

QUARTZ CRYSTAL OSCILLATOR

■ GENERAL DESCRIPTION

The NJU6333 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, H and Q 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.

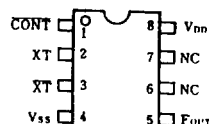
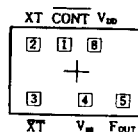
Driverbility of the 3-state output buffer is 24mA (sink/source), thus it can drive both of TTL and C-MOS load.

■ PACKAGE OUTLINE


NJU6333XC

NJU6333XE

■ PIN CONFIGURATION/PAD LOCATION



■ FEATURES

- Operating Voltage. — 4.0~6.0V
- Maximum Oscillation Frequency (See Line-Up Table)
- Low Operating Current
- High Fan-out — $I_{OL}/I_{OH}=24mA$
- 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

■ LINE-UP TABLE

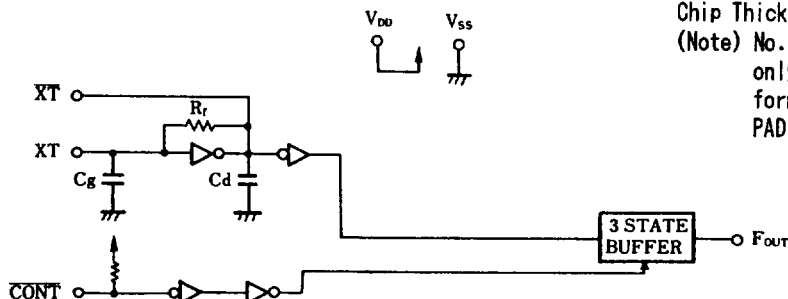
Type No.	Recommended Osc. Freq.	Output Freq.	C_g, C_d
NJU6333A	20~35MHz	f_0	28pF
6333H	30~50MHz		20pF
6333Q	45~75MHz		17pF

■ COORDINATES

 Unit: μm

No.	PAD	X	Y
1	CONT	-130	248
2	XT	-414	248
3	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 : $X=0\mu m, Y=0\mu m$
 Chip Thickness : $400\mu m \pm 30\mu m$
 (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	CONT	3-State Output Control
		CONT Output (F_{OUT})
		H Output Frequency f_o
		L Output High Impedance
2	XT	Quartz Crystal Connecting Terminals
3	$\overline{XT}$	
4	V_{SS}	GND
5	F_{OUT}	Output frequency f_o
8	V_{DD}	+ 5V

■ ABSOLUTE MAXIMUM RATINGS

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

P A R A M E T E R	SYMBOL	R A T I N G S	UNIT
Supply Voltage	V_{DD}	-0.5 ~ +7.0	V
Input Voltage	V_{IN}	$V_{SS}-0.5 \sim V_{DD}+0.5$	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	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

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

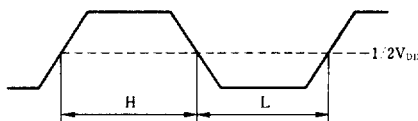
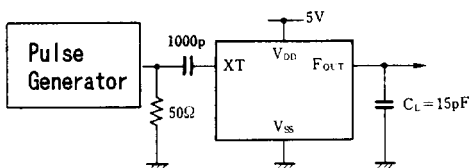
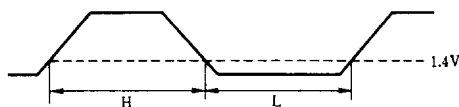
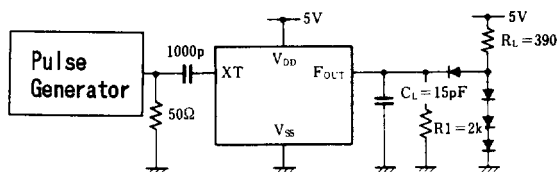
P A R A M E T E R	SYMBOL	C O N D I T I O N S	MIN	TYP	MAX	UNIT
Operating Voltage	V_{DD}		4		6	V
Operating Current	I_{DD1}	A Version $f_{OSC}=24\text{MHz}$, No Load			25	mA
	I_{DD2}	H Version $f_{OSC}=48\text{MHz}$, No Load			30	
	I_{DD3}	Q Version $f_{OSC}=48\text{MHz}$, No Load			35	
Stand-by Current	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}	$V_{DD}=5\text{V}$, $V_{OH}=4.5\text{V}$	24			mA
	I_{OL}	$V_{DD}=5\text{V}$, $V_{OL}=0.5\text{V}$	24			
Input Current	I_{IN}	CONT Terminal, CONT= V_{SS}	125	250	500	μA
3-St Off-leakage Current	I_{OZ}	CONT= V_{SS} , $F_{OUT}=V_{SS}$ or V_{DD}			± 0.1	μA
Internal Capacitor	Cg, Cd	A Version		28		pF
		H Version		20		
		Q Version		17		
Max. Oscillation Freq.	f_{MAX}	A Version	35			MHz
		H Version	50			
		Q Version	75			
Output Signal Symmetry	SYM	$C_L=15\text{pF}$ at 1.4V	45	50	55	%
		$C_L=15\text{pF}$ at 2.5V				
Output Signal Rise Time	t_{r1}	$C_L=15\text{pF}$, $R_L=390\Omega$, 20%~80%		2		ns
	t_{r2}	$C_L=15\text{pF}$, $R_L=390\Omega$, 0.4~2.4V		2		
	t_{r3}	$C_L=15\text{pF}$, 10~90%		3		
Output Signal Fall Time	t_{f1}	$C_L=15\text{pF}$, $R_L=390\Omega$, 80%~20%		2		ns
	t_{f2}	$C_L=15\text{pF}$, $R_L=390\Omega$, 2.4~0.4V		2		
	t_{f3}	$C_L=15\text{pF}$, 90~10%		3		

(Note) Excluding input current on CONT terminal.



MEASUREMENT CIRCUITS

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



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

