



# EC3A SERIES

## 3 WATT 2:1 INPUT RANGE

### DC-DC CONVERTERS

**RU**  
E176177 H/HM Versions Only

## FEATURES

- \* 3W 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)



MODEL NUMBER <sup>(1)</sup>	INPUT VOLTAGE <sup>(2)</sup>		OUTPUT VOLTAGE	OUTPUT CURRENT	INPUT CURRENT				% EFF. <sup>(3)</sup>		Cap. Load
		“-E”			NO LOAD		FULL LOAD			“-E”	
						“-E”		“-E”			
EC3A01	4.5-6 VDC	4.5-9 VDC	5 VDC	600 mA	15 mA	15 mA	800 mA	779 mA	75	77	2200uF
EC3A02	4.5-6 VDC	4.5-9 VDC	12 VDC	250 mA	15 mA	15 mA	759 mA	750 mA	79	80	2200uF
EC3A03	4.5-6 VDC	4.5-9 VDC	15 VDC	200 mA	15 mA	15 mA	779 mA	750 mA	77	80	2200uF
EC3A04	4.5-6 VDC	4.5-9 VDC	±5 VDC	±300 mA	25 mA	25 mA	779 mA	779 mA	77	77	1000uF
EC3A05	4.5-6 VDC	4.5-9 VDC	±12 VDC	±125 mA	25 mA	25 mA	789 mA	750 mA	76	80	1000uF
EC3A06	4.5-6 VDC	4.5-9 VDC	±15 VDC	±100 mA	25 mA	25 mA	800 mA	750 mA	75	80	1000uF
EC3A07	4.5-6 VDC	4.5-9 VDC	3.3 VDC	600 mA	15 mA	15 mA	582 mA	550 mA	68	72	2200uF
EC3A11	9-18 VDC		5 VDC	600 mA	7.5 mA	7.5 mA	325 mA	309 mA	77	81	2200uF
EC3A12	9-18 VDC		12 VDC	250 mA	7.5 mA	10 mA	313 mA	298 mA	80	84	2200uF
EC3A13	9-18 VDC		15 VDC	200 mA	7.5 mA	10 mA	316 mA	294 mA	79	85	2200uF
EC3A14	9-18 VDC		±5 VDC	±300 mA	12 mA	15 mA	325 mA	305 mA	77	82	1000uF
EC3A15	9-18 VDC		±12 VDC	±125 mA	12 mA	12 mA	325 mA	298 mA	77	84	1000uF
EC3A16	9-18 VDC		±15 VDC	±100 mA	12 mA	15 mA	316 mA	294 mA	79	85	1000uF
EC3A17	9-18 VDC		3.3 VDC	600 mA	7.5 mA	7.5 mA	229 mA	212 mA	72	78	2200uF
EC3A21	18-36 VDC		5 VDC	600 mA	5 mA	7.5 mA	158 mA	152 mA	79	82	2200uF
EC3A22	18-36 VDC		12 VDC	250 mA	5 mA	7.5 mA	156 mA	145 mA	80	86	2200uF
EC3A23	18-36 VDC		15 VDC	200 mA	5 mA	7.5 mA	152 mA	145 mA	82	86	2200uF
EC3A24	18-36 VDC		±5 VDC	±300 mA	7.5 mA	7.5 mA	162 mA	152 mA	77	82	1000uF
EC3A25	18-36 VDC		±12 VDC	±125 mA	7.5 mA	10 mA	158 mA	147 mA	79	85	1000uF
EC3A26	18-36 VDC		±15 VDC	±100 mA	7.5 mA	10 mA	154 mA	145 mA	81	86	1000uF
EC3A27	18-36 VDC		3.3 VDC	600 mA	5 mA	5 mA	111 mA	106 mA	74	78	2200uF
EC3A31	36-72 VDC		5 VDC	600 mA	2 mA	3 mA	78 mA	74 mA	79	84	2200uF
EC3A32	36-72 VDC		12 VDC	250 mA	2 mA	3 mA	78 mA	73 mA	80	86	2200uF
EC3A33	36-72 VDC		15 VDC	200 mA	2 mA	5 mA	78 mA	73 mA	80	86	2200uF
EC3A34	36-72 VDC		±5 VDC	±300 mA	3 mA	5 mA	80 mA	74 mA	78	85	1000uF
EC3A35	36-72 VDC		±12 VDC	±125 mA	3 mA	5 mA	80 mA	72 mA	78	87	1000uF
EC3A36	36-72 VDC		±15 VDC	±100 mA	3 mA	5 mA	80 mA	72 mA	78	87	1000uF
EC3A37	36-72 VDC		3.3 VDC	600 mA	3 mA	3 mA	57 mA	52 mA	72	79	2200uF

