

3G-SDI Cable Driver Compatibility Guide – TI / Semtech

ABSTRACT

To facilitate design with TI's 3G-SDI portfolio, this guide provides a detailed description about cable driver devices that are drop-in compatible and functional equivalent replacements for similar Semtech cable drivers. In addition, this guide provides details about 3G-SDI cable driver part selection for new designs to enable improved performance and an easy future upgrade path from 3G to 12G.

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1 Introduction

TI offers a diverse 3G-SDI portfolio that includes cable equalizers, reclockers, and cable drivers. Many of these 3G-SDI devices are pin-compatible or functional equivalent replacement options with devices offered by other SDI IC vendors. This guide serves as a pin-by-pin reference with a detailed comparison of TI's 3G cable drivers and similar cable driver devices offered by Semtech.

2 Cable Driver Compatibility Overview

The TI devices below are pin-compatible with the following Semtech cable drivers:

TI CABLE DRIVER	PIN-COMPATIBLE WITH...	DEVICE DETAILS
LMH0303 LMH0302	GS2978, GS2988	Single Cable Driver 16-Pin QFN 4 mm x 4 mm

The TI device below is functionally equivalent, but not pin-compatible, with the following Semtech cable driver:

TI CABLE DRIVER	FUNCTIONALLY COMPATIBLE WITH...	DEVICE DETAILS
LMH0307	GS2989	Dual Cable Driver 16-Pin QFN 4 mm x 4 mm

3 LMH0303, LMH0302 Pin Compatibility With GS2978, GS2988

3.1 Key Schematic Differences

Figure 1 highlights key schematic differences between TI and Semtech drop-in compatible solutions in blue. For a detailed comparison of device pin functionality, refer to Section 3.2.

