PRELIMINARY

INTRODUCTION

The EB-RD35 is an evaluation and reference design platform for Routing and Distribution applications using the *GENLINX™ II* GS9024 Equalizer, the GS9035 Reclocker, and the GS9028 Cable Driver.

CIRCUIT DESCRIPTION

A functional block diagram is shown below and illustrates the primary circuit functions. These include equalization, reclocking, and driving 75Ω co-axial cables. A complete schematic is also included.

The EB-RD35 accepts a serial digital data input signal which first goes into the GS9024 equalizer. Equalization of the input signal is completely automatic for signal attenuation due to cable length from 0dB to in excess of 30dB. The signal strength/carrier detect output of the equalizer, which is proportional to the amount of equalization taking place, is available via test point TP3. Also available as an output, is the equalizer "Output Eye Monitor" signal via a SMA connector (J6). The signal strength/carrier detect and Output Eye Monitor are useful diagnostic outputs.

After equalization, the differential data signal is passed to the GS9035 reclocker which generates clock and retimed data signals. In addition, the complementary serial clock output signals are available at BNC connectors J2 and J3. The GS9035 also drives data rate indication

LEDs and a LOCK LED which is provided to visually indicate when the reclocker has locked to the incoming video signal.

The reclocked data signals are then supplied to the GS9028 cable driver which provides two complementary data outputs at BNC connectors J4 and J5. The GS9028 is configured to drive 75Ω co-axial cables with SMPTE defined 800mV levels.

BOARD SET-UP AND TEST

The board is configured in SMPTE, auto-tune mode and supports five data rates: 143Mb/s, 177Mb/s, 270Mb/s, 360Mb/s, and 540Mb/s. LED indicators are used to indicate when the device is LOCKed and the detected data rate as shown below:

	SS2	SS1	SS0
143Mb/s	0	0	0
177Mb/s	0	0	1
270Mb/s	0	1	0
360Mb/s	0	1	1
540Mb/s	1	0	0

The GS9035 can also be configured for manual mode by first putting the AUTO/$\overline{\text{MANUAL}}$ jumper (JMP2) into the 2-3 position. Then jumpers JMP[7:5] are set accordingly.

Note that whenever the AUTO/$\overline{\text{MANUAL}}$ input of the GS9035 is HIGH (auto mode), jumpers JMP[7:5] should be left floating to avoid bus contention.

EB-RD35 BLOCK DIAGRAM

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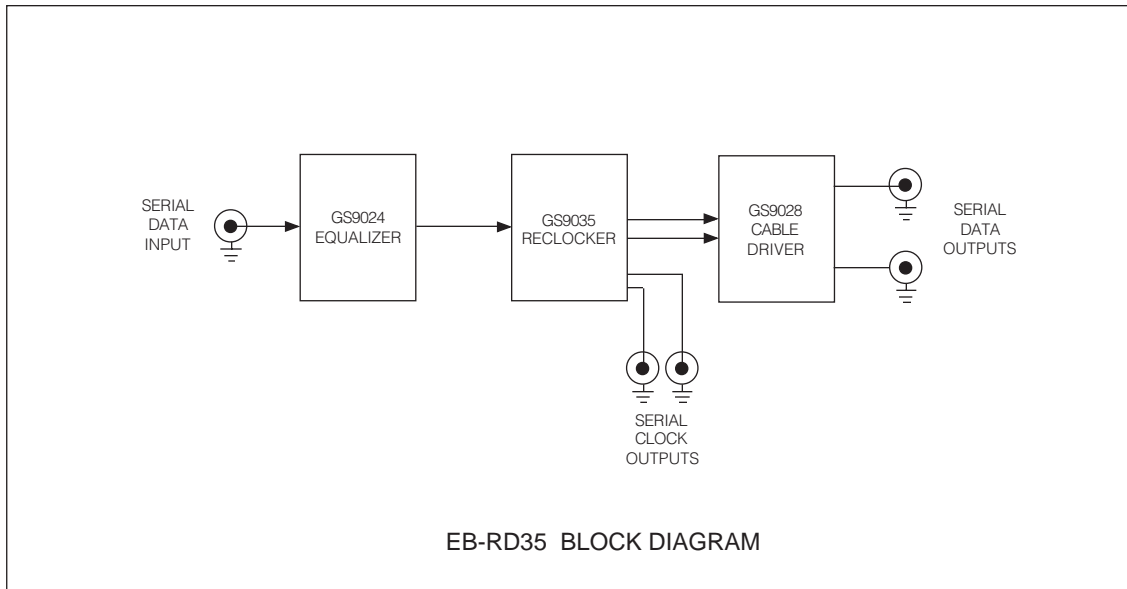
The CD_ADJ input of the GS9024 is biased via a resistor network including a potentiometer allowing the user to adjust the level at which loss of carrier is detected. For a detailed description of the CD_ADJ voltage level versus muting threshold refer to the GS9024 data sheet. Turning the potentiometer completely clockwise allows for maximum possible cable length equalization. In addition, the GS9024 outputs can be put in a HIGH-Z state by putting jumper JMP1 into the 1-2 position.

