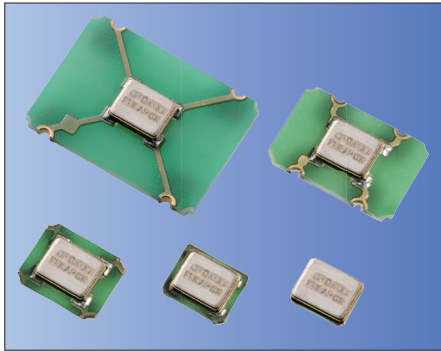




CMOS/ 1.8V, 2.5V, 3.3V, 5.0V / 2.0×1.6, 2.5×2.0, 3.2×2.5, 5.0×3.2, 7.0×5.0mm



RoHS Compliant

Features

- Frequency Range 1.5 to 160MHz
- CMOS output
- Wide Supply Voltage
 - 2.5,3.3,5.0V(Ver.N)
- Low current consumption
- Option: Low Phase Noise Version

Applications

- Consumer/ Networking/ Industrial/ Audio Codec/ Amuse

How to Order

KC2520K 25.0000 C □ □ □ 00
① ② ③ ④ ⑤ ⑥ ⑦

- ①Series
- ②Output Frequency (25.0000: 25MHz)
- ③Output Type (C: CMOS)
- ④Supply Voltage
Low Phase Noise : Version N

2	2.5V	3	3.3V
5	5.0V		

⑤Frequency Tolerance (See Table 1)

⑥Symmetry/ INH Function

N	45/ 55%
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⑦Individual Specification
(STD Specification is "00".)

Packaging Tape & Reel

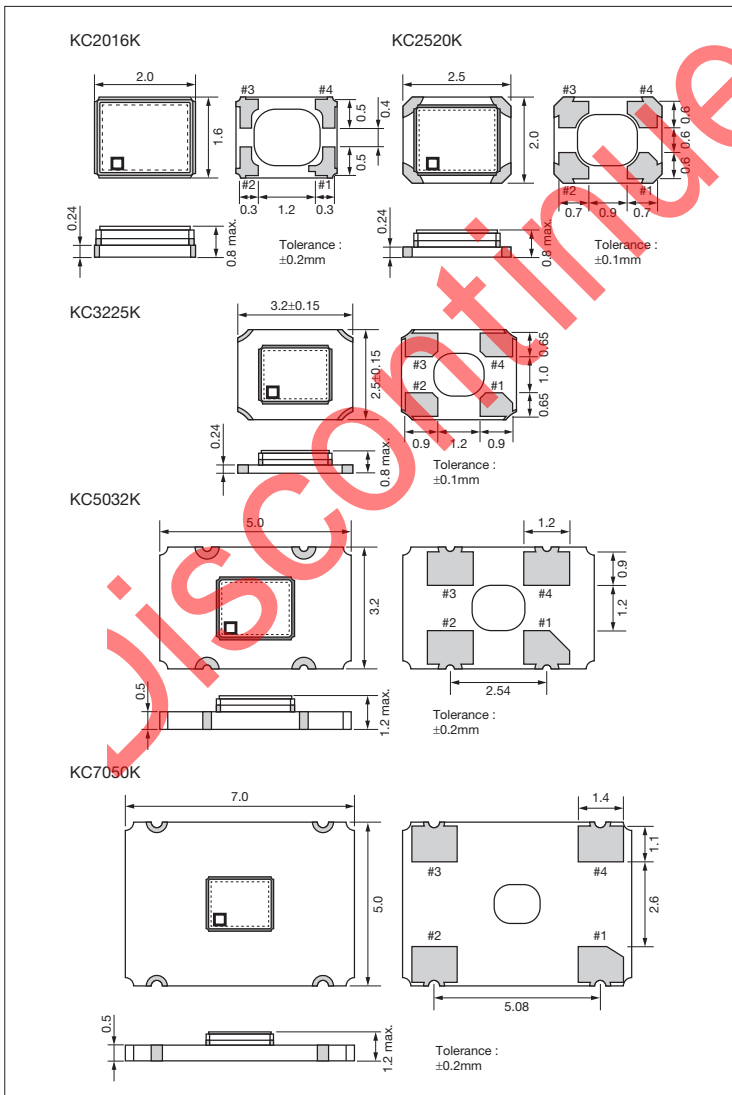
KC7050K/ KC5032K	1000 pcs./ reel
KC3225K/ KC2520K/ KC2016K	2000 pcs./ reel

