Preliminary Data Sheet

VSC7958

2.5Gb/s High Speed Limiting Post Amplifier for OC-48/SDH-16 Applications

Features

- 2.5Gb/s Data Rates (OC-48/SDH-16)
- Input Offset Error Cancellation
- Single 5V Power Supply
- Fully Differential Architecture

General Description

The Vitesse high speed limiting amplifier is intended for use as a post amplifier in wide band fiber optic links with data rates up to 2.5Gb/s. This amplifier provides very high sensitivity and broadband operation with a fully differential architecture. Additional features include on-chip, offset-correction circuitry to provide excellent pulse width distortion characteristics.

VSC7958 Block Diagram

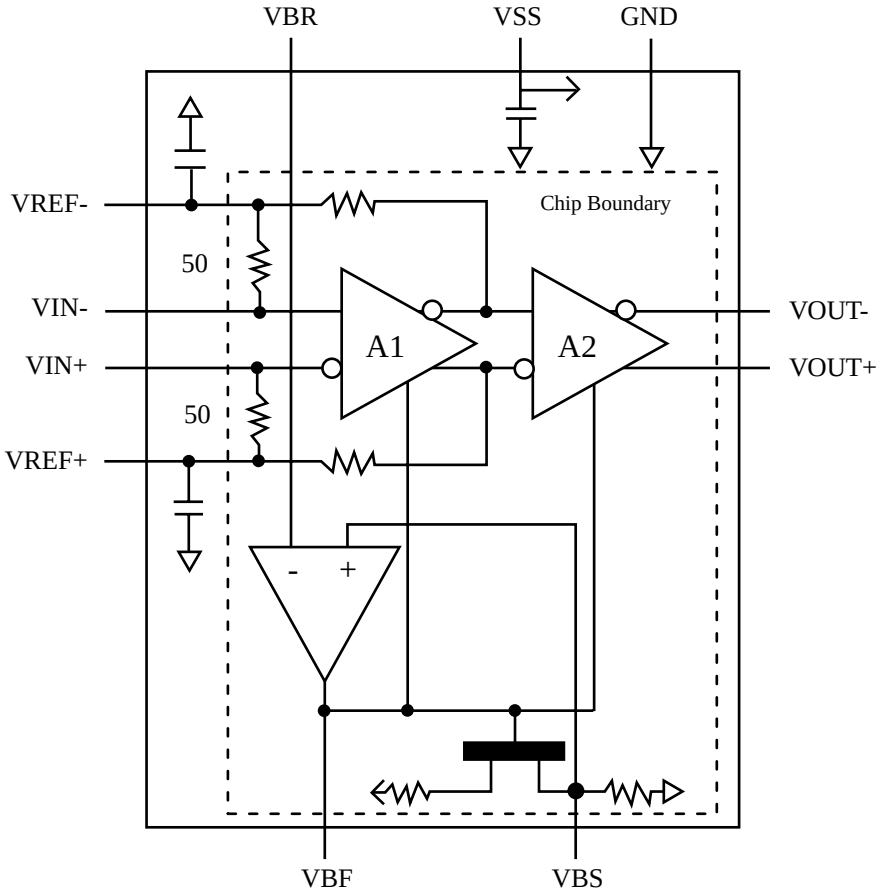

Table 1: Electrical Specifications

All min and max values are tested at V_{SS} = -4.5V and -5.5V, unless otherwise noted. All min and max values are guaranteed from T_{CASE} = 0°C to 85°C, unless otherwise noted.

