



# **EB-GS2989**

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## **Evaluation Board User Guide**

Version	ECR	Date	Changes and / or Modifications
1	152728	September 2009	Updated Section 3. Board Layout.
0	151385	September 2009	New document.

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## General Description

The GS2989 evaluation package is designed to accelerate the evaluation process of the GS2989 Dual Output SDI Cable Driver.

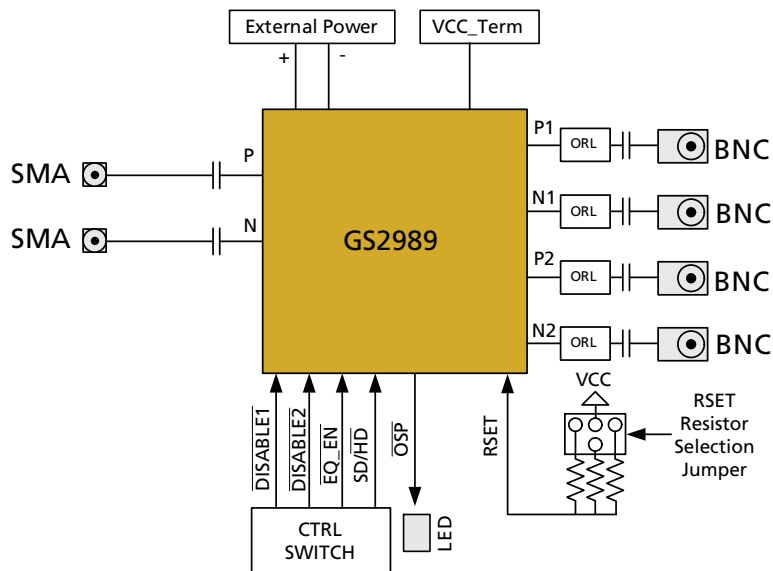
It is strongly recommended to read the GS2989 Data Sheet (Doc ID: 52133) before using this evaluation kit.

## Evaluation Kit Contents

- Gennum EB-GS2989 Evaluation Board
- CD containing GS2989 Collateral

## Overview

The purpose of the EB-GS2989 Evaluation Board is to evaluate the GS2989 Multi-Rate Dual Output Cable Driver. This device is designed to support SMPTE 424M, SMPTE 292M and SMPTE 259M and is optimized for performance at 270Mb/s, 1.485Gb/s and 2.97Gb/s.



Block Diagram of the EB-GS2989

# 1. Evaluation Board User Guide

Figure 1-1 shows the inputs, outputs and power connections for the EB-GS2989.

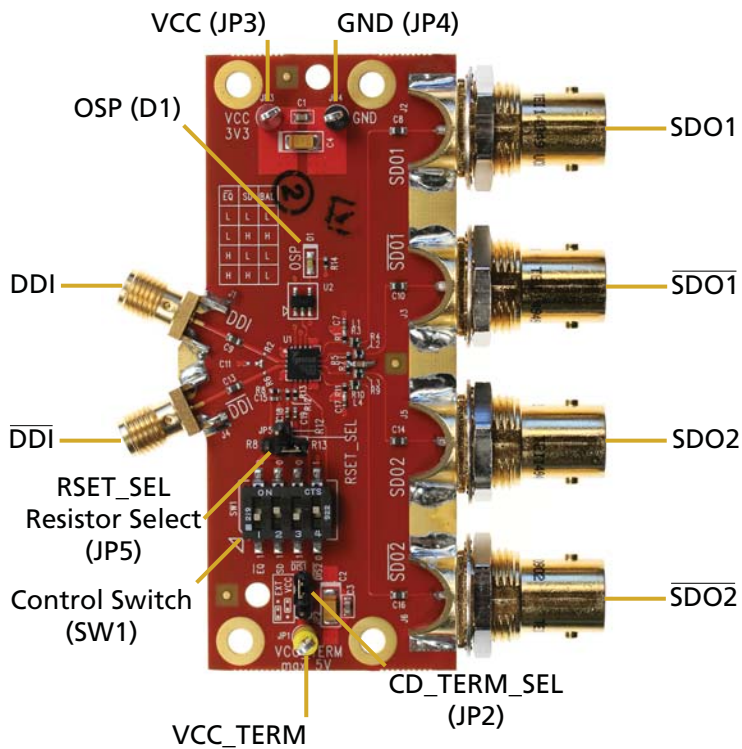


Figure 1-1: GS2989 Evaluation Board (EB-GS2989)

