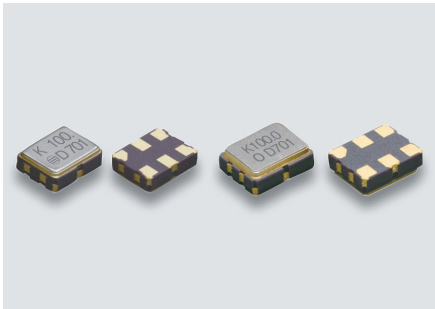


SMD Differential Output Crystal Oscillators (For Automotive)

DSO223SK/DSO323SK/DSO223SJ/DSO323SJ/DSO223SD/DSO323SD



Actual size DSO223S SERIES DSO323S SERIES

Features

- 2.5V/3.3V operating voltage, High speed type
- 3-state function
- LV-PECL output (DSO223/323SK)
- LVDS output (DSO223/323SJ)
- HCSL output (DSO223/323SD)
- AEC Standard
DSO223SK/SJ/SD: AEC-Q200 Compliant
DSO323SK/SJ/SD: AEC-Q200 Compliant
(Option: Equivalent to AEC-Q100)

Applications

- Multimedia devices such as car navigation systems and car audio

[Type]

| | |
|----------------|-----------|
| DSO223S SERIES | 2520 size |
| DSO323S SERIES | 3225 size |



[Function Code]

| | | |
|----------------|----------|-----------------------------|
| Model Code | K A A C | Operating Temperature Range |
| K : LVPECL | | C : -40 to +85°C |
| J : LVDS | | E : -40 to +105°C |
| D : HCSL | | Frequency Tolerance |
| Supply Voltage | A : 3.3V | A : ±100x10 ⁻⁶ |
| | C : 2.5V | B : ±50x10 ⁻⁶ |

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

Standard Specification

| Item | Type | Legend | DSO223SK DSO323SK | DSO223SJ DSO323SJ | DSO223SD DSO323SD |
|---|------|-------------------------------------|--|--|---------------------------------------|
| Output Specification | | — | LV-PECL | LVDS | HCSL |
| Output Frequency Range | | f _o | 13.5 to 167MHz | | |
| Supply Voltage | | V _{CC} | +2.5V±0.125V/+3.3V±0.165V | | |
| Frequency Tolerance (Includes frequency tolerance at room temperature.) | | f _{tol} | ±50×10 ⁻⁶ max., ±80×10 ⁻⁶ max. / ±100×10 ⁻⁶ max. | | |
| Storage Temperature Range | | T _{stg} | -40 to +105°C | | |
| Operating Temperature Range | | T _{use} | -40 to +85°C, -40 to +105°C | | |
| Current Consumption | | I _{CC} | 45mA max. | 20mA max. | 30mA max. |
| Stand-by Current (#1 pin "L" Level) | | I _{std} | 10μA max. | | |
| Load Resistance | | Load-R | 50Ω to V _{CC} -2V | 100Ω (Output-OutputN) | 50Ω |
| Symmetry | | SYM | 45 to 55% [at outputs cross point] | | |
| 0 Level Output Voltage | | V _{OL} | V _{CC} -1.81 to V _{CC} -1.62V | — | -0.15 to 0.15V |
| 1 Level Output Voltage | | V _{OH} | V _{CC} -1.025 to V _{CC} -0.88V | — | 0.58 to 0.85V |
| Rise and Fall Time | | tr, tf | 0.5ns max. [20 to 80% Output, OutputN] | 0.4ns max. [20 to 80% Output-OutputN] | 0.5ns max. [0.175 to 0.525V Level] |
| Differential Output Voltage | | V _{OD1} , V _{OD2} | — | 0.247 to 0.454V | — |
| Change to V _{OD} | | ΔV _{OD} | — | 50mV [ΔV _{OD} = V _{OD1} -V _{OD2}] | — |
| Offset Voltage | | V _{OS} | — | 1.125 to 1.375V | — |
| Offset to V _{OS} | | ΔV _{OS} | — | 50mV | — |
| Crossing Point Voltage | | V _{CR} | — | — | 250 to 550mV |
| OE Pin 0 Level input Voltage | | V _{IL} | V _{CC} ×0.3 max. | | |
| OE Pin 1 Level input Voltage | | V _{IH} | V _{CC} ×0.7 min. | | |
| Output Disable Time | | t _{PLZ} | 200ns | | |
| Output Enable Time | | t _{PZL} | 2ms | | |
| Period Jitter (1) | | t _{RMS} | 5ps typ. (13.5MHz≤f _o <27MHz) / 2.5ps typ. (27MHz≤f _o ≤167MHz) (σ) | | |
| | | tp-p | 33ps typ. (13.5MHz≤f _o <27MHz) / 22ps typ. (27MHz≤f _o ≤167MHz) (Peak to peak) | | |
| Total Jitter (1) | | t _{TL} | 50ps typ. (13.5MHz≤f _o <27MHz) / 35ps typ. (27MHz≤f _o ≤167MHz) [t _{DJ} + n×t _{RJ} n=14.1(BER=1×10 ⁻¹²) (2)] | | |
| Phase Jitter | | tpj | 1.5ps max. (13.5MHz≤f _o <27MHz) / 1ps max. (27MHz≤f _o ≤167MHz) [13.5MHz≤f _o <40MHz, f _o offset: 12kHz to 5MHz f _o ≥40MHz, f _o offset: 12kHz to 20MHz] | | |
| Reliability | | | AEC-Q200(DSO223 SERIES), AEC-Q100/AEC-Q200(DSO323 SERIES) | | |
| Packing Unit (3) | | | 2000pcs./reel(φ180) | | |

- (1) Measured WAVECREST DTS-2075
- (2) t_{DJ}:Deterministic jitter t_{RJ}:Random jitter
- (3) Moisture prevention packing is unnecessary.
Moisture Sensitivity Level: LEVEL 1 (IPC/JEDEC J-STD-033)

Consult our sales representative for other specifications.

DSO223S SERIES

DSO323S SERIES

Dimensions

Model Code: DSO223SJ: J, DSO223SK (2.5V): KB, DSO223SK (3.3V): K, DSO223SD: D

Pin Connections:

| Pin No. | Connection |
|---------|-------------------|
| #1 | OE(Output Enable) |
| #2 | NC |
| #3 | GND |
| #4 | Output |
| #5 | OutputN |
| #6 | V _{CC} |

Function:

| Pin | Condition |
|----------|-------------------------|
| #1 Input | #4, #5 Output condition |
| H | Oscillation out |
| Open | Oscillation out |
| L | High Z |

Recommended Land Pattern

<Top View>

Dimensions

Model Code: DSO323SJ, DSO323SK (2.5V): KB, DSO323SK (3.3V): K, DSO323SD

Pin Connections:

| Pin No. | Connection |
|---------|-------------------|
| #1 | OE(Output Enable) |
| #2 | NC |
| #3 | GND |
| #4 | Output |
| #5 | OutputN |
| #6 | V _{CC} |

Function:

| Pin | Condition |
|----------|-------------------------|
| #1 Input | #4, #5 Output condition |
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Recommended Land Pattern

<Top View>