

SMALL SIZED QUARTZ CRYSTAL OSCILLATOR

■GENERAL DESCRIPTION

The **NJU6366** series is a C-MOS fundamental quartz crystal oscillator that consists of an oscillation amplifier, 3-stage divider and 3-state output buffer.

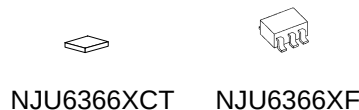
The 3-stage divider generates only one frequency selected of f_0 , $f_0/2$, $f_0/4$ and $f_0/8$ by internal circuits is output.

The oscillation amplifier is realized very low stand-by current using NAND circuit.

The 3-state output buffer is C-MOS compatible

Furthermore, the package is small-sized MTP-6.

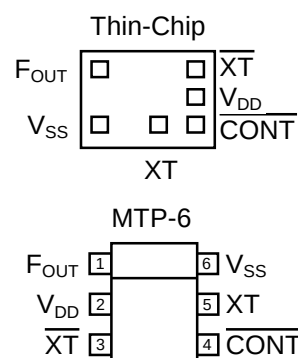
■PACKAGE OUTLINE



■FEATURES

- Operating Voltage 2.0 to 5.5V
- Maximum Oscillation Frequency 50MHz(T.B.D.)
- Low Operating Current
- High Fan-out $I_{OH}/I_{OL}=4mA @2.5V$
- 3-Stage Divider One of f_0 , $f_0/2$, $f_0/4$ and $f_0/8$
- Oscillation Stop and Output Stand-by Function
- 3-State Output Buffer
- Oscillation Capacitors C_g and C_d on-chip
- Package Outline Thin-Chip/MTP-6
- C-MOS Technology

■PAD LOCATION/PIN CONFIGURATION



■LINE-UP TABLE

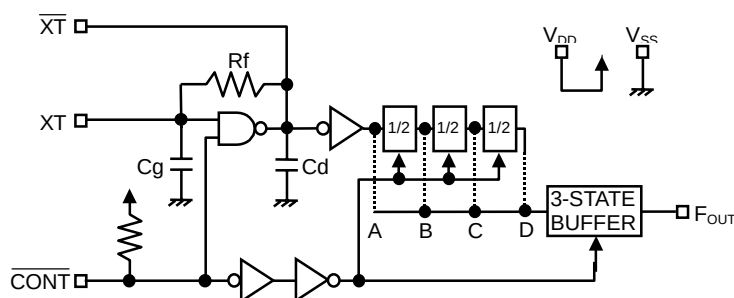
Type No.	F_{OUT}	Internal Connect		C_g/C_d
		Connect	Non Connect	
NJU6366	A f_0	A Line	B,C,D Line	T.B.D
	B $f_0/2$	B Line	A,C,D Line	T.B.D
	C $f_0/4$	C Line	A,B,D Line	T.B.D
	D $f_0/8$	D Line	A,B,C Line	T.B.D

■COORDINATES

Pad Name	X	Y
F_{OUT}	-207	247
V_{SS}	-207	-247
XT	33	-247
$\overline{CONT}$	207	-247
V_{DD}	207	-17
XT	207	172

Starting Point: Chip Center Unit[μm]
 Chip Size: 0.67x0.75mm
 Thin-Chip Thickness: $260 \pm 20 \mu m$
 Pad Size: 90x90 μm

■BLOCK DIAGRAM



■TERMINAL DESCRIPTION

SYMBOL	FUNCTION	
$\overline{\text{CONT}}$	Oscillation and 3-state Output Buffer Control	
	$\overline{\text{CONT}}$	F_{OUT}
	H or OPEN	Output either one frequency selected of f_0 , $f_0/2$, $f_0/4$ and $f_0/8$ Note1)
	L	Oscillation Stop and High impedance Output
XT $\overline{\text{XT}}$	Quartz Crystal Connecting Terminals	
V_{SS}	$V_{\text{SS}}=0\text{V}$	
F_{OUT}	Frequency Output	
V_{DD}	$V_{\text{DD}}=2.5\text{V}/3.0\text{V}/5.0\text{V}$	

Note1) Refer to the line-up table.

■ABSOLUTE MAXIMUM RATINGS

(Ta=25°C)

PARAMETER	SYMBOL	RATING	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 Note4)	P_{D}	200(MTP-6)	mW
Operating Temperature Range	T_{opr}	-40~+85	°C
Storage Temperature Range	T_{stg}	-55~+125	°C

Note2) If the supply voltage(V_{DD}) is less than 7.0V, the input voltage must not over the V_{DD} level though 7.0V is limit specified.

Note3) Decoupling capacitor should be connected between V_{DD} and V_{SS} due to the stabilized operation for the circuit.

Note4) The power dissipation is the maximum value at only the package.

■ELECTRICAL CHARACTERISTICS

(Ta=25°C)

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Operating Voltage	V _{DD}		2.0		5.5	V

(V_{DD}=2.5V, Ta=25°C)

