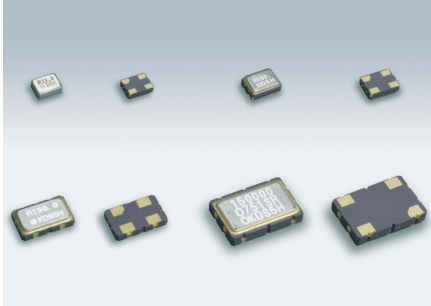


# SMD Crystal Oscillators

## 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<br>Range (MHz) | Legend | Spec.   |      |         |                   | Condition                                          |                                                    |          |
|----------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|---------------------|------------------------------------|--------|---------|------|---------|-------------------|----------------------------------------------------|----------------------------------------------------|----------|
|                                                                            | Supply Voltage                                                                                           | Frequency tolerance |                                    |        | min.    | Typ. | max.    | Unit              |                                                    |                                                    |          |
| Output Frequency Range                                                     | A                                                                                                        | *                   | 0.3≤fo≤160                         | Vdd    | +3.0    | +3.3 | +3.6    | V                 |                                                    |                                                    |          |
|                                                                            | B                                                                                                        | *                   | 0.3≤fo≤100                         |        | +2.6    | +2.8 | +3.0    |                   |                                                    |                                                    |          |
|                                                                            | C                                                                                                        | *                   | 0.3≤fo≤100                         |        | +2.25   | +2.5 | +2.75   |                   |                                                    |                                                    |          |
|                                                                            | D                                                                                                        | *                   | 0.3≤fo≤80                          |        | +1.6    | +1.8 | +2.0    |                   |                                                    |                                                    |          |
| Frequency Tolerance<br>(Includes frequency tolerance at room temperature.) | *                                                                                                        | A                   | 0.3≤fo≤160                         | f_tol  | −100    | −    | +100    | ×10 <sup>−6</sup> | −40~+85℃                                           | −10~+70℃<br>(Standard Operating Temperature Range) |          |
|                                                                            | *                                                                                                        | B                   | 0.3≤fo≤100                         |        | −50     | −    | +50     |                   |                                                    |                                                    |          |
|                                                                            | *                                                                                                        | C                   | 0.3≤fo≤80                          |        | −30     | −    | +30     |                   | −20~+70℃                                           |                                                    |          |
|                                                                            | *                                                                                                        | D                   | 0.3≤fo≤80                          |        | −25     | −    | +25     |                   |                                                    |                                                    |          |
|                                                                            | *                                                                                                        | E                   | 0.3≤fo≤50                          |        | −20     | −    | +20     |                   |                                                    |                                                    | −10~+70℃ |
| Current Consumption                                                        | A                                                                                                        | *                   | 0.3≤fo<32                          | Idd    | −       | −    | 1.8     | mA                | No Load                                            |                                                    |          |
|                                                                            |                                                                                                          |                     | 32≤fo<54                           |        | −       | −    | 2.5     |                   |                                                    |                                                    |          |
|                                                                            |                                                                                                          |                     | 54≤fo<80                           |        | −       | −    | 5.0     |                   |                                                    |                                                    |          |
|                                                                            |                                                                                                          |                     | 80≤fo<125                          |        | −       | −    | 6.0     |                   |                                                    |                                                    |          |
|                                                                            |                                                                                                          |                     | 125≤fo≤160                         |        | −       | −    | 8.0     |                   |                                                    |                                                    |          |
|                                                                            | B                                                                                                        | *                   | 0.3≤fo<32                          |        | −       | −    | 1.8     |                   |                                                    |                                                    |          |
|                                                                            |                                                                                                          |                     | 32≤fo<54                           |        | −       | −    | 2.5     |                   |                                                    |                                                    |          |
|                                                                            |                                                                                                          |                     | 54≤fo≤100                          |        | −       | −    | 5.0     |                   |                                                    |                                                    |          |
|                                                                            | C                                                                                                        | *                   | 0.3≤fo<32                          |        | −       | −    | 1.5     |                   |                                                    |                                                    |          |
|                                                                            |                                                                                                          |                     | 32≤fo<54                           |        | −       | −    | 2.0     |                   |                                                    |                                                    |          |
|                                                                            |                                                                                                          |                     | 54≤fo≤100                          |        | −       | −    | 4.0     |                   |                                                    |                                                    |          |
