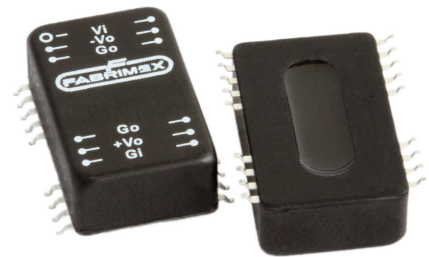


DC/DC Wide Input Converter ECW 03-S Series



- * 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, THT available
- * UL60950-1 recognized, H and V versions only
- * Safety Meets IEC/EN/UL62368-1

Product Range

Model	Input		lin @ Uin nom.		Uout	Output Iout max.	power	Efficiency typ.	Max. capacity
	nominal	range	full load	no load					
Single									
ECW05-0303S(x)-S	5Vdc	4.5...6Vdc	568mA	15mA	3.3Vdc	600mA	2W	68%	2'200uF
ECW05-0503S(x)-S	5Vdc	4.5...6Vdc	800mA	15mA	5.0Vdc	600mA	3W	75%	2'200uF
ECW05-1203S(x)-S	5Vdc	4.5...6Vdc	759mA	15mA	12Vdc	250mA	3W	79%	2'200uF
ECW05-1503S(x)-S	5Vdc	4.5...6Vdc	779mA	15mA	15Vdc	200mA	3W	77%	2'200uF
ECW12-0303S(x)-S	12Vdc	9...18Vdc	229mA	7.5mA	3.3Vdc	600mA	2W	72%	2'200uF
ECW12-0503S(x)-S	12Vdc	9...18Vdc	325mA	7.5mA	5.0Vdc	600mA	3W	77%	2'200uF
ECW12-1203S(x)-S	12Vdc	9...18Vdc	313mA	7.5mA	12Vdc	250mA	3W	80%	2'200uF
ECW12-1503S(x)-S	12Vdc	9...18Vdc	316mA	7.5mA	15Vdc	200mA	3W	79%	2'200uF
ECW24-0303S(x)-S	24Vdc	18...36Vdc	111mA	5mA	3.3Vdc	600mA	2W	74%	2'200uF
ECW24-0503S(x)-S	24Vdc	18...36Vdc	158mA	5mA	5.0Vdc	600mA	3W	79%	2'200uF
ECW24-1203S(x)-S	24Vdc	18...36Vdc	156mA	5mA	12Vdc	250mA	3W	80%	2'200uF

ECW24-1503S(x)-S	24Vdc	18...36Vdc	152mA	5mA	15Vdc	200mA	3W	82%	2'200uF
ECW48-0303S(x)-S	48Vdc	36...72Vdc	57mA	3mA	3.3Vdc	600mA	2W	72%	2'200uF
ECW48-0503S(x)-S	48Vdc	36...72Vdc	78mA	2mA	5.0Vdc	600mA	3W	79%	2'200uF
ECW48-1203S(x)-S	48Vdc	36...72Vdc	78mA	2mA	12Vdc	250mA	3W	80%	2'200uF
ECW48-1503S(x)-S	48Vdc	36...72Vdc	78mA	2mA	15Vdc	200mA	3W	80%	2'200uF

