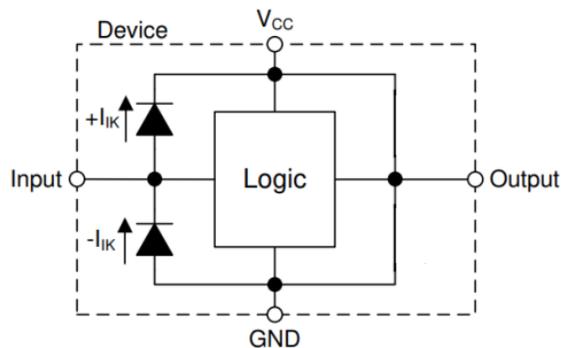


FEATURES

- Operating Voltage Range: 1.65V to 5.5V
- Low Power Consumption: 1μA (Max)
- Operating Temperature Range: -40°C to +125°C
- Inputs Accept Voltage to 5.5V
- Output Drive: ±24mA at V_{CC}=3.0V
- Micro Size Packages: SC70-5
- Positive-negative input clamp diode



APPLICATIONS

- AV Receiver
- Home Theaters
- Blu-ray Players and Home Theaters
- Desktops or Notebook PCs
- Digital Video Cameras (DVC)
- Personal Navigation Device (GPS)
- Portable Media Player
- Mobile Phones

DESCRIPTION

The Single Schmitt-trigger inverter is designed for 1.65V to 5.5V V_{CC} operation.

The GS1G14 device contains one inverter and performs the Boolean function $Y = \bar{A}$. The device functions as an independent inverter with Schmitt trigger inputs, so the device has different input threshold levels for positive-going (V_{T+}) and negative going (V_{T-}) signals to provide hysteresis (ΔV_T) which makes the device tolerant to slow or noisy input signals.

This device is fully specified for partial-power-down applications using I_{off}. The I_{off} circuitry disables the outputs, preventing damaging current backflow through the device when it is powered down.

The GS1G14 is available in Green SC70-5 packages. It operates over an ambient temperature range of -40°C to +125°C.

FUNCTION TABLE

INPUT	OUTPUT
A	Y
H	L
L	H

$$Y = \bar{A}$$

H=HIGH Logic Level

L=LOW Logic Level

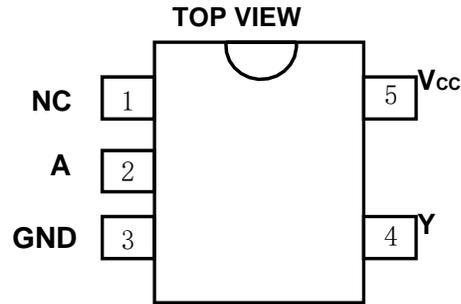
Functional Block Diagram



PACKAGE/ORDERING INFORMATION

PRODUCT	ORDER NUMBER	PACKAGE DESCRIPTION	PACKAGE OPTION	MARKING INFORMATION
GS1G14	GS1G14-CR	SC70-5	Tape and Reel,3000	1G14

PIN CONFIGURATIONS



SC70-5

PIN DESCRIPTION

PIN	NAME	I/O TYPE	FUNCTION
SC70-5			
1	NC	-	Not connected
2	A	I	Input
3	GND	P	Ground
4	Y	O	Output
5	V _{cc}	P	Power pin

Specifications

Absolute Maximum Ratings ⁽¹⁾

over operating free-air temperature range (unless otherwise noted) ⁽¹⁾⁽²⁾

		MIN	MAX	UNIT
V _{CC}	Supply voltage range	-0.5	6.5	V
V _I	Input voltage range ⁽²⁾	-0.5	V _{CC} +0.5	V
V _O	Voltage range applied to any output in the high-impedance or power-off state ⁽²⁾	-0.5	6.5	V
V _O	Voltage range applied to any output in the high or low state ⁽²⁾⁽³⁾	-0.5	V _{CC} +0.5	V
I _{IK}	Input clamp current	V _I <0	-50	mA
I _{OK}	Output clamp current	V _O <0	-50	mA
I _O	Continuous output current		±50	mA
	Continuous current through V _{CC} or GND		±100	mA
T _J	Junction temperature	-65	150	°C
T _{stg}	Storage temperature	-65	150	°C

- (1) Stresses beyond those listed under Absolute Maximum Ratings may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under Recommended Operating Conditions is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.
- (2) The input and output negative-voltage ratings may be exceeded if the input and output current ratings are observed.
- (3) The value of V_{CC} is provided in the Recommended Operating Conditions table.

