

## DC/DC Wide Input Converter ECW 03 Series



- \* I/O isolation of 500 Vdc (Suffix M)  
1500 Vdc ( Suffix H) or 3000 Vdc (Suffix V)
- \* Pi-filter at input
- \* Continuous short circuit proof
- \* Efficiency up to 82%
- \* 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
- \* SMD mounting available
- \* Inhibit as option

### Product Range

Model	Input		I <sub>in</sub> @ U <sub>in</sub> nom.		U <sub>out</sub>	Output I <sub>out</sub> max.	power	Efficiency typ.	Max. capacity
	nominal	range	full load	no load					
<b>Single</b>									
ECW05-0303S	5VDC	4.5...6VDC	650mA	15mA	3.3VDC	600mA	2W	61%	
ECW05-0503S	5VDC	4.5...6VDC	850mA	15mA	5.0VDC	600mA	3W	70%	
ECW05-1203S	5VDC	4.5...6VDC	800mA	15mA	12VDC	250mA	3W	75%	
ECW05-1503S	5VDC	4.5...6VDC	800mA	15mA	15VDC	200mA	3W	75%	

ECW12-0303S	12VDC	9...18VDC	254mA	7.5mA	3.3VDC	600mA	2W	61%
ECW12-0503S	12VDC	9...18VDC	340mA	7.5mA	5.0VDC	600mA	3W	70%
ECW12-1203S	12VDC	9...18VDC	320mA	7.5mA	12VDC	250mA	3W	75%
ECW12-1503S	12VDC	9...18VDC	320mA	7.5mA	15VDC	200mA	3W	75%
ECW24-0303S	24VDC	18...36VDC	125mA	5mA	3.3VDC	600mA	2W	65%
ECW24-0503S	24VDC	18...36VDC	168mA	5mA	5.0VDC	600mA	3W	73%
ECW24-1203S	24VDC	18...36VDC	156mA	5mA	12VDC	250mA	3W	78%
ECW24-1503S	24VDC	18...36VDC	156mA	5mA	15VDC	200mA	3W	78%
ECW48-0303S	48VDC	36...72VDC	61mA	2mA	3.3VDC	600mA	2W	66%
ECW48-0503S	48VDC	36...72VDC	82mA	2mA	5.0VDC	600mA	3W	74%
ECW48-1203S	48VDC	36...72VDC	78mA	2mA	12VDC	250mA	3W	80%
ECW48-1503S	48VDC	36...72VDC	78mA	2mA	15VDC	200mA	3W	80%

**Dual**

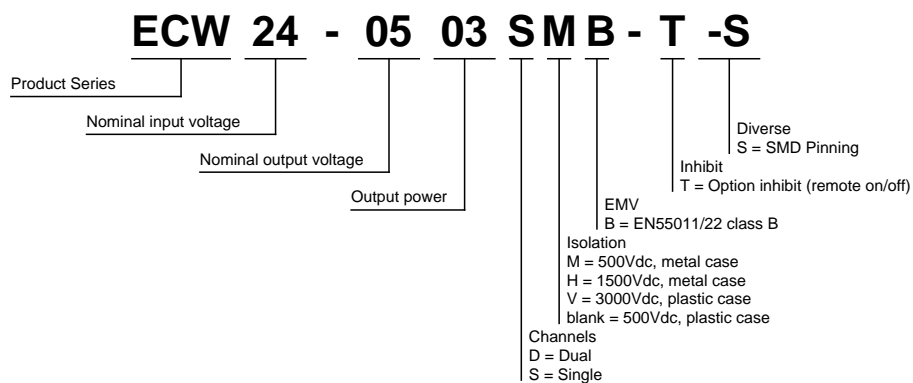
ECW05-0503D	5VDC	4.5...6VDC	850mA	25mA	+5.0VDC -5.0VDC	+300mA -300mA	1.5W 1.5W	70%
ECW05-1203D	5VDC	4.5...6VDC	800mA	25mA	+12VDC -12VDC	+125mA -125mA	1.5W 1.5W	75%
ECW05-1503D	5VDC	4.5...6VDC	800mA	25mA	+15VDC -15VDC	+100mA -100mA	1.5W 1.5W	75%
ECW12-0503D	12VDC	9...18VDC	340mA	12mA	+5.0VDC -5.0VDC	+300mA -300mA	1.5W 1.5W	70%
ECW12-1203D	12VDC	9...18VDC	320mA	12mA	+12VDC -12VDC	+125mA -125mA	1.5W 1.5W	75%
ECW12-1503D	12VDC	9...18VDC	320mA	12mA	+15VDC -15VDC	+100mA -100mA	1.5W 1.5W	75%
ECW24-0503D	24VDC	18...36VDC	168mA	7.5mA	+5.0VDC -5.0VDC	+300mA -300mA	1.5W 1.5W	74%
ECW24-1203D	24VDC	18...36VDC	156mA	7.5mA	+12VDC -12VDC	+125mA -125mA	1.5W 1.5W	80%
ECW24-1503D	24VDC	18...36VDC	156mA	7.5mA	+15VDC -15VDC	+100mA -100mA	1.5W 1.5W	80%
ECW48-0503D	48VDC	36...72VDC	82mA	3mA	+5.0VDC -5.0VDC	+300mA -300mA	1.5W 1.5W	76%
ECW48-1203D	48VDC	36...72VDC	80mA	3mA	+12VDC -12VDC	+125mA -125mA	1.5W 1.5W	78%
ECW48-1503D	48VDC	36...72VDC	80mA	3mA	+15VDC -15VDC	+100mA -100mA	1.5W 1.5W	78%

