

Preliminary Datasheet

VSC7925

SDH/SONET 2.5Gb/s
Laser Diode Driver

Features

- Rise Times Less Than 100ps
- High Speed Operation (Up to 2.5Gb/s NRZ Data)
- Single-ended Inputs
- Single Supply
- Direct Access to Modulation and Bias FET's
- Data Density Monitors
- On-chip Reclocking Register

Introduction

The VSC7925 is a single 5V supply, 2.5Gb/s laser diode driver with direct access to the laser modulation and bias FET's. Laser bias and modulation currents are set by external components allowing precision monitoring and setting of the current levels. Data density outputs are provided to allow the user to adjust the laser bias in high unbalanced data applications. Clock and data inputs have nominal 50 Ohm termination resistors and high frequency decoupling capacitors.

Applications

- SDH/SONET @ 622Mb/s, 1.244Gb/s, 2.488Gb/s
- Full Speed Fibre Channel (1.062 Gb/s)

VSC7925 Block Diagram

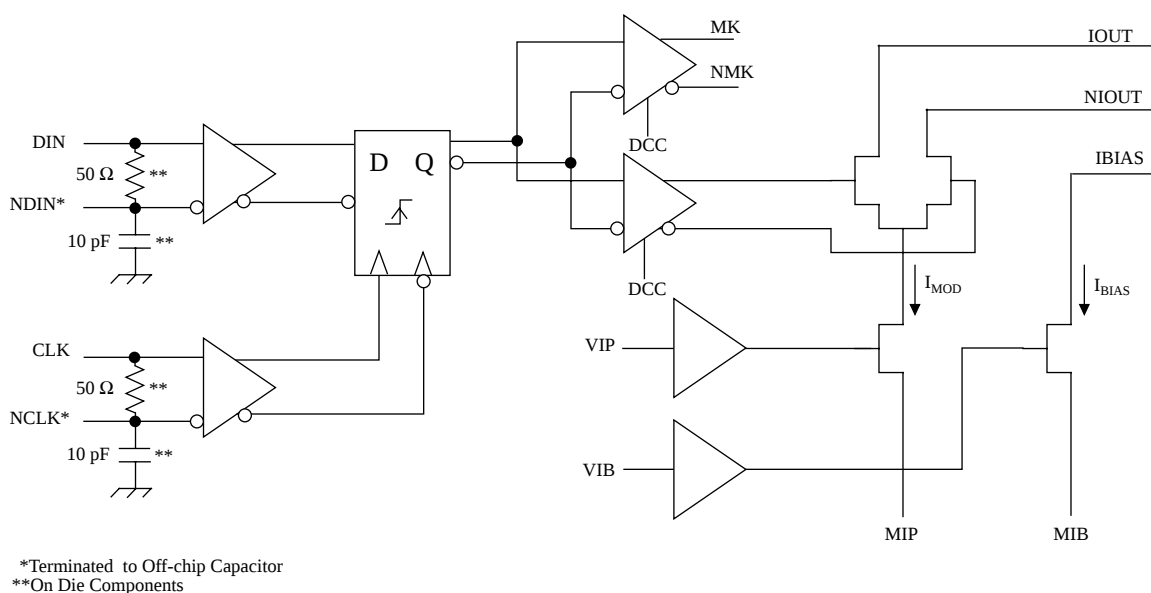


Table 1: Signal Pin Reference

<i>Signal</i>	<i>Type</i>	<i>Level</i>	<i># Pins</i>	<i>Description</i>
DIN, NDIN	In		2	Data Input and Data Reference
MK, NMK	Out	ECL	2	Data Density Differential Outputs
NIOUT	Out		1	Laser Modulation Current Output (Complementary)
IOUT	Out		1	Laser Modulation Current Output (To Laser Cathode)
VSS	Pwr	Pwr	4	Negative Voltage Rail
GND	Pwr	Pwr	6	Positive Voltage Rail
VIP	In	DC	1	Modulation Gate Node
MIP	In	DC	1	Modulation Source Node
VIB	In	DC	1	Bias Gate Node
MIB	In	DC	1	Bias Source Node
IBIAS	Out	DC	1	Laser Bias Output (To Laser Cathode)
CLK, NCLK	In		2	Clock Input and Clock Reference
DCC	In	DC	1	Duty Cycle Control, Leave Floating
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	-55C to + 125C
T_{stg}	Storage Temperature	-65C to +150C

Table 3: High Speed Inputs and ECL Outputs

<i>Symbol</i>	<i>Parameter</i>	<i>Min</i>	<i>Max</i>	<i>Units</i>	<i>Conditions</i>
V_{IN}	Single-ended Input Voltage Swing	300	1500	mV	$V_{CM} = -2.5V$
V_{CM}	Differential Input Common Mode Range	-3.3	-1.3	V	$V_{SS} = -5.2V$
V_{OH}	ECL Output High Voltage	-1200	-500	mV	50 Ohms to -2.0V
V_{OL}	ECL Output Low Voltage	-2000	-1600	mV	50 Ohms to -2.0V

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Table 4: Recommended Operating Conditions

Symbol	Parameter	Min	Typ	Max	Units	Conditions
GND	Positive Voltage Rail		0		V	
VSS	Negative Voltage Rail	-5.5	-5.2	-4.9	V	
T _{CASE CA}	*Operational Temperature	-40		75	C	Power dissipation = 1.3W Metal Glass Package
T _{CASE KF}	*Operational Temperature	-40		85	C	Power dissipation = 1.3W Ceramic Package

*Lower limit of specification is ambient temperature and upper limit is case temperature.

