



U74HC2G125

CMOS IC

DUAL BUFFER/LINE DRIVER; 3-STATE

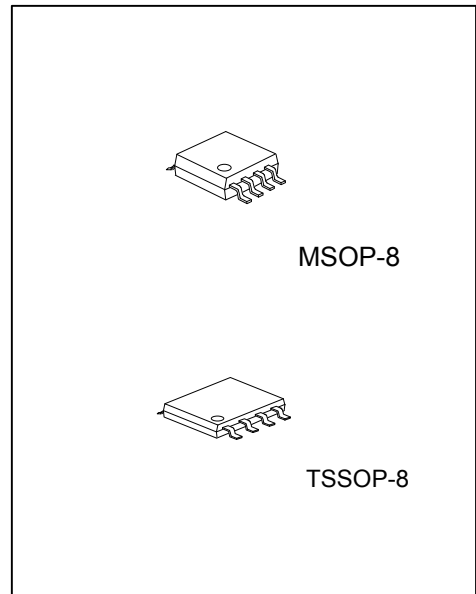
DESCRIPTION

The **U74HC2G125** is a high speed, Si-gate CMOS device.

The **U74HC2G125** provides two non-inverting buffer/line drivers with 3-state output. The 3-state output is controlled by the output enable input (pin \overline{nOE}). A HIGH level at pin \overline{nOE} causes the output to assume a high-impedance OFF-state.

FEATURES

- * Wide supply voltage range from 2.0V to 6.0V
- * Symmetrical output impedance
- * High noise immunity
- * Low power consumption
- * Balanced propagation delays
- * Multiple package options



ORDERING INFORMATION

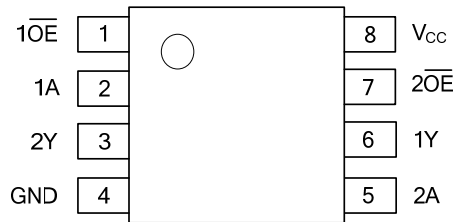
Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74HC2G125L-P08-R	U74HC2G125G-P08-R	TSSOP-8	Tape Reel
U74HC2G125L-SM1-R	U74HC2G125G-SM1-R	MSOP-8	Tape Reel

<p>U74HC2G125G-P08-R</p> <p>(1) Packing Type (2) Package Type (3) Green Package</p>	<p>(1) R: Tape Reel (2) P08: TSSOP-8, SM1: MSOP-8 (3) G: Halogen Free and Lead Free, L: Lead Free</p>
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MARKING

MSOP-8	TSSOP-8
<p>8 7 6 5 → Date Code UTC □□□□ L: Lead Free HC2G125□ G: Halogen Free □□ → Lot Code 1 2 3 4</p>	<p>1 2 3 4 → 8 7 6 5 → Date Code UTC □□□□ L: Lead Free 2GC5 □□ → G: Halogen Free □□ → Lot Code</p>

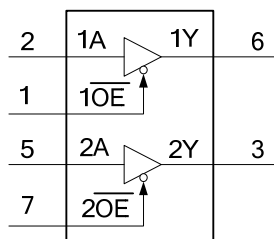
■ PIN CONFIGURATION



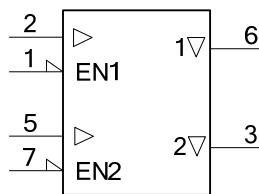
■ PIN CONFIGURATION

PIN NO.	SYMBOL	DESCRIPTION
1, 7	$\overline{1OE}$, $\overline{2OE}$	Output enable input (active LOW)
2, 5	1A, 2A	Data input
4	GND	Ground (0V)
6, 3	1Y, 2Y	Data output
8	V _{CC}	Supply voltage

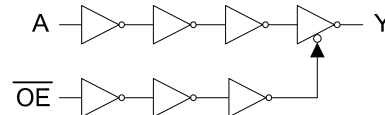
■ FUNCTIONAL DIAGRAM



LOGIC SYMBOL



IEC LOGIC SYMBOL



LOGIC DIAGRAM (one driver)