**Notes:**

Options B and T only available with Uin = 12V, 24V and 48V

Option T only available for H (1500Vdc) and V (3000Vdc) versions

## 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 <sub>IN</sub>	Input voltage		See	product	range	V
U <sub>UVLO</sub>	Under voltage lockout					V
	Max. input current at full load		See	product	range	A
	No load input current		See	product	range	mA

## Output Specifications

Characteristic		Conditions	min	typ	max	unit
U <sub>ACC</sub>	Output voltage accuracy		±2			%
	Output voltage adjust					%
	Line regulation			±0.5		%
	Load regulation	25% / 100% step load change		s: ±0.5, d: ±1		%
	Load transient recovery time	25% / 100% step load change				us
	Load transient error band					%
	Temperature coefficient			±0.05		%/K
	Ramp up time					ms
	Start up time					ms
	Ripple and noise	BW = 20MHz	3.3V/5V: 100, 12V/15V: 1%			mVpp
	Current limit					%
	Over voltage protection					%
	Short circuit protection					%
	Short circuit characteristic		continuous			

## General Specifications

Characteristic		Conditions	min	typ	max	unit
U <sub>ISO</sub>	Isolation voltage		500, 1500 or 3000			V
R <sub>ISO</sub>	Isolation resistance		> 1G			Ohm
R <sub>ISO</sub>	Switching frequency		100			kHz
	Approvals					
	Safety Approvals					
	MTBF		>1'000'000			h
	Case material		Copper, black coated or Plastic			
	Compound material					
	PCB material					
	Weight		Copper = 16, Plastic = 12			gr
	Dimensions		31.8 x 20.3 x 10.2 (SMD) 11.4			mm
	Soldering infos		275°C for 10			s

## EMC Specifications

Characteristic		Conditions	min	typ	max	unit
	EMC conducted	See EMC information	EN55022/11 Class A or B			

## Environmental Specifications

Characteristic		Conditions	min	typ	max	unit
T <sub>AMB</sub>	Operation temperature	See derating diagram	-25...+70			°C
T <sub>AMB</sub>	Storage temperature		-40...+100			°C
T <sub>SD</sub>	Thermal shutdown range		None			°C

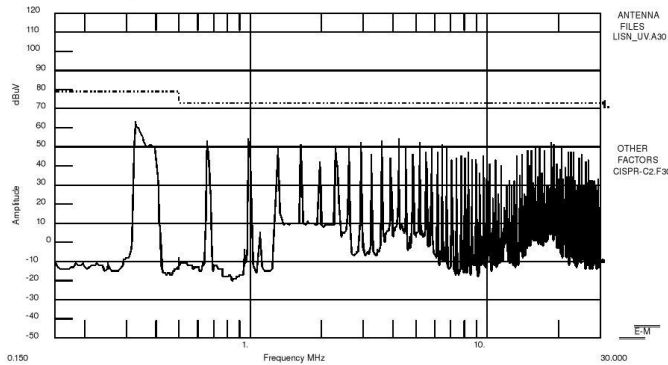
## Own notes

# EMC information

EMC emissions conducted, EN55022/11 Class A or B, Example:

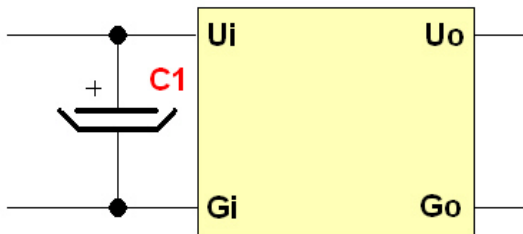
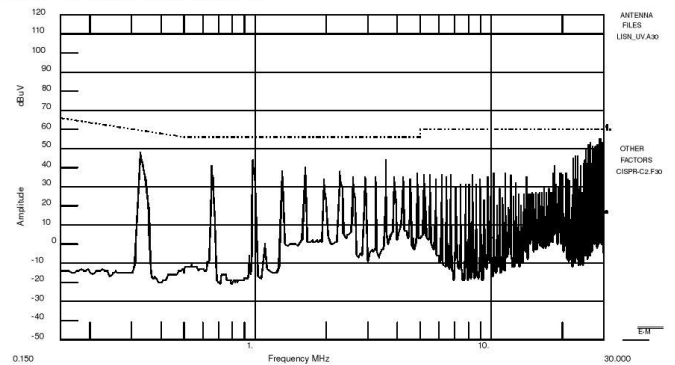
## Electro-Metrics

