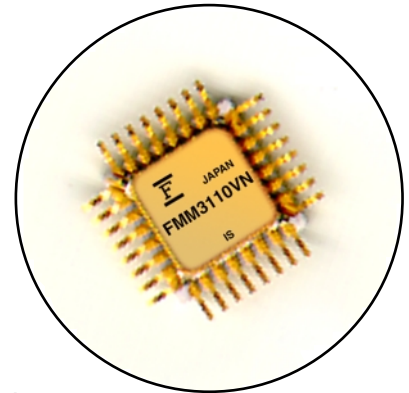


## FEATURES

- Operation DC to 10.7Gb/s, (NRZ)
- Internal Input 50Ω Termination
- Output Voltage Swing: 1.5Vpp to 2.5Vpp.
- Peak Current Adjustment
- SCFL Compatible Differential Input
- Single -6.8V Power Supply
- Duty Ratio Adjustment
- Output Offset Control Adjustment
- 6mm x 6mm 32 Pin Hermetic Seal Package



## DESCRIPTION

The FMM3110VN is a 10.7Gb/s(OC-192) driver with an output voltage of 2.5Vpp for the Modulator Integrated (MI)-Laser. This product is uniquely suited for use as a driver for MI-Lasers such as FLD3F10NP, FLD5F10NP, and FLD5F20NP. The output is adjustable for peak current, duty ratio, and offset voltage/current. This product features an internal 50Ω termination at both high-speed differential inputs for ease of design and use.

## ABSOLUTE MAXIMUM RATINGS (V<sub>DD</sub> = 0V, T<sub>a</sub>=25°C)

Parameter	Symbol	Ratings	Unit
Supply Voltage	V <sub>SS</sub>	-8.0 to 0.0	V
Input Voltage	V <sub>IN</sub>	-2.0 to 0.5	V
Power Supply Current	I <sub>SS</sub>	500	mA
Peak Current Control Voltage	V <sub>IP</sub>	V <sub>SS</sub> -1.20 to V <sub>SS</sub> +0.75	V
Duty Control Voltage	V <sub>dut</sub>	V <sub>SS</sub> -1.20 to V <sub>SS</sub> +1.50	V
Output Voltage	V <sub>out</sub>	-3.5 to 0.5	V
Output Offset Control Voltage	V <sub>ib1,2</sub>	-11.0 to 5.5	V
Output Offset Control Current	I <sub>b1,2</sub>	50	mA
Storage Temperature	T <sub>stg</sub>	-55 to 125	°C

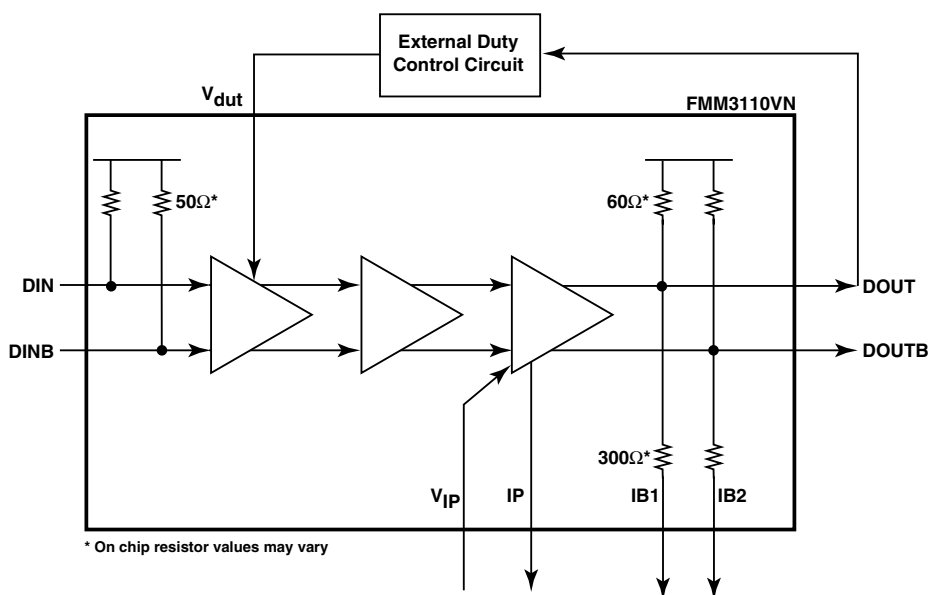
## ELECTRICAL CHARACTERISTICS (Unless otherwise specified, T<sub>c</sub>=25°C, V<sub>SS</sub>=-6.80V, R<sub>L</sub>=50Ω)

