

### 1.8V Operation 3rd. Over Tone Quartz Crystal Oscillator

#### ■GENERAL DESCRIPTION

The NJU6379D is a C-MOS IC for 3rd. overtone quartz crystal oscillator that consists of an oscillation amplifier and 3-state output buffer, and can oscillate at 1.8V very low voltage.

The NJU6379D has ability to oscillate from 60 to 70 MHz.

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

The 3-stage output buffer is C-MOS compatible.

#### ■PACKAGE OUTLINE

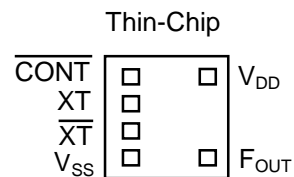


NJU6379DC-D

#### ■FEATURES

- Operating Voltage 1.8 to 2.8V
- Maximum Oscillation Frequency 70MHz
- Low Operating Current
- High Fan-out  $I_{OH}/I_{OL} = 4mA @ 2.5V$
- Oscillation Stop and Output Stand-by Function
- 3-State Output Buffer
- Oscillation Capacitors  $C_g$  and  $C_d$  on-chip
- Package Outline Thin-Chip
- C-MOS Technology

#### ■PAD LOCATION



#### ■LINE-UP TABLE

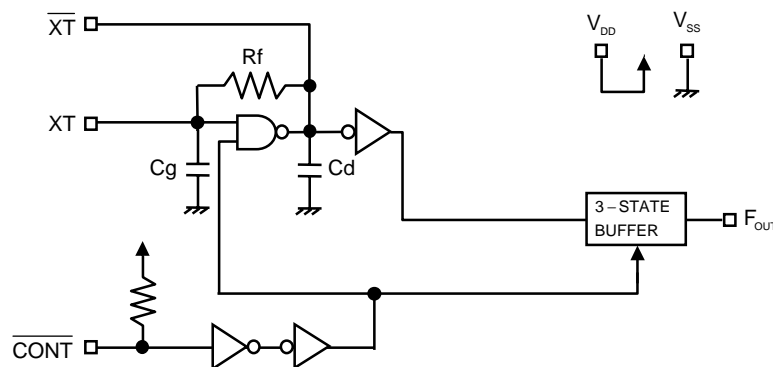
Type No.	Recommended Oscillation Frequency Range	Output Frequency	Cg/Cd
NJU6379D	60 to 70 MHz	$f_0$	8.5/9pF

#### ■COORDINATES

No	Pad Name	X	Y
1	$\overline{CONT}$	-178	231
2	XT	-178	77
3	$\overline{XT}$	-178	-77
4	$V_{SS}$	-178	-231
5	$F_{OUT}$	206	-231
8	$V_{DD}$	206	231

Starting Point: Chip Center Unit[um]  
 Chip Size: 0.7x0.75mm  
 Thin-Chip Thickness: 200±20um  
 Pad Size: 90x90um

#### ■BLOCK DIAGRAM



## ■TERMINAL DESCRIPTION

SYMBOL	FUNCTION	
$\overline{\text{CONT}}$	Oscillation and 3-state Output Buffer Control	
	$\overline{\text{CONT}}$	$F_{\text{OUT}}$
	H or OPEN	Output Frequency $f_0$
	L	Oscillation Stop and High impedance Output
$\overline{\text{XT}}$	Quartz Crystal Connecting Terminals	
$V_{\text{SS}}$	$V_{\text{SS}}=0\text{V}$	
$F_{\text{OUT}}$	Frequency Output	
$V_{\text{DD}}$	$V_{\text{DD}}=2.5\text{V}$	

Note1) Refer to the line-up table.

## ■ABSOLUTE MAXIMUM RATINGS

(Ta=25°C)

PARAMETER	SYMBOL	RATING	UNIT
Supply Voltage	$V_{\text{DD}}$	-0.5 to +7.0	V
Input Voltage	$V_{\text{IN}}$	$V_{\text{SS}}-0.5$ to $V_{\text{DD}}+0.5$	V
Output Voltage	$V_{\text{O}}$	-0.5 to $V_{\text{DD}}+0.5$	V
Input Current	$I_{\text{IN}}$	$\pm 10$	mA
Output Current	$I_{\text{O}}$	$\pm 25$	mA
Operating Temperature Range	$T_{\text{opr}}$	-40 to +85	°C
Storage Temperature Range	$T_{\text{stg}}$	-55 to +125	°C

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

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

## ■ ELECTRICAL CHARACTERISTICS

(Ta=25°C)

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Operating Voltage	V <sub>DD</sub>		1.8		2.8	V

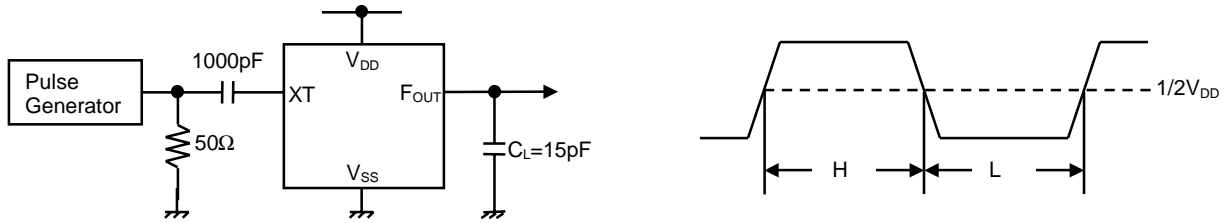
(V<sub>DD</sub>=2.5V, Ta=25°C)

