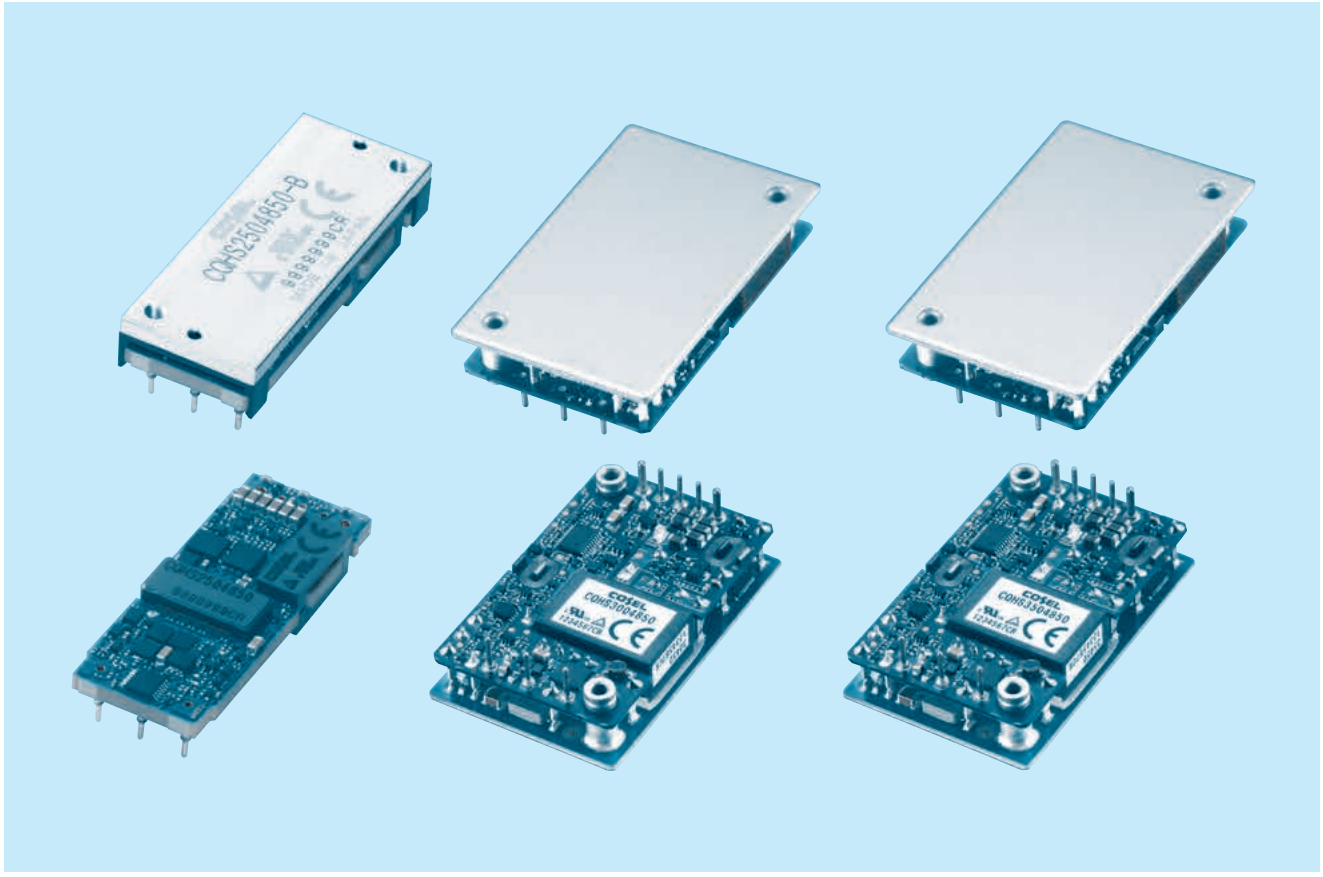
Low Profile | Isolated | Safety Approvals | OCP | OVP | Remote ON/OFF

CQHS-series



Feature

Compact DC-DC Converter, " BRICK SIZE" which has been standard size for Telecommunication Market
High efficiency (synchronous rectifier circuit)
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

Safety agency approvals

UL60950-1, C-UL, EN60950-1

5-year warranty

Optional parts

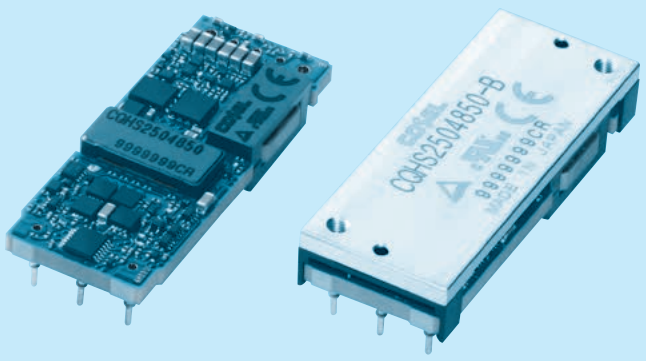
Heat sink (optional parts : CQHS300/CQHS350)

COSEL DC-DC Converters Bus Converter·Power Module Type

CQHS250

Ordering information

CQH	S	250	48	50	-□
①	②	③	④	⑤	⑧



①Series name
②Single output
③Output wattage
④Input voltage
48:DC36 - 76V
⑤Output voltage
⑧Optional
R :with Remote ON/OFF Positive logic control
N :Auto restart in protection circuit working
B :Base plate option with Mounting hole M3
L2:Pin length 5.3mm

