



U74HC1G66

CMOS IC

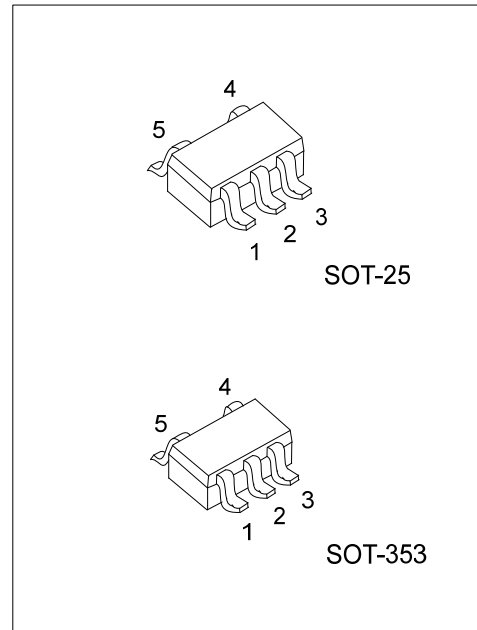
BILATERAL SWITCH

DESCRIPTION

The UTC **U74HC1G66** is a high-speed Si-gate CMOS device that provides an analog switch. The switch has two input/output pins(Y and Z) and an active high enable input pin (E). When pin E is low, the analog switch is turned off.

FEATURES

- * Operation voltage range: 2V~9V
- * Very low ON-resistance
- * Low power dissipation
- * Very small 5 pins package

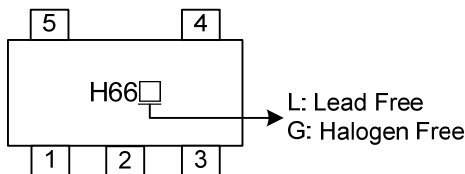


ORDERING INFORMATION

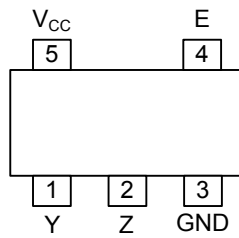
Order Number		Package	Packing
Lead Free	Halogen Free		
U74HC1G66L-AF5-R	U74HC1G66G-AF5-R	SOT-25	Tape Reel
U74HC1G66L-AL5-R	U74HC1G66G-AL5-R	SOT-353	Tape Reel

<p>U74HC1G66G-AF5-R</p> <p>(1) Packing Type (2) Package Type (3) Green Package</p>	<p>(1) R: Tape Reel (2) AF5: SOT-25, AL5: SOT-353 (3) G: Halogen Free and Lead Free, L: Lead Free</p>
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MARKING



■ PIN CONFIGURATION

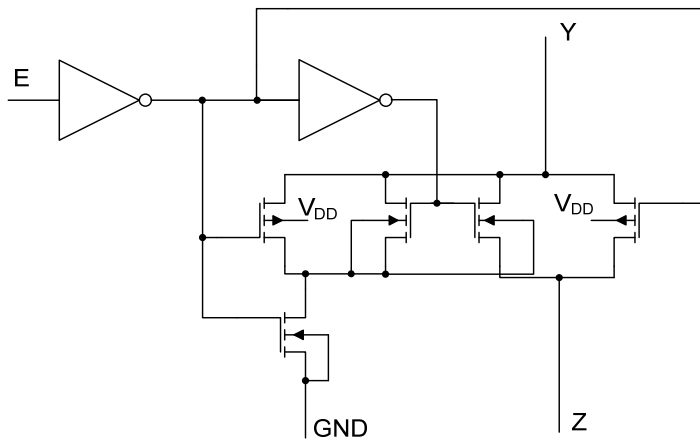


■ FUNCTION TABLE

INPUT(EN)	OUTPUT(Y/Z)
H	ON
L	OFF

Note: H: HIGH voltage level; L: LOW voltage level.

