

# QUARTZ CRYSTAL OSCILLATOR

## ■ GENERAL DESCRIPTION

The NJU6324 series is a C-MOS quartz crystal oscillator which consists of an oscillation amplifier, 3-stage divider and 3-state output buffer.

The oscillation frequency is as wide as up to 50MHz and the symmetry of 45-55% is realized over full oscillation frequency range.

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

The 3-stage divider generates  $f_o$ ,  $f_o/2$ ,  $f_o/4$  and  $f_o/8$  and only one frequency selected by internal circuits is output

The 3-state output buffer is C-MOS compatible and capable of 10 LSTTL driving.

## ■ PACKAGE OUTLINE

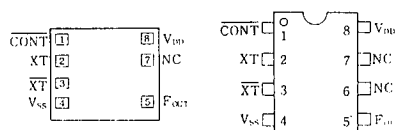


NJU6324XC



NJU6324XE

## ■ PIN CONFIGURATION/PAD LOCATION



## ■ FEATURES

- Operating Voltage -- 3.0~6.0V
- Maximum Oscillation Frequency -- 50MHz
- Low Operating Current
- High Fan-out -- LSTTL 10
- 3-state Output Buffer
- Selected Frequency Output (mask option)  
Only one frequency out of  $f_o$ ,  $f_o/2$ ,  $f_o/4$  and  $f_o/8$  output
- Oscillation Capacitors Cg and Cd on-chip
- Oscillation and/or Output Stand-by Function
- Package Outline -- CHIP/EMP 8
- C-MOS Technology

## ■ COORDINATES

 Unit:  $\mu\text{m}$ 

No.	PAD	X	Y
1	CONT	170	649
2	XT	170	483
3	XT	170	316
4	V <sub>SS</sub>	170	143
5	F <sub>OUT</sub>	1094	143
6	NC	-	-
7	NC	1094	462
8	V <sub>DD</sub>	1094	649

Chip Size : 1.24 X 0.8mm

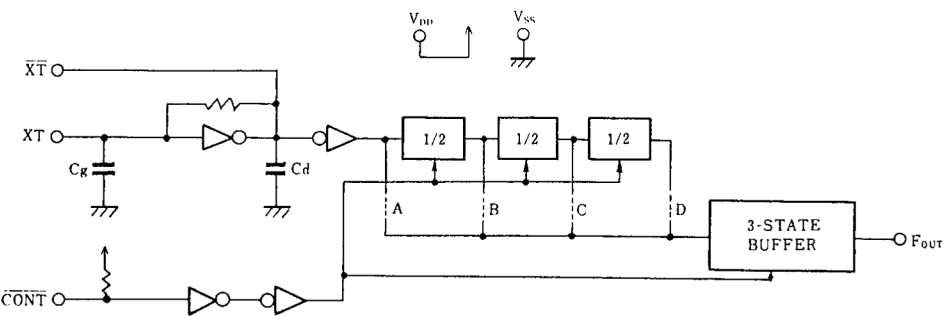
 Chip Thickness :  $400\mu\text{m} \pm 30\mu\text{m}$ 

(Note) No. 6 and 7 terminals are only for package type information. There is No.7 PAD on the chip but no No.6.

## ■ LINE-UP TABLE

Type No.	Output Frequency	Cg	Cd
NJU6324L	$f_o$	23pF	23pF
NJU6324M	$f_o/2$	23pF	23pF
NJU6324N	$f_o/4$	23pF	23pF
NJU6324U	$f_o/8$	23pF	23pF

■ BLOCK DIAGRAM



4

■ TERMINAL DESCRIPTION

NO.	SYMBOL	F U N C T I O N
1	CONT	3-State Output Control and Divider Reset
		Output ( F <sub>OUT</sub> )
		H Output either one frequency from f <sub>0</sub> , f <sub>0</sub> /2, f <sub>0</sub> /4 and f <sub>0</sub> /8
		L Output High Impedance and Divider Reset
2	XT	Quartz Crystal Connecting Terminals
3	XT	
5	F <sub>OUT</sub>	Output either one frequency from f <sub>0</sub> , f <sub>0</sub> /2, f <sub>0</sub> /4 and f <sub>0</sub> /8
8	V <sub>DD</sub>	+ 5V
4	V <sub>SS</sub>	GND

