eC30 Series – Isolated AC/DC Converters
85 - 264Vac Input, Maximum Power: 30W

Data Sheet
Jan 7, 2024

eC30 Series – Isolated AC/DC converters

Features

- Small, compact case
- Universal input (AC85~264V)
- High Efficiency
- Low input current at no load
  (0.3W@220VAC) at eCS30
  (0.4W@220VAC) at eCD30
- Built in EMI Filter
- Inrush current limit
- Over current protection
- Over voltage protection
- Output short circuit protection
- RoHS directive
- 2years warranty

Applications

- Telecommunication
- Datacom
- Instrumentation
- Distributed Power System

Description

The eC30 Series is a High Efficiency AC/DC Converter that provides up to 30 watts of output power and has 5models with single output and 6models with dual output. This module operate a burst mode below a given output power and it offers a high efficiency at light load. This module has an over current and over voltage protection mode and wide operating temperature range from -10℃ to +60℃.

Absolute Maximum Ratings

Parameter	Min	Typ	Max	Unit	Notes
Input Voltage Continuous	85	-	264	VAC	
Operating Ambient Temperature	-10	-	60	˚C	
Storage Temperature	-20	-	70	˚C	
I/O Isolation Voltage	-	-	3000	VAC	

Stresses in excess of the absolute maximum ratings can cause permanent damage to the device

Electrical Specifications

Input Characteristics

T_A = +25˚C ,Vin = 85 ~ 264VAC after warm up unless otherwise specified

Parameter	Symbol	Min	Typ	Max	Unit
Operating voltage Range		85		264	Vac
Input current (@ 220V / @110V)	I_{in}				
eCS30-3R3			0.26/0.43		A
eCS30-5			0.36/0.60		A
eCS30-12			0.35/0.58		A
eCS30-15			0.35/0.55		A
eCS30-24			0.34/0.58		A
eCD30-55			0.46/0.70		A
eCD30-52			0.44/0.66		A
eCD30-5F			0.45/0.67		A
eCD30-54			0.44/0.66		A
eCD30-1212			0.44/0.64		A
eCD30-1515			0.42/0.62		A
No load Input Power					
eCS30-3R3			0.3		W
eCS30-5			0.3		W
eCS30-12			0.3		W
eCS30-15			0.3		W
eCS30-24			0.3		W
eCD30-55			0.4		W
eCD30-52			0.4		W
eCD30-5F			0.4		W
eCD30-54			0.4		W
eCD30-1212			0.4		W
eCD30-1515			0.4		W
] \ Inrush Current@Cold start				30A max 60A max	@110VAC @220VAC
Operating Frequency		47		63	Hz

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Output Characteristics

T_A = +25˚C ,Vin = 85 ~ 264VAC After warm up unless otherwise specified

Parameter	Symbol	Min	Typ	Max	Unit
Output Voltage tolerance	Vo			±2	%
Output Current	Io				
eCS30-3R3				6	A
eCS30-5				6	A
eCS30-12				2.5	A
eCS30-15				2.0	A
eCS30-24				1.25	A
eCD30-55				3 / 3	A
eCD30-52				3 / 1.2	A
eCD30-5F				3 / 1	A
eCD30-54				3 / 0.6	A
eCD30-1212				1.2 / 1.2	A
eCD30-1515				1 / 1	A
Output Regulation;					
- Line Regulation				±1	%
- Load Regulation				±1	%
Output Current Limit (Automatic recovery)		>105			%
Output Ripple and noise (Vin =24V, and Io =Max Output Current Bandwidth 20MHz, 1uF Ceramic cap)	mVp-p		1% of Vout		mV
Efficiency					
eCS30-3R3			75.7		%
eCS30-5			81.8		%
eCS30-12			85.5		%
eCS30-15			87.0		%
eCS30-24			87.3		%
eCD30-55			76.3		%
eCD30-52			79.3		%
eCD30-5F			79.6		%
eCD30-54			80.4		%

eCD30-1212 eCD30-1515 (100% of max Io, Vin = 220VAC)			82.7 83.0		% %
Dynamic Load Response (1uF Ceramic 25% to 50 %, 50% to 25%, Slew rate = 0.05A/us)				±3% of Output Voltage	mV
Start – Up Time				400	ms
Hold – Up Time				10	ms
Turn – on overshoot				1	%
Maximum output capacitance					μF

