



Low Profile



Isolated



Safety Approvals



OCP

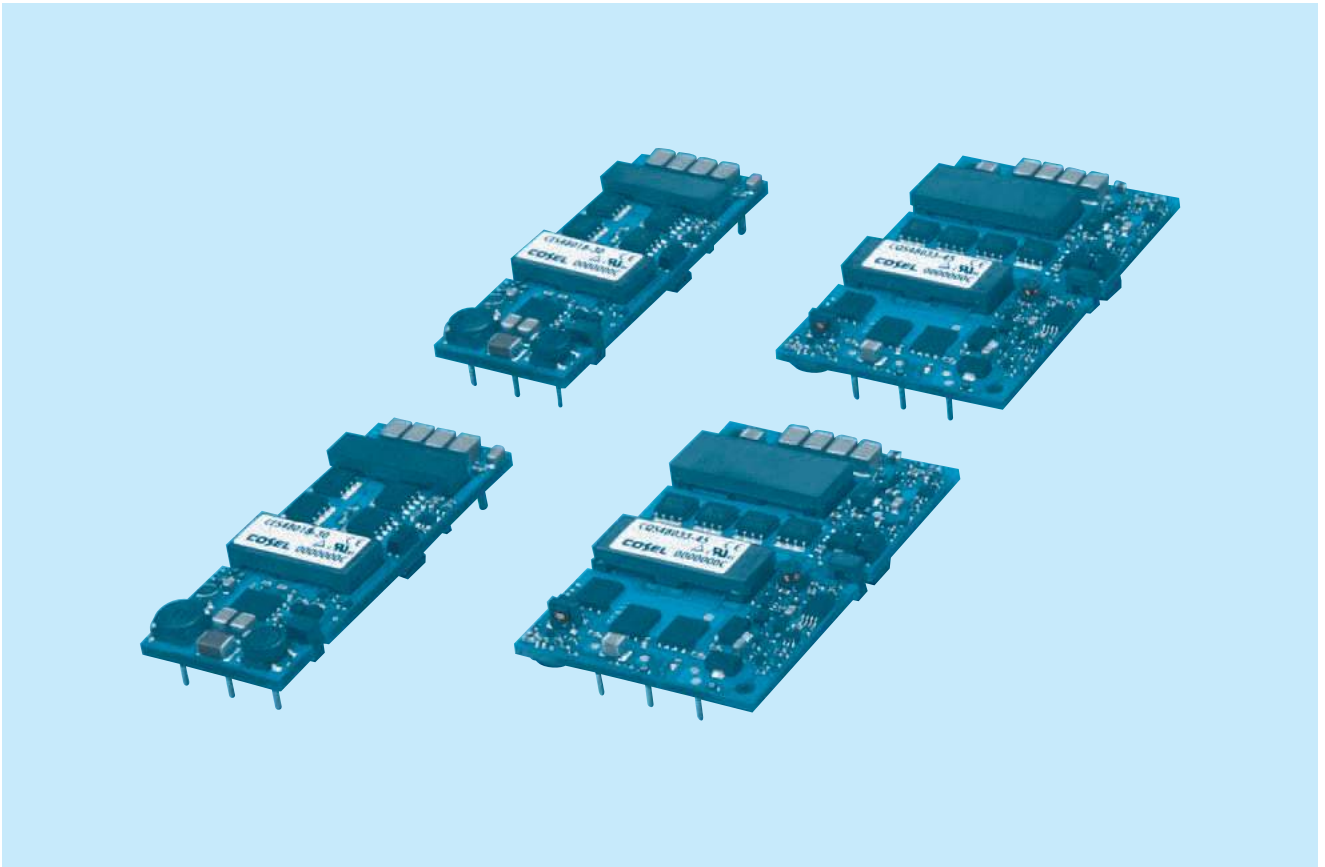


OVP



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
- RoHS Directive

## ■ UKCA marking

- Electrical Equipment Safety Regulations
- RoHS Regulations

## ■ Safety agency approvals

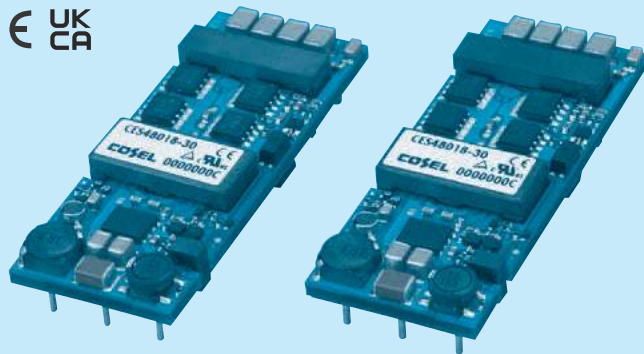
- UL60950-1, C-UL recognized, TÜV approved