## 1.1 SDI Inputs and Outputs

The GS2989 is a high-speed BiCMOS integrated circuit designed to drive one to four 75Ω co-axial cables. The EB-GS2989 is the Evaluation Board for the GS2989. It features one pair of 100Ω differential inputs through SMA connectors (J1, J4) and four 75Ω single-ended outputs through BNC connectors (J2, J3, J5, J6).

## 1.2 Power

The EB-GS2989 evaluation board uses a 3.3V or 2.5V external power supply through VCC (JP3) and GND (JP4) connections.

## 1.3 Switch Settings

A four-point dip switch (SW1) allows for input selection. The switch is simply used to override the default states of the four input pins as described in the [Table 1-1](#) below.

**Table 1-1: Switch Settings**

Switch Label	Switch OFF (Default State)	Switch OFF Description	Switch ON	Switch ON Description
$\overline{EQ}$	1	Trace EQ disabled	0	Trace EQ enabled
SD	1	Slew rate set for SD	0	Slew rate set for HD
$\overline{DIS1}$	1	Output 1 enabled	0	Output 1 disabled
$\overline{DIS2}$	0	Output 2 disabled	1	Output 2 enabled

## 1.4 Measuring ORL

To measure Output Return Loss (ORL) on the EB-GS2989 board, follow these steps:

1. Set the cable driver in balance mode by setting  $\overline{EQ}$  to 0 and SD to 1. The balance mode table is given below, and also appears on the top side of the board.

**Table 1-2: Balance Mode Truth Table**




$\overline{EQ}$	SD	BAL
L	L	L
L	H	H
H	L	L
H	H	L

2. The cable driver outputs are now balanced. ORL can now be measured single-endedly using a Network Analyzer. Please refer to the GS2989 data sheet (Doc ID 52133) for more information regarding balance mode.

## 1.5 RSET Jumper (JP5) Settings

The RSET pin controls the external output amplitude. A four-pin selection jumper (JP5) allows one of three different resistors to be used as the RSET resistor. The three possible selections are summarized in [Table 1-3](#):

**Table 1-3: RSET Jumper Settings**



Label	Connection	Description
R8		332Ω; sets the output swing to 1.8V (The termination voltage needs to be 5V. Please refer to Section 1.6 Termination Voltage Jumper (JP2) Settings).
R12		750Ω; sets the output swing to 800mV
R13		1.21kΩ; sets the output swing to 500mV

## 1.6 Termination Voltage Jumper (JP2) Settings

The VCC\_TERM connection (JP1) is provided to support an optional termination voltage power supply. A selection jumper (JP2) is provided to select the termination voltage. If the jumper is set to the EXT position, the termination voltage is determined by the external VCC\_TERM connection. If the jumper is set to the VCC position, the termination voltage will track the main power supply (VCC). These settings are summarized in Table 1-4. A 5V termination voltage is required for a high-swing output (1.8V).

In order to get the high output swing (1.8V), the termination voltage selection must be set to EXT, and a 5V power supply should be connected to the VCC\_TERM post.

**Table 1-4: Termination Voltage Selection**

Label	Connection	Description
VCC		Termination voltage tracks VCC
EXT		Termination voltage uses VCC_TERM connection

## 1.7 Output Signal Presence Indicator

The EB-GS2989 features a green LED (D1) which indicates when a valid signal has been detected at all enabled outputs. The LED turns on when a valid signal is detected for all enabled outputs and stays off otherwise.

