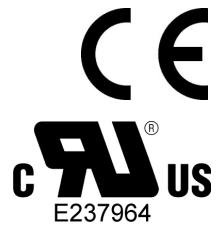


DC/DC Ultra Wide Input Converter ECU 200 Series



- * 4:1 input voltage range
- * 1500 Vdc isolation
- * Continuous short circuit Protection
- * Input Under Voltage Protection
- * Efficiency to 89%
- * External output voltage adjust
- * Inhibit on/off control
- * Half brick case
- * CE Mark Meets 2004/108/EC
- * UL60950-1 Approval (Except 28 Vout)

Product Range

Model	Input		I _{in} @ U _{in} nom.		U _{out}	Output		Efficiency typ.	Max. capacity
	nominal	range	full load	no load		U _{out}	I _{out} max.		
Single									
ECU24-3V3200	24Vdc	10...36Vdc	7.9A	150mA	3.3Vdc	50.00A	165W	87%	10'000uF
ECU24-5V0200	24Vdc	10...36Vdc	9.58A	150mA	5.0Vdc	40.00A	200W	87%	10'000uF
ECU24-12200	24Vdc	10...36Vdc	9.71A	100mA	12Vdc	16.70A	200W	86%	2'200uF
ECU24-15200	24Vdc	10...36Vdc	9.67A	100mA	15Vdc	13.30A	200W	87%	2'200uF
ECU24-24200	24Vdc	10...36Vdc	9.54A	100mA	24Vdc	8.30A	200W	87%	2'200uF
ECU24-28200	24Vdc	10...36Vdc	9.41A	55mA	28Vdc	7.14A	200W	88%	2'200uF
ECU24-48200	24Vdc	10...36Vdc	9.77A	60mA	48Vdc	4.2A	200W	86%	2'200uF
ECU48-3V3200	48Vdc	18...72Vdc	3.13A	80mA	3.3Vdc	40.00A	132W	88%	10'000uF

ECU48-5V0200	48Vdc	18...72Vdc	4.68A	80mA	5.0Vdc	40.00A	200W	89%	10'000uF
ECU48-12200	48Vdc	18...72Vdc	4.74A	60mA	12Vdc	16.70A	200W	88%	2'200uF
ECU48-15200	48Vdc	18...72Vdc	4.72A	60mA	15Vdc	13.30A	200W	88%	2'200uF
ECU48-24200	48Vdc	18...72Vdc	4.72A	60mA	24Vdc	8.30A	200W	88%	2'200uF
ECU48-28200	48Vdc	18...72Vdc	4.68A	50mA	28Vdc	7.14A	200W	89%	2'200uF
ECU48-48200	48Vdc	18...72Vdc	4.83A	50mA	48Vdc	4.2A	200W	87%	2'200uF

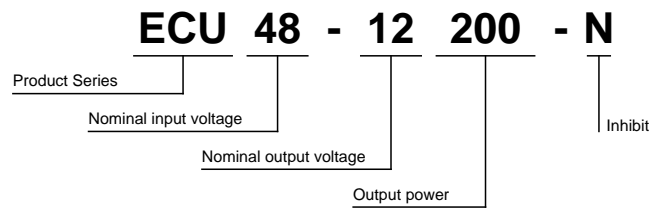
Notes:

The output terminal of 28Vout models required a minimum capacitor 100uF to maintain specified regulation.

The output terminal of 48Vout models required a minimum capacitor 47uF to maintain specified regulation.

An external input capacitor 470uF for 24Vin or 47uF for 48Vin models are recommended to reduce input ripple 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		9 / 18	24 / 48	36 / 72	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			±1.5		%
	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	3.3V/5V:100, 12V/15V:150, others:1%			mVpp
	Current limit		110		150	%
	Over voltage protection		115		140	%

	Short circuit protection			%
	Short circuit characteristic		continuous	

General Specifications

Characteristic		Conditions	min	typ	max	unit
U _{ISO}	Isolation voltage	in/out, in/case, out/case	1500			V
R _{ISO}	Isolation resistance		> 10M			Ohm
F _{SW}	Switching frequency		typ. 250			kHz
	Approvals					
	Safety Approvals		UL / cUL60950-1, EN60950-1			
	MTBF		600k			h
	Case material		Plastic / Aluminium			
	Compound material					
	PCB material					
	Weight		114			gr
	Dimensions		57.9 x 61.0 x 13.2			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			

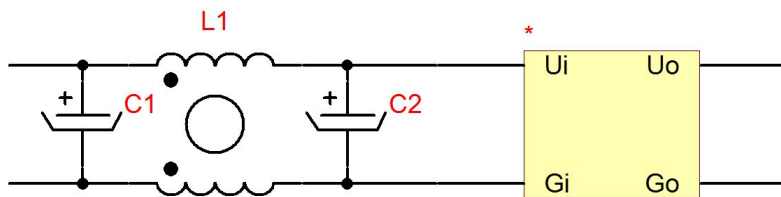
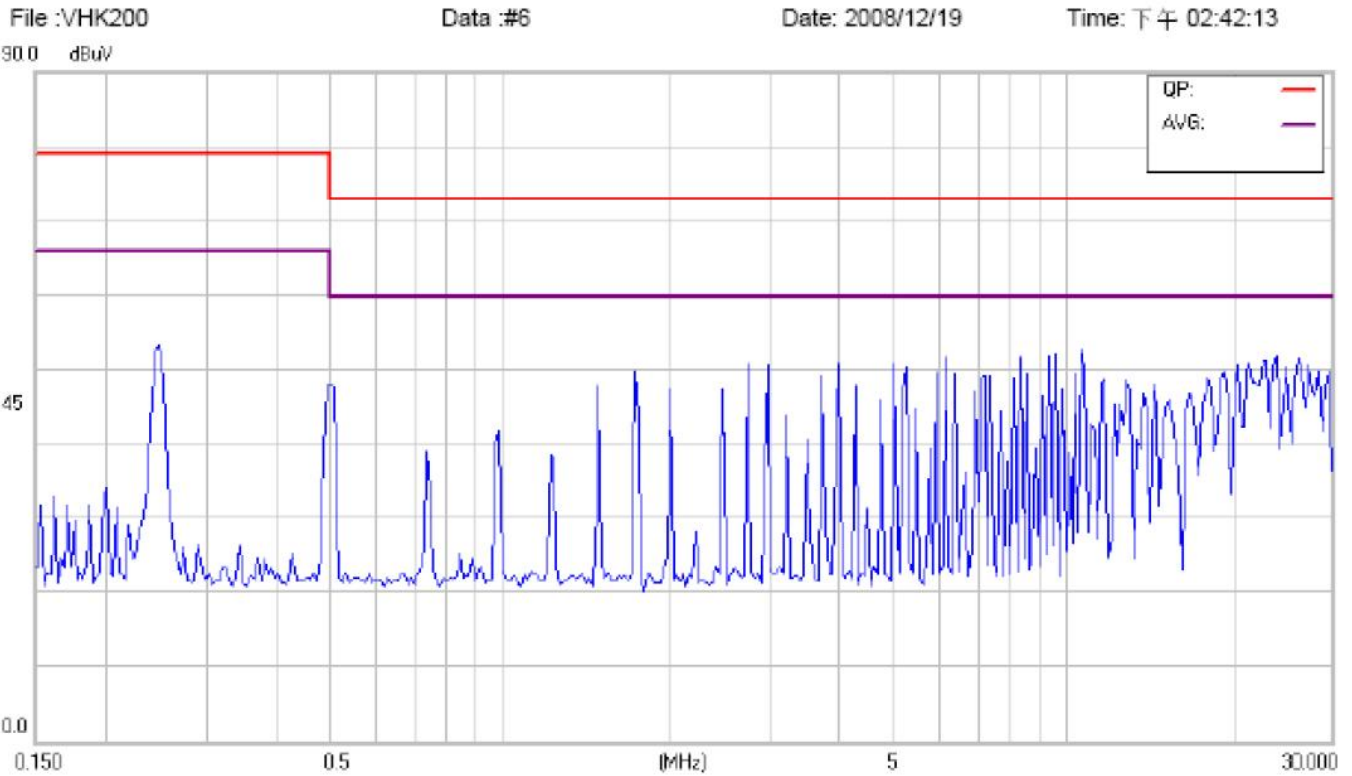
Environmental Specifications

