

FEATURES

- automatic cable equalization
- typically greater than 350 m of high quality cable at 270 Mb/s
- typically 300 m of high quality cable at 360 Mb/s
- improved jitter response vs cable length
- drop in replacement for GS9004B
- capability to drive 50 Ω loads (to V_{TT})
- fully compatible with SMPTE 259M and operational to 400 Mb/s
- signal strength indicator
- output 'eye' monitor
- 14 pin SOIC packaging
- single +5 or -5 volt power supply operation

APPLICATIONS

- Front-end cable equalization for digital video systems
- Input equalization for serial digital distribution amplifiers, routers, production switchers and other receiving equipment

DEVICE DESCRIPTION

The Gennum GS9004C is an improved monolithic automatic cable equalizer developed for SMPTE/EBU scrambled NRZI Serial Digital Video signals.

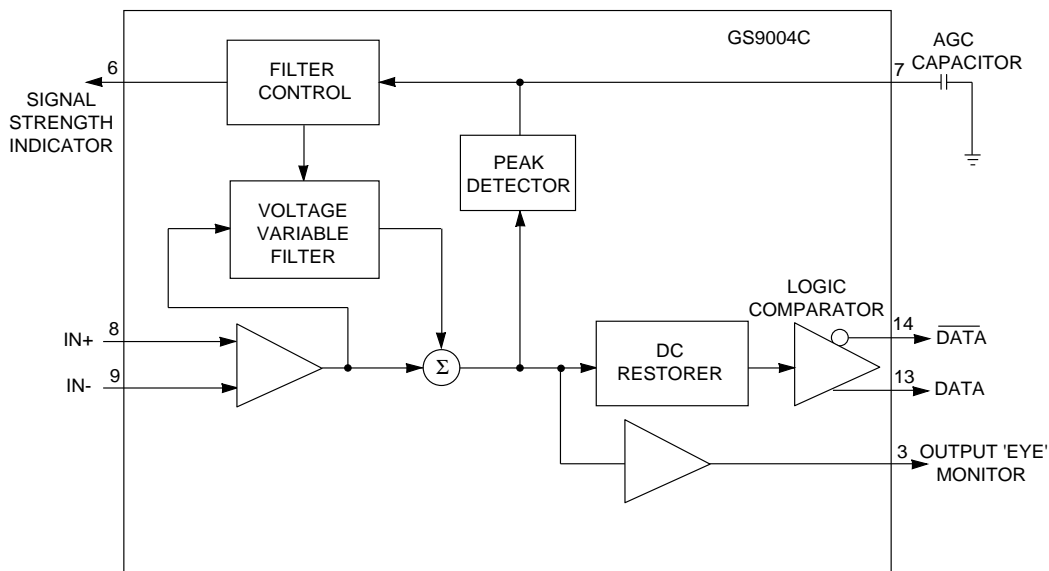
This device features DC restoration to pass the Pathological Test Signals and fully automatic equalization in order to meet the SMPTE 259M Serial Interface Standard. The DATA and $\overline{\text{DATA}}$ outputs typically deliver 800 mV (p-p) equalized signals into 50 Ω loads (to V_{TT}). These signals can be used to feed cable driver circuits for Serial Distribution Amplifier applications.

This device also incorporates an analog signal strength indicator (SSI) which provides a 0.5 V to 0 V output relative to V_{CC} , indicating the amount of equalization being applied to the signal.

The GS9004C features an OUTPUT 'EYE' MONITOR (OEM), which allows verification of signal integrity after equalization, prior to reslicing. Operating with a single +5 or -5 volt supply, the GS9004C typically draws 52 mA of current.