Isolation Specifications

Parameter	Symbol	Min	Typ	Max	Unit
I/O Isolation Voltage (AC500V, 1 Min) - Input-Output: - Input-Case: - Output-case:				 3000 2000 500	 VAC VAC VAC
Isolation Resistance - Output-Case (at DC500V at 25˚C And 70%RH for 1 min)	RISO	>100			MΩ
Isolation Capacitance	CISO				pF

Environmental

Parameter	Symbol	Min	Typ	Max	Unit
Operating Temperature		-10		60	˚C
Operating Humidity (RH non-condensing)		5		95	%
Storage Temperature		-20		70	˚C
Vibration @10G(98m/s^2)		10		55	Hz

Characteristic Curves

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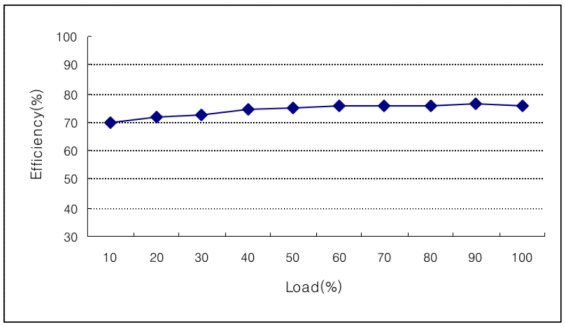
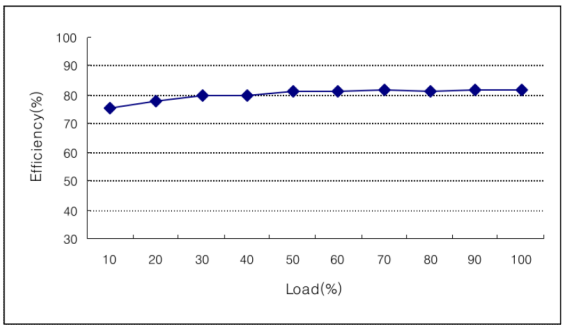
Efficiency Curves (Vin =220Vac)

eCS30-3R3



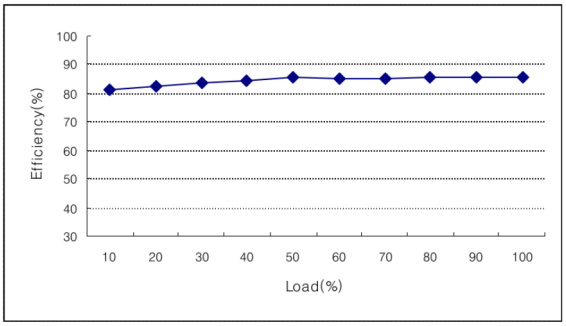
Vo=3.3V@6A , At 25°C

eCS30-5



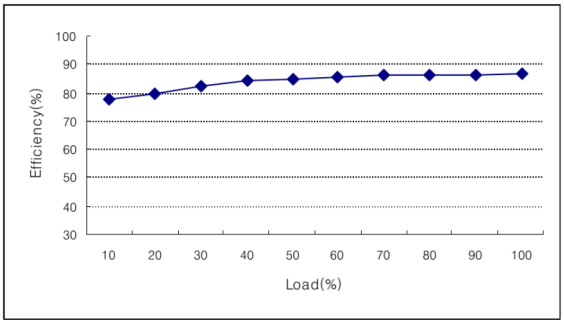
Vo=5V@6A, At 25°C

eCS30-12



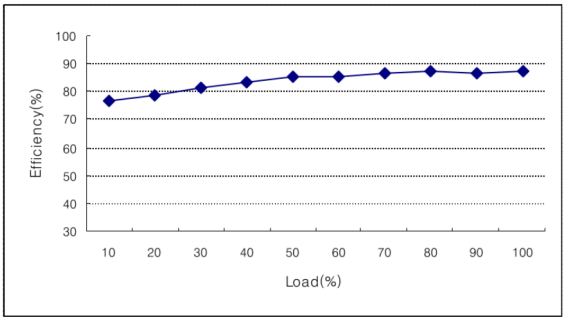
Vo=12V@2.5A, At 25°C

eCS30-15



Vo=15V@2A , At 25°C

eCS30-24



Vo=24V@1.25A, At 25°C

Efficiency Curves (in = 220Vac)