■ LOGIC DIAGRAM



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■ ABSOLUTE MAXIMUM RATINGS (unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V_{CC}	-0.5~11	V
V_{CC} or GND Current	I_{CC}	± 50	mA
Input Clamp Current	I_{IK}	± 20	mA
Switch Diode Current	I_{SK}	± 20	mA
Switch Current	I_S	± 25	mA
Power Dissipation	P_D	200	mW
Derate above $T_A > 55^\circ\text{C}$		2.5	mW/K
Operating Temperature	T_{OPR}	-40 ~ + 125	$^\circ\text{C}$
Storage Temperature	T_{STG}	-65 ~ +150	$^\circ\text{C}$

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	CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	V_{CC}		2.0	5.0	10.0	V
Input Voltage	V_{IN}		GND		V_{CC}	V
Switch voltage	V_S		GND		V_{CC}	V
Input Transition Rise or Fall Rate	t_R, t_F	$V_{CC}=2.0\text{V}$			1000	ns
		$V_{CC}=4.5\text{V}$		6	500	ns
		$V_{CC}=6.0\text{V}$			400	ns
		$V_{CC}=10.0\text{V}$			250	ns

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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
High-Level Input Voltage	V_{IH}	$V_{CC}=2\text{V}$	1.5			V
		$V_{CC}=4.5\text{V}$	3.15			V
		$V_{CC}=6\text{V}$	4.2			V
		$V_{CC}=9\text{V}$	6.3			V
Low-Level Input Voltage	V_{IL}	$V_{CC}=2\text{V}$			0.5	V
		$V_{CC}=4.5\text{V}$			1.35	V
		$V_{CC}=6\text{V}$			1.8	V
		$V_{CC}=9\text{V}$			2.7	V
Input Leakage Current	$I_{I(LEAK)}$	$V_{CC}=6\text{V}, V_{IN}=V_{CC}$ or GND		0.1	1	μA
		$V_{CC}=10\text{V}, V_{IN}=V_{CC}$ or GND		0.2	2	μA
Quiescent Supply Current	I_Q	$V_{CC}=6\text{V}, V_{IN}=V_{CC}$ or GND, $V_{IS}=\text{GND}$ or $V_{CC}, V_{OS}=V_{CC}$ or GND		1	10	μA
		$V_{CC}=10\text{V}, V_{IN}=V_{CC}$ or GND, $V_{IS}=\text{GND}$ or $V_{CC}, V_{OS}=V_{CC}$ or GND		2	20	μA
Analog Switch Current	OFF-state	I_S	$V_{CC}=10\text{V}, V_{IN}=V_{IH}$ or $V_{IL}; V_S =V_{CC}-\text{GND}$	0.1	1	μA
	ON-state		$V_{CC}=10\text{V}, V_{IN}=V_{IH}$ or $V_{IL}; V_S =V_{CC}-\text{GND}$	0.1	1	μA
ON-Resistance	PEAK	$R_{ON(PEAK)}$	$V_{CC}=2.0\text{V}, I_S=100\mu\text{A}, V_{IS}=V_{CC}$ to GND; $V_{IN}=V_{IH}$ or $V_{IL};$			Ω
			$V_{CC}=4.5\text{V}, I_S=1\text{mA}, V_{IN}=V_{IH}$ or $V_{IL};$ $V_{IS}=V_{CC}$ to GND	42	118	Ω
			$V_{CC}=6.0\text{V}, I_S=1\text{mA}, V_{IN}=V_{IH}$ or $V_{IL};$ $V_{IS}=V_{CC}$ to GND	31	105	Ω
			$V_{CC}=9.0\text{V}, I_S=1\text{mA}, V_{IN}=V_{IH}$ or $V_{IL};$ $V_{IS}=V_{CC}$ to GND	23	88	Ω

