GENERAL DESCRIPTION

The 2-bit non-inverting translator is a bidirectional voltage-level translator and can be used to establish digital switching compatibility between mixed-voltage systems. It uses two separate configurable power-supply rails, with the A ports supporting operating voltages from 1.2V to 5.5V while it tracks the V_{CCA} supply, and the B ports supporting operating voltages from 1.2V to 5.5V while it tracks the V_{CCB} supply. This allows the support of both lower and higher logic signal levels while providing bidirectional translation capabilities between any of the1.2V, 1.8V, 2.5V, 3.3V and 5V voltage nodes.

When the output-enable (OE) input is low, all I/Os are placed in the high-impedance state, which significantly reduces the power-supply quiescent current consumption. OE has an internal pull-down current source, as long as V_{CCA} is powered.

To ensure the high-impedance state during power up or power down, OE should be tied to GND through a pull-down resistor; the minimum value of the resistor is determined by the current-sourcing capability of the driver.

FEATURES

- No Direction-Control
- Data Rates: 24Mbps (Push-Pull)
  2Mbps (Open-Drain)
- 1.2V to 5.5V on A ports and 1.2V to 5.5V on B Ports ($V_{CCA} \leq V_{CCB}$)
- V_{CC} Isolation: If Either V_{CC} is at GND, Both Ports are in the High-Impedance State
- No Power-Supply Sequencing Required: Either V_{CCA} or V_{CCB} can be Ramped First
- I_{OFF}: Supports Partial-Power-Down Mode Operation
- Extended Temperature: -40°C to +125°C
- Packages: SOT23-8

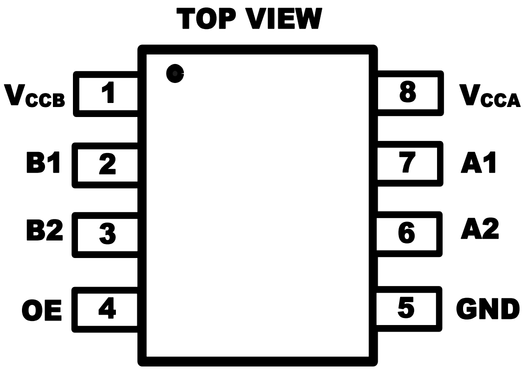
Applications:

- Automotive infotainment
- Advanced Driver Assistance
- System (ADAS)
- Telematics

ORDERING INFORMATION:

Part Number	Package	Ordering Number	Packing Option	Marking Information
GS0102	SOT23-8	GS0102-3TR	Tape and Real，3000	GS0102

PIN DESCRIPTION



SOT23-8

Name	SOT23-8	Type	Function
V_{CCB}	1	P	B Port Supply Voltage. 1.2V ≤ VCCB ≤ 5.5V
B1	2	I/O	Input/output B1. Reference to V_{CCB}
B2	3	I/O	Input/output B2. Reference to V_{CCB}
OE	4	I	Output Enable (Active High). Pull OE low to place all outputs in 3-state mode. Referenced to V_{CCA}.
GND	5	-	Ground
A2	6	I/O	Input/output A2. Reference to V_{CCA}
A1	7	I/O	Input/output A1. Reference to V_{CCA}
V_{CCA}	8	P	A Port Supply Voltage.1.65V<V_{CCA}<5.5V and V_{CCA}<V_{CCB}

（1）I=input，O=output，I/O=input and output，P=power

SPECIFICATIONS

Absolute Maximum Ratings：

Over recommended operating free-air temperature range (-40°C to 125°C, unless otherwise noted.)[1]

Parameter		Symbol	Min	Max	Unit
Supply voltage range		V_{CCA}	-0.3	6.0	V
Supply voltage range		V_{CCB}	-0.3	6.0	
Input voltage range [2]	A port	V_I	-0.3	6.0	
	B port		-0.3	6.0	
	OE		-0.3	6.0	
Voltage range applied to any output in the high-impedance or power-off state [2]	A port	V_O	-0.3	6.0	
	B port		-0.3	6.0	
Voltage range applied to any output in the high or Low impedance or power-off state [2] [3]	A port	V_O	-0.3	V_{CCA}+0.3	
	B port		-0.3	V_{CCB}+0.3	
Input clamp current	VI<0	I_{IK}		-50	mA
Out clamp current	VO<0	I_{OK}		-50	
Continuous output current		I_O		±50	
Continuous current through V_{CCA}, V_{CCB} or GND				±100	
Junction temperature		T_J		150	℃
Storage temperature		T_{STG}	-65	150	

Note:

[1] Stress greater than 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 Ratings" 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_{CCA} and V_{CCB} are provided in the recommended operating conditions table.

ESD Ratings:

Parameter	Symbol		Max	Unit
Electrostatic discharge	I_{ESD}	Latch up current	500	mA
	V_{ESD}	Human-body model（HBM）	±5000	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.