ORDERING INFORMATION

Part Number	Package Type	Temperature Range
GS9004CCKB	14 pin SOIC	0°C to 70°C
GS9004CCTB	14 pin SOIC Tape	0°C to 70°C

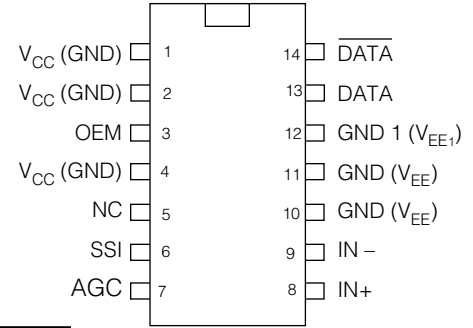


FUNCTIONAL BLOCK DIAGRAM

ABSOLUTE MAXIMUM RATINGS

PARAMETER	VALUE
Supply Voltage (V_S)	5.5 V
Input Voltage Range (any input)	$V_{CC}+0.5$ to $V_{EE}-0.5$ V
DC Input Current (any one input)	10 mA
Power Dissipation	500 mW
Operating Temperature Range	$0^{\circ}\text{C} \leq T_A \leq 70^{\circ}\text{C}$
Storage Temperature Range	$-65^{\circ}\text{C} \leq T_S \leq 150^{\circ}\text{C}$
Lead Temperature (soldering, 10 sec)	260 $^{\circ}\text{C}$

GS9004C PIN CONNECTIONS



PIN DESCRIPTIONS (I = INPUT, O = OUTPUT, S = SUPPLY function)

PIN NO.	SYMBOL	I/O	DESCRIPTION
1	V_{CC} (GND)	S	Most positive supply voltage (ECL outputs)
2	V_{CC} (GND)	S	Most positive supply voltage (DC Restore/Eye Monitor)
3	OEM	O	Output 'Eye' Monitor
4	V_{CC} (GND)	S	Most positive supply voltage (Equalizer)
5	NC		No Connection
6	SSI	O	Signal Strength Indicator
7	AGC	I	AGC capacitor connection
8	IN+	I	Non-inverting signal
9	IN-	I	Inverting signal
10	$\text{GND}(V_{EE})$	S	Most negative supply voltage
11	$\text{GND}(V_{EE})$	S	Most negative supply voltage
12	$\text{GND}1(V_{EE1})$	S	Most negative supply voltage for EYE MONITOR
13	DATA	O	DATA (true)
14	$\overline{\text{DATA}}$	O	DATA (inverse)

GS9004C DC ELECTRICAL CHARACTERISTICS Conditions: $V_S = 5$ V, $T_A = 0^{\circ}$ to 70°C , $R_L = 100 \Omega$, to ($V_{CC}-2$) volts, unless otherwise

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS	NOTES
Supply Voltage	V_S	Operating Range	4.75	5.0	5.25	V	
Power Consumption	P_D		-	285	360	mW	
		With MONITOR active	-	330	415	mW	
Supply Current	I_S		-	52	72	mA	
		With MONITOR active	-	60	83	mA	
Serial Data Output - High - Low	$V_{OH \text{ MIN}}$	$T_A = 25^{\circ}\text{C}$	-1.025	-	-0.88	V	with respect to V_{CC}
	$V_{OL \text{ MAX}}$	$T_A = 25^{\circ}\text{C}$	-1.8	-	-1.6	V	with respect to V_{CC}

GS9004C AC ELECTRICAL CHARACTERISTICS Conditions: $V_S = 5$ V, $T_A = 0^{\circ}$ to 70°C , $R_L = 100 \Omega$, to ($V_{CC}-2$) volts, unless otherwise

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS	NOTES
Output Signal Swing	V_O	$T_A = 25^{\circ}\text{C}$	700	800	900	mV	
Input Resistance(IN+, IN-)	R_{IN}		4k	5k	-	Ω	see fig. 8
Input Capacitance(IN+, IN-)	C_{IN}	$T_A = 25^{\circ}\text{C}$	-	1.3	-	pF	see fig. 8
Output 'Eye' Monitor	V_{OEM}	$R_L = 50 \Omega$, To V_{CC}	-	40	-	mV p-p	
Signal Strength Output	V_{SS}		4.4	-	5	V	see Fig. 5
GS9004C GAIN	A_V	$T_A = 25^{\circ}\text{C}$ $f = 135$ MHz	30	33	-	dB	see Fig. 4
JITTER (Added) 270Mb/s	t_j	$T_A = 25^{\circ}\text{C}$, 300m of 8281 cable.	-	600	-	ps p-p	Test setup 1 see Fig. 7

