



# EC4A SERIES

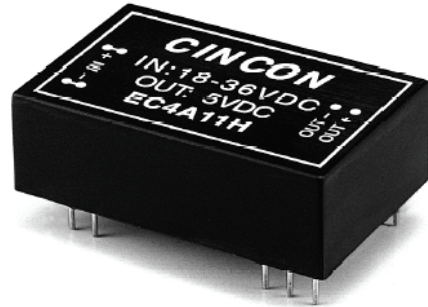
## 5-6 WATT 2:1 INPUT RANGE

### DC-DC CONVERTERS



## FEATURES

- \* 5-6W Isolated Output
- \* 24-Pin DIP Package
- \* Efficiency to 87%
- \* 2:1 Input Range
- \* Regulated Outputs
- \* Pi Input Filter
- \* Continuous Short Circuit Protection
- \* Meet EMI EN55022 class A (“-E” model)
- \* No Tantalum Capacitor inside (“-E” model)
- \* Wide Operating Temperature Range (“-E” model)
- \* UL60950-1 Approval for H/HM Versions only and “-E” Model



MODEL NUMBER <sup>(1)</sup>	INPUT VOLTAGE <sup>(2)</sup>	OUTPUT VOLTAGE	OUTPUT CURRENT		INPUT CURRENT				% EFF. <sup>(3)</sup>		CAPACITOR LOAD MAX.
					NO LOAD		FULL LOAD				
						“-E”		“-E”		“-E”	
EC4A01	9-18 VDC	5 VDC	1000 mA	1000 mA	7.5 mA	7.5 mA	541 mA	514 mA	77	81	4700uF
EC4A02	9-18 VDC	12 VDC	470 mA	500 mA	7.5 mA	10 mA	573 mA	595 mA	82	84	4700uF
EC4A03	9-18 VDC	15 VDC	400 mA	400 mA	7.5 mA	15 mA	625 mA	588 mA	80	85	4700uF
EC4A04	9-18 VDC	±12 VDC	±230 mA	±250 mA	12 mA	12 mA	554 mA	588 mA	83	85	2200uF
EC4A05	9-18 VDC	±15 VDC	±190 mA	±200 mA	12 mA	18 mA	556 mA	588 mA	81	85	2200uF
EC4A06	9-18 VDC	±5 VDC	±500 mA	±500 mA	12 mA	12 mA	541 mA	514 mA	77	81	2200uF
EC4A07	9-18 VDC	3.3 VDC	1000 mA	1200 mA	7.5 mA	7.5 mA	382 mA	429 mA	72	77	4700uF
EC4A11	18-36 VDC	5 VDC	1000 mA	1000 mA	5 mA	5 mA	260 mA	251 mA	80	83	4700uF
EC4A12	18-36 VDC	12 VDC	470 mA	500 mA	5 mA	8 mA	280 mA	291 mA	84	86	4700uF
EC4A13	18-36 VDC	15 VDC	400 mA	400 mA	5 mA	8 mA	298 mA	287 mA	84	87	4700uF
EC4A14	18-36 VDC	±12 VDC	±230 mA	±250 mA	7.5 mA	8 mA	280 mA	291 mA	82	86	2200uF
EC4A15	18-36 VDC	±15 VDC	±190 mA	±200 mA	7.5 mA	10 mA	293 mA	287 mA	81	87	2200uF
EC4A16	18-36 VDC	±5 VDC	±500 mA	±500 mA	7.5 mA	8 mA	260 mA	254 mA	80	82	2200uF
EC4A17	18-36 VDC	3.3 VDC	1000 mA	1200 mA	5 mA	5 mA	186 mA	209 mA	74	79	4700uF
EC4A21	36-72 VDC	5 VDC	1000 mA	1000 mA	2 mA	3 mA	132 mA	126 mA	79	83	4700uF
EC4A22	36-72 VDC	12 VDC	470 mA	500 mA	2 mA	6 mA	142 mA	144 mA	83	87	4700uF
EC4A23	36-72 VDC	15 VDC	400 mA	400 mA	2 mA	6 mA	154 mA	144 mA	81	87	4700uF
EC4A24	36-72 VDC	±12 VDC	±230 mA	±250 mA	3 mA	6 mA	142 mA	144 mA	81	87	2200uF
EC4A25	36-72 VDC	±15 VDC	±190 mA	±200 mA	3 mA	6 mA	147 mA	144 mA	81	87	2200uF
EC4A26	36-72 VDC	±5 VDC	±500 mA	±500 mA	3 mA	5 mA	130 mA	126 mA	80	83	2200uF
EC4A27	36-72 VDC	3.3 VDC	1000 mA	1200 mA	2 mA	2 mA	93 mA	104 mA	74	79	4700uF

### NOTE:

1. Suffix “-E” of the models are high efficiency and wide operating temperature version.
2. Nominal Input Voltage is 12, 24 or 48 VDC.
3. Typical value at nominal input voltage and full load.

# SPECIFICATIONS

All Specifications Typical At Nominal Line, Full Load, and 25°C Unless Otherwise Noted

## INPUT SPECIFICATIONS:

Input Voltage Range .....	12V .....	9-18V
	24V .....	18-36V
	48V .....	36-72V
Input Surge Voltage (100ms max.) .....	12V .....	25Vdc max.
	24V .....	50Vdc max.
	48V .....	100Vdc max.
Input Filter .....	Pi Type	

## OUTPUT SPECIFICATIONS:

Voltage Accuracy .....	±2.0% max.	
Voltage Balance (Dual) .....	±1.0% max.	
Temperature Coefficient .....	±0.05%/°C	
Ripple & Noise, 20MHz BW (Note 5) .....	3.3V/5V .....	100mV p-p, max
	12V/15V .....	1% p-p max.
Short Circuit Protection .....	Continuous	
Line Regulation .....	Single/Dual (Note 1) .....	±0.5% max.
Load Regulation .....	Single (Note 2) .....	±0.5% max.
	Dual (Note 3) .....	±1.0% max.
Start up time .....	5 ms max.	

