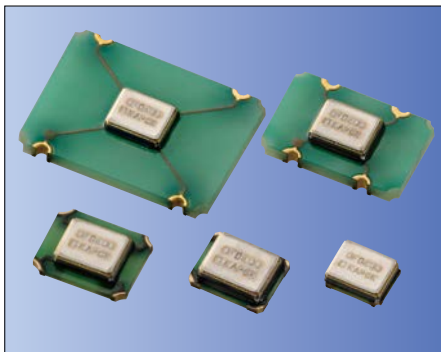


# Clock Oscillators Surface Mount Type

## Clock "K" Series



CMOS/ 1.8V, 2.5V, 3.3V, 5.0V 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

### Applications

- Consumer/ Networking/ Industrial/ Audio Codec/ Amuse

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	$\pm 50$		

### How to Order

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

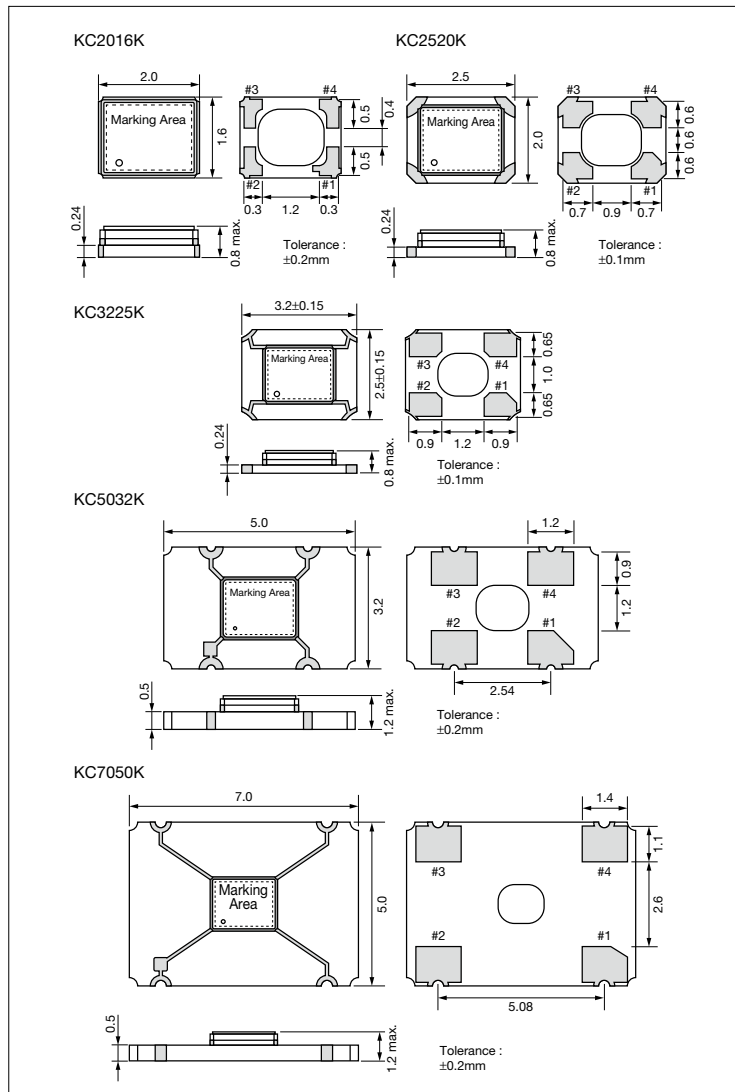
- ① Series
- ② Output Frequency (25.0000: 25MHz)
- ③ Output Type (C: CMOS)
- ④ Supply Voltage
  - 1 : 1.8V/ 2.5V/ 3.3V Multi Voltage (Version E : Standard)
  - 2 : 2.5V (Version N : Low Phase Noise)
  - 3 : 3.3V (Version N : Low Phase Noise)
  - 5 : 5.0V (Version N : Low Phase Noise)
- ⑤ Frequency Tolerance (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")

