QUARTZ CRYSTAL OSCILLATOR

4

■ 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.

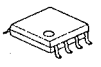
The oscillation amplifier incorporates feed-back resistance and oscillation capacitors(Cg, Cd), therefore, it requires no external component except quartz crystal.

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.

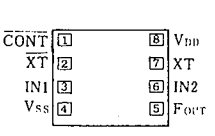
■ PACKAGE OUTLINE

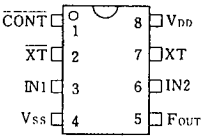
NJU6321XC



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

■ COORDINATES

Unit: μm

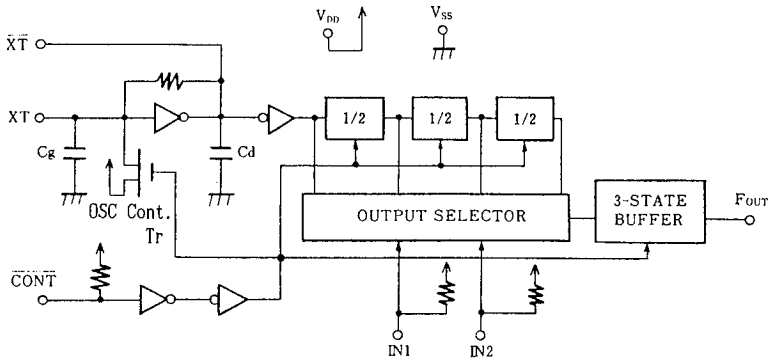
No.	PAD	X	Y
1	$\overline{CONT}$	165	651
2	$\overline{XT}$	165	484
3	IN1	165	317
4	V_{SS}	165	149
5	F_{OUT}	1113	149
6	IN2	1113	317
7	XT	1113	484
8	V_{DD}	1113	651

Chip Size : 1.28 X 0.8mm
Chip Thickness : 400μm±30μm

■ LINE-UP TABLE

Type No.	Cg	Cd	Osc. Stop (Tr)
NJU6321A	21pF	23pF	Yes
NJU6321P	NO	NO	NO

■ BLOCK DIAGRAM



(Note) Oscillation Stop Function is available only for NJU6321A.
NJU6321P has only output stand-by function.

■ TERMINAL DESCRIPTION

NO.	SYMBOL	FUNCTION
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 NJU6321A also oscillation stop
2 7	$\overline{XT}$ XT	Quartz Crystal Connecting Terminals
8	V_{DD}	+ 5V
3 6	IN1 IN2	3-State Divider Outputs selected by IN1 and IN2 IN1 = H, IN2 = H: f_O IN1 = L, IN2 = H: $f_O/2$ IN1 = H, IN2 = L: $f_O/4$ IN1 = L, IN2 = L: $f_O/8$
5	F_{OUT}	Output either one frequency from f_O, $f_O/2$, $f_O/4$, and $f_O/8$
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

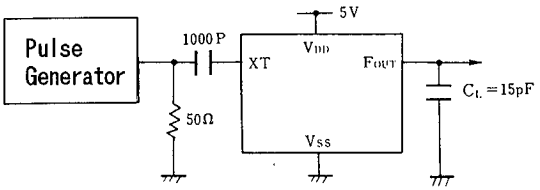
(Ta=25℃, V_{DD}=5V)

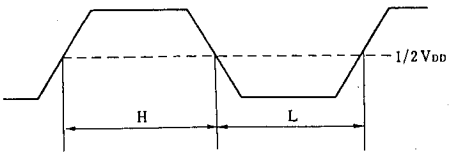
PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Operating Voltage	V_{DD}		3		6	V
Operating Current	I_{DD}	fosc=16MHz, No load			10	mA
Stand-by Current	Ist	$\overline{CONT}$,XT=V_{SS}, No load (Note)			1	μA
Input Voltage	V_{IH}		3.5		5.0	V
	V_{IL}		0		1.5	
Output Current	I_{OH}	V_{DD}=5V, V_{OH}=4.5V	4			mA
	I_{OL}	V_{DD}=5V, V_{OL}=0.5V	4			
Input Current	I_{IN}	$\overline{CONT}$, IN1, IN2 Terminals $\overline{CONT}$, IN1, IN2=V_{SS}			400	μA
Internal Capacitor	Cg	A Version		21		pF
	Cd	A Version		23		
	Cg,Cd	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 $\overline{CONT}$ terminal.

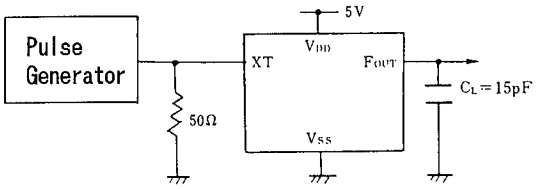
■ MEASUREMENT CIRCUITS

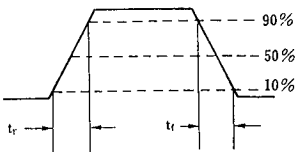
(1) Output Signal Symmetry (C_L=15pF)





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





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