

QUARTZ CRYSTAL OSCILLATOR

■ GENERAL DESCRIPTION

The NJU6331 series is a C-MOS quartz crystal oscillator which consists of oscillation amplifier, 3-stage divider and 3-state output buffer.

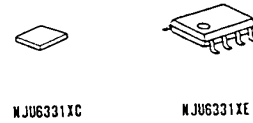
This series are classed into three groups A to D, H to L and Q to T according to their oscillation frequency range mentioned in the line-up table.

The feed-back resistor and oscillation load capacitors (Cg, Cd) incorporated on oscillation amplifier enables oscillation by connecting quartz crystal only.

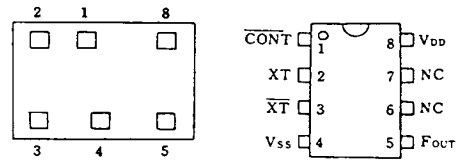
Only one frequency is selected from f0, f0/2, f0/4 and f0/8 by internal connection.

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

■ PACKAGE OUTLINE



■ PIN CONFIGURATION/PAD LOCATION



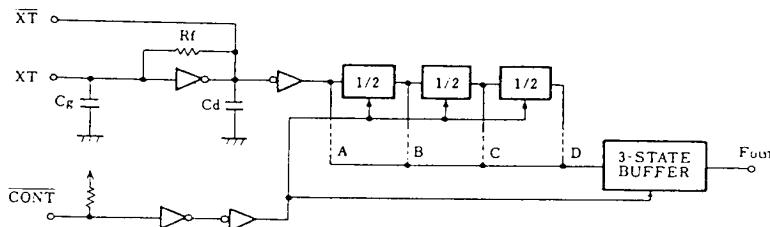
■ FEATURES

- Operating Voltage. -- 4.0~6.0V
- Maximum Oscillation Frequency. -- See Line-up Table.
- Low Operating Current.
- High Fanout -- TTL 10
- 3-state Output Buffer
- Output Frequency Selectable by mask option. One frequency out of f0, f0/2, f0/4 and f0/8 outputs.
- Oscillation Capacitors Cg and Cd On-chip
- Output Stand-by Function
- Package Outline -- CHIP/EMP 8
- C-MOS Technology

■ LINE-UP TABLE

TYPE NO.	Recommended Osc. Freq.	Output Freq.	Cg, Cd
NJU6331A 6331B 6331C 6331D	From 20 to 35MHz	f0 f0/2 f0/4 f0/8	28pF
NJU6331H 6331J 6331K 6331L	From 30 to 50MHz	f0 f0/2 f0/4 f0/8	20pF
NJU6331Q 6331R 6331S 6331T	From 45 to 75MHz	f0 f0/2 f0/4 f0/8	17pF

■ BLOCK DIAGRAM



■ COORDINATES

Unit : μm

No	PAD	X	Y
1	CONT	515	648
2	XT	231	648
3	XT	231	168
4	Vss	734	152
5	FOUT	1091	172
6	NC	--	--
7	NC	--	--
8	VDD	1091	628

CHIP SIZE : 1.29 × 0.8mm
CHIP THICKNESS : 400μm ± 30μm

■ ABSOLUTE MAXIMUM RATINGS

(Ta=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V _{DD}	-0.3 ~ 7.0	V
Input Voltage	V _{IN}	-0.3 ~ V _{DD} +0.3	V
Output Voltage	V _O	-0.5 ~ V _{DD} +0.5	V
Input Current	I _{IN}	-10 ~ +10	mA
Output Current	I _O	-25 ~ +25	mA
Power Dissipation (EMP)	P _D	200	mW
Operating Temperature Range	Topr	-30 ~ + 75	°C
Storage Temperature Range	Tstg	-40 ~ +125	°C

■ ELECTRICAL CHARACTERISTICS

 (Ta=25°C, V_{DD}=5V)

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Operating Voltage	V _{DD}		4	5	6	V
Operating Current	I _{DD1}	A,B,C,D f _{osc} =24MHz, No Load			15	mA
	I _{DD2}	H,J,K,L f _{osc} =48MHz, No Load			25	
	I _{DD3}	Q,R,S,T f _{osc} =48MHz, No Load			25	
Stand-by Current	I _{st}	$\overline{\text{CONT}}=V_{SS}$, No Load (Note)			1	uA
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}	$\overline{\text{CONT}}=V_{SS}$	125	250	500	uA
Off-leakage Current	I _{oz}	$\overline{\text{CONT}}=V_{SS}$, OUT=V _{SS} and V _{DD}			±0.1	uA
Output Signal Symmetry	SYM	C _L =15pF, at 1.4V,	45	50	55	%
Output Signal Rise Time	Tr1	C _L =15pF, R _L =390Ω, 20% - 80%		4	8	ns
	Tr2	C _L =15pF, R _L =390Ω, 0.4V-2.4V		3	6	
Output Signal Fall Time	Tf1	C _L =15pF, R _L =390Ω, 80% - 20%		3	6	ns
	Tf2	C _L =15pF, R _L =390Ω, 2.4V-0.4V		2	4	
Internal Capacitor	C _g ,C _d	A,B,C,D		28		pF
		H,J,K,L		20		
		Q,R,S,T		17		

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