■ STATIC CHARACTERISTICS (Cont.) (T_A=25°C, unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP (Note)	MAX	UNIT
ON-Resistance	RAIL	R _{ON(RAIL)}	V _{CC} =2.0V, I _S =100μA, V _{IS} =GND; V _{IN} =V _{IH} or V _{IL}		75		Ω
			V _{CC} =4.5V, I _S =1mA, V _{IS} =GND; V _{IN} =V _{IH} or V _{IL}		29	95	Ω
			V _{CC} =6.0V, I _S =1mA, V _{IS} =GND; V _{IN} =V _{IH} or V _{IL}		23	82	Ω
			V _{CC} =9.0V, I _S =1mA, V _{IS} =GND; V _{IN} =V _{IH} or V _{IL}		18	70	Ω
			V _{CC} =2.0V, I _S =100μA, V _{IS} =V _{CC} ; V _{IN} =V _{IH} or V _{IL}		75		Ω
			V _{CC} =4.5V, I _S =1mA, V _{IS} =V _{CC} ; V _{IN} =V _{IH} or V _{IL}		35	106	Ω
			V _{CC} =6.0V, I _S =1mA, V _{IS} =V _{CC} ; V _{IN} =V _{IH} or V _{IL}		27	94	Ω
			V _{CC} =9.0V, I _S =1mA, V _{IS} =V _{CC} ; V _{IN} =V _{IH} or V _{IL}		21	78	Ω

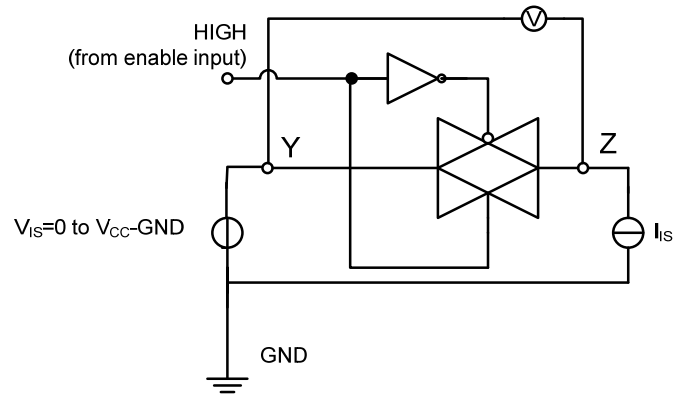
■ DYNAMIC CHARACTERISTICS (T_A=25°C, C_L=50pF, GND=0, t_R=t_F=6ns, unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP (Note)	MAX	UNIT
Propagation Delay V _{IS} to V _{OS}	t _{PHL} /t _{PLH}	V _{CC} =2.0V, R _L =∞			8	75	ns
		V _{CC} =4.5V, R _L =∞			3	15	ns
		V _{CC} =6.0V, R _L =∞			2	13	ns
		V _{CC} =9.0V, R _L =∞			1	10	ns
Turn-ON Time E to V _{OS}	t _{PZH} /t _{PZL}	V _{CC} =2.0V, R _L =1KΩ			50	125	ns
		V _{CC} =4.5V, R _L =1KΩ			16	25	ns
		V _{CC} =6.0V, R _L =1KΩ			13	21	ns
		V _{CC} =9.0V, R _L =1KΩ			9	16	ns
Turn-OFF Time E to V _{OS}	t _{PHZ} /t _{PLZ}	V _{CC} =2.0V, R _L =1KΩ			27	190	ns
		V _{CC} =4.5V, R _L =1KΩ			16	38	ns
		V _{CC} =6.0V, R _L =1KΩ			14	33	ns
		V _{CC} =9.0V, R _L =1KΩ			12	16	ns

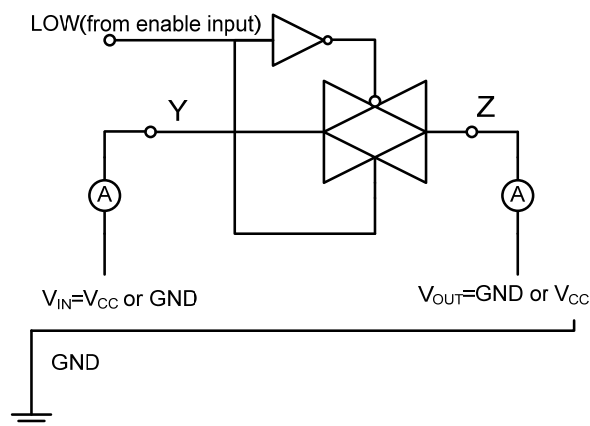
Note: All typical values are measured at T_A=25°C

