

Features

- Operate from 1.65V to 5.5V
- Inputs Accept Voltages to 5.5V
- High Noise Immunity
- Low Power Dissipation
- ESD Protection Exceeds JESD 22
 - 2000-V Human-Body Model (A114-A)
 - 200-V Machine Model (A115-A)
 - 1000-V Charged-Device Model (C101)

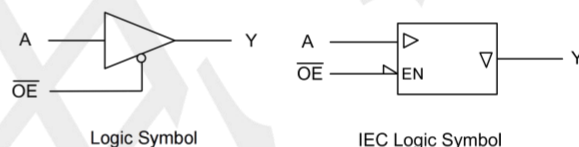
Applications

- AV Receiver
- Audio Dock: Portable
- Blu-ray Player and Home Theater
- Embedded PC
- Personal Digital Assistant(PDA)
- Power: Telecom/Server AC/DC Supply: Single Controller: Analog and Digital
- Solid State Drive(SSD): Client and Enterprise
- Wireless Headset, Keyboard, and Mouse

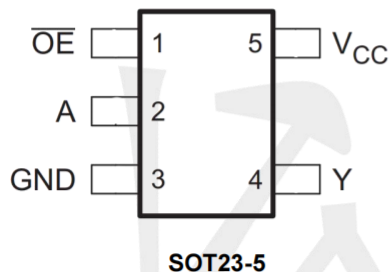
General Description

The NC7SZ125M5X-TP is a single bus buffer/line driver with 3-state output. When the output enable ($\overline{OE}$) is high the output will be disabled. In contrast, when the $\overline{OE}$ is low, true data will pass from A input to the Y output. This device has power-down protective circuit to prevent the device from destruction when it is powered down.

Logic Diagram



Pin Configuratio



Function Table

INPUT($\overline{OE}$)	INPUT(A)	OUTPUT(Y)
L	L	L
L	H	H
H	X	Z

Note: H: HIGH voltage level; L: LOW voltage level; X=don't care; Z=high-impedance OFF-state.

Absolute Maximum Ratings

PARAMETER		SYMBOL	CONDITIONS	RATINGS	UNIT
Supply Voltage		V _{CC}		-0.5 ~ +6.5	V
Input Voltage		V _{IN}		-0.5 ~ +6.5	V
Output Voltage	Enable mode	V _{OUT}		-0.5 ~ V _{CC} + 0.5	V
	Disable mode			-0.5 ~ +6.5	V
	Power-down mode			-0.5 ~ +6.5	V
VCC or GND Current		I _{CC}	Output in the Power-off state	±100	mA
Continuous Output Current		I _{OUT}	V _{OUT} =0~V _{CC}	±50	mA
Input Clamp Current		I _{IK}	V _{IN} <0	-50	mA
Output Clamp Current		I _{OK}	V _{OUT} <0	-50	mA
Storage Temperature Range		T _{STG}		-65 ~ +150	°C
Junction to Ambient		θ _{JA}	SOT-23-5	230	°C/W

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.

Recommended Operating Conditions

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	V _{CC}	Operating	1.65	--	5.5	V
Input Voltage	V _{IN}		0	--	5.5	V
Output Voltage	V _{OUT}	V _{CC} =1.65V ~ 5.5V; Enable mode	0	--	V _{CC}	V
		V _{CC} =1.65V ~ 5.5V; Disable mode	0	--	5.5	V
		V _{CC} =0V; Power-down mode	0	--	5.5	V
Input Transition Rise or Fall Rate	t _R /t _F	V _{CC} =1.65V ~ 2.7V	--	--	20	ns/V
		V _{CC} =2.7V ~ 5.5V	--	--	10	ns/V
Operating Temperature	T _A		-40	--	125	°C

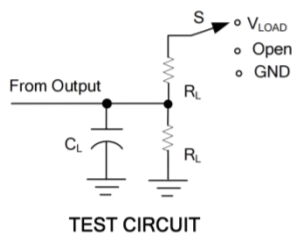
Electrical Characteristics (unless otherwise specified)

