

Reg. Nr. 12666

DC/DC Wide Input Converter ECW 75 Series



- * Industry standard pinning
- * I/O isolation of 1'500 VDC
- * Continuous short circuit proof
- * Over temperature protection
- * Remote on/off control
- * Sense (single output only)
- * Ext. output voltage adjustment $\pm 10\%$
- * Metal case with non conductive base, five sides shielded
- * Ready for mounting on heat sink

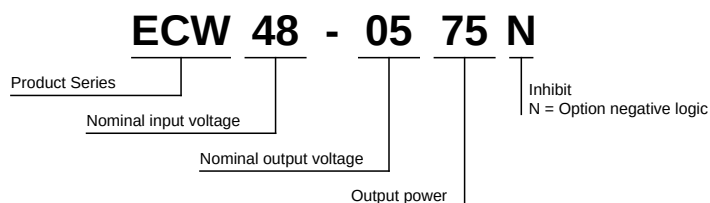


Product Range

Model	Input nominal	Input range	I _{in} @ U _{in} nom.		U _{out}	Output I _{out} max.	power	Efficiency typ.	Max. capacity
			full load	no load					
Single									
ECW12-3V375	12Vdc	9...18Vdc	5290mA	50mA	3.3Vdc	15A	49.5W	78%	10'000uF
ECW12-0575	12Vdc	9...18Vdc	7530mA	50mA	5.1Vdc	15A	76.5W	81%	10'000uF
ECW12-1275	12Vdc	9...18Vdc	7183mA	50mA	12Vdc	6.25A	75W	87%	10'000uF
ECW12-1575	12Vdc	9...18Vdc	7267mA	50mA	15Vdc	5A	75W	86%	4'000uF
ECW12-2475	12Vdc	9...18Vdc	7183mA	50mA	24Vdc	3.13A	75W	87%	2'000uF
ECW24-3V375	24Vdc	18...36Vdc	2578mA	50mA	3.3Vdc	15A	49.5W	80%	10'000uF
ECW24-0575	24Vdc	18...36Vdc	3720mA	50mA	5.1Vdc	15A	76.5W	84%	10'000uF
ECW24-1275	24Vdc	18...36Vdc	3551mA	50mA	12Vdc	6.25A	75W	88%	10'000uF
ECW24-1575	24Vdc	18...36Vdc	3551mA	50mA	15Vdc	5A	75W	88%	4'000uF
ECW24-2475	24Vdc	18...36Vdc	3551mA	50mA	24Vdc	3.13A	75W	88%	2'000uF

ECW48-3V375	48Vdc	36...72Vdc	1273mA	50mA	3.3Vdc	15A	49.5W	81%	10'000uF
ECW48-0575	48Vdc	36...72Vdc	1860mA	50mA	5.1Vdc	15A	76.5W	84%	10'000uF
ECW48-1275	48Vdc	36...72Vdc	1755mA	50mA	12Vdc	6.25A	75W	89%	10'000uF
ECW48-1575	48Vdc	36...72Vdc	1775mA	50mA	15Vdc	5A	75W	88%	4'000uF
ECW48-2475	48Vdc	36...72Vdc	1755mA	50mA	24Vdc	3.13A	75W	89%	2'000uF

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	$T_A < T_{MAX}$	See	product	range	V
U_{UVLO} Under voltage lockout					V
Max. input current at full load	$I_0 = I_{0max}$	See	product	range	A
No load input current	$I_0 = 0$	See	product	range	mA

Output Specifications

Characteristic	Conditions	min	typ	max	unit
U_{ACC} Output voltage accuracy			±1		%
Output voltage adjust			±10		%
Line regulation				±0.2	%
Load regulation				±0.2	%
Load transient recovery time	25% / 100% step load change		500		us
Load transient error band					%
Temperature coefficient			±0.03		%/K
Ramp up time					ms
Start up time					ms
Ripple and noise	BW = 20MHz	3.3/5V:75, 12/15V:100, 24V:240			mVpp
Current limit		110		140	% Inom
Over voltage protection		115		140	% 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	1500			Vdc
R _{ISO}	Isolation resistance		10M			Ohm
F _{SW}	Switching frequency		typ. 400			kHz
	Approvals		single ECW24/48: Meets UL / cUL1950			
	Safety Approvals					
	MTBF		>1'000'000			h
	Case material		S: ALU, D: ALU base with plastic case			
	Compound material					
	PCB material					
	Weight		92/108			gr
	Dimensions					mm
	Soldering infos		275°C for 10 sec.			s

