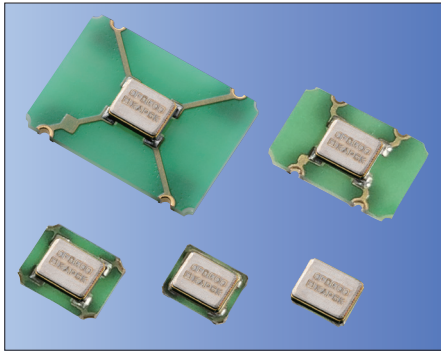




CMOS/ 1.8V, 2.5V, 3.3V, 5.0V / 2.0×1.6, 2.5×2.0, 3.2×2.5, 5.0×3.2, 7.0×5.0mm for Automotive



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. Code	Tol. $\times 10^{-6}$	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
Standard : Version E

④	Supply Voltage
1	1.8V/ 2.5V/ 3.3V compatible
2	2.5V/ 3.3V compatible

Low Phase Noise : Version N

④	Supply Voltage	⑤	Supply Voltage
2	2.5V	3	3.3V
5	5.0V		

- ⑤Frequency Tolerance (See Table 1)
- ⑥Symmetry/ INH Function

⑥	Frequency Tolerance
E	45/ 55%
N	45/ 55%, Low Phase Noise

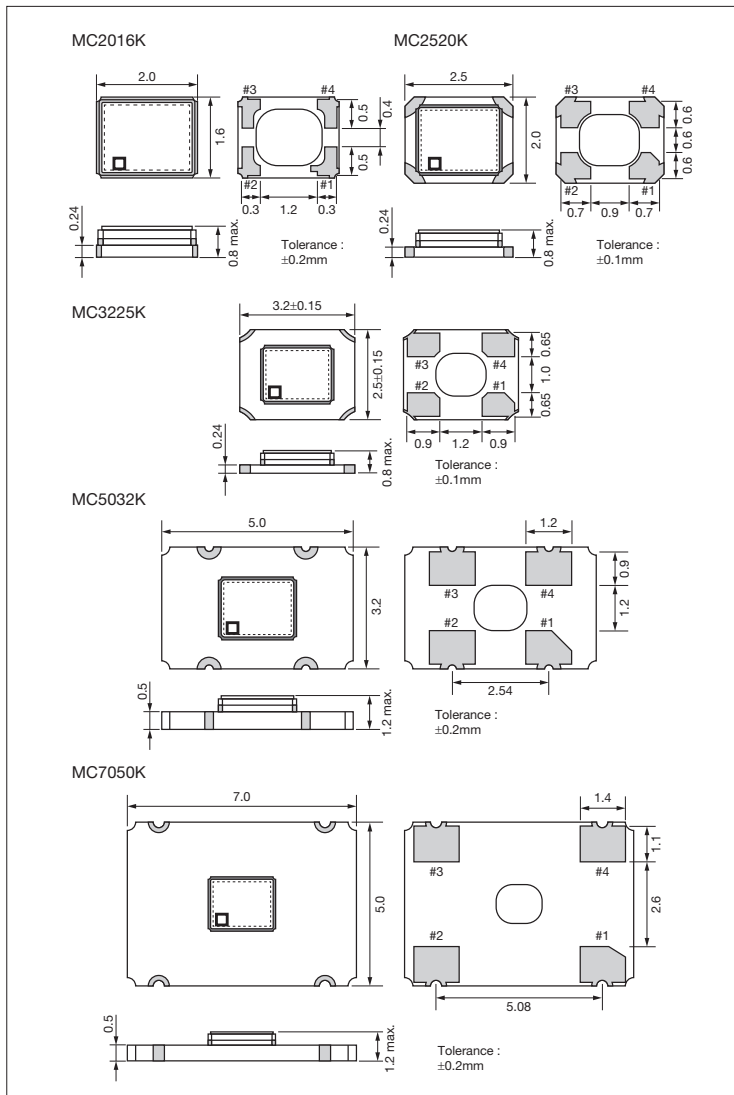
- ⑦Individual Specification
(STD Specification is "SH".)

