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.

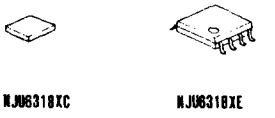
The oscillation frequency is as wide as up to 50MHz and the symmetry of 45-55% is realized over full oscillation frequency range.

The oscillation amplifier incorporates feed-back resistance and oscillation capacitors(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.

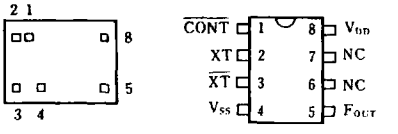
The 3-state output buffer is TTL compatible and capable of 10 TTL driving. And the input level of $\overline{CONT}$ terminal is also TTL compatible.

■ 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 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.	Output Frequency	Cg	Cd
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

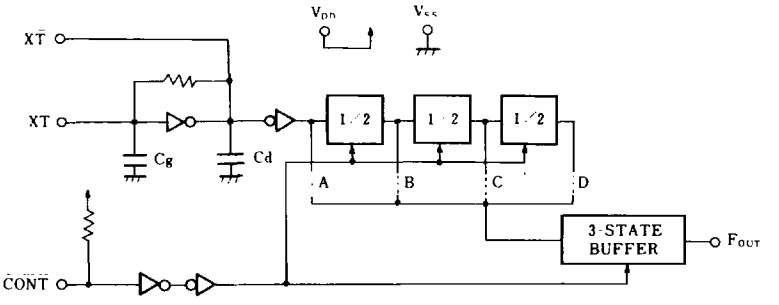
■ COORDINATES

Unit: μm

No.	PAD	X	Y
1	$\overline{CONT}$	350	655
2	XT	130	630
3	$\overline{XT}$	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 : 400μm±30μm
(Note) No. 6 and 7 terminals are only for package type information. There are no PAD on the chip.

■ BLOCK DIAGRAM



■ TERMINAL DESCRIPTION

NO.	SYMBOL	FUNCTION
1	$\overline{CONT}$	3-State Output Control and Divider Reset $\overline{CONT}$ = H: Output either one frequency from f_O, $f_O/2$, $f_O/4$ and $f_O/8$ $\overline{CONT}$ = L: Output High Impedance and Divider Reset
2	XT	Quartz Crystal Connecting terminals
3	$\overline{XT}$	
5	F_{OUT}	Output either one frequency from f_O, $f_O/2$, $f_O/4$ and $f_O/8$
8	V_{DD}	+ 5V
4	V_{SS}	GND

■ ABSOLUTE MAXIMUM RATINGS

(Ta=25℃)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V_{DD}	-0.5 ~ +7.0	V
Input Voltage	V_{IN}	-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 (EMP)	P_D	200	mW
Operating Temperature Range	Topr	-40 ~ + 85	℃
Storage Temperature Range	Tstg	-65 ~ +150	℃

■ ELECTRICAL CHARACTERISTICS

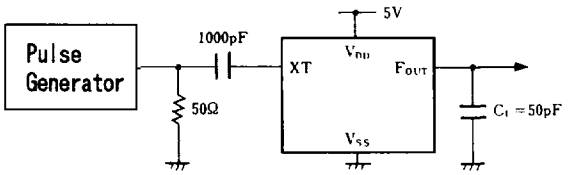
(Ta=25℃, V_{DD}=5V)

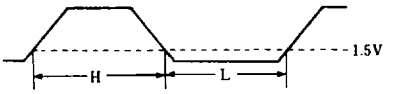
PARAMETER	SYMBOL	CONDITIONS		MIN	TYP	MAX	UNIT
Operating Voltage	V_{DD}			3		6	V
Operating Current	I_{DD}	fosc=16MHz, No load				15	mA
Stand-by Current	Ist	$\overline{CONT}$,XT=V_{SS}, No load (Note1)				1	μA
Input Voltage	V_{IH}			2.0			V
	V_{IL}					0.8	
Output Current	I_{OH}	V_{DD}=5V, V_{OH}=4.5V		4			mA
	I_{OL}	V_{DD}=5V, V_{OL}=0.5V		16			
Input Current	I_{IN}	$\overline{CONT}$ Terminal, $\overline{CONT}$=V_{SS}				400	μA
Internal Capacitor	Cg				Note 5		pF
	Cd				Note 5		
Max. Oscillation Freq.	f_{MAX}	V_{DD}=5V		50			MHz
Output Signal Symmetry	SYM	C_L=50pF at 1.5V (Note 2)		45	50	55	%
Output Signal Rise Time	t_{r1}	V_{DD}=5V,	20% - 80%	Note 3		8	ns
	t_{r2}	C_L=15pF	R_L=390Ω,0.4V-2.4V	Note 4		6	
Output Signal Fall Time	t_{f1}	V_{DD}=5V,	80% - 20%	Note 3		6	ns
	t_{f2}	C_L=15pF	R_L=390Ω,2.4V-0.4V	Note 4		4	

Note 1) Excluding input current on $\overline{CONT}$ terminal.
Note 2) Refer to measurement circuit (1)
Note 3) Refer to measurement circuit (2)
Note 4) Refer to measurement circuit (3)
Note 5) Refer to Line-Up Table.

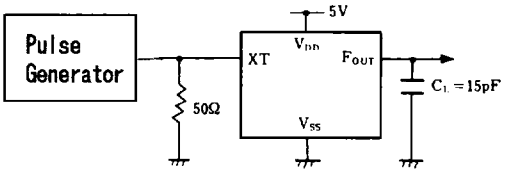
■ MEASUREMENT CIRCUITS

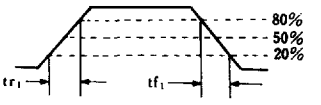
(1) Output Signal Symmetry (C_L=50pF)





(2) Output Signal Rise/Fall Time (C_L=15pF)





(3) Output Signal Rise/Fall Time (C_L=15pF, R_L=390Ω)