

QUARTZ CRYSTAL OSCILLATOR

PRELIMINARY

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.

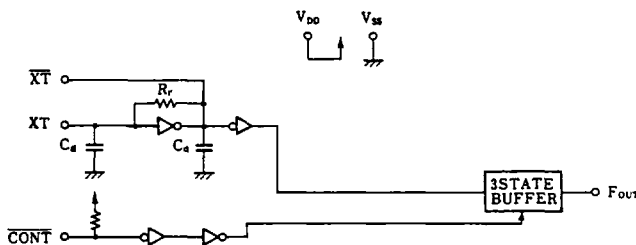
Driverbility of the 3-state output buffer is 8mA (sink/source), thus it can drive C-MOS load.

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

LINE-UP TABLE

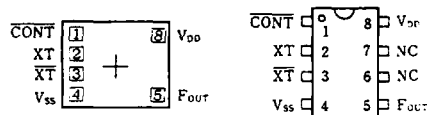
Type No.	Recommended Osc. Freq.	Output Freq.	C_g/C_d
NJU6392A	20~35MHz	f _o	27pF
6392B	30~50MHz		19pF
6392C	45~75MHz		12/14pF
6392P	~75MHz		No

BLOCK DIAGRAM

PACKAGE OUTLINE


NJU6392XC



NJU6392XE

PAD LOCATION/PIN CONFIGURATION

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 μm , Y=0 μm
 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	$\overline{\text{CONT}}$	3-State Output Control
		CONT Output (F_{OUT})
		H or OPEN Output Frequency f_o
		L Output High Impedance
2	XT	Quartz Crystal Connecting Terminals
3	XT	
4	V_{SS}	GND
5	F_{OUT}	Output frequency f_o
8	V_{DD}	+ 3 V

■ ABSOLUTE MAXIMUM RATINGS

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

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}	$V_{SS}-0.5 \sim V_{DD}+0.5$	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_o	200 (EMP)	mW
Operating Temperature Range	T_{opr}	-40 ~ +85	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	-55 ~ +125	$^\circ\text{C}$

■ ELECTRICAL CHARACTERISTICS

 ($T_a=25^\circ\text{C}$, $V_{DD}=3\text{V}$)

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 $f_{osc}=24\text{MHz}$, No Load		6	15	mA
	I_{DD2}	B Version $f_{osc}=48\text{MHz}$, No Load		9	20	
	I_{DD3}	C Version $f_{osc}=48\text{MHz}$, No Load (Note 1)		9	25	
Stand-by Current	I_{st}	$\overline{\text{CONT}}$, 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}	$V_{OH}=2.7\text{V}$	8			mA
	I_{OL}	$V_{OL}=0.3\text{V}$	8			
Input Current	I_{IN}	$\overline{\text{CONT}}$ Terminal, $\overline{\text{CONT}}=V_{SS}$	75	150	300	μA
3-St Off-leakage Current	I_{oz}	$\overline{\text{CONT}}=V_{SS}$, $F_{OUT}=V_{SS}$ or V_{DD}			± 0.1	μA
Internal Capacitor (Note 3)	Cg/Cd	A Version $f_{osc}=24\text{MHz}$, No Load		27		pF
		B Version $f_{osc}=48\text{MHz}$, No Load		19		
		C Version $f_{osc}=48\text{MHz}$, 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	$C_L=15\text{pF}$ at 1.5V	45	50	55	%
		$C_L=30\text{pF}$ at 1.5V				
Output Signal Rise Time	t_{r1}	$C_L=15\text{pF}$, 10~90%		2	4	ns
	t_{r2}	$C_L=30\text{pF}$, 10~90%			6	
Output Signal Fall Time	t_{f1}	$C_L=15\text{pF}$, 90~10%		2	4	ns
	t_{f2}	$C_L=30\text{pF}$, 90~10%			6	

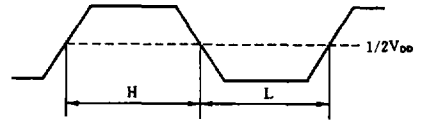
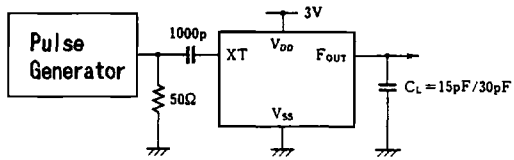
(Note 1) Only P Version is measured with external capacitors contained 3pF for Cg and 3pF for Cd.

 (Note 2) Excluding input current on $\overline{\text{CONT}}$ terminal.

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

MEASUREMENT CIRCUITS

(1) Output Signal Symmetry



(2) Output Signal Rise / Fall Time

