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(Cg, Cd), 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.

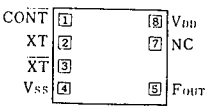
The 3-state output buffer is TTL compatible and capable of 10 TTL driving.

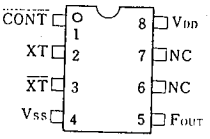
■ PACKAGE OUTLINE

NJU6322XC

NJU6322XE

■ 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 Cg and Cd on-chip
- Oscillation and/or Output Stand-by Function
- Package Outline -- CHIP/EMP 8
- C-MOS Technology

■ COORDINATES

Unit: μm

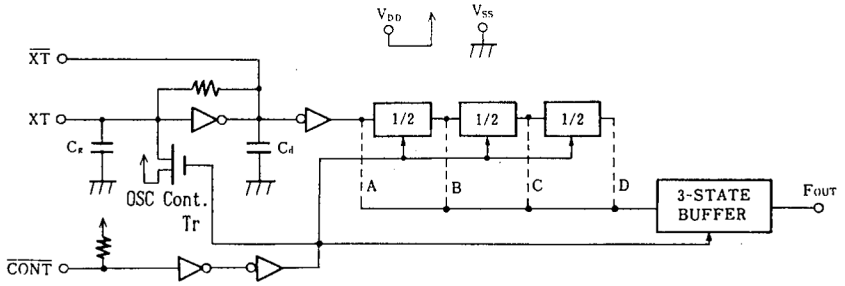
No.	PAD	X	Y
1	$\overline{CONT}$	170	649
2	XT	170	483
3	$\overline{XT}$	170	316
4	V_{SS}	170	143
5	F_{OUT}	1094	143
6	NC	-	-
7	NC	1094	462
8	V_{DD}	1094	649

Chip Size : 1.24 X 0.8mm
Chip Thickness : 400μm±30μm
(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	Cg	Cd	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



(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	$\overline{CONT}$	Oscillation Stop Control and Divider Reset $\overline{CONT}$ = H: Output either one frequency from f_O, $f_O/2$, $f_O/4$ and $f_O/8$ $\overline{CONT}$ = L: Output High Impedance and Divider Reset. In the NJU6322K also oscillation stop
2 3	XT $\overline{XT}$	Quartz Crystal Connecting Terminals
5	F_{OUT}	Output either one frequency from f_O, $f_O/2$, $f_O/4$, and $f_O/8$
8	V_{DD}	+5V
4	V_{SS}	GND

■ ABSOLUTE MAXIMUM RATINGS

(Ta=25℃)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V_{DD}	-0.5 ~ +7.0	V
Input Voltage	V_{IN}	-0.5 ~ V_{DD}+0.5	V
Output Voltage	V_O	-0.5 ~ V_{DD}+0.5	V
Input Current	I_{IN}	±10	mA
Output Current	I_O	±25	mA
Power Dissipation (EMP)	P_D	200	mW
Operating Temperature Range	Topr	-40 ~ + 85	℃
Storage Temperature Range	Tstg	-65 ~ +150	℃

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

■ ELECTRICAL CHARACTERISTICS

(Ta=25℃, V_{DD}=5V)

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	Ist	$\overline{CONT}$,XT=V_{SS}, No load (Note)				1	μA
Input Voltage	V_{IH}			3.5		5.0	V
	V_{IL}			0		1.5	
Output Current	I_{OH}	V_{DD}=5V, V_{OH}=4.5V		4			mA
	I_{OL}	V_{DD}=5V, V_{OL}=0.5V		16			
Input Current	I_{IN}	$\overline{CONT}$ Terminal, $\overline{CONT}$=V_{SS}				400	μA
Internal Capacitor	Cg,Cd	L, M, N, U Version			23		pF
		K Version			12.5		
		P, T Version			-		
Max. Oscillation Freq.	f_{MAX}	V_{DD}=5V, C_L=15pF		50			MHz
Output Signal Symmetry	SYM	V_{DD}=5V, C_L=15pF at 1.4V		45	50	55	%
Output Signal Rise Time	t_{r1}	V_{DD}=5V	20% - 80%			8	ns
	t_{r2}	C_L=15pF	R_L=390Ω,0.4V-2.4V			6	
Output Signal Fall Time	t_{f1}	V_{DD}=5V	80% - 20%			6	ns
	t_{f2}	C_L=15pF	R_L=390Ω,2.4V-0.4V			4	

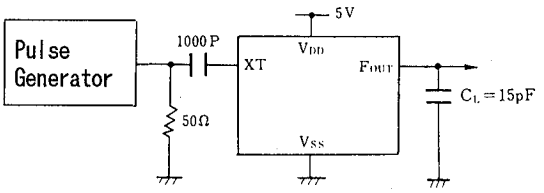
Note) Excluding input current on $\overline{CONT}$ terminal.

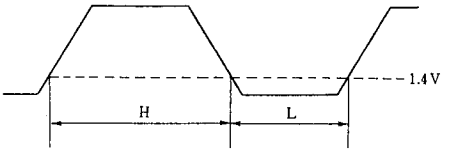
4

4

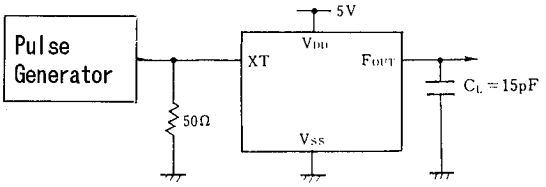
■ MEASUREMENT CIRCUITS

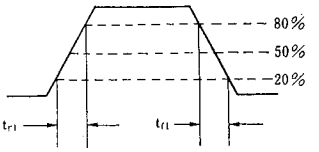
(1) Output Signal Symmetry (C_L=15pF)



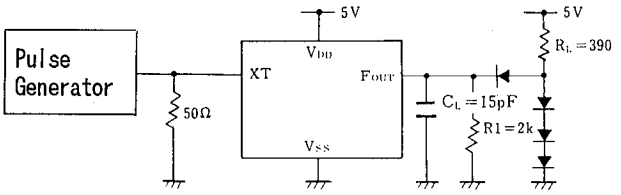


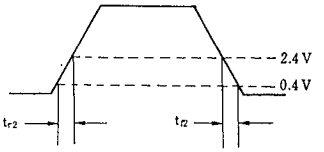
(2) Output Signal Rise / Fall Time (C_L=15pF)





(3) Output Signal Rise / Fall Time (C_L=15pF, R_L=390Ω)





MEMO