

QUARTZ CRYSTAL OSCILLATOR

4

■ GENERAL DESCRIPTION

The NJU6361A is a C-MOS quartz crystal oscillator which consists of an oscillation amplifier, 3-stage divider, output frequency selector and inverter 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 outputs  $f_0$ ,  $f_0/2$ ,  $f_0/4$  and  $f_0/8$  to the output frequency selector and it determined one output frequency according to the combination of two input-signal.

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

■ PACKAGE OUTLINE

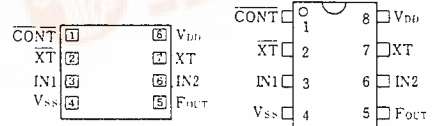


NJU6361AC



NJU6361AE

■ PIN CONFIGURATION/PAD LOCATION



■ FEATURES

- Operating Voltage -- 3.0~6.0V
- Maximum Oscillation Frequency -- 50MHz
- Low Operating Current
- High Fan-out -- LSTTL 10
- Inverter Output Buffer
- Selected Frequency Output  
Only one frequency out of  $f_0$ ,  $f_0/2$ ,  $f_0/4$  and  $f_0/8$  output
- Oscillation Capacitors Cg and Cd on-chip
- Oscillation and Output Stand-by Function
- Package Outline -- CHIP/EMP 8
- C-MOS Technology

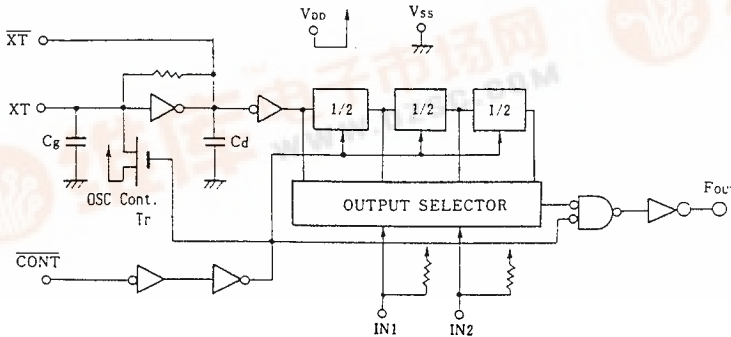
■ COORDINATES

Unit:  $\mu\text{m}$

| No. | PAD  | X    | Y   |
|-----|------|------|-----|
| 1   | CONT | 165  | 651 |
| 2   | XT   | 165  | 484 |
| 3   | IN1  | 165  | 317 |
| 4   | VSS  | 165  | 149 |
| 5   | FOUT | 1113 | 149 |
| 6   | IN2  | 1113 | 317 |
| 7   | XT   | 1113 | 484 |
| 8   | VDD  | 1113 | 651 |

Chip Size : 1.28 X 0.8mm  
Chip Thickness : 400  $\mu\text{m} \pm 30 \mu\text{m}$

■ BLOCK DIAGRAM



**■ TERMINAL DESCRIPTION**

| NO. | SYMBOL           | F U N C T I O N   |   |     |                   |
|-----|------------------|---|---|-----|-------------------|
| 1   | CONT             | Oscillation Stop Control and Divider Reset  |   |     |                   |
|     |                  | CONT  | F <sub>OUT</sub>  |     |                   |
|     |                  | H   | Output either one frequency from f <sub>0</sub> , f <sub>0</sub> /2, f <sub>0</sub> /4, and f <sub>0</sub> /8 |     |                   |
|     |                  | L   | Oscillation stop and Divider Reset  |     |                   |
| 2   | XT               | Quartz Crystal Connecting Terminals   |   |     |                   |
| 7   | XT               |   |   |     |                   |
| 8   | V <sub>DD</sub>  | + 5V  |   |     |                   |
| 3   | IN1              | 3-State Divider Outputs selected by IN1 and IN2   |   |     |                   |
|     |                  |   | IN1   | IN2 | F <sub>OUT</sub>  |
|     |                  |   | H   | H   | f <sub>0</sub>    |
|     |                  |   | L   | H   | f <sub>0</sub> /2 |
| 6   | IN2              |   | H   | L   | f <sub>0</sub> /4 |
|     |                  |   | L   | L   | f <sub>0</sub> /8 |
| 5   | F <sub>OUT</sub> | Output either one frequency from f <sub>0</sub> , f <sub>0</sub> /2, f <sub>0</sub> /4, and f <sub>0</sub> /8 |   |     |                   |
| 4   | V <sub>SS</sub>  | GND   |   |     |                   |

