

QUARTZ CRYSTAL OSCILLATOR

■ GENERAL DESCRIPTION

The NJU6330 series is a C-MOS quartz crystal oscillator which consists of an oscillation amplifier and a 3-state output buffer.

This series are classed into three versions A, B and C according to their oscillation frequency range mentioned in the line-up table.

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

Driverbility of the 3-state output buffer is 16mA (sink/source), thus it can drive both of TTL and C-MOS load.

■ PACKAGE OUTLINE



NJU6330XC



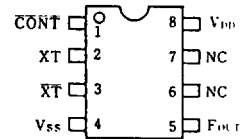
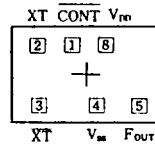
NJU6330XE

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■ FEATURES

- Operating Voltage. — 4.0~6.0V
- Maximum Oscillation Frequency (See Line-Up Table)
- Low Operating Current
- High Fan-out — $I_{OL}/I_{OH}=16\text{mA}$
- 3-state Output Buffer
- Oscillation Capacitors C_g and C_d on-chip
- Oscillation and/or Output Stand-by Function
- Package Outline — CHIP / EMP 8
- C-MOS Technology

■ PAD LOCATION/PIN CONFIGURATION



■ LINE-UP TABLE

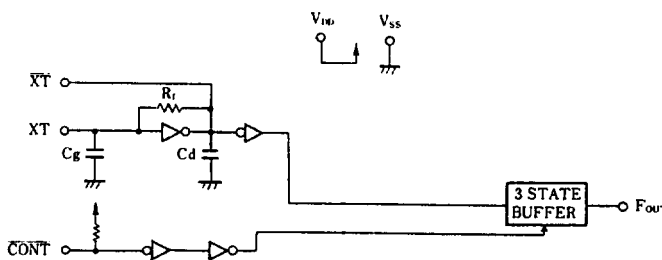
Type No.	Recommended Osc. Freq.	Output Freq.	C_g, C_d
NJU6330A	20~35MHz	f_0	28pF
6330B	30~50MHz		20pF
6330C	45~75MHz		17pF

■ COORDINATES

 Unit: μm

No.	PAD	X	Y
1	CONT	-130	248
2	XT	-414	248
3	$\overline{\text{XT}}$	-414	-232
4	V_{SS}	89	-248
5	F_{OUT}	446	-228
8	V_{DD}	153	228

■ BLOCK DIAGRAM



Chip Size : 1.29 X 0.8mm
 Chip Center : $X=0\mu\text{m}, Y=0\mu\text{m}$
 Chip Thickness : $400\mu\text{m} \pm 30\mu\text{m}$
 (Note) No.6 and 7 terminals are only for package type information. There are no PAD on the chip.


■ TERMINAL DESCRIPTION

NO.	SYMBOL	F U N C T I O N
1	$\overline{\text{CONT}}$	3-State Output Control
		$\overline{\text{CONT}}$ Output (F_{OUT})
		H Output Frequency f_o
		L Output High Impedance
2	XT	Quartz Crystal Connecting Terminals
3	$\overline{\text{XT}}$	
4	V_{SS}	GND
5	F_{OUT}	Output frequency f_o
8	V_{DD}	+ 5V

■ ABSOLUTE MAXIMUM RATINGS

 ($T_a=25^\circ\text{C}$)

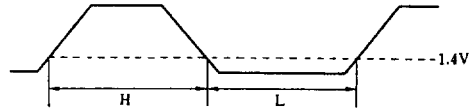
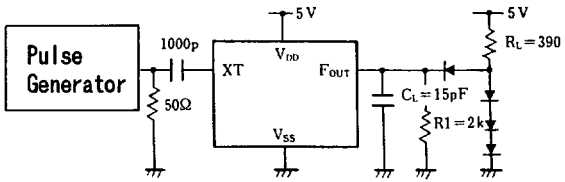
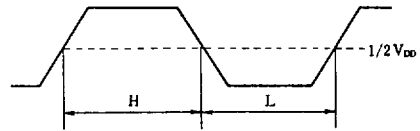
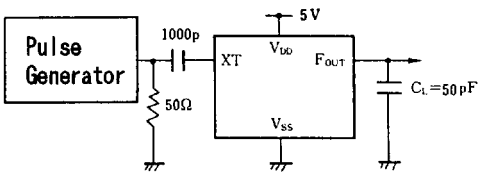
PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V_{DD}	-0.5 ~ +7.0	V
Input Voltage	V_{IN}	$V_{\text{SS}}-0.5 \sim V_{\text{DD}}+0.5$	V
Output Voltage	V_o	-0.5 ~ $V_{\text{DD}}+0.5$	V
Input Current	I_{IN}	± 10	mA
Output Current	I_o	± 25	mA
Power Dissipation	P_D	200 (EMP)	mW
Operating Temperature Range	T_{opr}	-40 ~ +85	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	-55 ~ +125	$^\circ\text{C}$

■ ELECTRICAL CHARACTERISTICS

 ($T_a=25^\circ\text{C}$, $V_{\text{DD}}=5\text{V}$)

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Operating Voltage	V_{DD}		4		6	V
Operating Current	I_{DD1}	A Version $f_{\text{osc}}=24\text{MHz}$, No Load			25	mA
	I_{DD2}	B Version $f_{\text{osc}}=48\text{MHz}$, No Load			30	
	I_{DD3}	C Version $f_{\text{osc}}=48\text{MHz}$, No Load			35	
Stand-by Current	I_{st}	$\overline{\text{CONT}}, \text{XT}=V_{\text{SS}}$, No Load (Note)			1	μA
Input Voltage	V_{IH}		2.0		5.0	V
	V_{IL}		0		0.8	
Output Current	I_{OH}	$V_{\text{DD}}=5\text{V}$, $V_{\text{OH}}=4.5\text{V}$	16			mA
	I_{OL}	$V_{\text{DD}}=5\text{V}$, $V_{\text{OL}}=0.5\text{V}$	16			
Input Current	I_{IN}	$\overline{\text{CONT}}$ Terminal, $\overline{\text{CONT}}=V_{\text{SS}}$	125	250	500	μA
3-St Off-leakage Current	I_{oz}	$\overline{\text{CONT}}=V_{\text{SS}}$, $F_{\text{OUT}}=V_{\text{SS}}$ or V_{DD}			± 0.1	μA
Internal Capacitor	C_g, C_d	A Version		28		pF
		B Version		20		
		C Version		17		
Max. Oscillation Freq.	f_{MAX}	A Version	35			MHz
		B Version	50			
		C Version	75			
Output Signal Symmetry	SYM	$C_L=15\text{pF}$ at 1.4V	40	50	60	%
		$C_L=15\text{pF}$ at 2.5V	45	50	55	
Output Signal Rise Time	t_{r1}	$C_L=15\text{pF}$, $R_L=390\Omega$, 0.4~2.4V		4	7	ns
		$C_L=50\text{pF}$, 10~90%		5	7	
Output Signal Fall Time	t_{f1}	$C_L=15\text{pF}$, $R_L=390\Omega$, 2.4~0.4V		4	7	ns
		$C_L=50\text{pF}$, 90~10%		5	7	

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


MEASUREMENT CIRCUITS
(1) Output Signal Symmetry

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(2) Output Signal Rise / Fall Time