TYPICAL PERFORMANCE CURVES (unless otherwise shown $V_S = 5V$, $T_A = 25^\circ C$)

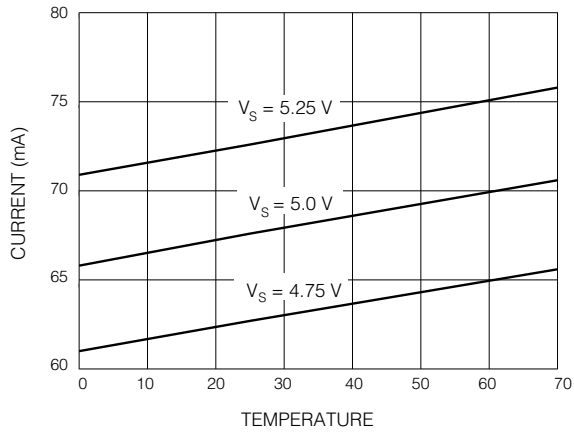


Fig. 3 Supply Current vs Temperature

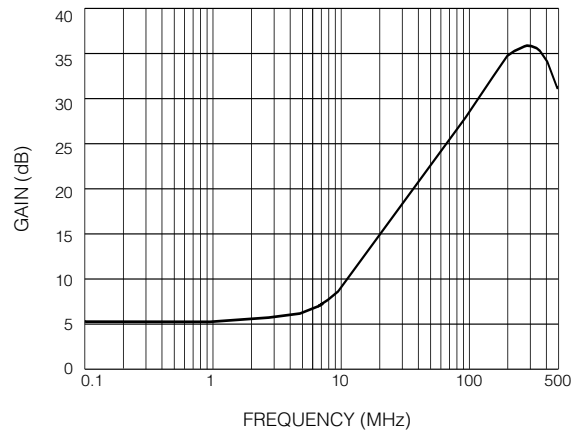


Fig. 4 Equalizer Gain vs Frequency

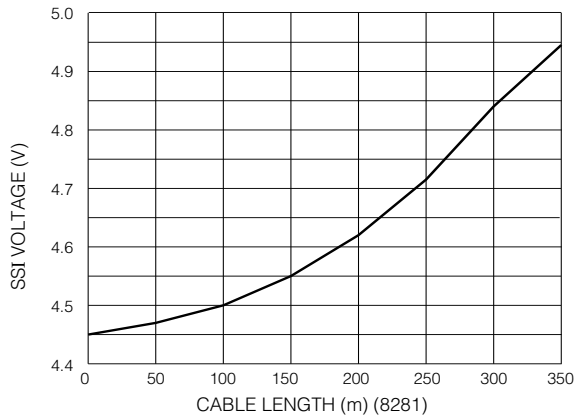


Fig. 5 Signal Strength Output Voltage vs Input Cable Length

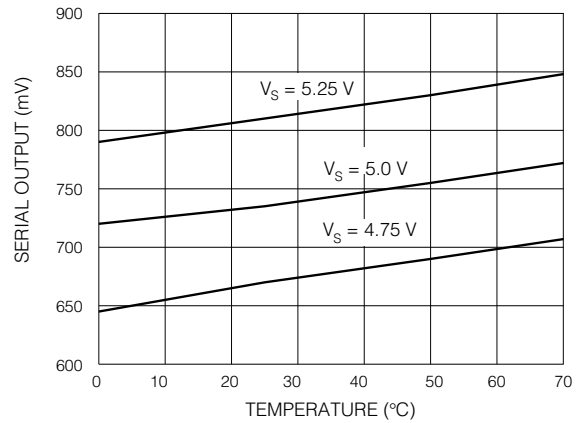