## ■ 5-year warranty

# CES

CE S 48 018 -30 -□

① ② ③ ④ ⑤ ⑥



- ① Series name
- ② Single output
- ③ Input voltage  
24:DC18 - 36V  
48:DC36 - 76V
- ④ Output voltage  
015:1.5V  
018:1.8V  
025:2.5V  
033:3.3V  
050:5V  
060:6V  
120:12V  
150:15V
- ⑤ Output current
- ⑥ Optional  
S :SMD  
R :with Remote ON/OFF  
Positive logic control  
V :Output voltage setting ±1%  
N :Auto restart from thermal protection

MODEL	CES24033-25	CES24050-16	CES24120-6	CES24150-4
MAX OUTPUT WATTAGE[W]	82.5	80.0	72.0	60.0
DC OUTPUT	3.3V 25A	5V 16A	12V 6A	15V 4A

### SPECIFICATIONS

	MODEL	CES24033-25	CES24050-16	CES24120-6	CES24150-4	
INPUT	VOLTAGE[V]	DC18 - 36			DC20 - 33	
	CURRENT[A]	3.78typ	3.67typ	3.30typ	2.75typ	
	EFFICIENCY[%]	91typ	91typ	91typ	91typ	
	START-UP VOLTAGE[V]	DC16 - 18				
	HYSTERESIS VOLTAGE[V]	DC1 min				
OUTPUT	VOLTAGE[V]	3.3	5	12	15	
	CURRENT[A]	25	16	6	4	
	LINE REGULATION[mV]	10max	10max	24max	30max	
	LOAD REGULATION[mV]	10max	10max	24max	30max	
	RIPPLE	[mVrms]	20max	20max	40max	40max
		[mVp-p]	60max	80max	120max	120max
	RIPPLE NOISE[mVp-p]	100max	120max	150max	150max	
	TEMPERATURE REGULATION[mV]	66max	100max	240max	300max	
	DRIFT[mV]	16max	20max	40max	50max	
	START-UP TIME[ms]	200max (DCIN 24V, Io=100%)				
OUTPUT VOLTAGE ADJUSTMENT RANGE	Fixed (TRM pin open), adjustable by external resistor					
	-15% / +15%	-20% / +20%	-20% / +10%	-20% / +5%		
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	125% - 135%	125% - 135%	117% - 127%		
	REMOTE SENSING	Provided				
	REMOTE ON/OFF	Provided (Negative logic L : ON, H : OFF)				

MODEL	Standard type							High wattage type		
	CES48015-30	CES48018-30	CES48025-25	CES48033-25	CES48050-16	CES48120-6	CES48150-4	CES48033-30	CES48050-20	CES48060-17
MAX OUTPUT WATTAGE[W]	45.0	54.0	62.5	82.5	80.0	72.0	60.0	99.0	100.0	102.0
DC OUTPUT	1.5V 30A	1.8V 30A	2.5V 25A	3.3V 25A	5V 16A	12V 6A	15V 4A	3.3V 30A	5V 20A	6V 17A

### SPECIFICATIONS

	MODEL	CES48015-30	CES48018-30	CES48025-25	CES48033-25	CES48050-16	CES48120-6	CES48150-4	CES48033-30	CES48050-20	CES48060-17	
INPUT	VOLTAGE[V]	DC36 - 76							DC40 - 60	DC36 - 76		
	CURRENT[A]	1.1typ	1.3typ	1.45typ	1.89typ	1.84typ	1.65typ	1.37typ	2.29typ	2.32typ	2.36typ	
	EFFICIENCY[%]	86typ	87typ	90typ	91typ	91typ	91typ	91typ	90typ	90typ	92typ	
	START-UP VOLTAGE[V]	DC32 - 36							DC36 - 40	DC32 - 36		
	HYSTERESIS VOLTAGE[V]	DC2 min										
OUTPUT	VOLTAGE[V]	1.5	1.8	2.5	3.3	5	12	15	3.3	5	6	
	CURRENT[A]	30	30	25	25	16	6	4	30	20	17	
	LINE REGULATION[mV]	10max	10max	10max	10max	10max	24max	30max	10max	10max	10max	
	LOAD REGULATION[mV]	10max	10max	10max	10max	10max	24max	30max	10max	10max	10max	
	RIPPLE	[mVrms]	20max	20max	20max	20max	25max	40max	40max	20max	25max	25max
		[mVp-p]	60max	60max	60max	60max	80max	120max	120max	60max	100max	100max
	RIPPLE NOISE[mVp-p]	100max	100max	100max	100max	120max	150max	150max	100max	150max	150max	
	TEMPERATURE REGULATION[mV]	66max	66max	66max	66max	100max	240max	300max	66max	100max	100max	
	DRIFT[mV]	16max	16max	16max	16max	20max	40max	50max	16max	20max	20max	
	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%		-20% / +5%	-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%				125% - 135%	117% - 127%		
	REMOTE SENSING	Provided										
	REMOTE ON/OFF	Provided (Negative logic L : ON, H : OFF)										