PARAMETER	SYMBOL	TEST Conditions	TA=25°C			TA=-40°C~+125°C			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
High-Level Input Voltage	V _{IH}	V _{CC} =1.65V ~ 1.95V	0.65×V _{CC}	--	--	0.65×V _{CC}	--	--	V
		V _{CC} =2.3V ~ 2.7V	1.7	--	--	1.7	--	--	V
		V _{CC} =3V ~ 3.6V	2	--	--	2	--	--	V
		V _{CC} =4.5V ~ 5.5V	0.7×V _{CC}	--	--	0.7×V _{CC}	--	--	V
Low-Level Input Voltage	V _{IL}	V _{CC} =1.65V ~ 1.95V	--	--	0.35×V _{CC}	--	--	0.35×V _{CC}	V
		V _{CC} =2.3V ~ 2.7V	--	--	0.7	--	--	0.7	V
		V _{CC} =3V ~ 3.6V	--	--	0.8	--	--	0.8	V
		V _{CC} =4.5V ~ 5.5V	--	--	0.35×V _{CC}	--	--	0.35×V _{CC}	V
High-Level Output Voltage	V _{OH}	V _{CC} =1.65 ~ 5.5V, I _{OH} =-100μA	V _{CC} -0.1	--	--	V _{CC} -0.1	--	--	V
		V _{CC} =1.65V, I _{OH} =-4mA	1.2	--	--	0.95	--	--	V
		V _{CC} =2.3V, I _{OH} =-8mA	1.9	--	--	1.7	--	--	V
		V _{CC} =2.7V, I _{OH} =-12mA	2.2	--	--	1.9	--	--	V
		V _{CC} =3.0V, I _{OH} =-24mA	2.3	--	--	2	--	--	V
		V _{CC} =4.5V, I _{OH} =-32mA	3.8	--	--	3.4	--	--	V
Low-Level Output Voltage	V _{OL}	V _{CC} =1.65 ~ 5.5V, I _{OL} =100μA	--	--	0.1	--	--	0.1	V
		V _{CC} =1.65V, I _{OL} =4mA	--	--	0.45	--	--	0.7	V
		V _{CC} =2.3V, I _{OL} =8mA	--	--	0.3	--	--	0.45	V
		V _{CC} =3.0V, I _{OL} =16mA	--	--	0.4	--	--	0.6	V
		V _{CC} =3.0V, I _{OL} =24mA	--	--	0.55	--	--	0.8	V
		V _{CC} =4.5V, I _{OL} =32mA	--	--	0.55	--	--	0.8	V
Input Leakage Current	I _{I(LEAK)}	V _{CC} =0 ~ 5.5V, V _{IN} =5.5V or GND	--	±0.1	±5	--	--	±5	μA
Power OFF Leakage Current	I _{OFF}	V _{CC} =0V, V _{IN} or V _{OUT} =5.5V	--	±0.1	±10	--	--	±10	μA
Quiescent Supply Current	I _Q	V _{CC} =1.65 ~ 5.5V, V _{IN} =V _{CC} or GND, I _{OUT} =0A	--	±0.1	10	--	--	±10	μA
Additional Quiescent Supply Current Per Input Pin	ΔI _Q	V _{CC} =3 ~ 5.5V, One input at V _{CC} -0.6V, Other inputs at V _{CC} or GND	--	5	500	--	--	500	μA

SWITCHING CHARACTERISTICS (unless otherwise specified)

