

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

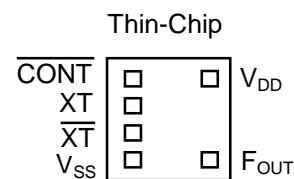


NJU6379DC-D

■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

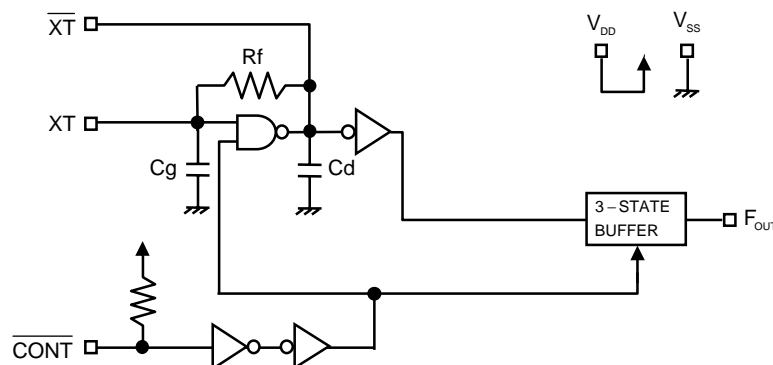
Type No.	Recommended Oscillation Frequency Range	Output Frequency	Cg/Cd
NJU6379D	60 to 70 MHz	f_0	8.5/9pF

■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_{OUT}
	H or OPEN	Output Frequency f_0
	L	Oscillation Stop and High impedance Output
$\overline{\text{XT}}$	Quartz Crystal Connecting Terminals	
$\overline{\text{XT}}$		
V_{SS}	$V_{\text{SS}}=0\text{V}$	
F_{OUT}	Frequency Output	
V_{DD}	$V_{\text{DD}}=2.5\text{V}$	

Note1) Refer to the line-up table.

■ABSOLUTE MAXIMUM RATINGS

($T_a=25^\circ\text{C}$)

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

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.

■ELECTRICAL CHARACTERISTICS

(Ta=25°C)

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Operating Voltage	V _{DD}		1.8		2.8	V

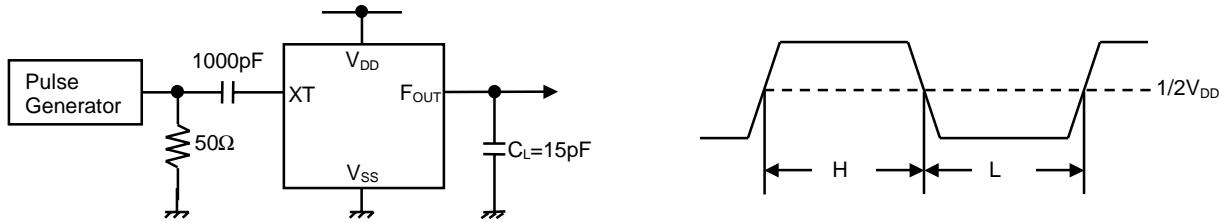
(V_{DD}=2.5V, Ta=25°C)

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Operating Current	I _{DD}	D version, fosc=70MHz, C _L =15pF			8	
Oscillation Stopping Current	I _{STB}	$\overline{\text{CONT}} = V_{SS}$, No load		2	5	uA
Stand-by Current	I _{st}	$\overline{\text{CONT}} = \text{XT} = V_{SS}$, No load Note4)			1	uA
Input Voltage	V _{IH}		2		2.5	V
	V _{IL}		0		0.5	V
Output Current	I _{OH}	V _{OH} =2.25V	4			mA
	I _{OL}	V _{OL} =0.25V	4			mA
Input Current	I _{IN}	$\overline{\text{CONT}} = 0.8V_{DD}$		7.5	12.0	uA
		$\overline{\text{CONT}} = 0.2V_{DD}$		1.2	2.0	uA
3-state Off Leakage Current	I _{OZ}	$\overline{\text{CONT}} = V_{SS}$, F _{OUT} = V _{DD} or V _{SS}			±0.1	uA
Feedback Resistance	R _f	D version, XT=V _{DD}		4.2		KΩ
Internal Capacitor	C _g /C _d	D version, f _{OSC} =70MHz		8.5/9		pF
Maximum Oscillation Frequency	F _{MAX}	D version	70			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

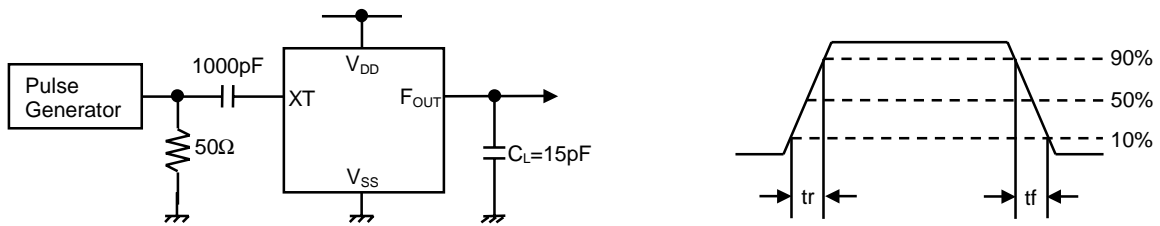
Note4) Excluding input current on $\overline{\text{CONT}}$ Terminal.

MEASUREMENT CIRCUITS

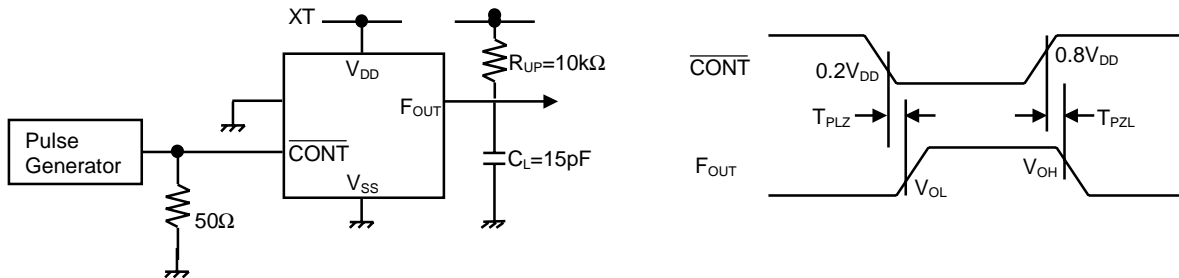
(1) Output Signal Symmetry ($C_L=15\text{pF}$)



(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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