EMC Specifications

Characteristic		Conditions	
	EMC conducted	See EMC information	EN55022/11 Class A (single)

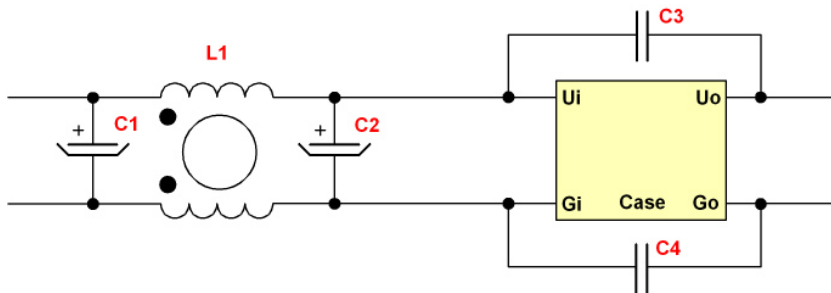
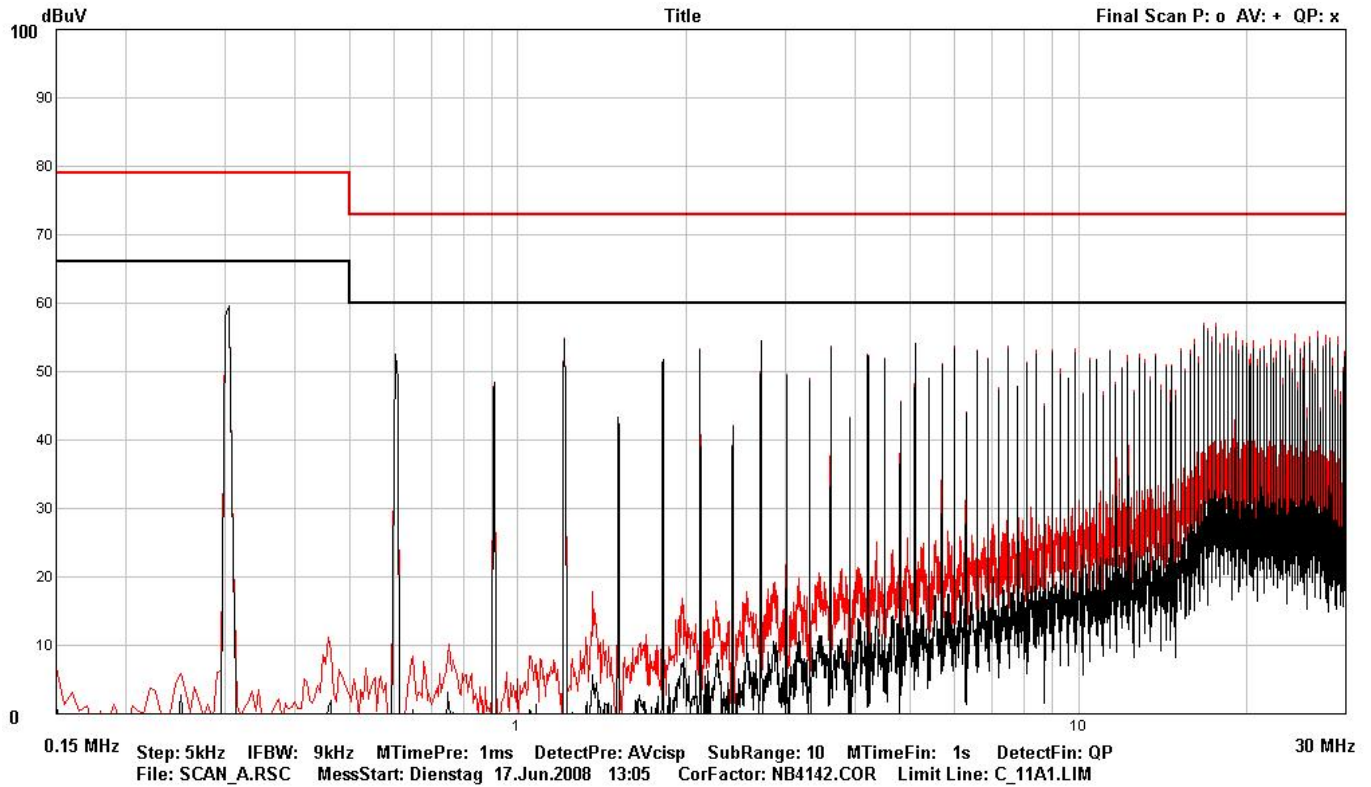
Environmental Specifications

