10.7Gb/s Trans-Impedance Amplifier

FMM3310X

FEATURES

- High Trans-Impedance Gain (Typ. 1200Ω)
- Complementary 50Ω Outputs
- Low Group Delay (<26ps@10GHz)
- Via Hole Ground
- Single -5.2V Power Supply
- With DC Feed Back Circuit

DESCRIPTION

The FMM3310X is a Trans-Impedance Amplifier for OC-192 applications.
This device has a very high trans-impedance gain and complementary 50Ω output.

ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

Parameter	Symbol	Ratings	Unit
Supply Voltage	V_{EE}	-7.0 to +0.5	V
Input Current	I_{in}	2.5	mApp
Storage Temperature	T_{stg}	-55 to +125	°C

ELECTRICAL CHARACTERISTICS(DC) (Tc=25°C, VEE=-5.2V, RL=50Ω)

Parameter	Symbol	Test Conditions	Limit			Unit
			Min.	Typ.	Max.	
Power Supply Current	I_{EE}	Iin=0mA	90	115	135	mA
Input Voltage	Vin	Iin=0mA	-3.1	-2.7	-2.5	V
Output Voltage	Vout	Iin=0mA Vout+=Vout-	-0.5	-0.4	-0.3	V
Output Signal Clipping Level	Vsat	Iin=0 to 1.3mApp	500	-	800	mVpp

ELECTRICAL CHARACTERISTICS(RF) (Tc=80°C, VEE=-5.2V, RL=50Ω)

Parameter	Symbol	Test Conditions	Limit			Unit
			Min.	Typ.	Max.	
Trans-Impedance Band Width	BW	-3dB from 500MHz	9.5	-	16.0	GHz
Input Impedance	Zin	500MHz to 10GHz	15	30	55	Ω
Single-Ended Output Return Loss	S_{22}	500MHz to 10GHz	-	-12	-10	dB
		10GHz to 12GHz	-	-	-8	
Trans-Impedance Gain	Zt	@500MHz	1000	1200	1650	Ω
Input Equivalent Noise Current Density	I_{ni}	500MHz to 10GHz	-	-	30	$pA/\sqrt{Hz}$
Group Delay	GD	500MHz to 10GHz	-	-	26	ps
Logic Sense (Note 1)		DATA Input current = "High" DATAout+ = "High" DATAout- = "Low"				

Note 1: DATAout(+/-) must be terminated with DC-coupled 50Ω

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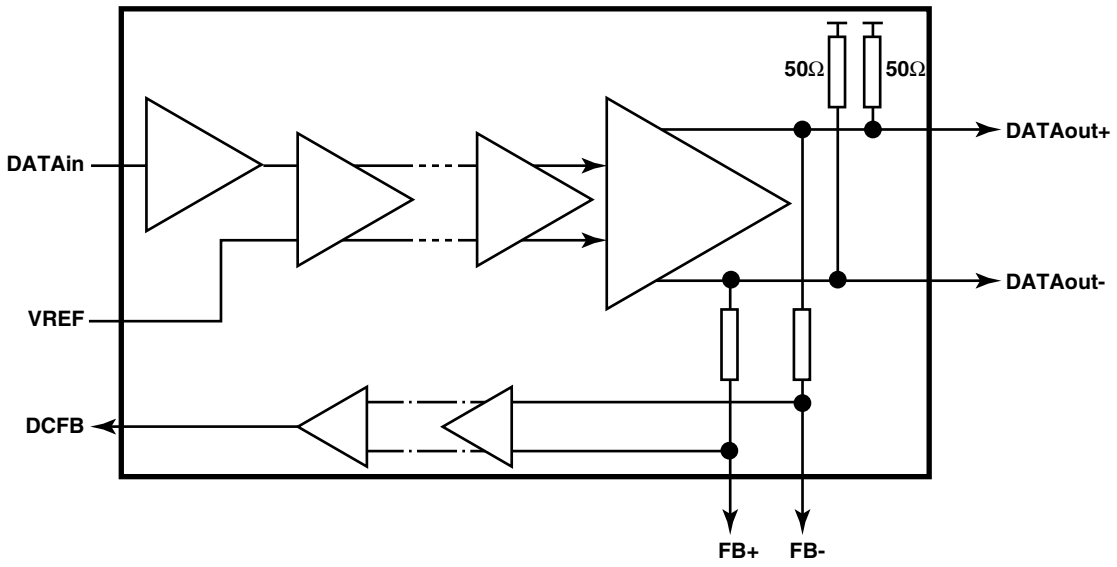
RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	Test Conditions	Limit			Unit
			Min.	Typ.	Max.	
Supply Voltage	V_{EE}		-5.46	-	-4.94	V
Chip Back Side Temperature	T_C		0	-	+80	°C

