



U74HCT1G66

CMOS IC

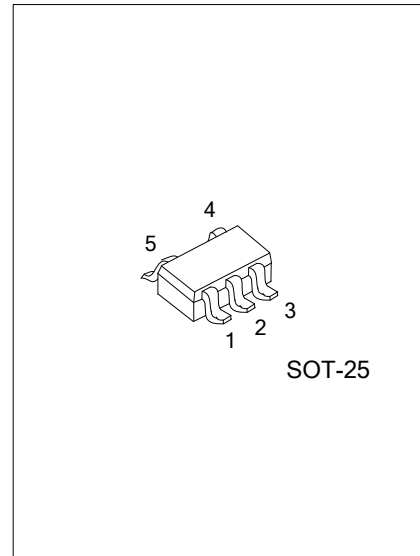
BILATERAL SWITCH

DESCRIPTION

The **U74HCT1G66** 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

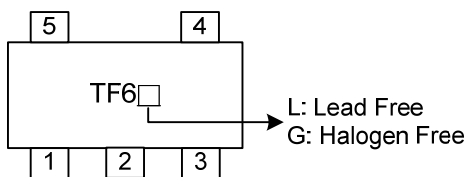


ORDERING INFORMATION

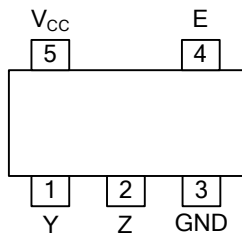
| Ordering Number | | Package | Packing |
|-------------------|-------------------|---------|-----------|
| Lead Free | Halogen Free | | |
| U74HCT1G66L-AF5-R | U74HCT1G66G-AF5-R | SOT-25 | Tape Reel |

| | |
|---|---|
| <p>U74HCT1G66L-AF5-R</p> <p>(1) Packing Type (2) Package Type (3) Lead Free</p> | <p>(1) R: Tape Reel (2) AF5: SOT-25 (3) G: Halogen Free, L: Lead Free</p> |
|---|---|

MARKING



■ PIN CONFIGURATION

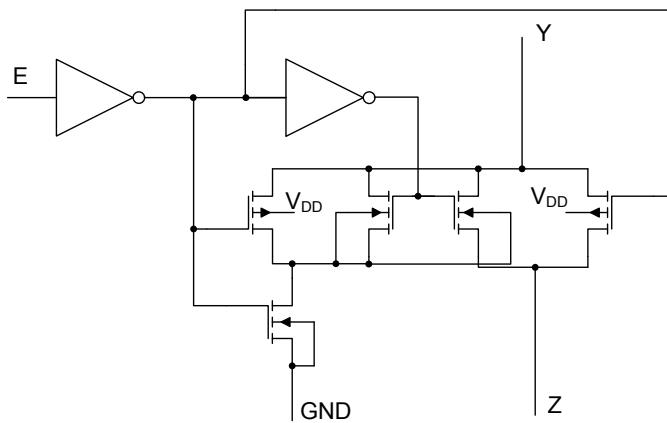


■ FUNCTION TABLE

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

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

■ LOGIC DIAGRAM



■ 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} | | 4.5 | 5.0 | 5.5 | 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 | $V_{CC}=2.0\text{V}$ | | | | ns |
| | | $V_{CC}=4.5\text{V}$ | | 6 | 500 | |
| | | $V_{CC}=6.0\text{V}$ | | | | |
| | | $V_{CC}=10.0\text{V}$ | | | | |