MODEL	CQHS2504832	CQHS2504850
MAX OUTPUT WATTAGE[W]	252.8	250
DC OUTPUT	32V 7.9A	50V 5.0A

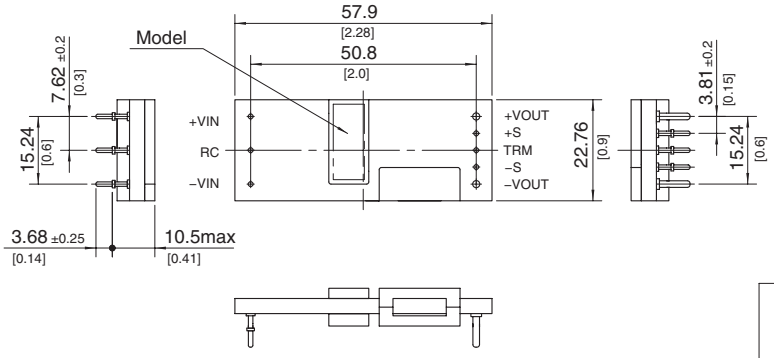
SPECIFICATIONS

	MODEL		CQHS2504832	CQHS2504850
INPUT	VOLTAGE[V]		DC36 - 76	
	CURRENT[A]	*1	5.60typ	5.54typ
	EFFICIENCY[%]	*1	94typ	94typ
	START-UP VOLTAGE[V]		DC32 - 36	
	HYSTERESIS VOLTAGE[V]		DC2 min	
OUTPUT	VOLTAGE[V]		32	50
	CURRENT[A]		7.9	5.0
	LINE REGULATION[mV]		64max	100max
	LOAD REGULATION[mV]		64max	100max
	RIPPLE[mVp-p]	-20 to +85℃ Vin=36-60V *2	255max	400max
		-20 to +85℃ Vin=60-76V *2	320max	500max
		-40 to -20℃ *2	320max	500max
	RIPPLE NOISE[mVp-p]	-20 to +85℃ *2	320max	500max
		-40 to -20℃ *2	410max	650max
	TEMPERATURE REGULATION[mV]	-40 to +85℃	640max	1000max
	DRIFT[mV]	*3	120max	185max
	START-UP TIME[ms]		200max (DCIN 48V, Io=100%)	
	OUTPUT VOLTAGE ADJUSTMENT RANGE[V]	*4	Fixed (TRM pin open), adjustable by external resistor	
			26.88 - 35.20	45.0 - 55.0
	OUTPUT VOLTAGE SETTING[V]	*1	31.68 - 32.32	49.50 - 50.50
PROTECTION CIRCUIT AND OTHERS	OVERCURRENT PROTECTION		Works over 105% of rating, low voltage protection (shut down) function is built-in.	
	OVERVOLTAGE PROTECTION[V]		36.80 - 44.80	56.50 - 67.50
	REMOTE SENSING		Provided	
	REMOTE ON/OFF		Provided (Negative Logic L : ON, H :OFF)	
ISOLATION	INPUT-OUTPUT		DC1,500V or AC500V 1minute, Cutoff current = 10mA, DC500V 50MΩ min (20±15℃)	
	INPUT-BASE PLATE	*5	DC1,500V or AC500V 1minute, Cutoff current = 10mA, DC500V 50MΩ min (20±15℃)	
	OUTPUT-BASE PLATE	*5	AC500V 1minute, Cutoff current = 100mA, DC500V 50MΩ min (20±15℃)	
ENVIRONMENT	OPERATING TEMP.,HUMID.AND ALTITUDE		-40 to +85℃, 20 - 95%RH (Non condensing) (Refer to "Derating"), 3,000m (10,000 feet) max	
	STORAGE TEMP.,HUMID.AND ALTITUDE		-40 to +100℃, 20 - 95%RH (Non condensing), 9,000m (30,000 feet) 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	
SAFETY	AGENCY APPROVALS		UL60950-1, C-UL (CSA60950-1), EN60950-1	
OTHERS	CASE SIZE/WEIGHT		57.9×10.5×22.76mm [2.28×0.41×0.9 inches] (W×H×D) / 30g max	
			58.4×12.7×23.26mm [2.3×0.5×0.92 inches] (W×H×D) / 45g max *5	
	COOLING METHOD		Convection / Forced air / Conduction	

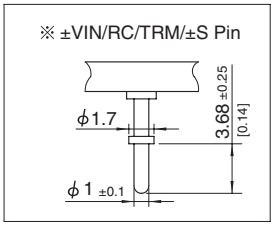
*1 At rated input(DC48V), rated load. Ta= 25℃, 2m/s.
*2 Ripple and ripple noise is measured by using measuring board. Refer to the manual.
*3 Drift is the change in DC output for an eight hour period after a half-hour warm-up at 25℃, with the input voltage held constant at the rated input/output.
*4 When the input voltage is in the range of DC36-40V, output voltage is limited. Refer to the manual.
*5 Base Plate Option.

