QUARTZ CRYSTAL OSCILLATOR

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■ GENERAL DESCRIPTION

The NJU6324 series is a C-MOS quartz crystal oscillator which consists of an oscillation amplifier, 3-stage divider and 3-state output buffer.

The oscillation frequency is as wide as up to 50MHz and the symmetry of 45-55% is realized over full oscillation frequency range.

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

The 3-stage divider generates f_O, $f_O/2$, $f_O/4$ and $f_O/8$ and only one frequency selected by internal circuits is output

The 3-state output buffer is C-MOS compatible and capable of 10 LSTTL driving.

■ FEATURES

- Operating Voltage -- 3.0~6.0V
- Maximum Oscillation Frequency -- 50MHz
- Low Operating Current
- High Fan-out -- LSTTL 10
- 3-state Output Buffer
- Selected Frequency Output (mask option)
  Only one frequency out of f_O, $f_O/2$, $f_O/4$ and $f_O/8$ output
- Oscillation Capacitors Cg and Cd on-chip
- Oscillation and/or Output Stand-by Function
- Package Outline -- CHIP/EMP 8
- C-MOS Technology

■ LINE-UP TABLE

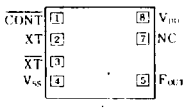
Type No.	Output Frequency	Cg	Cd
NJU6324L	f_O	23pF	23pF
NJU6324M	$f_O/2$	23pF	23pF
NJU6324N	$f_O/4$	23pF	23pF
NJU6324U	$f_O/8$	23pF	23pF

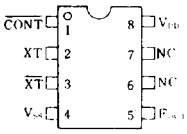
■ PACKAGE OUTLINE

NJU6324XC

NJU6324XE

■ PIN CONFIGURATION/PAD LOCATION





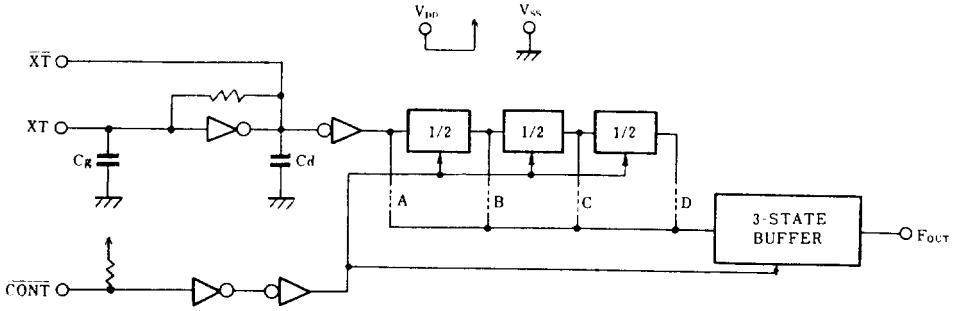
■ COORDINATES

Unit: μm

No.	PAD	X	Y
1	$\overline{CONT}$	170	649
2	XT	170	483
3	$\overline{XT}$	170	316
4	V_{SS}	170	143
5	F_{OUT}	1094	143
6	NC	-	-
7	NC	1094	462
8	V_{DD}	1094	649

Chip Size : 1.24 X 0.8mm
Chip Thickness : 400μm±30μm
(Note) No. 6 and 7 terminals are only for package type information. There is No.7 PAD on the chip but no No.6.

■ BLOCK DIAGRAM



■ TERMINAL DESCRIPTION

NO.	SYMBOL	F U N C T I O N
1	$\overline{CONT}$	3-State Output Control and Divider Reset $\overline{CONT}$ H: Output either one frequency from f_O, $f_O/2$, $f_O/4$ and $f_O/8$ $\overline{CONT}$ L: Output High Impedance and Divider Reset
2 3	XT $\overline{XT}$	Quartz Crystal Connecting Terminals
5	F_{OUT}	Output either one frequency from f_O, $f_O/2$, $f_O/4$ and $f_O/8$
8	V_{DD}	+ 5V
4	V_{SS}	GND

■ ABSOLUTE MAXIMUM RATINGS

(Ta=25℃)

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}	-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 (EMP)	P_D	200	mW
Operating Temperature Range	Topr	-40 ~ + 85	℃
Storage Temperature Range	Tstg	-65 ~ +150	℃

■ ELECTRICAL CHARACTERISTICS

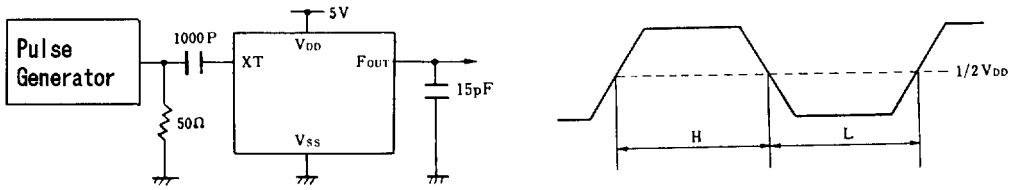
(Ta=25℃, V_{DD}=5V)

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Operating Voltage	V_{DD}		3		6	V
Operating Current	I_{DD}	fosc=16MHz, No load			10	mA
Stand-by Current	Ist	$\overline{CONT}$,XT=V_{SS}, No load (Note)			1	μA
Input Voltage	V_{IH}		3.5		5.0	V
	V_{IL}		0		1.5	
Output Current	I_{OH}	V_{DD}=5V, V_{OH}=4.5V	4			mA
	I_{OL}	V_{DD}=5V, V_{OL}=0.5V	4			
Input Current	I_{IN}	$\overline{CONT}$ Terminal, $\overline{CONT}$=V_{SS}			400	μA
Internal Capacitor	Cg,Cd			23		pF
Max. Oscillation Freq.	f_{MAX}	V_{DD}=5V, C_L=15pF	50			MHz
Output Signal Symmetry	SYM	V_{DD}=5V, C_L=15pF at 1/2V_{DD}	45	50	55	%
Output Signal Rise Time	t_r	V_{DD}=5V, C_L=15pF, 10% - 90%			8	ns
Output Signal Fall Time	t_f	V_{DD}=5V, C_L=15pF, 90% - 10%			8	ns

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

■ MEASUREMENT CIRCUITS

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



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