



Low Profile



Isolated



Safety Approvals



OCP

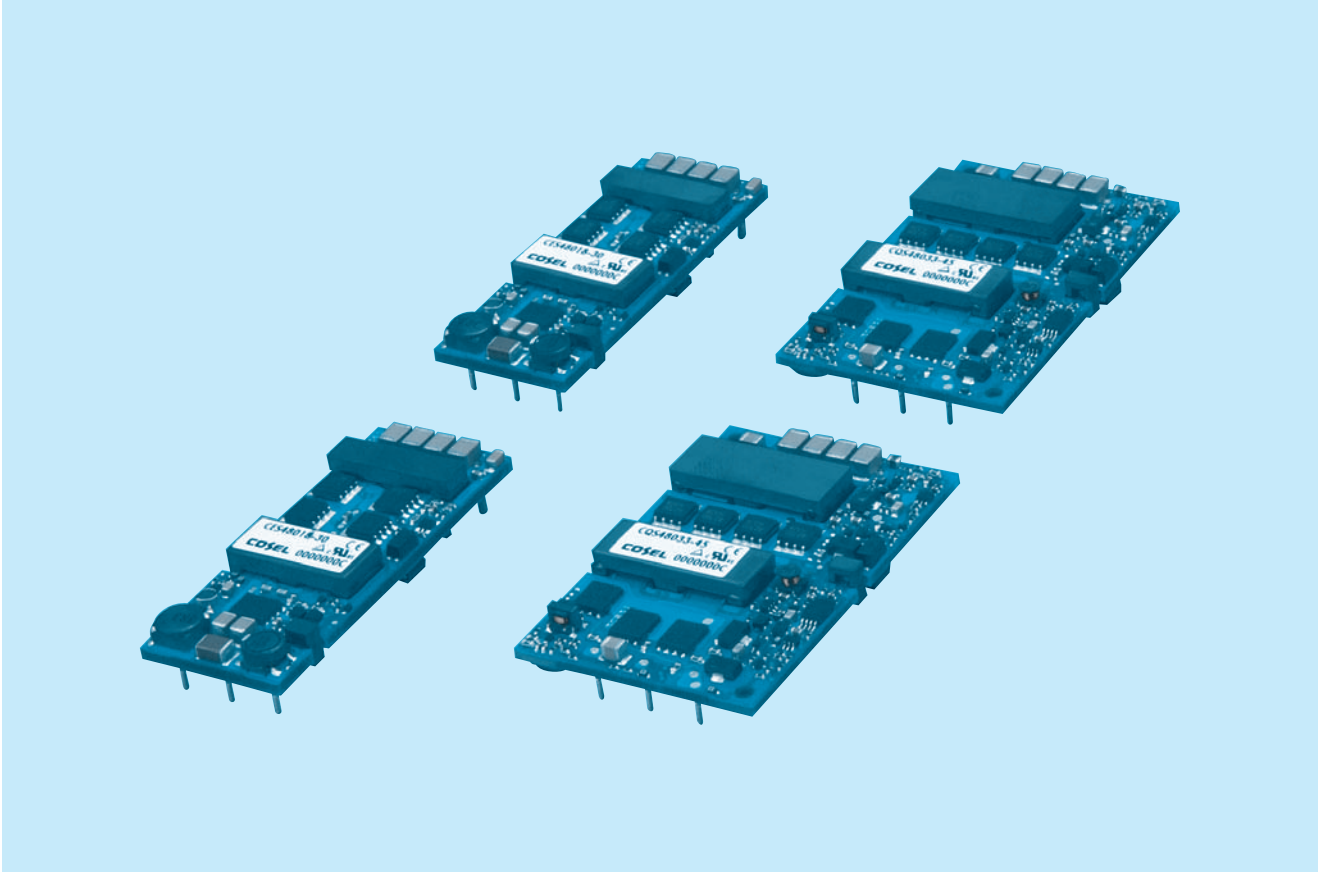


OVP



Remote ON/OFF

# CES/CQS-series



## ■ Feature

- Compact DC - DC Converter, "BRICK SIZE" 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