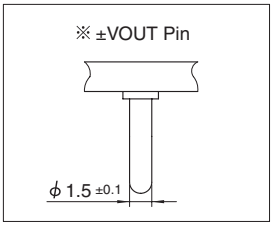
External view

1. DIP

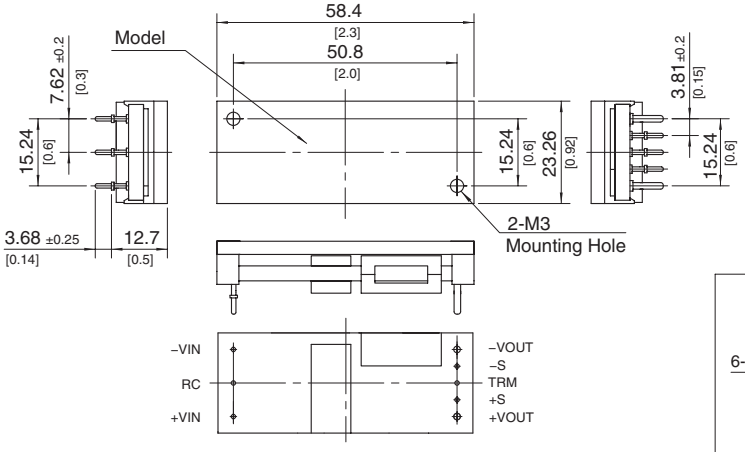


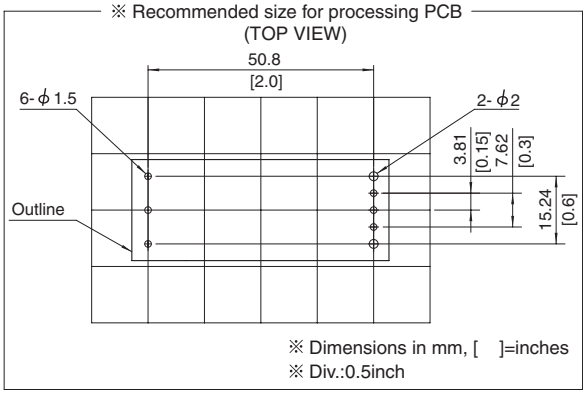
※Tolerance : ±0.5 [±0.02]
※Weight : 30g max(DIP)
45g max(Base Plate)
※Dimensions in mm, [ ]=inches





2. Base Plate (option B)



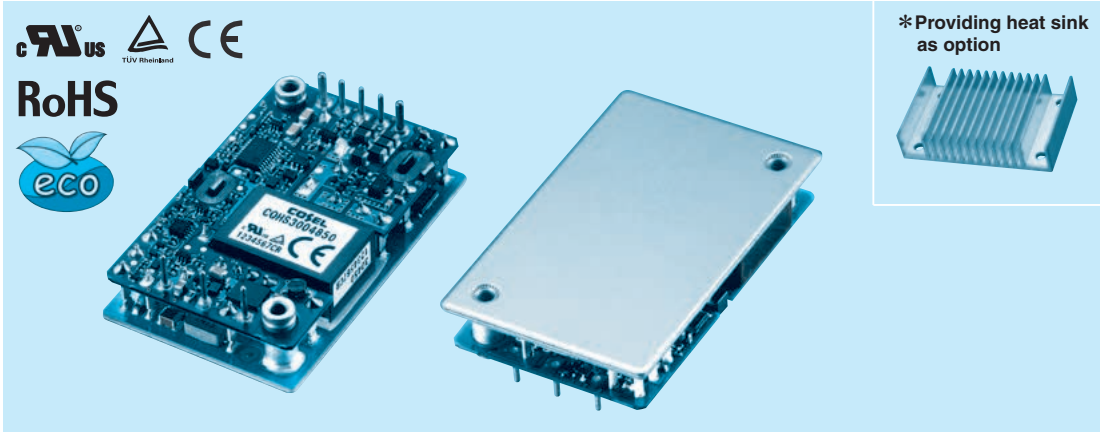


COSEL DC-DC Converters Bus Converter・Power Module Type

CQHS300

Ordering information

CQH	S	300	48	50	-□
①	②	③	④	⑤	⑧



＊Providing heat sink as option

①Series name
②Single output
③Output wattage
④Input voltage
48:DC36 - 76V
⑤Output voltage
⑧Optional
R :with Remote ON/OFF
Positive logic control
T :with Mounting hole
φ3.4 thru