Packaging Tape & Reel

Part Number	Quantity
MC7050K/ MC5032K	1000 pcs./ reel
MC3225K/ MC2520K/ MC2016K	2000 pcs./ reel

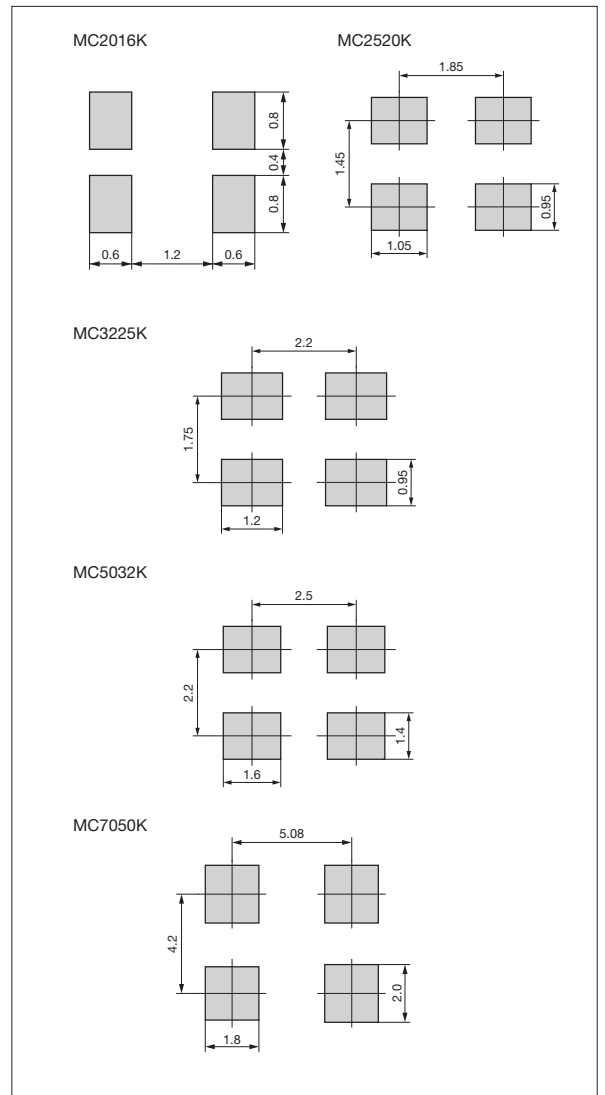
Dimensions

(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 E (Standard)		Version N (Low Phase Noise)		Unit			
				Min.	Max.	Min.(codeU)	Max.(codeU)				
Output Frequency Range ^{Note1}	f _o			1.5	160	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	-50	+50	×10 ⁻⁶			
			Temp.: -40 to +125°C	-100	+100	-100	+100				
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}			-40	+85	-40	+85	°C			
				-40	+105	-40	+105				
				-40	+125	-40	+125				
Max. Supply Voltage	—			-0.3	+4.0	-0.3	+7.0	V			
Supply Voltage	V _{cc}	CodeⓄ : 1/ E : 1.5≤F ₀ ≤125MHz		+1.60	+3.63	—	—	V			
		CodeⓄ : 2/ E : 125<F ₀ ≤160MHz		+2.25	+3.63	—	—				
		CodeⓄ : 2/ N : 1.5≤F ₀ ≤80MHz		—	—	+2.25(+2.38)	+2.75(+2.62)				
		CodeⓄ : 3/ N : 1.5≤F ₀ ≤80MHz		—	—	+2.97(+3.14)	+3.63(+3.46)				
		CodeⓄ : 5/ N : 1.5≤F ₀ ≤80MHz		—	—	+4.5(+4.75)	+5.5(+5.25)				
Current Consumption (Maximum Loaded)	I _{cc}	1.5≤F ₀ ≤24MHz	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				
			N : 4.50≤V _{cc} ≤5.50V	—	—	—	24				
		24<F ₀ ≤40MHz	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				
			N : 4.50≤V _{cc} ≤5.50V	—	—	—	24				
		40<F ₀ ≤62.5MHz	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				
			N : 4.50≤V _{cc} ≤5.50V	—	—	—	24				
		62.5<F ₀ ≤80MHz	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				
			N : 4.50≤V _{cc} ≤5.50V	—	—	—	40				
		80<F ₀ ≤125MHz	E : 1.6≤V _{cc} ≤2.25V	—	11.0	—	—				
			E : 2.25<V _{cc} ≤2.8V	—	14.0	—	—				
			E : 2.8<V _{cc} ≤3.63V	—	17.0	—	—				
		125<F ₀ ≤160MHz	E : 2.25<V _{cc} ≤2.8V	—	25.0	—	—				
			E : 2.8<V _{cc} ≤3.63V	—	27.0	—	—				
		Stand-by Current	I _{std}	1.5≤F ₀ ≤80MHz		—	5.0		—	10.0	μA
				80≤F ₀ ≤125MHz		—	5.0		—	—	
				125≤F ₀ ≤160MHz		—	10.0		—	—	
Symmetry	SYM	@50% V _{cc}		45	55	45	55	%			
Rise/ Fall Time (10% to 90% Output Level)	Tr/ Tf	1.5≤F ₀ ≤80MHz	E : 1.6≤V _{cc} ≤2.25V	—	6.0	—	—	ns			
