155 Mbit/s Cable Equaliser/ Driver Evaluation Board GD90360

Preliminary

General Description

The GD90360 Evaluation Board is designed for testing the performance of the high-speed integrated device GD16360, which offers:

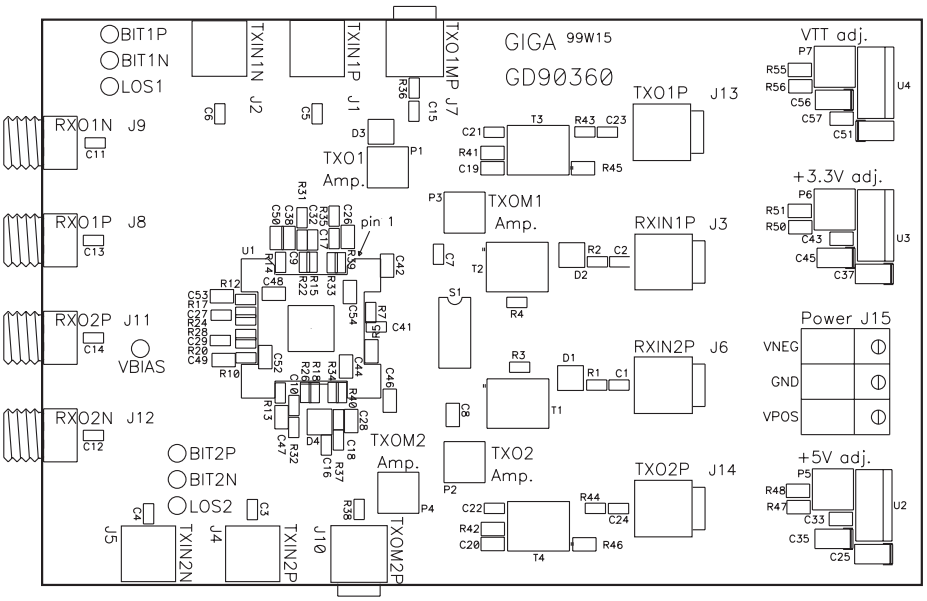
- Dual channel cable equaliser
- Cable driver
- LOS detection.

The evaluation board is designed with:

- 75 Ω transmission lines for the line inputs and outputs
- SMA connectors in order to enable easy interconnection of signals to/from external test equipment.

During the board design special attention has been paid to optimise the overall performance, with consideration of the GD16360's linear characteristics.

De-coupling capacitors are located as close as possible to the device, and the signal carrying traces in the PCB are kept free from via holes, sharp corners etc. to make the transmission line design as smooth as practically possible.



Features

- Easy evaluation of high speed performance in carefully designed PCB.
- High speed data in/outputs available via standard SMA connectors.
- Integrated 75 Ω transmission lines on the PCB for line input/output.
- Cable in/outputs with and without transformers available on board.
- Surge protection of line inputs/ outputs.
- Single unregulated 7.5 V, 50 mA power supply.
- Board dimensions: 83 × 126 mm (exclusive connectors).
- Gerber files for PCB layout available on request.

Functional Details

The GD16360 offers two identical independent channels, each of which is fully equipped in the GD90360 evaluation board. Individual amplitude adjustments are available, and digital supervision functions easily accessible via test pins on the board.

The descriptions below cover both channels with references in the form Channel1 (Channel2).

Data Inputs

The digital transmit data inputs J1/J2 (J4/J5) are differential LVPECL inputs, typically 140 - 155 Mbit/s CMI encoded data from a CMI encoder. A 280 - 311 Mbit/s NRZ coded signal with short CID runs can alternatively be used. The inputs are 50 Ω transmission lines, AC coupled to the GD16360 and terminated in R12/R14 (R10/R13). Single ended operation is possible if a 50 Ω termination is applied to the unused input.

The analogue receive data inputs J3 (J6) are single ended 75 Ω inputs. These inputs are mounted as AC coupled signals, accessing the GD16360 via a high-speed pulse transformer. If transformer-less connection is preferred, remove the transformer and mount a short between pad 1 and 6. Two SMD resistors size 0805 0 Ω in series will do the job.

The analogue inputs are overvoltage protected by the diodes D2 (D1) and drop resistors R2 (R1). The 75 Ω termination of the input line is R7 (R5), which is located closest possible to the input pins of the GD16360 in order to avoid stub effects and reflections from the PCB traces.

Data Outputs

The analogue data outputs from the line drivers are differential CML outputs. Each channel has two cable drivers. One is coupled out of the board via transformer, the other is AC coupled with protection diodes. The transformer outputs are differential outputs from the GD16360, mounted with the transformer in one branch and a compensating load in the other. The output line is DC terminated in R39 (R40) = 75 Ω. The signal is AC coupled to the transformer, and connected single ended out of the transformer to J13 (J14) to the transmission cable/test equipment. The coupling capacitor C21 (C22) to the transformer is balanced by C17 (C18) in the unused branch of the output stage, and resistor R35 (R37) compensates the impedance of the expected external load.

The transformerless output similarly consists of a differential output stage with an AC coupled branch and a branch with a compensation network R22, C9, R31 (R26, C10, R32) . The signal is connected via C15 (C16) to connector J7 (J10). A protection circuit is inserted into this output. It is composed of diode D3 (D4) and drop-resistor R36 (R38). These drop resistors may be optimised or omitted (short circuited) for optimum performance of the board. The requirements for a protection circuit depends on the overall system design philosophy and may be realised in other ways than suggested on the GD90360 board. The protection circuit is not necessary for the operation of the GD16360 device.