Characteristic		Conditions	min	typ	max	unit
T _{CASE}	Operation temperature		-40...+100			°C
T _{AMB}	Storage temperature		-55...+105			°C
T _{SD}	Thermal shutdown range		Tcase = 100			°C

Own notes

EMC information

EMC emissions conducted, EN55022/11 Class A (single), Example:



This was achieved with the following filter:
 C1 220uF / 63V Nic Comp. NRWS221M63V10X16
 C2 220uF / 63V Nic Comp. NRWS221M63V10X16
 C3 4n7 / 100V Kemet CK05
 C4 4n7 / 100V Kemet CK05
 L1 2 x 6.8uH / 1.2A Schaffner RN112-1.2/02

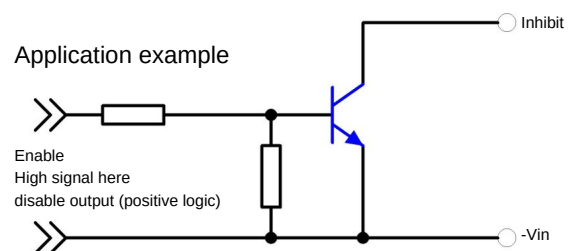
Inhibit

The ECW 75 Series allows the user to switch the module on and off electronically by inhibit on/off feature. The converters are available in "positive logic" or "negative logic" (option) versions for inhibit on/off.

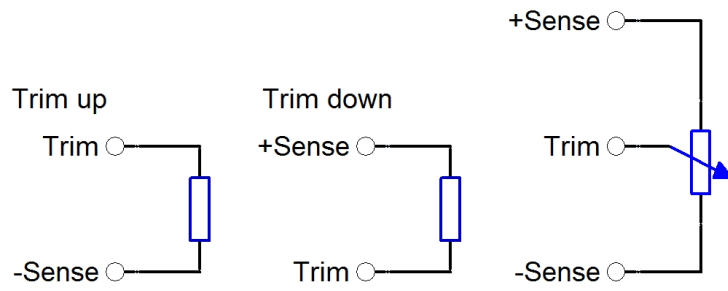
Logic table (inhibit pin)

Logic state	Negative logic*	Positive logic
Logic low	Module on	Module off
Logic high	Module off	Module on

