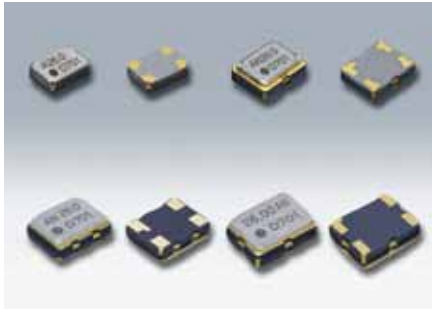


# High-precision SMD VC-TCXO/TCXO

DSA1612SDN/DSA211SDN/DSA221SDN/DSA321SDN  
DSB1612SDN, DSB1612SDNB/DSB211SDN, DSB211SDNB/DSB221SDN, DSB221SDNB/DSB321SDN, DSB321SDNB



Actual size DSA1612SDN □ DSA211SDN □  
DSA221SDN □ DSA321SDN □

## ■ Features

- Low voltage operation
- Low phase noise
- Single package structure

## ■ Applications

- Mobile phones
- GPS/GNSS and Industrial radio communications



[Type]

| VC-TCXO    | TCXO       | TCXO (Stand-by Function) | Size      |
|------------|------------|--------------------------|-----------|
| DSA1612SDN | DSB1612SDN | DSB1612SDNB              | 1612 size |
| DSA211SDN  | DSB211SDN  | DSB211SDNB               | 2016 size |
| DSA221SDN  | DSB221SDN  | DSB221SDNB               | 2520 size |
| DSA321SDN  | DSB321SDN  | DSB321SDNB               | 3225 size |