Table 1

Freq. Tol. Code	Tolerance × 10 ⁻⁶	Operating Temperature Range (°C)	Note
0	± 50	-10 to +70	Standard specifications
S	± 30	-10 to +70	With only certain frequencies
U	± 25	-40 to +85	
G	± 50	-40 to +85	
6	± 50	-40 to +105	

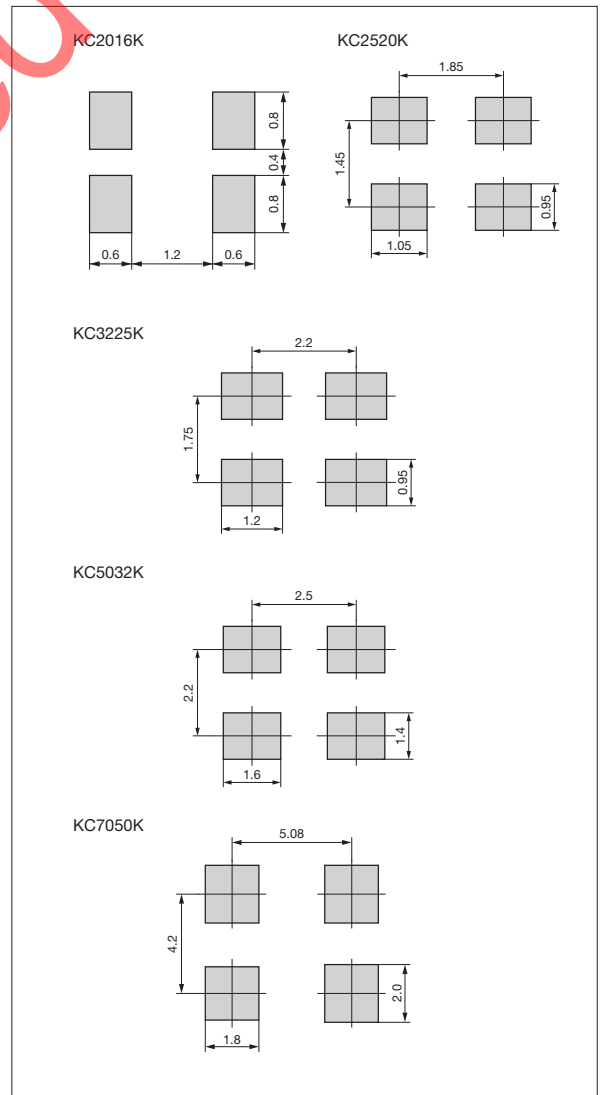
Dimensions

(Unit: mm)



Recommended Land Pattern

(Unit: mm)





