

# 10.0Gb/s Trans-Impedance Amplifier

# FMM3307X

## FEATURES

- High Trans-Impedance Gain (Typ. 1100Ω)
- Complementary 50Ω Outputs
- Low Group Delay (<18ps@10GHz)
- Via Hole Ground
- Single -5.2V Power Supply
- DC Feed Back Circuit

## DESCRIPTION

The FMM3307X 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	$I_{EE}$	lin = 0mA	90	115	135	mA
Input Voltage	$V_{in}$		-3.1	-2.7	-2.5	V
Output Voltage	$V_{out}$	lin = 0mA, Vout+ = Vout-	-0.5	-0.4	-0.3	V
Output Signal Clipping Level	$V_{sat}$	lin = 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	7.0	-	12.0	GHz
Input Impedance	$Z_{in}$	500MHz to 8GHz	15	30	60	Ω
Single-Ended Output Return Loss	$S_{22}$	500MHz to 8GHz	-	-14	-10	dB
Trans-Impedance Gain	$Z_t$	@500MHz	800	1100	1800	Ω
Input Equivalent Noise Current Density	$I_{ni}$	500MHz to 8GHz	-	16	22	$pA/\sqrt{Hz}$
Group Delay	GD	500MHz to 5.5GHz	-	10	14	ps
		5.5GHz to 10GHz	-	15	18	
Logic Sense (Note 1)		DATA Input current = "High" DATAout+ = "High" DATAout- = "Low"				

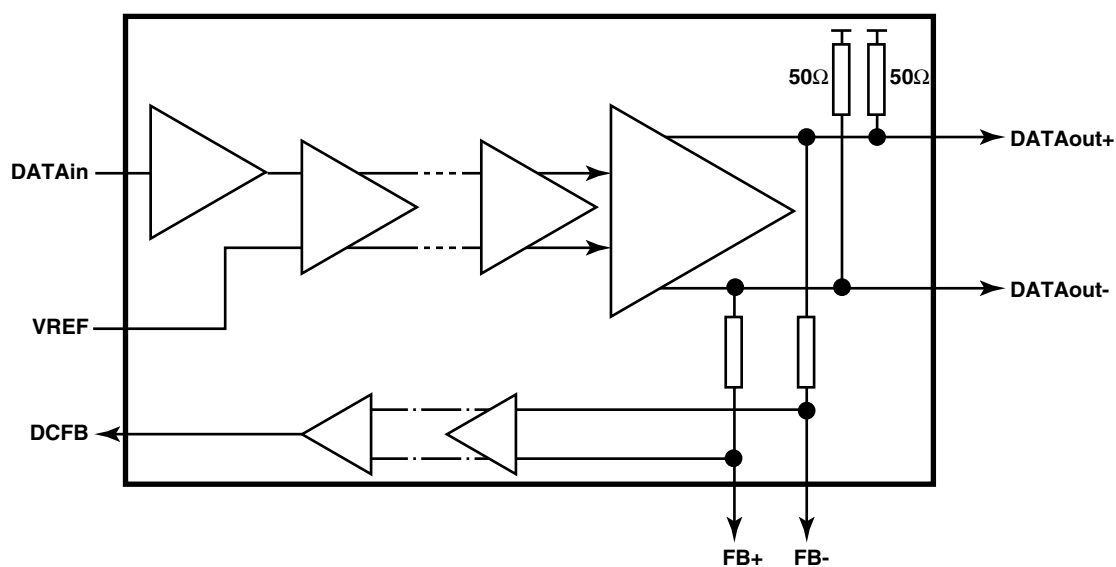
Note 1: The DATAout(+/-) must be terminated with DC-coupled 50Ω connection.

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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

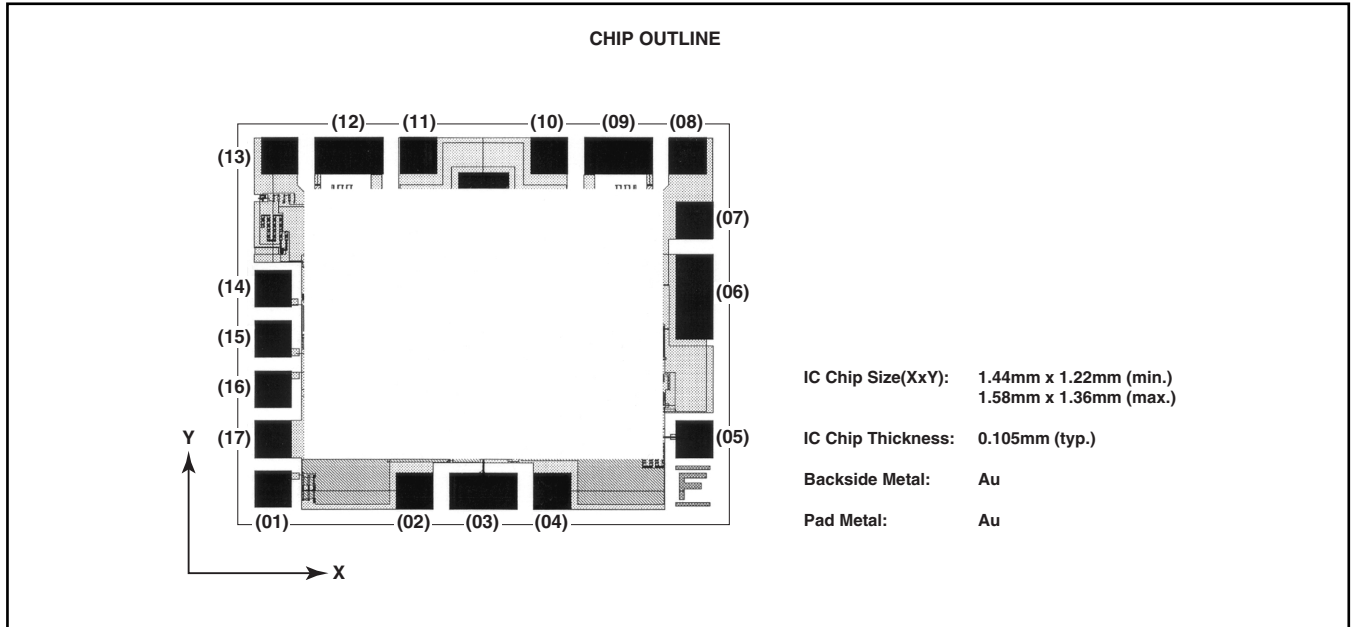
GND pads are connected to backside metal.

Unit:  $\mu\text{m}$

## 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



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Printed in U.S.A. FCSI012002M200