## ■ Standard Specification

| Item                          | Type | VC-TCXO   |                 |              |           | TCXO  |                 |              |           |                                 |                                |                                |                                |
|-------------------------------|------|---|-----------------|--------------|-----------|---|-----------------|--------------|-----------|---------------------------------|--------------------------------|--------------------------------|--------------------------------|
|                               |      | DSA1612SDN  | DSA211SDN       | DSA221SDN    | DSA321SDN | DSB1612SDN  | DSB211SDN       | DSB221SDN    | DSB321SDN | DSB1612SDNB (Stand-by Function) | DSB211SDNB (Stand-by Function) | DSB221SDNB (Stand-by Function) | DSB321SDNB (Stand-by Function) |
| Frequency Range               |      | 16 to 60MHz   | 12.288 to 52MHz | 9.6 to 52MHz |           | 16 to 60MHz   | 12.288 to 52MHz | 9.6 to 52MHz |           | 16 to 60MHz                     | 12.288 to 52MHz                | 9.6 to 52MHz                   |                                |
| Standard Frequency            |      | 19.2MHz/26MHz/38.4MHz/40MHz/52MHz   |                 |              |           | 16.3676MHz/16.367667MHz/16.368MHz/16.369MHz/16.8MHz/26MHz/33.6MHz   |                 |              |           |                                 |                                |                                |                                |
| Supply Voltage Range          |      | +1.68 to +3.5V  |                 |              |           |   |                 |              |           |                                 |                                |                                |                                |
| Supply Voltage (Vcc)          |      | +1.8V/+2.6V/+2.8V/+3.0V/+3.3V   |                 |              |           |   |                 |              |           |                                 |                                |                                |                                |
| Current Consumption           |      | +1.5mA max. (f≤26MHz) /+2.0mA max. (26<f≤52MHz) /+2.5mA max. (f≤60MHz)  |                 |              |           |   |                 |              |           |                                 |                                |                                |                                |
| Stand-by Current              |      | -   |                 |              |           |   |                 |              |           | +3μA max.                       |                                |                                |                                |
| Output Level                  |      | 0.8Vp-p min. (f≤52MHz) (Clipped Sinewave/DC-coupled)  |                 |              |           |   |                 |              |           |                                 |                                |                                |                                |
| Output Load                   |      | 10kΩ//10pF  |                 |              |           |   |                 |              |           |                                 |                                |                                |                                |
| Frequency Stability Tolerance |      | ±1.5×10 <sup>-6</sup> max. (After 2 reflows)  |                 |              |           |   |                 |              |           |                                 |                                |                                |                                |
| vs. Temperature               |      | ±1.0×10 <sup>-6</sup> , ±2.5×10 <sup>-6</sup> max./-30 to +85°C<br>±1.0×10 <sup>-6</sup> , ±2.5×10 <sup>-6</sup> max./-40 to +85°C (Option)                                       |                 |              |           | ±0.5×10 <sup>-6</sup> , ±2.5×10 <sup>-6</sup> max./-30 to +85°C<br>±0.5×10 <sup>-6</sup> , ±2.5×10 <sup>-6</sup> max./-40 to +85°C (Option) |                 |              |           |                                 |                                |                                |                                |
| vs. Supply Voltage            |      | ±0.2×10 <sup>-6</sup> max. (Vcc ±5%)  |                 |              |           |   |                 |              |           |                                 |                                |                                |                                |
| vs. Load Variation            |      | ±0.2×10 <sup>-6</sup> max. (10kΩ//10pF±10%)   |                 |              |           |   |                 |              |           |                                 |                                |                                |                                |
| vs. Aging                     |      | ±1.0×10 <sup>-6</sup> max./year   |                 |              |           |   |                 |              |           |                                 |                                |                                |                                |
| Frequency Control             |      | ±3.0×10 <sup>-6</sup> to ±5.0×10 <sup>-6</sup> /Vcont=+1.4V±1V @Vcc≥+2.6V   |                 |              |           | -   |                 |              |           |                                 |                                |                                |                                |
| Control Sensitivity           |      | ±3.0×10 <sup>-6</sup> to ±5.0×10 <sup>-6</sup> /Vcont=+0.9V±0.6V @Vcc=+1.8V   |                 |              |           | -   |                 |              |           |                                 |                                |                                |                                |
| Response Slope                |      | Positive  |                 |              |           | -   |                 |              |           |                                 |                                |                                |                                |
| Start up Time                 |      | 2.0ms max.  |                 |              |           |   |                 |              |           |                                 |                                |                                |                                |
| Output Enable Time            |      | -   |                 |              |           |   |                 |              |           | 2.0ms max.                      |                                |                                |                                |
| Phase Noise                   |      | [f≤26MHz]   |                 |              |           | [26MHz<f≤40MHz]   |                 |              |           | [40MHz<f≤52MHz]                 |                                |                                |                                |
| Offset 100Hz                  |      | -115dBc/Hz  |                 |              |           | -110dBc/Hz  |                 |              |           | -105dBc/Hz                      |                                |                                |                                |
| Offset 1kHz                   |      | -130dBc/Hz  |                 |              |           | -130dBc/Hz  |                 |              |           | -125dBc/Hz                      |                                |                                |                                |
| Offset 10kHz                  |      | -150dBc/Hz  |                 |              |           | -150dBc/Hz  |                 |              |           | -145dBc/Hz                      |                                |                                |                                |
| Offset 100kHz                 |      | -155dBc/Hz  |                 |              |           | -155dBc/Hz  |                 |              |           | -150dBc/Hz                      |                                |                                |                                |
| Packing Unit (1)              |      | DSA1612SDN/DSA211SDN/DSA221SDN, DSB1612SDN/DSB211SDN/DSB221SDN, DSB1612SDNB/DSB211SDNB/DSB221SDNB: 3000pcs./reel (φ180)<br>DSA321SDN, DSB321SDN, DSB321SDNB: 2000pcs./reel (φ180) |                 |              |           |   |                 |              |           |                                 |                                |                                |                                |

(1) Moisture prevention packing is unnecessary.  
Moisture Sensitivity Level : LEVEL 1 (IPC/JEDEC J-STD-033)

Consult our sales representative for other specifications.

# High-precision SMD VC-TCXO/TCXO

For Mobile communications/Industrial system/GPS/GNSS

## ■ Dimensions

[mm]

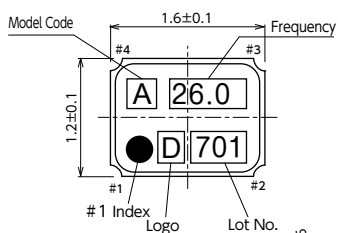
### ■ DSA1612SDN/DSB1612SDN/DSB1612SDNB

Model Code

A: VC-TCXO (DSA1612SDN)  
B: TCXO (DSB1612SDN)  
C: TCXO (DSB1612SDNB Stand-by Function)