|                                                                            | D                                                                                                        | *                   | 0.3≤fo<32                          |        | −       | −    | 1.0     |                   |                                                    |                                                    |          |
|                                                                            |                                                                                                          |                     | 32≤fo<54                           |        | −       | −    | 1.4     |                   |                                                    |                                                    |          |
|                                                                            |                                                                                                          |                     | 54≤fo≤80                           |        | −       | −    | 3.0     |                   |                                                    |                                                    |          |
|                                                                            |                                                                                                          |                     |                                    |        |         |      |         |                   |                                                    |                                                    |          |
| Stand-by current (#1 pin "L" Level)                                        | *                                                                                                        | *                   | *                                  | I_std  | −       | −    | 10      | μA                |                                                    |                                                    |          |
| Symmetry                                                                   | *                                                                                                        | *                   | fo<50                              | SYM    | 45      | 50   | 55      | %                 | 50% Vdd Level                                      |                                                    |          |
|                                                                            | *                                                                                                        | *                   | fo≥50                              |        | 40      | 50   | 60      |                   |                                                    |                                                    |          |
| 0 Level Output Voltage                                                     | *                                                                                                        | *                   | *                                  | Vol    | −       | −    | Vdd×0.1 | V                 |                                                    |                                                    |          |
| 1 Level Output Voltage                                                     | *                                                                                                        | *                   | *                                  | Voh    | Vdd×0.9 | −    | −       |                   |                                                    |                                                    |          |
| Rise and Fall Time                                                         | A,B,C                                                                                                    | *                   | 0.3≤fo≤54                          | tr, tf | −       | −    | 5 (4)   | ns                | L_CMOS:15pF 10~90% Vdd Level<br>(20~80% Vdd Level) |                                                    |          |
|                                                                            | D                                                                                                        | *                   | 0.3≤fo≤54                          |        | −       | −    | 7 (6)   |                   |                                                    |                                                    |          |
|                                                                            | *                                                                                                        | *                   | 54<fo<100                          |        | −       | −    | 4 (3)   |                   |                                                    |                                                    |          |
|                                                                            | *                                                                                                        | *                   | 100≤fo≤160                         |        | −       | −    | 3 (2.5) |                   |                                                    |                                                    |          |
|                                                                            | A                                                                                                        | *                   | 0.3≤fo≤54                          |        | −       | −    | 10      |                   |                                                    |                                                    |          |
|                                                                            | A                                                                                                        | *                   | 54<fo≤80                           |        | −       | −    | 6       |                   |                                                    |                                                    |          |
| Output Load                                                                | *                                                                                                        | *                   | *                                  | L_CMOS | −       | −    | 15      | pF                |                                                    |                                                    |          |
|                                                                            | A                                                                                                        | *                   | 0.3≤fo≤80                          |        | −       | −    | 30      |                   |                                                    |                                                    |          |
| OE Pin<br>0 Level Input Voltage                                            | *                                                                                                        | *                   | *                                  | Vil    | −       | −    | Vdd×0.2 | V                 |                                                    |                                                    |          |
| OE Pin<br>1 Level Input Voltage                                            | *                                                                                                        | *                   | *                                  | Vih    | Vdd×0.8 | −    | −       |                   |                                                    |                                                    |          |
| Output Disable Time                                                        | *                                                                                                        | *                   | *                                  | Tplz   | −       | −    | 150     | ns                |                                                    |                                                    |          |
| Output Enable Time                                                         | *                                                                                                        | *                   | *                                  | Tpzi   | −       | −    | 1       | ms                |                                                    |                                                    |          |
| Phase Jitter                                                               | A                                                                                                        | *                   | 45≤fo≤160                          | tpj    | −       | −    | 1       | ps                | fo offset: 12kHz~20MHz                             |                                                    |          |
| Packing Unit                                                               | DS0221SR, DS0321SR: 2000pcs./reel (φ180). DS0531SR: 1000pcs./reel (φ180). DS0751SR: 1000pcs./reel (φ254) |                     |                                    |        |         |      |         |                   |                                                    |                                                    |          |