Parameter	Symbol	Test Conditions	Limit			Unit
			Min.	Typ.	Max.	
Maximum Data Rate		NRZ	10.7	-	-	Gb/s
Power Supply Current	I <sub>ss</sub>	I <sub>P</sub> = 0mA	-	170	280	mA
Rise Time	t <sub>r</sub>	Dout=2.5Vpp 20% to 80%	-	-	40	ps
Fall Time	t <sub>f</sub>		-	-	40	ps
Output Voltage High	V <sub>oh</sub>	I <sub>B1</sub> =I <sub>B2</sub> =0 to 32.5mA	-0.75	-	0.00	V
Output Voltage Low	V <sub>ol</sub>	I <sub>B1</sub> =I <sub>B2</sub> =0 to 32.5mA	-3.25	-	-	V
Output Voltage Swing(max.)	V <sub>o-pp</sub>	V <sub>ip</sub> =V <sub>ss</sub> to V <sub>ss</sub> +0.7V	2.50	-	-	Vpp
Output Voltage Swing(min.)	V <sub>o-pp</sub>	V <sub>ip</sub> =V <sub>ss</sub>	-	-	2.00	Vpp
Output Termination	R <sub>out</sub>	V <sub>ss</sub> =V <sub>IP</sub> =V <sub>ib</sub> =open	54	60	66	Ω
Jitter RMS (OUT)	Jitter	V <sub>out</sub> =2.5Vpp at 65% cross	-	-	3.0	ps

## RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	Test Conditions	Limit			Unit
			Min.	Typ.	Max.	
Supply Voltage	V <sub>SS</sub>		-7.14	-6.80	-6.46	V
Input Data Level High	V <sub>IH</sub>		-0.02	0.00	0.00	V
Input Data Level Low	V <sub>IL</sub>		-1.20	-0.90	-0.50	V
Peak Current Control Voltage	V <sub>IP</sub>		V <sub>SS</sub>	-	V <sub>SS</sub> +0.7	V
Output Offset Control Voltage	V <sub>ib1,2</sub>		-10.0	-	0.0	V
Output Offset Control Current	I <sub>b1,2</sub>		0.0	-	32.5	mA
Duty Control Voltage	V <sub>dut</sub>	Duty = +65%	V <sub>SS</sub>	-	V <sub>SS</sub> +1.4	V
Case Temperature	T <sub>C</sub>		0.0	-	75	°C