Recommanded Operating Range:

Parameter	Symbol	Conditions		Min	Max	Unit
Supply Voltage	V_{CCA}			1.2	5.5	V
	V_{CCB}			1.2	5.5	
High-level input voltage	V_{IH}	A-port I/Os	V_{CCA}=1.2V to 1.95V V_{CCB}=1.2V to 5.5V	V_{CCI}-0.2	V_{CCI}	V
			V_{CCA}=1.2V to 5.5V V_{CCB}=1.2V to 5.5V	V_{CCI}-0.4	V_{CCI}	
		B-port I/Os	V_{CCA}=1.2V to 5.5V V_{CCB}=1.2V to 5.5V	V_{CCI}-0.4	V_{CCI}	
		OE input	V_{CCA}=1.2V to 5.5V V_{CCB}=1.2V to 5.5V	V_{CCA}-0.8	5.5	
Low-level input voltage	V_{IL}	A-port I/Os	V_{CCA}=1.2V to 5.5V V_{CCB}=1.2V to 5.5V	0	0.15	V
		B-port I/Os	V_{CCA}=1.2V to 5.5V V_{CCB}=1.2V to 5.5V	0	0.15	
		OE input	V_{CCA}=1.2V to 5.5V V_{CCB}=1.2V to 5.5V	0	V_{CCA}×0.25	
Input transition rise or fall	t_r,t_f	A-port I/Os push-pull driving			10	ns/V
		B-port I/Os push-pull driving			10	
		Control input			10	
Operating Temperature	T_A			-40	125	℃

Note:

[1] V_{CCA} must be less than or equal to V_{CCB}.

[2] The maximum V_{IL} value is provided to ensure that a valid V_{OL} is maintained. The V_{OL} value is V_{IL} plus the voltage drop across the pass gate transistor.

Electrical Characteristics:

Limits in standard typeface are for T_A = +25°C, bold typeface applies over T_A = -40 to +125°C.

Symbol	Parameter	Condition	V_{CCA}	V_{CCB}	Min	TYP	Max	Unit
V_{OHA}	Port A output high voltage	I_{OH}=-20μA, V_{IB}≧V_{CCB}-0.4V	1.2V to 5.5V	1.2V to 5.5V	V_{CCA}×0.7		5.5	V
V_{OLA}	Port A output low voltage	I_{OL}=1mA, V_{IB}≤0.15V	1.2V to 5.5V	1.2V to 5.5V			0.3	V
V_{OHB}	Port B output high voltage	I_{OH}=-20μA, V_{IA}≧V_{CCA}-0.4V	1.2V to 5.5V	1.2V to 5.5V	V_{CCB}×0.7			V
V_{OLB}	Port B output low voltage	I_{OL}=1mA, V_{IA}≤0.15V	1.2V to 5.5V	1.2V to 5.5V			0.3	V
I_I	Input leakage current	OE	1.2V to 5.5V	1.2V to 5.5V			±1 ±1.5	μA
I_{OFF}	Partial power down current	A port	0V	0V to 5.5V			±0.5 ±1	μA
		B port	0V to 5.5V	0V			±0.5 ±1	μA
I_{OZ}	High-impedance State output current	A or B port, OE=0V	1.2V to 5.5V	1.2V to 5.5V			±0.5 ±1	μA
I_{CCA}	V_{CCA} supply current	V_I=V_O=Open, I_O=0mA	1.2V to 5.5V	1.2V to 5.5V			1.0	μA
			5.5V	0V			1.0	μA
			0V	5.5V			-1	μA
I_{CCB}	V_{CCB} supply current	V_I=V_O=open, I_O=0mA	1.2V to V_{CCB}	1.2V to 5.5V			10	μA
			5.5V	0V			-1	μA
			0V	5.5V			1	μA
I_{CCA}+I_{CCB}	Combined supply current	V_I=V_{CCI} or open, I_O=0mA	1.2V to V_{CCB}	1.2V to 5.5V			15	μA
I_{CCZA}	V_{CCA} supply current	V_I=V_{CCI} or 0V, I_O = 0mA, OE=0V	1.2V to V_{CCB}	1.2V to 5.5V			1	μA
I_{CCZB}	V_{CCB} supply current	V_I=V_{CCI} or 0V, I_O = 0mA, OE=0V	1.2V to 5.5V	1.2V to 5.5V			1	μA
C_I	Input capacitance	OE	3.3V	3.3V		2.5		pF
C_{IO}	Input-to output internal capacitance	A port	3.3V	3.3V		5		pF
		B port	3.3V	3.3V		5		pF

Note:
V_{CCI} is the V_{CC} associated with the input port. V_{CCO} is the V_{CC} associated with the output port. V_{CCA} must be less than or equal to V_{CCB}.

