

## QUARTZ CRYSTAL OSCILLATOR

## ■ GENERAL DESCRIPTION

The NJU6322 series is a C-MOS quartz crystal oscillator which consists of an oscillation amplifier, 3-stage divider and 3-state output buffer.

The oscillation frequency is as wide as up to 50MHz and the symmetry of 45-55% is realized over full oscillation frequency range.

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

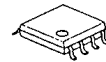
The 3-stage divider generates  $f_o$ ,  $f_o/2$ ,  $f_o/4$  and  $f_o/8$  and only one frequency selected by internal circuits is output.

The 3-state output buffer is TTL compatible and capable of 10 TTL driving.

## ■ PACKAGE OUTLINE



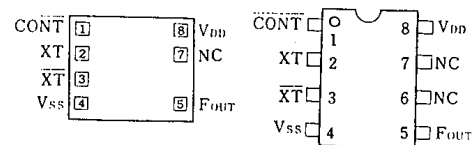
NJU6322XC



NJU6322XE

4

## ■ PIN CONFIGURATION/PAD LOCATION



## ■ FEATURES

- Operating Voltage -- 3.0~6.0V
- Maximum Oscillation Frequency -- 50MHz
- Low Operating Current
- High Fan-out -- TTL 10
- 3-state Output Buffer
- Selected Frequency Output (mask option)  
Only one frequency out of  $f_o$ ,  $f_o/2$ ,  $f_o/4$  and  $f_o/8$  output
- Oscillation Capacitors  $C_g$  and  $C_d$  on-chip
- Oscillation and/or Output Stand-by Function
- Package Outline -- CHIP/EMP 8
- C-MOS Technology

## ■ COORDINATES

 Unit:  $\mu\text{m}$ 

No.	PAD	X	Y
1	CONT	170	649
2	XT	170	483
3	XT	170	316
4	V <sub>SS</sub>	170	143
5	F <sub>OUT</sub>	1094	143
6	NC	-	-
7	NC	1094	462
8	V <sub>DD</sub>	1094	649

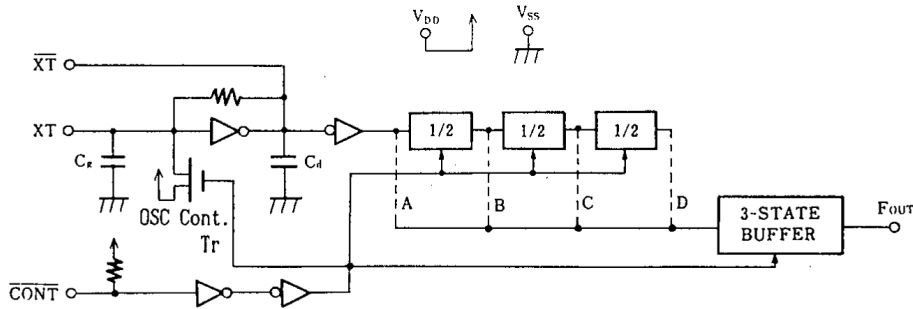
Chip Size : 1.24 X 0.8mm

 Chip Thickness : 400 $\mu\text{m}$ ±30 $\mu\text{m}$ 

(Note) No. 6 and 7 terminals are only for package type information. There is No.7 PAD on the chip but no No.6.

## ■ LINE-UP TABLE

Type No.	Output Frequency	$C_g$	$C_d$	Osc. Stop Function
NJU6322L	$f_o$	23pF	23pF	NO
NJU6322M	$f_o/2$	23pF	23pF	NO
NJU6322N	$f_o/4$	23pF	23pF	NO
NJU6322U	$f_o/8$	23pF	23pF	NO
NJU6322K	$f_o$	12.5pF	12.5pF	YES
NJU6322W	$f_o$	12.5pF	12.5pF	NO
NJU6322P	$f_o$	NO	NO	NO
NJU6322T	$f_o$	NO	NO	NO

**■ BLOCK DIAGRAM**

**4**

(Note) Oscillation stop function is available only for NJU6322K.  
Other series have only output stand-by function.

**■ TERMINAL DESCRIPTION**

No.	SYMBOL	F U N C T I O N
1	$\overline{\text{CONT}}$	Oscillation Stop Control and Divider Reset
		$\overline{\text{CONT}}$ Output ( $F_{\text{OUT}}$ )
		H Output either one frequency from $f_0$ , $f_0/2$ , $f_0/4$ and $f_0/8$
		L Output High Impedance and Divider Reset In the NJU6322K also oscillation stop
2	XT	Quartz Crystal Connecting Terminals
3	$\overline{\text{XT}}$	
5	$F_{\text{OUT}}$	Output either one frequency from $f_0$ , $f_0/2$ , $f_0/4$ , and $f_0/8$
8	$V_{\text{DD}}$	+5V
4	$V_{\text{SS}}$	GND