ESD Ratings:

PARAMETER	SYMBOL		MAX	UNIT
Electrostatic discharge	I _{ESD}	Latch up current	350	mA
	V _{ESD}	Human-body model (HBM)	±5500	V
		Charge device model (CDM)	±2000	

Thermal Information:

THERMAL METRIC		GS1G14	UNIT
		SC70-5	
R _{ΘJA}	Junction-to-ambient thermal resistance	214.7	°C/W
R _{ΘJC(top)}	Junction-to-case(top) thermal resistance	126.1	°C/W
R _{ΘJB}	Junction-to-board thermal resistance	59.0	°C/W
Ψ _{JT}	Junction-to-top characterization parameter	31.4	°C/W
Ψ _{JB}	Junction-to-board characterization parameter	56.4	°C/W
R _{ΘJC(bot)}	Junction-to-case(bottom) thermal resistance	N/A	°C/W

ELECTRICAL CHARACTERISTICS

over recommended operating free-air temperature range (TYP values are at $T_A = +25^\circ\text{C}$, unless otherwise noted.) ⁽¹⁾

Recommended Operating Conditions

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	MAX	UNITS
Supply voltage	V_{CC}	Operating	1.65	5.5	V
		Data retention only	1.5	5.5	
High-level input voltage	V_{IH}	$V_{CC}=1.65\text{V to }1.95\text{V}$	$0.5 \times V_{CC}$		V
		$V_{CC}=2.3\text{V to }2.7\text{V}$	1.1		
		$V_{CC}=3\text{V to }3.6\text{V}$	1.5		
		$V_{CC}=4.5\text{V to }5.5\text{V}$	$0.45 \times V_{CC}$		
Low-level input voltage	V_{IL}	$V_{CC}=1.65\text{V to }1.95\text{V}$		$0.3 \times V_{CC}$	V
		$V_{CC}=2.3\text{V to }2.7\text{V}$		0.55	
		$V_{CC}=3\text{V to }3.6\text{V}$		0.75	
		$V_{CC}=4.5\text{V to }5.5\text{V}$		$0.2 \times V_{CC}$	
Input voltage	V_I		0	5.5	V
Output voltage	V_O		0	V_{CC}	V
Input transition rise or fall	t_r, t_f	$V_{CC}=1.8\text{V} \pm 0.15\text{V}, 2.5\text{V} \pm 0.2\text{V}$		20	ns/V
		$V_{CC}=3.3\text{V} \pm 0.3\text{V}$		10	
		$V_{CC}=5\text{V} \pm 0.5\text{V}$		5	
Operating temperature	T_A		-40	+125	$^\circ\text{C}$

