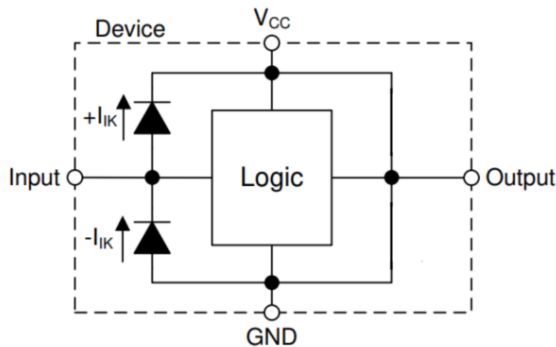## FEATURES

- 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
- High Output Drive: ±24mA at V_{CC}=3.0V
- I_{OFF} Supports Live Insertion, Partial-Power Down Mode, and Back-Drive Protection
- Micro Size Packages: SC70-6
- Positive-negative input clamp diode

APPLICATIONS

- Network Switch
- Telecom Infrastructure
- Servers
- I/O Expanders

Simplified Schematic
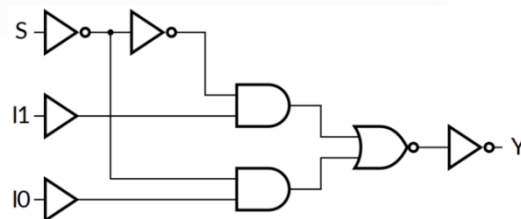
DESCRIPTION

The GS1G157 single 2-input multiplexer is designed for 1.65V to 5.5V V_{CC} operation.

The GS1G157 selects data from two data inputs (I0 and I1) under control of a common data select input (S). The state of the common data select input determines the particular register from which the data comes. The output (Y) presents the selected data in the true (non-inverted) form.

The GS1G157 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.

This device available in Green SC70-6 packages. It operates over an ambient temperature range of -40°C to +125°C.
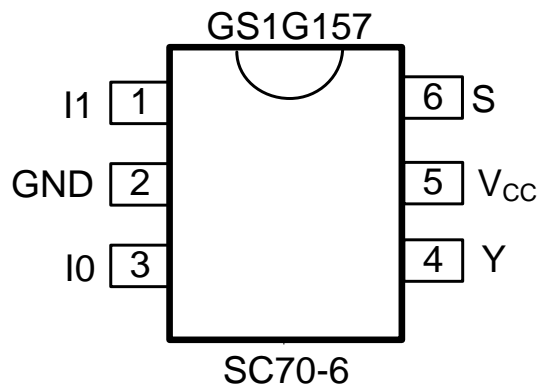
FUNCTION TABLE

INPUTS			OUTPUT
S	I1	I0	Y
L	X	L	L
L	X	H	H
H	L	X	L
H	H	X	H

(1)H=HIGH Voltage Level
L=LOW Voltage Level
X=Don't Car

PACKAGE/ORDERING INFORMATION

PRODUCT	ORDER NUMBER	PACKAGE DESCRIPTION	PACKAGE OPTION	MARKING INFORMATION
GS1G157	GS1G157-CR	SC70-6	Tape and Reel,3000	1G157

PIN CONFIGURATIONS

GS1G157

I1	1		6	S
GND	2		5	V_{CC}
I0	3		4	Y

SC70-6

PIN DESCRIPTION

PIN	NAME	I/O TYPE	FUNCTION
1	I1	I	Date Input
2	GND	-	Ground
3	I0	I	Date Input
4	Y	O	Multiplexer Output
5	V$_{CC}$	P	Supply Voltage
6	S	I	Common Date Select Input

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	6.5	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
θ_{JA}	Package thermal impedance	SC70-6		265	℃/W
T_J	Junction temperature [(5)]		-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.

(4) The package thermal impedance is calculated in accordance with JESD-51.

(5) The maximum power dissipation is a function of $T_{J(MAX)}$, $R_{\theta JA}$, and T_A. The maximum allowable power dissipation at any ambient temperature is $P_D = (T_{J(MAX)} - T_A) / R_{\theta JA}$. All numbers apply for packages soldered directly onto a PCB.

ESD Ratings：

PARAMETER	SYMBOL		MAX	UNIT
Electrostatic discharge	IESD	Latch up current	350	mA
	VESD	Human-body model (HBM)	±5500	V
		Charge device model (CDM)	±2000	

ESD SENSITIVITY CAUTION

ESD damage can range from subtle performance degradation to complete device failure. Precision integrated circuits may be more susceptible to damage because very small parametric changes could cause the device not to meet its published specifications.