■ 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 <sub>DD</sub>	-0.5 ~ 7.0	V
Input Voltage	V <sub>IN</sub>	-0.5 ~ V <sub>DD</sub> +0.5	V
Output Voltage	V <sub>O</sub>	-0.5 ~ V <sub>DD</sub> +0.5	V
Input Current	I <sub>IN</sub>	±10	mA
Output Current	I <sub>O</sub>	±25	mA
Power Dissipation (EMP)	P <sub>D</sub>	200	mW
Operating Temperature Range	T <sub>opr</sub>	-40 ~ + 85	°C
Storage Temperature Range	T <sub>stg</sub>	-65 ~ +150	°C

(Note) Decoupling capacitor should be connected between V<sub>DD</sub> and V<sub>SS</sub> due to the stabilized operation for the circuit.

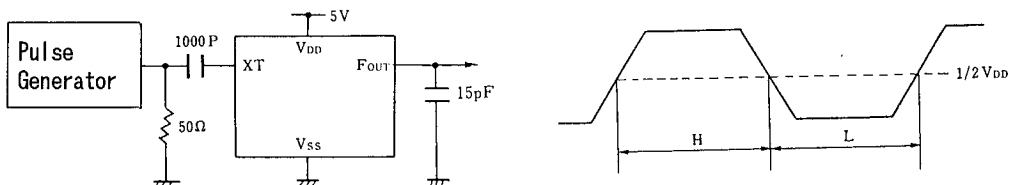
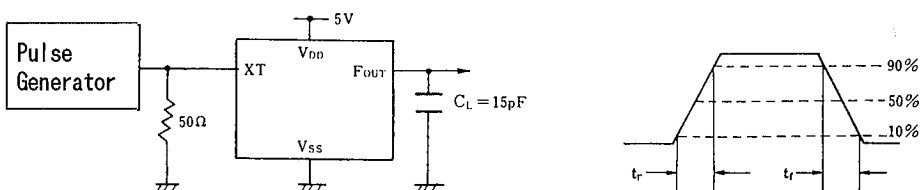
**■ ELECTRICAL CHARACTERISTICS**

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

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Operating Voltage	$V_{DD}$		3		6	V
Operating Current	$I_{DD}$	$f_{osc}=16\text{MHz}$ , No load			10	mA
Stand-by Current	$I_{st}$	$\overline{\text{CONT}}, \text{XT}=V_{SS}$ , No load (Note)			1	$\mu\text{A}$
Input Voltage	$V_{IH}$		3.5		5.0	V
	$V_{IL}$		0		1.5	
Output Current	$I_{OH}$	$V_{DD}=5\text{V}$ , $V_{OH}=4.5\text{V}$	4			mA
	$I_{OL}$	$V_{DD}=5\text{V}$ , $V_{OL}=0.5\text{V}$	4			
Input Current	$I_{IN}$	$\overline{\text{CONT}}$ Terminal, $\overline{\text{CONT}}=V_{SS}$			400	$\mu\text{A}$
Internal Capacitor	$C_g, C_d$			23		pF
Max. Oscillation Freq.	$f_{MAX}$	$V_{DD}=5\text{V}$ , $C_L=15\text{pF}$	50			MHz
Output Signal Symmetry	SYM	$V_{DD}=5\text{V}$ , $C_L=15\text{pF}$ at $1/2V_{DD}$	45	50	55	%
Output Signal Rise Time	$t_r$	$V_{DD}=5\text{V}$ , $C_L=15\text{pF}$ , 10% - 90%			8	ns
Output Signal Fall Time	$t_f$	$V_{DD}=5\text{V}$ , $C_L=15\text{pF}$ , 90% - 10%			8	ns

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

**■ MEASUREMENT CIRCUITS**

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

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


# NJU6324 Series

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MEMO

**[CAUTION]**

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