refer to table No.1	–	–	Aluminum	Yes		Yes	*1
CBS100	Forward converter	370		–	–	Aluminum	Yes		Yes	*1
CBS200	Forward converter	370		–	–	Aluminum	Yes		Yes	*1
CBS350	Forward converter	370		–	–	Aluminum	Yes		Yes	*1
CBS450	Forward converter	370		–	–	Aluminum	Yes		Yes	*1

Refer to Instruction Manual.

Table1. The value of input current (at rated input voltage and rated load)

Model	Output Voltage									
	1.8V	2.5V	3.3V	5V	12V	15V	24V	28V	32V	48V
CBS5024	1.2	1.6	2.0	2.5	2.4	2.4	2.4	2.4	—	—
CBS5048	0.6	0.8	1.0	1.3	1.2	1.2	1.2	1.2	—	—
CBS10024	2.5	3.2	4.1	5.0	4.8	4.8	4.8	4.8	—	—
CBS10048	1.2	1.6	2.0	2.5	2.4	2.4	2.4	2.4	—	—
CBS20024	3.8	4.8	6.1	7.6	9.6	9.6	9.7	9.7	—	—
CBS20048	1.9	2.4	3.0	3.8	4.8	4.8	4.8	4.8	—	4.8
CBS35024	—	—	—	—	15	—	17	17	17	14
CBS35048	—	—	—	—	8.4	—	8.2	8.1	8.2	8.2
CBS45048	—	—	—	—	—	—	10.6	10.5	9.3	—

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Documents / Resources

	Cosel CBS-series Converters Bus Converter Power Module Type [pdf] Owner's Manual CBS-series Converters Bus Converter Power Module Type, CBS-series, Converters Bus Converter Power Module Type, Converter Power Module Type, Power Module Type, Module Type
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References

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- [Notice | Technical Info. | COSEL Co., Ltd.](#)
- [CBS series | Product Info. | COSEL Co., Ltd.](#)