

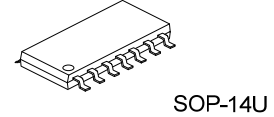
**U74HC4066****CMOS IC****QUAD BILATERAL SWITCHES****DESCRIPTION**

The UTC **U74HC4066** consists of four independent analog switches. Each switch has an Enable input (nE) which is active HIGH to decide the switch status.

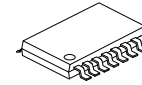
FEATURES

* Operation voltage range: 2~10V

* Very low "ON" resistance: $V_{CC}=4.5V$, 50Ω
 $V_{CC}=6V$, 45Ω
 $V_{CC}=9V$, 35Ω



SOP-14U

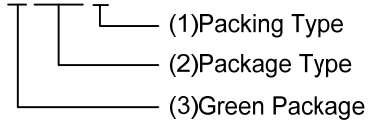


TSSOP-14U

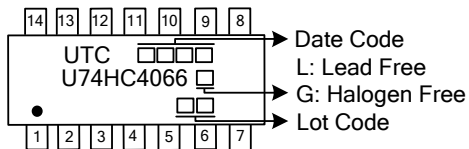
ORDERING INFORMATION

Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74HC4066L-UEA-R	U74HC4066G-UEA-R	SOP-14U	Tape Reel
U74HC4066L-UEB-R	U74HC4066G-UEB-R	TSSOP-14U	Tape Reel

U74HC4066G-UEA-R

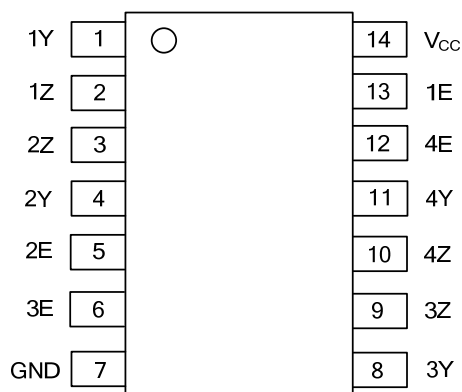


- (1) R: Tape Reel
(2) UEA: SOP-14U, UEB: TSSOP-14U
(3) G: Halogen Free and Lead Free, L: Lead Free

MARKING

- Date Code
→ L: Lead Free
→ G: Halogen Free
→ Lot Code

PIN CONFIGURATION

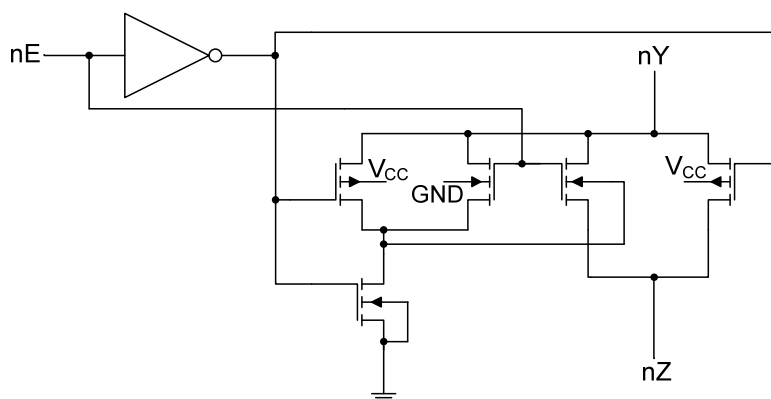


FUNCTION TABLE

INPUTS(nE)	SWITCH
H	ON
L	OFF

Note: H: High voltage level; L: Low voltage level.

LOGIC DIAGRAM



■ ABSOLUTE MAXIMUM RATING (T_A=25°C, unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V _{CC}	-0.5 ~ +11	V
Input Diode Current	I _{IK}	±20	mA
Switch Diode Current	I _{SK}	±20	mA
Switch Current	I _S	±25	mA
V _{CC} or GND Current	I _{CC}	±50	mA
Storage Temperature	T _{STG}	-65 ~ +150	°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	TEST 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} = 2.0V		6	1000	ns
		V _{CC} = 4.5V			500	ns
		V _{CC} = 6.0V			400	ns
		V _{CC} = 10.0V			250	ns
Operating Temperature	T _A		-40		+125	°C

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Ambient to Junction	SOP-14U	95	°C/W
	TSSOP-14U	115	°C/W