## 2. Schematics

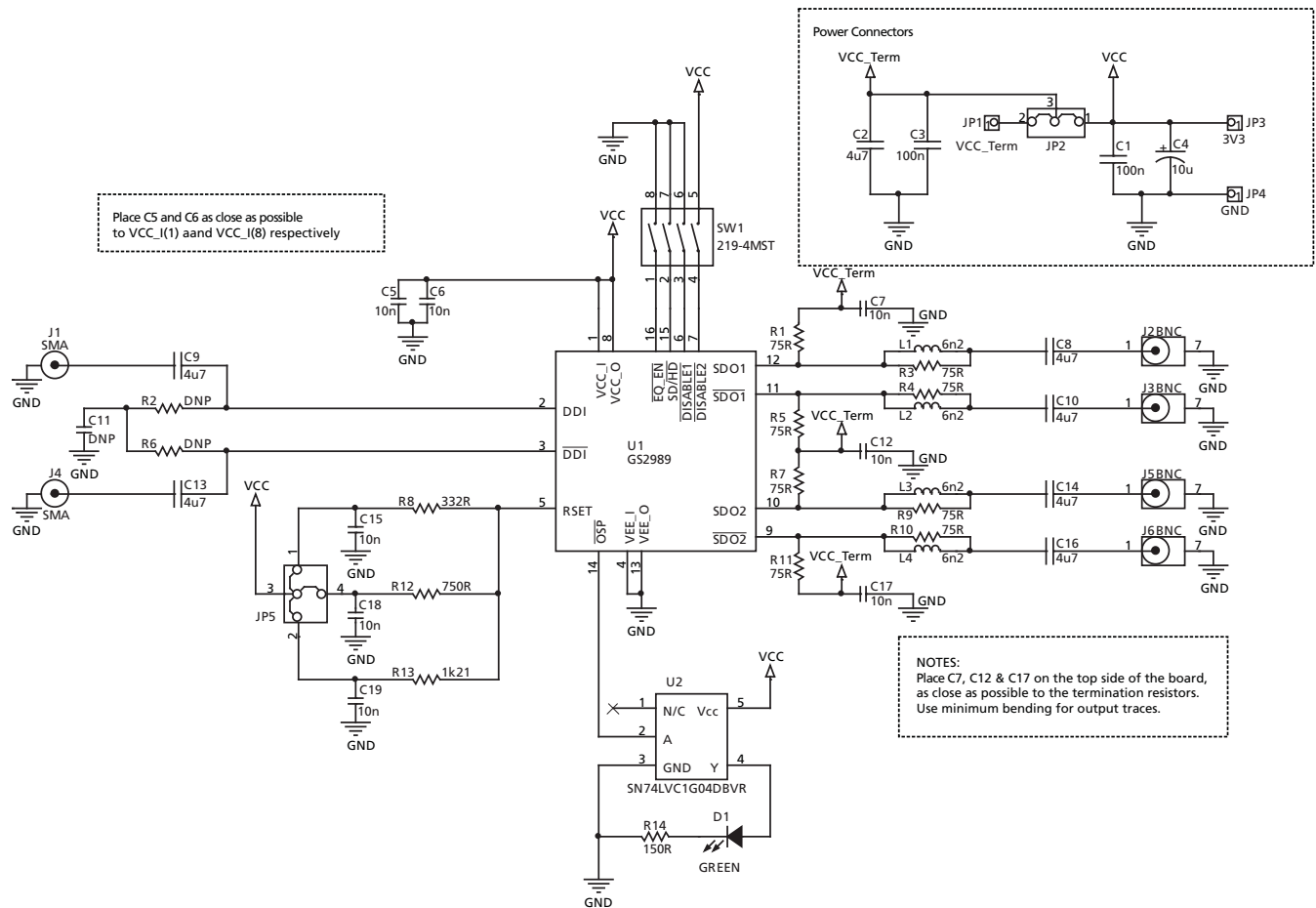


Figure 2-1: EB-GS2989 Schematic

# 3. Board Layout

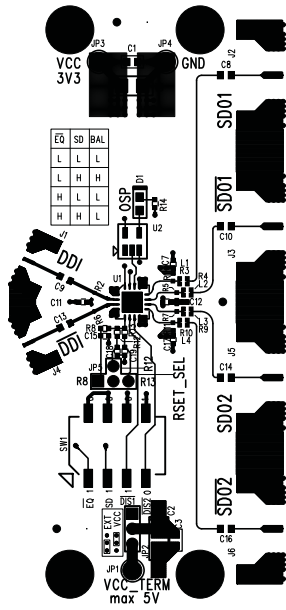


Figure 3-1: Layer 1 (Top Layer) and Top Silkscreen

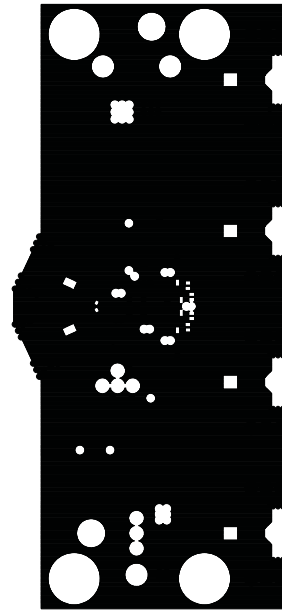


Figure 3-2: Layer 2 (Ground)

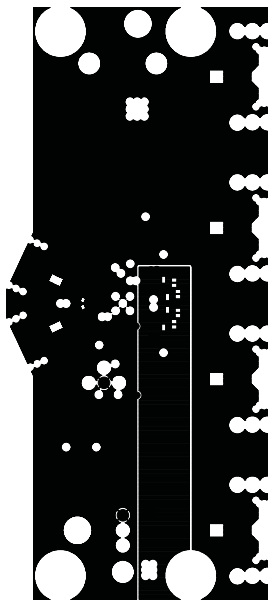


Figure 3-3: Layer 3 (Power)

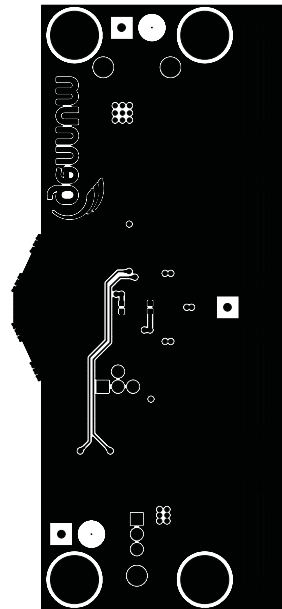


Figure 3-4: Layer 4 (Bottom)



## 4. Bill of Materials

Table 4-1: Bill of Materials

Quantity	Reference Designator	Part
2	C1, C3	Capacitor, ceramic; 0.1 $\mu$ F, 16V, 10%, X7R, 0603
7	C2, C8, C9, C10, C13, C14, C16	Capacitor, ceramic; 4.7 $\mu$ F, 10V, X5R, 0603
1	C4	Capacitor, tantalum; 10 $\mu$ F, 6.3V, 10%, 1206, SMD
8	C5, C6, C7, C12, C15, C17, C18, C19	Capacitor, ceramic; 10000pF, 16V, 10%, X7R, 0402
1	D1	LED, green; TSS type 0603, 1.9V, 565nm
2	J1, J4	SMA edge-mount connector, 26GHz