To verify operation of the EB-RD35, a source of serial digital video should be applied to the input BNC connector using 75Ω co-axial cable. Using a signal source that is not compliant to the SMPTE standards, can provide misleading results for equalizer cable length performance. The output data stream is available at the serial output and can be supplied to a D to A converter for verification via a monitor. Note that the jumpers should be set as shown below for an output to be present:

JMP1: 2-3 (equalizer outputs enabled)
JMP2: 1-2 (reclocker configured for AUTO mode)
JMP3: 1-2 (reclocker configured for SMPTE mode)

The power supply requirement for the EB-RD35 is +5V for VCC at a current rating of 230mA (nominally).

PCB DETAILS

The EB-RD35 is a four layer printed circuit board constructed of standard FR-4 material and measures approximately 5" by 4.5". Ground and power plane layers are internal to the board with signal layers on the top and bottom of the board. Components are mounted both on the top and bottom sides. The silkscreen (top and bottom) and all four layers are shown on the following pages. Note the following special artwork features used to optimize performance:

- A continuous ground plane is provided underneath all high speed traces avoiding impedance discontinuities and ensuring maximum signal integrity

- Copper on the power and ground planes has been removed from the area surrounding the center pin of the output
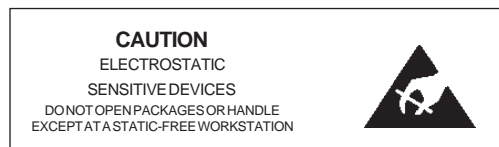
BNC connectors and from underneath the output components of the GS9028 cable driver. The purpose of these cutouts is to reduce the effect of the capacitance added by the connector and the pads of the components.

- Copper on the power and ground planes has been removed from underneath the loop filter and RVCO components of the GS9035. The purpose of these cutouts is to avoid any noise coupling from the planes into the GS9035.

- The ground plane associated with the input BNC connector and input components is isolated from the main board ground. The purpose of this is to provide a differential input signal to the equalizer.

APPLICATIONS

The EB-RD35 evaluation board is designed to show the characteristics of the GS9024 Equailizer, the GS9035 Reclocker, and the GS9028 Cable Driver. This board can also be used as a stand alone reclocking distribution amplifier for serial digital video signals.