## NOTE:

1. Measured From High Line to Low Line
2. Measured From Full Load to 10% Load
3. Measured From Full Load to 1/4 Load
4. Maximum case temperature under any operating condition should not exceed 95°C (Plastic Case), 100°C (Copper Case)
5. The output noise is measured with 0.1µF MLCC across for SMD package
6. S and HS models for "E" Version Only

## GENERAL SPECIFICATIONS:

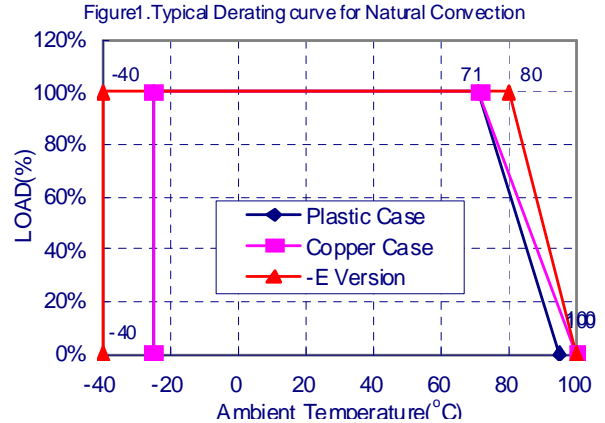
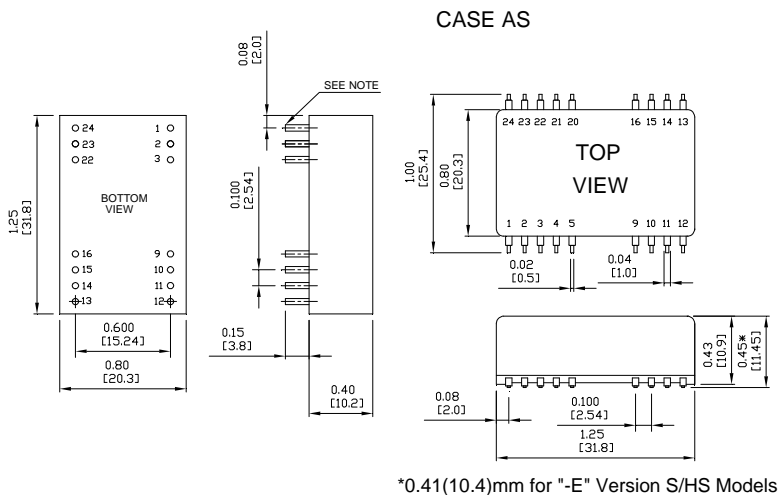
Efficiency .....	See Table	
Isolation Voltage:		
500 VDC min. ....	Standard Models	
3K VDC min. ... (Non-Conductive Black Plastic Only) .....	Suffix "H" Models	
1.5K VDC min. ....	Suffix "HM" Models	
Isolation Resistance .....	10 <sup>9</sup> ohm min.	
Isolation Capacitance.....	250pF Typ.	
Switching Frequency .....	100KHz, min.	
Operating Ambient Temperature Range .....	-25°C to +71°C	
	"-E" models: -40°C to +85°C with Derating	
Power de-rating Curve .....	see Figure1	
Case Temperature (Note 4) ... Plastic/Copper case... ..	95°C/100°C max.	
Cooling .....	Natural Convection	
Storage Temperature Range .....	-40°C to +100°C	
Humidity .....	95% RH max. Non condensing	
MTBF .....	MIL-STD-217F .....	
	2000Khrs typ.	
	"-E" models: 1800Khrs typ.	
Dimensions .....	DIP.....	1.25×0.80×0.40 inches(31.8×20.3×10.2mm)
	SMD .....	1.25×0.80×0.45 inches(31.8×20.3×11.4mm)
	S/HS Models (note 6) ...	1.25×0.80×0.41 inches(31.8×20.3×10.4mm)

## Case Material:

Standard Models .....	Non-Conductive Black Plastic
Suffix "M" Models ..	Black Coated Copper with Non-conductive Base
Suffix "S" Models .....	SMD package
Weight .....	12.5g

## Case A Dimensions:

NOTE: Pin Size is 0.02 ±0.002Inch (0.5±0.05mm)DIA  
 All Dimensions In Inches (mm)  
 Tolerances Inches: X.XX= ±0.02 , X.XXX= ±0.010  
 Millimeters: X.X= ±0.5 , X.XX=±0.25



Pin	PIN CONNECTION								
	500 VDC				1.5K & 3K VDC				
	Single Output		Dual Output		Pin	Single Output		Dual Output	
DIP	SMD	DIP	SMD	DIP		SMD	DIP	SMD	
1,24	+V Input		+V Input		1,24	NP	NC	NP	NC
2,23	NC		-V Output		2,3	-V Input		-V Input	
3,22	NC		Common		4,5	NP	NC	NP	NC
4	NP	NC	NP	NC	9	NC		Common	
5	NP	NC	NP	NC	10,15	NC		NC	
9	NP	NC	NP	NC	11	NC		-V Output	
10,15	-V Output		Common		12,13	NP	NC	NP	NC
11,14	+V Output		+V Output		14	+V Output		+V Output	
12,13	-V Input		-V Input		16	-V Output		Common	
16	NP	NC	NP	NC	20,21	NP	NC	NP	NC
20,21	NP	NC	NP	NC	22,23	+V Input		+V Input	

\* NP-NO PIN  
 \* NC-NO CONNECTION WITH PIN

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