

## QUARTZ CRYSTAL OSCILLATOR

### ■ GENERAL DESCRIPTION

The NJU6323 series is a C-MOS quartz crystal oscillator which consists of an oscillation amplifier, 3-stage divider, output frequency selector 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( $C_g$ ,  $C_d$ ), therefore, it requires no external component except quartz crystal.

The 3-stage divider outputs  $f_0$ ,  $f_0/2$ ,  $f_0/4$  and  $f_0/8$  to the output frequency selector and it determined one output frequency according to the combination of two input-signal.

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

### ■ PACKAGE OUTLINE



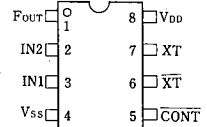
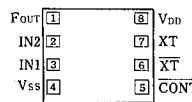
NJU6323XC



NJU6323XE

**4**

### ■ 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  $f_0$ ,  $f_0/2$ ,  $f_0/4$  and  $f_0/8$  output
- Oscillation Capacitors  $C_g$  and  $C_d$  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	FOUT	165	651
2	IN2	165	484
3	IN1	165	317
4	VSS	165	149
5	CONT	1113	149
6	XT	1113	317
7	XT	1113	484
8	VDD	1113	651

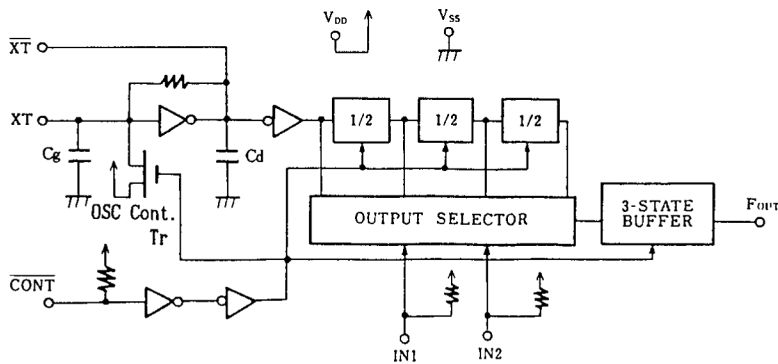
Chip Size : 1.28 X 0.8mm

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

### ■ LINE-UP TABLE

Type No.	$C_g$	$C_d$	Osc.Stop Function
NJU6323	21pF	23pF	Yes
NJU6323J	21pF	No	Yes
NJU6323P	No	No	Yes

■ BLOCK DIAGRAM



■ TERMINAL DESCRIPTION

NO.	SYMBOL	F U N C T I O N			
5	CONT	Oscillation Stop Control and Divider Reset			
		CONT	F <sub>OUT</sub>		
		H	Output either one frequency from f <sub>o</sub> , f <sub>o</sub> /2, f <sub>o</sub> /4, and f <sub>o</sub> /8		
		L	Oscillation Stop, Output High Impedance and Divider Reset		
6	XT	Quartz Crystal Connecting Terminals			
7	XT				
8	V <sub>DD</sub>	+ 5V			
3	IN1	3-Stage Divider Outputs Selected by IN1 and IN2			
2	IN2		IN1	IN2	F <sub>OUT</sub>
			H	H	f <sub>o</sub>
			L	H	f <sub>o</sub> /2
			H	L	f <sub>o</sub> /4
			L	L	f <sub>o</sub> /8
1	F <sub>OUT</sub>	Output either one frequency from f <sub>o</sub> , f <sub>o</sub> /2, f <sub>o</sub> /4, and f <sub>o</sub> /8			
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	VDD	-0.5 ~ +7.0	V
Input Voltage	VIN	-0.5 ~ VDD+0.5	V
Output Voltage	Vo	-0.5 ~ VDD+0.5	V
Input Current	IIN	±10	mA
Output Current	Io	±25	mA
Power Dissipation (EMP)	PD	200	mW
Operating Temperature Range	Topr	-40 ~ + 85	°C
Storage Temperature Range	Tstg	-65 ~ +150	°C

(Note) Decoupling capacitor should be connected between VDD and VSS due to the stabilized operation for the circuit.

# ELECTRICAL CHARACTERISTICS

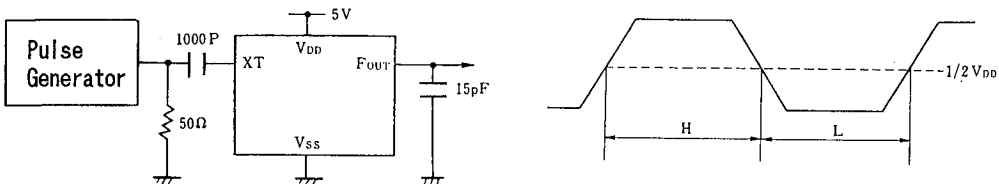
( $T_a=25^{\circ}\text{C}$ ,  $V_{DD}=5\text{V}$ )

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	$I_{st}$	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	$I_{OH}$	$V_{DD}=5\text{V}$ , $V_{OH}=4.5\text{V}$	4			mA
	$I_{OL}$	$V_{DD}=5\text{V}$ , $V_{OL}=0.5\text{V}$	4			
Input Current	$I_{IN}$	CONT, IN1, IN2 Terminals CONT, IN1, IN2= $V_{SS}$			400	$\mu\text{A}$
Internal Capacitor	$C_g$	Refer to Line-Up Table.				pF
	$C_d$					
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

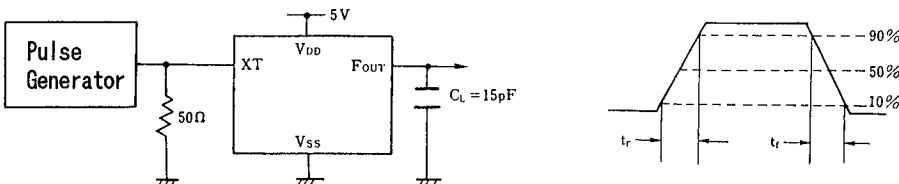
Note ) Excluding input current on CONT terminal.

# MEASUREMENT CIRCUITS

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



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



# NJU6323 Series

---

MEMO

**[CAUTION]**

The specifications on this databook are only given for information , without any guarantee as regards either mistakes or omissions. The application circuits in this databook are described only to show representative usages of the product and not intended for the guarantee or permission of any right including the industrial rights.