Table 5: Power Dissipation

Symbol	Parameter	Min	Typ	Max	Units	Conditions
I _{VSS}	Power Supply Current (VSS)	-	-	220	mA	I _{MOD} = I _{BIAS} = 0 mA
Pd	Total Power Dissipation	-	-	1200	mW	V _{SS} = -5.5, I _{MOD} = I _{BIAS} = 0 mA, Rload = 25 Ohms to GND

Table 6: Laser Driver DC Electrical Specifications

Symbol	Parameter	Min	Typ	Max	Units	Conditions
I _{BIAS}	Programmable Laser Bias Current	2		50	mA	-
I _{MOD}	Programmable Modulation Current	2	-	60	mA	
V _{IB}	Laser Bias Control Voltage			V _{SS} + 2.1	V	I _{BIAS} = 50 mA
V _{IP}	Laser Modulation Control Voltage			V _{SS} + 2.1	V	I _{MOD} = 60 mA
V _{OCM}	Output Voltage Compliance		GND -2.5V		V	V _{SS} = -5.2V

Table 7: Laser Driver AC Electrical Specifications

Symbol	Parameter	Min	Typ	Max	Units	Conditions
t _r t _f	Output Rise and Fall Times			100	ps	25 Ohm load, 20%-80% 15mA < I _{MOD} < 60 mA I _{BIAS} = 20 mA
t _{su}	t Setup Data to Clock		50		ps	
t _h	t Hold		50		ps	

Figure 1: Laser Driver Maximum Case Temperature vs. Modulation Current

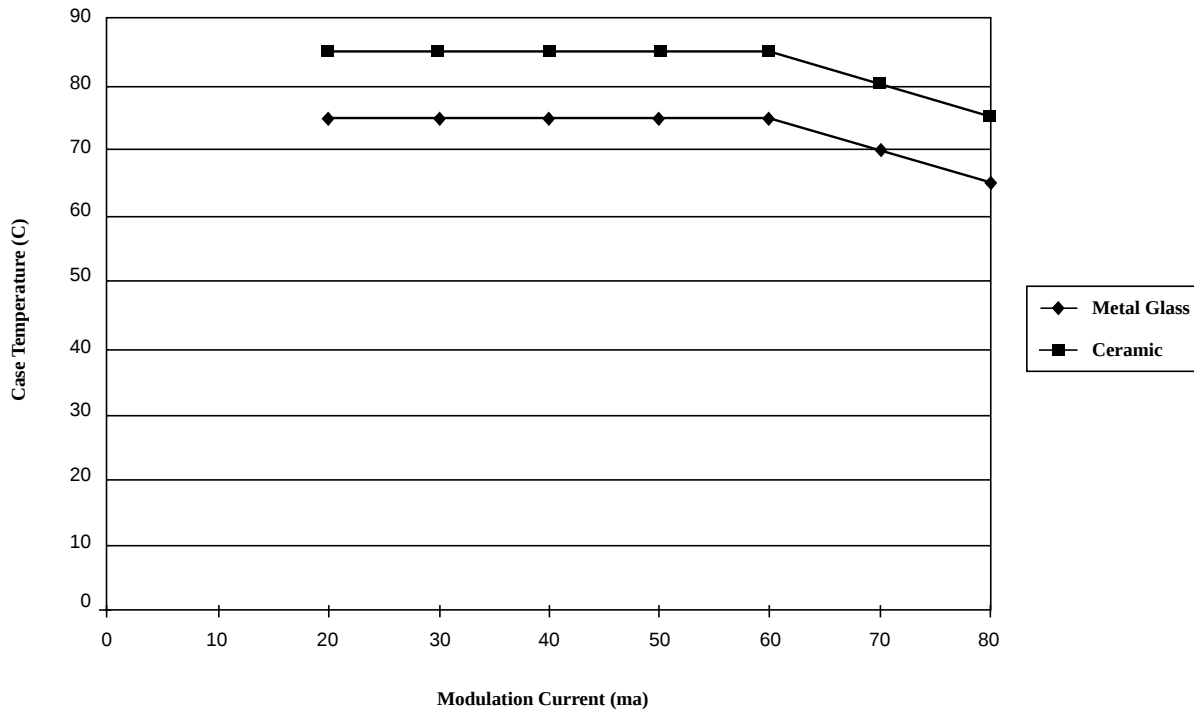
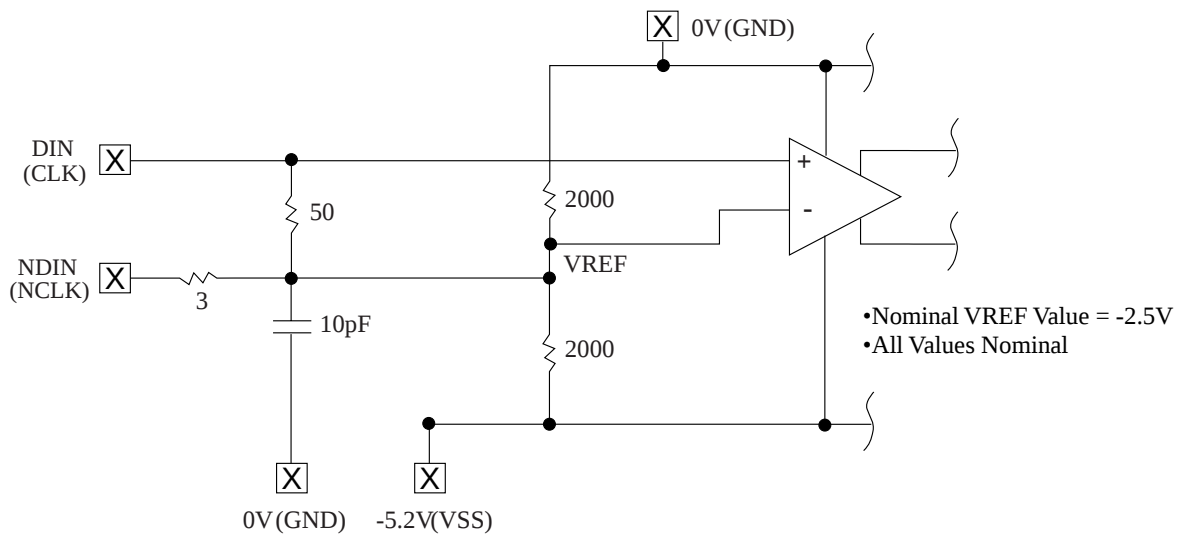


