

QUARTZ CRYSTAL OSCILLATOR

■ GENERAL DESCRIPTION

The NJU6375 series is a C-MOS quartz crystal oscillator which consists of an oscillation amplifier and a 3-state output buffer.

This series are classed into six versions A, B, C and H, J, K according to their oscillation frequency range mentioned in the line-up table.

The oscillation amplifier incorporates feed-back resistance and oscillation capacitors(Cg, Cd), therefore, it requires no external component except quartz crystal.

Driverbility of the 3-state output buffer is 24mA in A, B and C versions, 16mA in H, J and K versions, thus it can drive both of TTL and C-MOS load.

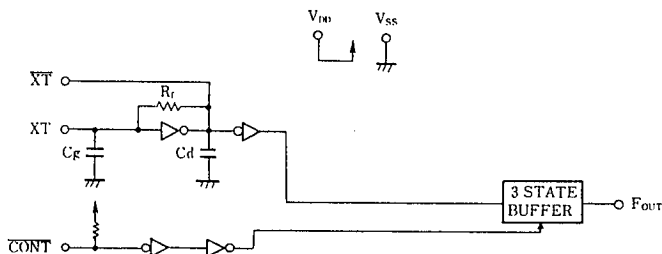
■ FEATURES

- Operating Voltage. -- 4.0~6.0V
- Maximum Oscillation Frequency (See Line-Up Table)
- Low Operating Current
- High Fan-out -- $I_{OL}/I_{OH}=24mA$ (A, B and C versions)
-- $I_{OL}/I_{OH}=16mA$ (H, J and K versions)
- 3-state Output Buffer
- Oscillation Capacitors Cg and Cd on-chip
- Oscillation and/or Output Stand-by Function
- Package Outline -- CHIP / EMP 8
- C-MOS Technology

■ LINE-UP TABLE

Type No.	Recommended Osc. Freq.	Output Freq.	Cg, Cd
NJU6375A	20~35MHz	f_o	28pF
6375B	30~50MHz		20pF
6375C	45~75MHz		17pF
NJU6375H	20~35MHz		28pF
6375J	30~50MHz		20pF
6375K	45~75MHz		17pF

■ BLOCK DIAGRAM



■ PACKAGE OUTLINE

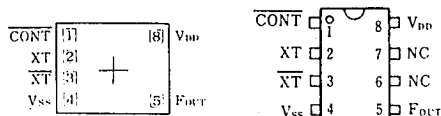


NJU6375XC



NJU6375XE

■ PAD LOCATION/PIN CONFIGURATION



■ COORDINATES

Unit: μm

No.	PAD	X	Y
1	CONT	-408	248
2	XT	-408	81
3	XT	-408	-86
4	VSS	-408	-248
5	FOUT	464	-248
8	VDD	464	248

Chip Size : 1.29 X 0.8mm
 Chip Center : X=0 μm , Y=0 μm
 Chip Thickness : 400 $\mu m \pm 30\mu m$
 (Note) No.6 and 7 terminals are only for package type information. There are no PAD on the chip.

■ TERMINAL DESCRIPTION

NO.	SYMBOL	F U N C T I O N	
1	$\overline{\text{CONT}}$	3-State Output Control	
		CONT	Output (F_{OUT})
		H	Output Frequency f_o
		L	Output High Impedance
2	XT	Quartz Crystal Connecting Terminals	
3	$\overline{\text{XT}}$		
4	V_{SS}	GND	
5	F_{OUT}	Output frequency f_o	
8	V_{DD}	+ 5V	

■ ABSOLUTE MAXIMUM RATINGS

 ($T_a=25^\circ\text{C}$)

P A R A M E T E R	SYMBOL	R A T I N G S	UNIT
Supply Voltage	V_{DD}	-0.5 ~ +7.0	V
Input Voltage	V_{IN}	$V_{\text{SS}}-0.5 \sim V_{\text{DD}}+0.5$	V
Output Voltage	V_o	-0.5 ~ $V_{\text{DD}}+0.5$	V
Input Current	I_{IN}	± 10	mA
Output Current	I_o	± 25	mA
Power Dissipation	P_D	200 (EMP)	mW
Operating Temperature Range	T_{opr}	-40 ~ +85	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	-55 ~ +125	$^\circ\text{C}$

(Note) Decoupling capacitor should be connected between V_{DD} and V_{SS} due to the stabilized operation for the circuit.

