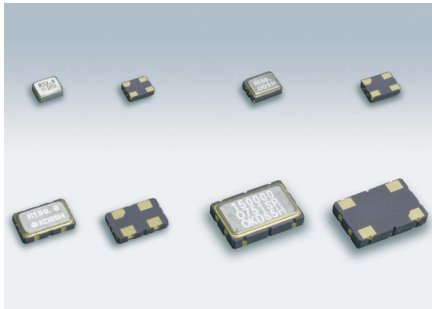


SMD Crystal Oscillators

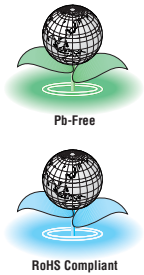
DS0221SR/DS0321SR/DS0531SR/DS0751SR



Actual size DS0221SR □ DS0321SR □
DS0531SR □ DS0751SR □

■ Features

- Low current consumption: 6mA max (125MHz, 3.3V)
- Low voltage operation: 1.8V/2.5V/2.8V/3.3V
- Offers Narrow deviation: $\pm 20 \times 10^{-6} / \pm 30 \times 10^{-6} / \pm 50 \times 10^{-6} / \pm 100 \times 10^{-6}$
- Available up to 160MHz by using AT cut fundamental resonator. Low jitter provides for high performance.
- Low profile: 0.815mm(DS0221SR),
1.1mm(DS0321SR/DS0531SR),
1.5mm(DS0751SR)



[Type]

| | |
|----------|-----------|
| DS0751SR | 7349 size |
| DS0531SR | 5032 size |
| DS0321SR | 3225 size |
| DS0221SR | 2520 size |

[Function Code]

| | |
|----------|------------------------------|
| DSO***SR | A C |
| A : 3.3V | A : $\pm 100 \times 10^{-6}$ |
| B : 2.8V | B : $\pm 50 \times 10^{-6}$ |
| C : 2.5V | C : $\pm 30 \times 10^{-6}$ |
| D : 1.8V | D : $\pm 25 \times 10^{-6}$ |
| | E : $\pm 20 \times 10^{-6}$ |

■ Standard Specification

When requesting the product, please select the model and function code of your request.

| Item | Function Code | | Available Frequency Range (MHz) | Legend | Spec. | | | Unit | Condition | |
|--|--|-----------------------|---------------------------------|------------------|---------------------|------|---------------------|------------------|---|---|
| | Supply Voltage | Frequency tolerance | | | min. | Typ. | max. | | | |
| Output Frequency Range | A | * | $0.3 \leq f_o \leq 160$ | Vdd | +3.0 | +3.3 | +3.6 | V | | |
| | B | * | $0.3 \leq f_o \leq 100$ | | +2.6 | +2.8 | +3.0 | | | |
| | C | * | $0.3 \leq f_o \leq 100$ | | +2.25 | +2.5 | +2.75 | | | |
| | D | * | $0.3 \leq f_o \leq 80$ | | +1.6 | +1.8 | +2.0 | | | |
| Frequency Tolerance (Includes frequency tolerance at room temperature.) | * | A | $0.3 \leq f_o \leq 160$ | f_tol | -100 | - | +100 | $\times 10^{-6}$ | -40~+85°C | -10~+70°C (Standard Operating Temperature Range) |
| | * | B | $0.3 \leq f_o \leq 100$ | | -50 | - | +50 | | -20~+70°C | |
| | * | C | $0.3 \leq f_o \leq 80$ | | -30 | - | +30 | | -10~+70°C | |
| | * | D | $0.3 \leq f_o \leq 80$ | | -25 | - | +25 | | | |
| | * | E | $0.3 \leq f_o \leq 50$ | | -20 | - | +20 | | | |
| Current Consumption | A | * | $0.3 \leq f_o < 32$ | Idd | - | - | 1.8 | mA | No Load | |
| | | | $32 \leq f_o < 54$ | | - | - | 2.5 | | | |
| | | | $54 \leq f_o < 80$ | | - | - | 5.0 | | | |
| | | | $80 \leq f_o < 125$ | | - | - | 6.0 | | | |
| | B | * | $0.3 \leq f_o < 32$ | | - | - | 1.8 | | | |
| | | | $32 \leq f_o < 54$ | | - | - | 2.5 | | | |
| | | | $54 \leq f_o \leq 100$ | | - | - | 5.0 | | | |
| | | | $0.3 \leq f_o < 32$ | | - | - | 1.5 | | | |
| | C | * | $32 \leq f_o < 54$ | | - | - | 2.0 | | | |
| | | | $54 \leq f_o \leq 100$ | | - | - | 4.0 | | | |
| | | | $0.3 \leq f_o < 32$ | | - | - | 1.0 | | | |
| | | | $32 \leq f_o < 54$ | | - | - | 1.4 | | | |
| D | * | $54 \leq f_o \leq 80$ | - | - | 3.0 | | | | | |
| | | | | | | | | | | |
| Stand-by current (#1 pin "L" Level) | * | * | * | I_std | - | - | 10 | μA | | |
| Symmetry | * | * | $f_o < 50$ | SYM | 45 | 50 | 55 | % | 50% Vdd Level | |
| | * | * | $f_o \geq 50$ | | 40 | 50 | 60 | | | |
| 0 Level Output Voltage | * | * | * | V _{ol} | - | - | $V_{dd} \times 0.1$ | V | | |
| 1 Level Output Voltage | * | * | * | V _{oh} | $V_{dd} \times 0.9$ | - | - | | | |
| Rise and Fall Time | A,B,C | * | $0.3 \leq f_o \leq 54$ | tr, tf | - | - | 5(4) | ns | $L_{CMOS}: 15pF$ 10~90% Vdd Level (20~80% Vdd Level) | |
| | D | * | $0.3 \leq f_o \leq 54$ | | - | - | 7(6) | | | |
| | * | * | $54 < f_o < 100$ | | - | - | 4(3) | | | |
| | * | * | $100 \leq f_o \leq 160$ | | - | - | 3(2.5) | | | |
| | A | * | $0.3 \leq f_o \leq 54$ | | - | - | 10 | | | |
| | A | * | $54 < f_o \leq 80$ | | - | - | 6 | | | |
| Output Load | * | * | * | L_{CMOS} | - | - | 15 | pF | | |
| | A | * | $0.3 \leq f_o \leq 80$ | | - | - | 30 | | | |
| OE Pin 0 Level Input Voltage | * | * | * | V _{il} | - | - | $V_{dd} \times 0.2$ | V | | |
| OE Pin 1 Level Input Voltage | * | * | * | V _{ih} | $V_{dd} \times 0.8$ | - | - | | | |
| Output Disable Time | * | * | * | T _{plz} | - | - | 150 | ns | | |
| Output Enable Time | * | * | * | T _{pzl} | - | - | 1 | ms | | |
| Phase Jitter | A | * | $45 \leq f_o \leq 160$ | tpj | - | - | 1 | ps | fo offset: 12kHz~20MHz | |
| Packing Unit | DS0221SR, DS0321SR: 2000pcs./reel ($\phi 180$), DS0531SR: 1000pcs./reel ($\phi 180$), DS0751SR: 1000pcs./reel ($\phi 254$) | | | | | | | | | |