* Suffix "N" to the model number with active low inhibit on /off



Trimming

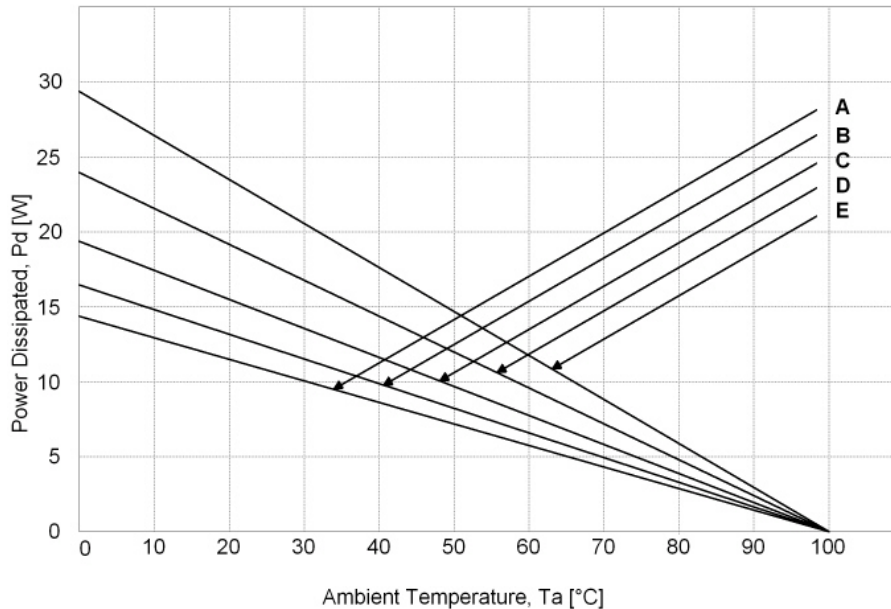


Own notes

Derating

The operating case temperature range of ECW 75 series is -40...+100°C. When operating the ECW 75 series, proper derating or cooling is needed. The following curves are the derating curves of ECW 75 without and with heat sink. 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.

Without Heat Sink: Power Dissipation vs Ambient Temperature and Air Flow for



- A: Natural Convection 0.1m/s
- B: 0.5 m/s
- C: 1.0 m/s
- D: 1.5 m/s
- E: 2.0 m/s

Remarks:

Fabrimex recommends a chassis mount or a heatsink. If neither is used a reasonable free space is recommended. Without heatsink, this leads to:

Free space = 30 mm min.

Where:

The power dissipation Pd:

$$P_d = P_i - P_o = \frac{P_o \cdot (1 - \eta)}{\eta}$$

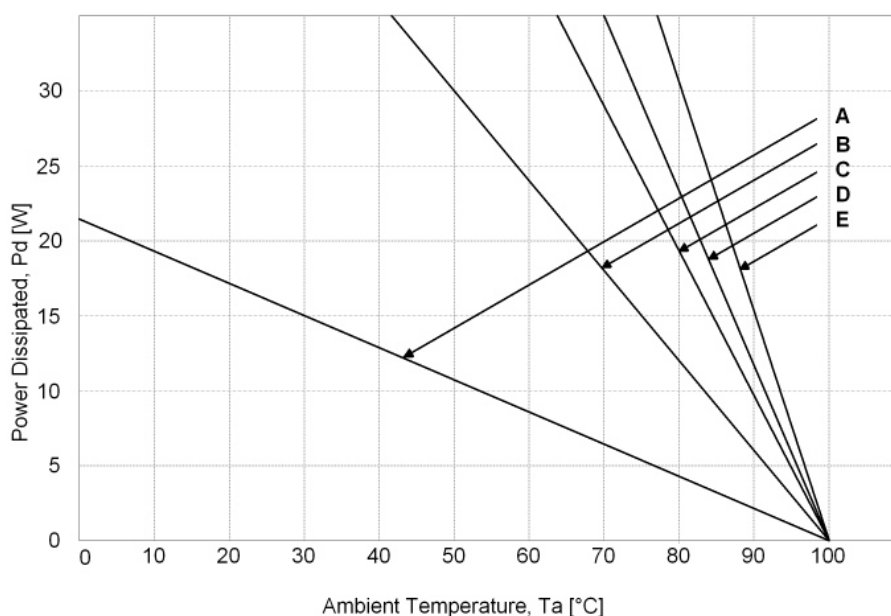
The thermal resistances without heat sink are listed below:

Air flow rate	Typical Rthca
natural convection 0.1m/s	7.12 K/W
0.5 m/s	6.21 K/W
1.0 m/s	5.17 K/W
1.5 m/s	4.29 K/W
2.0 m/s	3.64 K/W

The temperature rise Delta T:

$$\Delta T = P_d \cdot R_{thca}$$

With Heat Sink FH-6158-13: Power Dissipation vs Ambient Temperature; Height: 12.7mm



