

# CLC002

## SMPTE 292M / 259M Serial Digital Cable Driver

### General Description

The CLC002 SMPTE 292M / 259M serial digital cable driver is a monolithic, high-speed cable driver designed for use in SMPTE 292M / 259M serial digital video and ITU-T G.703 serial digital data transmission applications. The CLC002 drives 75Ω transmission lines (Belden 8281, Belden 1694A or equivalent) at data rates up to 1.485 Gbps.

The CLC002 provides two selectable slew rates for SMPTE 259M and SMPTE 292M compliance. The output voltage swing is adjustable from 800 mV<sub>P-P</sub> to 1.0 V<sub>P-P</sub> using an external resistor.

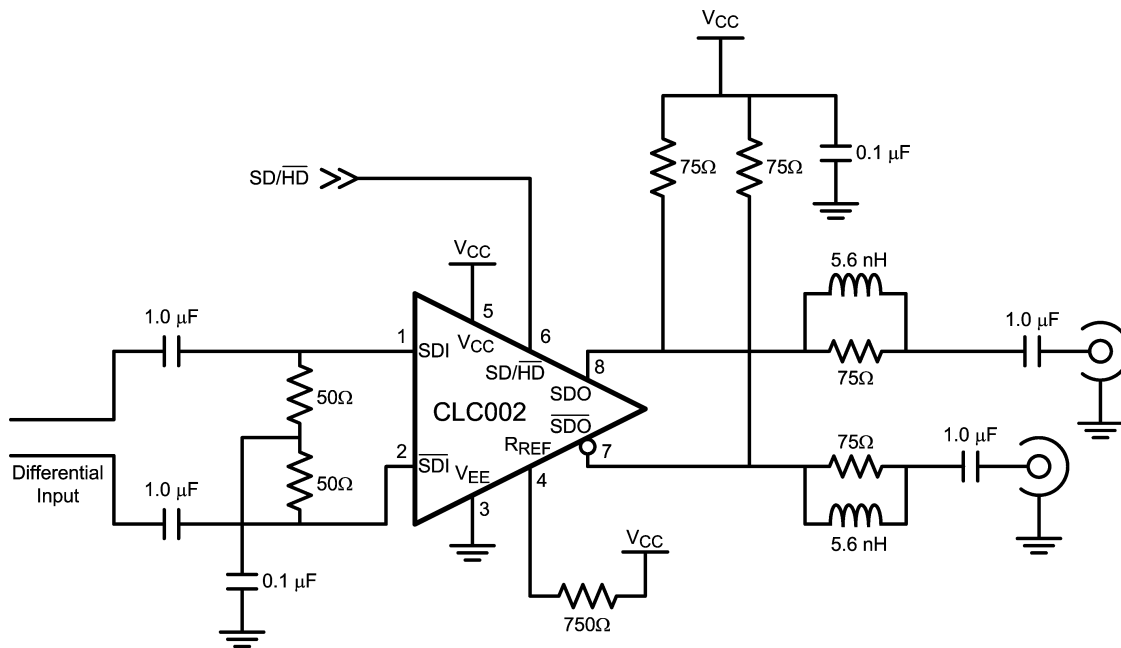
### Features

- SMPTE 292M, SMPTE 344M and SMPTE 259M compliant
- Data rates to 1.485 Gbps
- Differential input
- 75Ω differential output
- Selectable slew rate
- Adjustable output amplitude
- Single 3.3V supply operation
- Replaces the GS1528 and GS1528A

### Applications

- SMPTE 292M, SMPTE 344M, and SMPTE 259M serial digital interfaces
- Sonet/SDH and ATM interfaces
- Digital routers and distribution amplifiers
- Buffer applications

### Typical Application



20087602

**Absolute Maximum Ratings** (Note 1)

Supply Voltage:	-0.5V to 3.6V
Input Voltage (all inputs)	-0.3V to $V_{CC}+0.3V$
Output Current	28mA
ESD Rating (HBM)	2kV

**Recommended Operating Conditions**

Supply Voltage ( $V_{CC} - V_{EE}$ ):	3.3V $\pm 5\%$
Operating Free Air Temperature ( $T_A$ )	0°C to +70°C

**DC Electrical Characteristics**

Over Supply Voltage and Operating Temperature ranges, unless otherwise specified (Notes 2, 3).

Symbol	Parameter	Conditions	Reference	Min	Typ	Max	Units
$V_{CMIN}$	Input Common Mode Voltage		SDI, $\overline{SDI}$	1.6 + $V_{SDI}/2$		$V_{CC} -$ $V_{SDI}/2$	V
$V_{SDI}$	Input Voltage Swing	Differential		100		2000	mV <sub>P-P</sub>
$I_{IN}$	Input Current				3.5		$\mu A$
$V_{CMOUT}$	Output Common Mode Voltage		SDO, $\overline{SDO}$		$V_{CC} -$ $V_{SDO}$		V
$V_{SDO}$	Output Voltage Swing	Single-ended, 75 $\Omega$ load, $R_{REF} = 750\Omega$ 1%		720	800	880	mV <sub>P-P</sub>
		Single-ended, 75 $\Omega$ load, $R_{REF} = TBD$		900	1000	1100	mV <sub>P-P</sub>
	SD/ $\overline{HD}$ Input	Min for SD	SD/ $\overline{HD}$	2.4			V
		Max for HD				0.8	V
$I_{CC}$	Supply Current				48		mA

**AC Electrical Characteristics**

Over Supply Voltage and Operating Temperature ranges, unless otherwise specified (Note 3).

