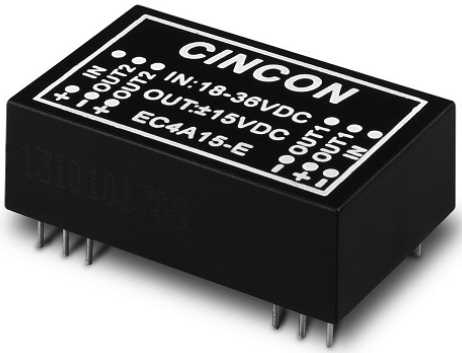
EC4A-E SERIES

5-6 WATT 2:1 INPUT RANGE DC-DC CONVERTERS

E176177

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
* No Tantalum Capacitor inside
* Wide Operating Temperature Range
* UL60950-1 Approval



MODEL NUMBER(1)	INPUT VOLTAGE(2)	OUTPUT VOLTAGE	OUTPUT CURRENT	INPUT CURRENT		% EFF.(3)	CAPACITOR LOAD MAX.
				NO LOAD	FULL LOAD		
EC4A01□-E	9-18 VDC	5 VDC	1000 mA	7.5 mA	514 mA	81	4700uF
EC4A02□-E	9-18 VDC	12 VDC	500 mA	10 mA	595 mA	84	4700uF
EC4A03□-E	9-18 VDC	15 VDC	400 mA	15 mA	588 mA	85	4700uF
EC4A04□-E	9-18 VDC	±12 VDC	±250 mA	12 mA	588 mA	85	2200uF
EC4A05□-E	9-18 VDC	±15 VDC	±200 mA	18 mA	588 mA	85	2200uF
EC4A06□-E	9-18 VDC	±5 VDC	±500 mA	12 mA	514 mA	81	2200uF
EC4A07□-E	9-18 VDC	3.3 VDC	1200 mA	7.5 mA	429 mA	77	4700uF
EC4A11□-E	18-36 VDC	5 VDC	1000 mA	5 mA	251 mA	83	4700uF
EC4A12□-E	18-36 VDC	12 VDC	500 mA	8 mA	291 mA	86	4700uF
EC4A13□-E	18-36 VDC	15 VDC	400 mA	8 mA	287 mA	87	4700uF
EC4A14□-E	18-36 VDC	±12 VDC	±250 mA	8 mA	291 mA	86	2200uF
EC4A15□-E	18-36 VDC	±15 VDC	±200 mA	10 mA	287 mA	87	2200uF
EC4A16□-E	18-36 VDC	±5 VDC	±500 mA	8 mA	254 mA	82	2200uF
EC4A17□-E	18-36 VDC	3.3 VDC	1200 mA	5 mA	209 mA	79	4700uF
EC4A21□-E	36-72 VDC	5 VDC	1000 mA	3 mA	126 mA	83	4700uF
EC4A22□-E	36-72 VDC	12 VDC	500 mA	6 mA	144 mA	87	4700uF
EC4A23□-E	36-72 VDC	15 VDC	400 mA	6 mA	144 mA	87	4700uF
EC4A24□-E	36-72 VDC	±12 VDC	±250 mA	6 mA	144 mA	87	2200uF
EC4A25□-E	36-72 VDC	±15 VDC	±200 mA	6 mA	144 mA	87	2200uF
EC4A26□-E	36-72 VDC	±5 VDC	±500 mA	5 mA	126 mA	83	2200uF
EC4A27□-E	36-72 VDC	3.3 VDC	1200 mA	2 mA	104 mA	79	4700uF

NOTE:

1. □ can be none, M, H, HM, S, MS, HS or HMS.
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℃ 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.
Under Voltage Lockout ..... 12V Power Up 8.8Vdc
12V Power Down 8Vdc
24V Power Up 17Vdc
24V Power Down 16Vdc
48V Power Up 34Vdc
48V Power Down 31Vdc

OUTPUT SPECIFICATIONS:

Voltage Accuracy ..... ±1.5% max.
Voltage Balance (Dual) ..... ±1.0% max.
Temperature Coefficient ..... ±0.05%/℃
Ripple & Noise, 20MHz BW (note 5) ..... 3.3V/5V ..... 100mV pk-pk, max
12V/15V ..... 1% pk-pk max.
Short Circuit Protection ..... Continuous
Line Regulation ..... Single/Dual (note1) ..... ±0.5% max.
Load Regulation ..... Single (note2) ..... ±0.5% max.
Dual (note3) ..... ±1.0% max.
Start up time ..... 5 ms max.