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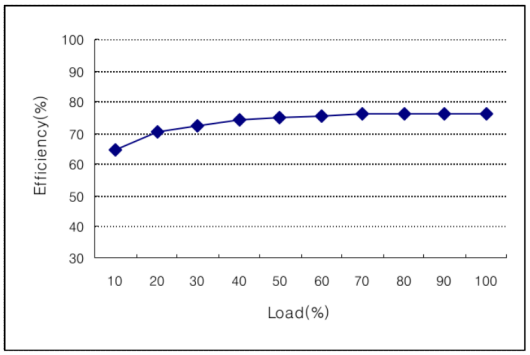
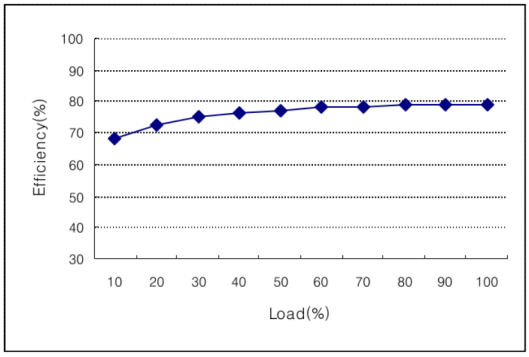
eCD30-55



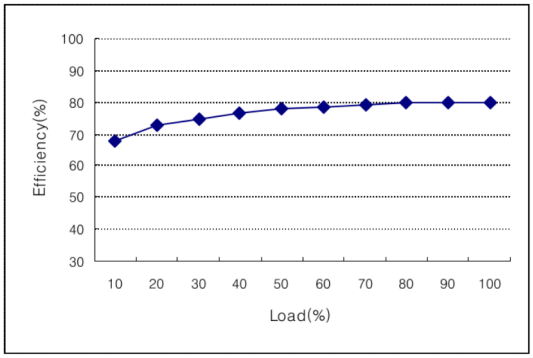
Vo1=5V@3A, Vo2=5V@3A, At 25°C

eCD30-52



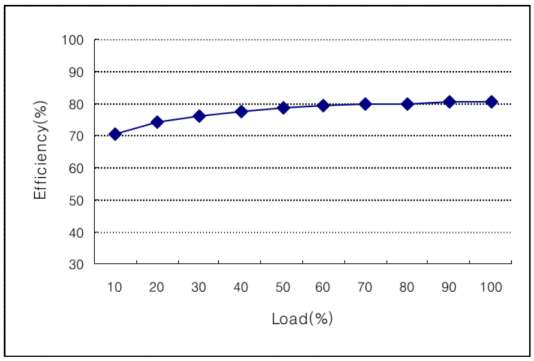
Vo1=5V@3A, Vo2=12V@1.2A, At 25°C

eCD30-5F



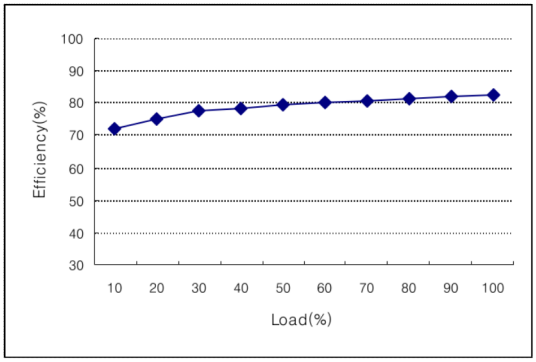
Vo1=5V@3A, Vo2=15V@1A, At 25°C

eCD30-54



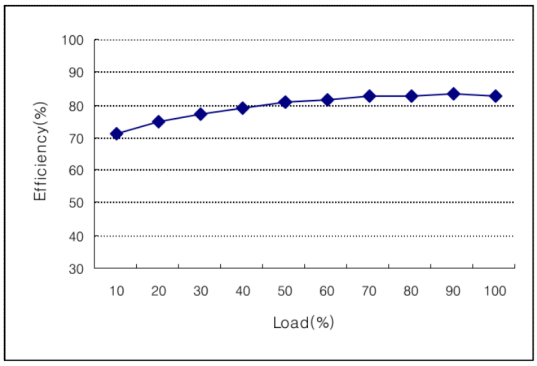
Vo1=5V@3A, Vo2=24V@0.6A, At 25°C

eCD30-1212



Vo1=12V@1.2A, Vo2=12V@1.2A, At 25°C

eCD30-1515



Vo1=15V@1A, Vo2=15V@1A, At 25°C

Output Ripple & Noise (Vin=220Vac)