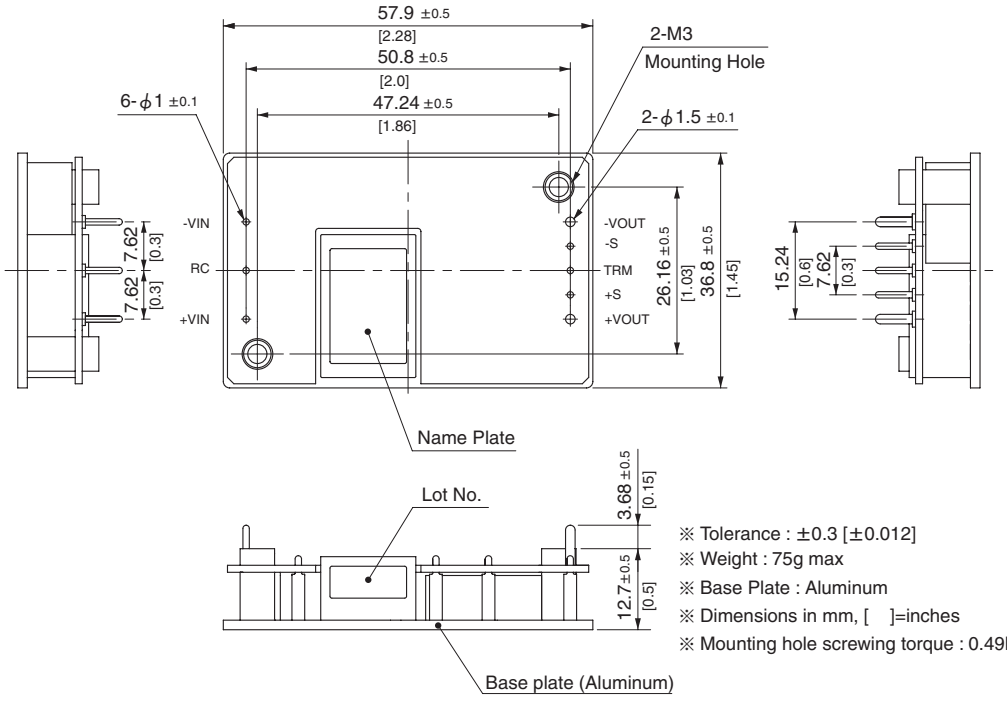
MODEL	CQHS3004832	CQHS3004850
MAX OUTPUT WATTAGE[W]	300.8	300
DC OUTPUT	32V 9.4A	50V 6A

SPECIFICATIONS

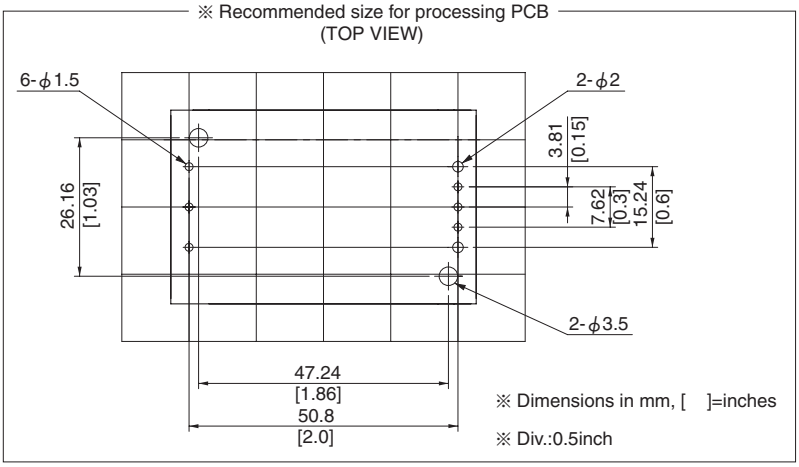
	MODEL		CQHS3004832	CQHS3004850
INPUT	VOLTAGE[V]		DC36 - 76	
	CURRENT[A]	＊1	6.67typ	6.65typ
	EFFICIENCY[%]	＊1	94typ	94typ
	START-UP VOLTAGE[V]		DC32 - 36	
	HYSTERESIS VOLTAGE[V]		DC2 min	
OUTPUT	VOLTAGE[V]		32	50
	CURRENT[A]		9.4	6.0
	LINE REGULATION[mV]		64max	100max
	LOAD REGULATION[mV]		64max	100max
	RIPPLE[mVp-p]	-20 to +100℃ ＊2	255max	400max
		-40 to -20℃ Vin=36-60V ＊2	320max	500max
		-40 to -20℃ Vin=60-76V ＊2	400max	500max
	RIPPLE NOISE[mVp-p]	-20 to +100℃ ＊2	320max	500max
		-40 to -20℃ ＊2	410max	650max
	TEMPERATURE REGULATION[mV]	0 to +65℃	320max	500max
		-40 to +100℃	640max	1000max
	DRIFT[mV]	＊3	120max	185max
	START-UP TIME[ms]		200max (DCIN 48V, Io=100%)	
	OUTPUT VOLTAGE ADJUSTMENT RANGE[V] ＊4		Fixed (TRM pin open), adjustable by external resistor	
			27.2 - 35.2	45.0 - 55.0
	OUTPUT VOLTAGE SETTING[V] ＊1		31.68 - 32.32	49.50 - 50.50
PROTECTION CIRCUIT AND OTHERS	OVERCURRENT PROTECTION		Works over 105% of rating, low voltage protection (shut down) function is built-in.	
	OVERVOLTAGE PROTECTION[V]		36.80 - 44.80	56.50 - 67.50
	REMOTE SENSING		Provided	
	REMOTE ON/OFF		Provided (Negative Logic L : ON, H :OFF)	
ISOLATION	INPUT-OUTPUT		DC1,500V or AC500V 1minute, Cutoff current = 10mA, DC500V 50MΩ min (20±15℃)	
	INPUT-BASE PLATE		DC1,500V or AC500V 1minute, Cutoff current = 10mA, DC500V 50MΩ min (20±15℃)	
	OUTPUT-BASE PLATE		AC500V 1minute, Cutoff current = 100mA, DC500V 50MΩ min (20±15℃)	
ENVIRONMENT	OPERATING TEMP.,HUMID.AND ALTITUDE		-40 to +100℃ (On aluminum base plate), 20 - 95%RH (Non condensing) (Refer to “Derating”), 3,000m (10,000 feet) max	
	STORAGE TEMP.,HUMID.AND ALTITUDE		-40 to +100℃, 20 - 95%RH (Non condensing), 9,000m (30,000 feet) 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	
SAFETY	AGENCY APPROVALS		UL60950-1, C-UL (CSA60950-1), EN60950-1	
OTHERS	CASE SIZE/WEIGHT		57.9×12.7×36.8mm [2.28×0.5×1.45 inches] (W×H×D) / 75g 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 25℃.
＊2 Ripple and ripple noise is measured by using measuring board with recommended capacitor Co & the film capacitor 0.1μF.
＊3 Drift is the change in DC output for an eight hour period after a half-hour warm-up at 25℃, with the input voltage held constant at the rated input/output.
＊4 When the input voltage is in the range of DC36-40V, output voltage is limited. Refer to the manual.