CMOS/ 1.8V, 2.5V, 3.3V, 5.0V / 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 N (Low Phase Noise)		Unit	
			Min.(codeU)	Max.(codeU)		
Output Frequency Range ^{Note1}	f _o		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	Temp.: -10 to +70°C/ -40 to +85°C/ -40 to +105°C	-50	+50	×10 ⁻⁶
			Temp.: -10 to +70°C	-30	+30	
			Temp.: -10 to +70°C	-25	+25	
Frequency Aging	f _{age}	@25°C First year	-3	+3	×10 ⁻⁶ /y	
Storage Temperature Range	T _{stg}		-55	+125	°C	
Operating Temperature Range	T _{use}		-10	+70	°C	
			-40	+85		
			-40	+105		
Max. Supply Voltage	—		-0.3	+7.0	V	
Supply Voltage	V _{cc}	CodeⓄ : 2	+2.25(+2.38)	+2.75(+2.62)	V	
		CodeⓄ : 3	+2.97(+3.14)	+3.63(+3.46)		
		CodeⓄ : 5	+4.5(+4.75)	+5.5(+5.25)		
Current Consumption (Maximum Loaded)	I _{cc}	1.5<F0≤24MHz	2.25≤V _{cc} ≤2.75V	—	4	mA
			2.97≤V _{cc} ≤3.63V	—	6	
			4.50≤V _{cc} ≤5.50V	—	24	
		24<F0≤40MHz	2.25≤V _{cc} ≤2.75V	—	5	
			2.97≤V _{cc} ≤3.63V	—	7	
			4.50≤V _{cc} ≤5.50V	—	24	
		40<F0≤62.5MHz	2.25≤V _{cc} ≤2.75V	—	8	
			2.97≤V _{cc} ≤3.63V	—	11	
			4.50≤V _{cc} ≤5.50V	—	24	
		62.5<F0≤80MHz	2.25≤V _{cc} ≤2.75V	—	14	
			2.97≤V _{cc} ≤3.63V	—	18	
			4.50≤V _{cc} ≤5.50V	—	40	
Stand-by Current	I _{std}	1.5≤F _o ≤80MHz	—	10.0	μA	
Symmetry	SYM	@50% V _{cc}	45	55	%	
Rise/ Fall Time (10% to 90% Output Level)	Tr/ Tf	1.5≤F _o ≤80MHz	2.25≤V _{cc} ≤2.75V	—	6.0	ns
			2.97≤V _{cc} ≤3.63V	—	5.0	
			4.50≤V _{cc} ≤5.50V	—	8.0	
Low Level Output Voltage	V _{OL}	1.5≤F _o ≤62.5MHz : I _{OL} = 4mA	—	10% V _{cc}	V	
		62.5<F _o ≤80MHz : I _{OL} = 8mA				
High Level Output Voltage	V _{OH}	1.5≤F _o ≤62.5MHz : I _{OL} = 4mA	90% V _{cc}	—	V	
		62.5<F _o ≤80MHz : I _{OL} = 8mA				
Output Load	L _{CMOS}		30		pF	
Low Level Input Voltage	V _{IL}		—	30% V _{cc}	V	
High Level Input Voltage	V _{IH}		70% V _{cc}	—	V	
Disable Time	t _{dis}		—	150	ns	
Enable Time	t _{ena}		—	5	ms	
Start-up Time	t _{str}		—	5	ms	
1 Sigma Jitter	J _{Sigma}		—	4	ps	
Peak to Peak Jitter	J _{PK-PK}		—	40	ps	
Phase Jitter	J _{Phase}	@25MHz	BW : 12kHz to 20MHz	—	0.5	ps
Phase Noise	—	@25MHz	@10Hz offset	Typ. -92		dBc/ Hz
			@100Hz offset	Typ. -126		
			@1kHz offset	Typ. -151		
			@10kHz offset	Typ. -160		
			@100kHz offset	Typ. -167		
			@1MHz offset	Typ. -170		
			@10MHz offset	Typ. -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.

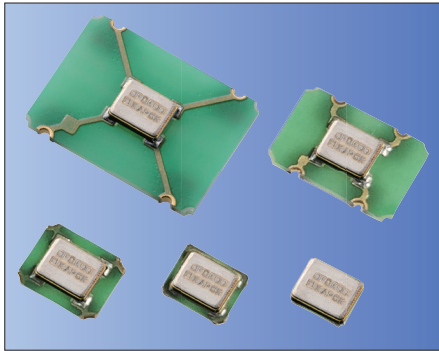
Pad Connections	
#1	INH
#2	Case GND
#3	Output
#4	V _{cc}

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





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



AEC-Q100/200 RoHS Compliant

Features

- Frequency Range 1.5 to 160MHz
- CMOS output
- Wide Supply Voltage
 - 1.6 to 3.63V (Ver.E)
 - 2.5,3.3,5.0V(Ver.N)
- Low current consumption
- Option: Low Phase Noise Version

Applications

- Automotive Radar/ Camera/ Navigation/ Sensor/ Mirror/ Head light

Table 1

Freq. Tol. Code	Tolerance $\times 10^{-6}$	Operating Temperature Range (°C)	Note
G	± 50	-40 to +85	Standard specifications
6	± 50	-40 to +105	
X	± 100	-40 to +125	

How to Order

MC2520K 25.0000 C □ □ □ SH
① ② ③ ④ ⑤ ⑥ ⑦

- ①Series
- ②Output Frequency (25.0000: 25MHz)
- ③Output Type (C: CMOS)
- ④Supply Voltage
Low Phase Noise : Version N

2	2.5V	3	3.3V
5	5.0V		

⑤Frequency Tolerance (See Table 1)