Symbol	*Parameter*	*Min*	*Typ*	*Max*	*Units*	*Conditions*
$V_{IN}\pm$(1)	Input Voltage Swing	-	-	800	mV_{p-p}	Single-ended source
(V_{IN}+) - (V_{IN}-)(1)	Input Voltage Swing	-	-	1600	mV_{p-p}	Differential source
(V_{REF}+) - (V_{REF}-)	Input Offset Voltage Swing	-	10	25	mV	V_{IN} = 0
(V_{OUT}+) - (V_{OUT} -)	Output Voltage Swing	320	500	1200	mV_{p-p}	Differential Output Swing. V_{IN} = 8mV, Differential Input peak-to-peak
V_{OFFSET}	Output DC Offset Voltage	-	-0.5	-	V	Measured to ground
PW%	Output Pulse Width	90	100	110	%	
t_R, t_F	Rise and Fall Time	-	100	-	ps	20%-80%, 25°C, V_{IN} = 50mV
G	Small Signal Gain	26	30	45	dB	V_{IN} = $4mV_{p-p}$ single-ended
f_{MAX}(1)	Small Signal -3dB Bandwidth	-	3	-	GHz	25°C, V_{IN} = $4mV_{p-p}$
f_{MIN}(1)	Low Frequency -3dB Cutoff	-	30	-	kHz	25°C, V_{IN} = $4mV_{p-p}$
S_{11}(1)	Input Return Loss Reference to 50Ω	-	15	-	dB	At 1.5GHz
S_{22}(1)	Output Return Loss Reference to 50Ω	-	15	-	dB	At 1.5GHz
I_{SS}	Supply Current	-	80	100	mA	
NF(1)	Noise Figure	-	15	-	dB	8kHz to 18GHz
V_{NR}(1)	Input Referred Wide Band Noise	-	170	-	μV_{rms}	Total single-ended output noise voltage divided by small-signal gain. 8kHz to 18GHz
θ_{JC}	Thermal Resistance	-	30	-	°C/W	Junction-to-case

NOTE:(1) These values are not measured during production test. These values are results of engineering characterization.

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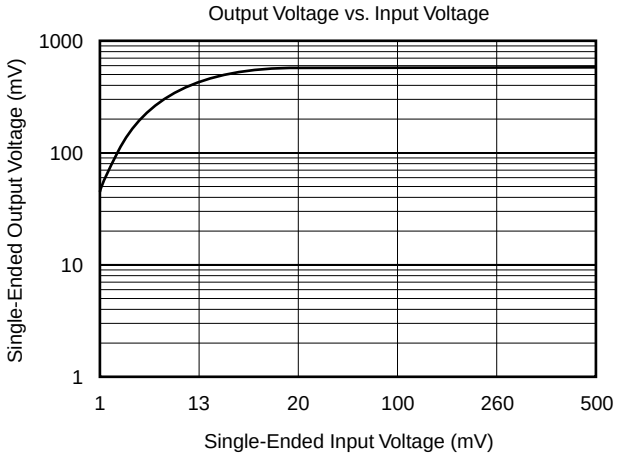
Figure 1: Typical Output Voltage vs. Input Voltage of Limiting Amplifier



Absolute Maximum Ratings (1) (at T_A = 25°C unless otherwise specified)

Power Supply Voltage (V_{SS}) ..... -7V to -0.5V
Power Dissipation..... 1W
All Pins ..... V_{SS} to + .5V
(VREF+) - (VIN+): ..... ±2V
(VREF-) - (VIN-): ..... ±2V
Storage Temperature Range (T_{STG})..... -40°C to 125°C
Operating Temperature Range..... 0°C to 100°C

NOTE: (1) CAUTION: Stresses listed under "Absolute Maximum Ratings" may be applied to devices one at a time without causing permanent damage. Functionality at or above the values listed is not implied. Exposure to these values for extended periods may affect device reliability.

Recommended Operating Conditions

Case Temperature Range (T_C)..... 0°C to 85°C
Negative Voltage Rail (V_{SS})..... -5.5V to -4.7V

Bit Rate = 2.488Gb/s NRZ and data pattern = 2^{23} -1 PRBS, unless otherwise specified.

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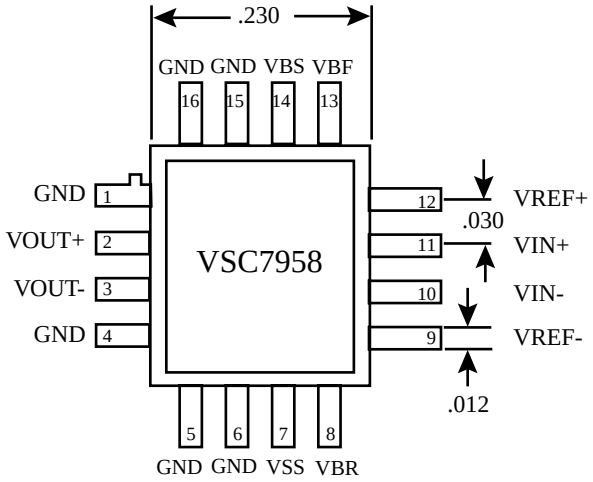
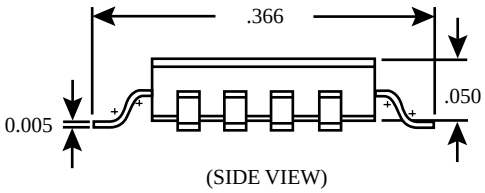
Package Pin Descriptions