Figure 2: Clock and Data Input Structure



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Figure 3: Single Ended Operation

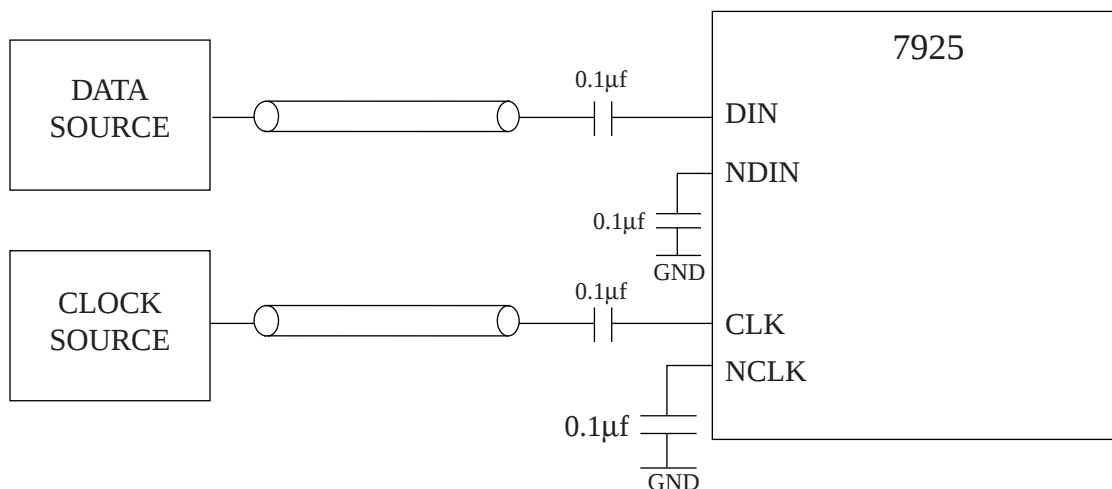


Figure 4: Control Signals VIP and VIB

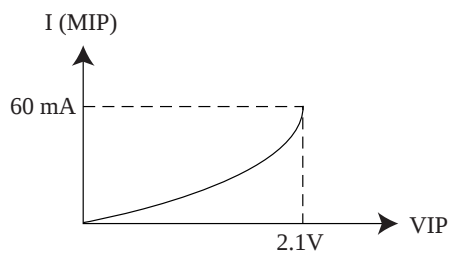
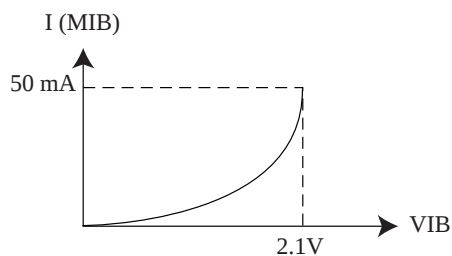
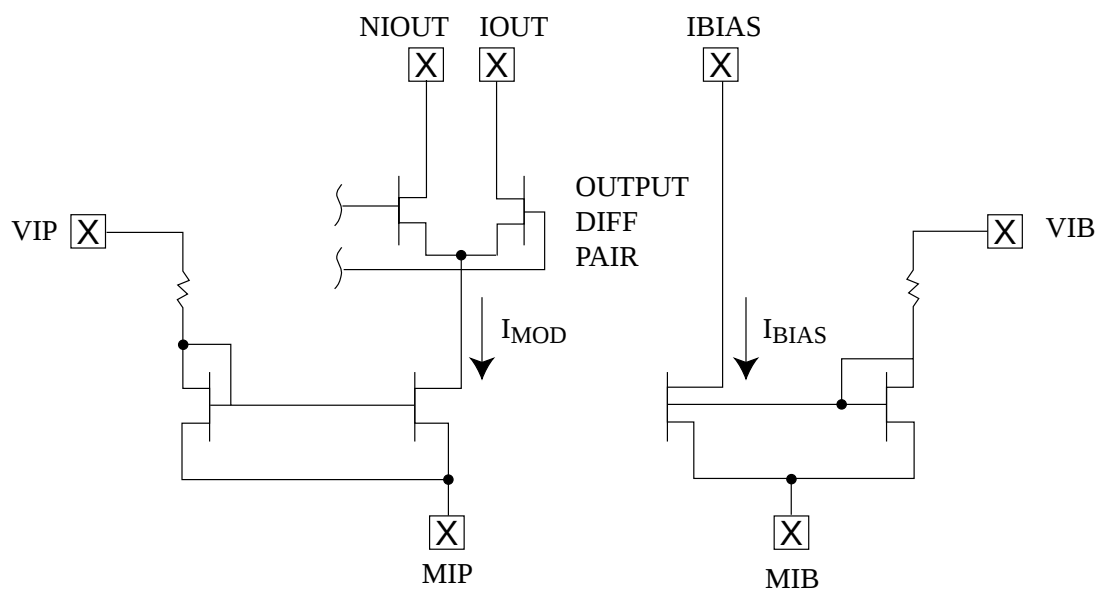