■ ELECTRICAL CHARACTERISTICS

• NJU6375A/B/C

 ($T_a=25^{\circ}\text{C}$, $V_{DD}=5\text{V}$)

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Operating Voltage	V_{DD}		4		6	V
Operating Current	I_{DD1}	A Version $f_{osc}=24\text{MHz}$, No Load			25	mA
	I_{DD2}	B Version $f_{osc}=48\text{MHz}$, No Load			30	
	I_{DD3}	C Version $f_{osc}=48\text{MHz}$, No Load			35	
Stand-by Current	I_{st}	$\overline{\text{CONT}}, \text{XT}=\overline{V_{SS}}$, No Load (Note 1)			1	μA
Input Voltage	V_{IH}		2.0		5.0	V
	V_{IL}		0		0.8	
Output Current	I_{OH}	$V_{DD}=5\text{V}$, $V_{OH}=4.5\text{V}$	24			mA
	I_{OL}	$V_{DD}=5\text{V}$, $V_{OL}=0.5\text{V}$	24			
Input Current	I_{IN}	$\overline{\text{CONT}}$ Terminal, $\overline{\text{CONT}}=\overline{V_{SS}}$	125	250	500	μA
3-St Off-leakage Current	I_{oz}	$\overline{\text{CONT}}=\overline{V_{SS}}$, $F_{OUT}=\overline{V_{SS}}$ or V_{DD}			± 0.1	μA
Internal Capacitor	C_g, C_d	A Version		28		pF
		B Version		20		
		C Version		17		
Max. Oscillation Freq.	f_{MAX}	A Version	35			MHz
		B Version	50			
		C Version	75			
Output Signal Symmetry	SYM	$C_L=15\text{pF}$ at 1.4V	45	50	55	%
		$C_L=15\text{pF}$ at 2.5V				
Output Signal Rise Time	t_{r1}	$C_L=15\text{pF}$, $R_L=390\Omega$, 20%~80%		2		ns
	t_{r2}	$C_L=15\text{pF}$, $R_L=390\Omega$, 0.4~2.4V		2		
	t_{r3}	$C_L=15\text{pF}$, 10~90%		3		
Output Signal Fall Time	t_{f1}	$C_L=15\text{pF}$, $R_L=390\Omega$, 80%~20%		2		ns
	t_{f2}	$C_L=15\text{pF}$, $R_L=390\Omega$, 2.4~0.4V		2		
	t_{f3}	$C_L=15\text{pF}$, 90~10%		3		

 (Note 1) Excluding input current on $\overline{\text{CONT}}$ terminal.

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• NJU6375H/J/K

 ($T_a=25^{\circ}\text{C}$, $V_{DD}=5\text{V}$)

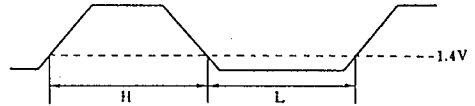
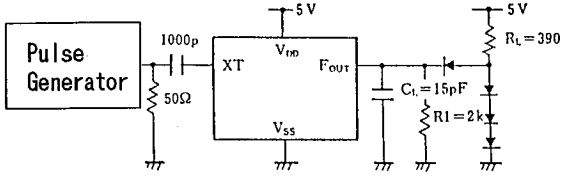
PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Operating Voltage	V_{DD}		4		6	V
Operating Current	I_{DD1}	H Version $f_{OSC}=24\text{MHz}$, No Load			25	mA
	I_{DD2}	J Version $f_{OSC}=48\text{MHz}$, No Load			30	
	I_{DD3}	K Version $f_{OSC}=48\text{MHz}$, No Load			35	
Stand-by Current	I_{st}	$\overline{\text{CONT}}$, $X_T=V_{SS}$, No Load (Note 2)			1	μA
Input Voltage	V_{IH}		2.0		5.0	V
	V_{IL}		0		0.8	
Output Current	I_{OH}	$V_{DD}=5\text{V}$, $V_{OH}=4.5\text{V}$	16			mA
	I_{OL}	$V_{DD}=5\text{V}$, $V_{OL}=0.5\text{V}$	16			
Input Current	I_{IN}	$\overline{\text{CONT}}$ Terminal, $\overline{\text{CONT}}=V_{SS}$	125	250	500	μA
3-St Off-leakage Current	I_{OZ}	$\overline{\text{CONT}}=V_{SS}$, $F_{OUT}=V_{SS}$ or V_{DD}			± 0.1	μA
Internal Capacitor	C_g, C_d	H Version		28		pF
		J Version		20		
		K Version		17		
Max. Oscillation Freq.	f_{MAX}	H Version	35			MHz
		J Version	50			
		K Version	75			
Output Signal Symmetry	SYM	$C_L=15\text{pF}$ at 1.4V	40	50	60	%
		$C_L=15\text{pF}$ at 2.5V	45	50	55	
Output Signal Rise Time	t_{r1}	$C_L=15\text{pF}$, $R_L=390\Omega$, 0.4~2.4V		4	7	ns
	t_{r2}	$C_L=50\text{pF}$, 10~90%		5	7	
Output Signal Fall Time	t_{f1}	$C_L=15\text{pF}$, $R_L=390\Omega$, 2.4~0.4V		4	7	ns
	t_{f2}	$C_L=50\text{pF}$, 90~10%		5	7	

 (Note 2) Excluding input current on $\overline{\text{CONT}}$ terminal.