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Operating Current	I <sub>DD</sub>	D version, fosc=70MHz, C <sub>L</sub> =15pF			8	
Oscillation Stopping Current	I <sub>STB</sub>	$\overline{\text{CONT}} = V_{SS}$ , No load		2	5	uA
Stand-by Current	I <sub>st</sub>	$\overline{\text{CONT}} = \text{XT} = V_{SS}$ , No load Note4)			1	uA
Input Voltage	V <sub>IH</sub>		2		2.5	V
	V <sub>IL</sub>		0		0.5	V
Output Current	I <sub>OH</sub>	V <sub>OH</sub> =2.25V	4			mA
	I <sub>OL</sub>	V <sub>OL</sub> =0.25V	4			mA
Input Current	I <sub>IN</sub>	$\overline{\text{CONT}} = 0.8V_{DD}$		7.5	12.0	uA
		$\overline{\text{CONT}} = 0.2V_{DD}$		1.2	2.0	uA
3-state Off Leakage Current	I <sub>OZ</sub>	$\overline{\text{CONT}} = V_{SS}$ , F <sub>OUT</sub> = V <sub>DD</sub> or V <sub>SS</sub>			±0.1	uA
Feedback Resistance	R <sub>f</sub>	D version, XT=V <sub>DD</sub>		4.2		KΩ
Internal Capacitor	C <sub>g</sub> /C <sub>d</sub>	D version, f <sub>OSC</sub> =70MHz		8.5/9		pF
Maximum Oscillation Frequency	F <sub>MAX</sub>	D version	70			MHz
Output Signal Symmetry	SYM	C <sub>L</sub> =15pF, @V <sub>DD</sub> /2	45	50	55	%
Output Signal Rise Time	t <sub>r</sub>	C <sub>L</sub> =15pF, 10%~90%		3	6	ns
Output Signal Fall Time	t <sub>f</sub>	C <sub>L</sub> =15pF, 90%~10%		3	6	ns
Output Disable time	T <sub>PLZ</sub>	C <sub>L</sub> =15pF, R <sub>UP</sub> =10kΩ			200	ns
Output Enable Time	T <sub>PZL</sub>	C <sub>L</sub> =15pF, R <sub>UP</sub> =10kΩ			200	ns

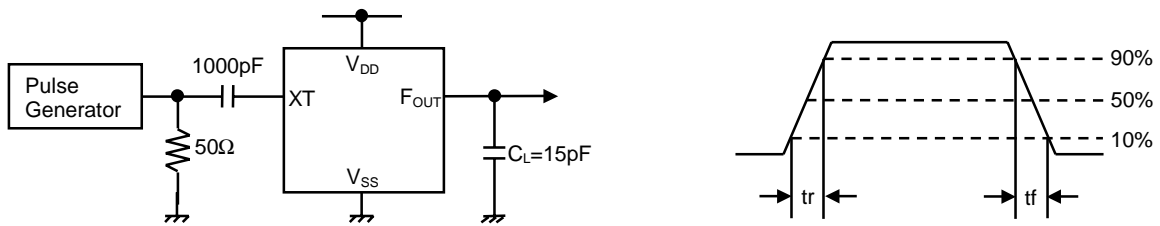
Note4) Excluding input current on  $\overline{\text{CONT}}$  Terminal.

MEASUREMENT CIRCUITS

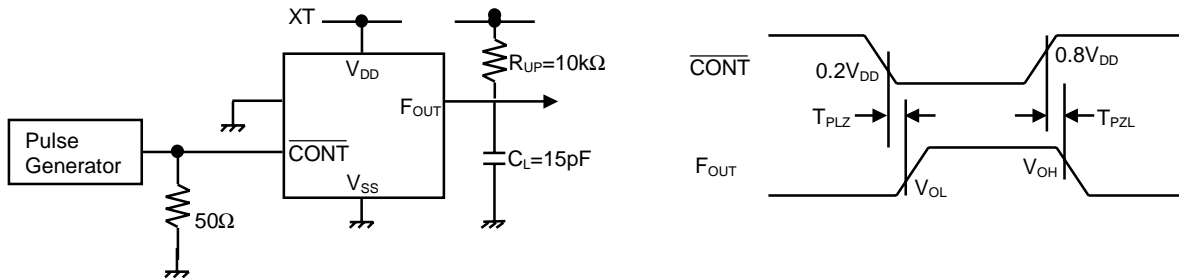
(1) Output Signal Symmetry ( $C_L=15\text{pF}$ )



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



(3) Output Disable/Enable Time ( $C_L=15\text{pF}, R_{UP}=10\text{k}\Omega$ )



**[CAUTION]**  
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