

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.

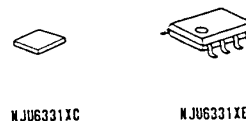
This series are classed into three groups A to D, H to L and Q to T according to their oscillation frequency range mentioned in the line-up table.

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

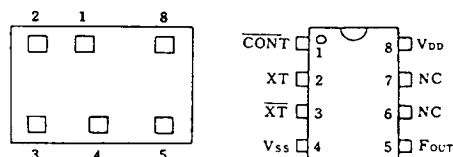
Only one frequency is selected from f_0 , $f_0/2$, $f_0/4$ and $f_0/8$ by internal connection.

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

■ PACKAGE OUTLINE



■ PIN CONFIGURATION/PAD LOCATION



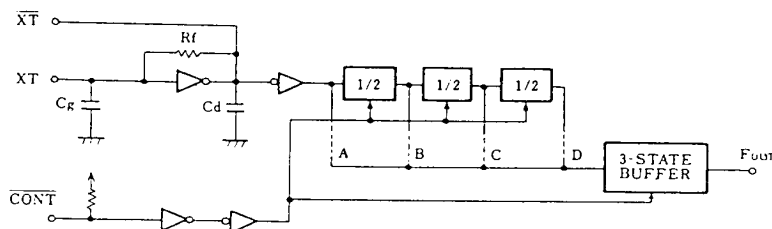
■ FEATURES

- 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 f_0 , $f_0/2$, $f_0/4$ and $f_0/8$ outputs.
- Oscillation Capacitors C_g and C_d On-chip
- Output Stand-by Function
- Package Outline -- CHIP/EMP 8
- C-MOS Technology

■ LINE-UP TABLE

TYPE NO.	Recomended Osc. Freq.	Output Freq.	C_g, C_d
NJU6331A 6331B 6331C 6331D	From 20 to 35MHz	f_0 $f_0/2$ $f_0/4$ $f_0/8$	28pF
NJU6331H 6331J 6331K 6331L	From 30 to 50MHz	f_0 $f_0/2$ $f_0/4$ $f_0/8$	20pF
NJU6331Q 6331R 6331S 6331T	From 45 to 75MHz	f_0 $f_0/2$ $f_0/4$ $f_0/8$	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 : 400 μm ± 30 μm

ABSOLUTE MAXIMUM RATINGS

(Ta=25°C)

P A R A M E T E R	S Y M B O L	R A T I N G S	U N I T
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)

P A R A M E T E R	S Y M B O L	C O N D I T I O N S	M I N	T Y P	M A X	U N I T
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}	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}	CONT=V _{SS}	125	250	500	uA
Off-leakage Current	I _{oz}	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 CONT terminal.