■ MEASUREMENT CIRCUITS 1 (NJU6375A/B/C)

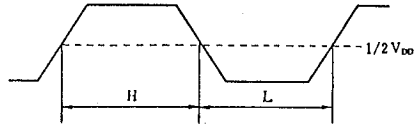
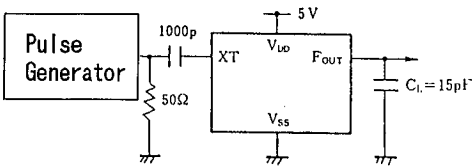
(1-1) Output Signal Symmetry

•TTL



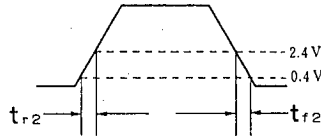
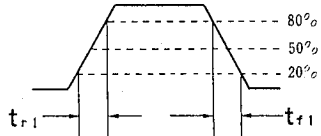
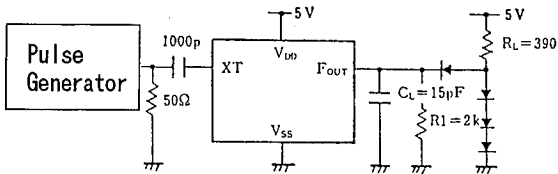
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•C-MOS

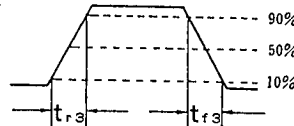
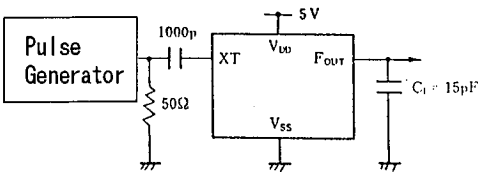


(1-2) Output Signal Rise / Fall Time

•TTL



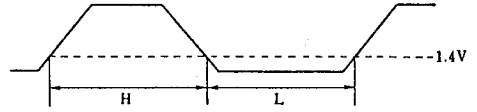
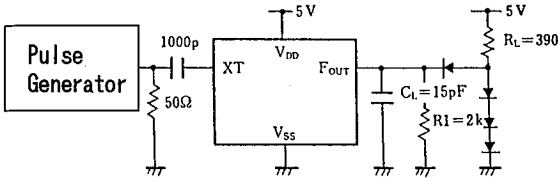
•C-MOS



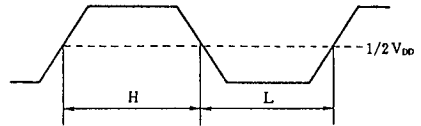
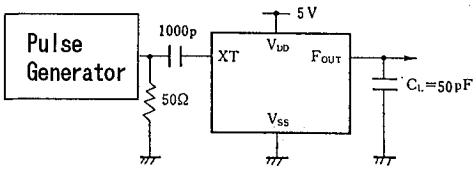
■ MEASUREMENT CIRCUITS 2 (NJU6375H/J/K)

(2-1) Output Signal Symmetry

•TTL

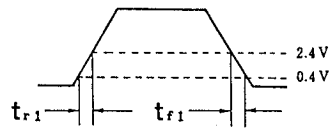
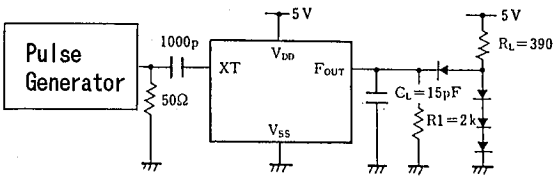


•C-MOS

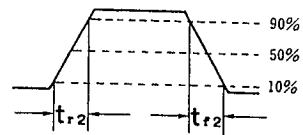
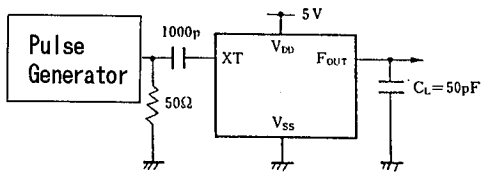


(2-2) Output Signal Rise / Fall Time

•TTL



•C-MOS



NJU6375 Series

MEMO

[CAUTION]

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