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 = 110			°C

Own notes

EMC information

EMC emissions conducted, EN55022/11 Class A, Example: ECU48-12200



This was achieved with the following filter:
 C1 = 150uF/100V ESR<0.062Ohm
 Aluminum Capacitor
 C2 = 150uF/100V ESR<0.062Ohm
 Aluminum Capacitor
 L1 = 0.5mH

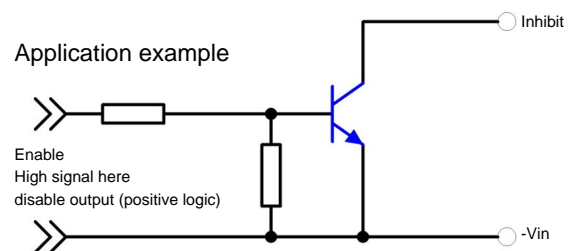
Inhibit

The ECU 200 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.

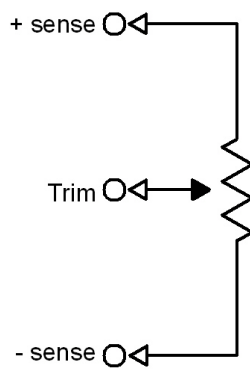
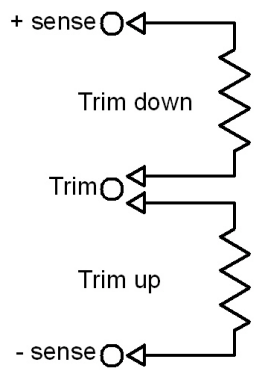
Logic table (inhibit pin)

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

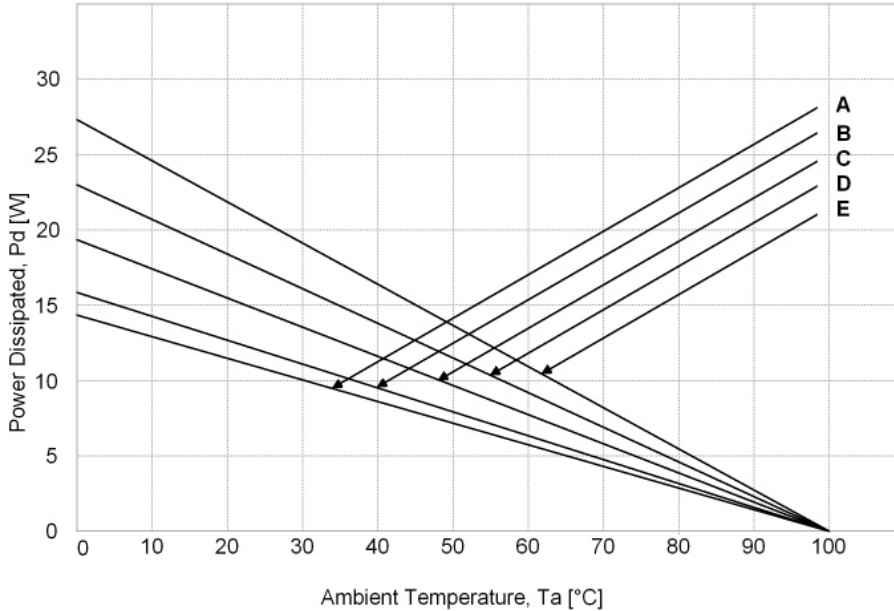


Own notes

Derating

The operating case temperature range of ECU 200 series is -40...+100°C. When operating the ECU 200 series, proper derating or cooling is needed. The following curves are the derating curves of ECU 200 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 ECU 200