Consult our sales representative for other specifications.

SMD Crystal Oscillators

DS0221SR/DS0321SR/DS0531SR/DS0751SR

Applications

- PC, PDA, and peripherals, gaming equipment
- DSC, DVD, Blu-ray Disk, TV, HDTV, DVC, HDD
- WiMAX
- Mobile phones: camera module
- Telecommunications: GbEthernet, ISDN

Dimensions[mm]

| <p>DS0221SR Model code: R</p> <table border="1"> <thead> <tr> <th colspan="2">Pin Connections</th> </tr> <tr> <th>Pin No.</th> <th>Connection</th> </tr> </thead> <tbody> <tr> <td>#1</td> <td>OE(Output Enable)</td> </tr> <tr> <td>#2</td> <td>GND</td> </tr> <tr> <td>#3</td> <td>Output</td> </tr> <tr> <td>#4</td> <td>Vdd</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th colspan="2">Function</th> </tr> <tr> <th>#1 input</th> <th>#3 output condition</th> </tr> </thead> <tbody> <tr> <td>H</td> <td>Oscillation out</td> </tr> <tr> <td>Open</td> <td>Oscillation out</td> </tr> <tr> <td>L</td> <td>High Z</td> </tr> </tbody> </table> <p>Recommended Land Pattern <Top View></p> | Pin Connections | | Pin No. | Connection | #1 | OE(Output Enable) | #2 | GND | #3 | Output | #4 | Vdd | Function | | #1 input | #3 output condition | H | Oscillation out | Open | Oscillation out | L | High Z | <p>DS0321SR Model code: R</p> <table border="1"> <thead> <tr> <th colspan="2">Pin Connections</th> </tr> <tr> <th>Pin No.</th> <th>Connection</th> </tr> </thead> <tbody> <tr> <td>#1</td> <td>OE(Output Enable)</td> </tr> <tr> <td>#2</td> <td>GND</td> </tr> <tr> <td>#3</td> <td>Output</td> </tr> <tr> <td>#4</td> <td>Vdd</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th colspan="2">Function</th> </tr> <tr> <th>#1 input</th> <th>#3 output condition</th> </tr> </thead> <tbody> <tr> <td>H</td> <td>Oscillation out</td> </tr> <tr> <td>Open</td> <td>Oscillation out</td> </tr> <tr> <td>L</td> <td>High Z</td> </tr> </tbody> </table> <p>Recommended Land Pattern <Top View></p> | Pin Connections | | Pin No. | Connection | #1 | OE(Output Enable) | #2 | GND | #3 | Output | #4 | Vdd | Function | | #1 input | #3 output condition | H | Oscillation out | Open | Oscillation out | L | High Z |
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| #1 | OE(Output Enable) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| #2 | GND | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| #3 | Output | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| #4 | Vdd | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Function | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| #1 input | #3 output condition | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| H | Oscillation out | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Open | Oscillation out | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| L | High Z | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| Pin No. | Connection | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| #1 | OE(Output Enable) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| #2 | GND | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| #3 | Output | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| #4 | Vdd | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| Open | Oscillation out | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| L | High Z | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| Pin No. | Connection | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| #1 | OE(Output Enable) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| #2 | GND | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| #3 | Output | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| #4 | Vdd | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Function | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| #1 input | #3 output condition | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| H | Oscillation out | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Open | Oscillation out | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| L | High Z | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| Pin No. | Connection | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| #1 | OE(Output Enable) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| #2 | GND | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| #3 | Output | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| #4 | Vdd | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Function | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| Open | Oscillation out | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| L | High Z | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |