

DC/DC Ultra Wide Input Converter ECU 03 Series



- * I/O isolation of 500Vdc (suffix -M or blank)
1500Vdc (suffix -H) or 3000Vdc (suffix -V)
- * 4:1 input voltage range
- * Continuous short circuit proof
- * No derating up to 71°C
- * Low output ripple and noise
- * Metal case with non conductive base plate,
six sides shielded or non conductive plastic case
- * Safety Meets IEC/EN/UL 62368-1
- * SMD mounting available

Product Range

Model	Input nominal	Input range	I _{in} @ U _{in} nom.		U _{out}	Output I _{out} max.	Output power	Efficiency typ.	Max. capacity
			full load	no load					
Single									
ECU24-0303S(x)	24Vdc	9...36Vdc	117 mA	15 mA	3.3 Vdc	600 mA	2 W	70%	
ECU24-0503S(x)	24Vdc	9...36Vdc	174 mA	15 mA	5.0 Vdc	600 mA	3 W	72%	
ECU24-1203S(x)	24Vdc	9...36Vdc	165 mA	15 mA	12.0 Vdc	250 mA	3 W	76%	
ECU24-1503S(x)	24Vdc	9...36Vdc	165 mA	15 mA	15.0 Vdc	200 mA	3 W	76%	
ECU48-0303S(x)	48Vdc	18...72Vdc	58 mA	7.5 mA	3.3 Vdc	600 mA	2 W	70%	
ECU48-0503S(x)	48Vdc	18...72Vdc	87 mA	7.5 mA	5.0 Vdc	600 mA	3 W	72%	
ECU48-1203S(x)	48Vdc	18...72Vdc	81 mA	7.5 mA	12.0 Vdc	250 mA	3 W	77%	
ECU48-1503S(x)	48Vdc	18...72Vdc	81 mA	7.5 mA	15.0 Vdc	200 mA	3 W	77%	

Dual

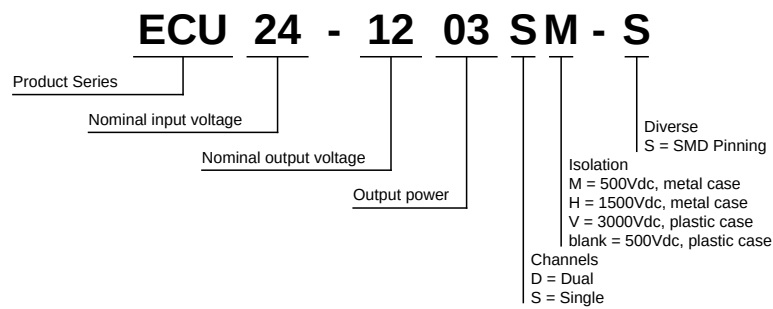
ECU24-0503D(x)	24Vdc	9...36Vdc	179 mA	25 mA	+ 5.0 Vdc - 5.0 Vdc	+ 300 mA - 300 mA	1.5 W 1.5 W	70%
ECU24-1203D(x)	24Vdc	9...36Vdc	174 mA	25 mA	+ 12.0 Vdc - 12.0 Vdc	+ 125 mA - 125 mA	1.5 W 1.5 W	72%
ECU24-1503D(x)	24Vdc	9...36Vdc	174 mA	25 mA	+ 15.0 Vdc - 15.0 Vdc	+ 100 mA - 100 mA	1.5 W 1.5 W	72%
ECU48-0503D(x)	48Vdc	18...72Vdc	88 mA	12 mA	+ 5.0 Vdc - 5.0 Vdc	+ 300 mA - 300 mA	1.5 W 1.5 W	71%
ECU48-1203D(x)	48Vdc	18...72Vdc	87 mA	12 mA	+ 12.0 Vdc - 12.0 Vdc	+ 125 mA - 125 mA	1.5 W 1.5 W	72%
ECU48-1503D(x)	48Vdc	18...72Vdc	87 mA	12 mA	+ 15.0 Vdc - 15.0 Vdc	+ 100 mA - 100 mA	1.5 W 1.5 W	72%

Notes:

(x) can be H, V or blank

Efficiency measured at nominal input voltage

Nomenclature



Specifications

All values refer to an ambient temperature of 25°C and nominal rated values where nothing else is specified.

