

CMOS/ 1.8V, 2.5V, 3.3V Compatible/ 2.0×1.6, 2.5×2.0, 3.2×2.5, 5.0×3.2, 7.0×5.0mm



RoHS Compliant

**Features**

- Frequency Range 1.5 to 80MHz
- CMOS output
- Wide Supply Voltage 1.6 to 3.63V
- Low current consumption
- Option: Low Phase Noise Version

**Table 1**

| Freq. Code | Tol. $\times 10^{-6}$ | Operating Temperature Range (°C) | Note                          |
|------------|-----------------------|----------------------------------|-------------------------------|
| 0          | $\pm 50$              | -10 to +70                       | Standard specifications       |
| S          | $\pm 30$              |                                  |                               |
| U          | $\pm 25$              | -40 to +85                       | With only certain frequencies |
| G          | $\pm 50$              |                                  |                               |
| 6          | $\pm 50$              |                                  |                               |

Packaging Tape & Reel  
 KC7050K/ KC5032K : 1000 pcs/ reel  
 KC3225K/ KC2520K/ KC2016K : 2000 pcs/ reel

**How to Order**

**KC2520K 25.0000 C 1 0 E 00**  
 ① ② ③ ④ ⑤ ⑥ ⑦

- ① Type 2.0×1.6mm: KC2016K  
 2.5×2.0mm: KC2520K  
 3.2×2.5mm: KC3225K  
 5.0×3.2mm: KC5032K  
 7.0×5.0mm: KC7050K
- ② Output Frequency (25.0000: 25MHz)
- ③ Output Type (C: CMOS)
- ④ Supply Voltage  
 1 : 1.8V/ 2.5V/ 3.3V Multi Voltage (Version E : Standard)  
 2 : 2.5V (Version N : Low Phase Noise)  
 3 : 3.3V (Version N : Low Phase Noise)
- ⑤ Frequency Tolerance (See Table 1)
- ⑥ Symmetry/ INH Function  
 E : 45/ 55%, Stand-by  
 N : 45/ 55%, Stand-by, Low Phase Noise
- ⑦ Customer Special Model Suffix (STD Specification is "00")

**Dimensions**

(Unit: mm)



**Recommended Land Pattern**

(Unit: mm)



