

QUARTZ CRYSTAL OSCILLATOR

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■ 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.

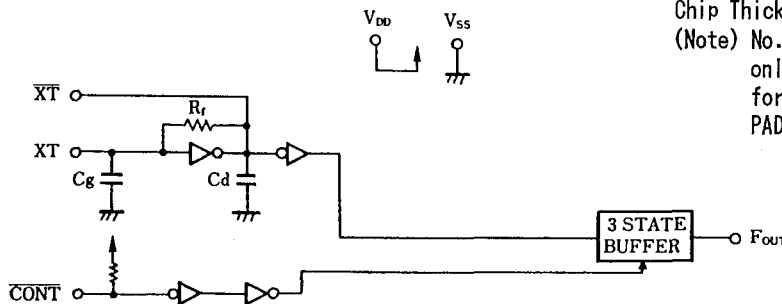
■ FEATURES

- 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

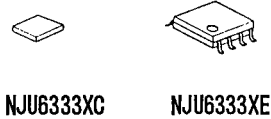
■ LINE-UP TABLE

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

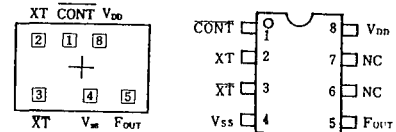
■ BLOCK DIAGRAM



■ PACKAGE OUTLINE



■ PIN CONFIGURATION/PAD LOCATION



■ COORDINATES

Unit: μm

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

Chip Size : 1.29 X 0.8mm
 Chip Center : X=0 μm , Y=0 μm
 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

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■ ABSOLUTE MAXIMUM RATINGS

(Ta=25°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 ~ 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	°C
Storage Temperature Range	T _{stg}	-55 ~ +125	°C

■ ELECTRICAL CHARACTERISTICS

 (Ta=25°C, V_{DD}=5V)

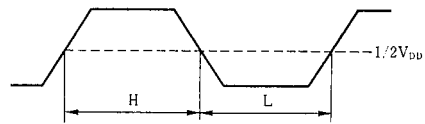
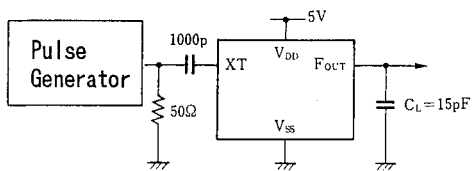
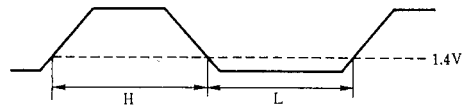
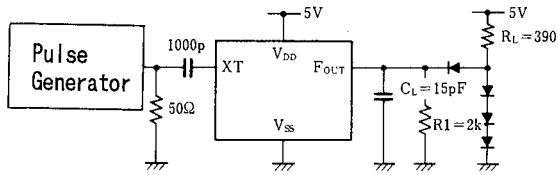
P A R A M E T E R	SYMBOL	C O N D I T I O N S	MIN	TYP	MAX	UNIT
Operating Voltage	V _{DD}		4		6	V
Operating Current	I _{DD1}	A Version f _{OSC} =24MHz, No Load			25	mA
	I _{DD2}	H Version f _{OSC} =48MHz, No Load			30	
	I _{DD3}	Q Version f _{OSC} =48MHz, No Load			35	
Stand-by Current	I _{st}	CONT, XT=V _{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} =5V, V _{OH} =4.5V	24			mA
	I _{OL}	V _{DD} =5V, V _{OL} =0.5V	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	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 =15pF at 1.4V	45	50	55	%
		C _L =15pF at 2.5V				
Output Signal Rise Time	t _{r1}	C _L =15pF, R _L =390Ω, 20%~80%		2		ns
	t _{r2}	C _L =15pF, R _L =390Ω, 0.4~2.4V		2		
	t _{r3}	C _L =15pF, 10~90%		3		
Output Signal Fall Time	t _{f1}	C _L =15pF, R _L =390Ω, 80%~20%		2		ns
	t _{f2}	C _L =15pF, R _L =390Ω, 2.4~0.4V		2		
	t _{f3}	C _L =15pF, 90~10%		3		

(Note) Excluding input current on CONT terminal.

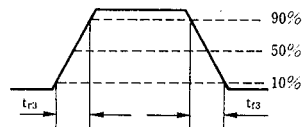
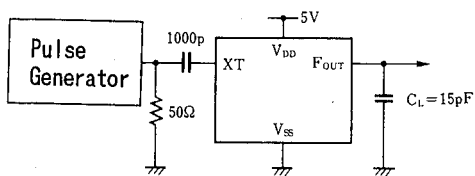
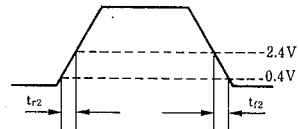
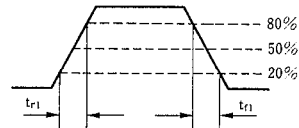
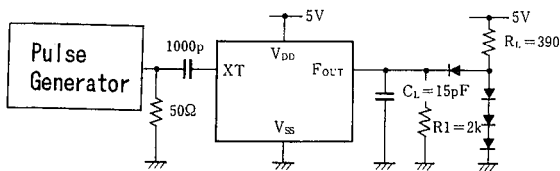
MEASUREMENT CIRCUITS

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

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



NJU6333 Series

MEMO

[CAUTION]

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