

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 (Cg, Cd), feedback resistance (Rf), and 3-state output buffer.

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

■ PACKAGE OUTLINE



NJU6395XC/XCT



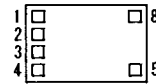
NJU6395XE

■ FEATURES

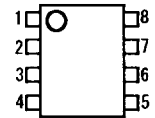
- Low Operating Voltage
- Maximum Oscillation Frequency — A:110MHz
B:125MHz
- High Fan-out — $I_{OL}/I_{OH}=8mA @3V$
- 3-state Output Buffer
- Oscillation Stop and Output Buffer Stand-by Function
- Pull-up Resistance Inside CONT Term. on-chip
- Oscillation Capacitors Cg and Cd on-chip
- Package Outline — Chip/Thin-Chip/EMP-8
- C-MOS Technology

■ PAD LOCATION

Chip/Thin-Chip



EMP-8



■ LINE-UP TABLE

Type No.	Operating Voltage Range	Recommended Oscillation Frequency	Package	Cg/Cd
NJU6395A	2.7~5.5V	80~110MHz	C/CT/EMP	8.5/9.5pF
NJU6395B	2.4~3.6V	105~125MHz	C/CT	8.0/9.0pF

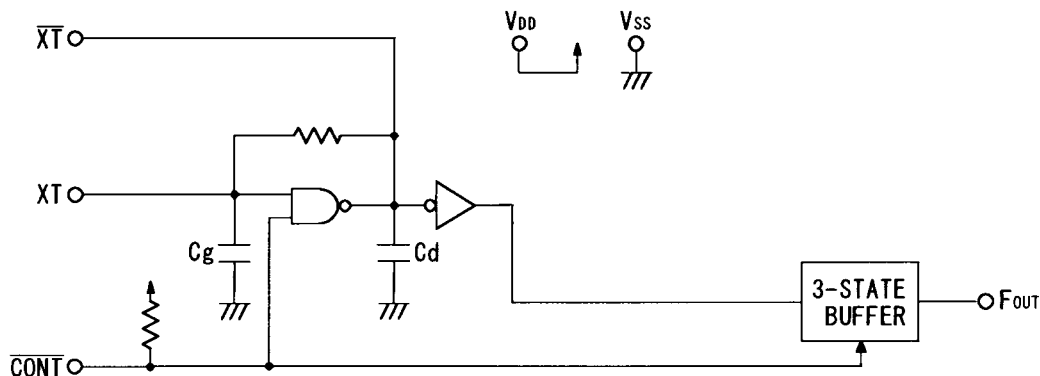
■ COORDINATES

UNIT: μm

No.	PAD	X	Y
1	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

Chip Center : X=0 μm , Y=0 μm
 Chip Size : 1.24x0.8 mm
 Chip Thickness : 400 \pm 30 μm
 Thin-Chip Thickness: 260 \pm 20 μm
 Note1) No. 6 and 7 are no pad.

■ BLOCK DIAGRAM



■ TERMINAL DESCRIPTION

No.	SYMBOL	F U N C T I O N	
1	$\overline{\text{CONT}}$	Oscillation and 3-State Output Buffer Control	
		$\overline{\text{CONT}}$	F_{OUT}
		H or Open	Output Frequency f_o
		L	Oscillation Stop and High Impedance Output
2	XT	Quartz Crystal Connecting terminals	
3	$\overline{\text{XT}}$		
4	V_{SS}	GND : $V_{\text{SS}}=0\text{V}$	
5	F_{OUT}	Output Frequency f_o	
8	V_{DD}	$V_{\text{DD}}=+3\text{V} / +5\text{V}$	

■ ABSOLUTE MAXIMUM RATINGS

(Ta=25°C)

P A R A M E T E R	SYMBOL	R A T I N G S	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	P_o	T. B. D (EMP-8)	mW
Operating Temperature Range	Topr	-40 ~ + 85	°C
Storage Temperature Range	Tstg	-55 ~ +125	°C

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}	A version	2.7		5.5	V
		B version	2.4		3.6	

 (V_{DD}=3.0V, Ta=25°C)