Consult our sales representative for other specifications.

# SMD Crystal Oscillators

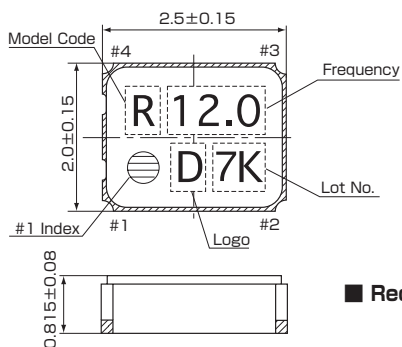
## DS0221SR/DS0321SR/DS0531SR/DS0751SR

### 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]

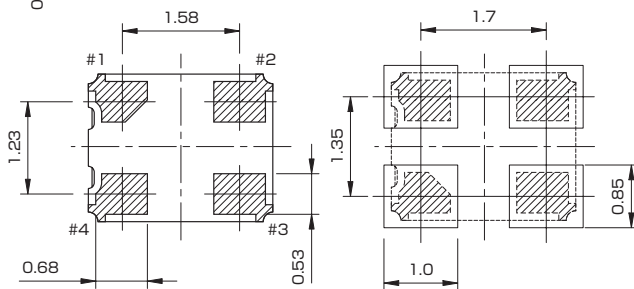
#### DS0221SR Model code: R



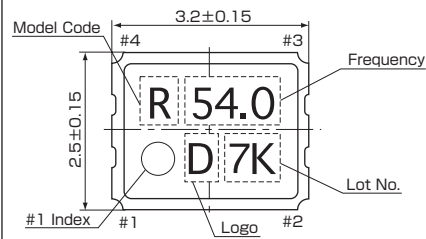
| Pin Connections |                   |
|-----------------|-------------------|
| Pin No.         | Connection        |
| #1              | OE(Output Enable) |
| #2              | GND               |
| #3              | Output            |
| #4              | Vdd               |

| Function |                     |
|----------|---------------------|
| #1 input | #3 output condition |
| H        | Oscillation out     |
| Open     | Oscillation out     |
| L        | High Z              |

#### Recommended Land Pattern <Top View>



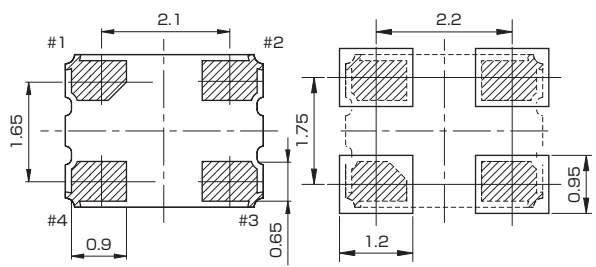
#### DS0321SR Model code: R



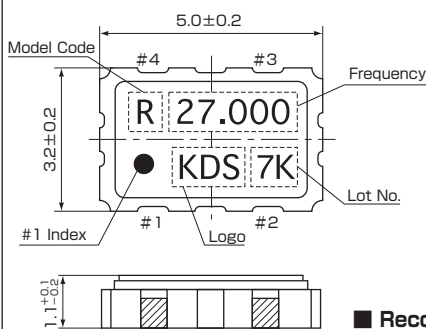
| Pin Connections |                   |
|-----------------|-------------------|
| Pin No.         | Connection        |
| #1              | OE(Output Enable) |
| #2              | GND               |
| #3              | Output            |
| #4              | Vdd               |

| Function |                     |
|----------|---------------------|
| #1 input | #3 output condition |
| H        | Oscillation out     |
| Open     | Oscillation out     |
| L        | High Z              |

#### Recommended Land Pattern <Top View>



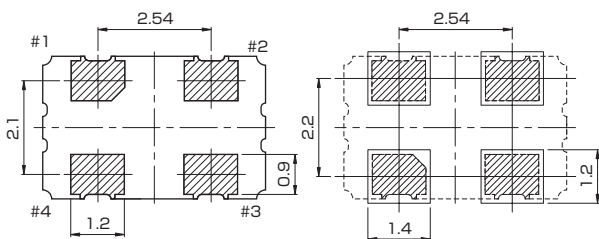
#### DS0531SR Model code: R



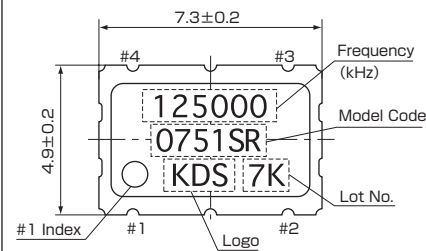
| Pin Connections |                   |
|-----------------|-------------------|
| Pin No.         | Connection        |
| #1              | OE(Output Enable) |
| #2              | GND               |
| #3              | Output            |
| #4              | Vdd               |

| Function |                     |
|----------|---------------------|
| #1 input | #3 output condition |
| H        | Oscillation out     |
| Open     | Oscillation out     |
| L        | High Z              |

#### Recommended Land Pattern <Top View>



#### DS0751SR Model code: 0751SR



| 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              |

#### Recommended Land Pattern <Top View>