			E : 2.25<V _{cc} ≤2.8V/ N : 2.25≤V _{cc} ≤2.75V	—	5.0	—	6.0				
			E : 2.8<V _{cc} ≤3.63V/ N : 2.97≤V _{cc} ≤3.63V	—	4.5	—	5.0				
			N : 4.50≤V _{cc} ≤5.50V	—	—	—	8.0				
		80<F ₀ ≤125MHz	E : 1.6<V _{cc} ≤3.63V	—	4.0	—	—				
125<F ₀ ≤160MHz	E : 2.25<V _{cc} ≤3.63V	—	2.5	—	—						
Low Level Output Voltage	V _{OL}	E : I _{OL} = 4mA		—	10% V _{cc}	—	10% V _{cc}	V			
		N (1.5≤F ₀ ≤62.5MHz) : I _{OL} = 4mA									
		N (62.5<F ₀ ≤80MHz) : I _{OL} = 8mA									
High Level Output Voltage	V _{OH}	E : I _{OH} = -4mA		90% V _{cc}	—	90% V _{cc}	—	V			
		N (1.5≤F ₀ ≤62.5MHz) : I _{OH} = -4mA									
		N (62.5<F ₀ ≤80MHz) : I _{OH} = -8mA									
Output Load	L _{CMOS}			15		30 (5.0V)/ 15 (2.5, 3.3V)		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			





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

Item	Symbol	Conditions		Version E (Standard)		Version N (Low Phase Noise)		Unit
				Min.	Max.	Min.(codeU)	Max.(codeU)	
Disable Time	t _{dis}	1.5≤F0≤80MHz		—	200	—	150	ns
		80<F0≤125MHz		—	200	—	—	
		125<F0≤160MHz		—	100	—	—	
Enable Time	t _{ena}			—	5	—	5	ms
Start-up Time	t _{str}	1.5≤F0≤80MHz	@Minimum operating voltage to be 0 sec.	—	5	—	5	ms
		80<F0≤125MHz		—	5	—	—	
		125<F0≤160MHz		—	10	—	—	
1Sigma Jitter	J _{Sigma}	1.5≤F0≤80MHz	Measured with Wavecrest SIA-3000	—	5	—	4	ps
		80<F0≤125MHz		—	5	—	—	
		125<F0≤160MHz		—	3	—	—	
Peak to Peak Jitter	J _{PK-PK}	1.5≤F0≤80MHz		—	50	—	40	ps
		80<F0≤125MHz		—	50	—	—	
		125<F0≤160MHz		—	25	—	—	
Phase Jitter	J _{Phase}	@25MHz	BW : 12kHz to 20MHz	—	1.0	—	0.5	ps
Phase Noise	—	@25MHz	@10Hz offset	Typ. -89		Typ. -92		dBc/ Hz
			@100Hz offset	Typ. -119		Typ. -126		
			@1kHz offset	Typ. -143		Typ. -151		
			@10kHz offset	Typ. -157		Typ. -160		
			@100kHz offset	Typ. -160		Typ. -167		
			@1MHz offset	Typ. -162		Typ. -170		
@10MHz offset	Typ. -162		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	Vcc

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

