

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.

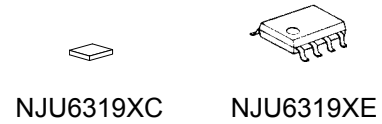
■FEATURES

- Operating Voltage ----- 2.7 to 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-Die
- Oscillation Output Stand-by Functuin
- Package Outline ----- Die/EMP-8
- C-MOS Technology

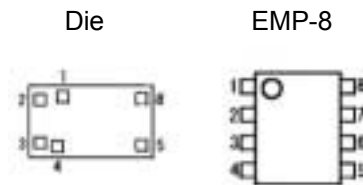
■LINE-UP TABLE

Type No.	F _{OUT}	Internal Connect	Cg/Cd	
NJU6319	A	f_0	Connected A Line	23/23pF
	B	$f_0/2$	Connected B Line	23/23pF
	C	$f_0/4$	Connected C Line	23/23pF
	D	$f_0/8$	Connected D Line	23/23pF
	P	f_0	Connected A Line	No

■PACKAGE OUTLINE



■PAD LOCATION

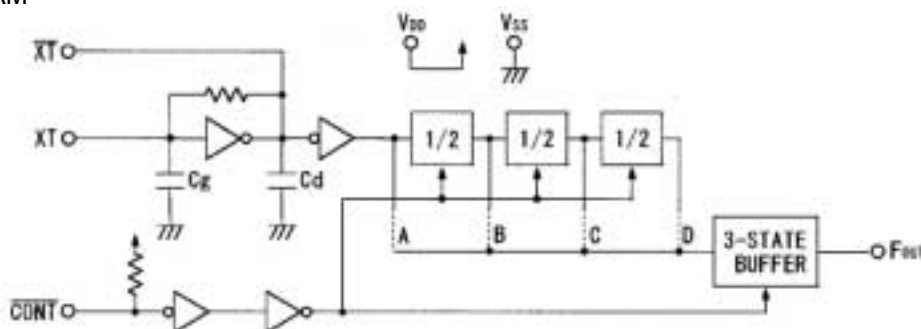


■COORDINATES

No	Pad Name	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

Starting Point: Lower Left Corner Unit[um]
 Chip Size: 1.33x0.8mm
 Die Thickness: 400±30um
 Note1) No.6 and 7 terminals are only for package type information. There no Pad on the Die

■BLOCK DIAGRAM



■ TERMINAL DESCRIPTION

SYMBOL	FUNCTION	
CONT	3-state Output Control and Divider Reset	
	CONT	F _{OUT}
	H or OPEN	Output either one frequency from of f ₀ , f ₀ /2, f ₀ /4 and f ₀ /8 (Note2)
	L	Output High Impedance and Divider Reset
XT	Quartz Crystal Connecting Terminals	
$\overline{\text{XT}}$		
V _{SS}	GND	
F _{OUT}	Frequency Output	
V _{DD}	V _{DD} =3V/5V	

Note2) Refer to the line-up table.

■ ABSOLUTE MAXIMUM RATINGS

(Ta=25°C)

PARAMETER	SYMBOL	RATING	UNIT
Supply Voltage	V _{DD}	-0.5 to +7.0	V
Input Voltage	V _{IN}	V _{SS} -0.5 to V _{DD} +0.5	V
Output Voltage	V _O	-0.5 to V _{DD} +0.5	V
Input Current	I _{IN}	±10	mA
Output Current	I _O	±25	mA
Power Dissipation	P _D	200 (EMP)	mW
Operating Temperature Range	T _{opr}	-40 to +85	°C
Storage Temperature Range	T _{stg}	-65 to +150	°C