Timing requirement

V_{CCA} =1.2V±0.15V

		V_{CCB}=2.5V±0.2V (TYP)	V_{CCB}=3.3V±0.2V (TYP)	V_{CCB}=5V±0.2V (TYP)	Unit
Data rate	Push-pull driving	20	21	24	Mbps
	Open-drain driving	2	2	2	
Pulse duration	Push-pull driving(data inputs)	50	47	41	ns
	Open-drain driving(data inputs)	500	500	500	

V_{CCA} =1.8V±0.15V

		V_{CCB}=2.5V±0.2V (TYP)	V_{CCB}=3.3V±0.2V (TYP)	V_{CCB}=5V±0.2V (TYP)	Unit
Data rate	Push-pull driving	21	22	24	Mbps
	Open-drain driving	2	2	2	
Pulse duration	Push-pull driving(data inputs)	47	45	41	ns
	Open-drain driving(data inputs)	500	500	500	

V_{CCA} =2.5V±0.15V

		V_{CCB}=2.5V±0.2V (TYP)	V_{CCB}=3.3V±0.2V (TYP)	V_{CCB}=5V±0.2V (TYP)	Unit
Data rate	Push-pull driving	20	22	24	Mbps
	Open-drain driving	2	2	2	
Pulse duration	Push-pull driving(data inputs)	50	45	41	ns
	Open-drain driving(data inputs)	500	500	500	

V_{CCA} =3.3V±0.15V

		V_{CCB}=2.5V±0.2V (TYP)	V_{CCB}=3.3V±0.2V (TYP)	Unit
Data rate	Push-pull driving	23	24	Mbps
	Open-drain driving	2	2	
Pulse duration	Push-pull driving(data inputs)	43	41	ns
	Open-drain driving(data inputs)	500	500	

V_{CCA} =5.0V±0.15V

		V_{CCB}=2.5V±0.2V (TYP)	Unit
Data rate	Push-pull driving	24	Mbps
	Open-drain driving	2	
Pulse duration	Push-pull driving(data inputs)	41	ns
	Open-drain driving(data inputs)	500	

Switching Characteristics: V_{CCA} = 1.2V

Over recommended operating free-air temperature range (-40°C to 85°C, unless otherwise noted.)

Parameter	Symbol	Conditions		V_{CCB}=2.5V ±0.2V(TYP)	V_{CCB}=3.3V ±0.2V(TYP)	V_{CCB}=5.0V ±0.2V(TYP)	Unit
Propagation delay time high-to-low output	t_{PHL}	A-to-B	Push-pull driving	1.44	2	2.28	ns
			Open-drain driving	15.1	14.8	14.4	
Propagation delay time low-to-high output	t_{PLH}	A-to-B	Push-pull driving	2.89	3.46	4.17	
			Open-drain driving	132	104	71	
Propagation delay time high-to-low output	t_{PHL}	B-to-A	Push-pull driving	1.28	1.57	1.12	
			Open-drain driving	15.1	14.9	15.1	
Propagation delay time low-to-high output	t_{PLH}	B-to-A	Push-pull driving	3.67	3.78	3.56	
			Open-drain driving	72	57	36	
Enable time	t_{en}	OE-to-A or B		24	21	19	
Disable time	t_{dis}	OE-to-A or B		1250	1250	1250	
Input rise time	t_{rA}	A port rise time	Push-pull driving	8.3	8.5	7.9	
			Open-drain driving	123	90	63	
Input rise time	t_{rB}	B port rise time	Push-pull driving	7.3	6.5	5.9	
			Open-drain driving	123	98	68	
Input fall time	t_{rA}	A port fall time	Push-pull driving	4.8	4.1	3.6	
			Open-drain driving	23	22	24	
Input fall time	t_{rB}	B port fall time	Push-pull driving	6.7	8.3	9	
			Open-drain driving	21	22	20	
Skew(time), output	$t_{SK(O)}$	Channel-to-Channel Skew		0.5	0.5	0.5	
Maximum data rate		Push-pull driving		20	21	24	Mbps
		Open-drain driving		2	2	2	

Switching Characteristics: V_{CCA} = 1.8V ± 0.15V

Over recommended operating free-air temperature range (-40°C to 85°C, unless otherwise noted.)

Parameter	Symbol	Conditions		V_{CCB}=2.5V ±0.2V(TYP)	V_{CCB}=3.3V ±0.2V(TYP)	V_{CCB}=5.0V ±0.2V(TYP)	Unit
Propagation delay time high-to-low output	t_{PHL}	A-to-B	Push-pull driving	2.76	3.32	4.24	ns
			Open-drain driving	26.1	26.4	26.6	
Propagation delay time low-to-high output	t_{PLH}	A-to-B	Push-pull driving	5.3	4.4	3.96	
			Open-drain driving	221	183	143	
Propagation delay time high-to-low output	t_{PHL}	B-to-A	Push-pull driving	2.32	2.56	2.72	
			Open-drain driving	26.1	26.1	26.2	
Propagation delay time low-to-high output	t_{PLH}	B-to-A	Push-pull driving	4.64	4.36	4.48	
			Open-drain driving	173	89	66	
Enable time	t_{en}	OE-to-A or B		25	21	19	
Disable time	t_{dis}	OE-to-A or B		1250	125	1250	
Input rise time	t_{rA}	A port rise time	Push-pull driving	6.9	6.1	5.6	
			Open-drain driving	118	39	13	
Input rise time	t_{rB}	B port rise time	Push-pull driving	5.8	4.8	4.1	
			Open-drain driving	166	127	75	
Input fall time	t_{rA}	A port fall time	Push-pull driving	3.0	2.8	2.7	
			Open-drain driving	1.9	1.7	1.6	
Input fall time	t_{rB}	B port fall time	Push-pull driving	4.8	6.2	8.4	
			Open-drain driving	2.3	2.4	2.8	
Skew(time), output	$t_{SK(O)}$	Channel-to-Channel Skew		0.5	0.5	0.5	
Maximum data rate		Push-pull driving		21	22	24	Mbps
		Open-drain driving		2	2	2	