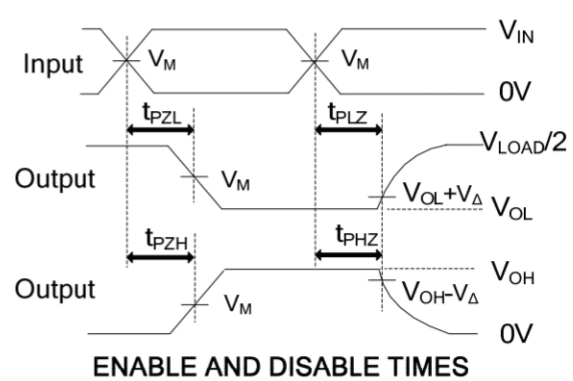
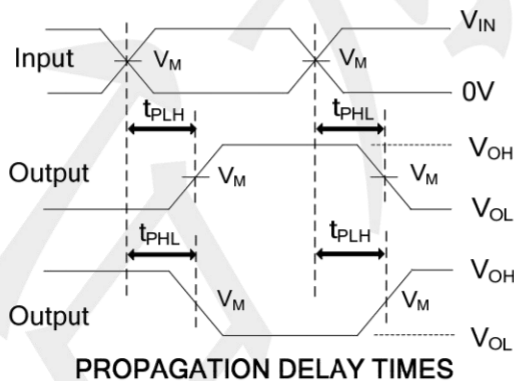
PARAMETER	SYMBOL	TEST Conditions		TA=25°C			TA=-40°C~+125°C			UNIT
				MIN	TYP	MAX	MIN	TYP	MAX	
Propagation Delay From Input A to Output Y	t _{PLH} / t _{PHL}	CL=30pF	V _{CC} =1.8±0.15V, R _L =1KΩ	1	12	19	--	--	21	nS
			V _{CC} =2.5±0.2V, R _L =500Ω	0.5	8	15	--	--	17	nS
		CL=50pF R _L =500Ω	V _{CC} =2.7V	0.5	6	12	--	--	14	nS
			V _{CC} =3.3±0.3V	0.5	5	9	--	--	11	nS
			V _{CC} =5±0.5V	0.5	3	7	--	--	9	nS
3-State Output Enable Time From Input OE to Output Y	t _{PZH} / t _{PZL}	CL=30pF	V _{CC} =1.8±0.15V, R _L =1KΩ	1	10	19	--	--	21	nS
			V _{CC} =2.5±0.2V, R _L =500Ω	0.5	7	15	--	--	17	nS
		CL=50pF R _L =500Ω	V _{CC} =2.7V	0.5	6	12	--	--	14	nS
			V _{CC} =3.3±0.3V	0.5	5	9	--	--	11	nS
			V _{CC} =5±0.5V	0.5	4	7	--	--	9	nS
3-State Output Disable Time From Input OE to Output Y	t _{PLZ} / t _{PHZ}	CL=30pF	V _{CC} =1.8±0.15V, R _L =1KΩ	1	5	10	--	--	12	nS
			V _{CC} =2.5±0.2V, R _L =500Ω	0.5	4	8	--	--	10	nS
		CL=50pF R _L =500Ω	V _{CC} =2.7V	0.5	4	7	--	--	9	nS
			V _{CC} =3.3±0.3V	0.5	3	6	--	--	8	nS
			V _{CC} =5±0.5V	0.5	3	5	--	--	7	nS

TEST CIRCUIT AND WAVEFORMS



TEST	S
t _{PLH} /t _{PHL}	Open
t _{PHZ} /t _{PZH}	GND
t _{PLZ} /t _{PZL}	V _{LOAD}

V _{CC}	INPUTS		V _M	V _{LOAD}	V _Δ	C _L	R _L
	V _{IN}	t _{RI} , t _F					
1.8V±0.15V	V _{CC}	≤2ns	V _{CC} /2	2 x V _{CC}	0.15V	30pF	1KΩ
2.5V±0.2V	V _{CC}	≤2ns	V _{CC} /2	2 x V _{CC}	0.15V	30pF	500Ω
2.7V	2.7V	≤2.5ns	1.5V	6V	0.3V	50pF	500Ω
3.3V±0.3V	2.7V	≤2.5ns	1.5V	6V	0.3V	50pF	500Ω
5V±0.5V	V _{CC}	≤2.5ns	V _{CC} /2	2 x V _{CC}	0.3V	50pF	500Ω



Note: C_L includes probe and jig capacitance.

