

QUARTZ CRYSTAL OSCILLATOR

■GENERAL DESCRIPTION

The NJU6395 series is up to 125MHz low-voltage C-MOS quartz crystal oscillator, the NJU6395A is up to 110MHz and the NJU6395B is up to 125MHz.

The NJU6395 series consists of an oscillation amplifier, internal capacitors (C_g , C_d), feedback resistance (R_f), and 3-state output buffer.

The output is 8mA at 3V and 12mA at 5V operation, which can drive C-MOS load.

■FEATURES

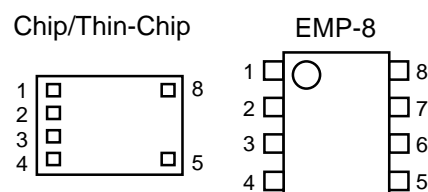
- Low Operating Voltage
- Maximum Oscillation Frequency
 - A: 110MHz
 - B: 125MHz
 - $I_{OH}/I_{OL}=8mA$ @3V
 - $I_{OH}/I_{OL}=12mA$ @5V
- High Fan-out
- 3-State Output Buffer
- Oscillation Stop and Output Buffer Stand-by Function
- Oscillation Capacitors C_g and C_d on-chip
- Package Outline
- C-MOS Technology

Chip/Thin-Chip/EMP-8

■PACKAGE OUTLINE



■PAD LOCATION



■LINE-UP TABLE

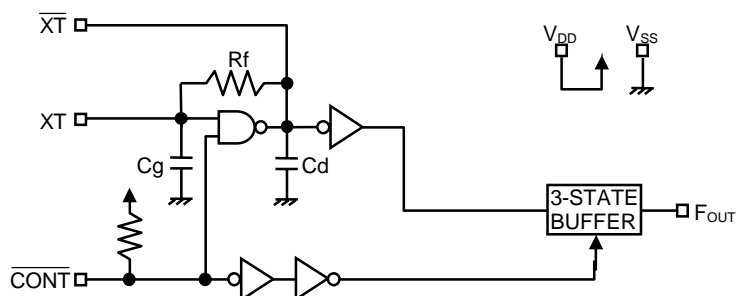
Type No.		Operating Voltage Range[V]	Recommended Oscillation Frequency[MHz]	Package	C_g/C_d [pF]
NJU6395	A	2.7 to 5.5	80 to 110	C/CT/E	8.5/9.5
	B	2.4 to 3.6	105 to 125	C/CT/E	8.0/9.0

■COORDINATES

No	Pad Name	X	Y
1	\overline{CONT}	-428	258
2	XT	-428	-86
3	\overline{XT}	-428	-86
4	V_{SS}	-428	-258
5	F_{OUT}	478	-258
8	V_{DD}	478	258

Starting Point : Chip Center Unit[um]
 Chip Size:1.24x0.8mm
 Thin-Chip Thickness:260±20um
 Pad Size:100x100um
 Note1) No.6 and No.7 are no pad.

■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
XT	Quartz Crystal Connecting Terminals	
$\overline{\text{XT}}$		
V_{SS}	$V_{\text{SS}}=0\text{V}$	
F_{OUT}	Frequency Output	
V_{DD}	$V_{\text{DD}}=3\text{V}/5\text{V}$	

■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
Power Dissipation	P_{D}	450(EMP-8)	mW
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.

Note4) The power dissipation is EMP-8 package without board.

■ ELECTRICAL CHARACTERISTICS

(Ta=25°C)

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Operating Voltage	V_{DD}	A version	2.7		5.5	V
		B version	2.4		3.6	

(V_{DD}=3.0V, Ta=25°C)

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Operating Current	I_{DD1}	A: fosc=100MHz, C _L =15pF		25	33	mA
		B: fosc=125MHz, C _L =15pF		20	33	
Oscillation Stopping Current	I_{DD2}	$\overline{CONT} = V_{SS}$, No load			10	uA
Stand-by Current	I_{st}	$\overline{CONT} = XT = V_{SS}$, No load Note5)			1	uA
Input Voltage	V_{IH}		2.4		3.0	V
	V_{IL}		0		0.6	V
Output Current	I_{OH}	$V_{OH}=2.7V$	8			mA
	I_{OL}	$V_{OL}=0.3V$	8			mA
Input Current	I_{IN}	$\overline{CONT} = 0.8V_{DD}$	15	30	60	uA
		$\overline{CONT} = 0.2V_{DD}$	5	10	20	uA
3-state Off Leakage Current	I_{OZ}	$\overline{CONT} = V_{SS}$, F _{OUT} = V _{DD} or V _{SS}			±0.1	uA
Internal Capacitor	Cg/Cd	A: fosc=100MHz		8.5/9.5		pF
		B: fosc=125MHz		8.0/9.0		
Maximum Oscillation Frequency	F_{MAX}	A version	110			MHz
		B version	125			
Output Signal Symmetry	SYM	C _L =15pF, @V _{DD} /2	45	50	55	%
Output Signal Rise Time	tr	C _L =15pF, 10% to 90%		2	4	ns
Output Signal Fall Time	tf	C _L =15pF, 90% to 10%		2	4	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 \overline{CONT} Terminal.