Switching Characteristics: V_{CCA} = 2.5V ± 0.15V

Over recommended operating free-air temperature range (-40°C to 85°C, unless otherwise noted.)

Parameter	Symbol	Conditions		V_{CCB}=2.5V ±0.2V(TYP)	V_{CCB}=3.3V ±0.2V(TYP)	V_{CCB}=5.0V ±0.2V(TYP)	Unit
Propagation delay time high-to-low output	t_{PHL}	A-to-B	Push-pull driving	2.5	3.5	4.2	ns
			Open-drain driving	26.3	26.5	26.6	
Propagation delay time low-to-high output	t_{PLH}	A-to-B	Push-pull driving	2.52	2.76	2.84	
			Open-drain driving	198	169	131	
Propagation delay time high-to-low output	t_{PHL}	B-to-A	Push-pull driving	2.96	3.16	4.72	
			Open-drain driving	26.4	26.5	26.6	
Propagation delay time low-to-high output	t_{PLH}	B-to-A	Push-pull driving	1.84	1.6	1.04	
			Open-drain driving	196	138	63	
Enable time	t_{en}	OE-to-A or B		24	20	17	
Disable time	t_{dis}	OE-to-A or B		1250	1250	1250	
Input rise time	t_{rA}	A port rise time	Push-pull driving	3.4	2.9	2.7	
			Open-drain driving	156	92	13	
Input rise time	t_{rB}	B port rise time	Push-pull driving	4.7	3.5	2.7	
			Open-drain driving	160	124	81	
Input fall time	t_{rA}	A port fall time	Push-pull driving	5.1	5.2	5.0	
			Open-drain driving	2.1	2.0	1.8	
Input fall time	t_{rB}	B port fall time	Push-pull driving	5.0	6.4	8.7	
			Open-drain driving	2.0	2.2	2.8	
Skew(time), output	$t_{SK(O)}$	Channel-to-Channel Skew		0.5	0.5	0.5	
Maximum data rate		Push-pull driving		20	22	24	Mbps
		Open-drain driving		2	2	2	

Switching Characteristics: V_{CCA} = 3.3V ± 0.15V

Over recommended operating free-air temperature range (-40°C to 85°C, unless otherwise noted.)

Parameter	Symbol	Conditions		V_{CCB}=2.3V ±0.2V(TYP)	V_{CCB}=5.0V ±0.2V(TYP)	Unit
Propagation delay time high-to-low output	t_{PHL}	A-to-B	Push-pull driving	4.16	5.04	ns
			Open-drain driving	26.4	26.6	
Propagation delay time low-to-high output	t_{PLH}	A-to-B	Push-pull driving	3.1	2.4	
			Open-drain driving	155	109	
Propagation delay time high-to-low output	t_{PHL}	B-to-A	Push-pull driving	3.68	5.68	
			Open-drain driving	26.5	26.7	
Propagation delay time low-to-high output	t_{PLH}	B-to-A	Push-pull driving	1.88	1.28	
			Open-drain driving	158	87	
Enable time	t_{en}	OE-to-A or B		19	15	
Disable time	t_{dis}	OE-to-A or B		1250	1250	
Input rise time	t_{rA}	A port rise time	Push-pull driving	2.3	2.1	
			Open-drain driving	117	48	
Input rise time	t_{rB}	B port rise time	Push-pull driving	3.0	2.4	
			Open-drain driving	117	75	
Input fall time	t_{rA}	A port fall time	Push-pull driving	8.0	7.6	
			Open-drain driving	2.2	2.1	
Input fall time	t_{rB}	B port fall time	Push-pull driving	8.2	10.8	
			Open-drain driving	2.1	2.4	
Skew(time), output	$t_{SK(O)}$	Channel-to-Channel Skew		0.5	0.5	
Maximum data rate		Push-pull driving		23	24	Mbps
		Open-drain driving		2	2	

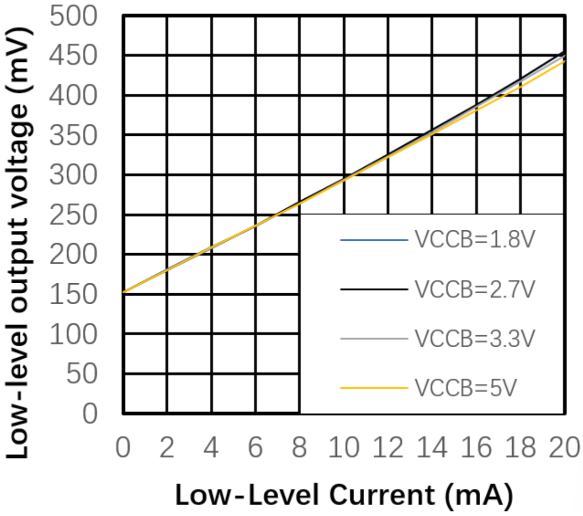
Switching Characteristics: V_{CCA} = 5.0V ± 0.15V

Over recommended operating free-air temperature range (-40°C to 85°C, unless otherwise noted.)

