

QUARTZ CRYSTAL OSCILLATOR

■ GENERAL DESCRIPTION

The NJU6318 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(C_g , C_d), 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 TTL compatible and capable of 10 TTL driving. And the input level of $\overline{\text{CONT}}$ terminal is also TTL compatible.

■ PACKAGE OUTLINE

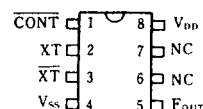
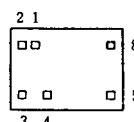


NJU6318XC



NJU6318XE

■ PIN CONFIGURATION/PAD LOCATION



■ FEATURES

- Operating Voltage — 3.0~6.0V
- Maximum Oscillation Frequency — 50MHz
- Low Operating Current
- High Fan-out — TTL 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 C_g and C_d on-chip
- Oscillation and/or Output Stand-by Function
- Package Outline — CHIP/EMP 8
- C-MOS Technology

■ 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

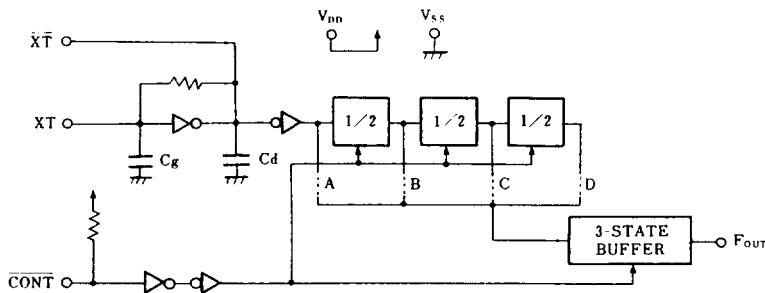
Chip Size : 1.33 X 0.8mm

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

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

■ LINE-UP TABLE

Type No.	Output Frequency	C_g	C_d
NJU6318A	f_o	23pF	23pF
NJU6318B	$f_o/2$	23pF	23pF
NJU6318C	$f_o/4$	23pF	23pF
NJU6318D	$f_o/8$	23pF	23pF
NJU6318W	f_o	12.5pF	12.5pF
NJU6318P	f_o	NO	NO


■ BLOCK DIAGRAM

4
■ TERMINAL DESCRIPTION

NO.	SYMBOL	F U N C T I O N
1	$\overline{\text{CONT}}$	3-State Output Control and Divider Reset
		$\overline{\text{CONT}}$ F_{OUT}
		H Output either one frequency from $f_0, f_0/2, f_0/4$ and $f_0/8$
		L Output High Impedance and Divider Reset
2	XT	Quartz Crystal Connecting terminals
3	$\overline{\text{XT}}$	
5	F_{OUT}	Output either one frequency from $f_0, f_0/2, f_0/4$ and $f_0/8$
8	V_{DD}	+ 5V
4	V_{SS}	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_{DD}	-0.5 ~ +7.0	V
Input Voltage	V_{IN}	-0.5 ~ $V_{\text{DD}}+0.5$	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 (EMP)	P_{D}	200	mW
Operating Temperature Range	T_{opr}	-40 ~ + 85	°C
Storage Temperature Range	T_{stg}	-65 ~ +150	°C


■ 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}	fosc=16MHz, No load			15	mA
Stand-by Current	I_{st}	$\overline{\text{CONT}}, \text{XT}=V_{SS}$, No load (Note1)			1	μA
Input Voltage	V_{IH}		2.0			V
	V_{IL}				0.8	
Output Current	I_{OH}	$V_{DD}=5\text{V}$, $V_{OH}=4.5\text{V}$	4			mA
	I_{OL}	$V_{DD}=5\text{V}$, $V_{OL}=0.5\text{V}$	16			
Input Current	I_{IN}	$\overline{\text{CONT}}$ Terminal, $\overline{\text{CONT}}=V_{SS}$			400	μA
Internal Capacitor	C_g			Note 2		pF
	C_d			Note 2		
Max. Oscillation Freq.	f_{MAX}	$V_{DD}=5\text{V}$	50			MHz
Output Signal Symmetry	SYM	$C_L=50\text{pF}$ at 1.5V	45	50	55	%
Output Signal Rise Time	t_{r1}	$V_{DD}=5\text{V}$, 20% - 80%			8	ns
	t_{r2}	$C_L=15\text{pF}$, $R_L=390\Omega$, 0.4V-2.4V			6	
Output Signal Fall Time	t_{f1}	$V_{DD}=5\text{V}$, 80% - 20%			6	ns
	t_{f2}	$C_L=15\text{pF}$, $R_L=390\Omega$, 2.4V-0.4V			4	

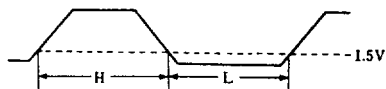
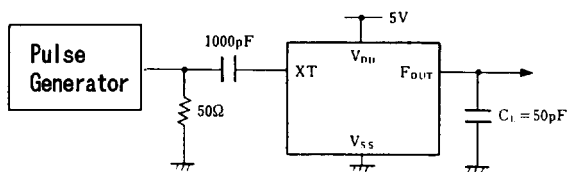
 Note 1) Excluding input current on $\overline{\text{CONT}}$ terminal.

Note 2) Refer to Line-Up Table.

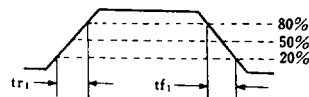
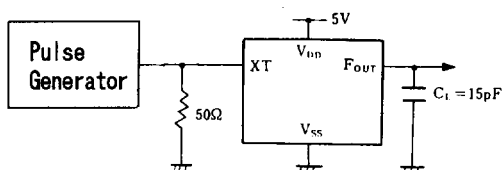


■ MEASUREMENT CIRCUITS

(1) Output Signal Symmetry ($C_L=50\text{pF}$)


4

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



(3) Output Signal Rise/Fall Time ($C_L=15\text{pF}$, $R_L=390\Omega$)

