

## Design and production time for Open Hardware designs

### Design

*V1 is not suitable for series production. Designs need usually two to four versions before being production ready.*

	#versions	Design start	First proto	V1	V2	Final version	P/E to FI	Order series	Preseries	Series	Notes
PFC PCIe FMC carrier	2	10/01/2010		16/09/2010	11/11/2010	11/11/2010					Project cancelled
SPEC PCI FMC carrier	4	22/06/2010	19/01/2011	18/04/2011	01/07/2011	21/11/2011	18/05/2011	17/07/2011	07/03/2012	18/07/2012	Additional preseries needed (assembly quality problem)
SPEC PCI FMC carrier		22/06/2010						13/06/2012	28/11/2012	30/04/2013	Second series, other company
VFC VME FMC carrier	2	03/08/2009		19/10/2010	22/02/2012	22/02/2012					Project cancelled
SVEC VME FMC carrier	2	25/10/2011	15/06/2012	24/10/2012	01/07/2013	01/07/2013	05/09/2012	05/11/2012	08/02/2013	01/11/2013	Additional preseries needed (version problem)
FMC ADC 100M14b4cha	5	23/11/2009		09/06/2010	07/01/2011	19/10/2011	22/07/2011	20/09/2011		04/04/2012	
FMC DEL 1ns 4cha	8	11/06/2010		03/02/2011	31/08/2011	18/06/2013	26/01/2012	07/03/2012	17/08/2012	15/01/2013	
FMC TDC 1ns 5cha	4	14/12/2010		30/05/2011	30/05/2012	13/05/2013		15/11/2012	13/05/2013	01/08/2013	Realistic estimate for delivery series
FMC DIO 5ch ttl a	3	27/05/2011	19/07/2011	15/02/2012	16/11/2012	16/11/2012		13/04/2012		30/09/2012	

#### Notes:

- Board received date, not tested (except series)
- Dates for hardware only. Firmware and drivers not shown.

### Time from design start [months]

*Highly resourced projects take two years from design start to series production. Others need almost three years.*

	#versions	Design start	First proto	V1	V2	Final version	P/E to FI	Order series	Preseries	Series	Notes
PFC PCIe FMC carrier	2	0		9	11	11					
SPEC PCI FMC carrier	4	0	7	10	13	17	11	13	21	25	External company, 3 CERN designers
SPEC PCI FMC carrier		0						24	30	35	
VFC VME FMC carrier	2	0		15	31	31					Collaboration BE-BI, BE-CO. Period with 4 designers on it
SVEC VME FMC carrier	2	0	8	12	21	21	11	13	16	25	External company, 3 CERN designers
FMC ADC 100M14b4cha	5	0		7	14	23	20	22		29	External company, CERN designer
FMC DEL 1ns 4cha	8	0		8	15	37	20	21	27	32	External company, CERN designer
FMC TDC 1ns 5cha	4	0		6	18	29		24	29	32	Collaboration TE-ABT, TE-CRG, BE-CO
FMC DIO 5ch ttl a	3	0	2	9	18	18		11		17	

#### Note:

- Number of months rounded up

### Order to series production [months]

*When components are provided by CERN, it usually still takes a company one year to produce a series. Pre-series are needed.*

	Order series	Preseries	Series	Notes
PFC PCIe FMC carrier		-	-	
SPEC PCI FMC carrier	0	8	13	Components provided by CERN. Two preseries were needed.
SPEC PCI FMC carrier	0	6	11	Few components provided by CERN
VFC VME FMC carrier		-	-	
SVEC VME FMC carrier	0	4	12	Components provided by CERN. Two preseries were needed.
FMC ADC 100M14b4cha	0	-	7	Components provided by CERN. No preseries.
FMC DEL 1ns 4cha	0	6	11	Three component types provided by CERN.
FMC TDC 1ns 5cha	0	6	9	Three component types provided by CERN.
FMC DIO 5ch ttl a	0	-	6	No preseries

#### Notes:

- Number of months rounded up
- Add two months for Price Enquiry
- Production companies tested boards with a Production Test System developed by CERN