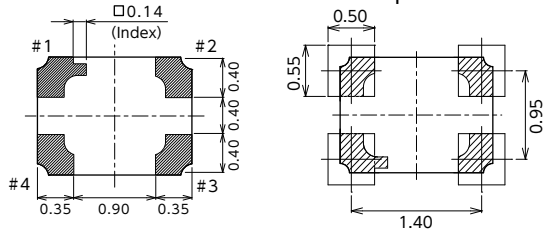
Pin Connections

| Pin No. | Connection   |
|---------|--|
| #1      | Vcont(VC-TCXO)/GND(TCXO)<br>ENABLE/DISABLE (Stand-by Function) |
| #2      | GND  |
| #3      | Output   |
| #4      | Vcc  |



#### ■ Recommended Land Pattern

<Top View>



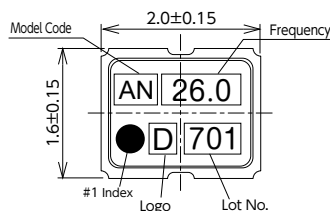
### ■ DSA211SDN/DSB211SDN/DSB211SDNB

Model Code

AN : VC-TCXO (DSA211SDN)  
BN : TCXO (DSB211SDN)  
CN : TCXO (DSB211SDNB Stand-by Function)

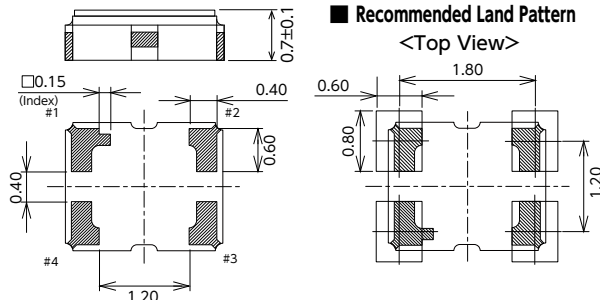
Pin Connections

| Pin No. | Connection   |
|---------|--|
| #1      | Vcont(VC-TCXO)/GND(TCXO)<br>ENABLE/DISABLE (Stand-by Function) |
| #2      | GND  |
| #3      | Output   |
| #4      | Vcc  |



#### ■ Recommended Land Pattern

<Top View>



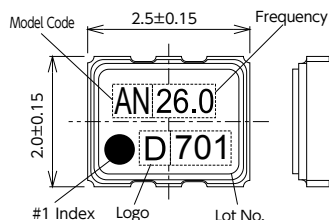
### ■ DSA221SDN/DSB221SDN/DSB221SDNB

Model Code

AN : VC-TCXO (DSA221SDN)  
BN : TCXO (DSB221SDN)  
CN : TCXO (DSB221SDNB Stand-by Function)

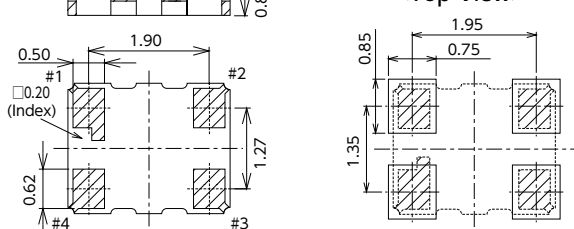
Pin Connections

| Pin No. | Connection   |
|---------|--|
| #1      | Vcont(VC-TCXO)/GND(TCXO)<br>ENABLE/DISABLE (Stand-by Function) |
| #2      | GND  |
| #3      | Output   |
| #4      | Vcc  |



#### ■ Recommended Land Pattern

<Top View>



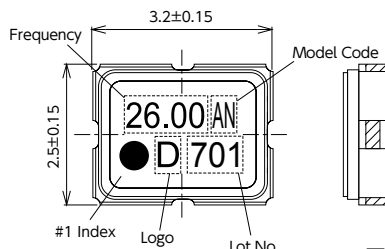
### ■ DSA321SDN/DSB321SDN/DSB321SDNB

Model Code

AN : VC-TCXO (DSA321SDN)  
BN : TCXO (DSB321SDN)  
CN : TCXO (DSB321SDNB Stand-by Function)

Pin Connections

| Pin No. | Connection   |
|---------|--|
| #1      | Vcont(VC-TCXO)/GND(TCXO)<br>ENABLE/DISABLE (Stand-by Function) |
| #2      | GND  |
| #3      | Output   |
| #4      | Vcc  |



#### ■ Recommended Land Pattern

<Top View>