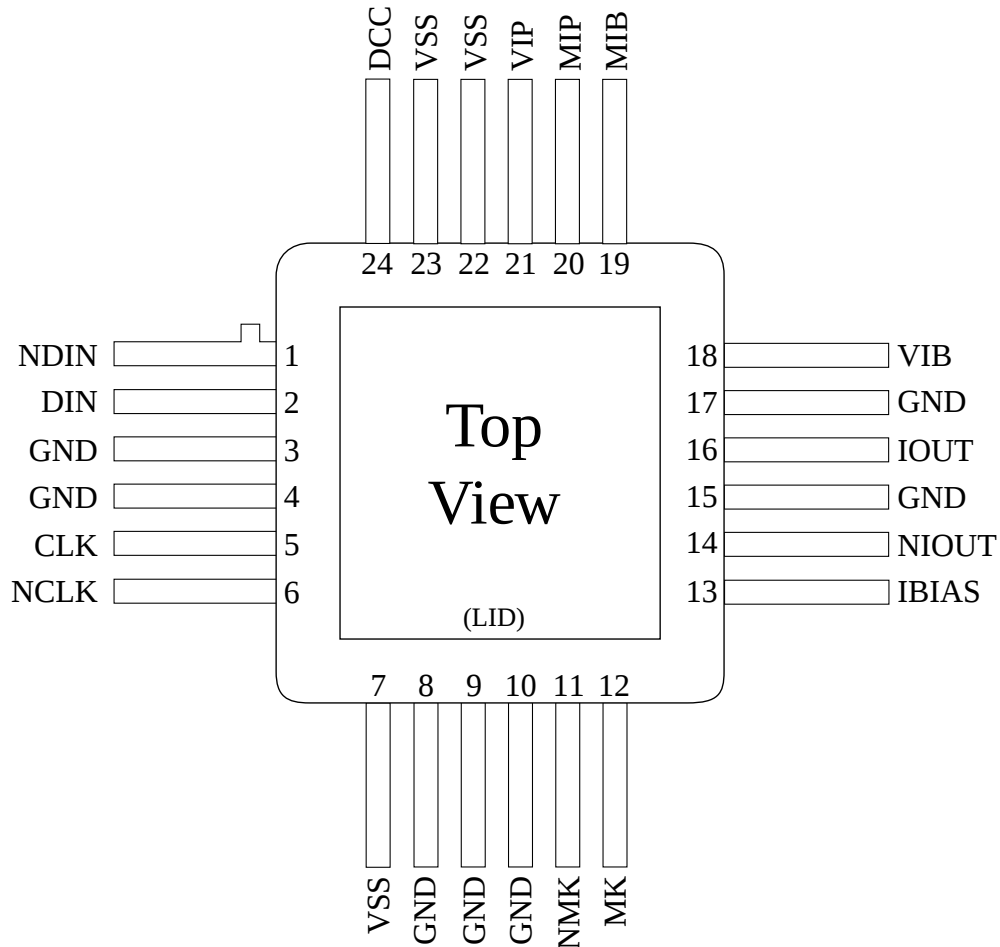
Figure 5: Simplified Output Structure



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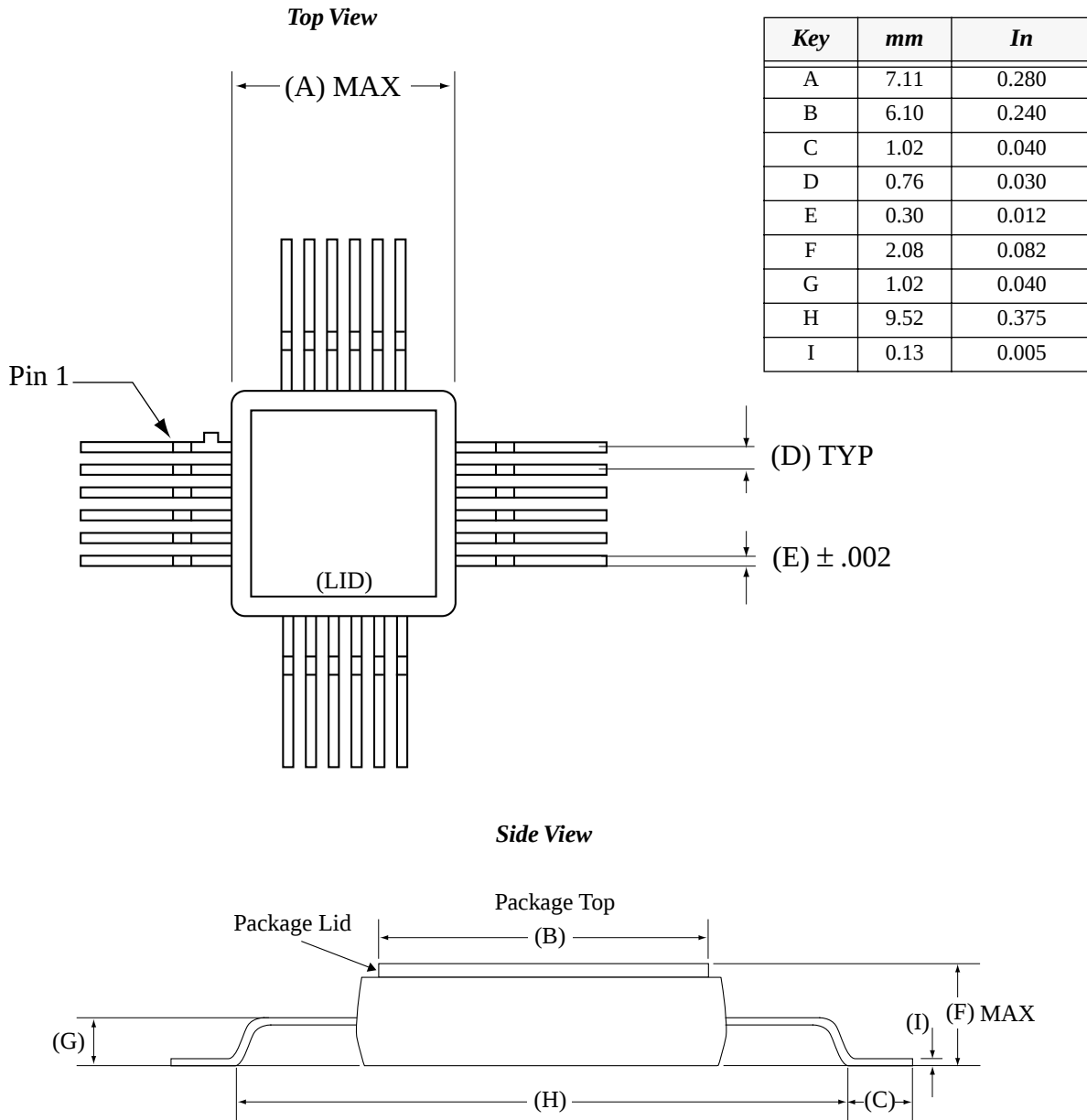
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Pin Diagram for 24 Pin Metal-Glass Package



Note: Package bottom plate is connected to GND within the package.
 Package lid is electrically unconnected.

Package Information - 24 Pin Metal-Glass Package (Formed Leads)