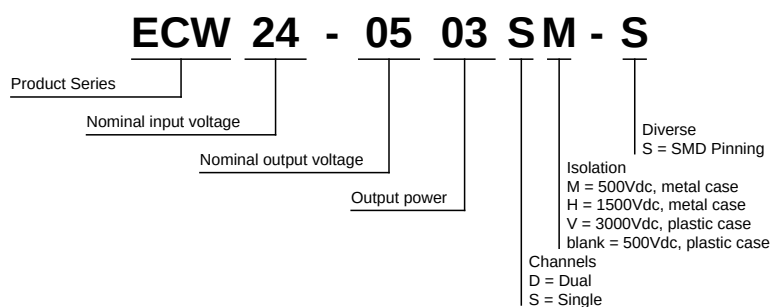
Dual

ECW05-0503D(x)-S	5Vdc	4.5...6Vdc	779mA	25mA	+5.0Vdc -5.0Vdc	+300mA -300mA	1.5W	77%	1'000uF
ECW05-1203D(x)-S	5Vdc	4.5...6Vdc	789mA	25mA	+12Vdc -12Vdc	+125mA -125mA	1.5W	76%	1'000uF
ECW05-1503D(x)-S	5Vdc	4.5...6Vdc	800mA	25mA	+15Vdc -15Vdc	+100mA -100mA	1.5W	75%	1'000uF
ECW12-0503D(x)-S	12Vdc	9...18Vdc	325mA	12mA	+5.0Vdc -5.0Vdc	+300mA -300mA	1.5W	77%	1'000uF
ECW12-1203D(x)-S	12Vdc	9...18Vdc	325mA	12mA	+12Vdc -12Vdc	+125mA -125mA	1.5W	77%	1'000uF
ECW12-1503D(x)-S	12Vdc	9...18Vdc	316mA	12mA	+15Vdc -15Vdc	+100mA -100mA	1.5W	79%	1'000uF
ECW24-0503D(x)-S	24Vdc	18...36Vdc	162mA	7.5mA	+5.0Vdc -5.0Vdc	+300mA -300mA	1.5W	77%	1'000uF
ECW24-1203D(x)-S	24Vdc	18...36Vdc	158mA	7.5mA	+12Vdc -12Vdc	+125mA -125mA	1.5W	70%	1'000uF
ECW24-1503D(x)-S	24Vdc	18...36Vdc	154mA	7.5mA	+15Vdc -15Vdc	+100mA -100mA	1.5W	81%	1'000uF
ECW48-0503D(x)-S	48Vdc	36...72Vdc	80mA	3mA	+5.0Vdc -5.0Vdc	+300mA -300mA	1.5W	78%	1'000uF
ECW48-1203D(x)-S	48Vdc	36...72Vdc	80mA	3mA	+12Vdc -12Vdc	+125mA -125mA	1.5W	78%	1'000uF
ECW48-1503D-S	48Vdc	36...72Vdc	80mA	3mA	+15Vdc -15Vdc	+100mA -100mA	1.5W	78%	1'000uF

Notes:

(x) can be M, H, V or blank.

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	V
U_{UVLO} 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 _{ACC}	Output voltage accuracy			±2		%
	Output voltage adjust					%
	Line regulation			±0.5		%
	Load regulation	10% / 100% step load change	s: ±0.5, d: ±1			%
	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	3.3V/5V: 100, 12V/15V: 1%			mVpp
	Current limit					% I _{nom}
	Over voltage protection					% U _{nom}
	Short circuit protection					% I _{nom}
	Short circuit characteristic		continuous			

General Specifications

Characteristic		Conditions	min	typ	max	unit
U _{ISO}	Isolation voltage		500, 1500 or 3000			Vdc
R _{ISO}	Isolation resistance		> 1G			Ohm
C _{ISO}	Isolation capacity					pF
F _{SW}	Switching frequency		100			kHz
	Approvals					
	Safety Approvals		UL60950-1 recognized, H and V versions			
	MTBF		2'000'000			h
	Case material		Copper, black coated or Plastic			
	Compound material		UL94V-0			
	PCB material		UL94V-0			
	Weight		12.5			gr
	Dimensions		31.8 x 20.3 x 11.4			mm
	Soldering infos		275°C for 10			s

EMC Specifications

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

Environmental Specifications

Characteristic		Conditions	min	typ	max	unit
T _{AMB}	Operation temperature	Derating above 71°C	-40...+85			°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 or B, Example:

