

Target Specification

VSC7934

Single Supply 2.5 Gb/s
Voltage Driver

Features

- Rise Times Typically 100ps
- High Speed Operation (Up to 2.5 Gb/s NRZ Data)
- 3 Volt Output Voltage Compliance
- Single-ended or Differential Input Operation
- Single Power Supply, 5 Volt or 5.2 Volts
- Direct Access to Modulation and Bias FET's

Introduction

The VSC7934 is a single 5V supply, 2.5Gb/s voltage driver with direct access to the output modulation and bias FET's. The output stage can drive 60 mA into 50 Ohms with adequate output voltage compliance. Output bias and modulation currents are set by external components allowing precision monitoring and setting of the voltage levels.

Applications

- SONET OC12, OC24, OC48, SDH16
- Full Speed Fibre Channel (1.062 Gb/s)

VSC7934 Block Diagram

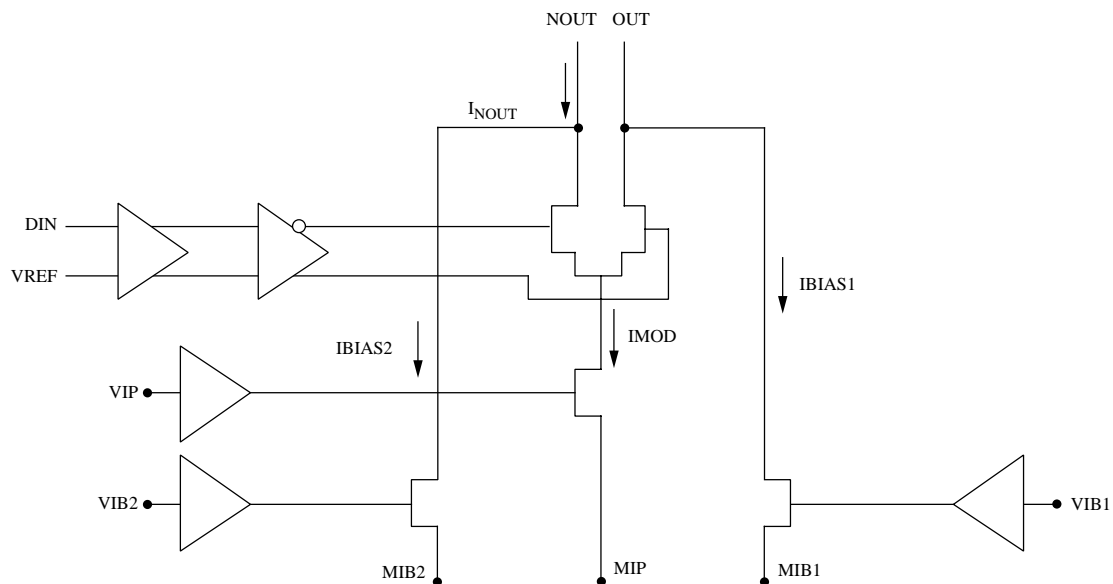


Table 1: Signal Pin Reference

<i>Signal</i>	<i>Type</i>	<i>Level</i>	<i># Pins</i>	<i>Description</i>
DIN	In	AC	1	Data Input
VREF	In	DC	1	Data Input Reference
OUT	Out	AC	1	Laser Modulation Current Output
NOUT	Out	AC	1	Laser Modulation Current Output (Complementary)
VSS	Pwr	Pwr	2	Negative Voltage Rail
GND	Pwr	Pwr	12	Positive Voltage Rail
VIP	In	DC	1	Modulation Control Node
MIP	In	DC	1	Modulation Monitor Node
VIB	In	DC	2	Bias Control Node
MIB	In	DC	2	Bias Monitor Node
Total Pins			24	

Table 2: Absolute Maximum Ratings

<i>Symbol</i>	<i>Rating</i>	<i>Limit</i>
V_{SS}	Negative Power Supply Voltage	V_{CC} to -6.0V
T_j	Maximum Junction Temperature	-55°C to + 125°C
T_{stg}	Storage Temperature	-65°C to +150°C

