

QUARTZ CRYSTAL OSCILLATOR

■ GENERAL DESCRIPTION

The NJU6321 series is a C-MOS quartz crystal oscillator which consists of an oscillation amplifier, 3-stage divider, output frequency selector and 3-state output buffer.

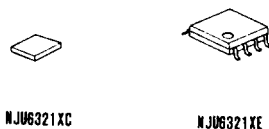
The oscillation frequency is as wide as up to 50MHz and the symmetry of 45-55% is realized over full oscillation frequency range.

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 outputs f_o , $f_o/2$, $f_o/4$ and $f_o/8$ to the output frequency selector and it determined one output frequency according to the combination of two input-signal.

The 3-state output buffer is C-MOS compatible and capable of 10 LSTTL driving.

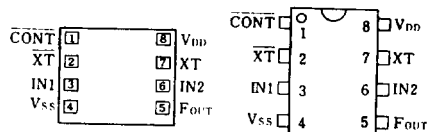
■ PACKAGE OUTLINE



NJU6321XC

NJU6321XE

■ PIN CONFIGURATION/PAD LOCATION



■ FEATURES

- Operating Voltage — 3.0~6.0V
- Maximum Oscillation Frequency — 50MHz
- Low Operating Current
- High Fan-out — LSTTL 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: μm

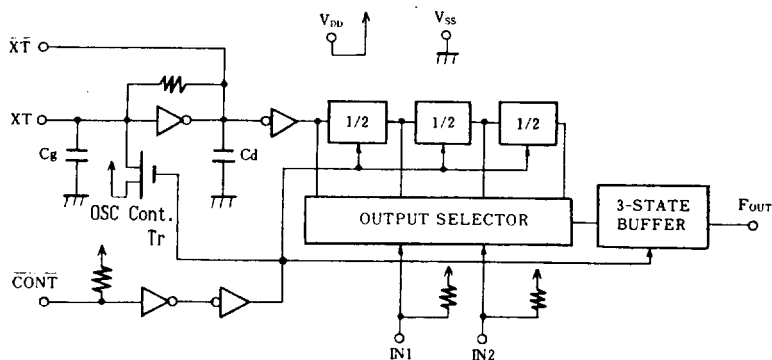
No.	PAD	X	Y
1	CONT	165	651
2	XT	165	484
3	IN1	165	317
4	VSS	165	149
5	FOUT	1113	149
6	IN2	1113	317
7	XT	1113	484
8	VDD	1113	651

Chip Size : 1.28 X 0.8mm

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

■ LINE-UP TABLE

Type No.	C_g	C_d	Osc. Stop (Tr)
NJU6321A	21pF	23pF	Yes
NJU6321P	NO	NO	NO


■ BLOCK DIAGRAM

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(Note) Oscillation Stop Function is available only for NJU6321A.
NJU6321P has 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															
		<table><tr><td>$\overline{\text{CONT}}$</td><td>F_{OUT}</td></tr><tr><td>H</td><td>Output either one frequency from f_0, $f_0/2$, $f_0/4$, and $f_0/8$</td></tr><tr><td>L</td><td>Output High Impedance and Divider Reset In the NJU6321A also oscillation stop</td></tr></table>	$\overline{\text{CONT}}$	F_{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 NJU6321A also oscillation stop									
		$\overline{\text{CONT}}$	F_{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 NJU6321A also oscillation stop																
2 7	$\overline{\text{XT}}$ XT	Quartz Crystal Connecting Terminals															
8	V_{DD}	+ 5V															
3 6	IN1 IN2	3-State Divider Outputs selected by IN1 and IN2 <table><tr><td>IN1</td><td>IN2</td><td>F_{OUT}</td></tr><tr><td>H</td><td>H</td><td>f_0</td></tr><tr><td>L</td><td>H</td><td>$f_0/2$</td></tr><tr><td>H</td><td>L</td><td>$f_0/4$</td></tr><tr><td>L</td><td>L</td><td>$f_0/8$</td></tr></table>	IN1	IN2	F_{OUT}	H	H	f_0	L	H	$f_0/2$	H	L	$f_0/4$	L	L	$f_0/8$
IN1	IN2	F_{OUT}															
H	H	f_0															
L	H	$f_0/2$															
H	L	$f_0/4$															
L	L	$f_0/8$															
5	F_{OUT}	Output either one frequency from f_0 , $f_0/2$, $f_0/4$, and $f_0/8$															
4	V_{SS}	GND															



ABSOLUTE MAXIMUM RATINGS

(Ta=25°C)

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	T _{opr}	-40 ~ + 85	°C
Storage Temperature Range	T _{stg}	-65 ~ +150	°C

ELECTRICAL CHARACTERISTICS

(Ta=25°C, V_{DD}=5V)

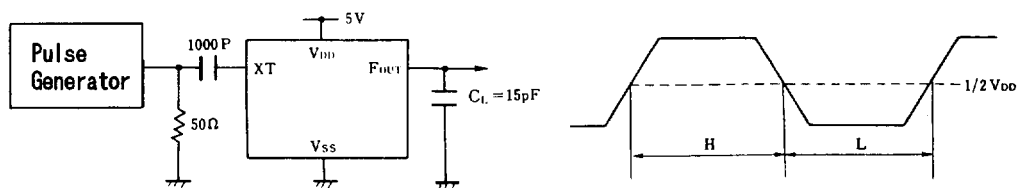
PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Operating Voltage	V _{DD}		3		6	V
Operating Current	I _{DD}	fosc=16MHz, No load			10	mA
Stand-by Current	I _{st}	CONT, XT=V _{SS} , No load (Note)			1	μA
Input Voltage	V _{IH}		3.5		5.0	V
	V _{IL}		0		1.5	
Output Current	I _{OH}	V _{DD} =5V, V _{OH} =4.5V	4			mA
	I _{OL}	V _{DD} =5V, V _{OL} =0.5V	4			
Input Current	I _{IN}	CONT, IN1, IN2 Terminals CONT, IN1, IN2=V _{SS}			400	μA
Internal Capacitor	C _g	A Version		21		pF
	C _d	A Version		23		
	C _g , C _d	P 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 1/2V _{DD}	45	50	55	%
Output Signal Rise Time	t _r	V _{DD} =5V, C _L =15pF, 10% - 90%			8	ns
Output Signal Fall Time	t _f	V _{DD} =5V, C _L =15pF, 90% - 10%			8	ns

Note) Excluding input current on CONT terminal.



■ MEASUREMENT CIRCUITS

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


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