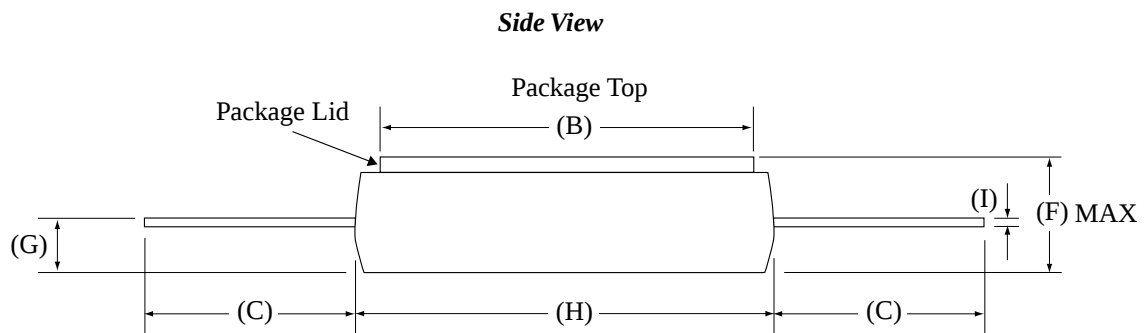
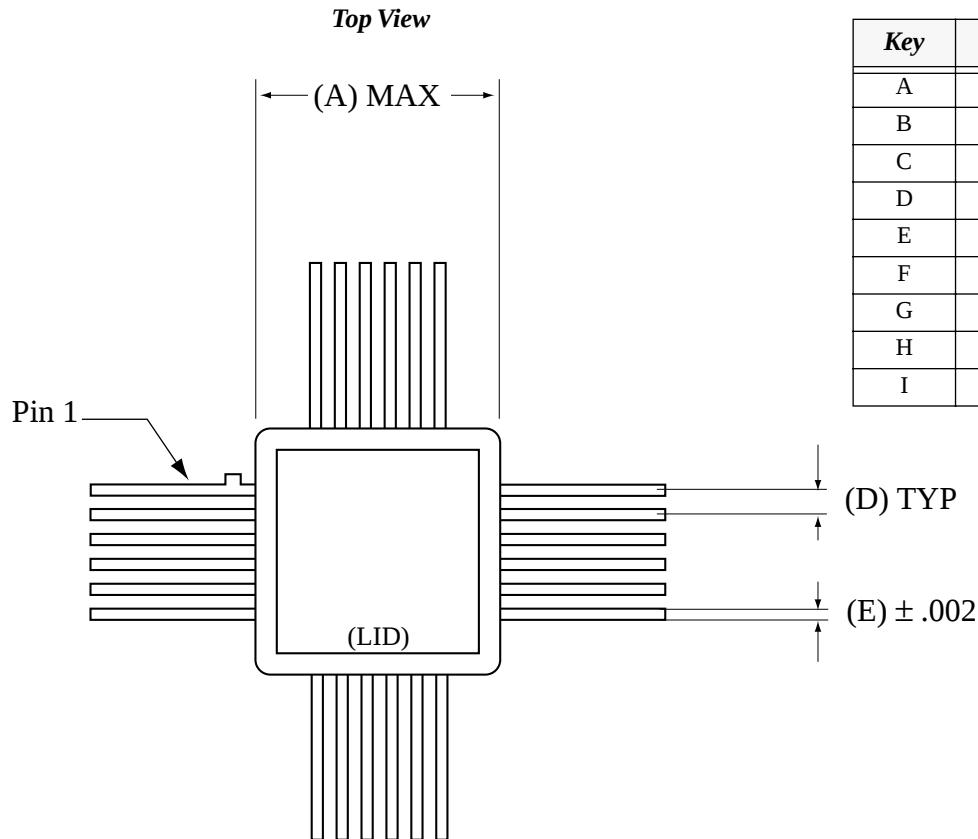


NOTES: Drawing not to scale.
Package #: 101-000-0 Issue #:1

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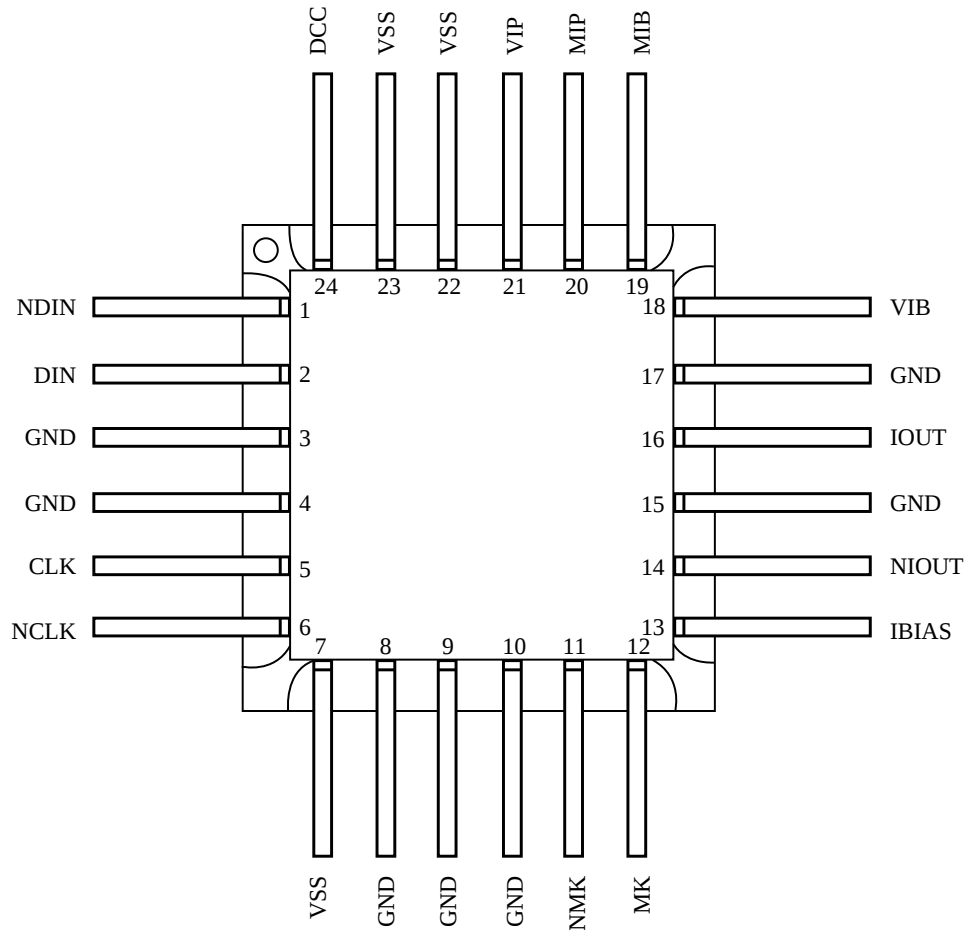
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Package Information - 24 Pin Metal-Glass Package (Straight Leads)