Block Diagram

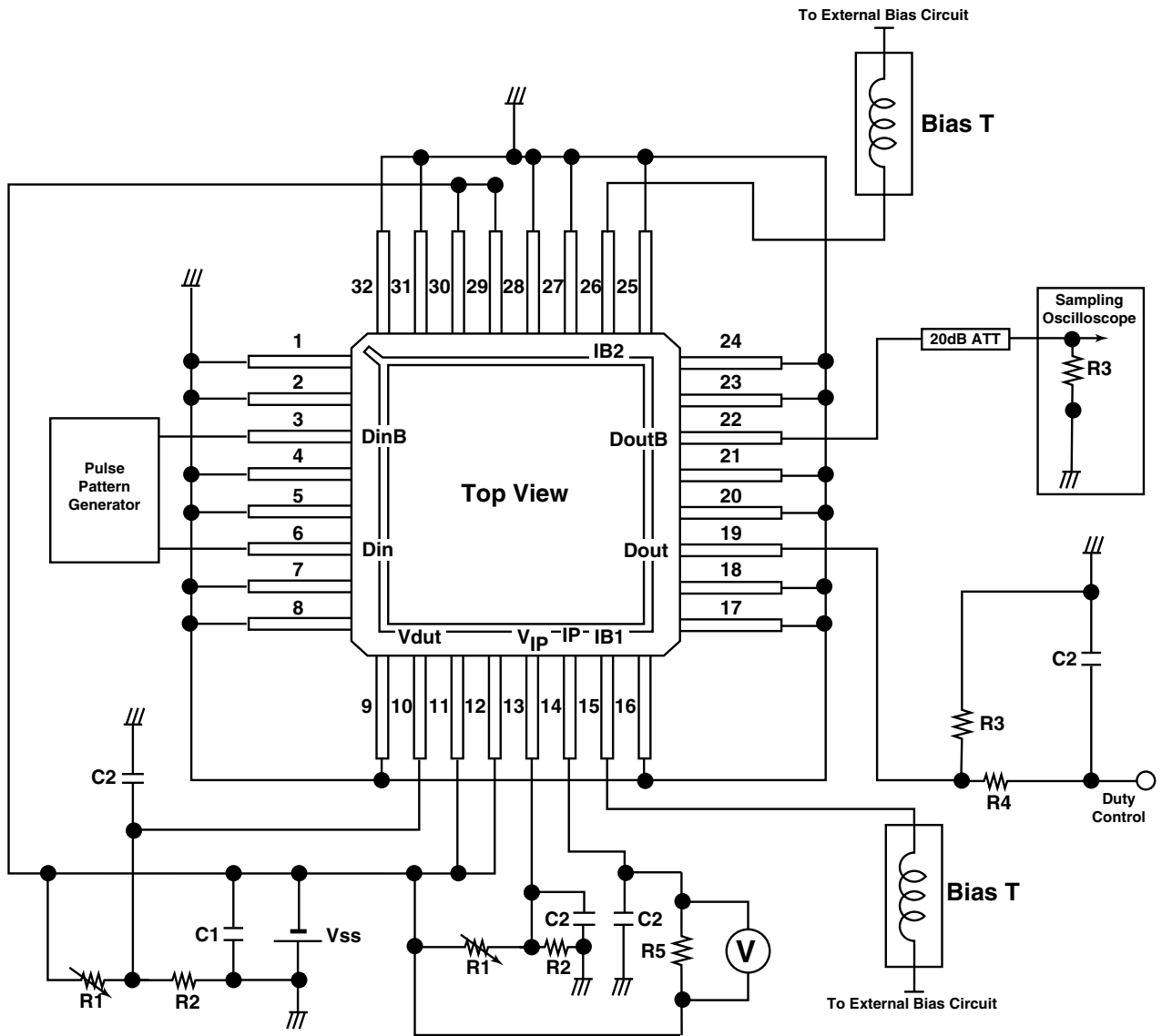


Truth Table For DOUT & DOUTB

DIN	DINB	DOUT	DOUTB	Optical Output from MI-LD at DOUT	Optical Output from MI-LD at DOUTB
0	1	1	0	1	0
1	0	0	1	0	1

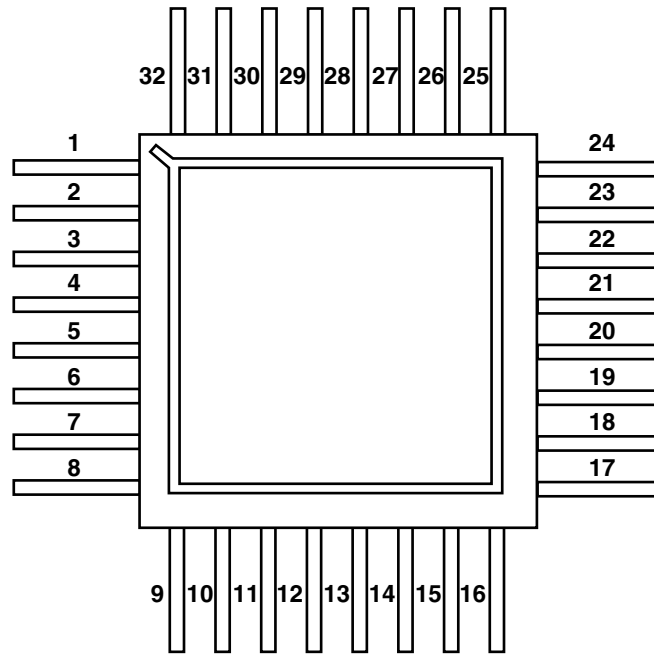
The output polarity is determined by the optical output. The electrical output polarity is inverted as shown in the above truth table.

