

FMC1662M – 8-GSPS 10-bit Single DAC with 2:1 MUX's FMC Module

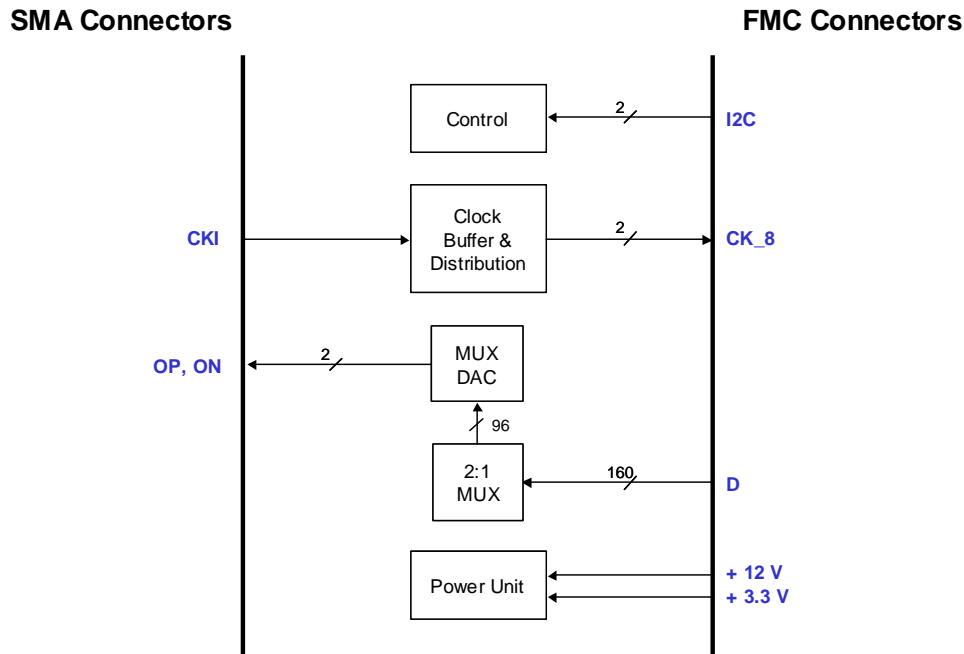
PRODUCT DESCRIPTION

The *FMC1662M* module is equipped with a *Euvis MD662H* digital-to-analog converter (DAC). At 8 GSPS, the module provides analog outputs with bandwidth from DC to 4 GHz (Nyquist bandwidth). The 80 LVDS pairs of digital data are fed through a FMC connector, a high-pin-count (HPC) connector. The digital data multiplexing ratio is 8:1 and the digital data rate is 1 GBPS with the DAC operating at 8 GSPS. The LVDS reset signals of the DAC can be independently controlled via the FMC connector. The module includes a clock buffer to relax the need of high-power clock source. Both amplitude and duty cycle of the clock buffer can be programmed through I²C interface or use factory preset values.

KEY FEATURES

- 10-bit DAC
- 1 ~ 8 GSPS sampling rate
- On-board clock buffers with adjustable gain and duty cycle
- Power supplies needed from carrier: 12V and 3.3 V
- Compliant with Vita 57.1 standard

BLOCK DIAGRAM



ELECTRICAL SPECIFICATIONS

Parameter	Symbol	Min	Typical	Max	Unit
Operating Temperature	T_o		25		°C
Sampling Rate	f_{data}	1	8	8	GSPS
Clock Frequency	f_{CK}	0.5	4	4	GHz
Clock Input Power	P_{CK}	+3	+6	+10	dBm
Output Frequency ¹	f_{out}	0		4	GHz
Output Level ²	V_{out}	-635		0	mV
Output Power	P_{out}	-4		0	dBm
Output Residue Phase Noise ³	N_ϕ			-130	dBc/Hz
Output Port Return Loss	RL_{RF}		15		dB
Power Supply	V_{33}		+3.3		V
	I_{33}		150		mA
	V_{120}		+12		V
	I_{120}		1.6		A

¹Normal operation has usable bandwidth from DC to Nyquist bandwidth, 4 GHz, at 8 GSPS.