Fig. 6 Data and Data Output Voltage vs Temperature

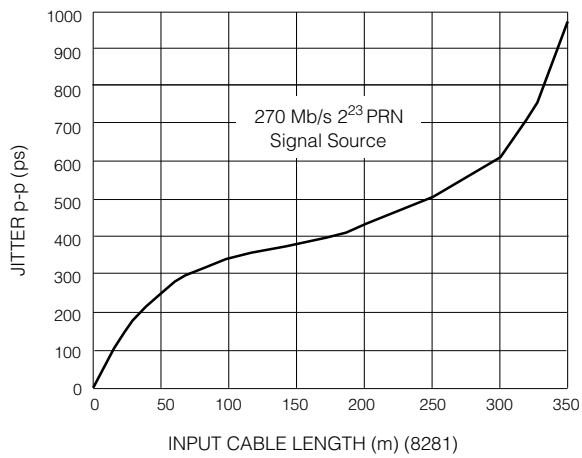
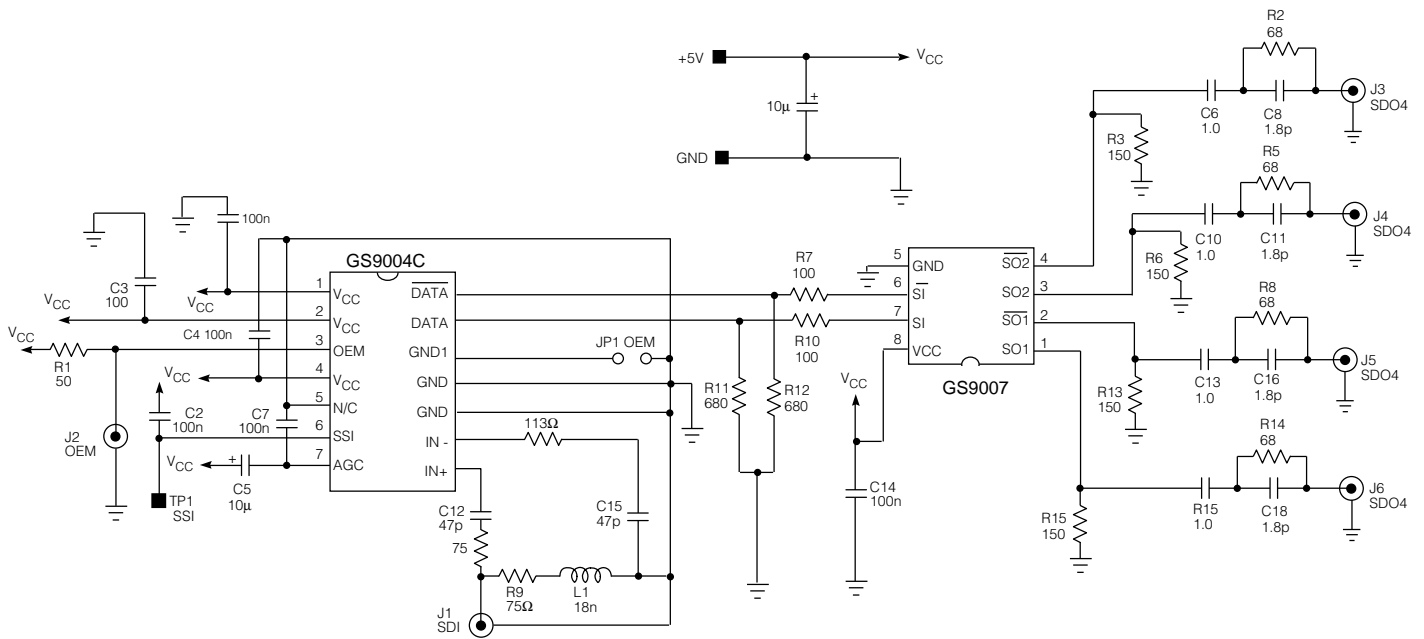


Fig. 7 Additive Jitter vs Input Cable Length at 270 Mb/s



All resistors in ohms, all capacitors
in microfarads unless otherwise stated.

Fig. 8 Typical Application Circuit

DOCUMENT IDENTIFICATION

PRODUCT PROPOSAL

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