Block Diagram



Location of PAD Center

Pad Name	Location of PAD Center(X,Y)	PAD Size(X,Y)	Pad Name	Location of PAD Center(X,Y)	PAD Size(X,Y)
(01)VREF	(0,5)	(100,100)	(10)GND	(820,1000)	(100,100)
(02)GND	(420,0)	(100,100)	(11)GND	(430,1000)	(100,100)
(03)DATAin	(625,0)	(193,100)	(12)DATAout+	(225,1000)	(193,100)
(04)GND	(830,0)	(100,100)	(13)GND	(20,1000)	(100,100)
(05)NC	(1250,155)	(100,100)	(14)DCFB	(0,605)	(100,100)
(06)VEE	(1250,580)	(100,243)	(15)FB-	(0,455)	(100,100)
(07)GND	(1250,810)	(100,100)	(16)FB+	(0,305)	(100,100)
(08)GND	(1230,1000)	(100,100)	(17)GND	(0,155)	(100,100)
(09)DATAout-	(1025,1000)	(193,100)			

NC: No Connect
GND pads are connected to backside metal.

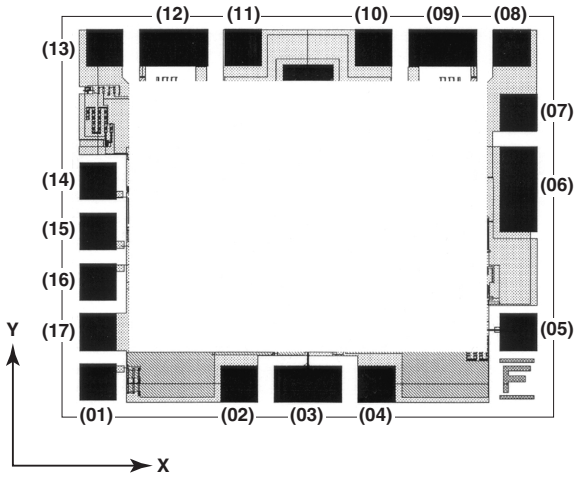
Unit: μm

Pin Assignment

Pin Description

Pin Name	Pin No.	Description
VREF	1	Complementary Data Input
GND	2	Ground
DATAin	3	Data Input
GND	4	Ground
NC	5	No Connect
VEE	6	Supply Voltage
GND	7	Ground
GND	8	Ground
DATAout-	9	DATA Output (-)
GND	10	Ground
GND	11	Ground
DATAout+	12	DATA Output (+)
GND	13	Ground
DCFB	14	Output of DC Feed Back
FB-	15	Input of DC Feed Back (-)
FB+	16	Input of DC Feed Back (+)
GND	17	Ground

CHIP OUTLINE



IC Chip Size(XxY):	**1.44mm x 1.22mm (min.) 1.58mm x 1.36mm (max.)**
IC Chip Thickness:	**0.105mm (typ.)**
Backside Metal:	**Au**
Pad Metal:	**Au**

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CAUTION

Fujitsu Compound Semiconductor Products contain **gallium arsenide (GaAs)** which can be hazardous to the human body and the environment. For safety, observe the following procedures:

- **Do not put this product into the mouth.**
- **Do not alter the form of this product into a gas, powder, or liquid through burning, crushing, or chemical processing as these by-products are dangerous to the human body if inhaled, ingested, or swallowed.**
- **Observe government laws and company regulations when discarding this product. This product must be discarded in accordance with methods specified by applicable hazardous waste procedures.**

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