External view



※ Tolerance : ±0.3 [±0.012]
※ Weight : 75g max
※ Base Plate : Aluminum
※ Dimensions in mm, [ ]=inches
※ Mounting hole screwing torque : 0.49N・m (5.0kgf・cm) max

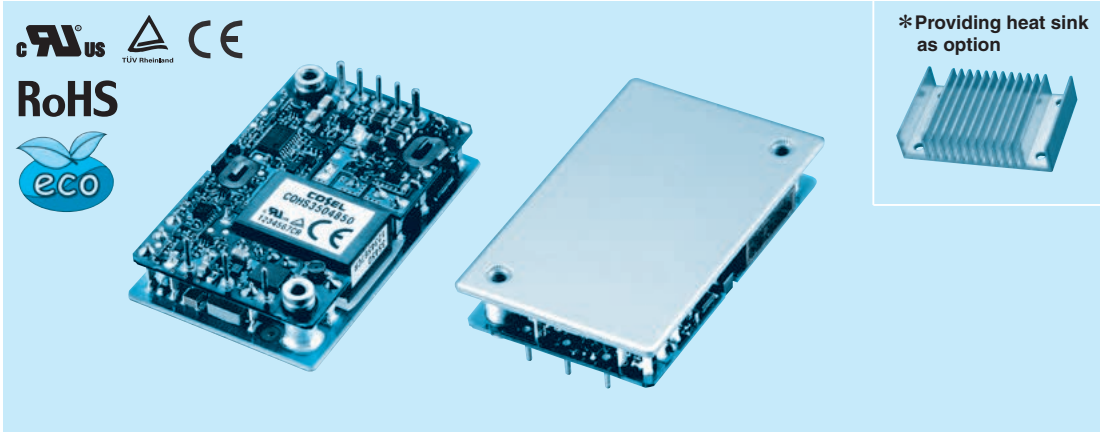


COSEL DC-DC Converters Bus Converter·Power Module Type

CQHS350

Ordering information

CQH	S	350	48	50	-□
①	②	③	④	⑤	⑧



*Providing heat sink as option

①Series name
②Single output
③Output wattage
④Input voltage
48:DC36 - 65V
⑤Output voltage
⑧Optional
R :with Remote ON/OFF Positive logic control
T :with Mounting hole φ3.4 thru

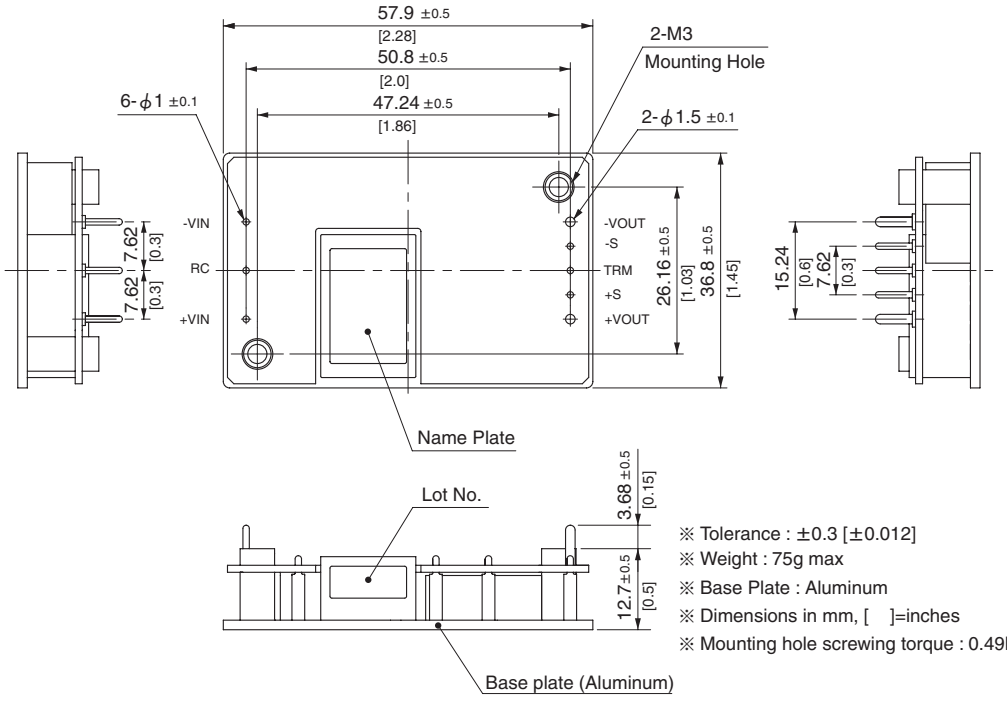
MODEL	CQHS3504832	CQHS3504850
MAX OUTPUT WATTAGE[W]	352	350
DC OUTPUT	32V 11A	50V 7A

