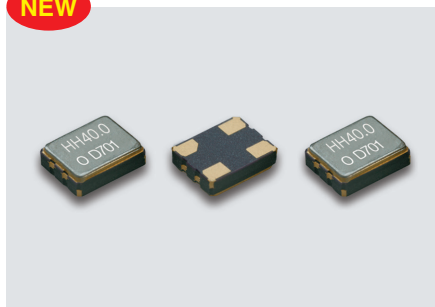


# SMD Crystal Oscillators

## DSO321SHH

NEW



Actual size

### Features

- Supply Voltage: 1.8V/2.5V/2.8V/3.3V
- Ultra low phase noise : Offset 1kHz -160dBc/Hz(typ.)  
: Offset 100kHz -172dBc/Hz(typ.)
- Available frequency range: 20 to 50MHz
- Low profile : 1.1 mm
- CMOS Level Output
- 3-state function

### Applications

- High quality audio equipment,  
Communication equipment  
and visual applications

[Function Code]

DSO321SHH A A

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 :  $\pm 25 \times 10^{-6}$

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



### Standard Specification

| Item                                                                          | Function Code                    |                        | Output<br>Frequency Range<br>(MHz) | Legend            | Spec.   |      |         |                    | Condition           |                                                          |
|-------------------------------------------------------------------------------|----------------------------------|------------------------|------------------------------------|-------------------|---------|------|---------|--------------------|---------------------|----------------------------------------------------------|
|                                                                               | Supply<br>Voltage                | Frequency<br>tolerance |                                    |                   | min.    | typ. | max.    | Unit               |                     |                                                          |
| Supply Voltage                                                                | A                                | *                      | 20≤f0≤50                           | Vcc               | +3.0    | +3.3 | +3.6    | V                  |                     |                                                          |
|                                                                               | B                                |                        |                                    |                   | +2.6    | +2.8 | +3.0    |                    |                     |                                                          |
|                                                                               | C                                |                        |                                    |                   | +2.25   | +2.5 | +2.75   |                    |                     |                                                          |
|                                                                               | D                                |                        |                                    |                   | +1.62   | +1.8 | +2.0    |                    |                     |                                                          |
| Frequency Tolerance<br>(Includes frequency tolerance<br>at room temperature.) | *                                | A                      | *                                  | f_tol             | −100    | −    | +100    | × 10 <sup>−6</sup> | −40 to +85℃         | −10 to +70℃<br>(Standard Operating<br>Temperature Range) |
|                                                                               |                                  | B                      |                                    |                   | −50     | −    | +50     |                    |                     |                                                          |
|                                                                               |                                  | C                      |                                    |                   | −30     | −    | +30     |                    |                     |                                                          |
|                                                                               |                                  | D                      |                                    |                   | −25     | −    | +25     |                    |                     |                                                          |
| Current Consumption                                                           | A                                | *                      | 20≤f0≤50                           | Icc               | −       | −    | 7.7     | mA                 | No Load             |                                                          |
|                                                                               | B                                |                        |                                    |                   | −       | −    | 5.5     |                    |                     |                                                          |
|                                                                               | C                                |                        |                                    |                   | −       | −    | 4.8     |                    |                     |                                                          |
|                                                                               | D                                |                        |                                    |                   | −       | −    | 2.9     |                    |                     |                                                          |
| Stand-by Current<br>(#1 pin "L" Level)                                        | A                                | *                      | 20≤f0≤50                           | I_std             | −       | −    | 35      | μA                 |                     |                                                          |
|                                                                               | B                                |                        |                                    |                   | −       | −    | 32      |                    |                     |                                                          |
|                                                                               | C                                |                        |                                    |                   | −       | −    | 30      |                    |                     |                                                          |
|                                                                               | D                                |                        |                                    |                   | −       | −    | 25      |                    |                     |                                                          |
| Symmetry                                                                      | *                                | *                      | *                                  | SYM               | 45      | 50   | 55      | %                  | 50% Vcc Level       |                                                          |
| 0 Level Output Voltage                                                        | *                                | *                      | *                                  | V <sub>OL</sub>   | −       | −    | Vcc×0.1 | V                  |                     |                                                          |
| 1 Level Output Voltage                                                        | *                                | *                      | *                                  | V <sub>OH</sub>   | Vcc×0.9 | −    | −       | V                  |                     |                                                          |
| Rise and Fall Time                                                            | A                                | *                      | *                                  | tr, tf            | −       | −    | 2.1     | ns                 | 10 to 90% Vcc Level |                                                          |
|                                                                               | B                                |                        |                                    |                   | −       | −    | 2.5     |                    |                     |                                                          |
|                                                                               | C                                |                        |                                    |                   | −       | −    | 2.7     |                    |                     |                                                          |
|                                                                               | D                                |                        |                                    |                   | −       | −    | 4.7     |                    |                     |                                                          |
| Load Condition                                                                | *                                | *                      | *                                  | L <sub>CMOS</sub> | −       | −    | 15      | pF                 |                     |                                                          |
| OE Pin 0 Level Input Voltage                                                  | *                                | *                      | *                                  | V <sub>IL</sub>   | −       | −    | Vcc×0.3 | V                  |                     |                                                          |
| OE Pin 1 Level Input Voltage                                                  | *                                | *                      | *                                  | V <sub>IH</sub>   | Vcc×0.7 | −    | −       | V                  |                     |                                                          |
| Output Disable Time                                                           | *                                | *                      | *                                  | tPLZ              | −       | −    | 10      | μs                 |                     |                                                          |
| Output Enable Time                                                            | *                                | *                      | *                                  | tPZL              | −       | −    | 1       | ms                 |                     |                                                          |
| Phase Noise                                                                   | A                                | *                      | 20≤f0≤50                           | −                 | −       | −160 | −       | dBc/Hz             | Offset 1kHz         |                                                          |
|                                                                               | D                                |                        |                                    |                   | −       | −158 | −       |                    |                     |                                                          |
|                                                                               | A                                |                        |                                    |                   | −       | −172 | −       |                    | Offset 100kHz       |                                                          |
|                                                                               | D                                |                        |                                    |                   | −       | −166 | −       |                    |                     |                                                          |
| Packing Unit (1)                                                              | DSO321SHH: 2000pcs./reel ( φ180) |                        |                                    |                   |         |      |         |                    |                     |                                                          |

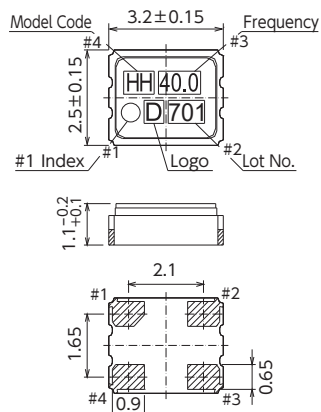
(1) Moisture prevention packing is unnecessary.

Moisture Sensitivity Level : Level1 (IPC/JEDEC J-STD-033)

Consult our sales representative for other specifications.

[mm]

### Dimensions



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

| Function |                     |
|----------|---------------------|
| #1 Input | #3 Output condition |
| H        | Oscillation out     |
| Open     | Oscillation out     |
| L        | High Z              |

### Recommended Land Pattern

<Top View>