Figure 2: Pin Configuration



(TOP VIEW)



(SIDE VIEW)

*All values are typical in inches

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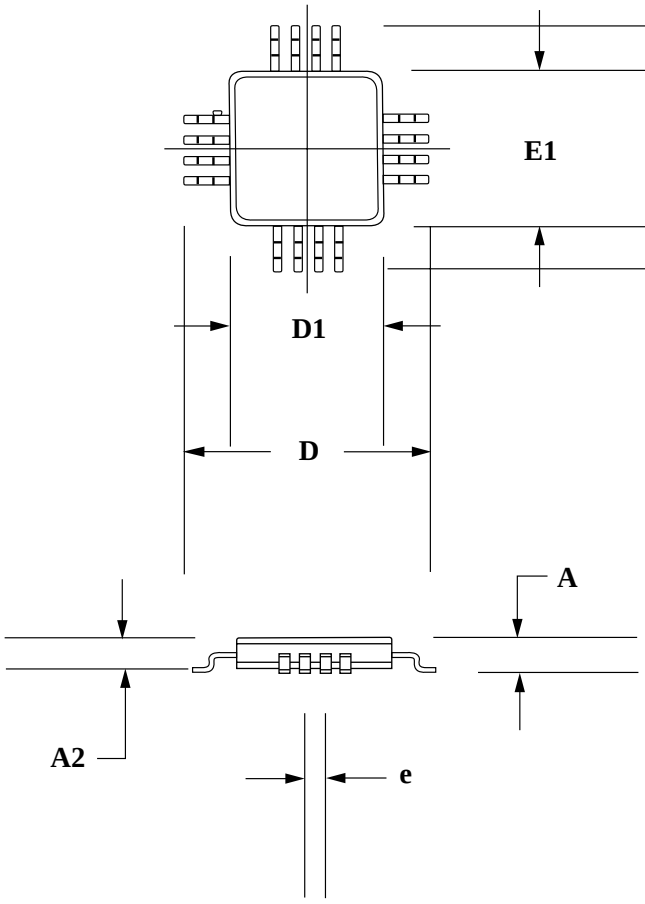
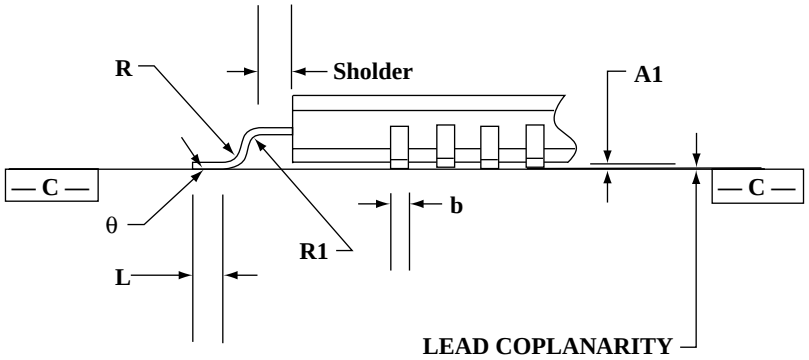
Package Information