NOTES: Drawing not to scale.
 Package #: 101-000-0 Issue #:1

Pin Diagram for 24 Pin Ceramic Package



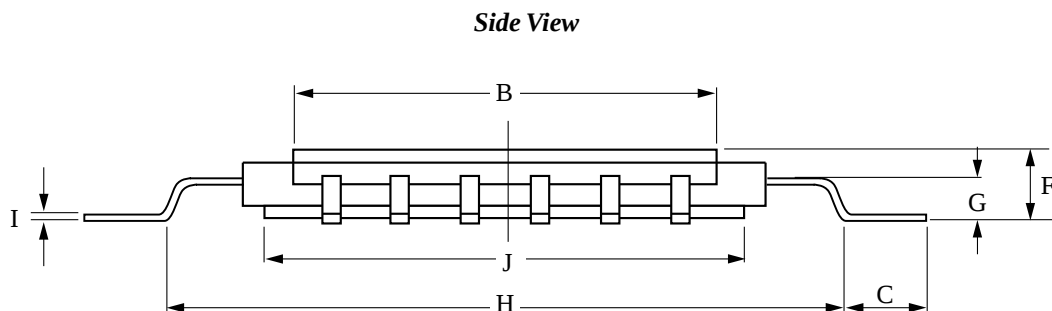
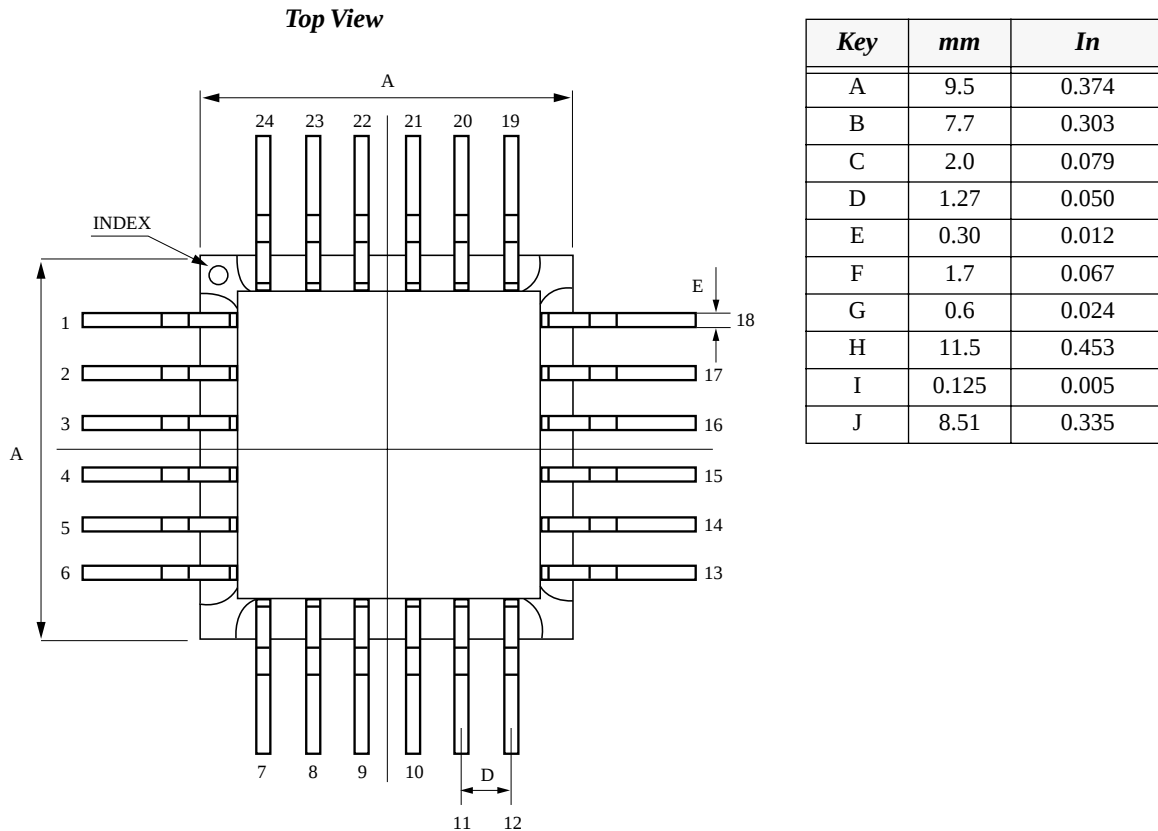
Note: Package lid and bottom heat spreader are electrically connected to GND within the package.