### Packaging Tape & Reel

- KC7050K/ KC5032K : 1000 pcs/ reel
- KC3225K/ KC2520K/ KC2016K : 2000 pcs/ reel

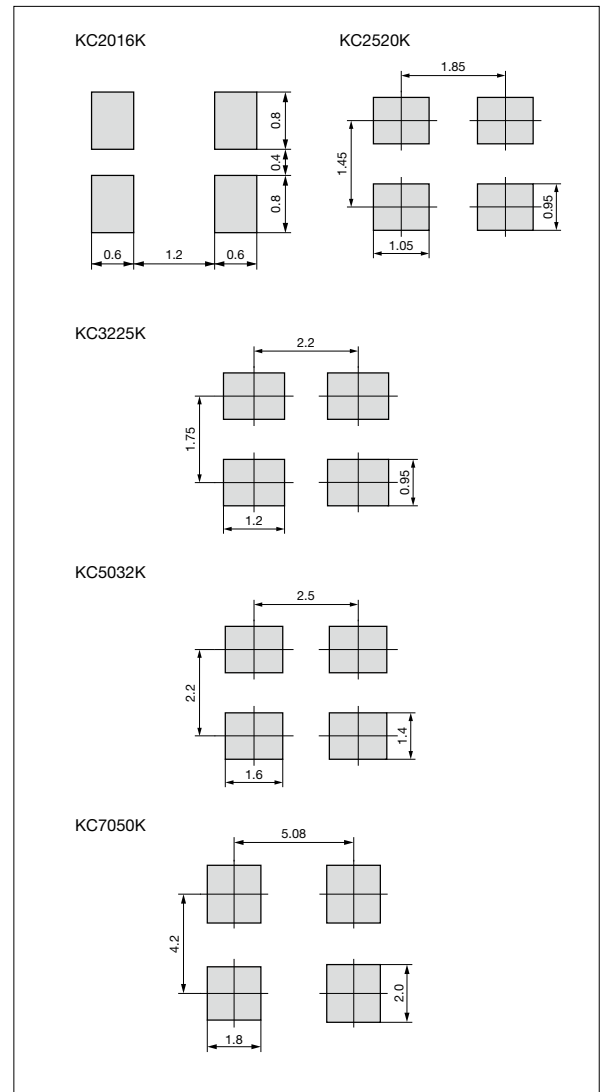
### Dimensions

(Unit: mm)



### Recommended Land Pattern

(Unit: mm)



# Clock Oscillators Surface Mount Type

## Clock "K" Series



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

### Specifications

Item	Symbol	Conditions	Version E (Standard)		Version N (Low Phase Noise)		Units	
			Min.	Max.	Min.	Max.		
Output Frequency Range <sup>Note1</sup>	f <sub>o</sub>		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/ -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	+7.0	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		
		Code ④ : 5	—	—	+4.50	+5.50		
Current Consumption (Maximum Loaded/ 1.5≤F <sub>0</sub> <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		
		N : 4.50≤V <sub>cc</sub> ≤5.50V	—	—	—	24		
Current Consumption (Maximum Loaded/ 24≤F <sub>0</sub> <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		
		N : 4.50≤V <sub>cc</sub> ≤5.50V	—	—	—	24		
Current Consumption (Maximum Loaded/ 40≤F <sub>0</sub> <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		
		N : 4.50≤V <sub>cc</sub> ≤5.50V	—	—	—	24		
Current Consumption (Maximum Loaded/ 62.5≤F <sub>0</sub> <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		
		N : 4.50≤V <sub>cc</sub> ≤5.50V	—	—	—	24		
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		
		N : 4.50≤V <sub>cc</sub> ≤5.50V	—	—	—	8		
Low Level Output Voltage	V <sub>OL</sub>	E : I <sub>OL</sub> = 4mA	—	10% V <sub>cc</sub>	—	10% V <sub>cc</sub>	V	
		N (1.5≤F <sub>0</sub> ≤62.5MHz) : I <sub>OL</sub> = 4mA						
		N (62.5<F <sub>0</sub> ≤80MHz) : I <sub>OL</sub> = 8mA						
High Level Output Voltage	V <sub>OH</sub>	E : I <sub>OH</sub> = -4mA	90% V <sub>cc</sub>	—	90% V <sub>cc</sub>	—	V	
		N (1.5≤F <sub>0</sub> ≤62.5MHz) : I <sub>OL</sub> = 4mA						
		N (62.5<F <sub>0</sub> ≤80MHz) : I <sub>OL</sub> = 8mA						
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>		—	3	—	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	—	0.3	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)

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