⑥Symmetry/ INH Function

N	45/ 55%, Low Phase Noise
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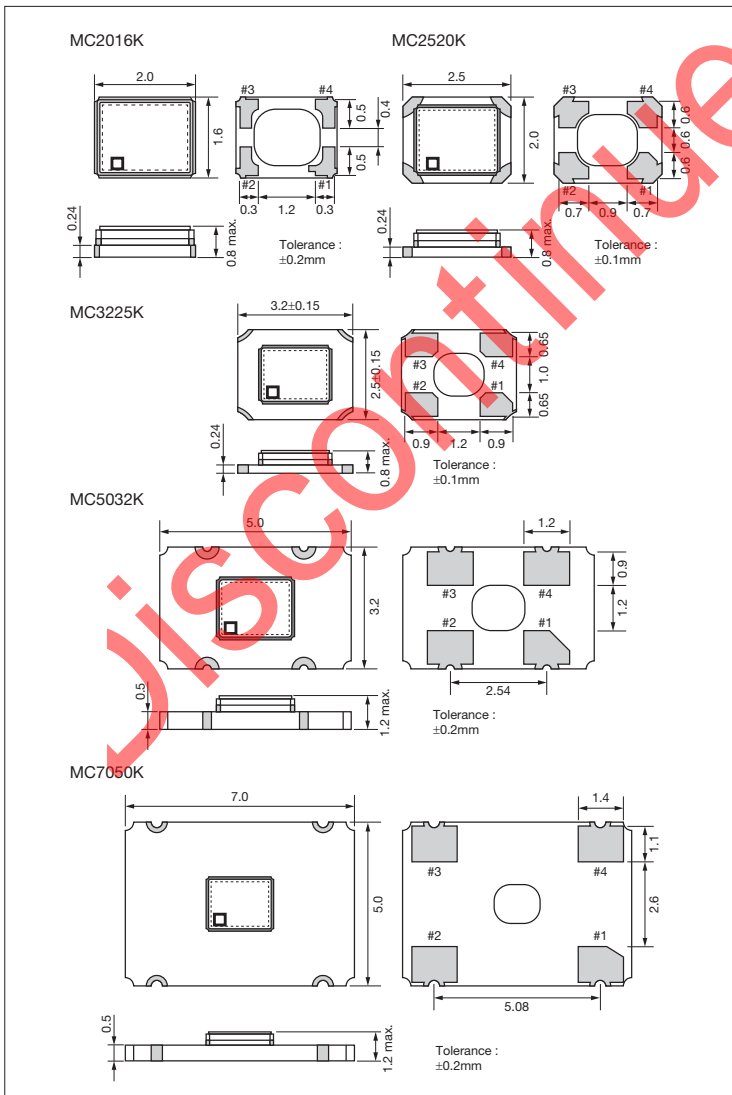
⑦Individual Specification (STD Specification is "SH")