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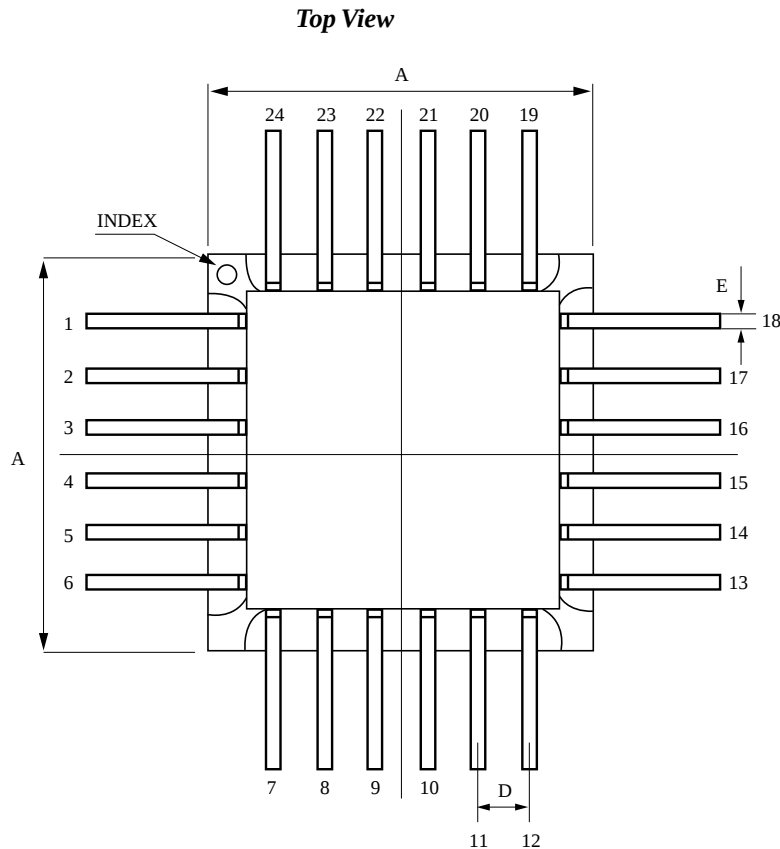
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Package Information - 24 Pin Ceramic Package (Formed Leads)

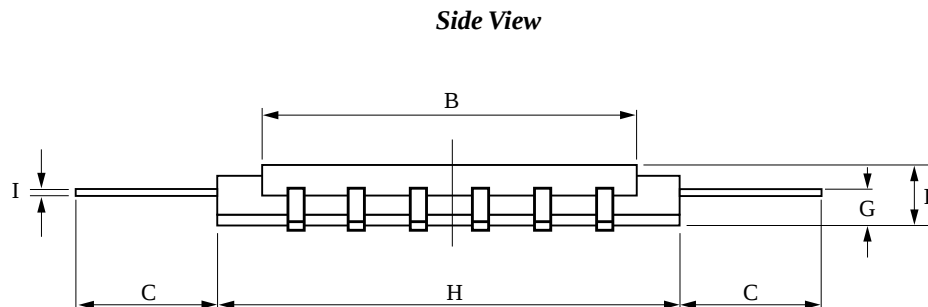


NOTES: Drawing not to scale.
Package #: 101-000-0 Issue #:1

Package Information - 24 Pin Ceramic Package (Straight Leads)



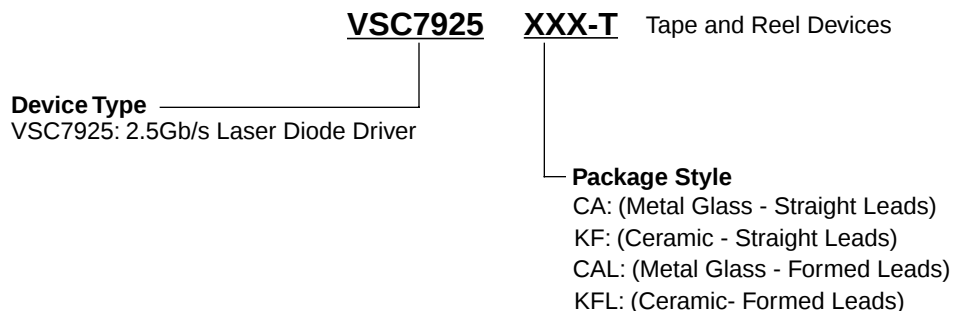
Key	mm	In
A	9.5	0.374
B	7.7	0.303
C	5.8	.230
D	1.27	0.050
E	0.30	0.012
F	1.7	0.067
G	0.6	0.024
H	9.53	0.375
I	0.125	0.005
J	8.51	0.335



NOTES: Drawing not to scale.
Package #: 101-000-0 Issue #:1

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VSC7925*SDH/SONET 2.5Gb/s
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The order number for this product is formed by a combination of the device number, and package style.

**Notice**

This document contains preliminary information about a new product in the preproduction phase of development. The information in this document is based on initial product characterization. Vitesse reserves the right to alter specifications, features, capabilities, functions, manufacturing release dates, and even general availability of the product at any time. The reader is cautioned to confirm this datasheet is current prior to using it for design.

Warning

Vitesse Semiconductor Corporation's product are not intended for use in life support appliances, devices or systems. Use of a Vitesse product in such applications without the written consent is prohibited.

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