DC Characteristics

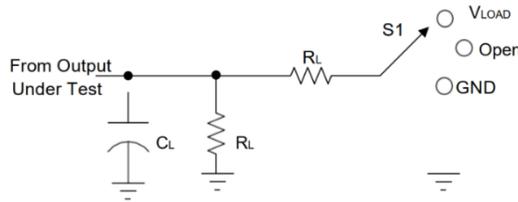
PARAMETER	TEST CONDITIONS	V_{CC}	TEMP	MIN	TYP	MAX	UNITS
V_{OH}	$I_{OH} = -100\mu\text{A}$	1.65V to 5.5V	Full	$V_{CC}-0.1$			V
	$I_{OH} = -4\text{mA}$	1.65V		1.2			
	$I_{OH} = -8\text{mA}$	2.3V		1.7			
	$I_{OH} = -16\text{mA}$	3V		2.2			
	$I_{OH} = -24\text{mA}$			2.1			
	$I_{OH} = -32\text{mA}$	4.5V		3.6			
V_{OL}	$I_{OL} = 100\mu\text{A}$	1.65V to 5.5V	Full			0.1	V
	$I_{OL} = 4\text{mA}$	1.65V				0.15	
	$I_{OL} = 8\text{mA}$	2.3V				0.25	
	$I_{OL} = 16\text{mA}$	3V				0.25	
	$I_{OL} = 24\text{mA}$					0.35	
	$I_{OL} = 32\text{mA}$	4.5V				0.35	
I_I	A or B inputs	$V_I=5.5\text{V or GND}$	5.5V	+25 C	± 0.1	± 1	μA
				Full		± 5	
I_{off}	$V_O=5.5\text{V}$	0	+25 C		± 0.1	± 1	μA
			Full			± 10	
I_{CC}	$V_I=V_{CC} \text{ or GND}, I_O=0$	1.65V to 5.5V	+25 C		0.1	1	μA
			Full			10	
ΔI_{CC}	One input at $V_{CC}-0.6\text{V}$, Other inputs at $V_{CC} \text{ or GND}$	3V to 5.5V	Full			500	μA

AC Characteristics

PARAMETER	SYMBOL	TEST CONDITIONS		MIN	TYP	MAX	UNITS
Propagation Delay	t_{pd}	$V_{CC}=1.8V\pm 0.15V$	$C_L=30pF, R_L=1k\Omega$		8.8		ns
		$V_{CC}=2.5V\pm 0.2V$	$C_L=30pF, R_L=500\Omega$		5		
		$V_{CC}=3.3V\pm 0.3V$	$C_L=50pF, R_L=500\Omega$		3.8		
		$V_{CC}=5V\pm 0.5 V$	$C_L=50pF, R_L=500\Omega$		3.5		
Input Capacitance	C_i	$V_{CC}=0V$			4		pF
Power dissipation capacitance	C_{pd}	$V_{CC}=3.3V$	$f=10MHz$		26		pF
		$V_{CC}=5V$			31		

(1) All unused inputs of the device must be held at V_{CC} or GND to ensure proper device operation.

Parameter Measurement Information



TEST	S1
t_{PLH}/t_{PHL}	Open
t_{PLZ}/t_{PZL}	V_{LOAD}
t_{PHZ}/t_{PZH}	GND

V_{CC}	INPUTS		V_M	V_{LOAD}	C_L		R_L		V_{Δ}
	V_I	t_i/t_f							
$1.8V \pm 0.15V$	V_{CC}	$\leq 2ns$	$V_{CC}/2$	$2 \times V_{CC}$	15pF	30pF	1M Ω	1k Ω	0.15V
$2.5V \pm 0.2V$	V_{CC}	$\leq 2ns$	$V_{CC}/2$	$2 \times V_{CC}$	15pF	30pF	1M Ω	500 Ω	0.15V
$3.3V \pm 0.3V$	3V	$\leq 2.5ns$	1.5V	6V	15pF	50pF	1M Ω	500 Ω	0.3V
$5V \pm 0.5V$	V_{CC}	$\leq 2.5ns$	$V_{CC}/2$	$2 \times V_{CC}$	15pF	50pF	1M Ω	500 Ω	0.3V