SPECIFICATIONS

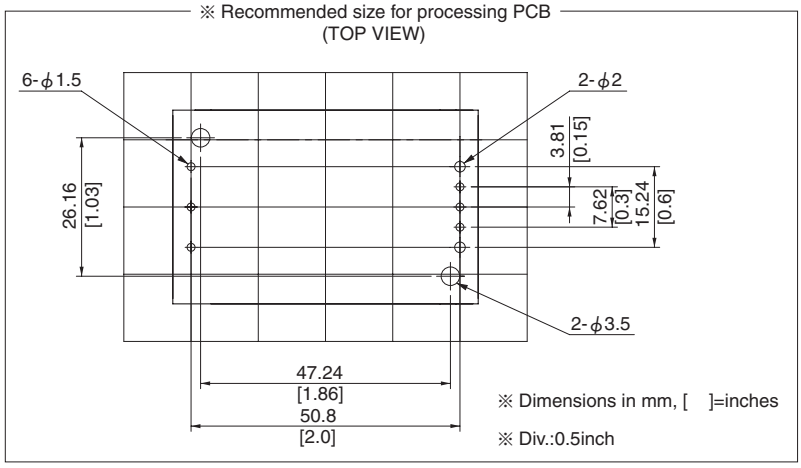
	MODEL		CQHS3504832	CQHS3504850
INPUT	VOLTAGE[V]		DC36 - 65	
	CURRENT[A]	*1	7.8typ	7.76typ
	EFFICIENCY[%]	*1	94typ	94typ
	START-UP VOLTAGE[V]		DC32 - 36	
	HYSTERESIS VOLTAGE[V]		DC2 min	
OUTPUT	VOLTAGE[V]		32	50
	CURRENT[A]		11.0 *5	7.0
	LINE REGULATION[mV]		64max	100max
	LOAD REGULATION[mV]		64max	100max
	RIPPLE[mVp-p]	-20 to +100℃ *2	255max	400max
		-40 to -20℃ Vin=36-60V *2	320max	500max
		-40 to -20℃ Vin=60-65V *2	400max	500max
	RIPPLE NOISE[mVp-p]	-20 to +100℃ *2	320max	500max
		-40 to -20℃ *2	410max	650max
	TEMPERATURE REGULATION[mV]	0 to +65℃	320max	500max
		-40 to +100℃	640max	1000max
	DRIFT[mV]	*3	120max	185max
	START-UP TIME[ms]		200max (DCIN 48V, Io=100%)	
	OUTPUT VOLTAGE ADJUSTMENT RANGE[V] *4		Fixed (TRM pin open), adjustable by external resistor	
			26.88 - 35.20	45.0 - 55.0
	OUTPUT VOLTAGE SETTING[V] *1		31.68 - 32.32	49.50 - 50.50
PROTECTION CIRCUIT AND OTHERS	OVERCURRENT PROTECTION		Works over 105% of rating, low voltage protection (shut down) function is built-in.	
	OVERVOLTAGE PROTECTION[V]		36.80 - 44.80	56.50 - 67.50
	REMOTE SENSING		Provided	
	REMOTE ON/OFF		Provided (Negative Logic L : ON, H :OFF)	
ISOLATION	INPUT-OUTPUT		DC1,500V or AC500V 1minute, Cutoff current = 10mA, DC500V 50MΩ min (20±15℃)	
	INPUT-BASE PLATE		DC1,500V or AC500V 1minute, Cutoff current = 10mA, DC500V 50MΩ min (20±15℃)	
	OUTPUT-BASE PLATE		AC500V 1minute, Cutoff current = 100mA, DC500V 50MΩ min (20±15℃)	
ENVIRONMENT	OPERATING TEMP.,HUMID.AND ALTITUDE		-40 to +100℃ (On aluminum base plate), 20 - 95%RH (Non condensing) (Refer to "Derating"), 3,000m (10,000 feet) max	
	STORAGE TEMP.,HUMID.AND ALTITUDE		-40 to +100℃, 20 - 95%RH (Non condensing), 9,000m (30,000 feet) 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	
SAFETY	AGENCY APPROVALS		UL60950-1, C-UL (CSA60950-1), EN60950-1	
OTHERS	CASE SIZE/WEIGHT		57.9×12.7×36.8mm [2.28×0.5×1.45 inches] (W×H×D) / 75g 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 25℃.
*2 Ripple and ripple noise is measured by using measuring board with recommended capacitor Co & the film capacitor 0.1μF.
*3 Drift is the change in DC output for an eight hour period after a half-hour warm-up at 25℃, with the input voltage held constant at the rated input/output.
*4 When the input voltage is in the range of DC36-40V, output voltage is limited. Refer to the manual.
*5 Rated current is increased adjusting output voltage to lower than rated output voltage. Refer to the manual.