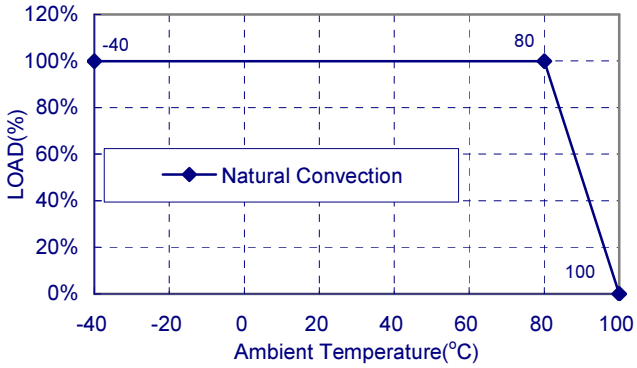
NOTE:

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 100℃.
5. The output noise is measured with 0.1uF MLCC across for SMD package.

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 ..... 10^9 ohm min.
Isolation Capacitance ..... 250pF typ.
Switching Frequency ..... 100KHz min.
Operating Ambient Temperature Range ..... -40℃ to +85℃
De-rating, Above 80℃ ..... Linearly to Zero Power at 100℃
Case Temperature ..... 100℃ max.
Cooling ..... Natural Convection
Storage Temperature Range ..... -40℃ to +100℃
EMI ..... Conductive emi Meet EN55022 Class A
Humidity ..... 95% RH max. Non condensing
MTBF ..... MIL-STD-217F .....1800Khrs typ.
Dimensions ..... DIP ..... 1.25×0.80x0.40 inches(31.8x20.3×10.2 mm)
MS/HMS Models ... 1.25×0.80x0.45 inches(31.8x20.3×11.4 mm)
S/HS Models ..... 1.25×0.80x0.41 inches(31.8x20.3×10.4 mm)
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

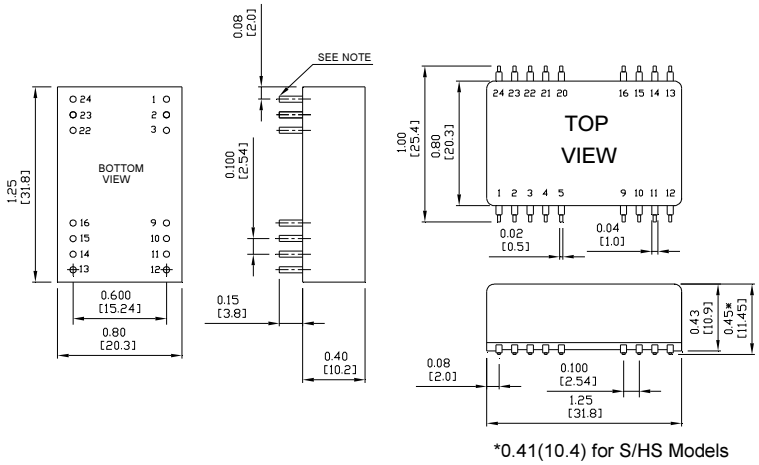
Figure1.Typical Derating curve for Natural Convection



Case A Dimensions:

NOTE:Pin Size is 0.02 ±0.002 Inch (0.5±0.05 mm)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

CASE AS



*0.41(10.4) for S/HS Models

PIN CONNECTION									
	500 VDC					1.5K & 3K VDC			
Pin	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