Parameter	Symbol	Conditions		V_{CCB}=5.0V±0.2V(TYP)	Unit
Propagation delay time high-to-low output	t_{PHL}	A-to-B	Push-pull driving	8.72	ns
			Open-drain driving	26.8	
Propagation delay time low-to-high output	t_{PLH}	A-to-B	Push-pull driving	2	
			Open-drain driving	155	
Propagation delay time high-to-low output	t_{PHL}	B-to-A	Push-pull driving	8.04	
			Open-drain driving	27.5	
Propagation delay time low-to-high output	t_{PLH}	B-to-A	Push-pull driving	1.5	
			Open-drain driving	160	
Enable time	t_{en}	OE-to-A or B		17	
Disable time	t_{dis}	OE-to-A or B		1250	
Input rise time	t_{rA}	A port rise time	Push-pull driving	1.9	
			Open-drain driving	105	
Input rise time	t_{rB}	B port rise time	Push-pull driving	2.3	
			Open-drain driving	95	
Input fall time	t_{rA}	A port fall time	Push-pull driving	9.0	
			Open-drain driving	2.6	
Input fall time	t_{rB}	B port fall time	Push-pull driving	8.9	
			Open-drain driving	2.5	
Skew(time), output	$t_{SK(O)}$	Channel-to-Channel Skew		0.5	
Maximum data rate		Push-pull driving		24	Mbps
		Open-drain driving		2	

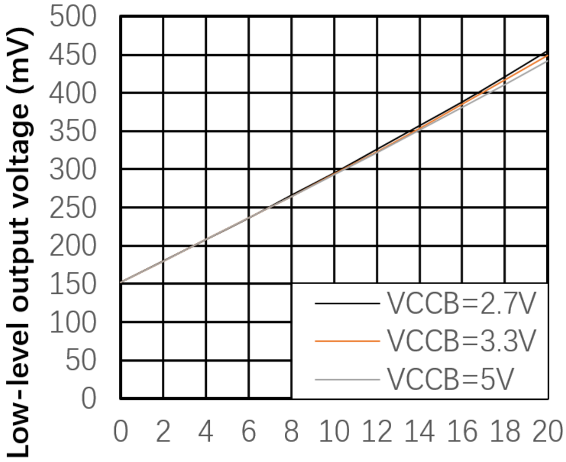
PERFORMANCE CHARACTERISTICS:

(C_{IN}=C_{OUT}=1μF, Tested under T_J =25°C, unless otherwise specified)



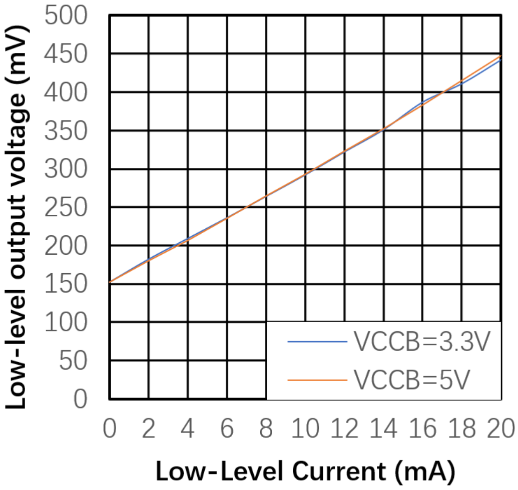
V_{CCA}=1.2V V_{IL}(A)=150mV

Figure 1 Low-Level Output Voltage vs Low-Level Current



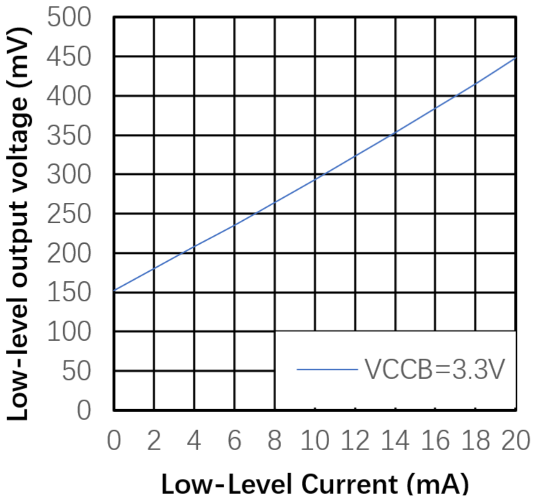
V_{CCA}=1.8V V_{IL}(A)=150mV

Figure 2 Low-Level Output Voltage vs Low-Level Current



V_{CCA}=2.7V V_{IL}(A)=150mV

Figure 3 Low-Level Output Voltage vs Low-Level Current



V_{CCA}=3.3V V_{IL}(A)=150mV

Figure 4 Low-Level Output Voltage vs Low-Level Current

Parameter Measurement Information

Unless otherwise noted, all input pulses are supplied by generators having the following characteristics:

• PRR 10MHz

• ZO = 50 Ω

• dv /dt ≥ 1 V/ns

Note: All input pulses are measured one at a time, with one transition per measurement.