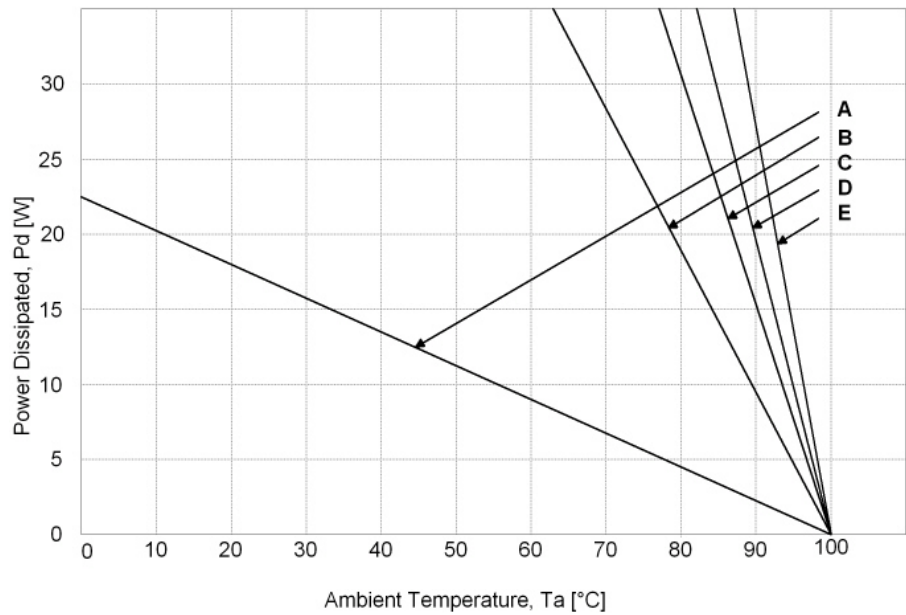
- A: Natural Convection 0.1m/s
- B: 0.5 m/s
- C: 1.0 m/s
- D: 1.5 m/s
- E: 2.0 m/s

Remarks:

Fabrimex recommends a free space of at least half heat sink height above the heat sink at natural air flow. For the FH-6158-13 this equals to:

Free space = 6.5 mm min.

With Heat Sink FH-5861-21: Power Dissipation vs Ambient Temperature; Height: 21mm"



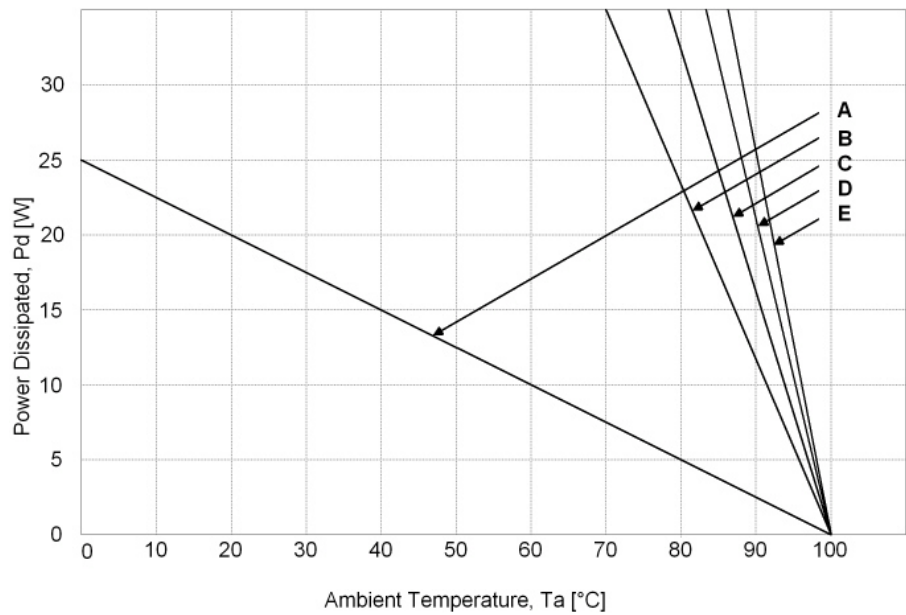
- A: Natural Convection 0.1m/s
- B: 0.5 m/s
- C: 1.0 m/s
- D: 1.5 m/s
- E: 2.0 m/s

Remarks:

Fabrimex recommends a free space of at least half heat sink height above the heat sink at natural air flow. For the FH-5861-21 this equals to:

Free space = 10.5 mm min.