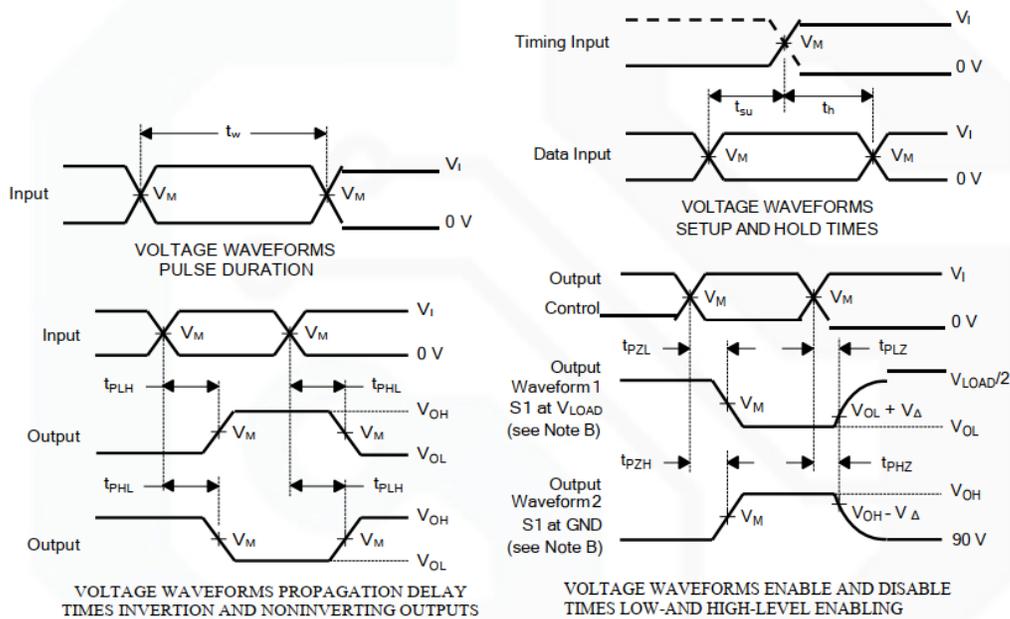


Figure 1. Load Circuit and Voltage Waveforms

Notes: A. C_L includes probe and jig capacitance.

B. Waveform 1 is for an output with internal conditions such that the output is low, except when disabled by the output control. Waveform 2 is for an output with internal conditions such that the output is high, except when disabled by the output control.

C. All input pulses are supplied by generators having the following characteristics: $PRR \leq 10 \text{ MHz}$, $Z_O = 50\Omega$.

D. The outputs are measured one at a time, with one transition per measurement.

E. t_{PLZ} and t_{PHZ} are the same as t_{dis} .

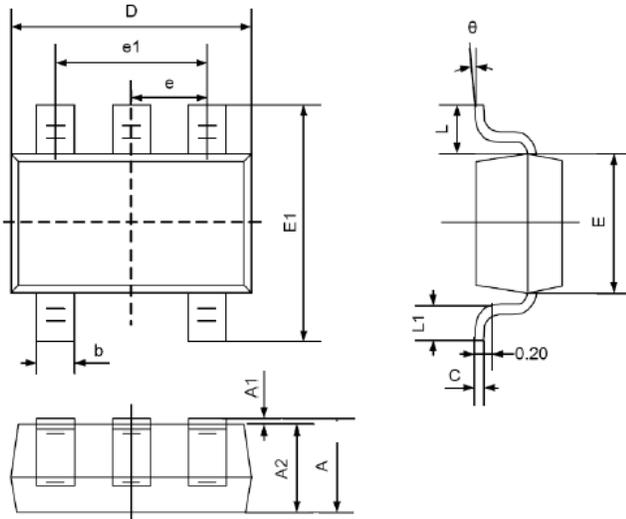
F. t_{PZL} and t_{PZH} are the same as t_{en} .

G. t_{PLH} and t_{PHL} are the same as t_{pd} .

H. All parameters and waveforms are not applicable to all devices.

PACKAGE OUTLINE DIMENSIONS

SC70-5



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.100	0.035	0.043
A1	0.000	0.100	0.000	0.004
A2	0.900	1.000	0.035	0.039
b	0.150	0.350	0.006	0.014
C	0.080	0.150	0.003	0.006
D	2.000	2.200	0.079	0.087
E	1.150	1.350	0.045	0.053
E1	2.150	2.450	0.085	0.096
e	0.650TYP		0.026TYP	
e1	1.200	1.400	0.047	0.055
L	0.525REF		0.021REF	
L1	0.260	0.460	0.010	0.018
θ	0°	8°	0°	8°