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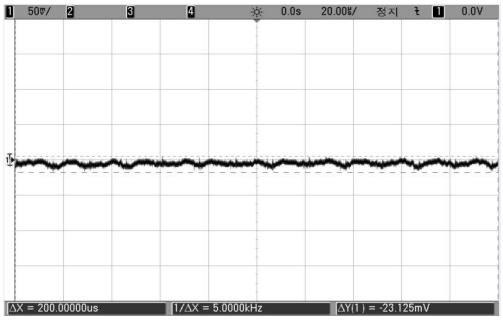
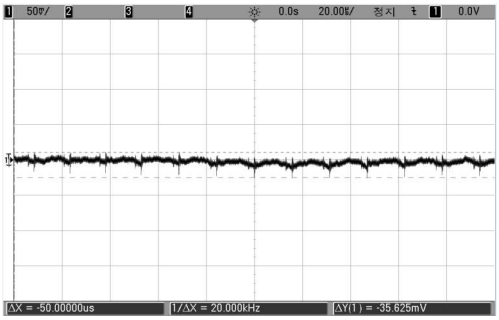
eCS30-3R3



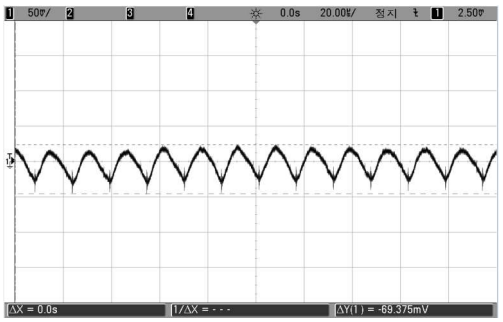
Vo=3.3V@6A , At 25°C

eCS30-5



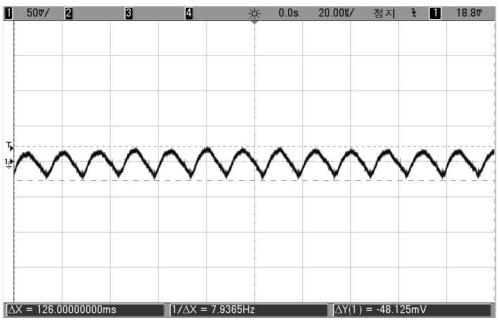
Vo=5V@6A, At 25°C

eCS30-12



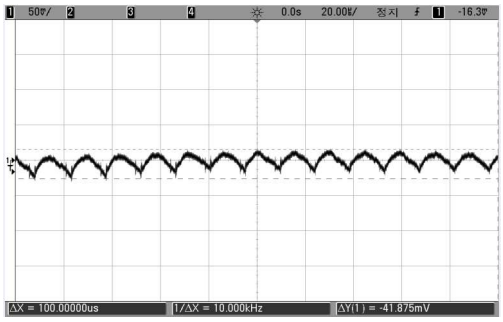
Vo=12V@2.5A, At 25°C

eCS30-15



Vo=15V@2A , At 25°C

eCS30-24



Vo=24V@1.25A, At 25°C

Start-up Time (Vin=220Vac)

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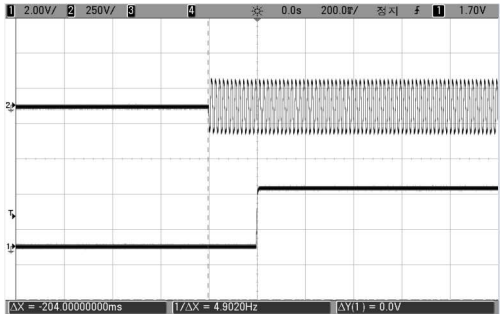
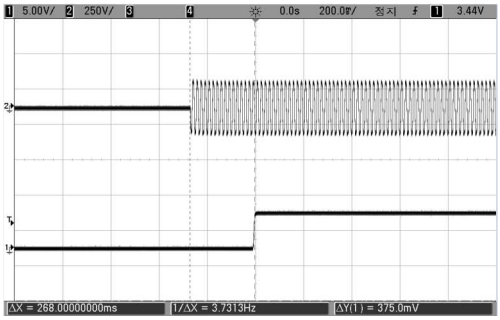
eCS30-3R3