ELECTRICAL CHARACTERISTICS

over recommended operating free-air temperature range (TYP values are at T_A = +25℃, 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}=1.65V to 1.95V	$0.5 \times V_{CC}$		V
		V_{CC}=2.3V to 2.7V	1.1		
		V_{CC}=3V to 3.6V	1.5		
		V_{CC}=4.5V to 5.5V	$0.45 \times V_{CC}$		
Low-level input voltage	V_{IL}	V_{CC}=1.65V to 1.95V		$0.3 \times V_{CC}$	V
		V_{CC}=2.3V to 2.7V		0.55	
		V_{CC}=3V to 3.6V		0.75	
		V_{CC}=4.5V to 5.5V		$0.2 \times V_{CC}$	
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}=1.8V$\pm$ 0.15V,2.5V $\pm$ 0.2V		20	ns/V
		V_{CC}=3.3V$\pm$ 0.3V		10	
		V_{CC}=5V$\pm$ 0.5V		5	
Operating temperature	T_A		-40	+125	°C

DC Characteristics

PARAMETER		TEST CONDITIONS	V_{CC}	TEMP	MIN	TYP	MAX	UNITS
V_{OH}		$I_{OH} = -100\mu A$	1.65V to 5.5V	Full	V_{CC}-0.1			V
		$I_{OH} = -4mA$	1.65V		1.2			
		$I_{OH} = -8mA$	2.3V		1.7			
		$I_{OH} = -16mA$	3V		2.2			
		$I_{OH} = -24mA$			2.1			
		$I_{OH} = -32mA$	4.5V		3.6			
V_{OL}		$I_{OL} = 100\mu A$	1.65V to 5.5V	Full			0.1	V
		$I_{OL} = 4mA$	1.65V				0.15	
		$I_{OL} = 8mA$	2.3V				0.25	
		$I_{OL} = 16mA$	3V				0.25	
		$I_{OL} = 24mA$					0.35	
		$I_{OL} = 32mA$	4.5V				0.35	
I_I	A or B inputs	V_I=5.5V or GND	5.5V	+25 C		±0.1	±1	µA
				Full			±5	
I_{off}		V_O=5.5V	0	+25 C		±0.1	±1	µA
				Full			±10	
I_{CC}		V_I=V_{CC} 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}-0.6V, Other inputs at V_{CC} 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±0.15V	C_L=30pF, R_L=1kΩ		8.8		ns
		V_{CC}=2.5V±0.2V	C_L=30pF, R_L=500Ω		5		
		V_{CC}=3.3V±0.3V	C_L=50pF, R_L=500Ω		3.8		
		V_{CC}=5V±0.5 V	C_L=50pF, R_L=500Ω		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 deviceoperation.

Parameter Measurement Information
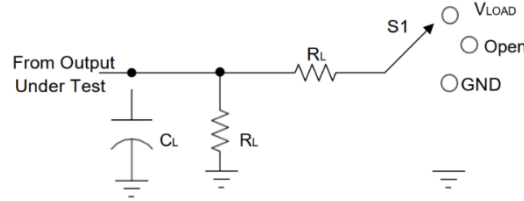
TEST	S1
t$_{PLH}$/t$_{PHL}$	Open
t$_{PLZ}$/t$_{PZL}$	V$_{LOAD}$
t$_{PHZ}$/t$_{PZH}$	GND

V$_{CC}$	INPUTS		V$_M$	V$_{LOAD}$	C$_L$		R$_L$		V$_\Delta$
	V$_I$	t$_r$/t$_f$							
1.8V±0.15V	V$_{CC}$	≤2ns	V$_{CC}$/2	2 x V$_{CC}$	15pF	30pF	1MΩ	1kΩ	0.15V
2.5V±0.2V	V$_{CC}$	≤2ns	V$_{CC}$/2	2 x V$_{CC}$	15pF	30pF	1MΩ	500Ω	0.15V
3.3V±0.3V	3V	≤2.5ns	1.5V	6V	15pF	50pF	1MΩ	500Ω	0.3V
5V±0.5V	V$_{CC}$	≤2.5ns	V$_{CC}$/2	2 x V$_{CC}$	15pF	50pF	1MΩ	500Ω	0.3V