■ FUNCTION TABLE

Control	Input	Output
\overline{nOE}	nA	nY
L	L	L
L	H	H
H	X	Z

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

■ ABSOLUTE MAXIMUM RATING

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	V_{CC}		-0.5		+7.0	V
Input Voltage	V_I		-0.5		+7.0	V
Input Clamping Current	I_{IK}	$V_I < -0.5V$ or $V_I > V_{CC} + 0.5V$			± 20	mA
Output Clamping Current	I_{OK}	$V_O < -0.5V$ or $V_O > V_{CC} + 0.5V$			± 20	mA
Output Current	I_O	$V_O = -0.5V \sim (V_{CC} + 0.5V)$			35	mA
Supply Current	I_{CC}				70	mA
Ground Current	I_{GND}		-70			mA
Power Dissipation	P_D				300	mW
Storage Temperature	T_{STG}		-65		+150	°C

Note: The input and output voltage ratings may be exceeded if the input and output current ratings are observed.

■ RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	V_{CC}		2	5	6	V
Input Voltage	V_I		0		V_{CC}	V
Output Voltage	V_O		0		V_{CC}	V
Input Transition Rise and Fall Rate	$\Delta t/\Delta v$	$V_{CC}=2V$			625	ns/V
		$V_{CC}=4.5V$		1.67	139	ns/V
		$V_{CC}=6V$			83	ns/V
Ambient Temperature	T_A		-40	+25	+125	°C

Note: Voltages are referenced to GND (ground=0V).

■ ELECTRICAL CHARACTERISTICS ($T_A=25^\circ C$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
High-level Input Voltage	V_{IH}	$V_{CC}=2V$	1.5	1.2		V
		$V_{CC}=4.5V$	3.15	2.4		V
		$V_{CC}=6V$	4.2	3.2		V
Low-level Input Voltage	V_{IL}	$V_{CC}=2V$		0.8	0.5	V
		$V_{CC}=4.5V$		2.1	1.35	V
		$V_{CC}=6V$		2.8	1.8	V
Output Voltage HIGH-Level	V_{OH}	$V_{CC}=2V, I_{OH}=-20\mu A$	1.9	2.0		V
		$V_{CC}=4.5V, I_{OH}=-20\mu A$	4.4	4.5		V
		$V_{CC}=6V, I_{OH}=-20\mu A$	5.9	6.0		V
		$V_{CC}=4.5V, I_{OH}=-6mA$	3.84	4.32		V
		$V_{CC}=6V, I_{OH}=-7.8mA$	5.34	5.81		V
Output Voltage LOW-Level	V_{OL}	$V_{CC}=2V, I_{OL}=20\mu A$		0	0.1	V
		$V_{CC}=4.5V, I_{OL}=20\mu A$		0	0.1	V
		$V_{CC}=6V, I_{OL}=20\mu A$		0	0.1	V
		$V_{CC}=4.5V, I_{OL}=6mA$		0.15	0.33	V
		$V_{CC}=6V, I_{OL}=7.8mA$		0.16	0.33	V
Input Leakage Current	I_I	$V_{CC}=6V, V_I = V_{CC}$ or GND			± 1	μA
OFF-state output current	I_{OZ}	$V_{CC}=6V, V_I = V_{IH}$ or $V_{IL}, V_O = V_{CC}$ or GND			0.25	μA
Quiescent Supply Current	I_{CC}	$V_{CC}=6V, V_I = V_{CC}$ or GND, $I_{OUT}=0$			1	μA
Input Capacitance	C_I			1.0		pF
Output Capacitance	C_O			1.5		pF

