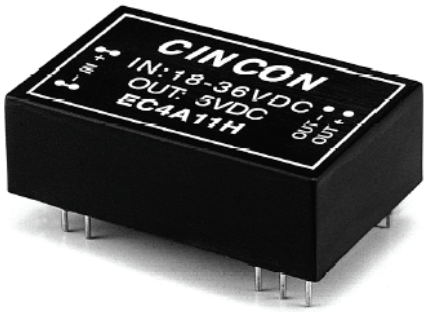
EC4A SERIES

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 (“-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[1]	INPUT VOLTAGE[2]	OUTPUT VOLTAGE	OUTPUT CURRENT		INPUT CURRENT				% EFF.[3]		CAPACITOR LOAD MAX.
					NO LOAD		FULL LOAD				
				“-E”		“-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℃ 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%/℃
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.

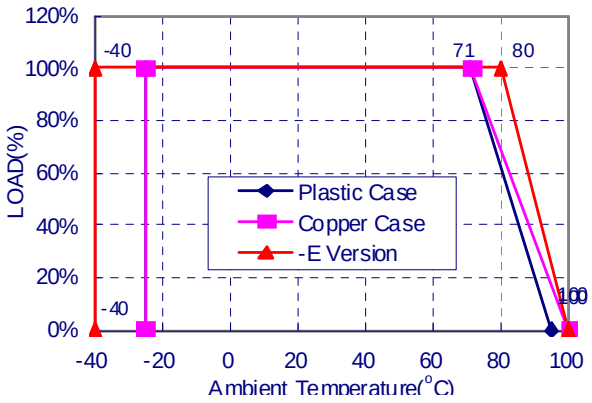
NOTE:

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℃(Plastic Case),100℃(Copper Case)
5. The output noise is measured with 0.1uF 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 ..... 10^9 ohm min.
Isolation Capacitance..... 250pF Typ.
Switching Frequency ..... 100KHz, min.
Operating Ambient Temperature Range ..... -25℃ to +71℃
“-E” models: -40℃ to +85℃ with Derating
Power de-rating Curve ..... see Figure1
Case Temperature (Note 4) ... Plastic/Copper case... 95℃/100℃ max.
Cooling ..... Natural Convection
Storage Temperature Range ..... -40℃ to +100℃
Humidity ..... 95% RH max. Non condensing
MTBF ..... MIL-STD-217F ..... 2000Khrs typ.
“-E” models: 1800Khrs typ.
Dimensions ..... DIP..... 1.25×0.80x0.40 inches(31.8x20.3×10.2mm)
SMD ..... 1.25×0.80x0.45 inches(31.8x20.3×11.4mm)
S/HS Models (note 6) ... 1.25×0.80x0.41 inches(31.8x20.3×10.4mm)
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

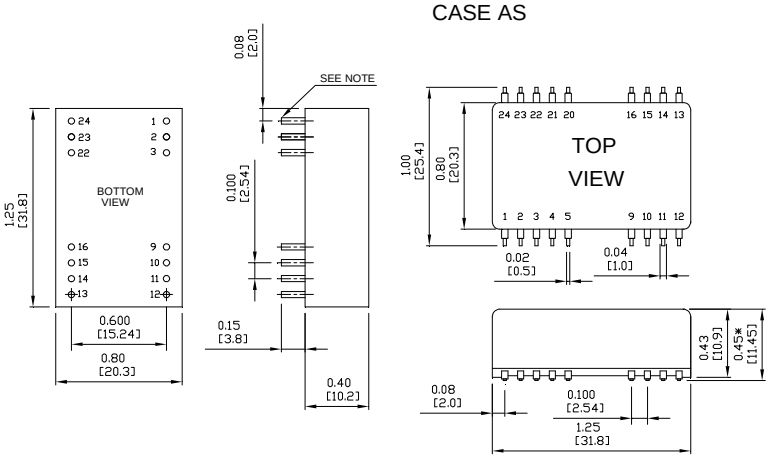
Figure1.Typical Derating curve for Natural Convection



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

CASE AS



*0.41(10.4)mm for "-E" Version 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

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EC4A02H EC4A26H EC4A05H EC4A01 EC4A02 EC4A03 EC4A04 EC4A05 EC4A06 EC4A07 EC4A11 EC4A12 EC4A13 EC4A14 EC4A15 EC4A16 EC4A17 EC4A21 EC4A22 EC4A23 EC4A24 EC4A25 EC4A26 EC4A27 EC4A03HM EC4A05HM EC4A02M EC4A25M EC4A22HM EC4A17M EC4A24HM EC4A15M EC4A02HM EC4A17HM EC4A03M EC4A16HM EC4A27HM EC4A27M EC4A13HM EC4A06HM EC4A04M EC4A14M EC4A22M EC4A16M EC4A14HMS EC4A03MS EC4A02MS EC4A25MS EC4A14MS EC4A22MS EC4A17MS EC4A16MS EC4A11MS EC4A05MS EC4A15MS EC4A07MS EC4A27MS EC4A24MS EC4A12MS EC4A26MS EC4A21MS EC4A01MS EC4A04MS EC4A13MS EC4A23MS EC4A06MS EC4A01H-E EC4A02H-E EC4A04H-E EC4A06H-E EC4A07H-E EC4A11H-E EC4A12H-E EC4A14H-E EC4A16H-E EC4A17H-E EC4A21H-E EC4A22H-E EC4A24H-E EC4A26H-E EC4A27H-E EC4A01H EC4A03H EC4A07H EC4A11H EC4A12H EC4A13H EC4A17H EC4A21H EC4A22H EC4A23H EC4A27H EC4A04H EC4A06H EC4A14H EC4A15H EC4A16H EC4A24H EC4A25H EC4A21HM