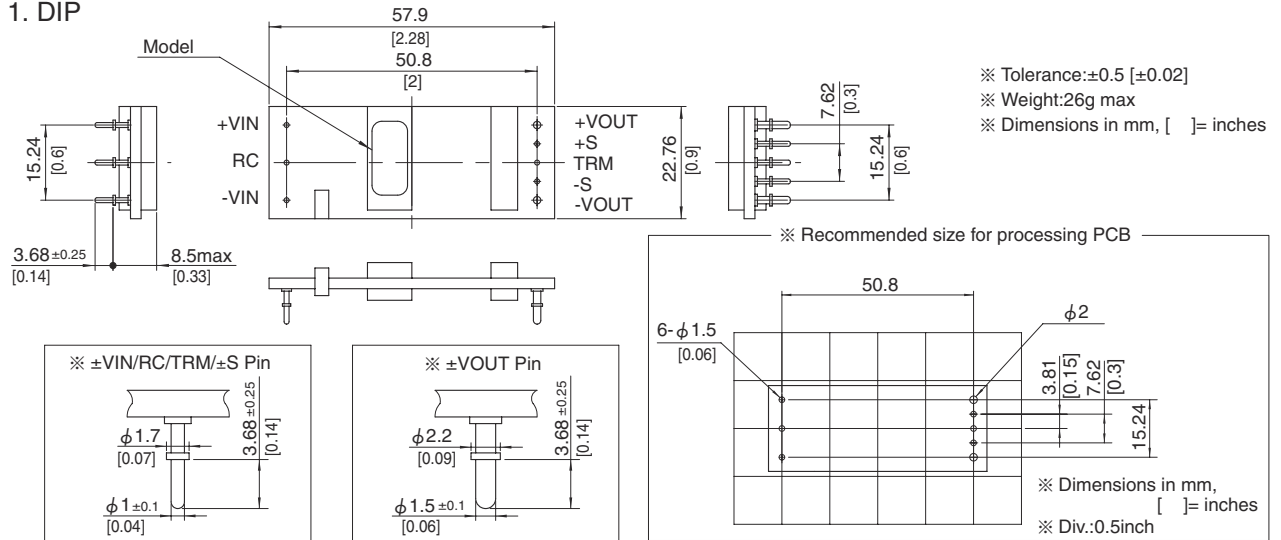
## GENERAL SPECIFICATIONS

<b>ISOLATION</b>	<b>INPUT-OUTPUT</b>	DC1,500V or AC1,000V 1minute, Cutoff current = 10mA, DC500V 50MΩ min (20 ± 15°C)
<b>ENVIRONMENT</b>	<b>OPERATING TEMP., HUMID. AND ALTITUDE</b>	-40 to +85°C, 20 - 95%RH (Non condensing) (Refer to DERATING CURVE), 3,000m (10,000feet) max
	<b>STORAGE TEMP., HUMID. AND ALTITUDE</b>	-40 to +100°C, 20 - 95%RH (Non condensing), 9,000m (30,000feet) max (Option S: Refer to the instruction Manual)
	<b>VIBRATION</b>	10 - 55Hz, 49.0m/s <sup>2</sup> (5G), 3minutes period, 60minutes each along X, Y and Z axis
<b>SAFETY</b>	<b>IMPACT</b>	196.1m/s <sup>2</sup> (20G), 11ms, once each along X, Y and Z axis
	<b>AGENCY APPROVALS</b>	UL60950-1, C-UL (CSA60950-1), EN62368-1
<b>OTHERS</b>	<b>CASE SIZE/WEIGHT</b>	57.9 × 8.5 × 22.76mm [2.28 × 0.33 × 0.9 inches] (W × H × D) / 26g max
	<b>COOLING METHOD</b>	Convection / Forced air

- \*1 At rated input(DC24V,DC48V) and rated load and 25°C, 2m/s.
- \*2 Ripple and ripple noise is measured by using measuring board with ceramic capacitor 22 μF. Refer to the 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.
- \*4 Refer to the instruction manual for input voltage derating.

### External view

#### 1. DIP



#### 2. SMD(optionS)