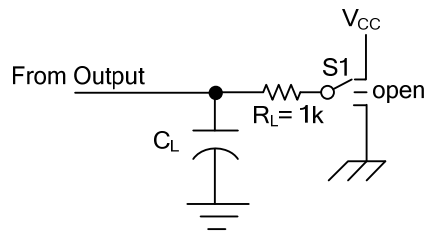
■ SWITCHING CHARACTERISTICS ($t_r = t_f \leq 6\text{ns}$, $C_L = 50\text{pF}$, $T_A = 25^\circ\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Propagation delay from input (nA) to output(nY)	t_{PLH} / t_{PHL}	$V_{CC} = 2\text{V}$		35	115	ns
		$V_{CC} = 4.5\text{V}$		11	23	ns
		$V_{CC} = 5\text{V}$, $C_L = 15\text{pF}$		10		ns
		$V_{CC} = 6\text{V}$		8	20	ns
Enable time from \overline{nOE} to nY	t_{PZL} / t_{PZH}	$V_{CC} = 2\text{V}$		40	115	ns
		$V_{CC} = 4.5\text{V}$		11	23	ns
		$V_{CC} = 6\text{V}$		8	20	ns
Disable time from \overline{nOE} to nY	t_{PLZ} / t_{PHZ}	$V_{CC} = 2\text{V}$		24	125	ns
		$V_{CC} = 4.5\text{V}$		12	25	ns
		$V_{CC} = 6\text{V}$		10	21	ns
Transition time	t_{THL} / t_{TLH}	$V_{CC} = 2\text{V}$		18	75	ns
		$V_{CC} = 4.5\text{V}$		6	15	ns
		$V_{CC} = 6\text{V}$		5	13	ns

■ CAPACITIVE CHARACTERISTICS ($T_A = 25^\circ\text{C}$, unless otherwise specified)

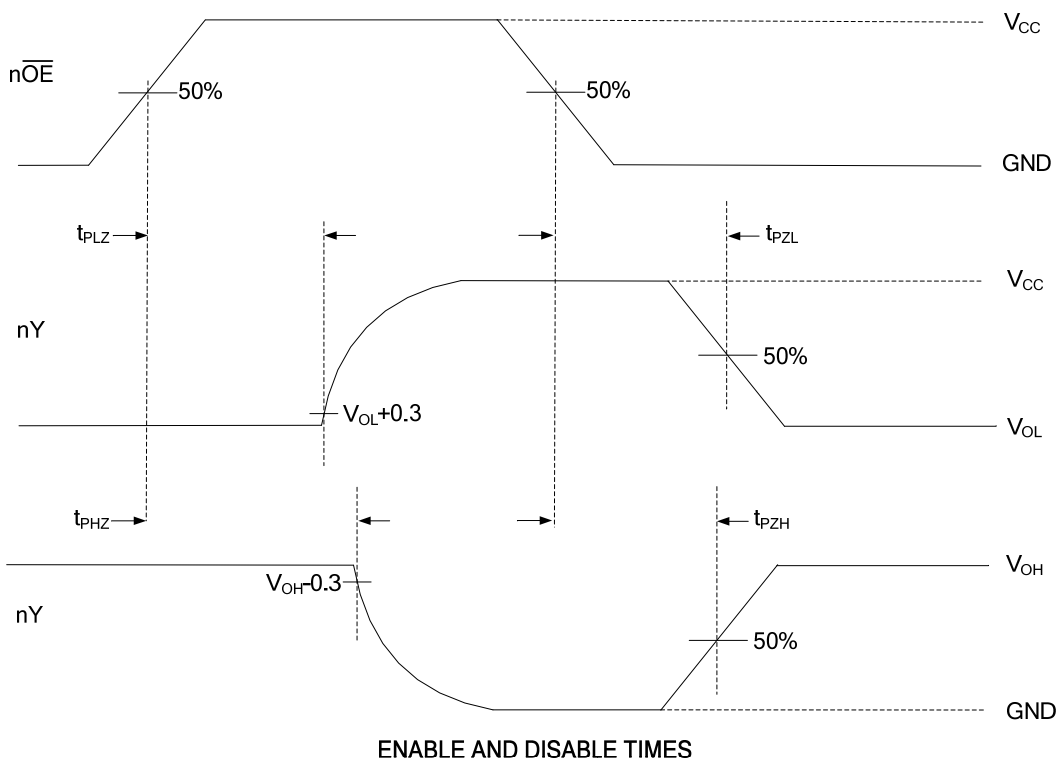
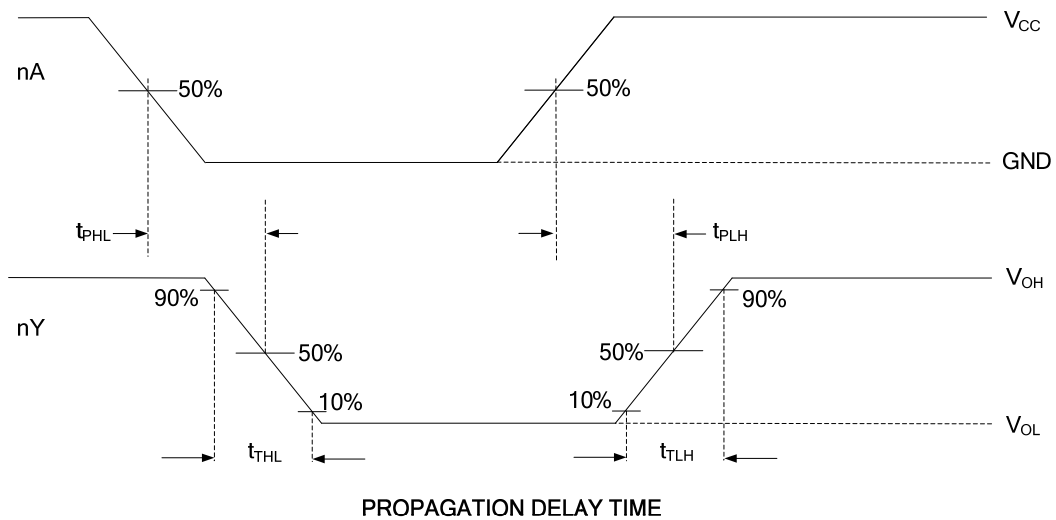
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Power Dissipation Capacitance	C_{PD}	per buffer, $V_I = \text{GND to } V_{CC}$		11		pF
		output enabled		1		pF
		output disabled				

