

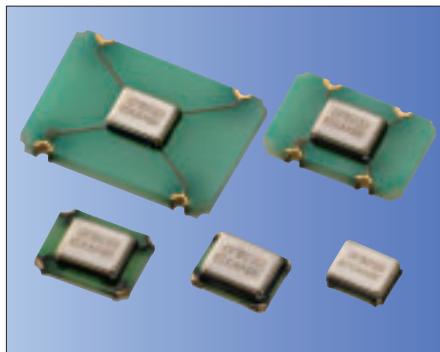


Clock Oscillators Surface Mount Type

Clock "K" Series



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	± 50	-10 to +70	Standard specifications
S	± 30		With only certain frequencies
U	± 25		
G	± 50		
6	± 50		

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

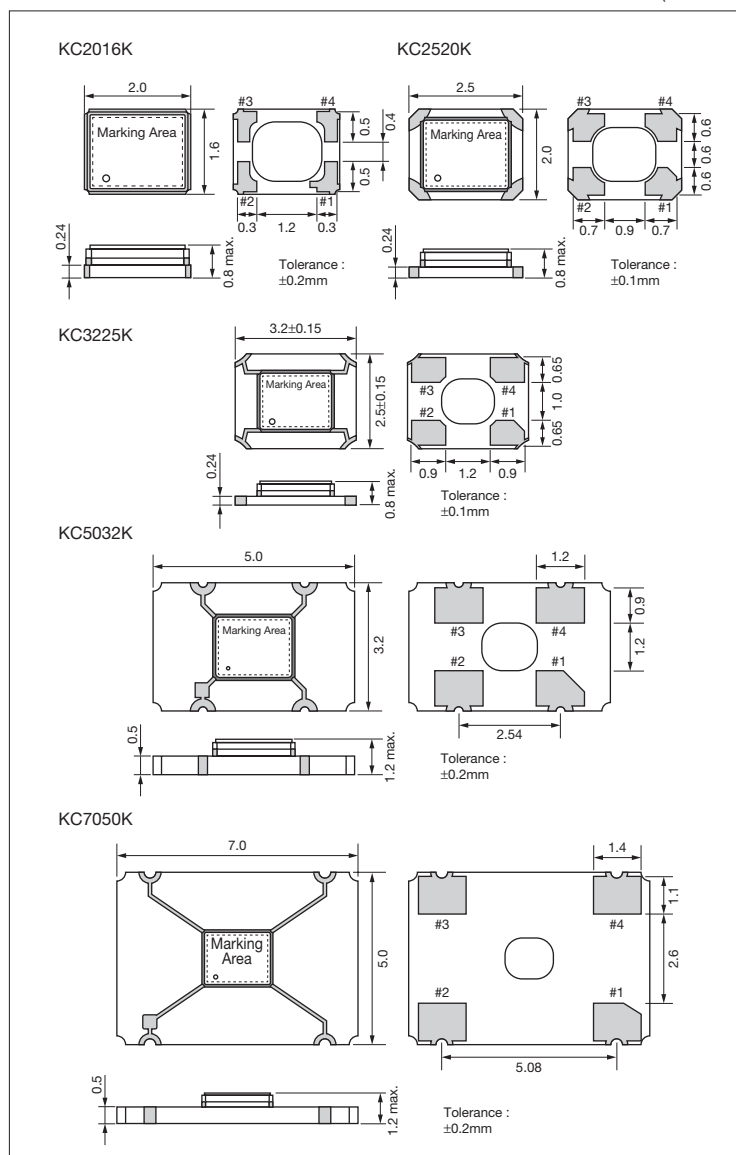
How to Order

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")