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

| PARAMETER | SYMBOL | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|-------------------------------------|---------------|---|--|-----|-----|---------------|
| High-Level Input Voltage | V_{IH} | $V_{CC}=4.5\text{V}\sim 5.5\text{V}$ | 2.0 | | | V |
| Low-Level Input Voltage | V_{IL} | $V_{CC}=4.5\text{V}\sim 5.5\text{V}$ | | | 0.8 | V |
| Input Leakage Current | $I_{I(LEAK)}$ | $V_{CC}=5.5\text{V}, V_{IN}=V_{CC}$ or GND | | 0.1 | 1.0 | μA |
| Quiescent Supply Current | I_Q | $V_{CC}=4.5\text{V}\sim 5.5\text{V}, V_{IN}=V_{CC}$ or GND, $V_{IS}=\text{GND}$ or $V_{CC}, V_{OS}=V_{CC}$ or GND | | 1 | 10 | μA |
| Additional supply current per input | ΔI_Q | $V_{CC}=4.5$ to $5.5\text{V}, V_{IN}=V_{CC}-2.1\text{V}$ | | | 500 | μA |
| Analog Switch Current | OFF-state | I_S | $V_{CC}=5.5, V_{IN}=V_{IH}$ or $V_{IL}; V_S =V_{CC}-\text{GND}$ | 0.1 | 1 | μA |
| | ON-state | | | 0.1 | 1 | |
| ON-Resistance | PEAK | $R_{ON(PEAK)}$ | $V_{CC}=4.5\text{V}, I_S=1\text{mA}, V_{IS}=V_{CC}$ to GND; $V_{IN}=V_{IH}$ or $V_{IL};$ | 42 | 118 | Ω |
| | RAIL | $R_{ON(RAIL)}$ | $V_{CC}=4.5\text{V}, I_S=1\text{mA}, V_{IS}=\text{GND}; V_{IN}=V_{IH}$ or $V_{IL};$ | 29 | 95 | |
| | | | $V_{CC}=4.5\text{V}, I_S=1\text{mA}, V_{IS}=V_{CC}; V_{IN}=V_{IH}$ or $V_{IL};$ | 35 | 106 | |

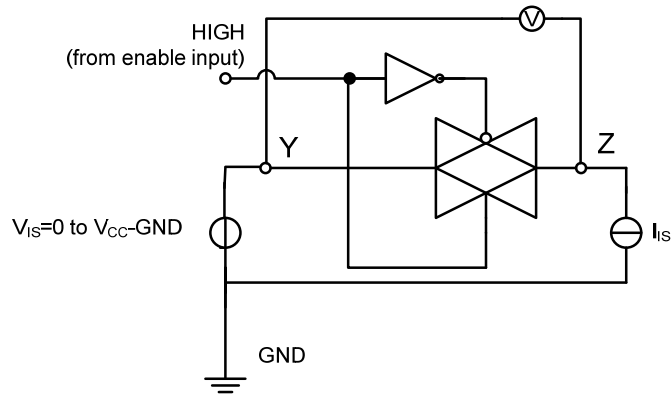
■ DYNAMIC CHARACTERISTICS ($T_A=25^\circ\text{C}, C_L=50\text{pF}, \text{Input: } t_R=t_F=6\text{ns}$, unless otherwise specified)

| PARAMETER | SYMBOL | TEST CONDITIONS | MIN | TYP (Note) | MAX | UNIT |
|--|-------------------|---|-----|------------|-----|------|
| Propagation Delay V_{IS} to V_{OS} | t_{PHL}/t_{PLH} | $V_{CC}=4.5\text{V}, R_L=\infty$ | | 3 | 15 | ns |
| Turn-ON Time E to V_{OS} | t_{PZH}/t_{PZL} | $V_{CC}=4.5\text{V}, R_L=1\text{K}\Omega$ | | 15 | 30 | ns |
| Turn-OFF Time E to V_{OS} | t_{PHZ}/t_{PLZ} | $V_{CC}=4.5\text{V}, R_L=1\text{K}\Omega$ | | 13 | 44 | ns |

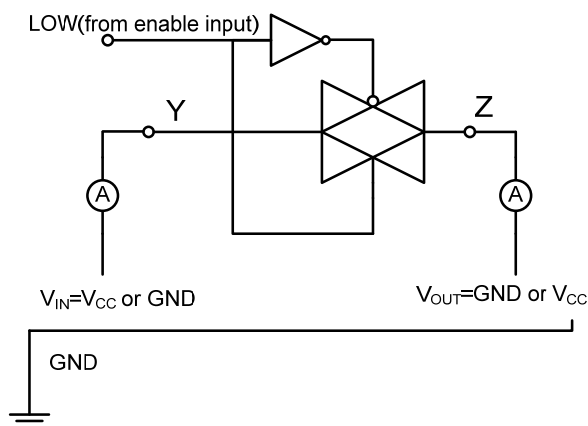
Note : All typical values are measured at $T_A=25^\circ\text{C}$