- 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:

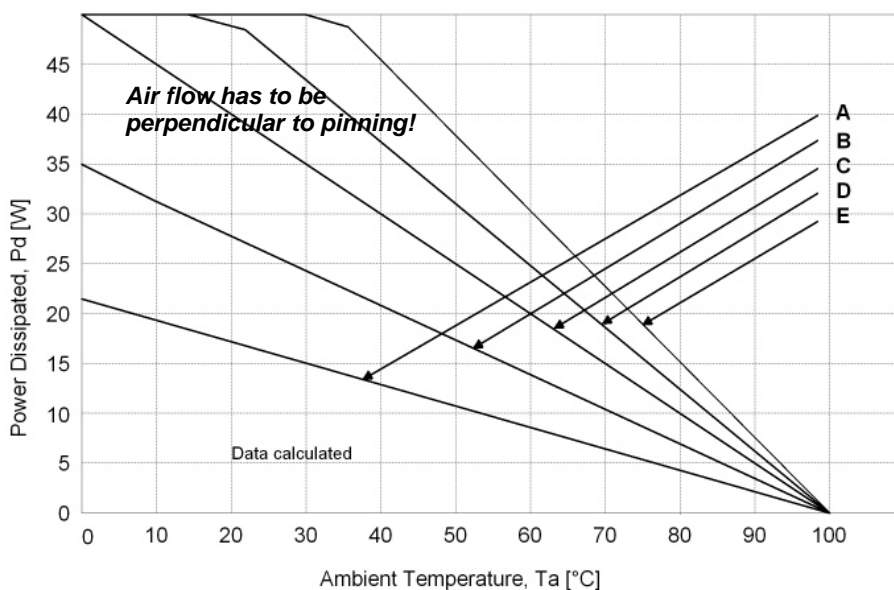
$$Pd = Pi - Po = \frac{Po \cdot (1 - \eta)}{\eta}$$

The temperature rise Delta T: $\Delta T = Pd \cdot R_{thca}$

The thermal resistances with out 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

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



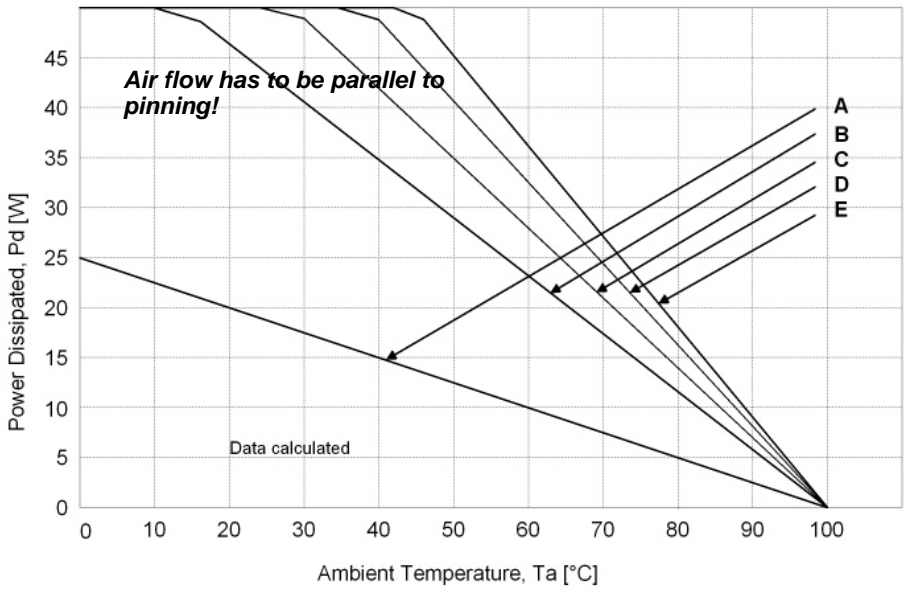
- A: Natural Convection 0.1m/s
- B: 0.5 m/s
- C: 1.0 m/s
- D: 1.5 m/s
- E: 2.0 m/s