²If external 50 Ω loads are terminated to ground, the analog outputs will have voltage swings from ground to -0.6 V with a common mode voltage of -0.3 V. If a positive analog output common mode level is desired, the external 50 Ω loads can be terminated to a positive voltage V_{pull} with a resultant analog output common mode voltage of $(V_{pull} - 0.6)/2$.

V_{pull} should not exceed 5 V.

³10 KHz offset

TERMINAL DESCRIPTION

Name	Function	I/O	Signal
CKI	Input Clock	I	RF
OP	Analog Output Positive	O	RF
ON	Analog Output Negative	O	RF
GND	Ground		DC
D	80 LVDS Pairs of Digital Data Inputs	I	RF
CK_8	LVDS Pair of 1/8 Clock	I	RF
SCK	I ² C Clock	I	RF
SDA	I ² C Data	I/O	RF

SWITCHING CHARACTERISTICS

Parameter	Description	Min	Typ	Max	Units
Data, Reset, CK_8: LVDS Logic					
V _{IH}	Input Voltage High		1.4		V
V _{IL}	Input Voltage Low		1		V
I	Input driving current		2		mA
T _s	Setup time	0.2			ns
T _h	Hold time	0.2			ns
I²C SDA, SCK: LVTTTL33 Logic					
Speed	Standard		100		KHz
	Fast		400		KHz
	High-Speed		3400		KHz
V _{IH}	Input Voltage High	2	3.3		V
V _{IL}	Input Voltage Low		0	1	V
I	Input driving current			±1	uA
C _{in}	Input Capacitance			2	pF
V _{Hys}	Input Hysteresis	0.3			V

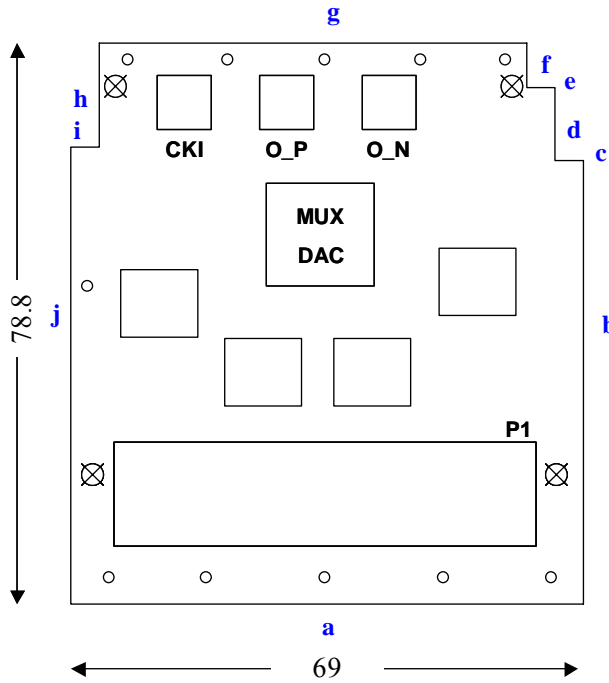
PIN ASSIGNMENT

Signal Name	FMC Pin Name	
MDA_RESETP	HPC_CLK00P	P1.H4
MDA_RESETN	HPC_CLK00N	P1.H5
MDA_SEL1	I ² C I/O Expander	
MDA_SEL2		
MXA_SEL1		
MXB_SEL1		
MXC_SEL1		
MXD_SEL1		
CKD8FP	HPC_CLK01P	P1.G2
CKD8FN	HPC_CLK01N	P1.G3
+12V	12P0V	P1.C35
	12P0V	P1.C37
+3.3V	3P3V	P1.C39
	3P3VAUX	P1.D32
	3P3V	P1.D36
	3P3V	P1.D38
	3P3V	P1.D40