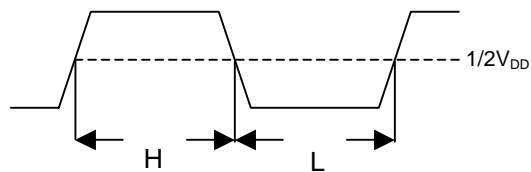
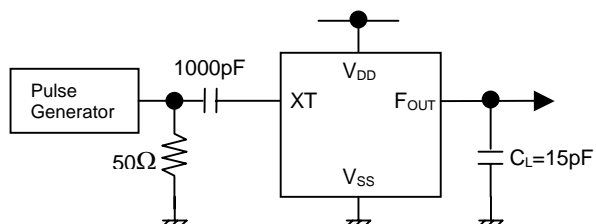
(V_{DD}=5.0V, Ta=25°C, Only A version)

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Operating Current	I _{DD1}	fosc=100MHz, C _L =15pF		50	65	mA
Oscillation Stopping Current	I _{DD2}	$\overline{\text{CONT}} = V_{SS}$, No load			10	uA
Stand-by Current	I _{st}	$\overline{\text{CONT}} = \text{XT} = V_{SS}$, No load Note5)			1	uA
Input Voltage	V _{IH}		4.0		5.0	V
	V _{IL}		0		1.0	V
Output Current	I _{OH}	V _{OH} =4.5V	12			mA
	I _{OL}	V _{OL} =0.5V	12			mA
Input Current	I _{IN}	$\overline{\text{CONT}} = 0.8V_{DD}$	30	60	120	uA
		$\overline{\text{CONT}} = 0.2V_{DD}$	10	20	40	uA
3-state Off Leakage Current	I _{OZ}	$\overline{\text{CONT}} = V_{SS}$, F _{OUT} = V _{DD} or V _{SS}			±0.1	uA
Internal Capacitor	Cg/Cd	fosc=100MHz		8.5/9.5		pF
Maximum Oscillation Frequency	F _{MAX}		110			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%		2	4	ns
Output Signal Fall Time	t _f	C _L =15pF, 90% to 10%		2	4	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

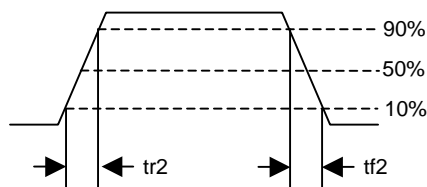
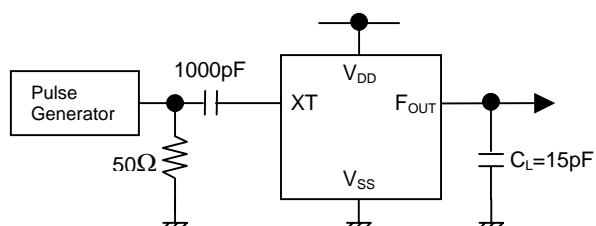
Note5) Excluding input current on $\overline{\text{CONT}}$ Terminal.

MEASUREMENT CIRCUITS

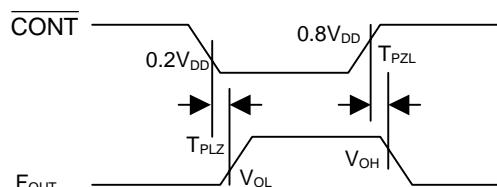
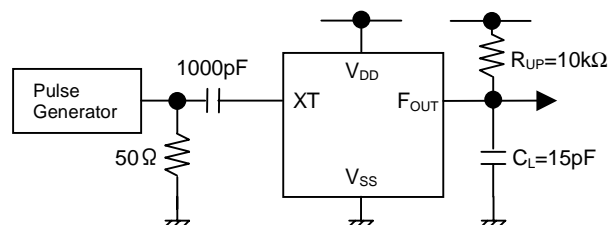
(1) Output Signal Symmetry ($C_L=15\text{pF}$)



(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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