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 on plastic HB this equals to:

Free space = 6.5 mm min.

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



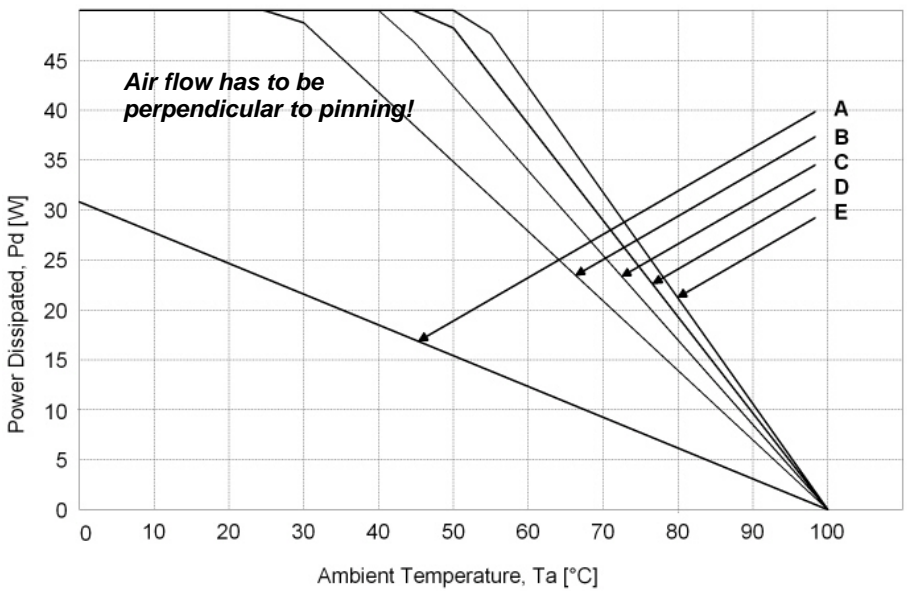
- A: Natural Convection 0.1m/s
- B: 0.5 m/s
- C: 1.0 m/s
- D: 1.5 m/s
- E: 2.0 m/s

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 on plastic HB 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 on plastic HB this equals to:

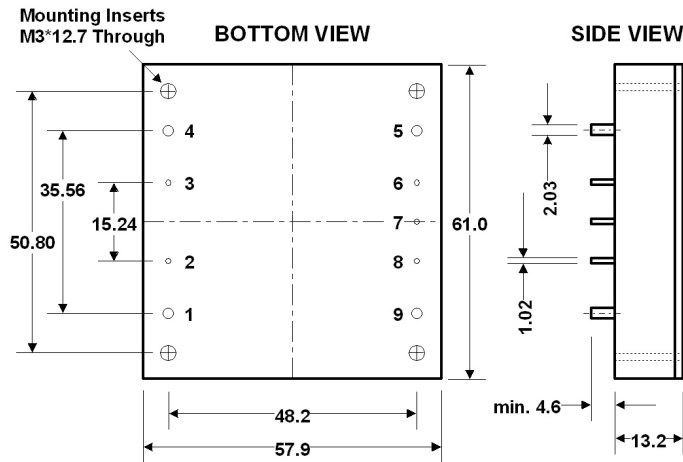
Free space = 12.5 mm min.

Case

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

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

SINGLE OUTPUT ALU baseplate / plastic



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

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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