**Test Circuit**



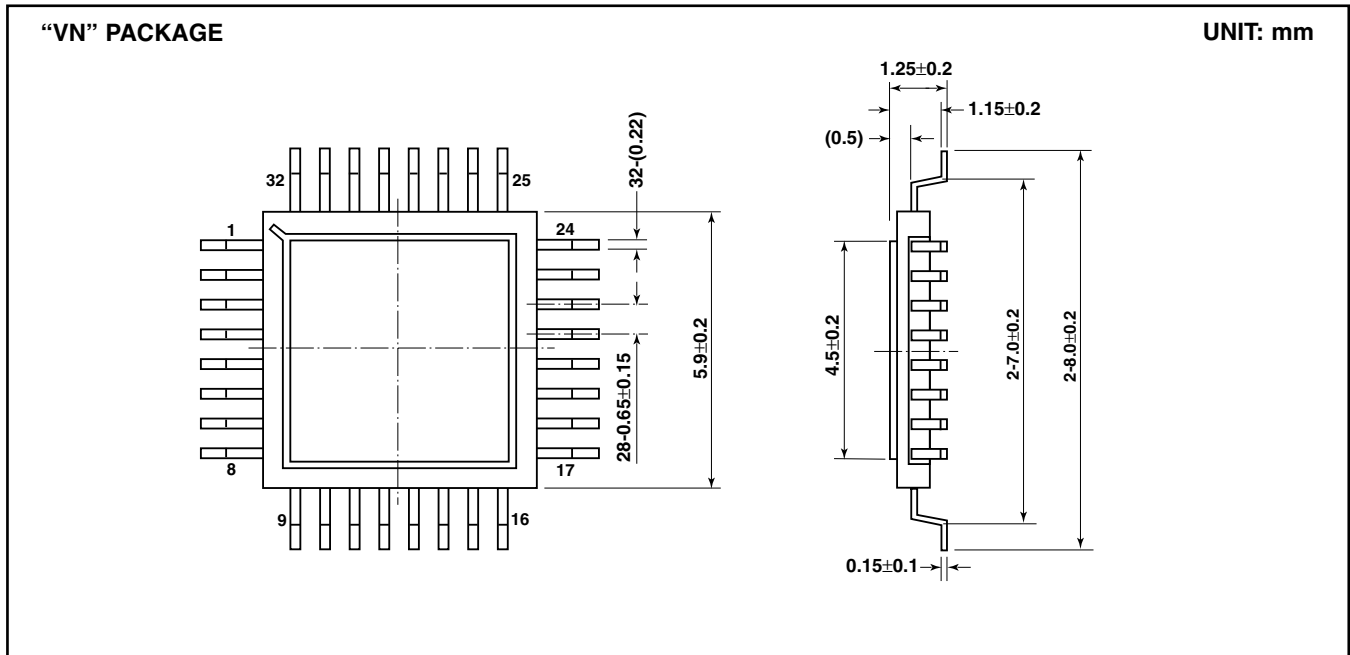
- C1: 0.03 $\mu$ F
- C2: 0.068 $\mu$ F
- R1: 0 to 100 $\Omega$ (10 turns)
- R2: 500 $\Omega$
- R3: 50 $\Omega$
- R4: 1000 $\Omega$
- R5: 1.0 $\Omega$

FMM3110VN Pin Assignment



Pin Description

Pin Name	Pin No.	Description	Pin Name	Pin No.	Description
GND	1	Ground	GND	17	Ground
GND	2	Ground	GND	18	Ground
DinB	3	Complementary Data Input	Dout	19	Data Output
GND	4	Ground	GND	20	Ground
GND	5	Ground	GND	21	Ground
Din	6	Data Input	DoutB	22	Complementary Data Output
GND	7	Ground	GND	23	Ground
GND	8	Ground	GND	24	Ground
GND	9	Ground	GND	25	Ground
Vdut	10	Duty Control Voltage	IB2	26	DoutB Offset Control Current 2 (for DoutB)
Vss	11	Supply Voltage (-6.8V)	GND	27	Ground
Vss	12	Supply Voltage (-6.8V)	GND	28	Ground
V <sub>IP</sub>	13	Peak Current Control Voltage	Vss	29	Supply Voltage (-6.8V)
IP	14	Peak Current Monitor (Vss)	Vss	30	Supply Voltage (-6.8V)
IB1	15	Dout Offset Control Current 1 (for Dout)	GND	31	Ground
GND	16	Ground	GND	32	Ground



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Printed in U.S.A. FCSI0801M200