■ TEST CIRCUIT AND WAVEFORMS

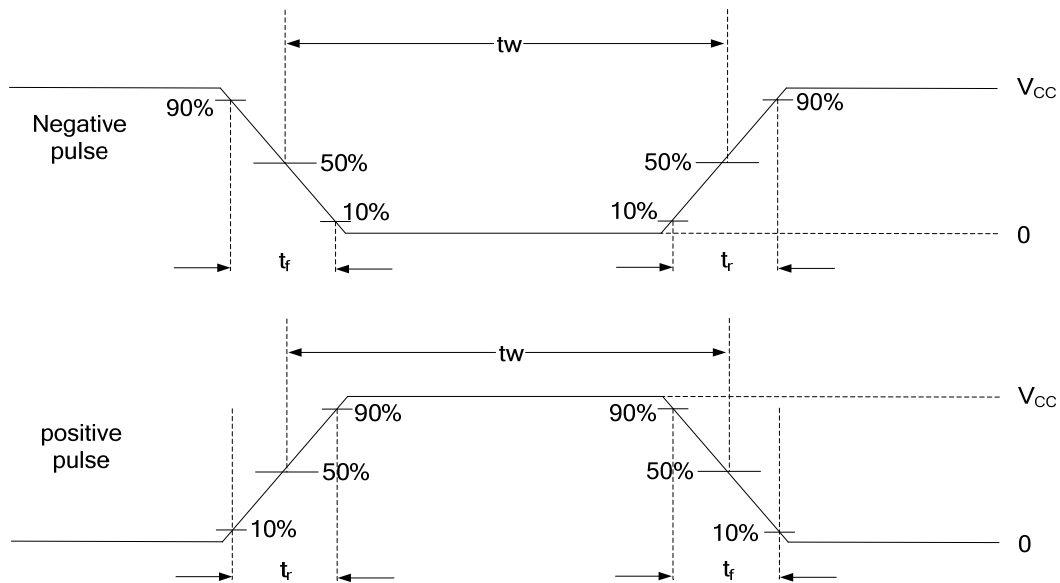


TEST CIRCUIT

S1 position		
t_{PHL}, t_{PLH}	t_{PZH}, t_{PHZ}	t_{PZL}, t_{PLZ}
open	GND	V_{CC}



■ TEST CIRCUIT AND WAVEFORMS (Cont.)



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