**■ ABSOLUTE MAXIMUM RATINGS**

 ( T<sub>a</sub>=25°C )

| PARAMETER                   | SYMBOL           | RATINGS                     | UNIT |
|-----------------------------|------------------|-----------------------------|------|
| Supply Voltage              | V <sub>DD</sub>  | -0.5 ~ +7.0                 | V    |
| Input Voltage               | V <sub>IN</sub>  | -0.5 ~ V <sub>DD</sub> +0.5 | V    |
| Output Voltage              | V <sub>O</sub>   | -0.5 ~ V <sub>DD</sub> +0.5 | V    |
| Input Current               | I <sub>IN</sub>  | ±10                         | mA   |
| Output Current              | I <sub>O</sub>   | ±25                         | mA   |
| Power Dissipation (EMP)     | P <sub>D</sub>   | 200                         | mW   |
| Operating Temperature Range | T <sub>opr</sub> | -40 ~ + 85                  | °C   |
| Storage Temperature Range   | T <sub>stg</sub> | -65 ~ +150                  | °C   |

**■ ELECTRICAL CHARACTERISTICS**

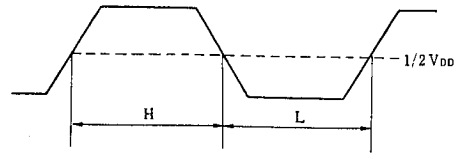
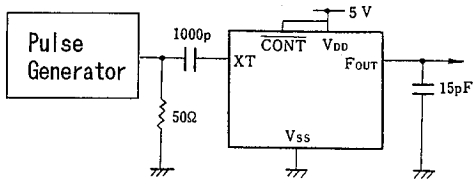
 ( T<sub>a</sub>=25°C, V<sub>DD</sub>=5V )

| PARAMETER               | SYMBOL                          | CONDITIONS  | MIN | TYP | MAX | UNIT |
|-------------------------|---------------------------------|---|-----|-----|-----|------|
| Operating Voltage       | V <sub>DD</sub>                 |   | 3   |     | 6   | V    |
| Operating Current       | I <sub>DD</sub>                 | f <sub>osc</sub> =16MHz, No load                                |     |     | 10  | mA   |
| Stand-by Current        | I <sub>st</sub>                 | CONT, XT=V <sub>SS</sub> , No load (Note)                       |     |     | 1   | μA   |
| Input Voltage           | V <sub>IH</sub>                 |   | 3.5 |     | 5.0 | V    |
|                         | V <sub>IL</sub>                 |   | 0   |     | 1.5 | V    |
| Output Current          | I <sub>OH</sub>                 | V <sub>DD</sub> =5V, V <sub>OH</sub> =4.5V                      | 4   |     |     | mA   |
|                         | I <sub>OL</sub>                 | V <sub>DD</sub> =5V, V <sub>OL</sub> =0.5V                      | 4   |     |     | mA   |
| Input Current           | I <sub>IN</sub>                 | CONT, IN1, IN2 Terminals<br>CONT, IN1, IN2=V <sub>SS</sub>      |     |     | 400 | μA   |
| Internal Capacitor      | C <sub>g</sub>                  | A Version   |     | 21  |     | pF   |
|                         | C <sub>d</sub>                  | A Version   |     | 23  |     | pF   |
|                         | C <sub>g</sub> , C <sub>d</sub> | P Version   |     | -   |     | pF   |
| Max. Oscillation Freq.  | f <sub>MAX</sub>                | V <sub>DD</sub> =5V, C <sub>L</sub> =15pF                       | 50  |     |     | MHz  |
| Output Signal Symmetry  | SYM                             | V <sub>DD</sub> =5V, C <sub>L</sub> =15pF at 1/2V <sub>DD</sub> | 45  | 50  | 55  | %    |
| Output Signal Rise Time | t <sub>r</sub>                  | V <sub>DD</sub> =5V, C <sub>L</sub> =15pF, 10% - 90%            |     |     | 8   | ns   |
| Output Signal Fall Time | t <sub>f</sub>                  | V <sub>DD</sub> =5V, C <sub>L</sub> =15pF, 90% - 10%            |     |     | 8   | ns   |

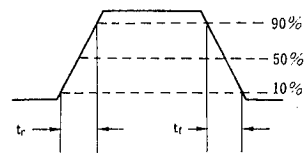
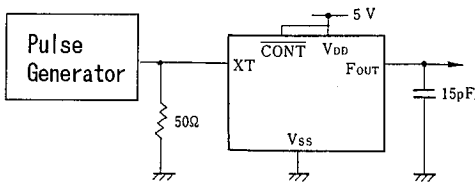
Note ) Excluding input current on CONT terminal.

■ MEASUREMENT CIRCUITS

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



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



# NJU6361A

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## MEMO

[CAUTION]  
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