## ■ CE marking

- Low Voltage Directive

## ■ Safety agency approvals

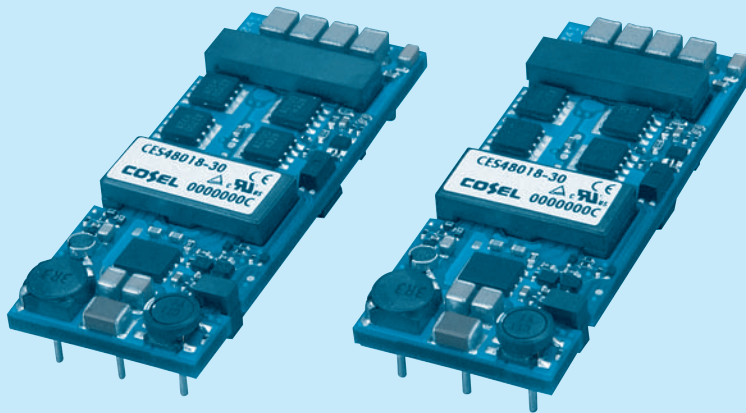
- UL60950-1, C-UL recognized, TÜV approved

## ■ 5-year warranty



★marked models : Consult with us for delivery.

- ①Series name
- ②Single output
- ③Input voltage  
48 :DC36 - 76V
- ④Output voltage  
018:1.8V  
025:2.5V  
033:3.3V
- ⑤Output current
- ⑥Optional  
R :with Remote ON/OFF  
Positive logic control  
V :Output voltage setting ±1%  
N :Auto restart from thermal  
protection



MODEL	CES48018-30	CES48025-25	CES48033-25	CES48050-16	CES48120-6
MAX OUTPUT WATTAGE[W]	54.0	62.5	82.5	80.0	72.0
DC OUTPUT	1.8V 30A	2.5V 25A	3.3V 25A	5V 16A	12V 6A