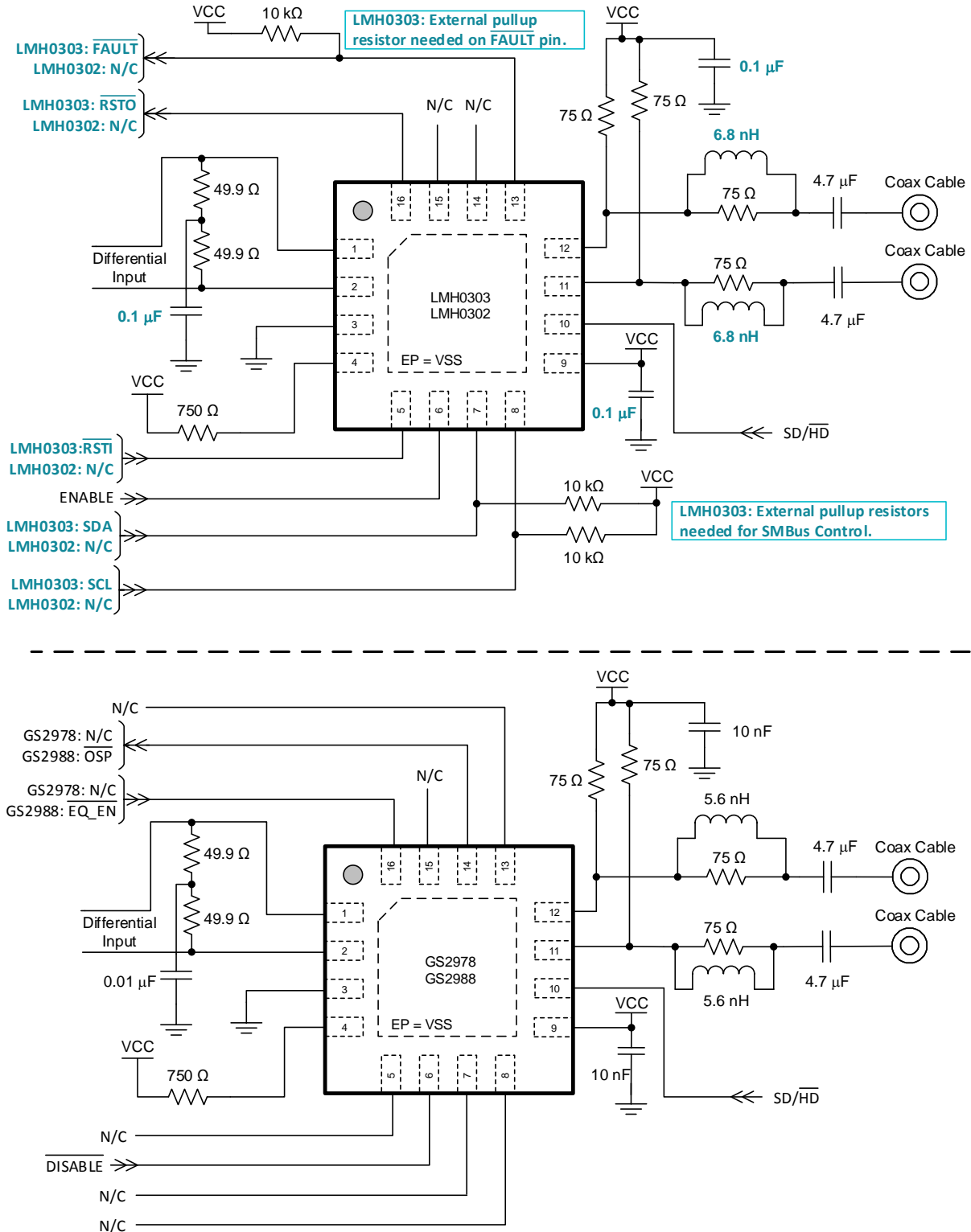


Figure 1. LMH0303, LMH0302 Pin Compatibility With GS2978, GS2988

3.2 Pin-by-Pin Comparison

PIN NO.	LMH0303 ⁽¹⁾ LMH0302	GS2978 GS2988	FUNCTIONAL DIFFERENCES AND NOTES
1, 2	SDI, SDI	DDI, DDI	None
3, DAP	V _{EE}	V _{EE}	None
4	R _{REF}	R _{SET}	Use 750-Ω pullup for 800 mVpp launch amplitude.
5	LMH0303: $\overline{\text{RSTI}}$ LMH0302: N/C	N/C	LMH0303: Reset input with internal pullup. Can be left as no connect for normal operation
6	ENABLE	$\overline{\text{DISABLE}}$	None
7	LMH0303: SDA LMH0302: N/C	RSVD	LMH0303: SMBus bidirectional data. When using SMBus interface, this pin requires 10-kΩ pullup. Otherwise, this pin may be left floating.
8	LMH0303: SCL LMH0302: N/C	N/C	LMH0303: SMBus clock input. When using SMBus interface, this pin requires 10-kΩ pullup. Otherwise, this pin may be left floating.
9	V _{CC}	V _{CC}	None. 3.3-V Supply
10	SD/ $\overline{\text{HD}}$	SD/ $\overline{\text{HD}}$	None
11, 12	$\overline{\text{SDO}}$, SDO	$\overline{\text{SDO}}$, SDO	None
13	LMH0303: $\overline{\text{FAULT}}$ LMH0302: N/C	N/C	LMH0303: Fault open-drain output flag. Requires external pullup resistor for normal operation.
14	N/C	GS2978: N/C GS2988: $\overline{\text{OSP}}$	GS2988: Output Signal Presence Status Output
15	N/C	N/C	None
16	LMH0303: $\overline{\text{RSTO}}$ LMH0302: N/C	GS2978: N/C GS2988: EQ_EN	LMH0303: Reset output. For pin compatibility, this pin can be left as no connect for normal operation. GS2988: Trace Equalization Enable. This pin can be left floating to turn trace equalization off.

⁽¹⁾ The LMH0303 can be configured either by pin settings or optional SMBus interface. The Semtech GS2978/GS2988 only supports configuration by pin settings.

3.3 External Component Differences

To replace the GS2978/GS2988, the following external component changes should be observed regarding the LMH0303/LMH0302:

COMPONENT(S)	CHANGE FROM...	CHANGE TO...
External Pullup Resistor on Pin 13	N/C	LMH0303: 10-kΩ pullup LMH0302: N/C
External Pullup Resistor on Pins 7 and 8	N/C	LMH0303: 10-kΩ pullup if SMBus interface is used. Otherwise, leave as N/C. LMH0302: N/C
Return Loss Inductor	5.6 nH	6.8 nH

4 LMH0307 Functional Equivalent With GS2989

While TI does not have a pin-compatible equivalent to Semtech's GS2989 3G-SDI dual cable driver, the LMH0307 can be used as a functional equivalent. The LMH0307 offers improved slew rate and extended programmability through SMBus control.

