

QUARTZ CRYSTAL OSCILLATOR

■ GENERAL DESCRIPTION

The NJU6338 series is a C-MOS quartz crystal oscillator which consists of an oscillation amplifier, 3-stage divider and 3-state output buffer.

This series are classed into three groups A to D, H to L and Q to T according to their oscillation frequency range mentioned in the line-up table.

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 TTL compatible and capable of 10 TTL driving.

The difference between NJU6338 and NJU6331 series is only pin configuration.

■ FEATURES

- Operating Voltage. -- 4.0~6.0V
- Maximum Oscillation Frequency (See Line-Up Table)
- Low Operating Current
- High Fan-out -- TTL 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.	Recommended Osc. Freq.	Output Freq.	Cg, Cd
NJU6338A 6338B 6338C 6338D	From 20 to 35MHz	$f_o$ $f_o/2$ $f_o/4$ $f_o/8$	28pF
NJU6338H 6338J 6338K 6338L	From 30 to 50MHz	$f_o$ $f_o/2$ $f_o/4$ $f_o/8$	20pF
NJU6338Q 6338R 6338S 6338T	From 45 to 75MHz	$f_o$ $f_o/2$ $f_o/4$ $f_o/8$	17pF

■ PACKAGE OUTLINE

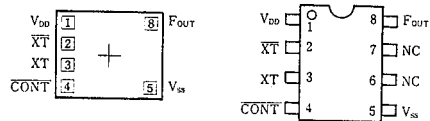


NJU6338XC

NJU6338XE

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■ PIN CONFIGURATION/PAD LOCATION



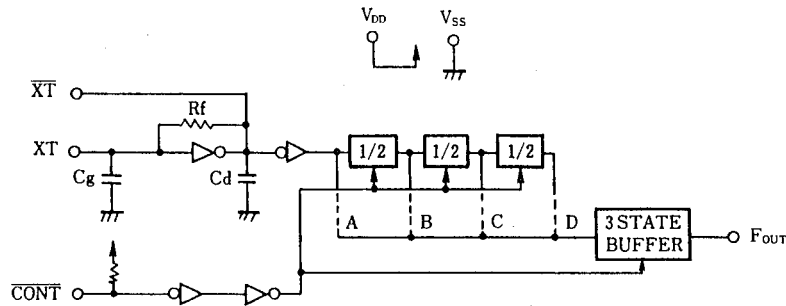
■ COORDINATES

Unit:  $\mu\text{m}$

No.	PAD	X	Y
1	V <sub>DD</sub>	-408	248
2	XT	-408	81
3	XT	-408	-86
4	CONT	-408	-248
5	V <sub>SS</sub>	464	-248
8	F <sub>OUT</sub>	464	248

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

## ■ BLOCK DIAGRAM



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## ■ TERMINAL DESCRIPTION

NO.	SYMBOL	F U N C T I O N	
1	$V_{DD}$	+ 5V	
2	$\overline{XT}$	Quartz Crystal Connecting Terminals	
3	XT		
4	$\overline{CONT}$	3-State Output Control and Divider Reset	
		CONT	$F_{OUT}$
		H	Output either one frequency from $f_0$ , $f_0/2$ , $f_0/4$ and $f_0/8$
	L	Output High Impedance and Divider Reset	
5	$V_{SS}$	GND	
8	$F_{OUT}$	Output either one frequency from $f_0$ , $f_0/2$ , $f_0/4$ and $f_0/8$	

(Note) Reference the Line-Up Table

## ■ ABSOLUTE MAXIMUM RATINGS

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

PARAMETER	SYMBOL	RATINGS	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	$I_{IN}$	$\pm 10$	mA
Output Current	$I_O$	$\pm 25$	mA
Power Dissipation	$P_D$	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

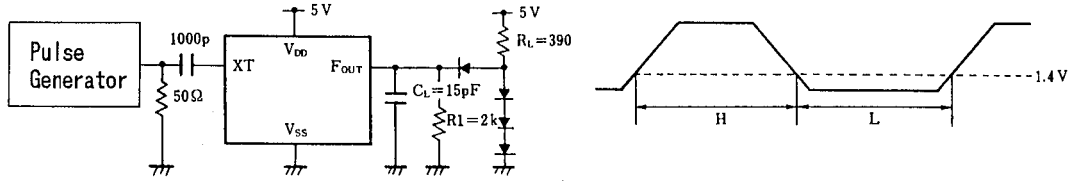
 (  $T_a=25^{\circ}\text{C}$ ,  $V_{DD}=5\text{V}$  )

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Operating Voltage	$V_{DD}$		4		6	V
Operating Current	$I_{DD1}$	A,B,C,D $f_{osc}=24\text{MHz}$ , No Load			15	mA
	$I_{DD2}$	H,J,K,L $f_{osc}=48\text{MHz}$ , No Load			20	
	$I_{DD3}$	Q,R,S,T $f_{osc}=48\text{MHz}$ , No Load			25	
Stand-by Current	$I_{st}$	$\overline{\text{CONT}}, \text{XT}=\overline{V_{SS}}$ , No Load (Note)			1	$\mu\text{A}$
Input Voltage	$V_{IH}$		3.5		5.0	V
	$V_{IL}$		0		1.5	
Output Current	$I_{OH}$	$V_{DD}=5\text{V}$ , $V_{OH}=4.5\text{V}$	4			mA
	$I_{OL}$	$V_{DD}=5\text{V}$ , $V_{OL}=0.5\text{V}$	16			
Input Current	$I_{IN}$	$\overline{\text{CONT}}$ Terminal, $\overline{\text{CONT}}=\overline{V_{SS}}$	125	250	500	$\mu\text{A}$
3-St Off-leakage Current	$I_{OZ}$	$\overline{\text{CONT}}=\overline{V_{SS}}$ , $F_{OUT}=\overline{V_{SS}}$ and $V_{DD}$			$\pm 0.1$	$\mu\text{A}$
Internal Capacitor	$C_g, C_d$	A,B,C,D Version, $f_{osc}=24\text{MHz}$		28		pF
		H,J,K,L Version, $f_{osc}=48\text{MHz}$		20		
		Q,R,S,T Version, $f_{osc}=48\text{MHz}$		17		
Maximum Oscillation Frequency	$f_{MAX}$	A,B,C,D Version	35			MHz
		H,J,K,L Version	50			
		Q,R,S,T Version	75			
Output Signal Symmetry	SYM	$C_L=15\text{pF}$ , $R_L=390\Omega$ at 1.4V	45	50	55	%
Output Signal Rise Time	$t_r$	$C_L=15\text{pF}$ , $R_L=390\Omega$ , 0.4~2.4V			6	ns
Output Signal Fall Time	$t_f$	$C_L=15\text{pF}$ , $R_L=390\Omega$ , 2.4~0.4V			4	ns

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

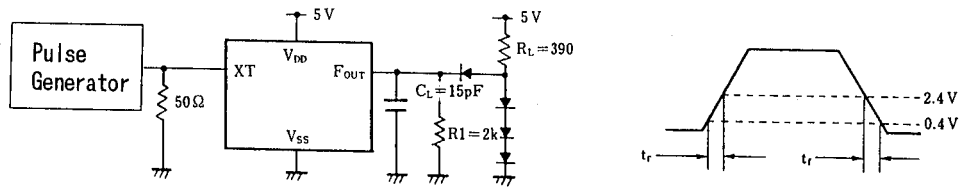
■ MEASUREMENT CIRCUITS

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



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(2) Output Signal Rise / Fall Time ( $C_L=15\text{pF}$ )



# NJU6338 Series

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MEMO

**[CAUTION]**

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