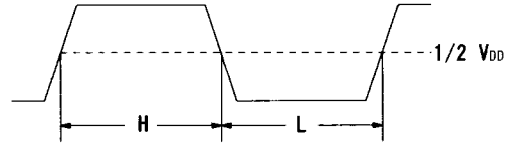
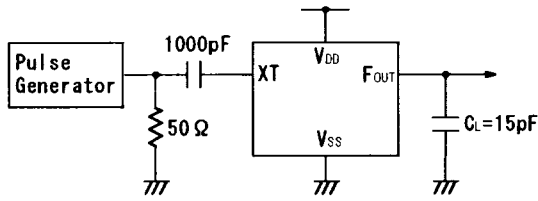
PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Operating Current	I _{DD1}	A, f _{osc} =100MHz, C _L =15pF		25	33	mA
		B, f _{osc} =125MHz, C _L =15pF		20	33	
Waiting Current	I _{DD2}	CONT=V _{SS}			10	μA
Stand-by Current	I _{st}	CONT=XT=V _{SS} , No load			1	μA
Input Voltage	V _{IH}		2.4		3.0	V
	V _{IL}		0		0.6	
Output Current	I _{OH}	V _{OH} =2.7V	8			mA
	I _{OL}	V _{OL} =0.3V	8			
Input Current	I _{IN}	CONT=0.8V _{DD}	15	30	60	μA
		CONT=0.2V _{DD}	5	10	20	
3-state Off-leakage Current	I _{oz}	CONT=V _{SS} , F _{OUT} =V _{DD} or V _{SS}			±0.1	μA
Internal Capacitor	C _e /C _d	A version, f _{osc} =100MHz		8.5 / 9.5		pF
		B version, f _{osc} =125MHz		8.0 / 9.0		
Maximum Oscillation Frequency	F _{MAX}	A version	110			MHz
		B version	125			
Output Signal Symmetry	SYM	C _L =15pF, @1/2·V _{DD}	45	50	55	%
Output Signal Rise Time	t _r	C _L =15pF, 10%~90%		2	4	ns
Output Signal Fall Time	t _f	C _L =15pF, 90%~10%		2	4	
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	

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

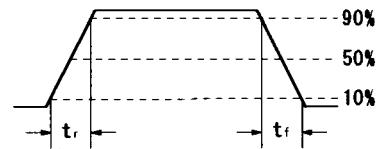
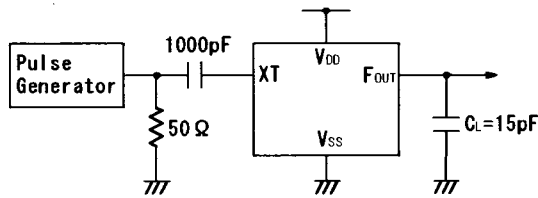
PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Operating Current	I _{DD1}	f _{OSC} =100MHz, C _L =15pF		50	65	mA
Waiting Current	I _{DD2}	$\overline{\text{CONT}}=V_{SS}$			10	μA
Stand-by Current	I _{st}	$\overline{\text{CONT}}=\text{XT}=V_{SS}$, No load			1	μA
Input Voltage	V _{IH}		4.0		5.0	V
	V _{IL}		0		1.0	
Output Current	I _{OH}	V _{OH} =4.5V	12			mA
	I _{OL}	V _{OL} =0.5V	12			
Input Current	I _{IN}	$\overline{\text{CONT}}=0.8V_{DD}$	30	60	120	μA
		$\overline{\text{CONT}}=0.2V_{DD}$	10	20	40	
3-state Off-leakage Current	I _{oz}	$\overline{\text{CONT}}=V_{SS}$, F _{OUT} =V _{DD} or V _{SS}			±0.1	μA
Internal Capacitor	C _s /C _d	f _{OSC} =100MHz		8.5 / 9.5		pF
Maximum Oscillation Frequency	F _{MAX}		110			MHz
Output Signal Symmetry	SYM	C _L =15pF, @1/2·V _{DD}	45	50	55	%
Output Signal Rise Time	t _r	C _L =15pF, 10%~90%		2	4	ns
Output Signal Fall Time	t _f	C _L =15pF, 90%~10%		2	4	
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	

MEASUREMENT CIRCUITS

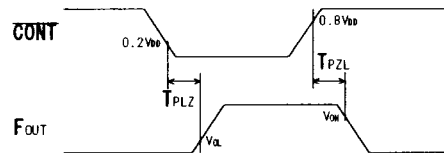
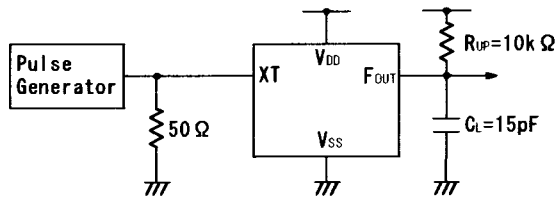
(1) Output Signal Symmetry ($C_L=15pF$)



(2) Output Signal Rise/Fall Time ($C_L=15pF$)



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



[CAUTION]
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