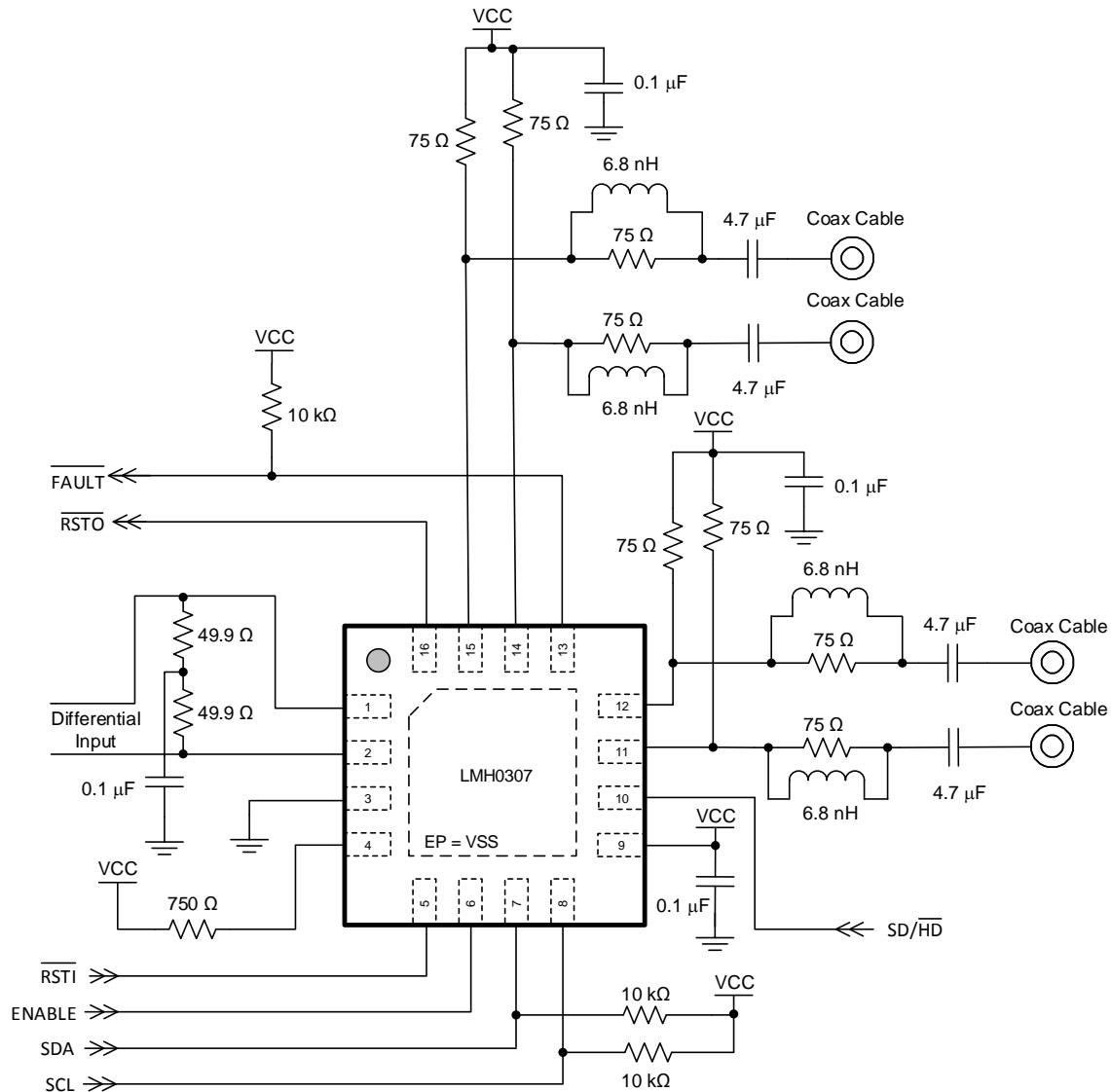


Figure 2. LMH0307 Dual Cable Driver Schematic

5 LMH0318 3G-SDI Cable Driver for New Designs

For new 3G-SDI designs in the component-selection phase, TI recommends designing with the LMH0318. Using the LMH0318 enables an easy upgrade path to the LMH1218, a pin-compatible 12G-SDI cable driver with integrated reclocker. In addition, the LMH0318 offers the following advantages compared to previous generation 3G-SDI cable drivers:

- User-Programmable PCB Trace Equalizer
- Integrated Reclocker
- Internal Eye-Opening Monitor for Debug Purposes
- Integrated Input and Output Terminations
- Integrated Return Loss Network
- Input 2:1 Mux
- 75-Ω and 100-Ω Transmitter Outputs
- SMBus or SPI Control Programmability

NOTE: The LMH0318 is *not* pin-compatible with the previously mentioned 3G-SDI devices (LMH0302, LMH0303, LMH0307).