External view

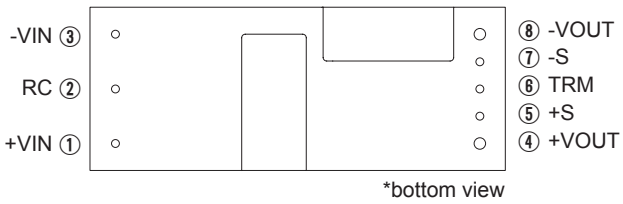


※ Tolerance : ±0.3 [±0.012]
※ Weight : 75g max
※ Base Plate : Aluminum
※ Dimensions in mm, [ ]=inches
※ Mounting hole screwing torque : 0.49N・m (5.0kgf・cm) max



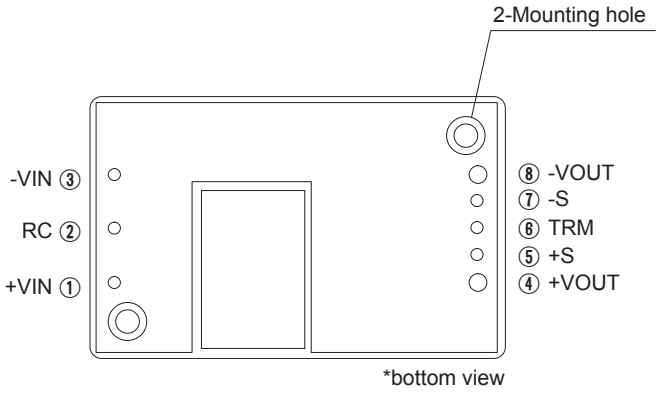
Pin Configuration

●CQHS250



No.	Pin Name	Function
①	+VIN	+DC input
②	RC	Remote ON/OFF
③	-VIN	-DC input
④	+VOUT	+DC output
⑤	+S	+Remote sensing
⑥	TRM	Adjustment of output voltage
⑦	-S	-Remote sensing
⑧	-VOUT	-DC output
–	Mounting hole	Mounting hole

●CQHS300/CQHS350



Implementation・Mounting Method

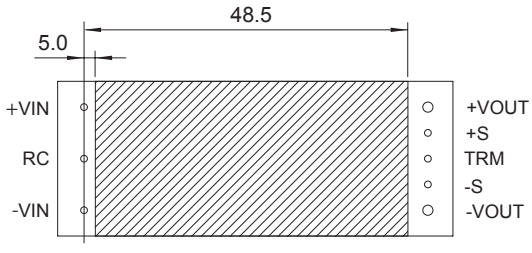
Mounting method

■When multiple power modules are used side by side, position them with sufficient spaces to allow adequate air ventilation so that the 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 mounting hole.

■Avoid placing pattern layout in hatched area shown in right figure to insulate between pattern and power supply.



●CQHS300/CQHS350

■Soldering CQHS series with printed board must be done under the flat condition by using the mounting hole and fixing with the screw.
If CQHS series is inclined and it’s mounted, the insulation of the internal components and printed board might not be kept.

■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.
Please make sure a mounting hole will be connected to a grounding capacitor CY.

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

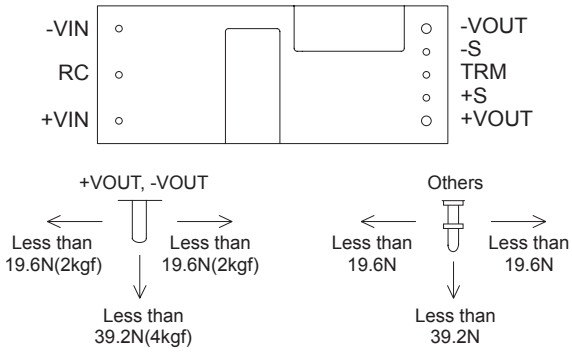
Implementation・Mounting Method

Stress onto the pins

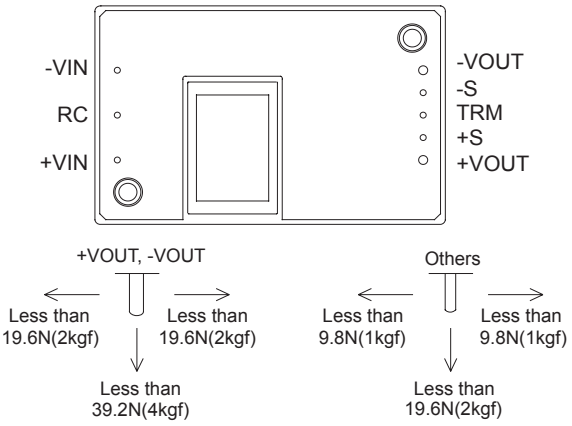
■Applying excessive stress to the input or output pins of the power module may damage internal connections. Avoid applying stressin excess of that shown in below.

■Input and output pins are soldered onto the internal PCB. Do not bend or pull the leads with excessive force.

●CQHS250



●CQHS300/CQHS350



●CQHS300/CQHS350

■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 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℃ for up to 15 seconds.

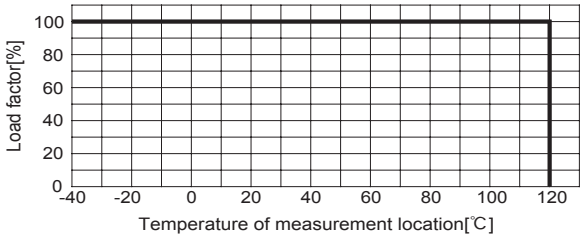
■Soldering iron (26W) : 450℃ for up to 5 seconds.

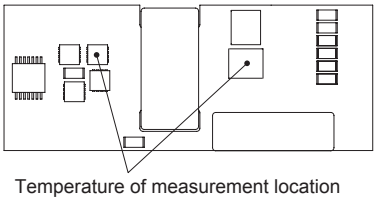
Derating

■It is necessary to note the thermal fatigue life by power cycle.Please reduce the temperature fluctuation range as much as possible when the up and down of the temperature are frequently generated. Contact us for more information on cooling methods.