Table 3: Recommended Operating Conditions

<i>Symbol</i>	<i>Parameter</i>	<i>Min</i>	<i>Typ</i>	<i>Max</i>	<i>Units</i>	<i>Conditions</i>
GND	Positive Voltage Rail		0		V	
VSS	Negative Voltage Rail	-5.5	-5.2	-4.75	V	
VIH	HIGH Level Input Voltage	-1.0	-0.9	—	V	VREF = -1.3V
VIL	LOW Level Input Voltage	—	-1.7	-1.6	V	VREF = -1.3V
VIB1 VIB2	BIAS Control Voltages	VSS		VSS +1.1	V	
VIP	Modulation Control Voltage	VSS		VSS +1.8	V	
θ_{jc}	Thermal Resistance Junction to Case		25		°C/W	
T_j	Operational Junction Temperature			120	°C	

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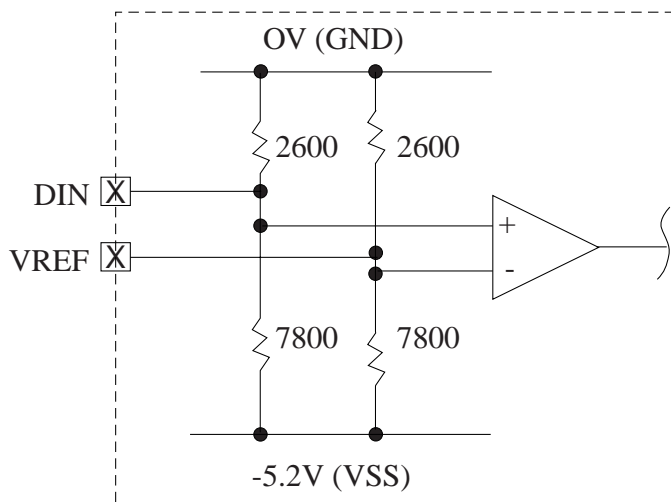
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Table 4: Electrical Specifications (Tc = 25°C, VSS = -5.2V, RL = 50Ω, at $\overline{\text{OUT}}$ Pin)

Symbol	Parameter	Min	Typ	Max	Units	Conditions
I_{NOUT}	Maximum Peak Current	60	—	—	mA	VIP = -4.1V VIB1 = -5.2V VIB2 = -5.2V DIN = "Lo"
I_{NOUT}	Maximum Peak Current	—	—	4	mA	VIP = -4.1V VIB1 = -5.2V VIB2 = -5.2V DIN = "Hi"
$I_{\text{BIAS1}},$ I_{BIAS2}	Maximum Bias Current	30	—	—	mA	VIB2 = -3.4V VIB1 = -5.2V VIP = -5.2V
	Rise Time	—	100	—	ps	20% to 80%
	Fall Time	—	100	—	ps	20% to 80%
VREF	Reference Voltage	—	-1.3	—	V	
	Output Voltage	—	—	-3.0	V	VIP = -4.1V VIB1 = -5.2V VIB2 = -5.2V DIN = "Lo"
I_{VSS}	Power Supply Current (VSS)		90		mA	VSS = -5.2V VIP = -5.2V VIB1 = -5.2V VIB2 = -5.2V