■ TEST CIRCUIT AND WAVEFORMS

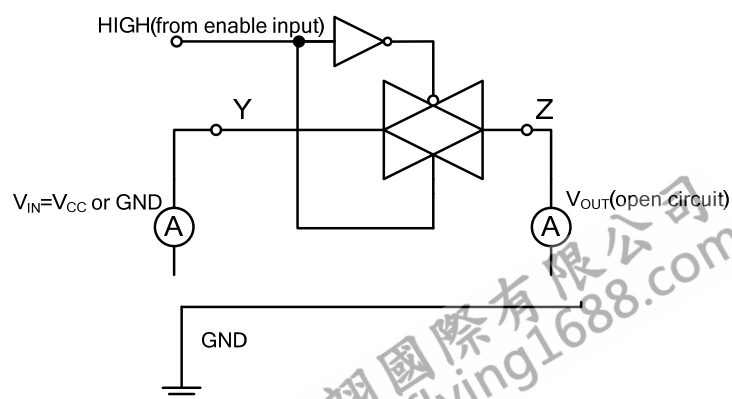
Test circuit for measuring ON-resistance (Ron)



Test circuit for measuring OFF-state current

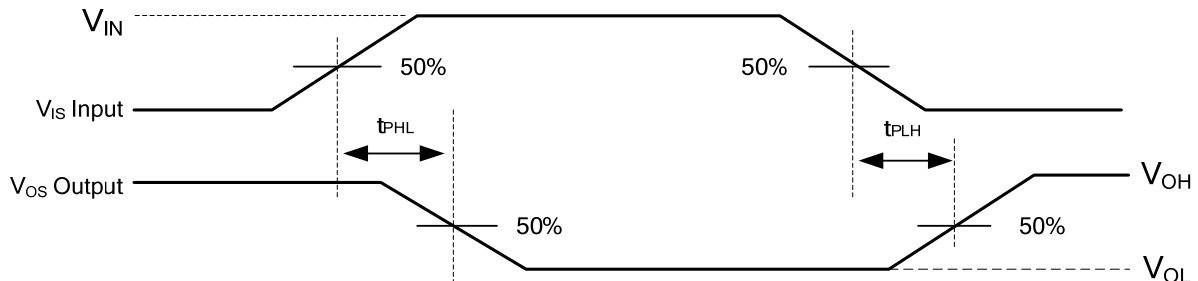


Test circuit for measuring ON-state current

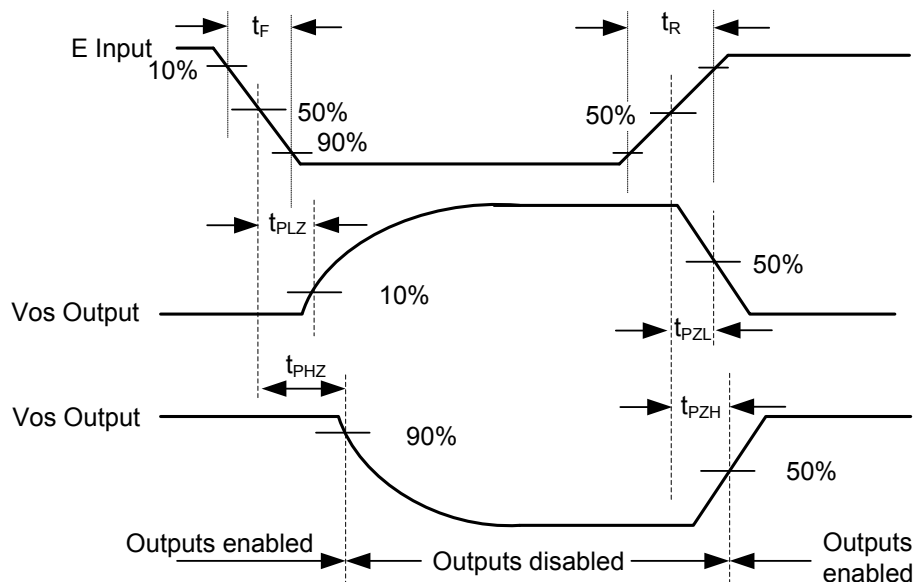


■ TEST CIRCUIT AND WAVEFORMS(Cont.)

Waveforms showing the Input (V_{IS}) to Output (V_{OS}) propagation delays



Waveforms showing the turn-on and turn-off times.



Note: $V_{IN} = \text{GND to } V_{CC}$

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