Input Specifications

Characteristic	Conditions	min	typ	max	unit
U_{IN} Input voltage		See	product	range	Vdc
U_{UVLO} Under voltage lockout					Vdc
Max. input current at full load		See	product	range	A
No load input current		See	product	range	mA
Inrush current					A ² s
Input surge voltage					Vdc

Output Specifications

Characteristic	Conditions	min	typ	max	unit
U_{ACC} Output voltage accuracy			±2		%
Output voltage adjust					%
Line regulation	Single / Dual			±0.5	%
Load regulation	Single / Dual				%
Cross regulation					%
Load transient recovery time					µs
Load transient error band					%
Temperature coefficient			±0.05		%/K

	Ramp up time			ms
	Start up time			ms
	Ripple and noise	BW = 20MHz	single&±5V: 100, dual: 1%	mVpp
	Current limit			% Inom
	Over voltage protection			% Unom
	Short circuit protection			% Inom
	Short circuit characteristic		continuous	

General Specifications

Characteristic		Conditions	min	typ	max	unit
U _{ISO}	Isolation voltage	in/out, in/case, out/case	500, 1500 or 3000			Vdc
R _{ISO}	Isolation resistance		> 1G			Ohm
C _{ISO}	Isolation capacity					pF
F _{SW}	Switching frequency		typ. 100			kHz
	Approvals					
	Safety Approvals					
	MTBF					h
	Case material		Black Coated Copper or Plastic			
	Compound material		UL 94V-0			
	PCB material		UL 94V-0			
	Weight		12.5			gr
	Dimensions		31.8 x 20.3 x 10.2			mm
	Soldering infos		275°C for 10			s

EMC Specifications

Characteristic		Conditions	
	EMC conducted	See EMC information	EN55022/11 Class A

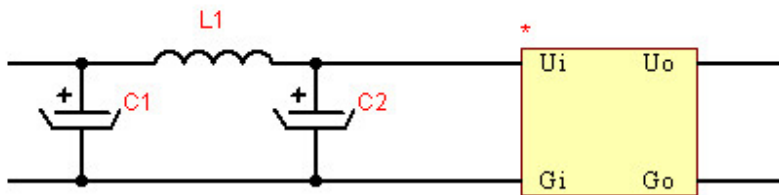
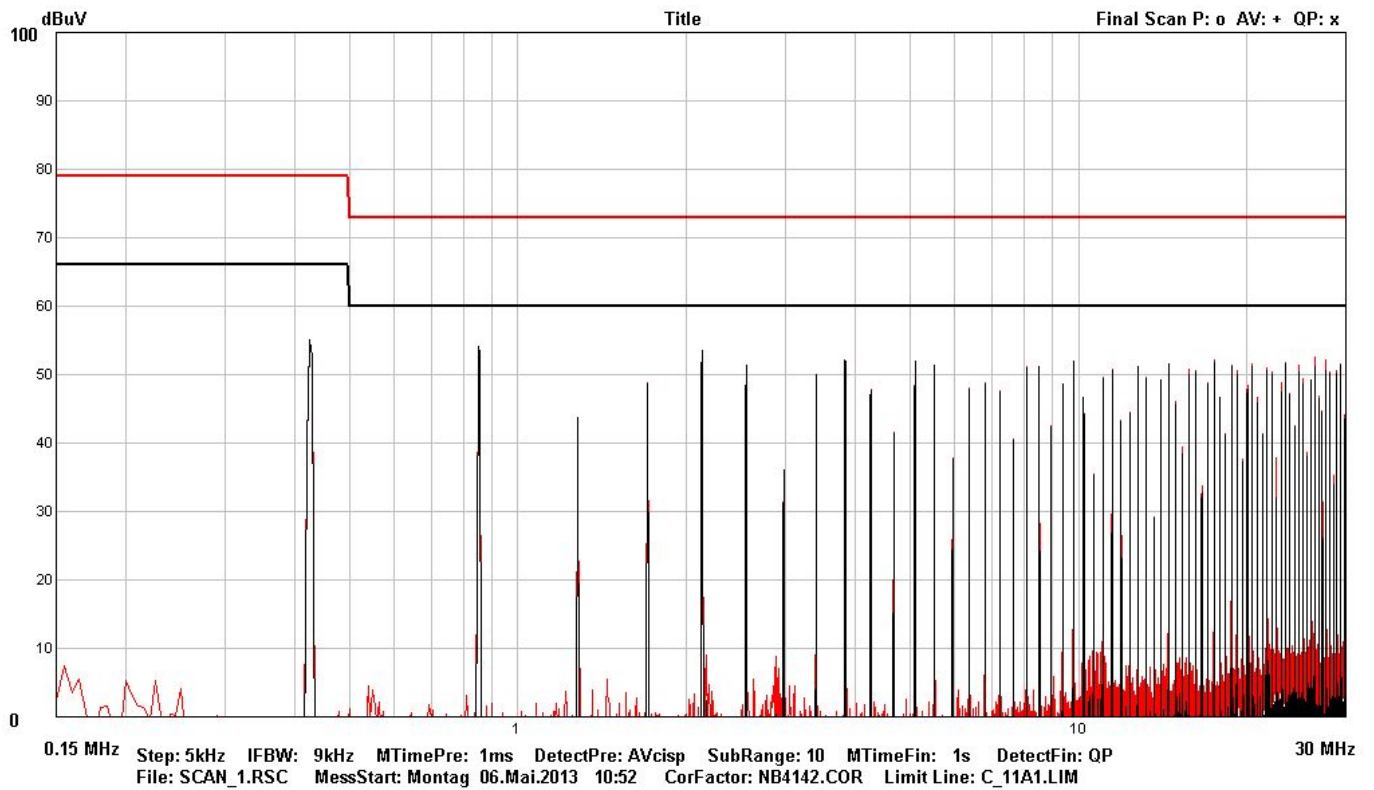
Environmental Specifications

