

QUARTZ CRYSTAL OSCILLATOR

GENERAL DESCRIPTION

The NJU6392 series is a 3V operation C-MOS quartz crystal oscillator which consists of an oscillation amplifier and a 3-state output buffer.

This series is classed into four versions A, B, C and P according to their oscillation frequency range mentioned in the line-up table.

The oscillation amplifier incorporates feed-back resistance and oscillation capacitors(C_g , C_d), therefore, it requires no external component except quartz crystal.

Drivability of the 3-state output buffer is 8mA (sink/source), thus it can drive C-MOS load.

PACKAGE OUTLINE



NJU6392XC



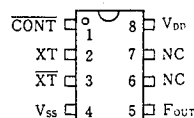
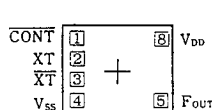
NJU6392XE

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FEATURES

- Low Operating Voltage. — 2.4~3.6V
- Maximum Oscillation Frequency (See Line-Up Table)
- Low Operating Current
- High Fan-out — $I_{OL}/I_{OH}=8mA$
- 3-state Output Buffer
- Oscillation Capacitors C_g and C_d on-chip
- Oscillation Output Stand-by Function
- Package Outline — CHIP / EMP 8
- C-MOS Technology

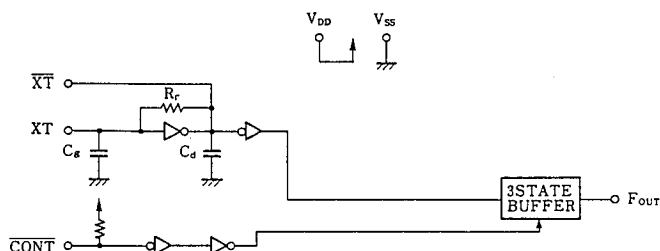
PAD LOCATION/PIN CONFIGURATION



LINE-UP TABLE

Type No.	Recommended Osc. Freq.	Output Freq.	C_g/C_d
NJU6392A	20~35MHz	f_o	27pF
6392B	30~50MHz		19pF
6392C	45~75MHz		12/14pF
6392P	~75MHz		No

BLOCK DIAGRAM



COORDINATES

Unit: μm

No.	PAD	X	Y
1	CONT	-408	248
2	XT	-408	81
3	XT	-408	-86
4	Vss	-408	-248
5	FOUT	464	-248
8	VDD	464	248

Chip Size : 1.29 X 0.8mm
Chip Center : $X=0\mu m, Y=0\mu m$
Chip Thickness : $400\mu m \pm 30\mu m$
(Note) No.6 and 7 terminals are only for package type information. There are no PAD on the chip.

TERMINAL DESCRIPTION

NO.	SYMBOL	F U N C T I O N
1	CONT	3-State Output Control
		CONT
		Output (F _{OUT})
		H or OPEN
2	XT	Quartz Crystal Connecting Terminals
		XT
4	V _{SS}	GND
5	F _{OUT}	Output frequency f _o
8	V _{DD}	+ 3 V

ABSOLUTE MAXIMUM RATINGS

(T_a=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 _{SS} -0.5 ~ V _{DD} +0.5	V
Output Voltage	V _o	-0.5 ~ V _{DD} +0.5	V
Input Current	I _{IN}	±10	mA
Output Current	I _o	±25	mA
Power Dissipation	P _D	200 (EMP)	mW
Operating Temperature Range	T _{opr}	-40 ~ +85	°C
Storage Temperature Range	T _{stg}	-55 ~ +125	°C

(Note) Decoupling capacitor should be connected between V_{DD}-V_{SS} due to the stabilized operation for the circuit.

ELECTRICAL CHARACTERISTICS

(T_a=25°C, V_{DD}=3V)

P A R A M E T E R	SYMBOL	C O N D I T I O N S	MIN	TYP	MAX	UNIT
Operating Voltage	V _{DD}		2.4		3.6	V
Operating Current	I _{DD1}	A Version f _{osc} =24MHz, No Load		6	15	mA
	I _{DD2}	B Version f _{osc} =48MHz, No Load		9	20	
	I _{DD3}	C Version f _{osc} =48MHz, No Load (Note 1)		9	25	
Stand-by Current	I _{st}	CONT, XT=V _{SS} , No Load (Note 2)			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 Terminal, CONT=V _{SS}	75	150	300	μA
3-St Off-leakage Current	I _{oz}	CONT=V _{SS} , F _{OUT} =V _{SS} or V _{DD}			±0.1	μA
Internal Capacitor (Note 3)	C _g /C _d	A Version f _{osc} =24MHz, No Load		27		pF
		B Version f _{osc} =48MHz, No Load		19		
		C Version f _{osc} =48MHz, No Load		12/14		
Max. Oscillation Freq.	f _{MAX}	A Version	35			MHz
		B Version	50			
		C/P Version (Note 1)	75			
Output Signal Symmetry	SYM	C _L =15pF at 1.5V C _L =30pF at 1.5V	45	50	55	%
Output Signal Rise Time	t _{r1}	C _L =15pF, 10~90%		2	4	ns
	t _{r2}	C _L =30pF, 10~90%			6	
Output Signal Fall Time	t _{f1}	C _L =15pF, 90~10%		2	4	ns
	t _{f2}	C _L =30pF, 90~10%			6	

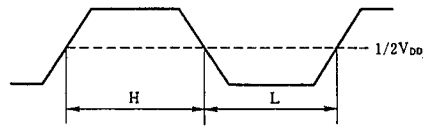
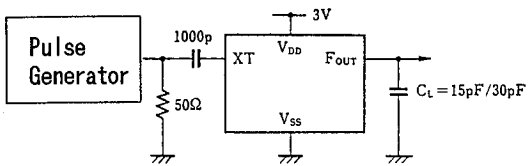
(Note 1) Only P Version is measured with external capacitors contained 3pF for C_g and 3pF for C_d.

(Note 2) Excluding input current on CONT terminal.

(Note 3) P Version is not mentioned due to internal oscillation capacitors C_g and C_d separated.

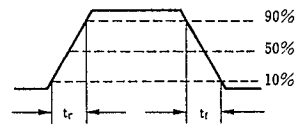
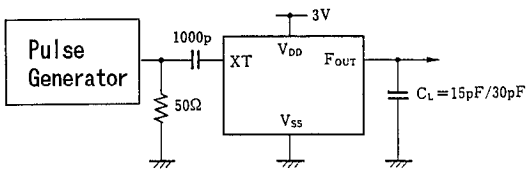
MEASUREMENT CIRCUITS

(1) Output Signal Symmetry



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(2) Output Signal Rise / Fall Time



NJU6392 Series

MEMO

[CAUTION]

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