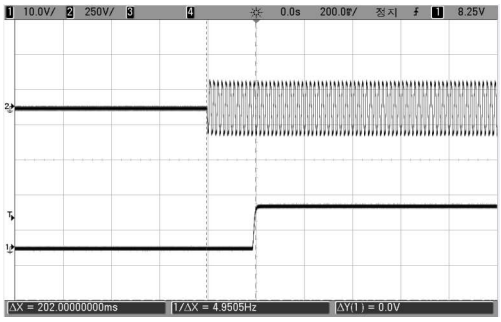
Vo=3.3V @6A , At 25°C

eCS30-5



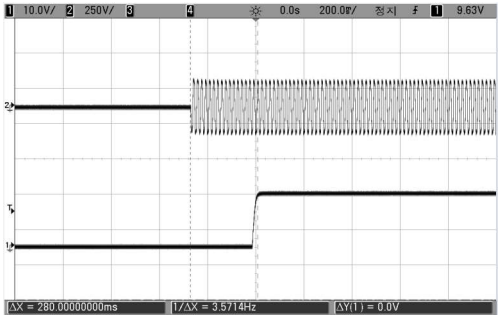
Vo=5V @6A , At 25°C

eCS30-12



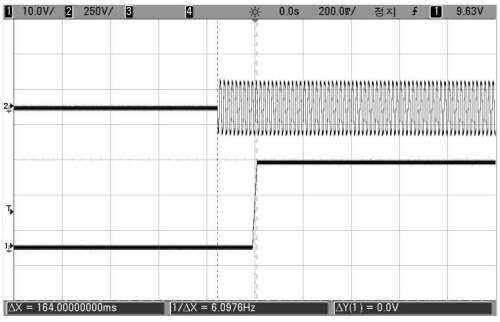
Vo=12V @2.5A , At 25°C

eCS30-15



Vo=15V @2A, At 25°C

eCS30-24



Vo=24V @1.25A , At 25°C

Hold Up Time (Vin=220Vac)

eCS30-3R3

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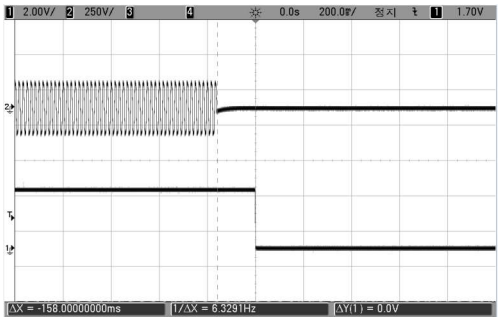
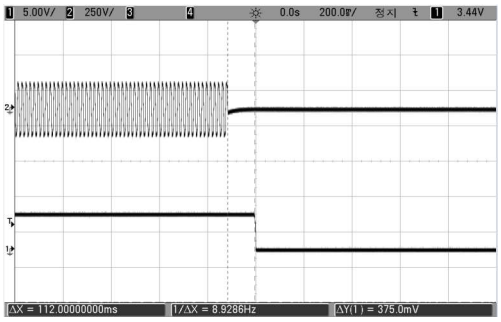


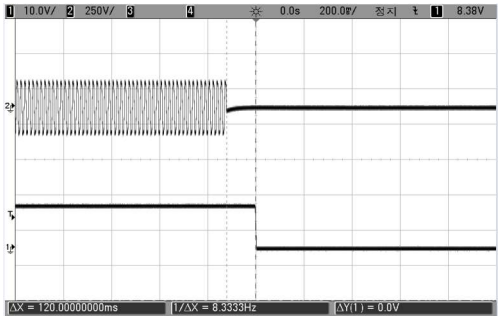
Vo=3.3V @6A , At 25°C

eCS30-5



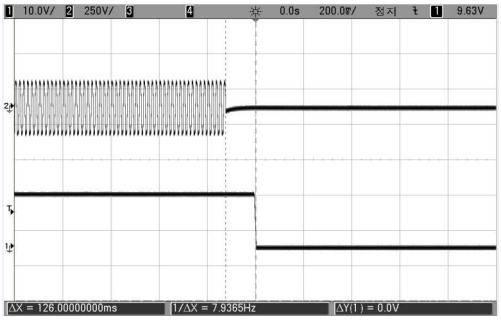
Vo=5V @6A , At 25°C

eCS30-12



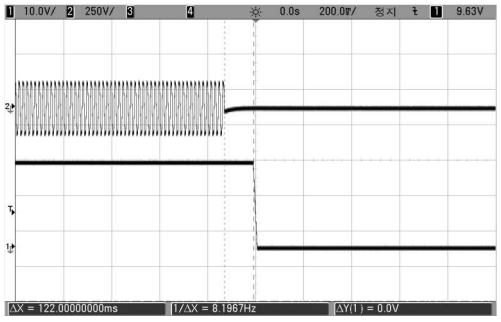
Vo=12V @2.5A , At 25°C

eCS30-15



Vo=15V @2A, At 25°C

eCS30-24



Vo=24V @1.25A,At 25°C

Output Load Transient Response

(25%↔50% of full load, slew rate = 0.1A/us)