Packaging Tape & Reel

MC7050K/ MC5032K	1000 pcs./ reel
MC3225K/ MC2520K/ MC2016K	2000 pcs./ reel

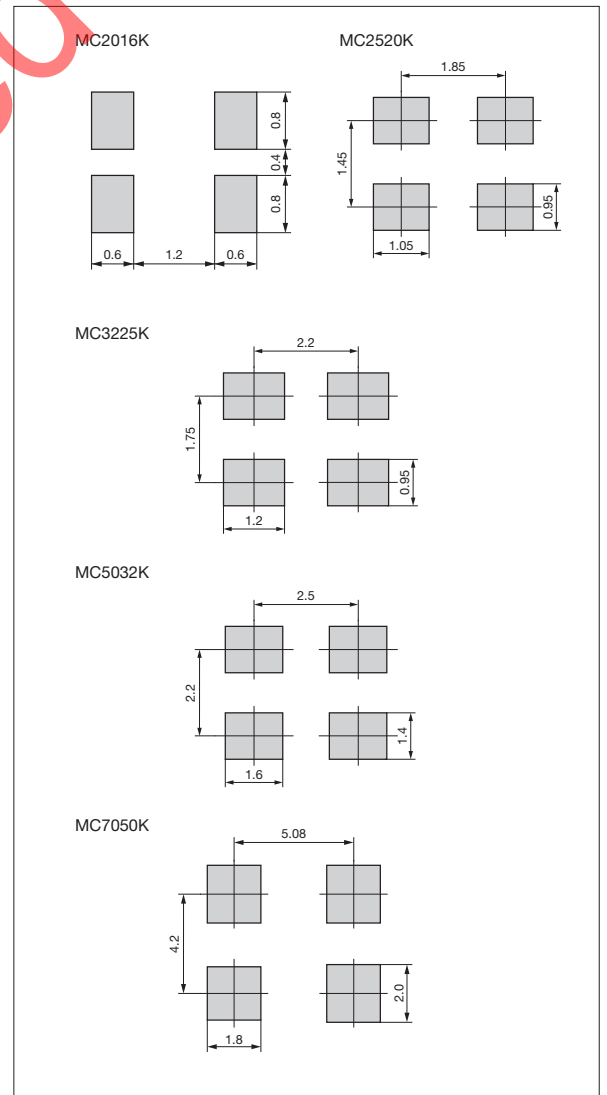
Dimensions

(Unit: mm)



Recommended Land Pattern

(Unit: mm)





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

Specifications

Item	Symbol	Conditions		Version N (Low Phase Noise)		Unit	
				Min.(codeU)	Max.(codeU)		
Output Frequency Range ^{Note1}	f _o			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	Temp.: -40 to +85°C/ -40 to +105°C	-50	+50	×10 ⁻⁶	
			Temp.: -40 to +125°C	-100	+100		
Frequency Aging	f _{age}	@25°C First year		-3	+3	×10 ⁻⁶ /y	
Storage Temperature Range	T _{stg}			-55	+125	°C	
Operating Temperature Range	T _{use}			-40	+85	°C	
				-40	+105		
				-40	+125		
Max. Supply Voltage	—			-0.3	+7.0	V	
Supply Voltage	V _{cc}	CodeⓄ : 2		+2.25(+2.38)	+2.75(+2.62)	V	
		CodeⓄ : 3		+2.97(+3.14)	+3.63(+3.46)		
		CodeⓄ : 5		+4.5(+4.75)	+5.5(+5.25)		
Current Consumption (Maximum Loaded)	I _{cc}	1.5<F0≤24MHz	2.25≤V _{cc} ≤2.75V	—	4	mA	
			2.97≤V _{cc} ≤3.63V	—	6		
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		24<F0≤40MHz	2.25≤V _{cc} ≤2.75V	—	5		
			2.97≤V _{cc} ≤3.63V	—	7		
			4.50≤V _{cc} ≤5.50V	—	24		
		40<F0≤62.5MHz	2.25≤V _{cc} ≤2.75V	—	8		
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			4.50≤V _{cc} ≤5.50V	—	40		
Stand-by Current	I _{std}	1.5≤F _o ≤80MHz		—	10.0	μA	
Symmetry	SYM	@50% V _{cc}		45	55	%	
Rise/ Fall Time (10% to 90% Output Level)	Tr/ Tf	1.5≤F _o ≤80MHz	2.25≤V _{cc} ≤2.75V	—	6.0	ns	
			2.97≤V _{cc} ≤3.63V	—	5.0		
			4.50≤V _{cc} ≤5.50V	—	8.0		
Low Level Output Voltage	V _{OL}	1.5≤F _o ≤62.5MHz : I _{OL} = 4mA			10% V _{cc}	V	
		62.5<F _o ≤80MHz : I _{OL} = 8mA					
High Level Output Voltage	V _{OH}	1.5≤F _o ≤62.5MHz : I _{OL} = 4mA	90% V _{cc}		—	V	
		62.5<F _o ≤80MHz : I _{OL} = 8mA					
Output Load	L _{CMOS}			30 (5.0V)/ 15 (2.5, 3.3V)		pF	
Low Level Input Voltage	V _{IL}			—	30% V _{cc}	V	
High Level Input Voltage	V _{IH}			70% V _{cc}	—	V	
Disable Time	t _{dis}			—	150	ns	
Enable Time	t _{ena}			—	5	ms	
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1Sigma Jitter	J _{Sigma}			—	4	ps	
Peak to Peak Jitter	J _{PK-PK}			—	40	ps	
Phase Jitter	J _{Phase}	@25MHz	BW : 12kHz to 20MHz		—	0.5	ps
		@25MHz	@10Hz offset	Typ. -92		dBc/ Hz	
@100Hz offset	Typ. -126						
@1kHz offset	Typ. -151						
@10kHz offset	Typ. -160						
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INH Function	
Pad1	Pad3 (Output)
Open	Active
"H" Level	Active
"L" Level	High Z (No-Oscillation)

Crystal Oscillators