EB-RD35

GENLINX™ II

SDI ROUTING AND
DISTRIBUTION CHIPSET

REV 2.1

GENNUM
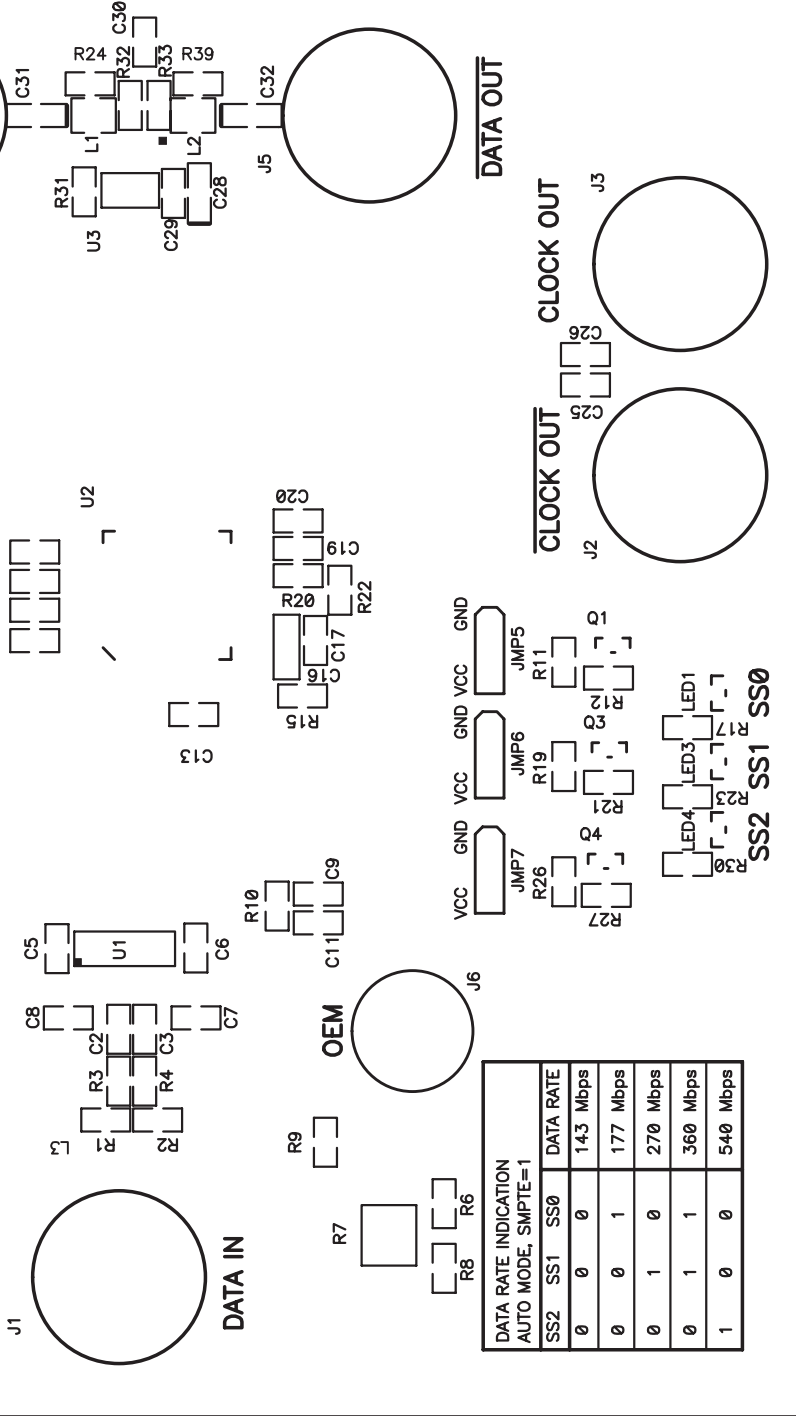C O R P O R A T I O N

DATA OUT

J4

C31

R24 C30
R32 R33 R39

L1   L2

C32

J5

DATA OUT

R31
U3   C28
C29

J3

CLOCK OUT

C26

C25

CLOCK OUT

J2

JMP4
JMP3
JMP2

TP2
GND

VCC TP1

C4
C1

	1-2	2-3
JMP1	HIGH-Z	ENABLED
JMP2	AUTO	MANUAL
JMP3	SMPTE	OTHER
JMP4	CLOCK ENABLE	CLOCK DISABLE

JMP1

U2

C21
C23
C18
C15

C20
C19

R20
C17
C16

R22

R15

C13

GND VCC

JMP5
R11
Q1
R12

VCC GND VCC

JMP6
R19
Q3
R21

LED1
R17 SS0

LED3
R231 SS1

VCC GND

JMP7
R26
Q4
R27

LED4
R30 SS2

SSI/CD
TP3
C10

LOCK
Q2

LED2
R16 R18

C5
U1
C6

R10
C11 C9

C8
R3 C2
C7
R4 C3

OEM

J6

L3
R1
R2

R9

DATA IN

J1

R7
R6
R8

DATA RATE INDICATION AUTO MODE, SMPTE=1			
SS2	SS1	SS0	DATA RATE
0	0	0	143 Mbps
0	0	1	177 Mbps
0	1	0	270 Mbps
0	1	1	360 Mbps
1	0	0	540 Mbps

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