eCS30-3R3

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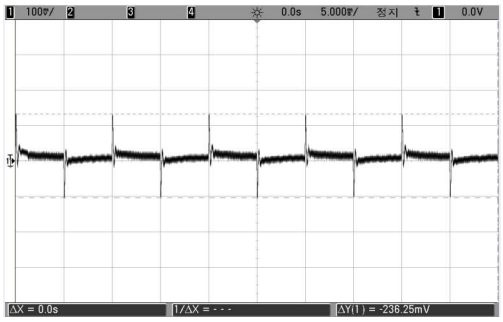
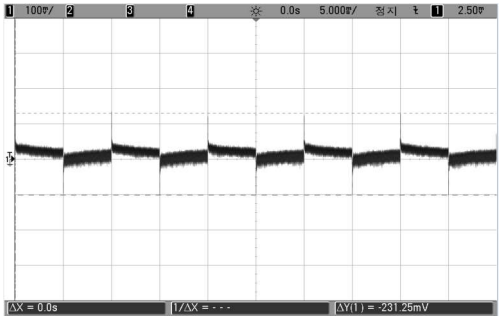


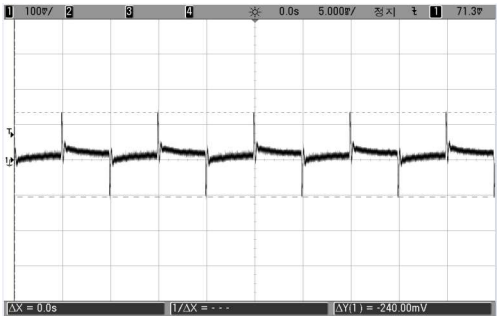
Vin=220VAC , At 25°C

eCS30-12



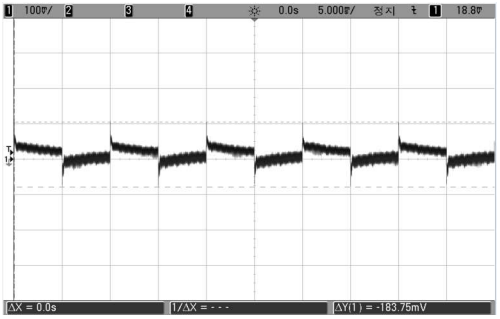
Vin = 220VAC, At 25°C

eCS30-5



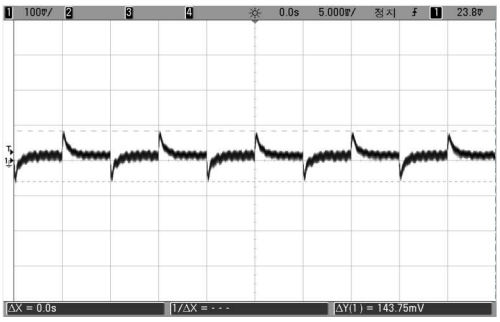
Vin=220VAC, At 25°C

eCS30-15



Vin=220VAC, At 25°

eCS30-24



Vin=220VAC, At 25°

Instruction manual

Basic connection

10uH

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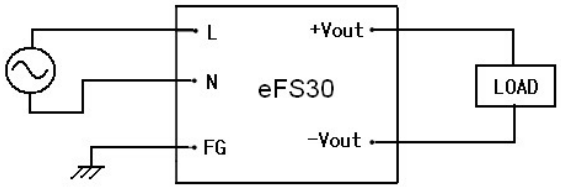
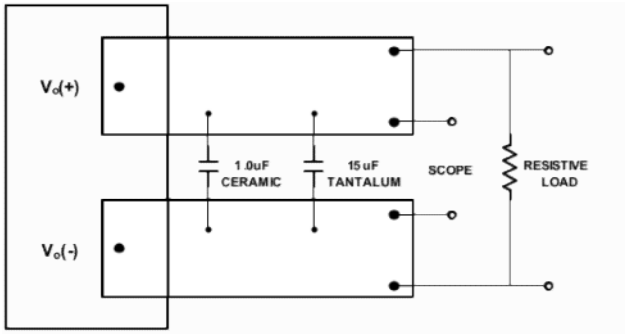