SPECIFICATIONS

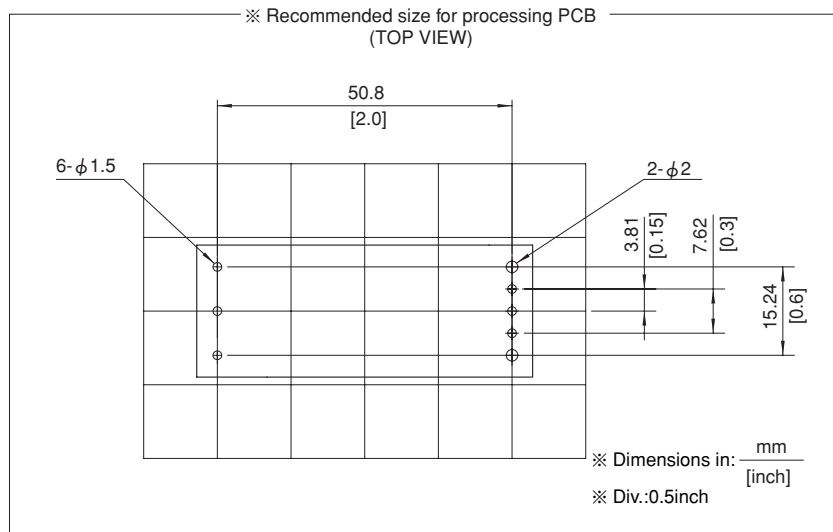
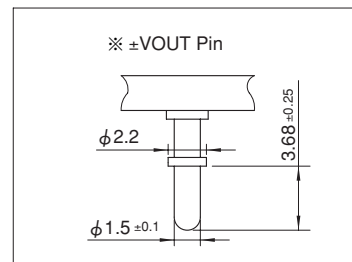
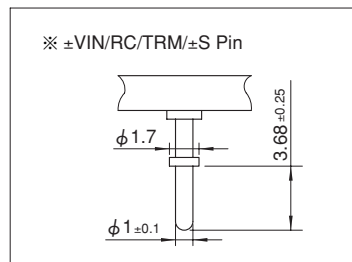
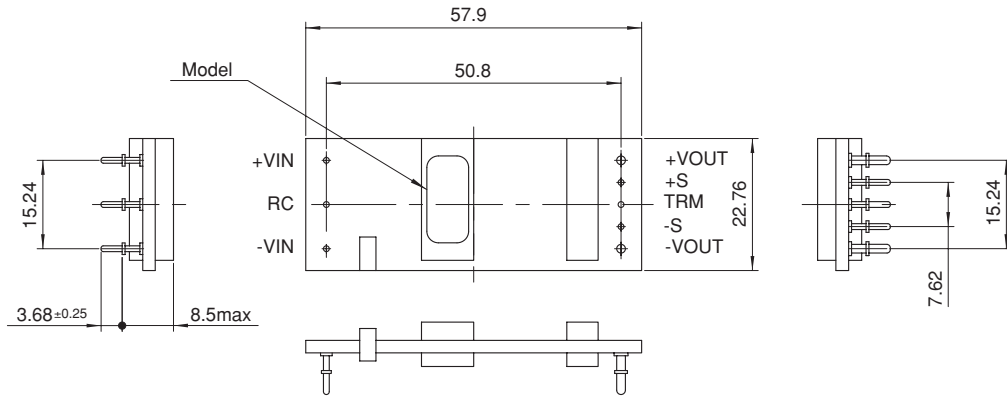
	MODEL	CES48018-30	CES48025-25	CES48033-25	CES48050-16	★CES48120-6	
INPUT	VOLTAGE[V]	DC36 - 76					
	CURRENT[A]	*1 1.30typ	1.45typ	1.89typ	1.84typ	1.65typ	
	EFFICIENCY[%]	*1 87typ	90typ	91typ	91typ	91typ	
	START-UP VOLTAGE[V]	DC32 - 36					
	HYSTERESIS VOLTAGE[V]	DC2 min					
OUTPUT	VOLTAGE[V]	1.8	2.5	3.3	5	12	
	CURRENT[A]	30	25	25	16	6	
	LINE REGULATION[mV]	±5max	±5max	±5max	±5max	±12max	
	LOAD REGULATION[mV]	±5max	±5max	±5max	±5max	±12max	
	RIPPLE	[mVrms] *2	20max	20max	20max	25max	40max
		[mVp-p] *2	60max	60max	60max	80max	120max
	RIPPLE NOISE[mVp-p] *2	100max	100max	100max	120max	150max	
	TEMPERATURE REGULATION[mV]	66max	66max	66max	100max	240max	
	DRIFT[mV] *3	16max	16max	16max	20max	40max	
	START-UP TIME[ms]	200max (DCIN 48V, Io=100%)					
OUTPUT VOLTAGE ADJUSTMENT RANGE	Fixed (TRM pin open), adjustable by external resistor						
	-20% / +10%		-15% / +15%		-20% / +10%		
OUTPUT VOLTAGE SETTING	±1.6%						
PROTECTION CIRCUIT AND OTHERS	OVERCURRENT PROTECTION	Works over 105% of rating, low voltage protection (shut down) function is built-in.					
	OVERVOLTAGE PROTECTION	117% - 127%		125% - 135%		117% - 127%	
	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 50MΩ min (20±15°C)					
ENVIRONMENT	OPERATING TEMP.,HUMID.AND ALTITUDE	-40 to +85°C, 20 - 95%RH (Non condensing) (Refer to DERATING CURVE), 3,000m (10,000feet) max					
	STORAGE TEMP.,HUMID.AND ALTITUDE	-40 to +100°C, 20 - 95%RH (Non condensing), 9,000m (30,000feet) max					
	VIBRATION	10 - 55Hz, 49.0m/s <sup>2</sup> (5G), 3minutes period, 60minutes each along X, Y and Z axis					
	IMPACT	196.1m/s <sup>2</sup> (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	57.9×8.5×22.76mm (W×H×D) / 26g max					
	COOLING METHOD	Convection/Forced air					

\*1 At rated input(DC48V) and rated load. Ta=25°C, 2m/s.