Note3) 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 Note4)			8	mA
Stand-by Current	I _{st}	CONT=XT=V _{SS} , No load Note5)			1	uA
Input Voltage	V _{IH}		2.7		3.0	V
	V _{IL}		0		0.3	V
Output Current	I _{OH}	V _{OH} =2.7V	1			mA
	I _{OL}	V _{OL} =0.3V	1			mA
Input Current	I _{IN}	CONT=V _{SS}			400	uA
3-state Off Leakage Current	I _{OZ}	CONT=V _{SS} , F _{OUT} = V _{DD} or V _{SS}			±0.1	uA
Internal Capacitor	Cg/Cd	Note6)		23/23		pF
Maximum Oscillation Frequency	F _{MAX}	Note4)	50			MHz
Output Signal Symmetry	SYM	C _L =15pF, @V _{DD} /2	45	50	55	%
Output Signal Rise Time	t _r	C _L =15pF, 20% to 80%			8	ns
Output Signal Fall Time	t _f	C _L =15pF, 80% to 20%			8	ns

(V_{DD}=5V, Ta=25°C)

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Operating Current	I _{DD}	fosc=16MHz, No load Note4)			15	mA
Stand-by Current	I _{st}	CONT=XT=V _{SS} , No load Note5)			1	uA
Input Voltage	V _{IH}		2.0		5.0	V
	V _{IL}		0		0.8	V
Output Current	I _{OH}	V _{OH} =4.5V	5			mA
	I _{OL}	V _{OL} =0.5V	5			mA
Input Current	I _{IN}	CONT=V _{SS}			400	uA
3-state Off Leakage Current	I _{OZ}	CONT=V _{SS} , F _{OUT} = V _{DD} or V _{SS}			±0.1	uA
Internal Capacitor	Cg/Cd	Note6)		23/23		pF
Maximum Oscillation Frequency	F _{MAX}	Note4)	50			MHz
Output Signal Symmetry	SYM	C _L =15pF, @V _{DD} /2	45	50	55	%
Output Signal Rise Time	t _r	C _L =15pF, 20% to 80%			8	ns
Output Signal Fall Time	t _f	C _L =15pF, 80% to 20%			8	ns

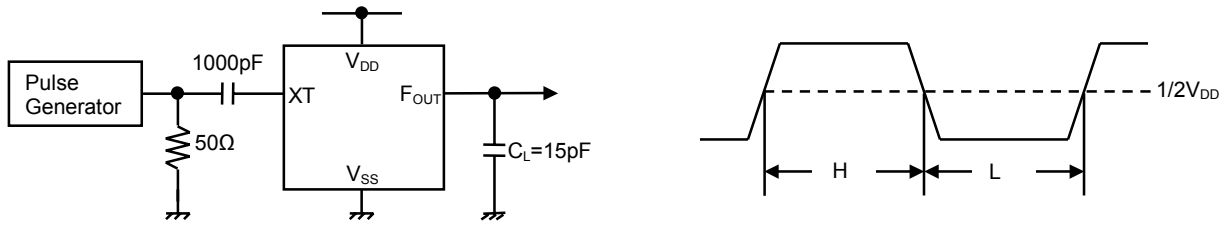
Note4) Only P version is measured with external capacitors contained 18pF for Cg and 16pF for Cd.

Note5) Excluding input current on CONT Terminal.

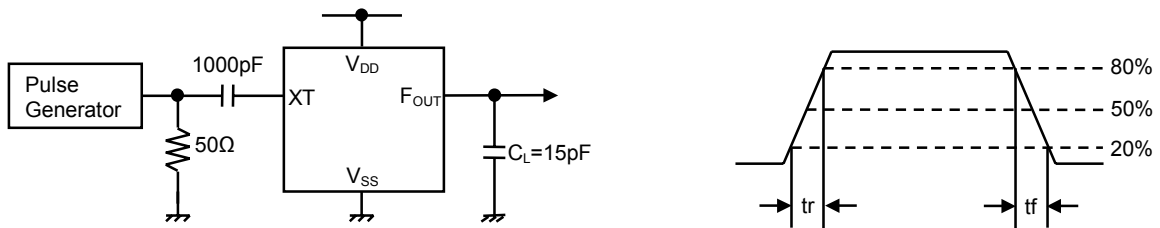
Note6) P version is not mentioned due to internal oscillation capacitors Cg and Cd separated.

MEASUREMENT CIRCUITS

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



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



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