

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(Cg, Cd), 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

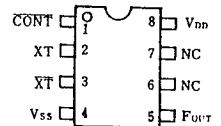
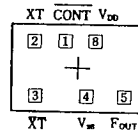


NJU6333XC



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

■ LINE-UP TABLE

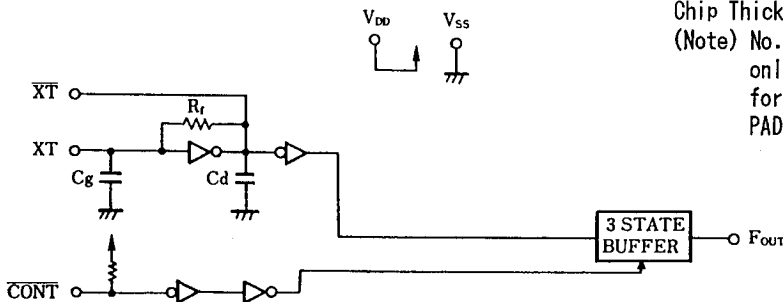
Type No.	Recommended Osc. Freq.	Output Freq.	Cg, Cd
NJU6333A	20~35MHz	fo	28pF
6333H	30~50MHz		20pF
6333Q	45~75MHz		17pF

■ COORDINATES

Unit:  $\mu m$

No.	PAD	X	Y
1	CONT	-130	248
2	XT	-414	248
3	XT	-414	-232
4	VSS	89	-248
5	FOUT	446	-228
8	VDD	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	XT		
4	$V_{SS}$	GND	
5	$F_{OUT}$	Output frequency $f_o$	
8	$V_{DD}$	+ 5V	

**4**
**■ 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	$I_{IN}$	$\pm 10$	mA
Output Current	$I_o$	$\pm 25$	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	$^\circ\text{C}$

(Note) Decoupling capacitor should be connected between  $V_{DD}$  and  $V_{SS}$  due to the stabilized operation for the circuit.

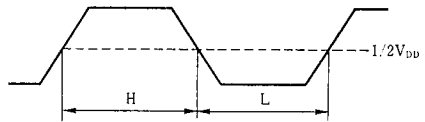
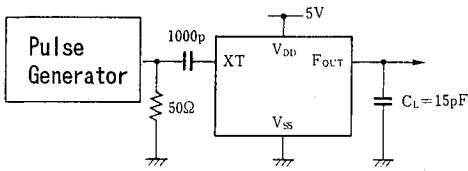
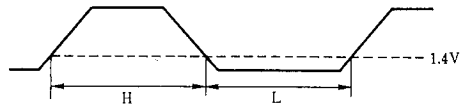
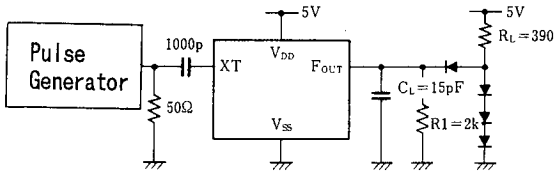
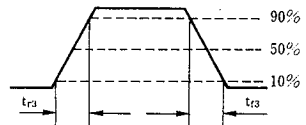
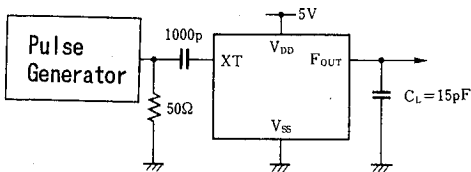
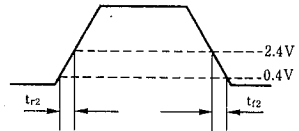
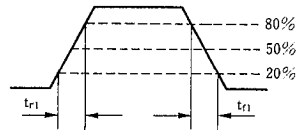
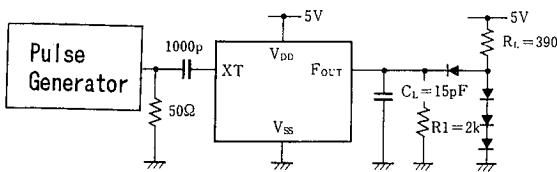
**■ ELECTRICAL CHARACTERISTICS**

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

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	$\mu\text{A}$
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	$\mu\text{A}$
3-St Off-leakage Current	$I_{oz}$	CONT= $V_{SS}$ , $F_{OUT}=V_{SS}$ or $V_{DD}$			$\pm 0.1$	$\mu\text{A}$
Internal Capacitor	$C_g, C_d$	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 ( $C_L=15\text{pF}$ )


# NJU6333 Series

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MEMO

**[CAUTION]**

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