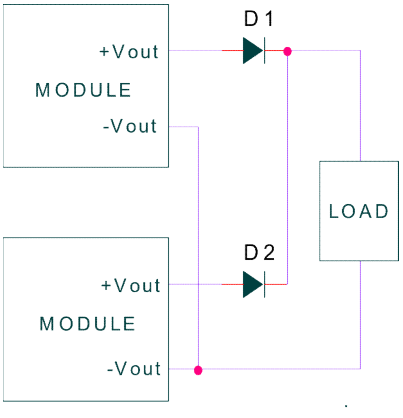
Output ripple and noise Test



* Conductor from Vout-pins to capacitors = 50mm (1.97in)

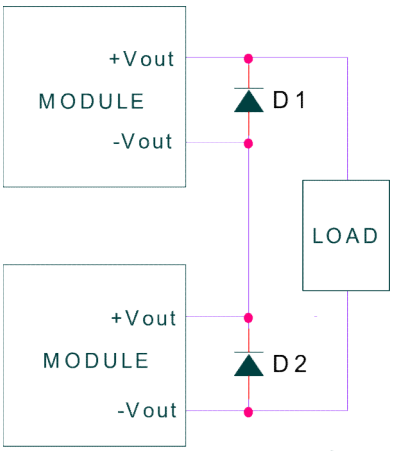
Parallel operation

Parallel operation is available by connecting the units as shown below.



Series operation

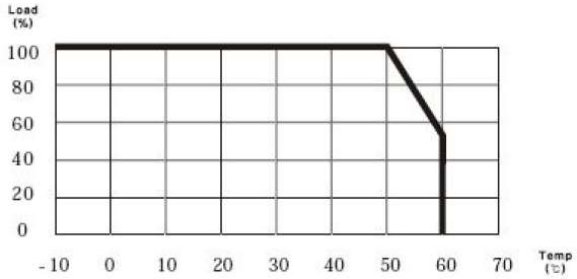
Series operation is available by connecting the outputs of two or more power supplies, as shown below. Output current in series connection should be lower than the lowest current in each unit.(Please use schottky barrier diode)



Thermal Considerations

eC30 series has wide operating temperature range from -10˚C to +60˚C.

However, it should be required a enough air flow for more reliable operation. Output derating curve provide designers with a quantity of a current under the desired ambient temperature and velocity of a airflow.



Feature Description

Input Fuse

In order to comply with safety requirements,

eC30 series has a fuse built in.

Input Output Filter

eC30 series have an internal EMI filter. To reduce conducted noise, additional external input filter is required

To reduce a output ripple and noise, external capacitor is required at the output of the device

Over current Protection (OCP)

eC30 series built in over current protection circuit which operates when the output current is over 105% of rating and automatically recovers when over current condition is removed

If the short or overload condition continues, the power module could be damaged.

Over Voltage Protection (OVP)

eC30 series built in overvoltage protection circuit. When the OVP trigger, the output will be shut down. The input must be taken out(for at least five seconds), and than re-inputted manually. Otherwise, the module will not operate.

Soldering Information

The product is intended for through hole mounting in a PCB, When wave soldering is used, the temperature on the pins is specified to maximum 260˚C for maximum 10 seconds

when hand soldering, care should be taken to avoid direct contact between the hot soldering iron tip and the pins for more than a few seconds in order to prevent overheating.

Mechanical Specification

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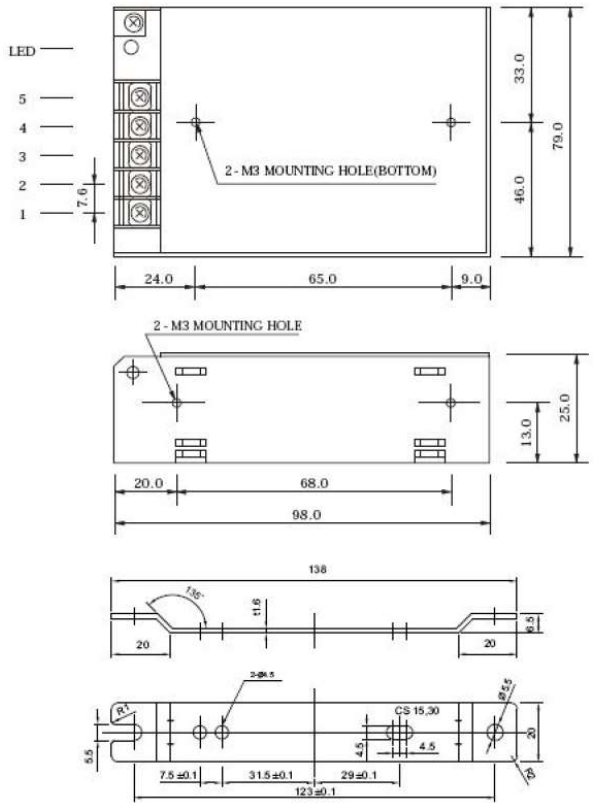
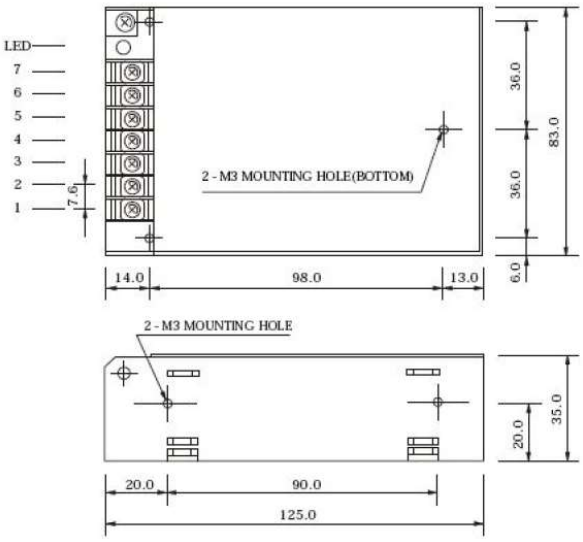
▶ Single Output