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**Specifications**

| Item   | Symbol             | Conditions  | Version E (Standard)                                    |                     | Version N (Low Phase Noise) |                     | Units                |                   |
|--|--------------------|---|---|---------------------|-----------------------------|---------------------|----------------------|-------------------|
|  |                    |   | Min.  | Max.                | Min.                        | Max.                |                      |                   |
| Output Frequency Range <sup>Note1</sup>              | fo                 |   | 1.5   | 80                  | 1.5                         | 80                  | MHz                  |                   |
| Frequency Tolerance                                  | f <sub>tol</sub>   | Initial tolerance, Operating temperature range, Rated power supply voltage change, Load change, Aging (1 year @25°C), Shock and vibration | Op. Temp.: -10 to +70°C/<br>-40 to +85°C/ -40 to +105°C | -50                 | +50                         | -50                 | +50                  | ×10 <sup>-6</sup> |
|  |                    |   | Op. Temp.: -10 to +70°C                                 | -30                 | +30                         | -30                 | +30                  |                   |
|  |                    |   | Op. Temp.: -10 to +70°C                                 | -25                 | +25                         | -25                 | +25                  |                   |
| Frequency Aging                                      | f <sub>age</sub>   | @25°C First year  | -3  | +3                  | -3                          | +3                  | ×10 <sup>-6</sup> /y |                   |
| Storage Temperature Range                            | T <sub>stg</sub>   |   | -55   | +125                | -55                         | +125                | °C                   |                   |
| Operating Temperature Range                          | T <sub>use</sub>   |   | -10   | +70                 | -10                         | +70                 | °C                   |                   |
|  |                    |   | -40   | +85                 | -40                         | +85                 |                      |                   |
|  |                    |   | -40   | +105                | -40                         | +105                |                      |                   |
| Max. Supply Voltage                                  | —                  |   | -0.3  | +4.0                | -0.3                        | +4.0                | V                    |                   |
| Supply Voltage                                       | V <sub>cc</sub>    | Code ④ : 1  | +1.60   | +3.63               | —                           | —                   | V                    |                   |
|  |                    | Code ④ : 2  | —   | —                   | +2.25                       | +2.75               |                      |                   |
|  |                    | Code ④ : 3  | —   | —                   | +2.97                       | +3.63               |                      |                   |
| Current Consumption (Maximum Loaded/ 1.5<F0<24MHz)   | I <sub>cc</sub>    | E : 1.6<V <sub>cc</sub> <=2.25V   | —   | 2.5                 | —                           | —                   | mA                   |                   |
|  |                    | E : 2.25<V <sub>cc</sub> <=2.8V/ N : 2.25<=V <sub>cc</sub> <=2.75V  | —   | 3.0                 | —                           | 4                   |                      |                   |
|  |                    | E : 2.8<V <sub>cc</sub> <=3.63V/ N : 2.97<=V <sub>cc</sub> <=3.63V  | —   | 3.5                 | —                           | 6                   |                      |                   |
| Current Consumption (Maximum Loaded/ 24<=F0<40MHz)   | I <sub>cc</sub>    | E : 1.6<=V <sub>cc</sub> <=2.25V  | —   | 3.5                 | —                           | —                   |                      |                   |
|  |                    | E : 2.25<V <sub>cc</sub> <=2.8V/ N : 2.25<=V <sub>cc</sub> <=2.75V  | —   | 4.5                 | —                           | 5                   |                      |                   |
|  |                    | E : 2.8<V <sub>cc</sub> <=3.63V/ N : 2.97<=V <sub>cc</sub> <=3.63V  | —   | 5.0                 | —                           | 7                   |                      |                   |
| Current Consumption (Maximum Loaded/ 40<=F0<62.5MHz) | I <sub>cc</sub>    | E : 1.6<=V <sub>cc</sub> <=2.25V  | —   | 5.0                 | —                           | —                   |                      |                   |
|  |                    | E : 2.25<=V <sub>cc</sub> <=2.8V/ N : 2.25<=V <sub>cc</sub> <=2.75V   | —   | 5.5                 | —                           | 8                   |                      |                   |
|  |                    | E : 2.8<=V <sub>cc</sub> <=3.63V/ N : 2.97<=V <sub>cc</sub> <=3.63V   | —   | 6.0                 | —                           | 11                  |                      |                   |
| Current Consumption (Maximum Loaded/ 62.5<=F0<80MHz) | I <sub>cc</sub>    | E : 1.6<=V <sub>cc</sub> <=2.25V  | —   | 6.0                 | —                           | —                   |                      |                   |
|  |                    | E : 2.25<=V <sub>cc</sub> <=2.8V/ N : 2.25<=V <sub>cc</sub> <=2.75V   | —   | 6.5                 | —                           | 14                  |                      |                   |
|  |                    | E : 2.8<=V <sub>cc</sub> <=3.63V/ N : 2.97<=V <sub>cc</sub> <=3.63V   | —   | 8.0                 | —                           | 18                  |                      |                   |
| Stand-by Current                                     | I <sub>std</sub>   |   | —   | 5                   | —                           | 5                   | μA                   |                   |
| Symmetry   | SYM                | @50% V <sub>cc</sub>  | 45  | 55                  | 45                          | 55                  | %                    |                   |
| Rise/ Fall Time (10% to 90% Output Level)            | tr/ tf             | E : 1.6<=V <sub>cc</sub> <=2.25V  | —   | 6                   | —                           | —                   | ns                   |                   |
|  |                    | E : 2.25<=V <sub>cc</sub> <=2.8V/ N : 2.25<=V <sub>cc</sub> <=2.75V   | —   | 5                   | —                           | 6                   |                      |                   |
|  |                    | E : 2.8<=V <sub>cc</sub> <=3.63V/ N : 2.97<=V <sub>cc</sub> <=3.63V   | —   | 4.5                 | —                           | 5                   |                      |                   |
| Low Level Output Voltage                             | V <sub>OL</sub>    | I <sub>OL</sub> =4mA  | —   | 10% V <sub>cc</sub> | —                           | 10% V <sub>cc</sub> | V                    |                   |
| High Level Output Voltage                            | V <sub>OH</sub>    | I <sub>OH</sub> =-4mA   | 90% V <sub>cc</sub>                                     | —                   | 90% V <sub>cc</sub>         | —                   | V                    |                   |
| Output Load  | L <sub>CMOS</sub>  |   | 15 <sup>Note2</sup>                                     |                     | 15 <sup>Note2</sup>         |                     | pF                   |                   |
| Low Level Input Voltage                              | V <sub>IL</sub>    |   | —   | 30% V <sub>cc</sub> | —                           | 30% V <sub>cc</sub> | V                    |                   |
| High Level Input Voltage                             | V <sub>IH</sub>    |   | 70% V <sub>cc</sub>                                     | —                   | 70% V <sub>cc</sub>         | —                   | V                    |                   |
| Disable Time   | t <sub>dis</sub>   |   | —   | 200                 | —                           | 150                 | ns                   |                   |
| Enable Time  | t <sub>ena</sub>   |   | —   | 5                   | —                           | 5                   | ms                   |                   |
| Start-up Time  | t <sub>str</sub>   | @Minimum operating voltage to be 0 sec.   | —   | 3                   | —                           | 5                   | ms                   |                   |
| 1 Sigma Jitter                                       | J <sub>Sigma</sub> | Measured with Wavecrest SIA-3000  | —   | 5                   | —                           | 4                   | ps                   |                   |
| Peak to Peak Jitter                                  | J <sub>PK-PK</sub> |   | —   | 50                  | —                           | 40                  | ps                   |                   |
| Phase Jitter   | J <sub>Phase</sub> |   | BW : 12kHz to 20MHz                                     | —                   | 1.0                         | —                   | 0.5                  | ps                |
| Phase Noise  | —                  | @25MHz  | @10Hz offset  | -89                 | —                           | -92                 | dBc/ Hz              |                   |
|  |                    |   | @100Hz offset   | -119                | —                           | -126                |                      |                   |
|  |                    |   | @1kHz offset  | -143                | —                           | -151                |                      |                   |
|  |                    |   | @10kHz offset   | -157                | —                           | -160                |                      |                   |
|  |                    |   | @100kHz offset  | -160                | —                           | -167                |                      |                   |
|  |                    |   | @1MHz offset  | -162                | —                           | -170                |                      |                   |
|  |                    |   | @10MHz offset   | -162                | —                           | -170                |                      |                   |

Note: All electrical characteristics are defined at the maximum load and operating temperature range.

Note1: Please contact us for inquiry about operating temperature range, available frequencies and other conditions.

Note2: Please contact us for Output Load 30pF.

| Pad Connections |                 |
|-----------------|-----------------|
| #1              | Enable/ Disable |
| #2              | Case GND        |
| #3              | Output          |
| #4              | V <sub>cc</sub> |

| INH Function |                         |
|--------------|-------------------------|
| Pad1         | Pad3 (Output)           |
| Open         | Active                  |
| "H" Level    | Active                  |
| "L" Level    | High Z (No-Oscillation) |