\*2 Ripple and ripple noise is measured by using measuring board with electroplytic capacitor 10 μF & ceramic capacitor 1 μF. Refer to Instruction Manual.

\*3 Drift is the change in DC output for an eight hour period after a half-hour warm-up at 25°C, with the input voltage held constant at the rated input/output.

External view

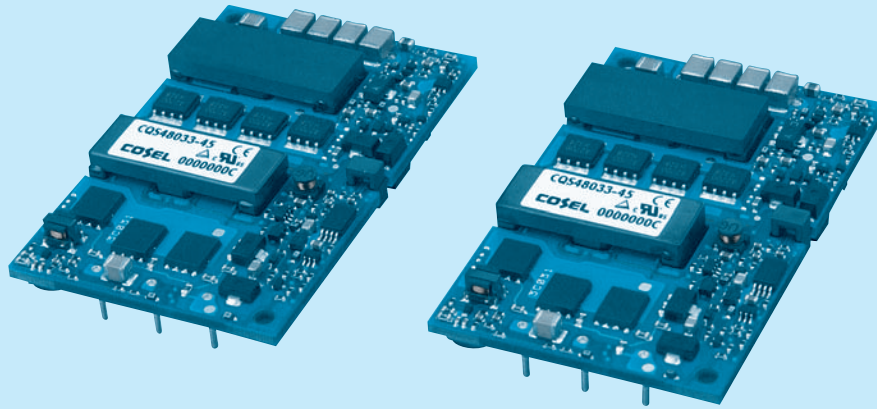


- ※ Tolerance: ±0.5
- ※ Mass: 26g or less
- ※ Dimensions in mm



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protection



MODEL	CQS48018-50	CQS48025-45	CQS48033-45	CQS48050-28	CQS48120-14
MAX OUTPUT WATTAGE[W]	90.0	112.5	148.5	140.0	168.0
DC OUTPUT	1.8V 50A	2.5V 45A	3.3V 45A	5V 28A	12V 14A