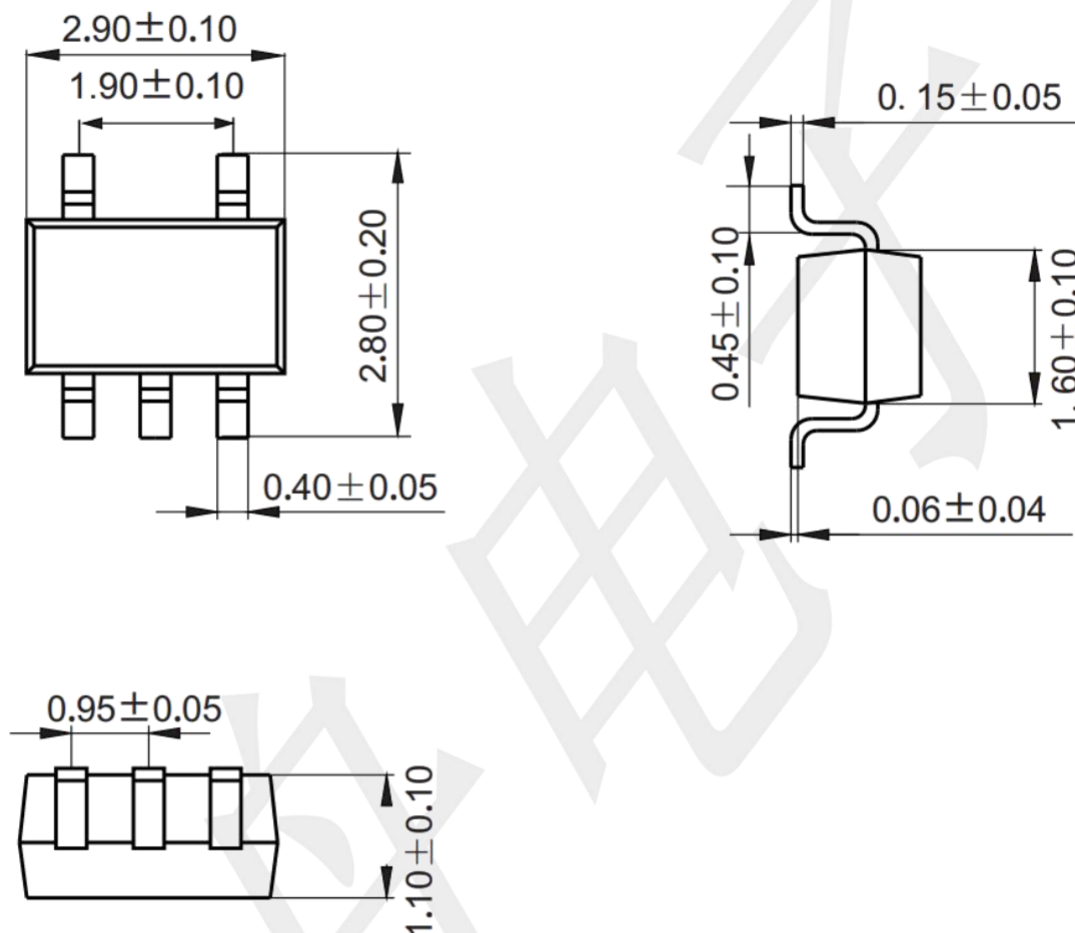
All input pulses are supplied by generators having the following characteristics: P_{RR} ≤10MHz, Z_O = 50Ω.

Notes: 1. C_L includes probe and jig capacitance.

2. All input pulses are supplied by generators having the following characteristics: P_{RR} ≤10MHz, Z_O = 50Ω.

Package information

SOT23-5 (Unit: mm)



Mounting Pad Layout (unit: mm)