■ ELECTRICAL CHARACTERISTICS (T_A=25°C, unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
High-Level Input Voltage		V _{IH}	V _{CC} =2.0V	1.5			V
			V _{CC} =4.5V	3.15			V
			V _{CC} =6.0V	4.2			V
			V _{CC} =9.0V	6.3			V
Low-Level Input Voltage		V _{IL}	V _{CC} =2.0V			0.50	V
			V _{CC} =4.5V			1.35	V
			V _{CC} =6.0V			1.80	V
			V _{CC} =9.0V			2.70	V
Input Leakage Current		I _{I(LEAK)}	V _{CC} =6V, V _{IN} =V _{CC} or GND			±1.0	μA
			V _{CC} =10V, V _{IN} =V _{CC} or GND			±2.0	μA
current per channel	OFF-state	I _S	V _{CC} =10V, V _{IN} =V _{IH} or V _{IL} , V _S =V _{CC} -GND			±1.0	μA
	ON-state					±1.0	μA
Quiescent Supply Current		I _Q	V _{CC} =6V , V _{IN} =V _{IS} =V _{OS} =V _{CC} or GND			20	μA
			V _{CC} =10V , V _{IN} =V _{IS} =V _{OS} =V _{CC} or GND			40	μA
ON-resistance		Peak	V _{CC} =4.5V, I _S =1mA, V _{IN} =V _{IH} or V _{IL} , V _{IS} =V _{CC} to GND		54	118	Ω
			V _{CC} =6.0V, I _S =1mA, V _{IN} =V _{IH} or V _{IL} , V _{IS} =V _{CC} to GND		42	105	Ω
			V _{CC} =9.0V, I _S =1mA, V _{IN} =V _{IH} or V _{IL} , V _{IS} =V _{CC} to GND		32	88	Ω
			V _{CC} =2.0V, I _S =100μA, V _{IN} =V _{IH} or V _{IL} , V _{IS} =GND		80		Ω
		Rail	V _{CC} =4.5V, I _S =1mA, V _{IN} =V _{IH} or V _{IL} , V _{IS} =GND		35	95	Ω
			V _{CC} =6.0V, I _S =1mA, V _{IN} =V _{IH} or V _{IL} , V _{IS} =GND		27	82	Ω
			V _{CC} =9.0V, I _S =1mA, V _{IN} =V _{IH} or V _{IL} , V _{IS} =GND		20	70	Ω
			V _{CC} =2.0V, I _S =100μA, V _{IN} =V _{IH} or V _{IL} , V _{IS} =V _{CC}		100		Ω
			V _{CC} =4.5V, I _S =1mA, V _{IN} =V _{IH} or V _{IL} , V _{IS} =V _{CC}		42	106	Ω
			V _{CC} =6.0V, I _S =1mA, V _{IN} =V _{IH} or V _{IL} , V _{IS} =V _{CC}		35	94	Ω
			V _{CC} =9.0V, I _S =1mA, V _{IN} =V _{IH} or V _{IL} , V _{IS} =V _{CC}		27	78	Ω
Maximum variation of ON-resistance between any two channels		ΔR _{ON}	V _{CC} =4.5V, V _{IN} =V _{IH} or V _{IL} , V _{IS} =V _{CC} to GND		5		Ω
			V _{CC} =6.0V, V _{IN} =V _{IH} or V _{IL} , V _{IS} =V _{CC} to GND		4		Ω
			V _{CC} =9.0V, V _{IN} =V _{IH} or V _{IL} , V _{IS} =V _{CC} to GND		3		Ω

■ **DYNAMIC CHARACTERISTICS** ($T_A=25^\circ\text{C}$, $\text{GND}=0\text{V}$; $t_R=t_F=6\text{ns}$; $C_L=50\text{pF}$)