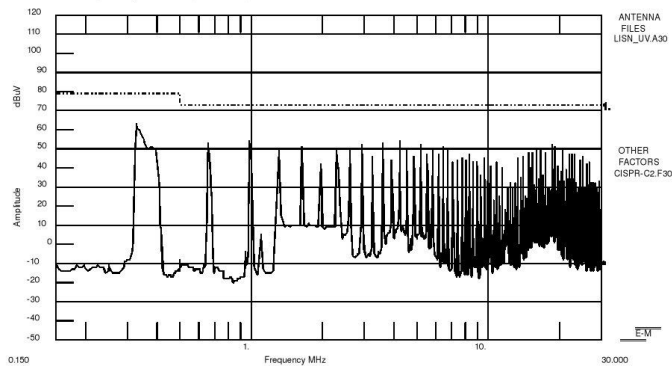
Electro-Metrics

EMV Measuring
Date : 09/08/99
Technician : U. Luessl
Test Method : CONDUCTED EMISSION
Equipment : ECW24-0503SM
Mode of Op. : Normal operation
Serial No. : 9934
Comment : 24VDC input voltage with 10uF capacitor near input

Time : 09/09/06:34
Test Equip. : EMC-30 MKIV
Test Number : 1
Sensor Loc. : NA
Sensor Pol. : positiv
Ext. Atten. : 0 dB

EMC-30 SETTINGS
Detector : QuasiPeak
Bandwidth : CISPR
Dwell : N/A
RF Atten. : 0 dB
IF Atten. : 0 dB

SPECS
1) EN 55022 Class A QuasiPeak



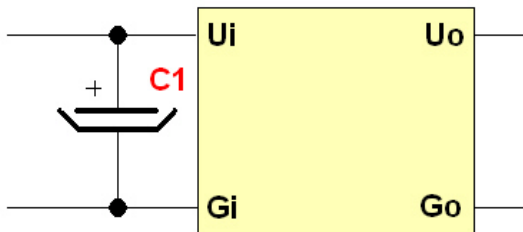
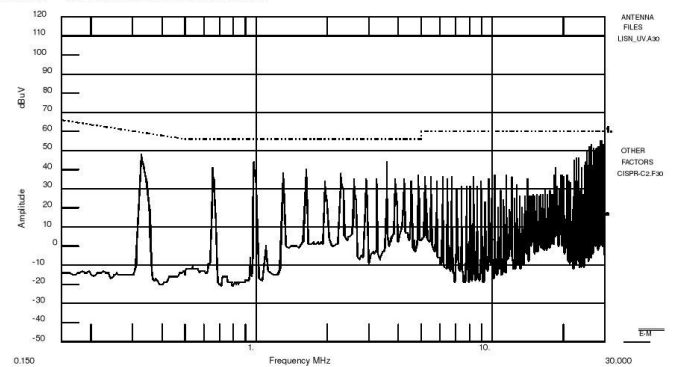
Electro-Metrics

EMV Measuring
Date : 09/08/99
Technician : U. Luessl
Test Method : CONDUCTED EMISSION
Equipment : ECW24-0503SVB
Mode of Op. : Nominal operation
Serial No. : 9918
Comment : 24VDC input voltage with 10uF capacitor near input

Time : 08/42:26:14
Test Equip. : EMC-30 MKIV
Test Number : 1
Sensor Loc. : NA
Sensor Pol. : positiv
Ext. Atten. : 0 dB

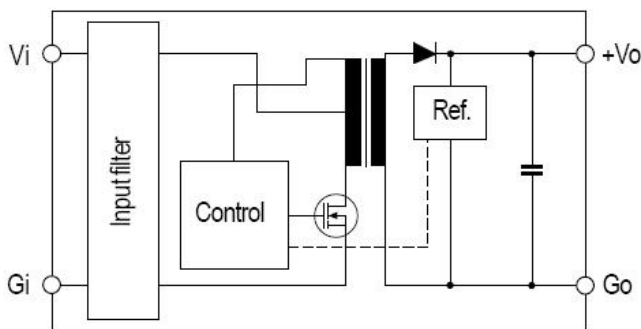
EMC-30 SETTINGS
Detector : QuasiPeak
Bandwidth : CISPR
Dwell : N/A
RF Atten. : 0 dB
IF Atten. : 0 dB