Figure 3: Package Dimensions



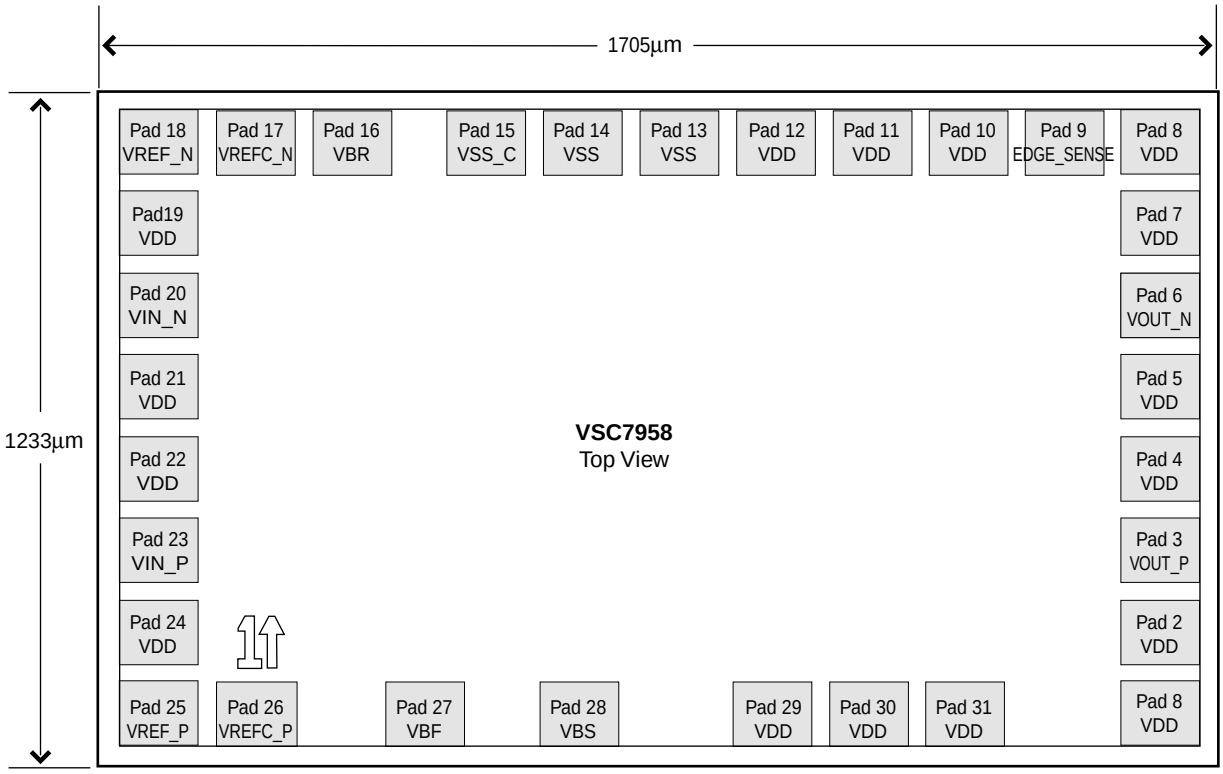
Key	*Dimension*	*Tolerance*
A	0.054	REF
A1	0.003	±0.003
A2	0.050	REF
D	0.366	±0.010
D1	0.225	±0.005
E	0.366	±0.010
E1	0.225	±0.005
L	0.020	±0.005
e	0.030	REF
b	0.012	Typ.
θ		0-10
R	0.013	±0.003
R1	0.013	±0.003
Shoulder	0.020	

All Dimensions in inches



Die Information

Figure 4: Die Pad Information



Maximum Total Die Size:	1233µm x 1705µm
Die Thickness:	305µm
Pad Size:	100µm x 100µm
Pad Passivation Opening:	90µm x 90µm

This device requires external components when used in die form.
Please contact your Vitesse sales representative for information.

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Table 2: Pin Identifications

Pin #	*Name*	*Function*
1, 4, 5, 6, 15, 16, and bottom heat spreader	GND	DEVICE GROUND The package bottom heat spreader should be connected to ground for the optimum thermal and electrical performance.
2	VOUT+	POSITIVE DATA OUTPUT
3	VOUT-	NEGATIVE DATA OUTPUT
7	VSS	NEGATIVE DC SUPPLY
8	VBR	DEVICE REFERENCE VOLTAGE This pin can either float or be set to an external -1.5V supply.
9	VREF-	NEGATIVE DATA INPUT REFERENCE This pin should be bypassed to ground with a 0.1µF cap and a 5Ω series resistor.
10	VIN-	NEGATIVE DATA INPUT
11	VIN+	POSITIVE DATA INPUT
12	VREF+	POSITIVE DATA INPUT REFERENCE This pin should be bypasSed to ground with a 0.1µF cap and a 5Ω series resistor.
13	VBF	INTERNAL TEST POINT Do not connect.
14	VBS	INTERNAL TEST POINT Do not connect.

Ordering Information

The order number for this product is formed by a combination of the device number, and package style.

VSC7958 XX

Device Type
VSC7958: 2.5Gb/s Limiting Amplifier

Package Style
CC: (Metal Glass - Formed Leads)
X : (Bare Die)

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