■ TEST CIRCUIT AND WAVEFORMS

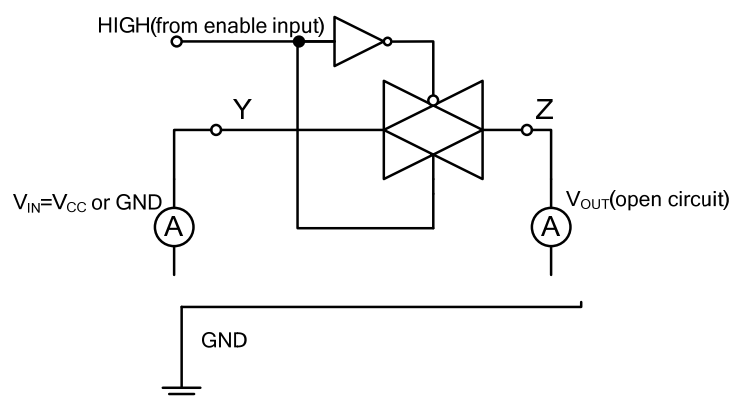
Test circuit for measuring ON-resistance (Ron)



Test circuit for measuring OFF-state current

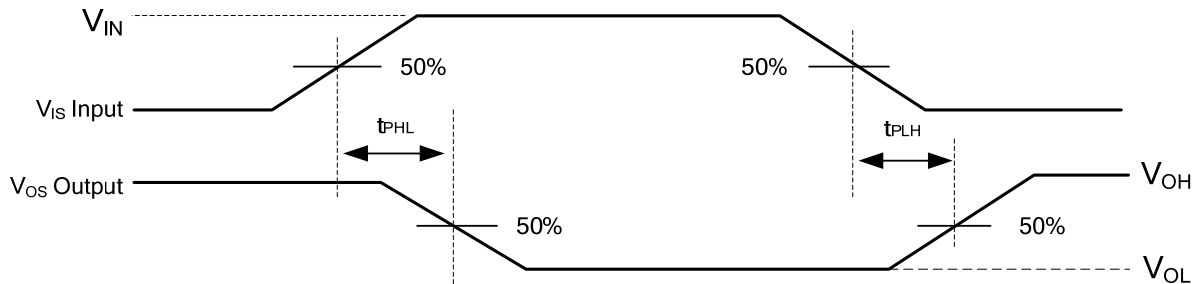


Test circuit for measuring ON-state current

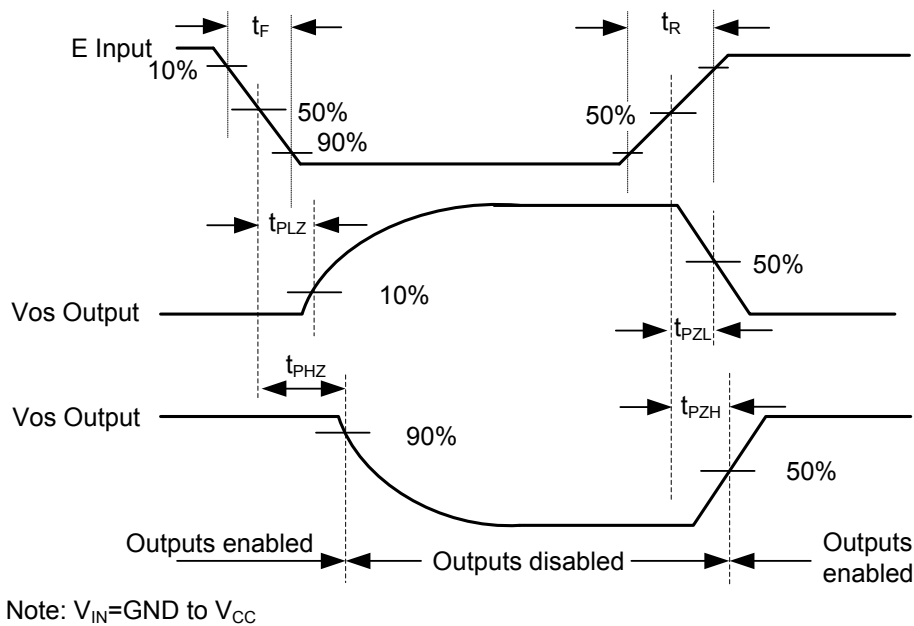


■ TEST CIRCUIT AND WAVEFORMS(Cont.)

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



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



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