SPECS
1) EN 55022 CLASS B / QuasiPeak

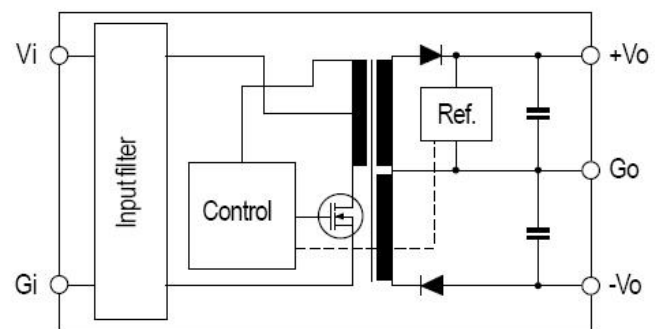


This was achieved with the following filter:
 $V_{in} = 24V$
 $C1 = 100\mu F$

Block diagram



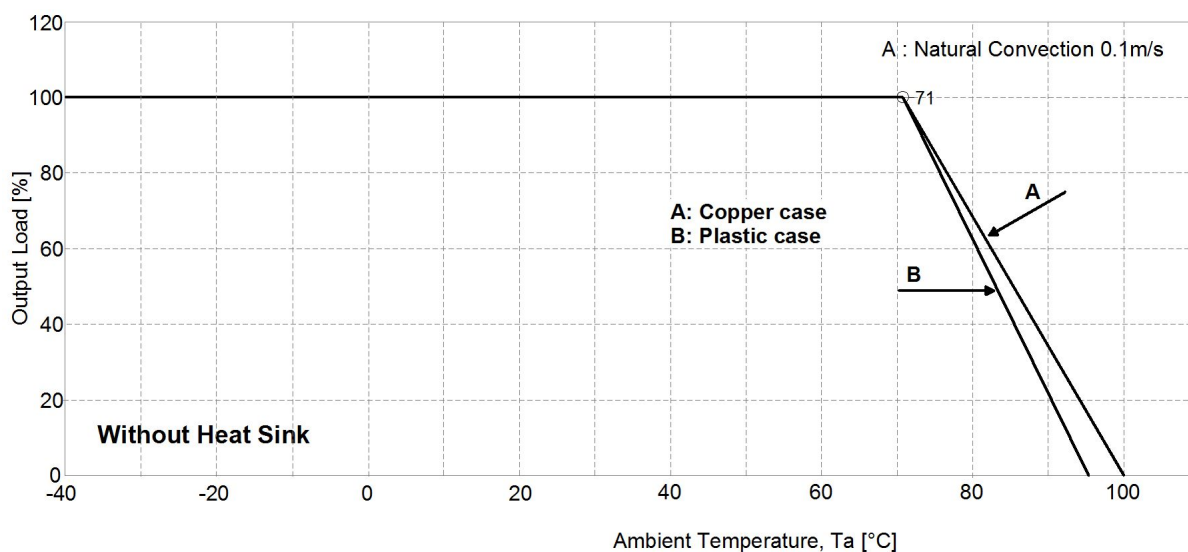
Single output converter block diagram



Dual output converter block diagram

Derating

The operating case temperature range of ECW 03-S series is -40...+85°C. When operating the ECW 03-S series, proper derating or cooling is needed. The following curves are the derating curves of ECW 03-S. 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.