▶ Dual Output



NOTES
1. All dimensions are mm.
2. Weight : 270g or less (single)
   370g or less(Dual)
3. Mounting holes(5) for M3 screw, which should not enter the supply surface by more than 2.5mm.

Pin assignments

Single Ouput				Dual Output		
PIN	NAME	FUNCTION		PIN	NAME	FUNCTION
1	AC(L)	AC Input		1	AC(L)	AC Input
2	AC(N)	AC Input		2	AC(N)	AC Input
3	FG	Frame Ground		3	FG	Frame Ground
4	-Vo1	GND of output		4	-Vo2	GND of output2
5	+Vo1	Positive side of output		5	+Vo2	Positive side of output2
				6	-Vo1	GND of output1
				7	+Vo1	Positive side of output1

Ordering Information

Input	Output1,	Output2	Power	Ripple & Noise	Efficiency	Model

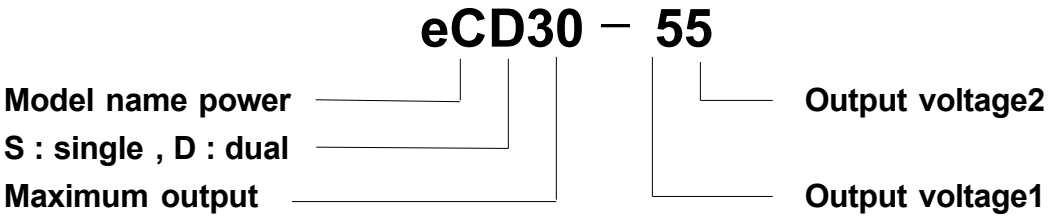
eC30 Series – Isolated AC/DC Converters

85 - 264Vac Input, Maximum Power: 30W

Data Sheet
Jan 7, 2024

			(Max.)	(Typ.)	(Typ.)	Number
85 – 264V	3.3V@6A		19.8W	50mVp-p	77%	eCS30-3R3
	5V@6A		30W	50mVp-p	81%	eCS30-5
	12V@2.5A		30W	120mVp-p	86%	eCS30-12
	15V@2A		30W	150mVp-p	87%	eCS30-15
	24V@1.25A		30W	240mVp-p	88%	eCS30-24
	5V@3A	5V@3A	30W	50/50mVp-p	76.3%	eCD30-55
	5V@3A	12V@1.2A	29.4W	50/120mVp-p	79.3%	eCD30-52
	5V@3A	15V@1A	30W	50/150mVp-p	79.6%	eCD30-5F
	5V@3A	24V@0.6A	29.4W	50/240mVp-p	80.4%	eCD30-54
	+12V@1.2A,	+12V@1.2A	28.8W	120/120mVp-p	82.6%	eCD30-1212
	+15V@1A,	+15V@1A	30W	150/150mVp-p	83.0%	eCD30-1515

Model number structure



HEAD OFFICE & FACTORY

#1401, 14F/L 6th Daeryung TechnoTown 493-6, Gasan-Dong, Kumchon-Gu, Seoul, 153-803, Korea

TEL: +82 2 855 4955 | FAX: +82 2 855 4954

GENERAL SALES INQUIRIES

Please feel free to contact : sales@powerplaza.co.kr