

QUARTZ CRYSTAL OSCILLATOR

■ GENERAL DESCRIPTION

The NJU6319 series is a C-MOS quartz crystal oscillator which contains 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 and operating voltage is correspondence of 3V.

The 3-stage divider generates f_0 , $f_0/2$, $f_0/4$ and $f_0/8$ 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.

■ FEATURES

- Operating Voltage — 2.7~6.0V
- 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 Cg and Cd on-chip
- Oscillation Output Stand-by Function
- Package Outline — Chip/EMP/VSP 8
- C-MOS Technology

■ LINE-UP TABLE

Type No.	Output Frequency	Cg	Cd
NJU6319A	f_0	23pF	23pF
NJU6319B	$f_0/2$	23pF	23pF
NJU6319C	$f_0/4$	23pF	23pF
NJU6319D	$f_0/8$	23pF	23pF
NJU6319P	f_0	No	No

■ PACKAGE OUTLINE



NJU6319XC

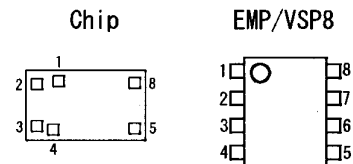


NJU6319XE



NJU6319XR

■ PAD LOCATION/PIN CONFIGURATION



■ COORDINATES

Unit: μm

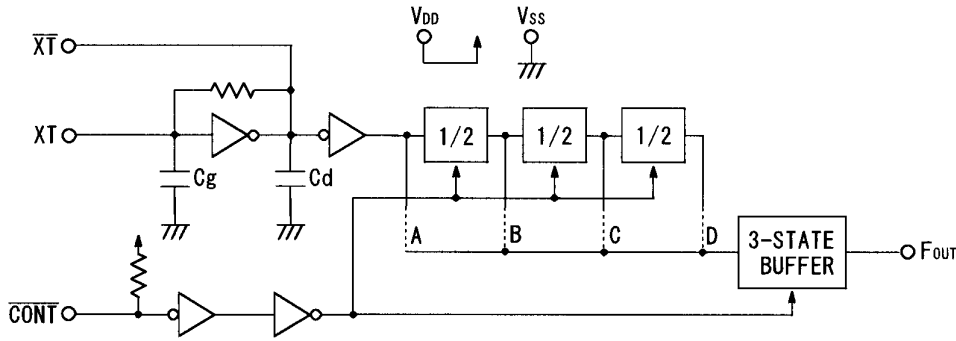
No.	PAD	X	Y
1	$\overline{\text{CONT}}$	350	655
2	XT	130	630
3	$\overline{\text{XT}}$	140	175
4	V_{SS}	300	130
5	F _{OUT}	1185	145
6	NC	-	-
7	NC	-	-
8	V_{DD}	1185	650

Chip Size : 1.33 X 0.8mm

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

Note1) No. 6 and 7 terminals are only for package type information. There are no PAD on the chip.

■ BLOCK DIAGRAM



■ TERMINAL DESCRIPTION

No.	SYMBOL	F U N C T I O N						
1	$\overline{\text{CONT}}$	3-State Output Control and Divider Reset						
		<table border="1"> <tr> <td>CONT</td> <td>F_{OUT}</td> </tr> <tr> <td>H or Open</td> <td>Output either one frequency from $f_o, f_o/2, f_o/4$ and $f_o/8$ (Note2)</td> </tr> <tr> <td>L</td> <td>Output High Impedance and Divider Reset</td> </tr> </table>	CONT	F_{OUT}	H or Open	Output either one frequency from $f_o, f_o/2, f_o/4$ and $f_o/8$ (Note2)	L	Output High Impedance and Divider Reset
		CONT	F_{OUT}					
		H or Open	Output either one frequency from $f_o, f_o/2, f_o/4$ and $f_o/8$ (Note2)					
L	Output High Impedance and Divider Reset							
2	XT	Quartz Crystal Connecting terminals						
3	$\overline{\text{XT}}$							
4	V_{SS}	GND						
5	F_{OUT}	Output either one frequency from $f_o, f_o/2, f_o/4$ and $f_o/8$						
8	V_{DD}	+3V/+5V						

Note2) Refer to Line-Up Table.

