

3rd. Over Tone Quartz Crystal Oscillator for 125MHz

■GENERAL DESCRIPTION

The NJU6397D is a C-MOS IC for quartz crystal oscillator consists of an oscillation amplifier and 3-state output buffer.

The frequency range is from 100 to 125MHz.

The oscillation amplifier realizes very low oscillation stop current with NAND circuit.

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

■PACKAGE OUTLINE

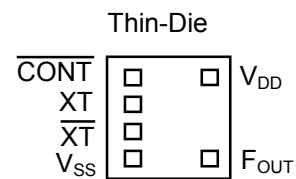


NJU6397DC-X

■FEATURES

- Operating Voltage 2.25 to 2.75V
- Maximum Oscillation Frequency 125MHz
- High Fan-out $I_{OH}/I_{OL} = 6mA @ V_{DD} = 2.5V$
- Oscillation Stop and Output Stand-by Function
- 3-State Output Buffer
- Oscillation Capacitors C_g and C_d on-chip
- Package Outline Thin-Die/Wafer
- C-MOS Technology

■PAD LOCATION



■LINE-UP TABLE

Type No.	Recommended Oscillation Frequency	Output Frequency	C_g/C_d
NJU6397 D	100 to 125MHz	f_0	8/9pF

■COORDINATES

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

Starting Point: Chip Center Unit[μm]

Chip Size: 0.7x0.75mm

Thin-Die Thickness(C-D): $200 \pm 20 \mu m$

Thin-Die Thickness(C-L): $140 \pm 10 \mu m$

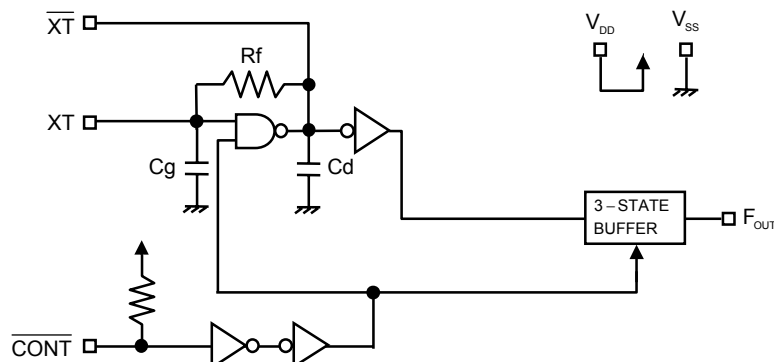
Wafer Thickness(W-H): $200 \pm 20 \mu m$

Wafer Thickness(W-L): $140 \pm 10 \mu m$

Pad Size: 90x90 μm

Die Substrate: V_{DD} Level

■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}	$V_{\text{DD}}=2.5\text{V}$	

■ABSOLUTE MAXIMUM RATINGS

(Ta=25°C)

PARAMETER	SYMBOL	RATING	UNIT
Supply Voltage	V_{DD}	-0.5 to +7.0	V
Input Voltage	V_{IN}	$V_{\text{SS}}-0.5$ 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	°C
Storage Temperature Range	T_{stg}	-55 to +125	°C

 Note1) If the supply voltage(V_{DD}) is less than 7.0V, the input voltage do not over the V_{DD} level.

 Note2) 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}		2.25		2.75	V

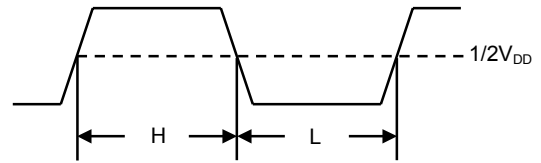
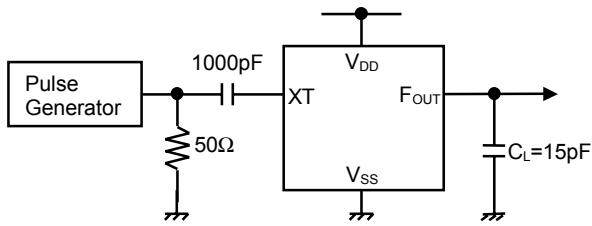
 (V_{DD}=2.5V, Ta=25°C)

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Operating Current	I _{DD1}	D type, fosc=90MHz, C _L =15pF		13	25	mA
Oscillation Stopping Current	I _{DD2}	CONT=V _{SS} , No load		2	5	uA
Stand-by Current	I _{st}	CONT=XT=V _{SS} , No load Note3)			1	uA
Input Voltage	V _{IH}		1.75		2.5	V
	V _{IL}		0		0.75	V
Output Current	I _{OH}	V _{OH} =2.2V	6			mA
	I _{OL}	V _{OL} =0.3V	6			mA
Input Current	I _{IN}	CONT=0.8V _{DD}		7.5	12.0	uA
		CONT=0.2V _{DD}		1.2	2.0	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	D type		2.9		kΩ
Internal Capacitor	C _g /C _d	D type, fosc=90MHz		8/9		pF
Maximum Oscillation Frequency	F _{MAX}	D type	125			MHz
Output Signal Symmetry	SYM	C _L =15pF, @V _{DD} /2	45	50	55	%
Output Signal Rise Time	t _r	C _L =15pF, 10% to 90%		3	4	ns
Output Signal Fall Time	t _f	C _L =15pF, 90% to 10%		3	4	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

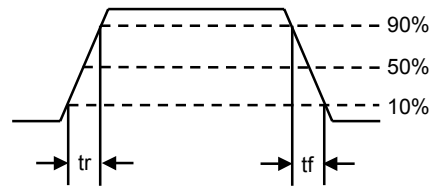
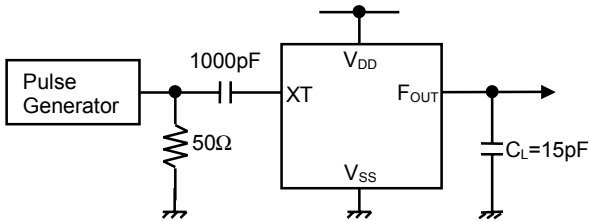
Note3) Excluding input current on CONT Terminal.

MEASUREMENT CIRCUITS

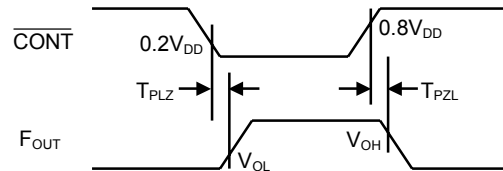
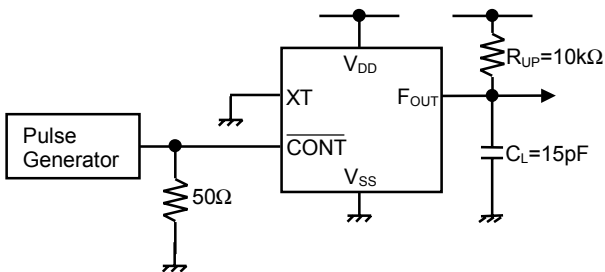
(1) Output Signal Symmetry ($C_L=15\text{pF}$)



(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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