●CQHS250

■Use with the convection cooling or the forced air cooling. Make sure the temperatures at temperature measurement locations shown below are on or under the derating curve. Ambient temperature must be kept at 85℃ or under.

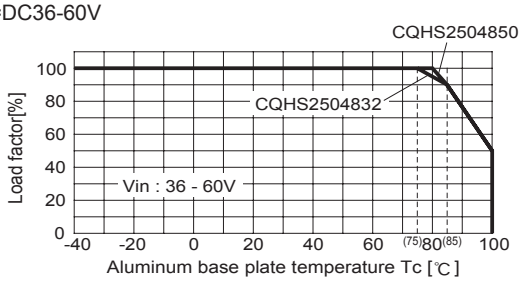


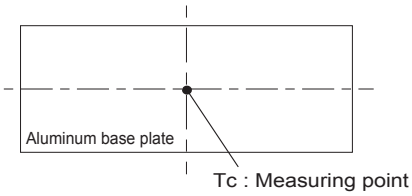


■For option “B” which is used with the convection cooling, forced air cooling or conduction cooling, use the temperature measurement location as shown in below.

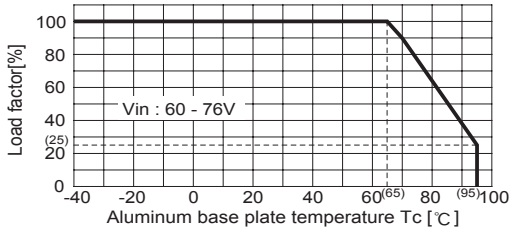
Derating

①Vin=DC36-60V





②Vin=DC60-76V

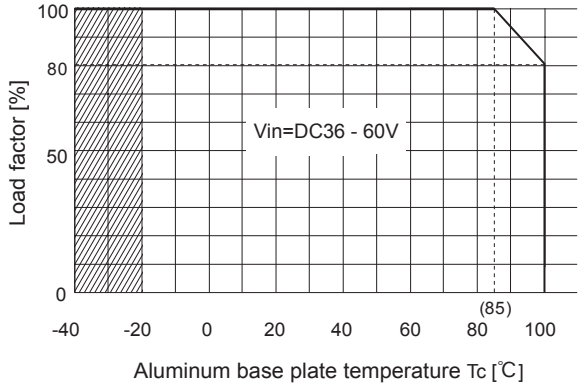


●CQHS300/CQHS350

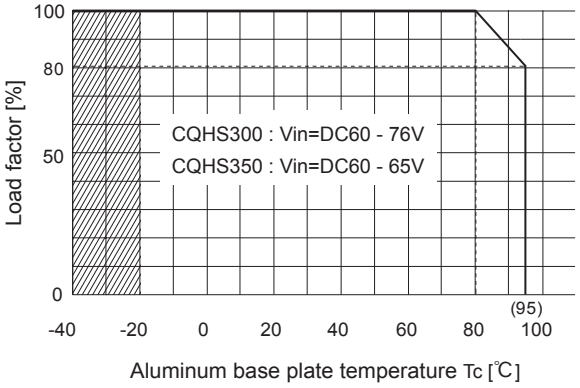
■Use the power modules with conduction cooling (e.g. heat dissipation from the aluminum base plate to the attached heat sink).
Below figure shows the derating curves with respect to the aluminum base plate temperature. Note that operation within the hatched areas will cause a significant level of ripple and ripple noise. Contact us for more information on cooling methods.

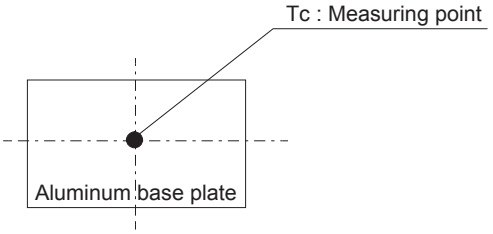
■Please measure the temperature on the aluminum base plate edge side when you cannot measure the temperature of the center part of the aluminum base plate. In this case, please take 5deg temperature margin from the derating characteristic of below figure .

①Vin=DC36-60V



②CQHS300 : Vin=DC60 - 76V　CQHS350 : Vin=DC60 - 65V





Instruction Manual

◆ It is neccessary to read the “Instruction Manual” and “Before using our product” before you use our product.

Instruction Manual	https://en.cosel.co.jp/product/powersupply/CQHS/
Before using our product	https://en.cosel.co.jp/technical/caution/index.html

CQHS

NOTICE

Basic Characteristics Data

Model	Circuit method	Switching frequency [kHz]	Input current	Rated input fuse	Inrush current protection	PCB/Pattern			Series/Redundancy operation availability	
						Material	Single sided	Double sided	Series operation	Redundancy operation
CQHS250	Full-bridge converter	140	✻1	-	-	glass fabric base, epoxy resin		Multilayer	Yes	✻2
CQHS300	Forward converter	250	✻1	-	-	Aluminum	Yes		Yes	✻2
CQHS350	Forward converter	250	✻1	-	-	Aluminum	Yes		Yes	✻2

✻1 Refer to Specification.
✻2 Refer to Instruction Manual.

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

Cosel:
CQHS3004850-T CQHS3004832 CQHS3004832-T CQHS3004832-RT CQHS3004850-R CQHS3004850-RT CQHS3004850 CQHS3004832-R