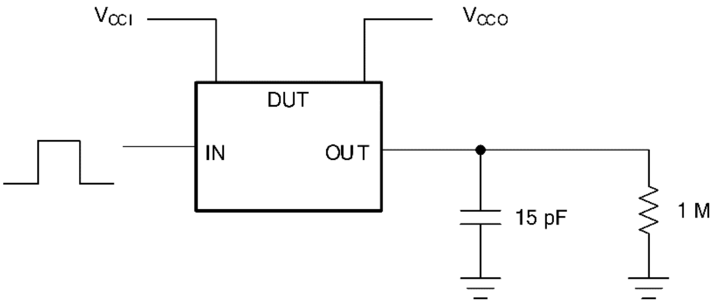


Figure 5 Data Rate, Pulse Duration, Propagation Delay, Output Rise and Fall Time Measurement Using A Push-Pull Driver

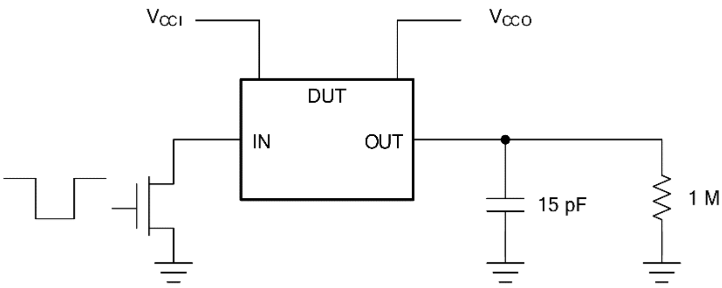


Figure 6 Data Rate, Pulse Duration, Propagation Delay, Output Rise and Fall Time Measurement Using an Open-Drain Driver

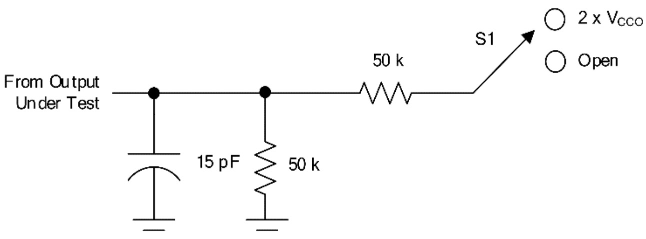


Figure 7 Load Circuit for Enable/Disable Time Measurement

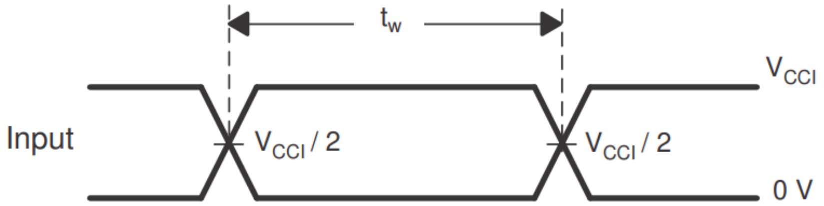
Table 1. Switch Configuration for Enable/Disable Timing

Test	S1
t_{PZL}/t_{PLZ}	2 ×V_{CCO}
t_{PHZ}/t_{PZH}	Open

Note:

[1] t_{PLZ} and t_{PHZ} are the same as t_{dis}.

[2] t_{PZL} and t_{PZH} are the same as t_{en}.



(1) All input pulses are measured one at a time, with one transition per measurement.