Characteristic		Conditions	min	typ	max	unit
T _{AMB}	Operation temperature	See derating diagram	-25...+71			°C
T _{AMB}	Storage temperature		-40...+100			°C
T _{SD}	Thermal shutdown range		None			°C

Own notes

EMC information

EMC emissions conducted, EN55022/11 Class A, Example: ECU24-0503SM

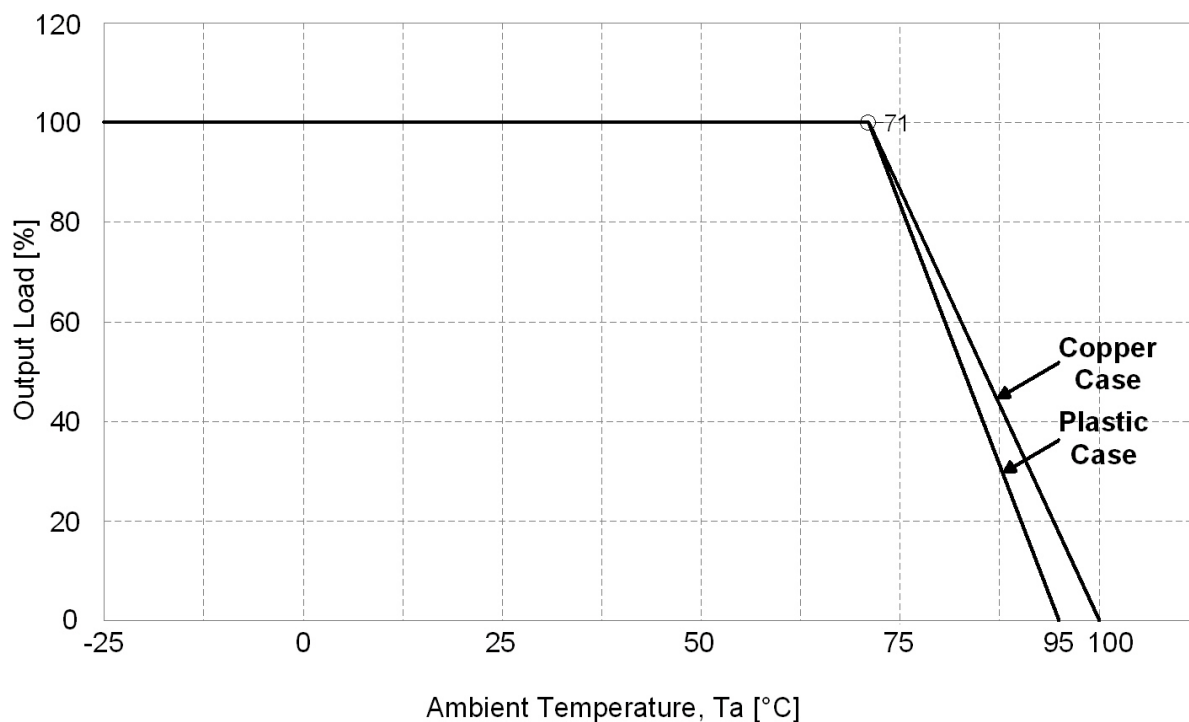


This was achieved with the following filter:
C1 10uF/50V B45197
C2 10uF/50V B45197
L1 10uH / 1.2A Coilcraft DS1608C-103

Own notes

Derating

The operating case temperature range of ECU 03 series is -25...+71°C. When operating the ECU 03 series, proper derating or cooling is needed. The following curves are the derating curves of ECU 03. Please note that these are relative values in a test environment. Ambient temperature can not be exactly defined in an application, only the case temperature. Please ask the factory for a suitable heat sink.