4	J2, J3, J5, J6	BNC edge-mount PCB connector (Trompeter UCBBJE20-1 or Cambridge Connectors C-SX-077)
1	JP1	Test Point; male, 1-pole, loop clip (yellow)
1	JP2	Header; male, 3-pole, 2mm
1	JP3	Test Point; male, 1-pole, loop clip (red)
1	JP4	Test Point; male, 1-pole, loop clip (black)
1	JP5	Header; male, 4-pole, 2mm
4	L1, L2, L3, L4	Inductor; 6.2nH 300mA 0402
8	R1, R3, R4, R5, R7, R9, R10, R11	Resistor; 75.0 $\Omega$ , 1/16W 1% 0402 SMD
1	R12	Resistor; 750 $\Omega$ , 1/16W 1% 0402 SMD
1	R13	Resistor; 1.21K $\Omega$ , 1/16W 1% 0402 SMD
1	R14	Resistor; 150 $\Omega$ , 1/16W 1% 0402 SMD
3	R8	Resistor; 332 $\Omega$ , 1/16W 1% 0402 SMD
1	SW1	Switch; tape seal 4-position SMD
1	U1	Gennum GS2989 3G Dual Output Cable Driver
1	U2	IC; single inverter-gate, SOT-23-5

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**DOCUMENT IDENTIFICATION  
EVALUATION BOARD USER GUIDE**

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