**■ ABSOLUTE MAXIMUM RATINGS**

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

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	$V_{\text{DD}}$	-0.5 ~ +7.0	V
Input Voltage	$V_{\text{IN}}$	-0.5 ~ $V_{\text{DD}}+0.5$	V
Output Voltage	$V_{\text{O}}$	-0.5 ~ $V_{\text{DD}}+0.5$	V
Input Current	$I_{\text{IN}}$	$\pm 10$	mA
Output Current	$I_{\text{O}}$	$\pm 25$	mA
Power Dissipation (EMP)	$P_{\text{D}}$	200	mW
Operating Temperature Range	$T_{\text{opr}}$	-40 ~ + 85	$^\circ\text{C}$
Storage Temperature Range	$T_{\text{stg}}$	-65 ~ +150	$^\circ\text{C}$

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

## ■ ELECTRICAL CHARACTERISTICS

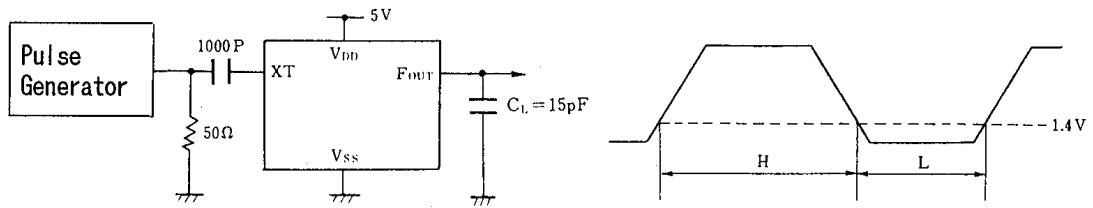
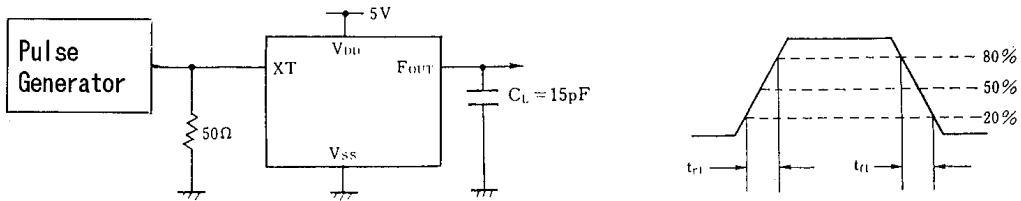
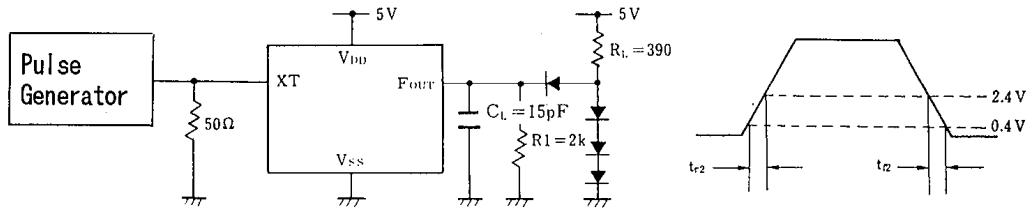
 (  $T_a=25^{\circ}\text{C}$ ,  $V_{DD}=5\text{V}$  )

PARAMETER	SYMBOL	CONDITIONS		MIN	TYP	MAX	UNIT
Operating Voltage	$V_{DD}$			3		6	V
Operating Current	$I_{DD}$	fosc=16MHz, No load				10	mA
Stand-by Current	$I_{st}$	$\overline{\text{CONT}}, \text{XT}=\overline{V_{SS}}$ , No load (Note)				1	$\mu\text{A}$
Input Voltage	$V_{IH}$			3.5		5.0	V
	$V_{IL}$			0		1.5	
Output Current	$I_{OH}$	$V_{DD}=5\text{V}$ , $V_{OH}=4.5\text{V}$		4			mA
	$I_{OL}$	$V_{DD}=5\text{V}$ , $V_{OL}=0.5\text{V}$		16			
Input Current	$I_{IN}$	$\overline{\text{CONT}}$ Terminal, $\overline{\text{CONT}}=\overline{V_{SS}}$				400	$\mu\text{A}$
Internal Capacitor	$C_g, C_d$	L, M, N, U Version			23		pF
		K Version			12.5		
		P, T Version			-		
Max. Oscillation Freq.	$f_{MAX}$	$V_{DD}=5\text{V}$ , $C_L=15\text{pF}$		50			MHz
Output Signal Symmetry	SYM	$V_{DD}=5\text{V}$ , $C_L=15\text{pF}$ at 1.4V		45	50	55	%
Output Signal Rise Time	$t_{r1}$	$V_{DD}=5\text{V}$	20% - 80%			8	ns
	$t_{r2}$	$C_L=15\text{pF}$	$R_L=390\Omega$ , 0.4V-2.4V			6	
Output Signal Fall Time	$t_{f1}$	$V_{DD}=5\text{V}$	80% - 20%			6	ns
	$t_{f2}$	$C_L=15\text{pF}$	$R_L=390\Omega$ , 2.4V-0.4V			4	

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

**4**

## ■ MEASUREMENT CIRCUITS

 (1) Output Signal Symmetry ( $C_L=15\text{pF}$ )

 (2) Output Signal Rise / Fall Time ( $C_L=15\text{pF}$ )

 (3) Output Signal Rise / Fall Time ( $C_L=15\text{pF}$ ,  $R_L=390\Omega$ )


# NJU6322 Series

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## MEMO

**[CAUTION]**

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