Own notes

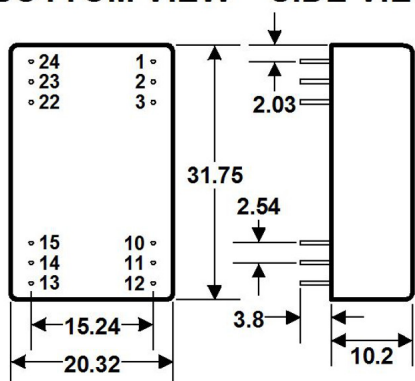
Case

Normal tolerance 1/10 ± 0.5 mm, 1/100 ± 0.25 mm; Pin tolerance ± 0.05 mm diameter

NP = No pin, NC = Not connected, NA = Not available for electrical contact, do not connect, (opt) = optional

500V: A1/A2 10.2mm

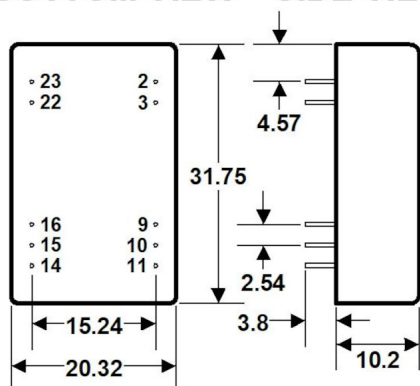
BOTTOM VIEW SIDE VIEW



Pin	Single	Dual	Pin
1	+Vi	+Vi	1
2	NC	-Vo	2
3	NC	Go	3
10	Go	Go	10
11	+Vo	+Vo	11
12	Gi	Gi	12
13	Gi	Gi	13
14	+Vo	+Vo	14
15	Go	Go	15
22	NC	Go	22
23	NC	-Vo	23
24	+Vi	+Vi	24

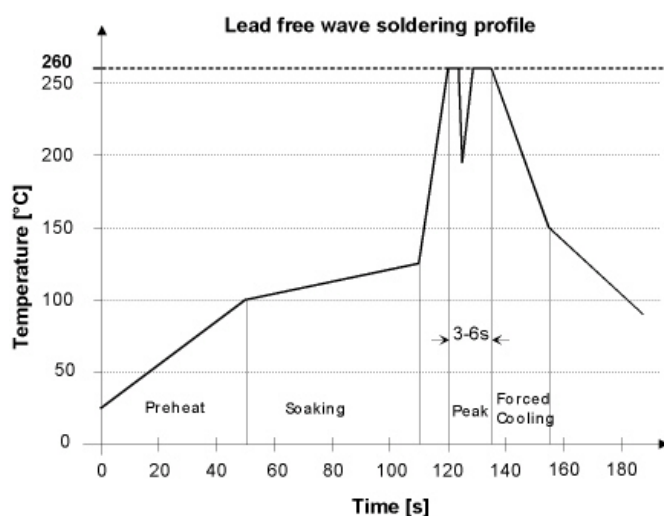
1k5, 3kV: A4 / A5 10.2mm

BOTTOM VIEW SIDE VIEW



Pin	Single	Dual	Pin
2	Gi	Gi	2
3	Gi	Gi	3
9	NC	Go	9
10	NC	NC	10
11	NC	-Vo	11
14	+Vo	+Vo	14
15	NC	NC	15
16	Go	Go	16
22	+Vi	+Vi	22
23	+Vi	+Vi	23

Soldering



1. Soldering Materials: Sn/Cu/Ni
2. Preheat: 1.4 °C/s (From 30°C to 100°C)
3. Soaking: 0.5 °C/s (From 100°C to 130°C), 60 $\pm$ 20s
4. Peak temperature: 260°C, above 250°C 3~6s
5. Forced cooling: -10.0 °C/s (From 260°C to 150°C)

Cleaning

The modules are cleanable with the today's known and in the electronics industry usually used products. Due to the different cleaning processes and new available products, we highly recommend to do a compatibility test when using the converters the first time.

Own notes

Notice: All statements, technical information, and recommendations related to FABRIMEX's products are based on information believed to be reliable, but the accuracy or completeness thereof is not guaranteed. Before utilizing the product, the user should determine the suitability of the product for its intended use.

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The logo for EXISTA, featuring the word "EXISTA" in a bold, sans-serif font. The letters "E", "X", "I", and "S" are dark blue, while the letters "T" and "A" are a lighter, teal blue.