EMV Messung  
 Date: 09/08/99 Time: 09:09:06.34 EMC-30 SETTINGS  
 Technician: U. Luesel Test Equip.: EMC-30 MKIV Detector: QuasiPeak SPECS  
 Test Method: CONDUCTED EMISSION Test Number: 1 Bandwidth: CISPR Dwell: N/A 1) EN 55022 Class A QuasiPeak  
 Equipment: ECW24-0503SM Sensor Loc.: NA RF Atten: 0 dB  
 Mode of Op.: Normal operation Sensor Pol.: positiv IF Atten: 0 dB  
 Serial No.: 9934 Ext. Atten.: 0 dB  
 Comment: 24VDC input voltage with 10uF capacitor near input



## Electro-Metrics

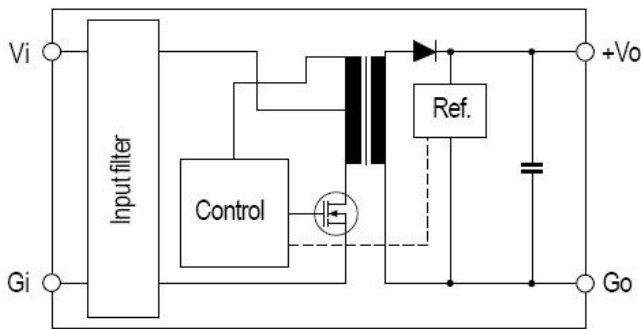
EMV Messung  
 Date: 09/08/99 Time: 08:42:26.14 EMC-30 SETTINGS  
 Technician: U. Luesel Test Equip.: EMC-30 MKIV Detector: QuasiPeak SPECS  
 Test Method: CONDUCTED EMISSION Test Number: 1 Bandwidth: CISPR Dwell: N/A 1) EN 55022 CLASS B / QuasiPeak  
 Equipment: ECW24-0503SVB Sensor Loc.: NA RF Atten: 0 dB  
 Mode of Op.: Nominal operation Sensor Pol.: positiv IF Atten: 0 dB  
 Serial No.: 9918 Ext. Atten.: 0 dB  
 Comment: 24VDC input voltage with 10uF capacitor near input



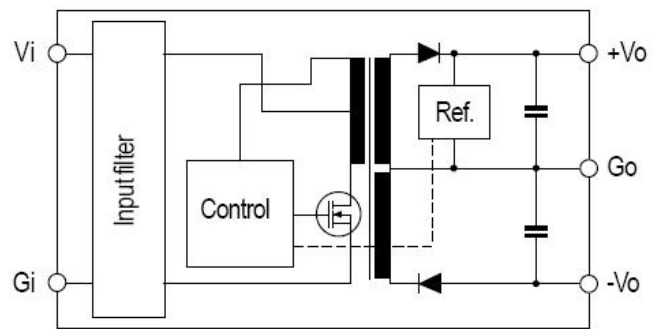
This was achieved with the following filter:

$V_{in} = 24V$   
 $C1 = 100\mu F$

# Block diagram



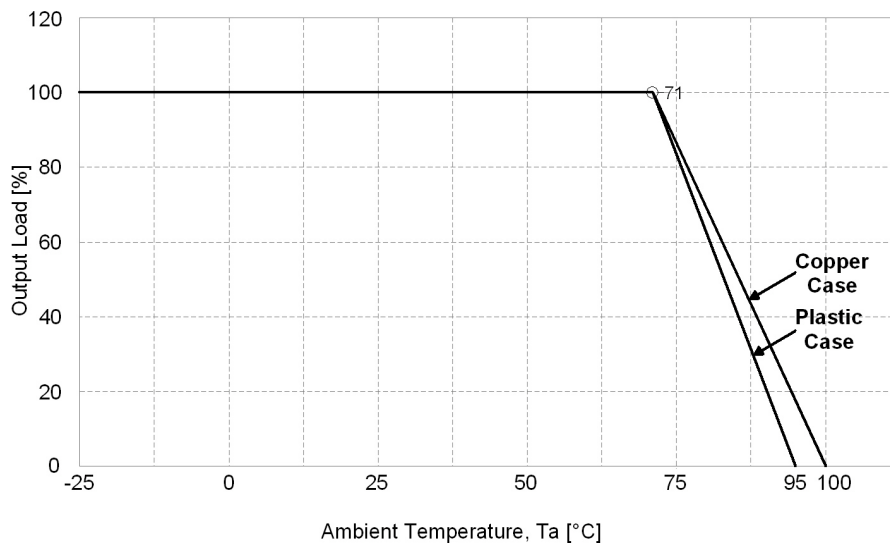
Single output converter block diagram



Dual output converter block diagram

# Derating

The operating case temperature range of ECW 03 series is -25...+70°C. When operating the ECW 03 series, proper derating or cooling is needed. The following curves are the derating curves of ECW 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.