Input Termination Schemes

Figure 1: Input Structure



- Nominal VREF = -1.3V
- 2600, 7800 Ohm Resistors on die, nominal values

Figure 2: Single Ended AC Coupled

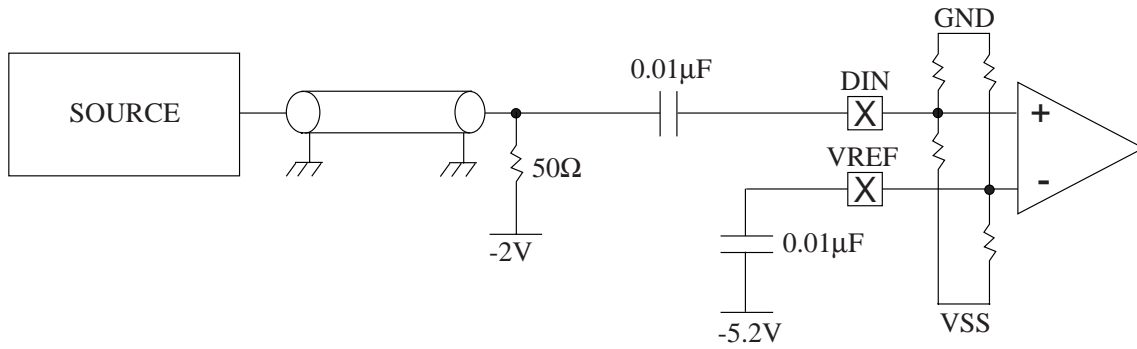


Figure 3: Differential AC Coupled

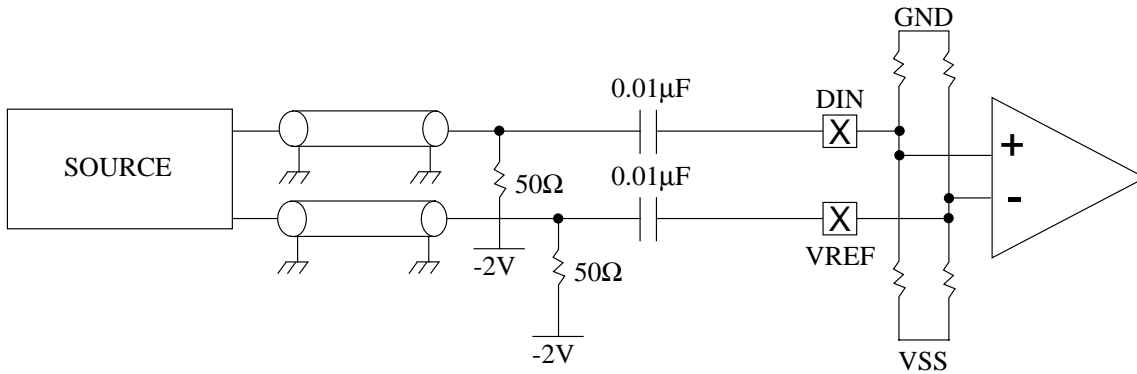
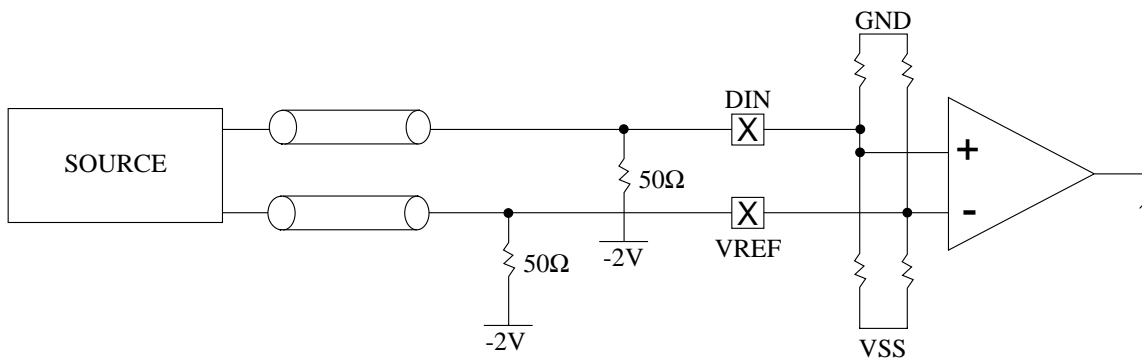


Figure 4: Differential DC Coupled



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Figure 5: Single Ended AC Coupled with Offset Adjust