■ 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}	$V_{\text{SS}}-0.5 \sim V_{\text{DD}}+0.5$	V
Output Voltage	V_o	-0.5 ~ $V_{\text{DD}}+0.5$	V
Input Current	I_{IN}	± 10	mA
Output Current	I_o	± 25	mA
Power Dissipation	P_D	200 (EMP) 320 (VSP)	mW
Operating Temperature Range	T_{opr}	-40 ~ + 85	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	-65 ~ +150	$^\circ\text{C}$

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

ELECTRICAL CHARACTERISTICS

(Ta=25°C)

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Operating Voltage	V _{DD}		2.7		6.0	V

(V_{DD}=3V, Ta=25°C)

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Operating Current	I _{DD}	fosc=16MHz, No load Note3			8	mA
Stand-by Current	I _{st}	$\overline{\text{CONT}}$, XT=V _{SS} , No load Note4			1	uA
Input Voltage	V _{IH}		2.7		3.0	V
	V _{IL}		0		0.3	
Output Current	I _{OH}	V _{OH} =2.7V	1			mA
	I _{OL}	V _{OL} =0.3V	1			
Input Current	I _{IN}	$\overline{\text{CONT}}$ =V _{SS}			400	uA
3-st. Offleakage Current	I _{oz}	$\overline{\text{CONT}}$ =V _{SS} , F _{OUT} =V _{DD} or V _{SS}			±0.1	uA
Internal Capacitor	C _g , C _d	Note5		23		pF
Max. Oscillation Freq.	f _{MAX}	Note3	50			MHz
Output Signal Symmetry	SYM	C _L =15pF at 1/2V _{DD}	45	50	55	%
Output Signal Rise Time	t _r	C _L =15pF, 20%-80%			8	ns
Output Signal Fall Time	t _f	C _L =15pF, 80%-20%			8	ns

(V_{DD}=5V, Ta=25°C)

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Operating Current	I _{DD}	fosc=16MHz, No load Note3			15	mA
Stand-by Current	I _{st}	$\overline{\text{CONT}}$ =XT=V _{SS} , No load Note4			1	uA
Input Voltage	V _{IH}		2.0		5.0	V
	V _{IL}		0		0.8	
Output Current	I _{OH}	V _{OH} =4.5V	4			mA
	I _{OL}	V _{OL} =0.5V	4			
Input Current	I _{IN}	$\overline{\text{CONT}}$ =V _{SS}			400	uA
3-st. Offleakage Current	I _{oz}	$\overline{\text{CONT}}$ =V _{SS} , F _{OUT} =V _{DD} or V _{SS}			±0.1	uA
Internal Capacitor	C _g , C _d	Note5		23		pF
Max. Oscillation Freq.	f _{MAX}	Note3	50			MHz
Output Signal Symmetry	SYM	C _L =15pF at 1/2V _{DD}	45	50	55	%
Output Signal Rise Time	t _r	C _L =15pF, 20% - 80%			8	ns
Output Signal Fall Time	t _f	C _L =15pF, 80% - 20%			8	ns

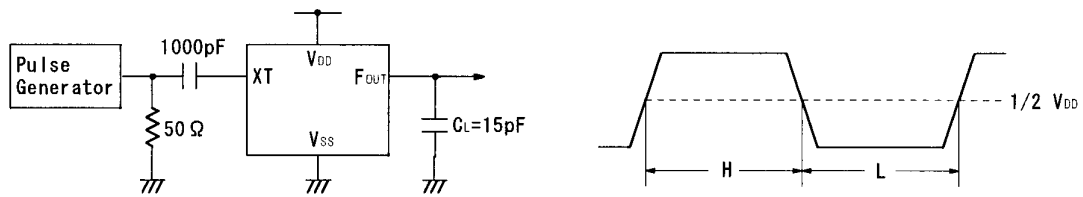
Note3) Only P version is measured with external capacitors contained 18pF for C_g and 16pF for C_d.

Note4) Excluding input current on $\overline{\text{CONT}}$ terminal.

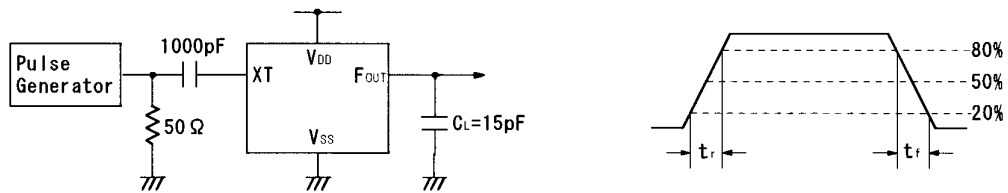
Note5) P version is not mentioned due to internal oscillation capacitors C_g and C_d separated.

MEASUREMENT CIRCUITS

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



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



MEMO

[CAUTION]

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