### NOTE:

1. Suffix “-E” of the models are high efficiency and wide operating temperature version.
2. Nominal Input Voltage is 5, 12, 24 or 48VDC.
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	5V	4.5-6V, 4.5-9V
	12V	9-18V
	24V	18-36V
	48V	36-72V
Input Surge Voltage (100ms max.)	5V	10Vdc max.
	12V	25Vdc max.
	24V	50Vdc max.
	48V	100Vdc max.
Input Filter	Pi Type	

## OUTPUT SPECIFICATIONS:

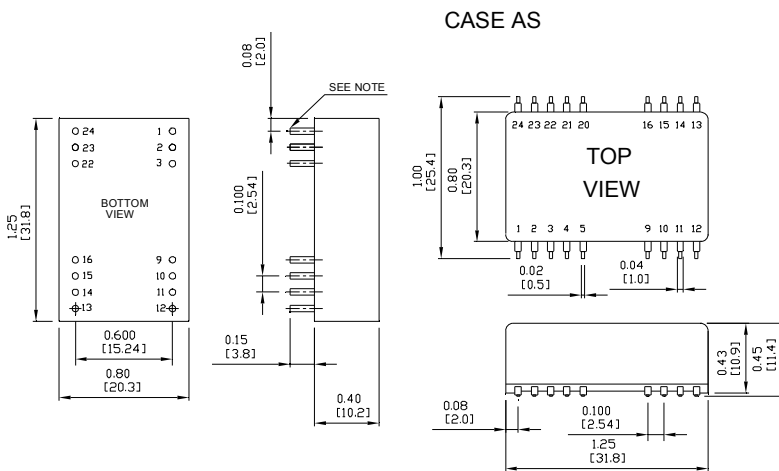
Voltage Accuracy	±2.0% max.
Voltage Balance (Dual)	±1.0% max.
Temperature Coefficient	±0.05%/°C
Ripple & Noise, 20MHz BW (Note 5)	3.3V/5V 100mV p-p, max
	12V/15V 1% p-p max.
Short Circuit Protection	Continuous
Line Regulation	Single/Dual (Note 1) ±0.5% max.
Load Regulation	Single (Note 2) ±0.5% max.
	Dual (Note 3) ±1.0% max.
Start up time	10 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 0.1uF MLCC across for SMD package

## 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



## 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

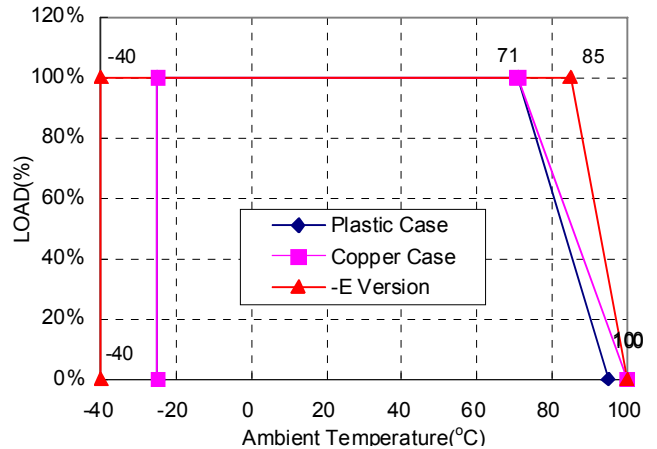
"-E" models: -40°C to +85°C

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 T.B.D. hrs
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)

### 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



PIN CONNECTION									
Pin	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