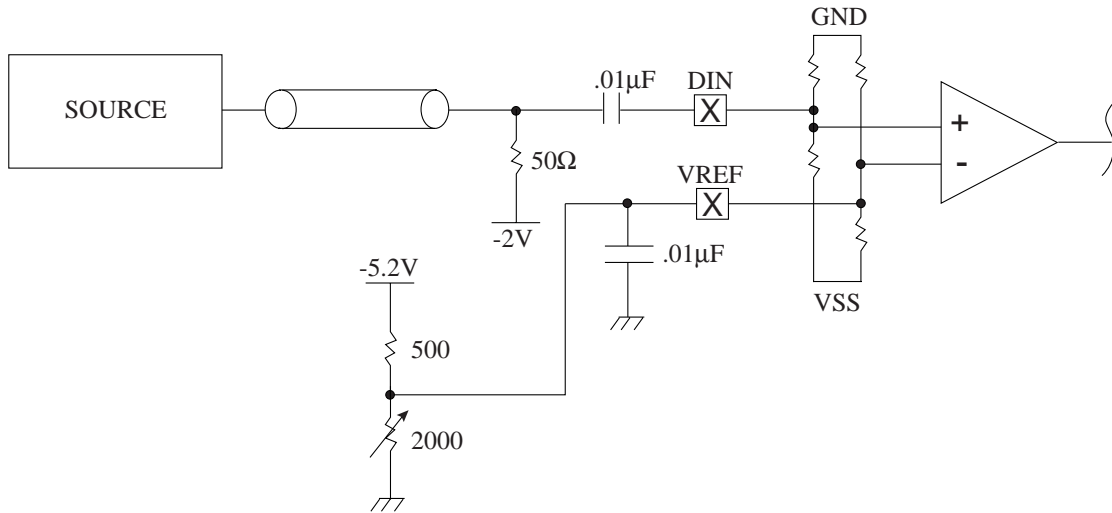
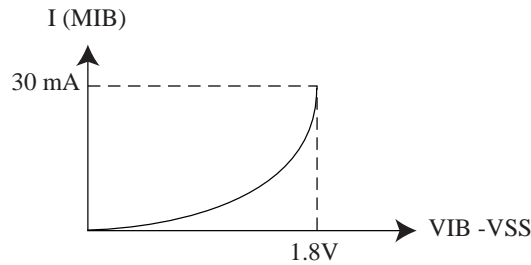
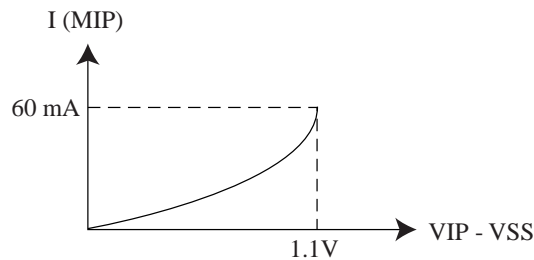