With Heat Sink FH-6158-25: Power Dissipation vs Ambient Temperature; Height: 25.4mm



- A: Natural Convection 0.1m/s
- B: 0.5 m/s
- C: 1.0 m/s
- D: 1.5 m/s
- E: 2.0 m/s

Remarks:

Fabrimex recommends a free space of at least half heat sink height above the heat sink at natural air flow. For the FH-6158-25 this equals to:

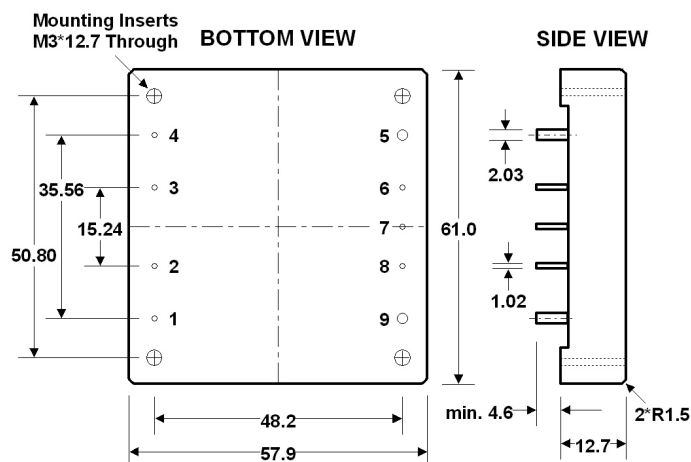
Free space = 12.5 mm min.

Case

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

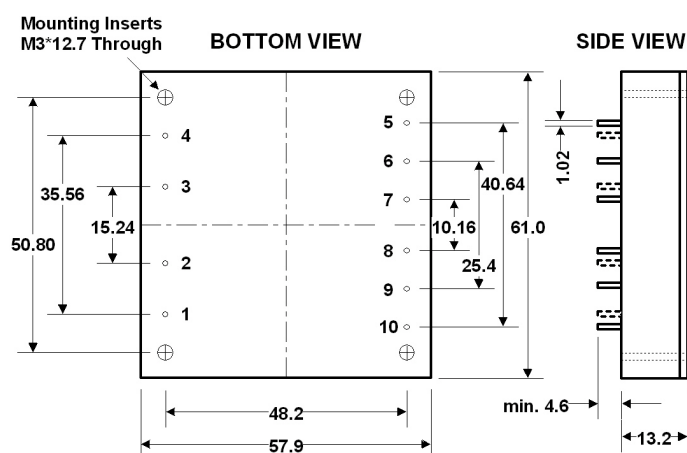
NP = No pin, NC = Not connected, NA = Not available for electrical contact, do not connect, (opt) = optional

SINGLE OUTPUT ALU



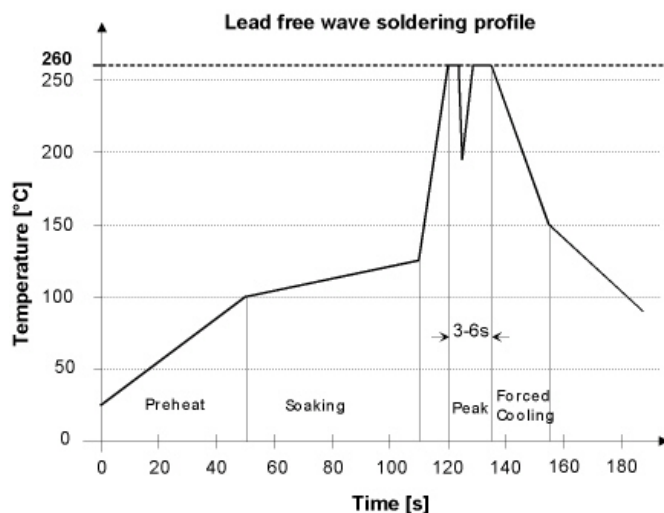
Pin	Single
1	+Vin
2	on/off
3	Case
4	-Vin
5	-Vout
6	-Sense
7	Trim
8	+Sense
9	+Vout

DUAL OUTPUT



Pin	Dual
1	+Vin
2	on/off
3	Case
4	-Vin
5	+Vout2
6	-Vout2
7	Vout2 Trim
8	+Vout1
9	-Vout1
10	Vout1 Trim

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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