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

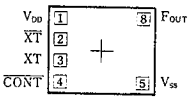
■ LINE-UP TABLE

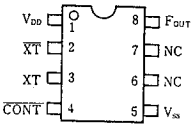
Type No.	Recommended Osc. Freq.	Output Freq.	Cg,Cd
NJU6338A 6338B 6338C 6338D	From 20 to 35MHz	f_o $f_o/2$ $f_o/4$ $f_o/8$	28pF
NJU6338H 6338J 6338K 6338L	From 30 to 50MHz	f_o $f_o/2$ $f_o/4$ $f_o/8$	20pF
NJU6338Q 6338R 6338S 6338T	From 45 to 75MHz	f_o $f_o/2$ $f_o/4$ $f_o/8$	17pF

■ PACKAGE OUTLINE


NJU6338XC NJU6338XE

■ PIN CONFIGURATION/PAD LOCATION



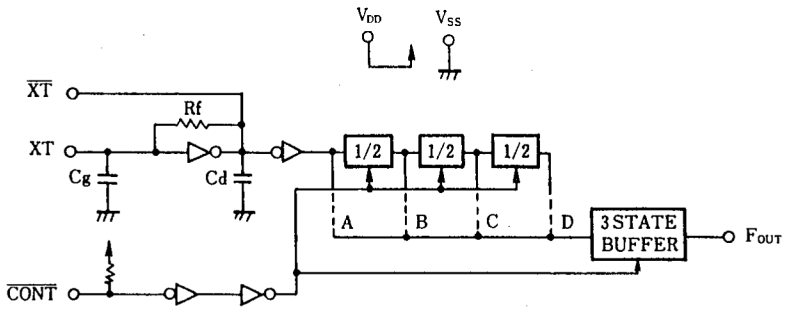


■ COORDINATES Unit:μm

No.	PAD	X	Y
1	V_{DD}	-408	248
2	$\overline{XT}$	-408	81
3	XT	-408	- 86
4	$\overline{CONT}$	-408	-248
5	V_{SS}	464	-248
8	F_{OUT}	464	248

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

■ BLOCK DIAGRAM



■ 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

$\overline{CONT}$	F_{OUT}
H	Output either one frequency from f_O, $f_O/2$, $f_O/4$ and $f_O/8$
L	Output High Impedance and Divider Reset

5	V_{SS}	GND
8	F_{OUT}	Output either one frequency from f_O, $f_O/2$, $f_O/4$ and $f_O/8$

(Note) Reference the Line-Up Table

■ 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}	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	℃
Storage Temperature Range	T_{stg}	-55 ～ +125	℃

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

■ ELECTRICAL CHARACTERISTICS

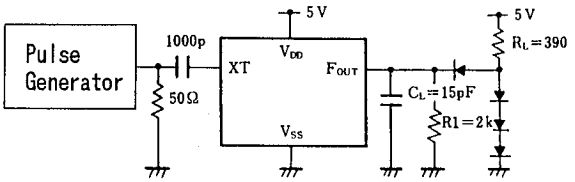
(Ta=25℃, V_{DD}=5V)

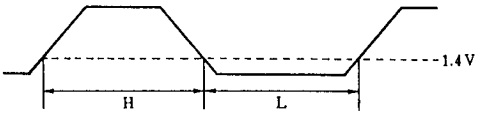
PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Operating Voltage	V_{DD}		4		6	V
Operating Current	I_{DD1}	A,B,C,D f_{OSC}=24MHz, No Load			15	mA
	I_{DD2}	H,J,K,L f_{OSC}=48MHz, No Load			20	
	I_{DD3}	Q,R,S,T f_{OSC}=48MHz, No Load			25	
Stand-by Current	Ist	$\overline{CONT}$,XT=V_{SS}, No Load (Note)			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	16			
Input Current	I_{IN}	$\overline{CONT}$ Terminal, $\overline{CONT}$=V_{SS}	125	250	500	μA
3-St Off-leakage Current	I_{OZ}	$\overline{CONT}$=V_{SS}, F_{OUT}=V_{SS} and V_{DD}			±0.1	μA
Internal Capacitor	Cg,Cd	A,B,C,D Version, fosc=24MHz		28		pF
		H,J,K,L Version, fosc=48MHz		20		
		Q,R,S,T Version, fosc=48MHz		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=15pF, R_L=390Ω at 1.4V	45	50	55	%
Output Signal Rise Time	t_r	C_L=15pF, R_L=390Ω, 0.4~2.4V			6	ns
Output Signal Fall Time	t_f	C_L=15pF, R_L=390Ω, 2.4~0.4V			4	ns

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

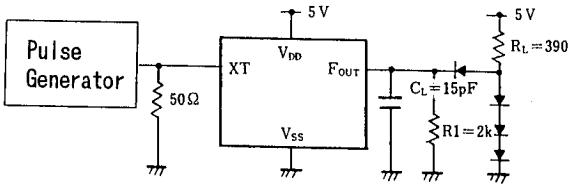
■ MEASUREMENT CIRCUITS

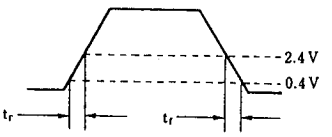
(1) Output Signal Symmetry (C_L=15pF)





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





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