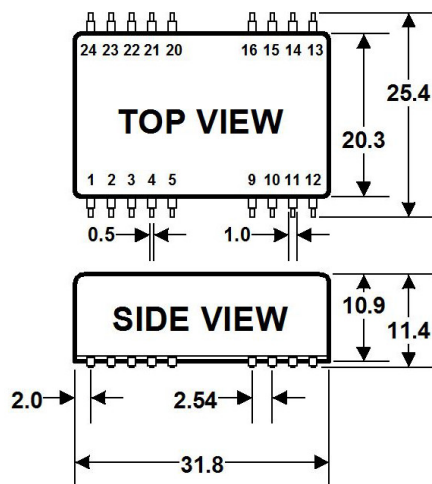
Own notes

Case

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

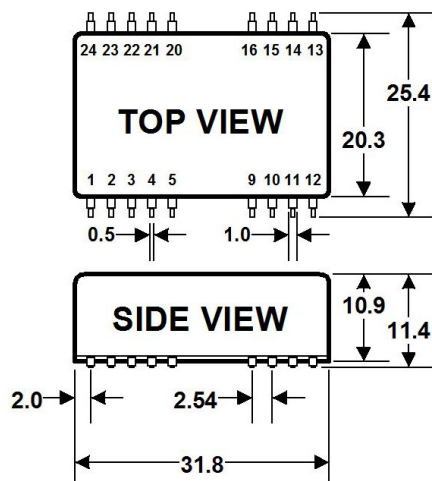
NP = No pin, NC = Not connected, NA = Not available for electrical contact, do not connect, (opt) = optional

DIL24 500V AS1/AS2



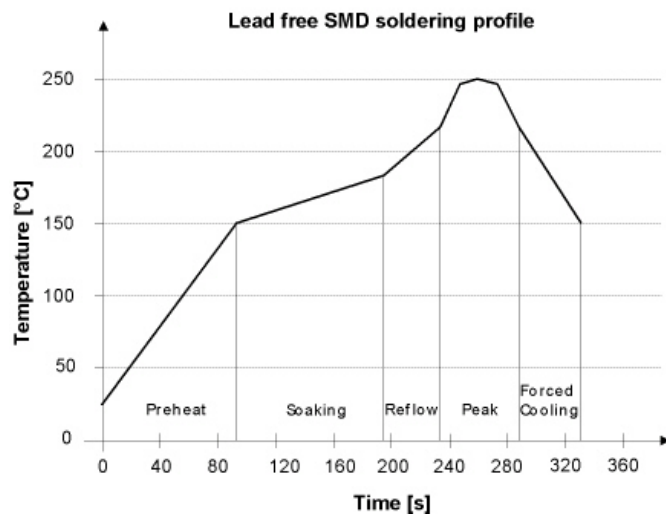
Pin	Single	Dual	Pin
1	+Vin	+Vin	1
2	NC	-Vout	2
3	NC	Common	3
4	NC	NC	4
5	NC	NC	5
9	NC	NC	9
10	-Vout	Common	10
11	+Vout	+Vout	11
12	-Vin	-Vin	12
13	-Vin	-Vin	13
14	+Vout	+Vout	14
15	-Vout	Common	15
16	NC	NC	16
20	NC	NC	20
21	NC	NC	21
22	NC	Common	22
23	NC	-Vout	23
24	+Vin	+Vin	24

DIL24 1.5/3kV AS4/AS5



Pin	Single	Dual	Pin
1	NC	NC	1
2	-Vin	-Vin	2
3	-Vin	-Vin	3
4	NC	NC	4
5	NC / Rem	NC / Rem	5
9	NC	Common	9
10	NC	NC	10
11	NC	-Vout	11
12	NC	NC	12
13	NC	NC	13
14	+Vout	+Vout	14
15	NC	NC	15
16	-Vout	Common	16
20	NC	NC	20
21	NC	NC	21
22	+Vin	+Vin	22
23	+Vin	+Vin	23
24	NC	NC	24

Soldering



1. Soldering Materials: SHENMAO PF610-P(Sn/Ag/Cu)
2. Preheat: 1.6 °C/s (From 30°C to 150°C)
3. Soaking: 0.32 °C/s (From 150°C to 180°C)
4. Reflow: 1.0°C/s (From 220°C to 250°C)
5. Peak temperature: 260°C, above 220°C 40 to 60s
6. Forced cooling: -1.67 °C/s (From 220°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.

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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