Figure 8 Voltage Waveforms Pulse Duration

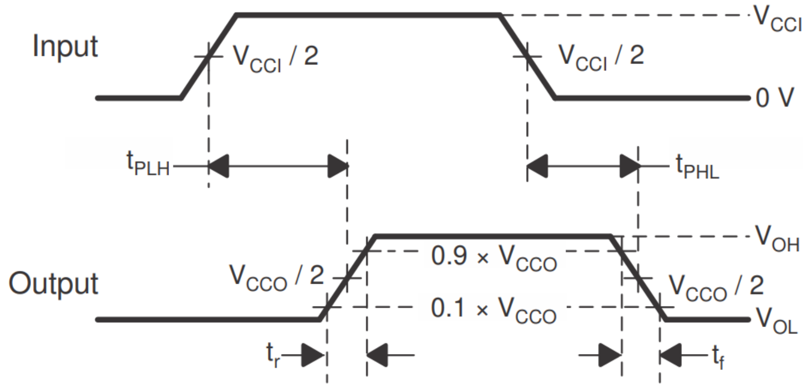


Figure 9 Voltage Waveforms Propagation Delay Times

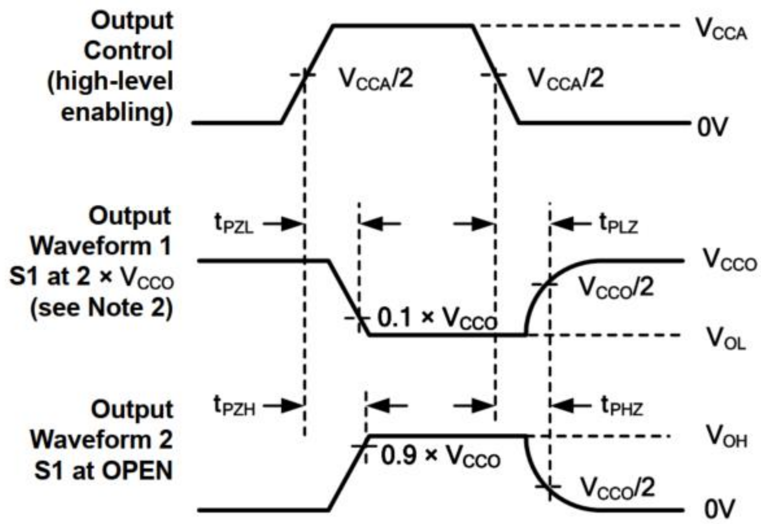


Figure 10 Voltage Waveforms Enable and Disable

Feature DESCRIPTION：

Overview

The GS0102 device is a directionless voltage-level translator specifically designed for translating logic voltage levels. The A port is able to accept I/O voltages ranging from 1.2 V to 5.5 V, while the B port can accept I/O voltages from 1.2 V to 5.5 V. The device is a pass-gate architecture with edge-rate accelerators (one-shots) to improve the overall data rate. 10-kΩ pullup resistors, commonly used in open-drain applications, have been conveniently integrated so that an external resistor is not needed. While this device is designed for open-drain applications, the device can also translate push-pull CMOS logic outputs.

Architecture

The GS0102 architecture is an auto-direction-sensing based translator that does not require a direction-control signal to control the direction of data flow from A to B or from B to A. These two bidirectional channels independently determine the direction of data flow without a direction-control signal. Each I/O pin can be automatically reconfigured as either an input or an output, which is how this auto-direction feature is realized.

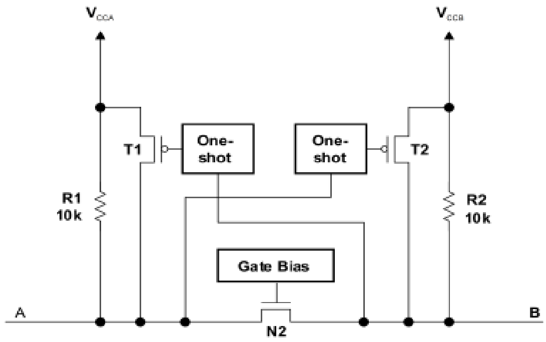


Figure 11. Architecture of a GS0102 Cell

The GS0102 employs two key circuits to enable this voltage translation:
• An N-channel pass-gate transistor topology that ties the A-port to the B-port.
• Output one-shot (O.S.) edge-rate accelerator circuitry to detect and accelerate rising edges on the A or B Ports.

Input Driver Requirements

The continuous dc-current "sinking" capability is determined by the external system-level open-drain (or push - pull) drivers that are interfaced to the GS0102 I/O pins. Since the high bandwidth of these bidirectional I/O circuits is used to facilitate this fast change from an input to an output and an output to an input, they have a modest dc-current "sourcing" capability of hundreds of micro-Amps, as determined by the internal 10kΩ pullup resistors.

The fall time (t_{fA}, t_{fB}) of a signal depends on the edge-rate and output impedance of the external device driving GS0102 data I/Os, as well as the capacitive loading on the data lines.

Similarly, the t_{PHL} and max data rates also depend on the output impedance of the external driver. The values for t_{fA}, t_{fB}, t_{PHL} and maximum data rates in the data sheet assume that the output impedance of the external driver is less than 50Ω.

Output Load Considerations

We recommend careful PCB layout practices with short PCB trace lengths to avoid excessive capacitive loading and to ensure that proper O.S. triggering takes place. PCB signal trace-lengths should be kept short enough such that the round-trip delay of any reflection is less than the one-shot duration. This improves signal integrity by ensuring that any reflection sees a low impedance at the driver. The O.S. circuits have been designed to stay on for approximately 30ns. The maximum capacitance of the lumped load that can be driven also depends directly on the one-shot duration. With very heavy capacitive loads, the one-shot can time-out before the signal is driven fully to the positive rail. The O.S. duration has been set to best optimize trade-offs between dynamic I_{CC}, load driving capability, and maximum bit-rate considerations. Both PCB trace length and connectors add to the capacitance that the GS0102 device output sees, so it is recommended that this lumped-load capacitance be considered to avoid O.S. retriggering, bus contention, output signal oscillations, or other adverse system-level affects.