Figure 6: Control Signals VIP and VIB

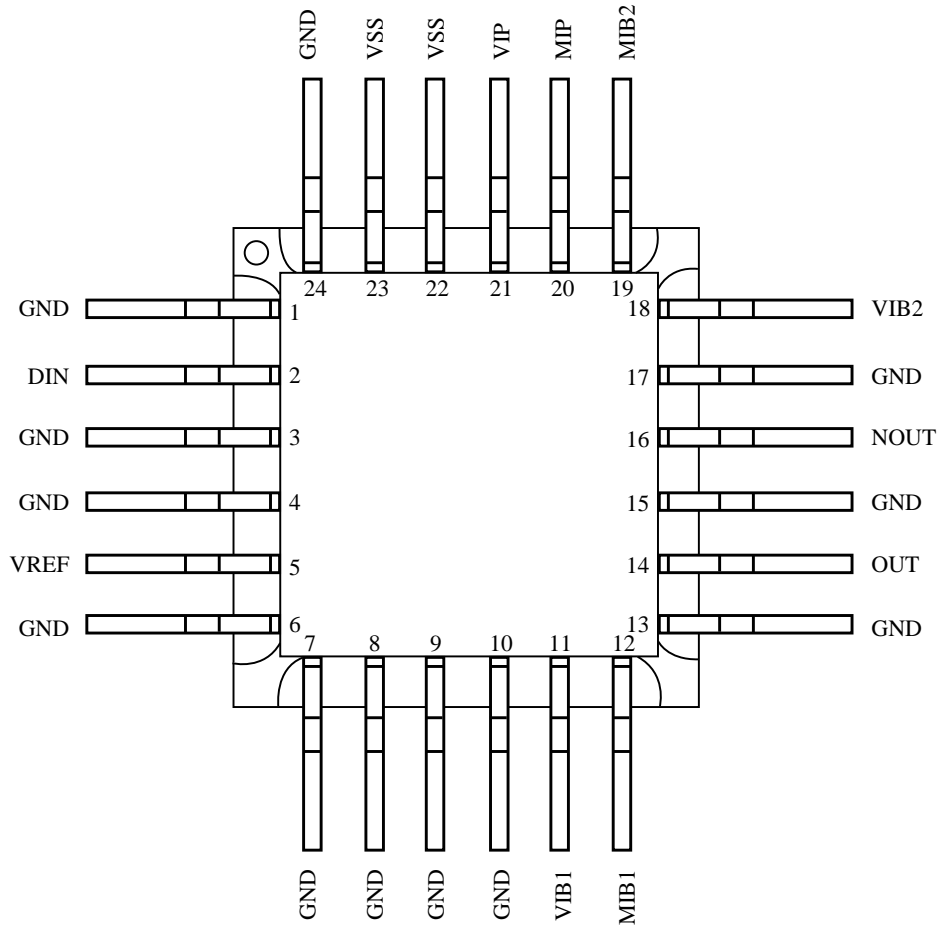


Typical Bias Current v.s. Bias Voltage



Typical Modulation Current v.s. Modulation Voltage

Pin Diagram

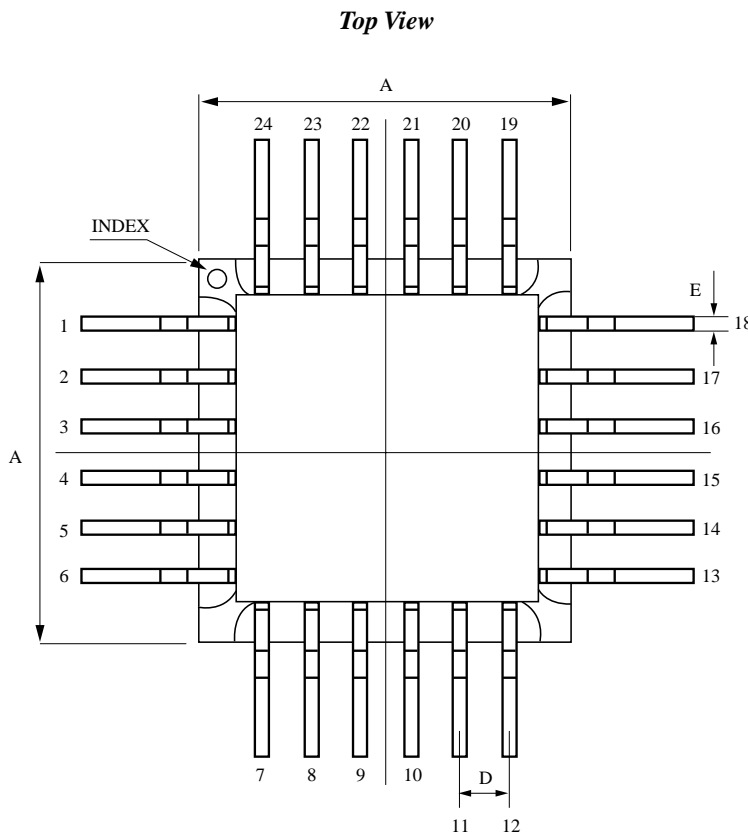


Note: Package lid and bottom heat spreader are electrically connected to GND within the package.

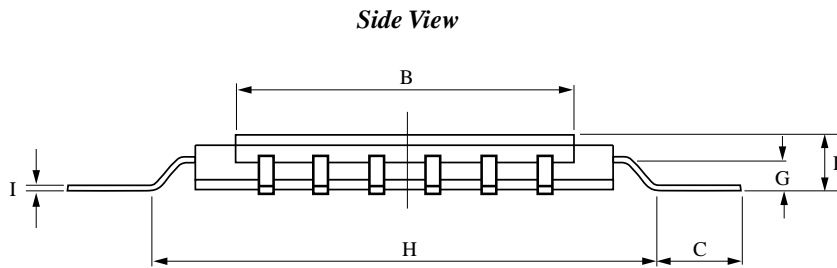
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Package Information



Key	mm	In
A	9.5	0.374
B	7.7	0.303
C	2.0	0.079
D	1.27	0.050
E	0.30	0.012
F	1.7	0.067
G	0.6	0.024
H	11.5	0.453
I	0.125	0.005



NOTES: Drawing not to scale.

Notice

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