MUXDAC Data		FMC Pin		MUXDAC Data		FMC Pin		MUXDAC Data		FMC Pin	
A11	A	HPC_HB17P	P1.K37	A7	A	HPC_LA27P	P1.C26	A3	A	HPC_LA14P	P1.C18
	B	HPC_HB18N	P1.J36		B	HPC_LA27N	P1.C27		B	HPC_LA14N	P1.C19
B11	A	HPC_HB16P	P1.F34	B7	A	HPC_LA26P	P1.D26	B3	A	HPC_LA11P	P1.H16
	B	HPC_HB16N	P1.F35		B	HPC_LA26N	P1.D27		B	HPC_LA11N	P1.H17
C11	A	HPC_HB19P	P1.E33	C7	A	HPC_LA23P	P1.D23	C3	A	HPC_LA12P	P1.G15
	B	HPC_HB19N	P1.E34		B	HPC_LA23N	P1.D24		B	HPC_LA12N	P1.G16
D11	A	HPC_HB14P	P1.K34	D7	A	HPC_LA18P	P1.C22	D3	A	HPC_LA09P	P1.D14
	B	HPC_HB14N	P1.K35		B	HPC_LA18N	P1.C23		B	HPC_LA09N	P1.D15
A10	A	HPC_HB15P	P1.J33	A6	A	HPC_LA17P	P1.D20	A2	A	HPC_LA10P	P1.C14
	B	HPC_HB15N	P1.J34		B	HPC_LA17N	P1.D21		B	HPC_LA10N	P1.C15
B10	A	HPC_HB12P	P1.F31	B6	A	HPC_HA22P	P1.J21	B2	A	HPC_LA07P	P1.H13
	B	HPC_HB12N	P1.F32		B	HPC_HA22N	P1.J22		B	HPC_LA07N	P1.H14
C10	A	HPC_HB13P	P1.E30	C6	A	HPC_HA23P	P1.K22	C2	A	HPC_LA08P	P1.G12
	B	HPC_HB13N	P1.E31		B	HPC_HA23N	P1.K23		B	HPC_LA08N	P1.G13
D10	A	HPC_HB10P	P1.K31	D6	A	HPC_HA19P	P1.F19	D2	A	HPC_LA05P	P1.D11
	B	HPC_HB10N	P1.K32		B	HPC_HA19N	P1.F20		B	HPC_LA05N	P1.D12
A9	A	HPC_HB11P	P1.J30	A5	A	HPC_HA20P	P1.E18	A1	A	n/a	n/a
	B	HPC_HB11N	P1.J31		B	HPC_HA20N	P1.E19		B	n/a	n/a
B9	A	HPC_HB08P	P1.F28	B5	A	HPC_HA21P	P1.K19	B1	A	n/a	n/a
	B	HPC_HB08N	P1.F29		B	HPC_HA21N	P1.K20		B	n/a	n/a
C9	A	HPC_HB07P	P1.J27	C5	A	HPC_HA18P	P1.J18	C1	A	n/a	n/a
	B	HPC_HB07N	P1.J28		B	HPC_HA18N	P1.J19		B	n/a	n/a
D9	A	HPC_HB06P	P1.K28	D5	A	HPC_HA17P	P1.K16	A0	A	n/a	n/a
	B	HPC_HB06N	P1.K29		B	HPC_HA17N	P1.K17		B	n/a	n/a
A8	A	HPC_HB09P	P1.E27	A4	A	HPC_HA15P	P1.F16	B0	A	n/a	n/a
	B	HPC_HB09N	P1.E28		B	HPC_HA15N	P1.F17		B	n/a	n/a
B8	A	HPC_HB04P	P1.F25	B4	A	HPC_HA16P	P1.E15	C0	A	n/a	n/a
	B	HPC_HB04N	P1.F26		B	HPC_HA16N	P1.E16		B	n/a	n/a
C8	A	HPC_HB04P	P1.F25	D4	A	HPC_HA14P	P1.J15	D0	A	n/a	n/a
	B	HPC_HB04N	P1.F26		B	HPC_HA14N	P1.J16		B	n/a	n/a
D8	A	HPC_HB00P	P1.K25	A3	A	HPC_HA10P	P1.K13	B0	A	n/a	n/a
	B	HPC_HB00N	P1.K26		B	HPC_HA10N	P1.K14		B	n/a	n/a
A7	A	HPC_HB01P	P1.J24	B3	A	HPC_HA11P	P1.J12	C0	A	n/a	n/a
	B	HPC_HB01N	P1.J25		B	HPC_HA11N	P1.J13		B	n/a	n/a
B7	A	HPC_HB05P	P1.E24	C3	A	HPC_HA11P	P1.J12	D0	A	n/a	n/a
	B	HPC_HB05N	P1.E25		B	HPC_HA11N	P1.J13		B	n/a	n/a