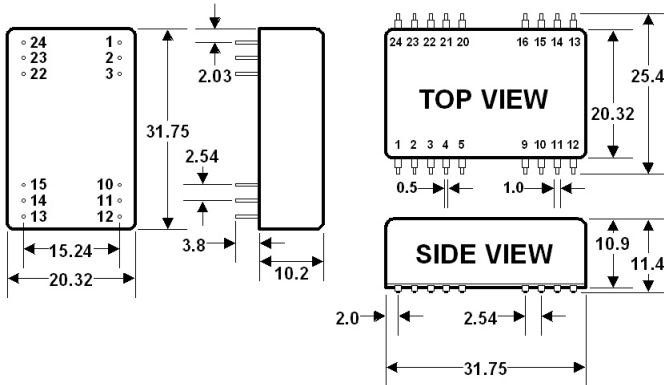
## Own notes

# Case

Normal tolerance 1/10 ±0.5 mm, 1/100 ±0.25 mm; Pin tolerance ±0.5 mm diameter  
 NP = No pin, NC = Not connected, NA = Not available for electrical contact, do not connect

500V THD & SMD

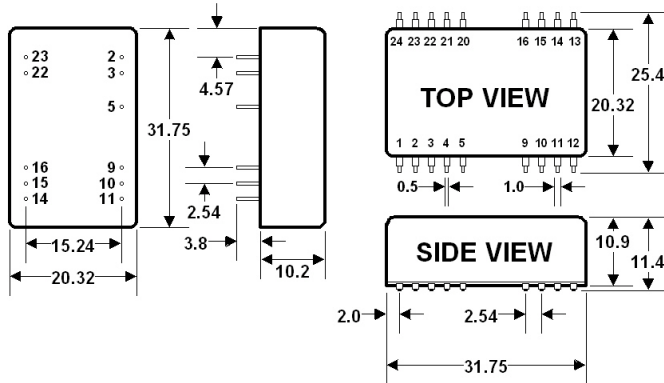
**BOTTOM VIEW SIDE VIEW**



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

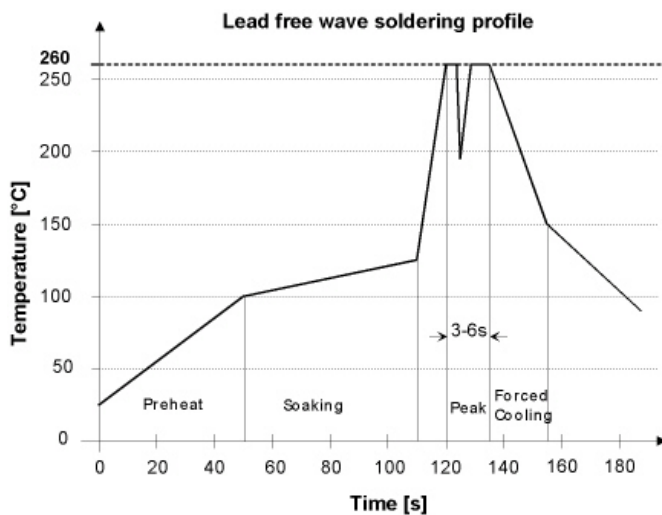
1500V / 3000V / 4000V, THD & SMD

**BOTTOM VIEW SIDE VIEW**



Pin	Single	Dual	Pin
2	Gi	Gi	2
3	Gi	Gi	3
5	on/off or NP	on/off or NP	5
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 ±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.

Switzerland:  
FABRIMEX AG - Techcenterstr. 2  
CH-8608 Bubikon  
Tel: +41 55 253 31 90 - Fax: +41 55 253 31 91  
[www.fabrimex.com](http://www.fabrimex.com)  
[info@fabrimex.ch](mailto:info@fabrimex.ch)



**FABRIMEX**  
POWER SUPPLIES

Germany:  
CAC FABRIMEX GmbH - Karlstrasse 70  
D-89543 Gerstetten  
Tel: +49 7323 95000 - Fax: +49 7323 95050  
[www.fabrimex.de](http://www.fabrimex.de)  
[info@cac-fabrimex-ger.de](mailto:info@cac-fabrimex-ger.de)