Symbol	Parameter	Conditions	Reference	Min	Typ	Max	Units
$DR_{SDI}$	Input Data Rate		SDI, $\overline{SDI}$			1485	Mbps
$t_{jit}$	Additive Jitter	1.485 Gbps	SDO, $\overline{SDO}$		15		ps <sub>P-P</sub>
		270 Mbps			25		ps <sub>P-P</sub>
$t_r, t_f$	Output Rise Time, Fall Time	SD/ $\overline{HD} = 0, 20\% - 80\%$			TBD	220	ps
		SD/ $\overline{HD} = 1, 20\% - 80\%$		400	TBD	800	ps
	Mismatch in Rise/Fall Time					30	ps
$t_{OS}$	Output Overshoot	Note 4				8	%
$RL_{SDO}$	Output Return Loss			15	18-20		dB

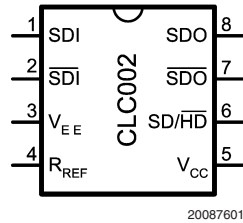
**Note 1:** "Absolute Maximum Ratings" are those parameter values beyond which the life and operation of the device cannot be guaranteed. The stating herein of these maximums shall not be construed to imply that the device can or should be operated at or beyond these values. The table of "Electrical Characteristics" specifies acceptable device operating conditions.

**Note 2:** Current flow into device pins is defined as positive. Current flow out of device pins is defined as negative. All voltages are stated referenced to  $V_{EE} = 0$  Volts.

**Note 3:** Typical values are stated for  $V_{CC} = +3.3V$  and  $T_A = +25^\circ C$ .

**Note 4:** Specification is guaranteed by design.

## Connection Diagram



**8-Pin SOIC**  
**Order Number CLC002MA**  
**See NS Package Number M08A**

## Pin Descriptions

Pin #	Name	Description
1	SDI	Serial data true input.
2	$\overline{\text{SDI}}$	Serial data complement input.
3	$V_{EE}$	Negative power supply (ground).
4	$R_{REF}$	Output driver level control. Connect a resistor to $V_{CC}$ to set output voltage swing.
5	$V_{CC}$	Positive power supply (+3.3V).
6	$\overline{\text{SD/HD}}$	Output slew rate control. Output rise/fall time complies with SMPTE 292M when low and SMPTE 259M when high.
7	$\overline{\text{SDO}}$	Serial data complement output.
8	SDO	Serial data true output.

## Device Operation

### INPUT INTERFACING

The CLC002 accepts either differential or single-ended input.

### OUTPUT INTERFACING

The CLC002 uses current mode outputs. Single-ended output levels range from 800 mV<sub>P-P</sub> to 1.0 V<sub>P-P</sub> ±10% into 75Ω AC-coupled coaxial cable. Output level is controlled by the value of  $R_{REF}$  connected between pin 4 and  $V_{CC}$ .

### OUTPUT SLEW RATE CONTROL

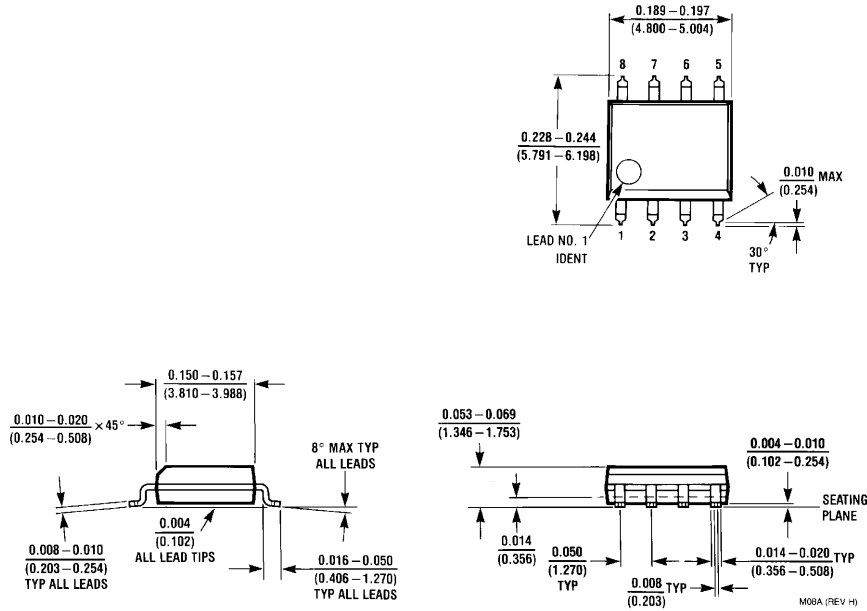
The CLC002 output rise and fall times are selectable for either SMPTE 259M or SMPTE 292M compliance via pin 6,  $\overline{\text{SD/HD}}$ . For slower rise and fall times, or SMPTE 259M compliance,  $\overline{\text{SD/HD}}$  is set high. For faster rise and fall times, or SMPTE 292M compliance,  $\overline{\text{SD/HD}}$  is set low.

### REPLACING THE GENNUM GS1528

The CLC002 is form-fit-function compatible with the Gennum GS1528.

**Physical Dimensions** inches (millimeters)

unless otherwise noted



**8-Pin SOIC**  
**Order Number CLC002MA**  
**NS Package Number M08A**

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