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Operating Current	I _{DD}	A version, fosc=16MHz, C _L =15pF			5	mA
		B version, fosc=16MHz, C _L =15pF			T.B.D	
		C version, fosc=16MHz, C _L =15pF			T.B.D	
		D version, fosc=16MHz, C _L =15pF			T.B.D	
Oscillation Stopping Current	I _{STB}	CONT=V _{SS} , No load		2	5	uA
Stand-by Current	I _{st}	CONT=XT=V _{SS} , No load Note5)			1	uA
Input Voltage	V _{IH}		2.0		2.5	V
	V _{IL}		0		0.5	V
Output Current	I _{OH}	V _{OH} =2.2V	4			mA
	I _{OL}	V _{OL} =0.3V	4			mA
Input Current	I _{IN}	CONT=0.8V _{DD}		T.B.D	T.B.D	uA
		CONT=0.2V _{DD}		T.B.D	T.B.D	uA
3-state Off Leakage Current	I _{OZ}	CONT=V _{SS} , F _{OUT} = V _{DD} or V _{SS}			±0.1	uA
Feedback Resistance	R _f			T.B.D		kΩ
Internal Capacitor	C _g /C _d	fosc=16MHz		T.B.D		pF
Maximum Oscillation Frequency	F _{MAX}		T.B.D			MHz
Output Signal Symmetry	SYM	C _L =15pF, @V _{DD} /2	45	50	55	%
Output Signal Rise Time	t _r	C _L =15pF, 10%~90%		3	6	ns
Output Signal Fall Time	t _f	C _L =15pF, 90%~10%		3	6	ns
Output Disable time	T _{PLZ}	C _L =15pF, R _{UP} =10kΩ			250	ns
Output Enable Time	T _{PZL}	C _L =15pF, R _{UP} =10kΩ			250	ns

Note5) Excluding input current on CONT Terminal.

(V_{DD}=3.0V, Ta=25°C)

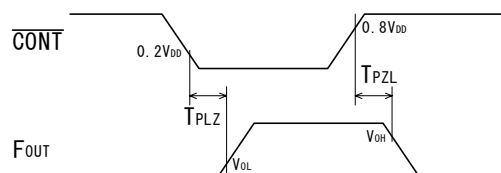
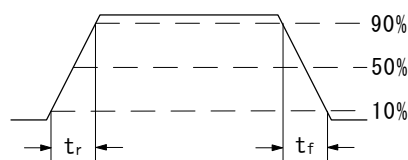
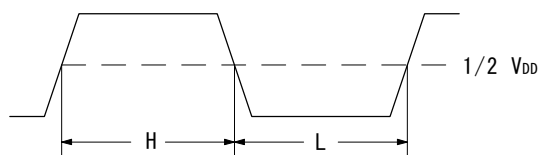
PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Operating Current	I _{DD}	A version, fosc=16MHz, C _L =15pF			6	mA
		B version, fosc=16MHz, C _L =15pF			T.B.D	
		C version, fosc=16MHz, C _L =15pF			T.B.D	
		D version, fosc=16MHz, C _L =15pF			T.B.D	
Oscillation Stopping Current	I _{STB}	CONT=V _{SS} , No load		2	5	uA
Stand-by Current	I _{st}	CONT=XT=V _{SS} , No load Note5)			1	uA
Input Voltage	V _{IH}		2.4		3.0	V
	V _{IL}		0		0.6	V
Output Current	I _{OH}	V _{OH} =2.7V	5			mA
	I _{OL}	V _{OL} =0.3V	5			mA
Input Current	I _{IN}	CONT=0.8V _{DD}		T.B.D	T.B.D	uA
		CONT=0.2V _{DD}		T.B.D	T.B.D	uA
3-state Off Leakage Current	I _{OZ}	CONT=V _{SS} , F _{OUT} = V _{DD} or V _{SS}			±0.1	uA
Feedback Resistance	R _f			T.B.D		kΩ
Internal Capacitor	C _g /C _d	fosc=16MHz		T.B.D		pF
Maximum Oscillation Frequency	F _{MAX}		50			MHz
Output Signal Symmetry	SYM	C _L =15pF, @V _{DD} /2	45	50	55	%
Output Signal Rise Time	t _r	C _L =15pF, 10%~90%		3	6	ns
Output Signal Fall Time	t _f	C _L =15pF, 90%~10%		3	6	ns
Output Disable time	T _{PLZ}	C _L =15pF, R _{UP} =10kΩ			200	ns
Output Enable Time	T _{PZL}	C _L =15pF, R _{UP} =10kΩ			200	ns

Note5) Excluding input current on CONT Terminal.

(V_{DD}=5.0V, Ta=25°C)

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Operating Current	I _{DD}	A version, fosc=16MHz, C _L =15pF			10	mA
		B version, fosc=16MHz, C _L =15pF			T.B.D	
		C version, fosc=16MHz, C _L =15pF			T.B.D	
		D version, fosc=16MHz, C _L =15pF			T.B.D	
Oscillation Stopping Current	I _{STB}	CONT=V _{SS} , No load		5	10	uA
Stand-by Current	I _{st}	CONT=XT=V _{SS} , No load Note5)			1	uA
Input Voltage	V _{IH}		3.5		5.0	V
	V _{IL}		0		1.5	V
Output Current	I _{OH}	V _{OH} =4.5V	8			mA
	I _{OL}	V _{OL} =0.5V	8			mA
Input Current	I _{IN}	CONT=0.8V _{DD}		T.B.D	T.B.D	uA
		CONT=0.2V _{DD}		T.B.D	T.B.D	uA
3-state Off Leakage Current	I _{OZ}	CONT=V _{SS} , F _{OUT} = V _{DD} or V _{SS}			±0.1	uA
Feedback Resistance	R _f			T.B.D		kΩ
Internal Capacitor	C _g /C _d	fosc=16MHz		T.B.D		pF
Maximum Oscillation Frequency	F _{MAX}		50			MHz
Output Signal Symmetry	SYM	C _L =15pF, @V _{DD} /2	45	50	55	%
Output Signal Rise Time	t _r	C _L =15pF, 10%~90%		3	6	ns
Output Signal Fall Time	t _f	C _L =15pF, 90%~10%		3	6	ns
Output Disable time	T _{PLZ}	C _L =15pF, R _{UP} =10kΩ			100	ns
Output Enable Time	T _{PZL}	C _L =15pF, R _{UP} =10kΩ			100	ns

Note5) Excluding input current on CONT Terminal.



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