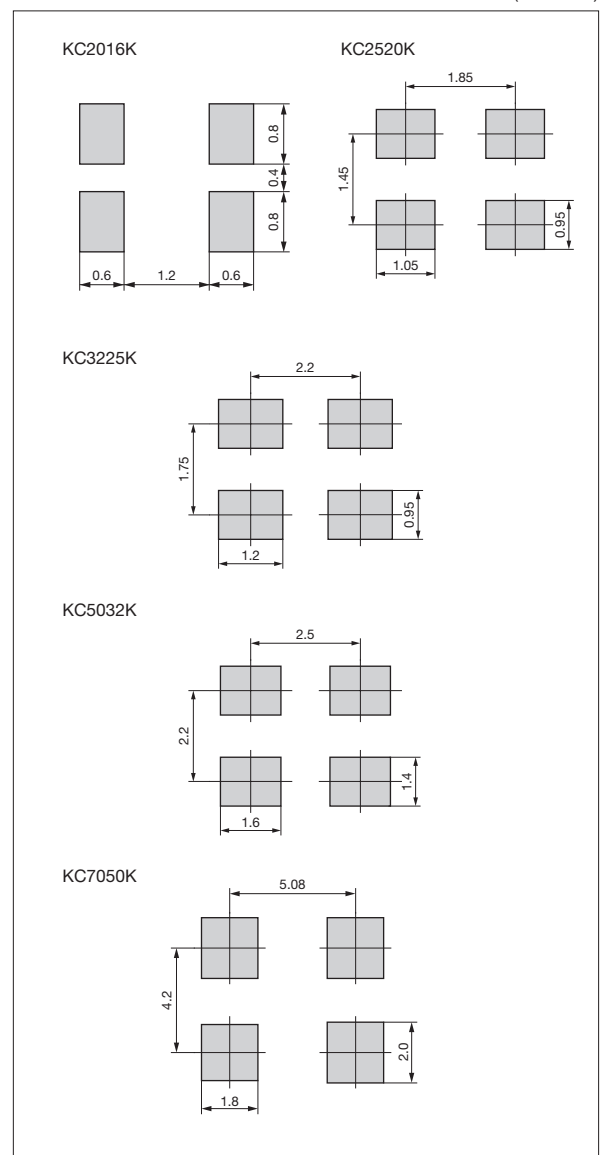
Dimensions

(Unit: mm)



Recommended Land Pattern

(Unit: mm)





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

Specifications

Item	Symbol	Conditions		Version E (Standard)		Version N (Low Phase Noise)		Units
				Min.	Max.	Min.	Max.	
Output Frequency Range ^{Note1}	f _o			1.5	80	1.5	80	MHz
Frequency Tolerance	f _{tol}	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 ⁻⁶
			Op. Temp.: -10 to +70°C	-30	+30	-30	+30	
			Op. Temp.: -10 to +70°C	-25	+25	-25	+25	
Frequency Aging	f _{age}	@25°C First year		-3	+3	-3	+3	×10 ⁻⁶ / y
Storage Temperature Range	T _{stg}			-55	+125	-55	+125	°C
Operating Temperature Range	T _{use}			-10	+70	-10	+70	°C
				-40	+85	-40	+85	
Max. Supply Voltage	—			-40	+105	-40	+105	V
				-0.3	+4.0	-0.3	+4.0	
Supply Voltage	V _{cc}	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≤F ₀ <24MHz)	I _{cc}	E : 1.6≤V _{cc} ≤2.25V		—	2.5	—	—	mA
		E : 2.25<V _{cc} ≤2.8V/ N : 2.25≤V _{cc} ≤2.75V		—	3.0	—	4	
E : 2.8<V _{cc} ≤3.63V/ N : 2.97≤V _{cc} ≤3.63V		—	3.5	—	6			
E : 1.6≤V _{cc} ≤2.25V		—	3.5	—	—			
E : 2.25<V _{cc} ≤2.8V/ N : 2.25≤V _{cc} ≤2.75V		—	4.5	—	5			
E : 2.8<V _{cc} ≤3.63V/ N : 2.97≤V _{cc} ≤3.63V		—	5.0	—	7			
E : 1.6≤V _{cc} ≤2.25V		—	5.0	—	—			
E : 2.25<V _{cc} ≤2.8V/ N : 2.25≤V _{cc} ≤2.75V		—	5.5	—	8			
E : 2.8<V _{cc} ≤3.63V/ N : 2.97≤V _{cc} ≤3.63V		—	6.0	—	11			
E : 1.6≤V _{cc} ≤2.25V		—	6.0	—	—			
E : 2.25<V _{cc} ≤2.8V/ N : 2.25≤V _{cc} ≤2.75V		—	6.5	—	14			
E : 2.8<V _{cc} ≤3.63V/ N : 2.97≤V _{cc} ≤3.63V		—	8.0	—	18			
Stand-by Current	I _{std}			—	5	—	5	μA
Symmetry	SYM	@50% V _{cc}		45	55	45	55	%
Rise/ Fall Time (10% to 90% Output Level)	tr/ tf	E : 1.6≤V _{cc} ≤2.25V		—	6	—	—	ns
		E : 2.25<V _{cc} ≤2.8V/ N : 2.25≤V _{cc} ≤2.75V		—	5	—	6	
		E : 2.8<V _{cc} ≤3.63V/ N : 2.97≤V _{cc} ≤3.63V		—	4.5	—	5	
Low Level Output Voltage	V _{OL}	I _{OL} =4mA		—	10% V _{cc}	—	10% V _{cc}	V
High Level Output Voltage	V _{OH}	I _{OH} =-4mA		90% V _{cc}	—	90% V _{cc}	—	V
Output Load	L _{CMOS}			15 ^{Note2}		15 ^{Note2}		pF
Low Level Input Voltage	V _{IL}			—	30% V _{cc}	—	30% V _{cc}	V
High Level Input Voltage	V _{IH}			70% V _{cc}	—	70% V _{cc}	—	V
Disable Time	t _{dis}			—	200	—	150	ns
Enable Time	t _{ena}			—	5	—	5	ms
Start-up Time	t _{str}	@Minimum operating voltage to be 0 sec.		—	3	—	5	ms
1 Sigma Jitter	J _{Sigma}	Measured with Wavecrest SIA-3000		—	5	—	4	ps
Peak to Peak Jitter	J _{PK-PK}			—	50	—	40	ps
Phase Jitter	J _{Phase}			—	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 _{cc}

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