VOLTAGE WAVEFORMS
PULSE DURATION

VOLTAGE WAVEFORMS
SETUP AND HOLD TIMES

VOLTAGE WAVEFORMS PROPAGATION DELAY
TIMES INVERTION AND NONINVERTING OUTPUTS

VOLTAGE WAVEFORMS ENABLE AND DISABLE
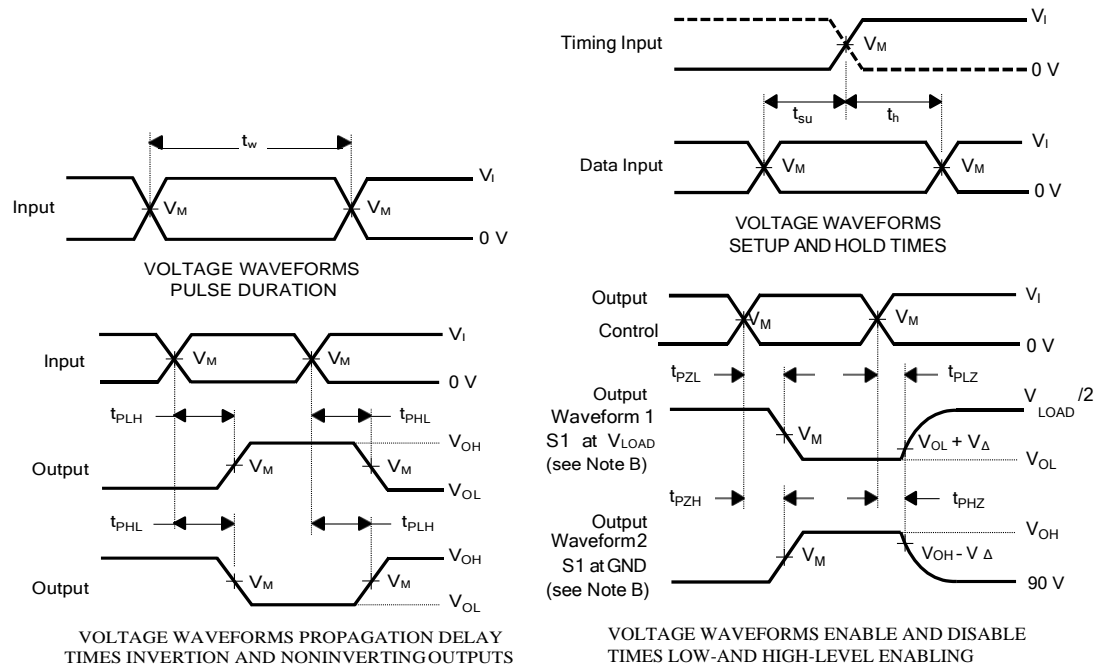TIMES LOW-AND HIGH-LEVEL ENABLING

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≤10 MHz, Z$_O$ = 50Ω.

D. The outputs are measured one at a time, with one transition per measurement.
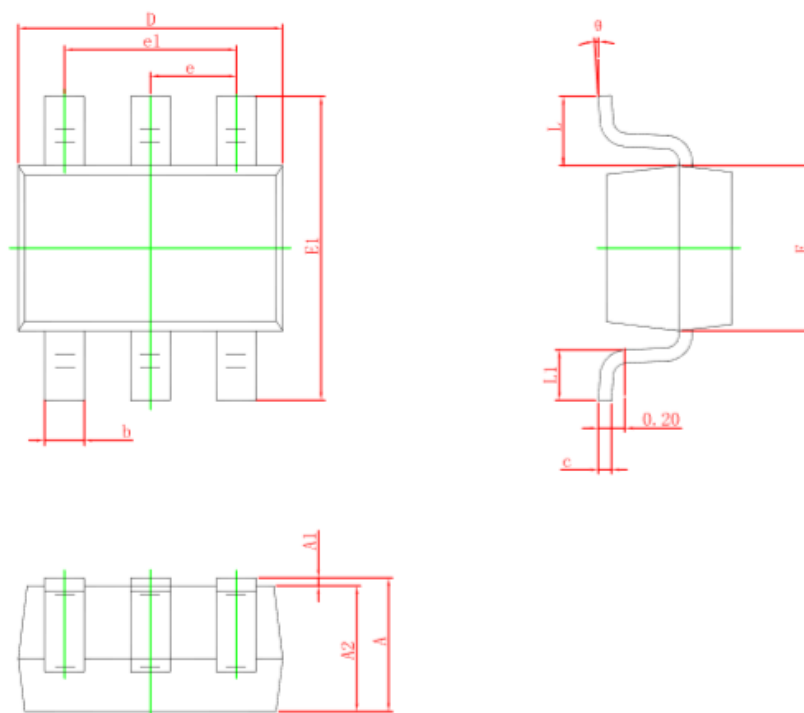
E. t$_{PLZ}$ and t$_{PHZ}$ are the same as t$_{dis}$.

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

SC70-6

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	0.110	0.175	0.004	0.007
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	0.650 TYP.		0.026 TYP.	
e1	1.200	1.400	0.047	0.055
L	0.525 REF.		0.021 REF.	
L1	0.260	0.460	0.010	0.018
θ	0°	8°	0°	8°