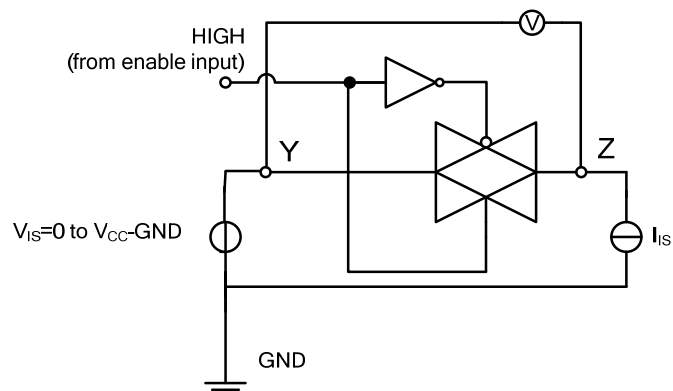
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Propagation Delay From V_{IS} to V_{OS}	t_{PHL}/t_{PLH}	$V_{CC}=2.0\text{V}$, $R_L=\infty$		8	75	ns
		$V_{CC}=4.5\text{V}$, $R_L=\infty$		3	15	ns
		$V_{CC}=6.0\text{V}$, $R_L=\infty$		2	13	ns
		$V_{CC}=9.0\text{V}$, $R_L=\infty$		2	10	ns
Turn-ON Time from nE to V_{OS}	t_{PZH}/t_{PZL}	$V_{CC}=2.0\text{V}$, $R_L=1\text{K}\Omega$		36	125	ns
		$V_{CC}=4.5\text{V}$, $R_L=1\text{K}\Omega$		13	25	ns
		$V_{CC}=6.0\text{V}$, $R_L=1\text{K}\Omega$		10	21	ns
		$V_{CC}=9.0\text{V}$, $R_L=1\text{K}\Omega$		8	16	ns
Turn-OFF Time from nE to V_{OS}	t_{PHZ}/t_{PLZ}	$V_{CC}=2.0\text{V}$, $R_L=1\text{K}\Omega$		44	190	ns
		$V_{CC}=4.5\text{V}$, $R_L=1\text{K}\Omega$		16	38	ns
		$V_{CC}=6.0\text{V}$, $R_L=1\text{K}\Omega$		13	33	ns
		$V_{CC}=9.0\text{V}$, $R_L=1\text{K}\Omega$		16	26	ns
Sine-Wave Distortion	THD	$V_{CC}=4.5\text{V}$, $V_{IS(P-P)}=4\text{V}$, $f=1\text{kHz}$, $R_L=10\text{k}$		0.04		%
		$V_{CC}=9\text{V}$, $V_{IS(P-P)}=8\text{V}$, $f=1\text{kHz}$, $R_L=10\text{k}$		0.02		%
		$V_{CC}=4.5\text{V}$, $V_{IS(P-P)}=4\text{V}$, $f=10\text{kHz}$, $R_L=10\text{k}$		0.12		%
		$V_{CC}=9\text{V}$, $V_{IS(P-P)}=8\text{V}$, $f=10\text{kHz}$, $R_L=10\text{k}$		0.06		%
Switch OFF Signal Feed-Through (Note 1)	α_{OFF}	$V_{CC}=4.5\text{V}$, $R_L=600\Omega$, $f=1\text{MHz}$		-50		dB
		$V_{CC}=9\text{V}$, $R_L=600\Omega$, $f=1\text{MHz}$		-50		dB
Crosstalk Between any two Switches (Note 1)	$\alpha_{CT(S)}$	$V_{CC}=4.5\text{V}$, $R_L=600\Omega$, $f=1\text{MHz}$		-60		dB
		$V_{CC}=9\text{V}$, $R_L=600\Omega$, $f=1\text{MHz}$		-60		dB
Crosstalk Voltage Between any input to any Switch (Peak-to-Peak Value)	$V_{(P-P)}$	$V_{CC}=4.5\text{V}$, $R_L=600\Omega$, $f=1\text{MHz}$		110		mV
		$V_{CC}=9\text{V}$, $R_L=600\Omega$, $f=1\text{MHz}$		220		mV
Minimum Frequency Response(-3dB) (Note 2)	f_{MAX}	$V_{CC}=4.5\text{V}$, $R_L=50\Omega$, $C_L=10\text{pF}$		180		MHz
		$V_{CC}=9\text{V}$, $R_L=50\Omega$, $C_L=10\text{pF}$		200		MHz
maximum switch capacitance	C_S			8		pF

Note 1. Adjust input voltage V_{IS} is 0dbm level (0dbm=1mW into 600 Ω)