C7	A	HPC_HB02P	P1.F22	D3	A	HPC_HA12P	P1.F13	A0	A	n/a	n/a
	B	HPC_HB02N	P1.F23		B	HPC_HA12N	P1.F14		B	n/a	n/a
D7	A	HPC_HB03P	P1.E21	A2	A	HPC_HA13P	P1.E12	B0	A	n/a	n/a
	B	HPC_HB03N	P1.E22		B	HPC_HA13N	P1.E13		B	n/a	n/a
A6	A	HPC_LA32P	P1.H37	B2	A	HPC_HA06P	P1.K10	C0	A	n/a	n/a
	B	HPC_LA32N	P1.H38		B	HPC_HA06N	P1.K11		B	n/a	n/a
B6	A	HPC_LA33P	P1.G36	C2	A	HPC_HA07P	P1.J9	D0	A	n/a	n/a
	B	HPC_LA33N	P1.G37		B	HPC_HA07N	P1.J10		B	n/a	n/a
C6	A	HPC_LA30P	P1.H34	D2	A	HPC_HA09P	P1.E9	A0	A	n/a	n/a
	B	HPC_LA30N	P1.H35		B	HPC_HA09N	P1.E10		B	n/a	n/a
D6	A	HPC_LA30P	P1.H34	A1	A	HPC_HA08P	P1.F10	B0	A	n/a	n/a
	B	HPC_LA30N	P1.H35		B	HPC_HA08N	P1.F11		B	n/a	n/a
A5	A	HPC_LA31P	P1.G33	B1	A	HPC_HA04P	P1.F7	C0	A	n/a	n/a
	B	HPC_LA31N	P1.G34		B	HPC_HA04N	P1.F8		B	n/a	n/a
B5	A	HPC_LA28P	P1.H31	C1	A	HPC_HA05P	P1.E6	D0	A	n/a	n/a
	B	HPC_LA28N	P1.H32		B	HPC_HA05N	P1.E7		B	n/a	n/a
C5	A	HPC_LA29P	P1.G30	D1	A	HPC_HA02P	P1.K7	A0	A	n/a	n/a
	B	HPC_LA29N	P1.G31		B	HPC_HA02N	P1.K8		B	n/a	n/a
D5	A	HPC_LA24P	P1.H28	A2	A	HPC_HA03P	P1.J6	B0	A	n/a	n/a
	B	HPC_LA24N	P1.H29		B	HPC_HA03N	P1.J7		B	n/a	n/a
A4	A	HPC_LA25P	P1.G27	B2	A	HPC_HA00P	P1.F4	C0	A	n/a	n/a
	B	HPC_LA25N	P1.G28		B	HPC_HA00N	P1.F5		B	n/a	n/a
B4	A	HPC_LA21P	P1.H25	C2	A	HPC_HA01P	P1.E2	D0	A	n/a	n/a
	B	HPC_LA21N	P1.H26		B	HPC_HA01N	P1.E3		B	n/a	n/a
C4	A	HPC_LA22P	P1.G24	D2	A	HPC_LA15P	P1.H19	A0	A	n/a	n/a
	B	HPC_LA22N	P1.G25		B	HPC_LA15N	P1.H20		B	n/a	n/a
D4	A	HPC_LA20P	P1.G21	A3	A	HPC_LA16P	P1.G18	B0	A	n/a	n/a
	B	HPC_LA20N	P1.G22		B	HPC_LA16N	P1.G19		B	n/a	n/a
A3	A	HPC_LA19P	P1.H22	B3	A	HPC_LA13P	P1.D17	C0	A	n/a	n/a
	B	HPC_LA19N	P1.H23		B	HPC_LA13N	P1.D18		B	n/a	n/a

BOARD OUTLINE AND DIMENSIONS

TOP VIEW



All dimensions use the bottom left corner of the board as the origin. All dimensions are in millimeters (mm). Board thickness is 1.62 mm.

Board Edge Lengths

Edge	Length	Edge	Length	Edge	Length
a	69	b	61.7	c	2.4
od	9.1	e	2.1	f	8
g	61	h	21.9	i	3
j	56.9	Width	69	Height	78.8

⊗ **FMC Connector Mount Hole Locations (x, y)**

73, 18.4	136, 18.4	3, 18.4	66, 18.4
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SMA Locations (x, y)

CKI	118.6, 69.3
OA_P	61.7, 69.3
OA_N	92.1, 69.3

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