Enable and Disable

The GS0102 device has an OE input that is used to disable the device by setting OE low, which places all I/Os in the Hi-Z state. The disable time (t_{dis}) indicates the delay between the time when OE goes low and when the outputs are disabled (Hi-Z). The enable time (t_{en}) indicates the amount of time the user must allow for the one-shot circuitry to become operational after OE is taken high.

Pullup or Pulldown Resistors on I/O Lines

Each A-port I/O has an internal 10kΩ pullup resistor to V_{CCA}, and each B-port I/O has an internal 10kΩ pullup resistor to V_{CCB}. If a smaller value of pullup resistor is required, an external resistor must be added from the I/O to V_{CCA} or V_{CCB} (in parallel with the internal 10kΩ resistors). Adding lower value pull-up resistors will affect V_{OL} levels, however. The internal pull-ups of the GS0102 are disabled when the OE pin is low.

Application Information

The GS0102 device can be used to bridge the digital-switching compatibility gap between two voltage nodes to successfully interface logic threshold levels found in electronic systems. It should be used in a point-to-point topology for interfacing devices or systems operating at different interface voltages with one another. Its primary target application use is for interfacing with open-drain drivers on the data I/Os such as I2C or 1-wire, where the data is bidirectional and no control signal is available. The device can also be used in applications where a push-pull driver is connected to the data I/Os, but the GS0102 might be a better option for such push-pull applications.

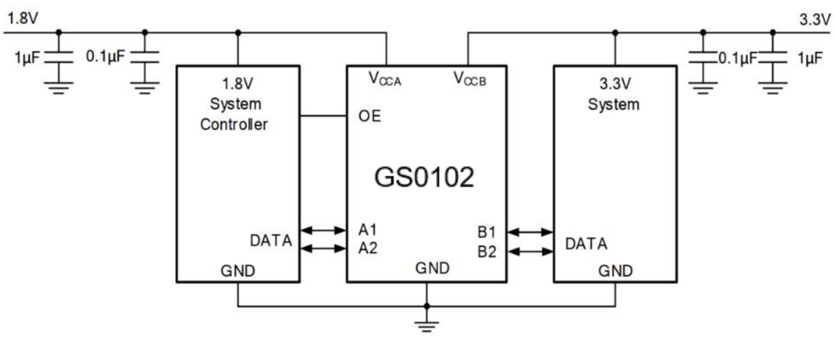
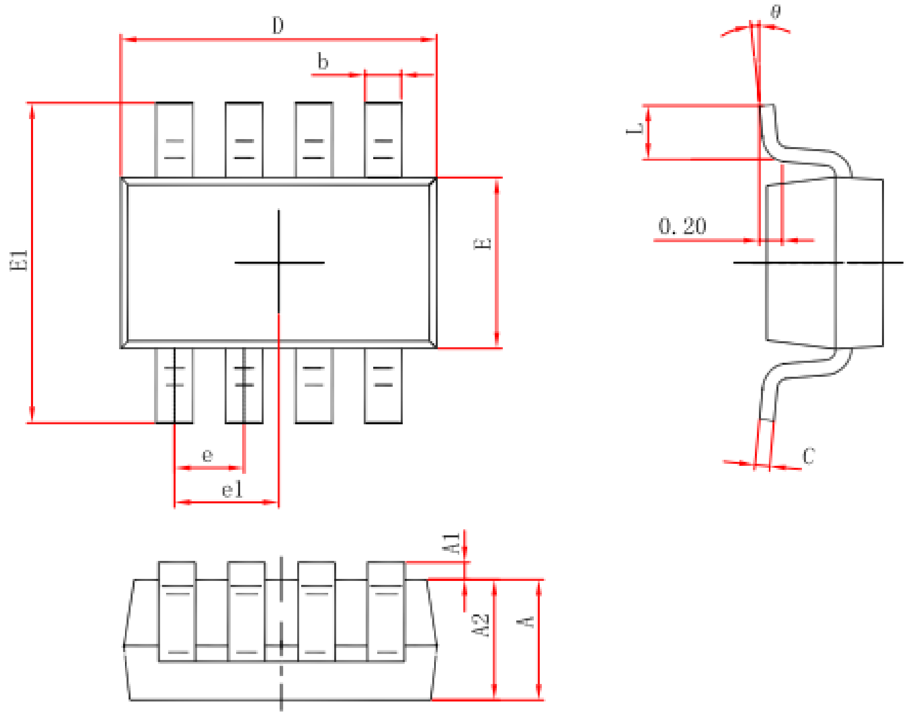


Figure 12 Typical Application Circuit

PACKAGE OUTLINE:

SOT23-8 Package



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.65 (BSC)		0.026(BSC)	
e1	0.975 (BSC)		0.038(BSC)	
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°