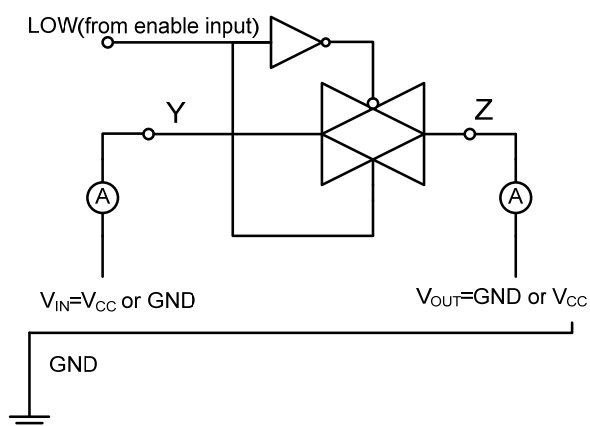
2. Adjust input voltage V_{IS} is 0dbm level at V_{OS} for 1MHz (0dbm=1mW into 50 Ω)

■ TEST CIRCUIT AND WAVEFORMS

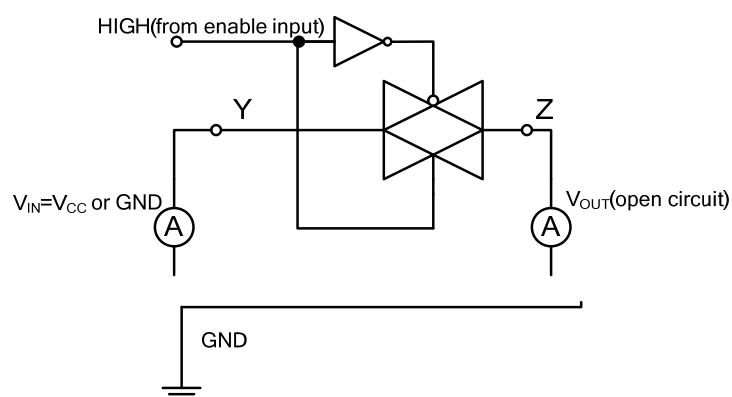
Test circuit for measuring ON-resistance (R_{ON})



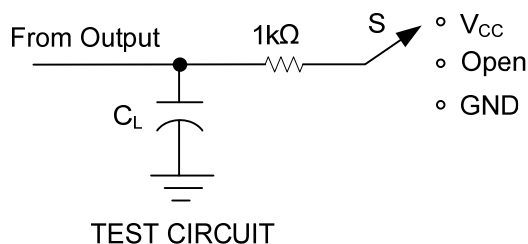
Test circuit for measuring OFF-state current



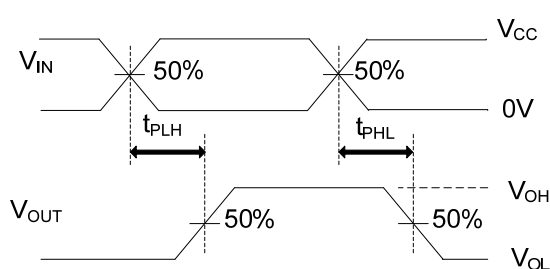
Test circuit for measuring ON-state current



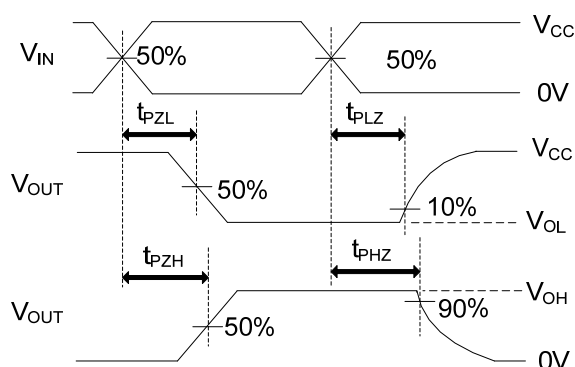
■ TEST CIRCUIT AND WAVEFORMS(Cont.)



	S	V_{IN}
t_{PLH}/t_{PHL}	OPEN	V_{IN}
t_{PHZ}/t_{PZH}	GND	V_{CC}
t_{PLZ}/t_{PZL}	V_{CC}	GND



PROPAGATION DELAY TIMES



ENABLE AND DISABLE TIMES

Note: 1. C_L includes probe and jig capacitance.
 2. $PRR \leq 1\text{MHz}$, $Z_o = 50\Omega$, $t_R \leq 6\text{ns}$, $t_F \leq 6\text{ns}$.

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