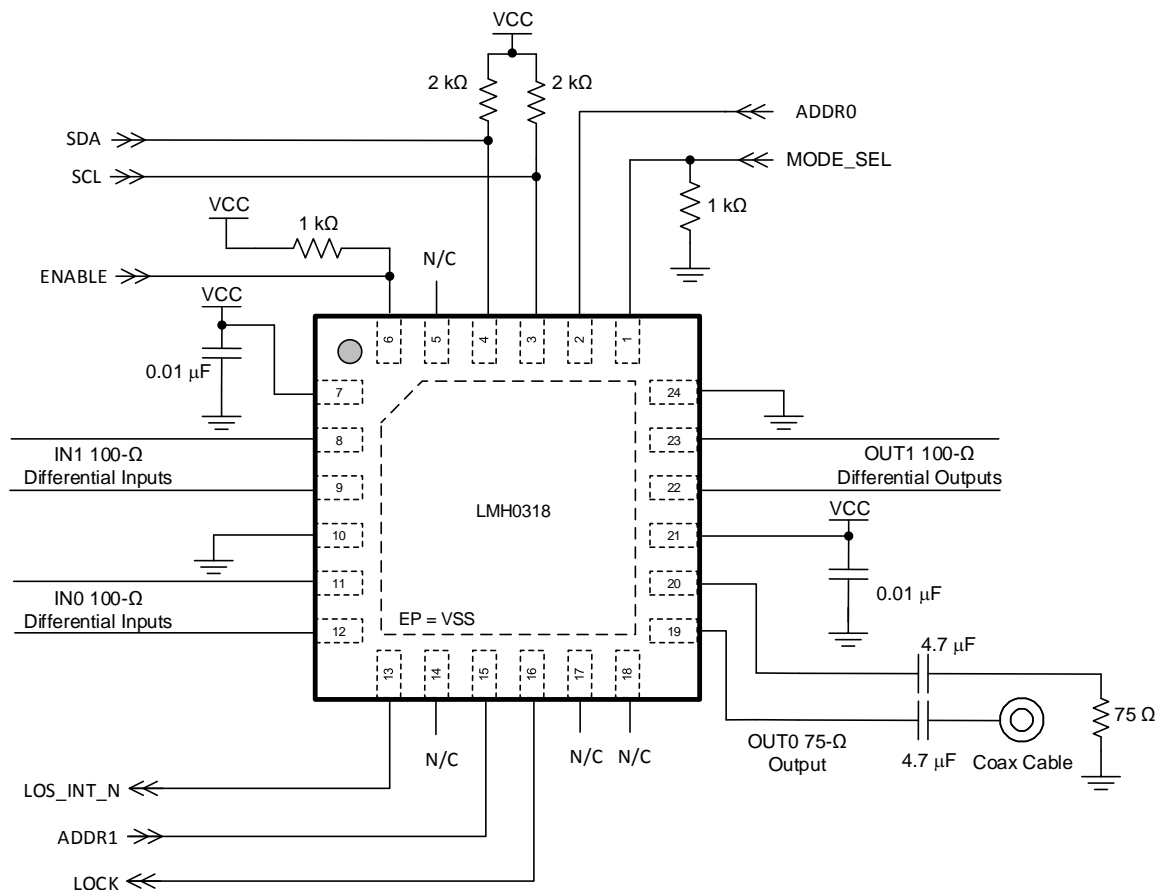


Figure 3. LMH0318 Application Schematic in SMBus Mode

For more information, visit the [LMH0318](#) product folder to access the full data sheet and other design documents.

6 Summary

TI offers a wide SDI portfolio with pin-compatible and functional equivalent alternatives to Semtech 3G-SDI cable drivers. With a few simple component changes to an existing SDI design and board layout, a Semtech 3G-SDI single cable driver can be replaced and improved with TI's pin-compatible 3G-SDI cable drivers. For Semtech's 3G-SDI dual cable driver, the LMH0307 can be used as a functionally compatible replacement. For new 3G designs that are in the component selection phase, TI recommends the LMH0318 for improved performance and easy upgrade path to 12G.

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