**SPECIFICATIONS**

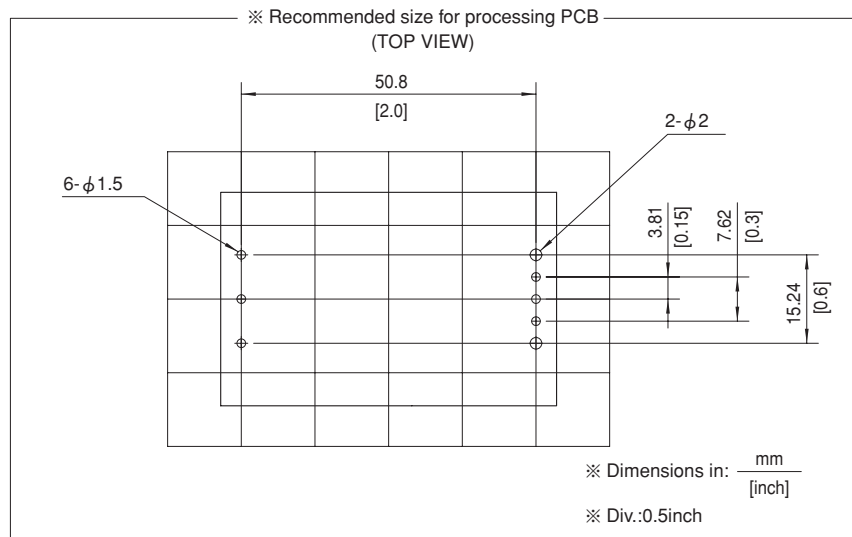
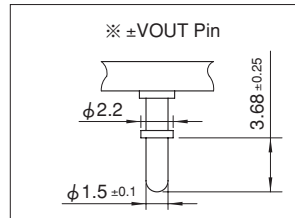
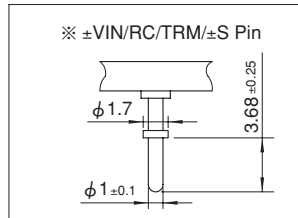
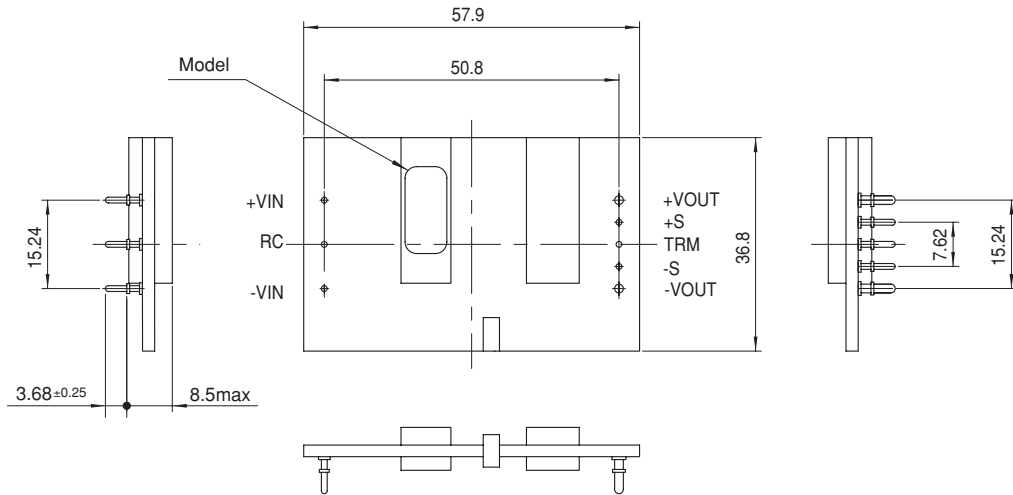
	MODEL	CQS48018-50	CQS48025-45	CQS48033-45	★CQS48050-28	★CQS48120-14	
INPUT	VOLTAGE[V]	DC36 - 76					
	CURRENT[A]	2.13typ	2.58typ	3.36typ	3.17typ	3.80typ	
	EFFICIENCY[%]	88typ	91typ	92typ	92typ	92typ	
	START-UP VOLTAGE[V]	DC32 - 36					
	HYSTERESIS VOLTAGE[V]	DC2 min					
OUTPUT	VOLTAGE[V]	1.8	2.5	3.3	5	12	
	CURRENT[A]	50	45	45	28	14	
	LINE REGULATION[mV]	±5max					
	LOAD REGULATION[mV]	±5max					
	RIPPLE	[mVrms]	20max	20max	20max	25max	40max
		[mVp-p]	60max	60max	60max	80max	120max
	RIPPLE NOISE[mVp-p]	100max	100max	100max	120max	150max	
	TEMPERATURE REGULATION[mV]	66max	66max	66max	100max	240max	
	DRIFT[mV]	16max	16max	16max	20max	40max	
	START-UP TIME[ms]	200max (DCIN 48V, Io=100%)					
OUTPUT VOLTAGE ADJUSTMENT RANGE	Fixed (TRM pin open), adjustable by external resistor						
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OTHERS	CASE SIZE/WEIGHT	57.9×8.5×36.8mm (W×H×D) / 40g max					
	COOLING METHOD	Convection/Forced air					

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External view



- ※ Tolerance:±0.5
- ※ Mass:40g or less
- ※ Dimensions in mm

## Basic characteristics data

Model	Circuit method	Switching frequency [KHz]	Input current	Rated input fuse	Inrush current protection circuit	PCB/Pattern			Series/Parallel operation availability	
						Material	Single sided	Double sided	Series operation	Parallel operation
CES	Forward converter	420	Refer to table 1	-	-	glass fabric base, epoxy resin		Multilayer	Yes	* 1
CQS	Forward converter	420	Refer to table 1	-	-	glass fabric base, epoxy resin		Multilayer	Yes	* 1

\* 1 Refer to Instruction Manual.

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

[A]

Model	1.8V	2.5V	3.3V	5V	12V
CES48	1.3	1.5	1.9	1.8	1.7
CQS48	2.2	2.6	3.4	3.2	3.8