Individual potentiometers are mounted for regulation of the individual outputs. TX01 (TX02) controls the transformer output, while TXOM1 (TXOM2) controls the transformerless output.

The digital outputs from the cable equaliser is a differential LVPECL interface, which connects the received CMI signal out via J8/J9 (J11/J12). This output is AC coupled out of the board for easy testing.

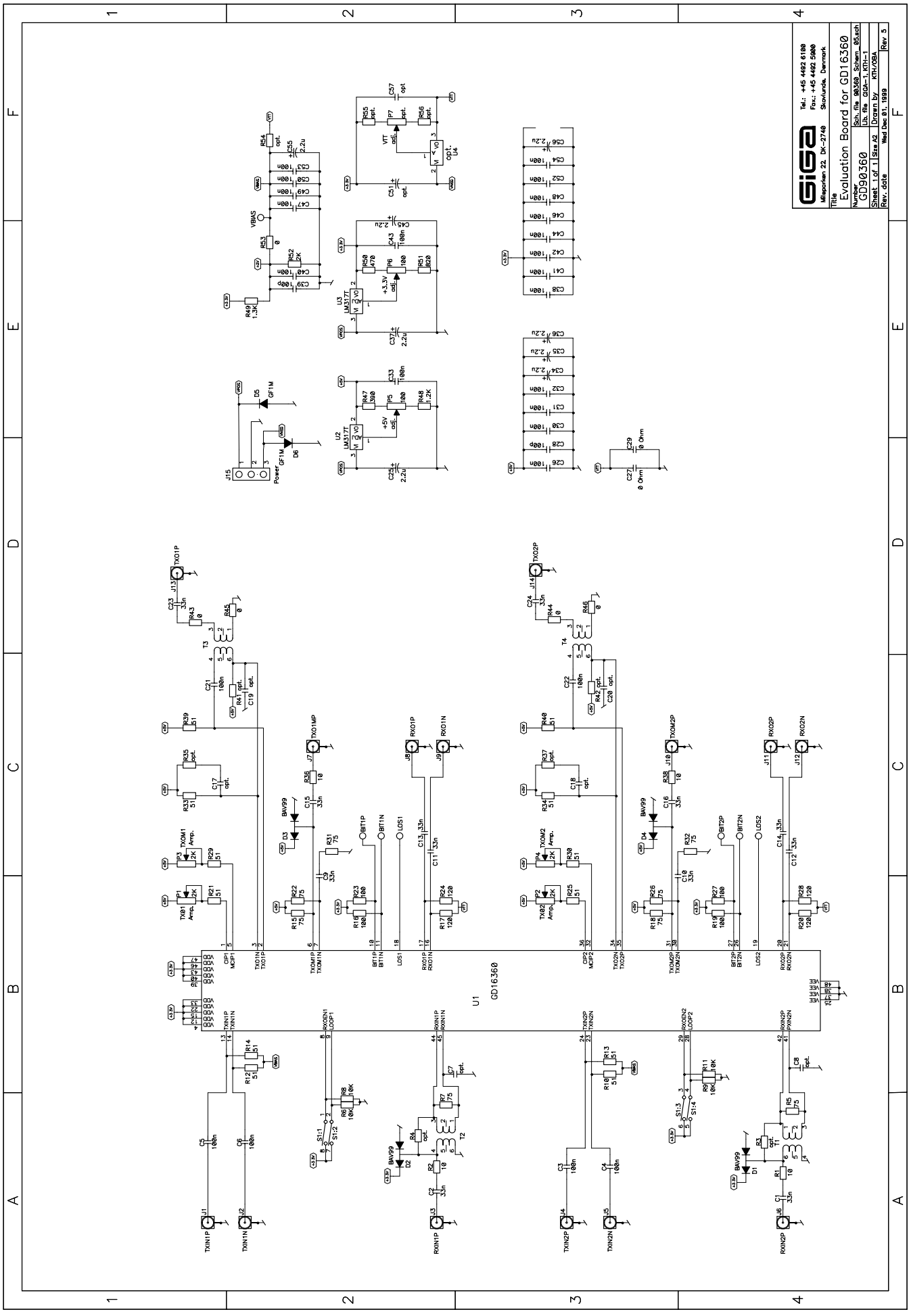
The coupling capacitors C13/C11 (C14/C12) can be short-circuited and R17/24 (R20/R28) removed, if DC coupled output is preferred.

Mode Control

The GD16360 has loop-back and receiver shut-down for each of the two channels. The operating modes are controlled by the DIP switch S1-1/2 (S1-3/4).

Power Supply

The GD90360 evaluation board may be powered from an unregulated power supply, delivering 7.5 V, 0.5 A minimum. Stabilised 3.3 V and 5 V supplies for the GD16360 are generated locally on the board.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Title
Evaluation Board for GD16360
Number
GD90360
Sch. file 90360_Schem_05.sch
Lib. file gl2A-1, KTH-1
Sheet 1 of 1
Size A2
Drawn by KTH/SBA
Rev. date
Wed Dec 01, 1999
Rev 5
GD16360
U1

References:

- GD16360 Data Sheet (latest revision).
- GD16360 Test Report, available from GIGA A/S.

Ordering Information

To order please specify as below:

Product Name:	**Description:**
GD90360	The evaluation kit comprises: Evaluation board in antistatic bag GD16360 device mounted on the board How to get started GD90360 Data sheet (this document)

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