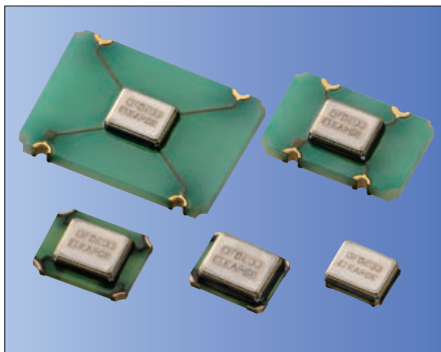


Clock Oscillators Surface Mount Type

Clock "MC" 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 for Automotive



RoHS Compliant

Features

- Frequency Range 1.5 to 80MHz
- 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
- AEC-Q100/ 200 qualified

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

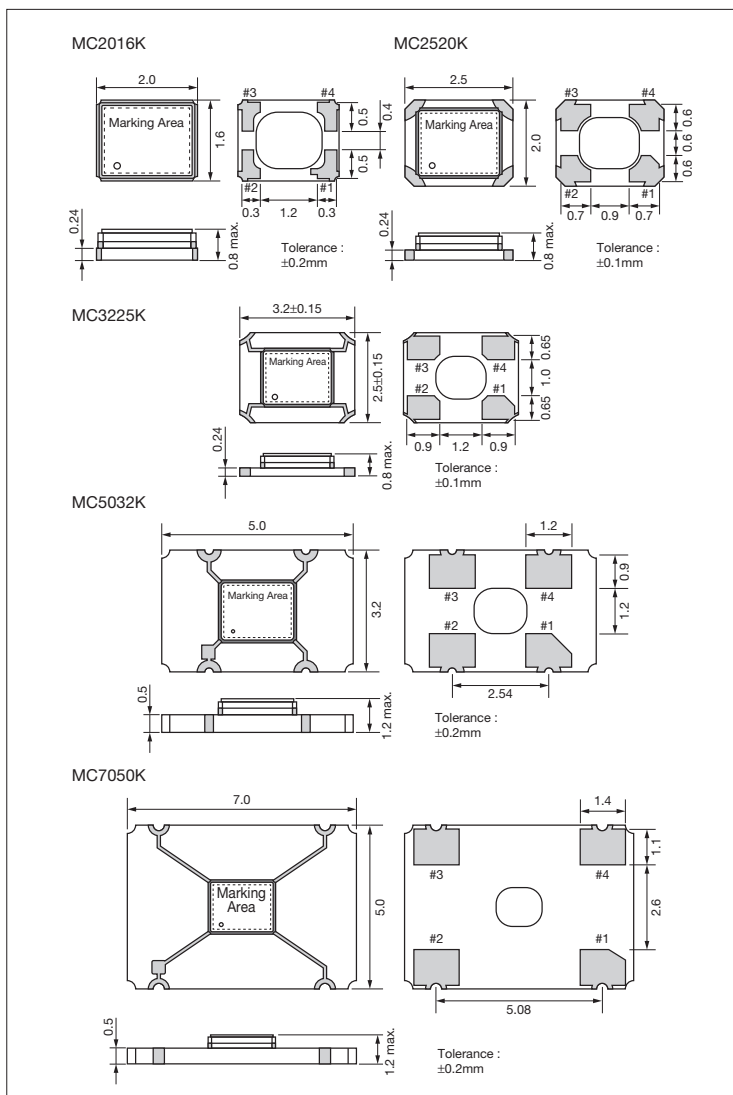
MC2520K 25.0000 C 1 0 E 00
 ① ② ③ ④ ⑤ ⑥ ⑦

- ① Series
- ② Output Frequency (25.0000: 25MHz)
- ③ Output Type (C: CMOS)
- ④ Supply Voltage
 - 1 : 1.8V/ 2.5V/ 3.3V compatible (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
 MC7050K/ MC5032K
 : 1000 pcs/ reel
 MC3225K/ MC2520K/ MC2016K
 : 2000 pcs/ reel

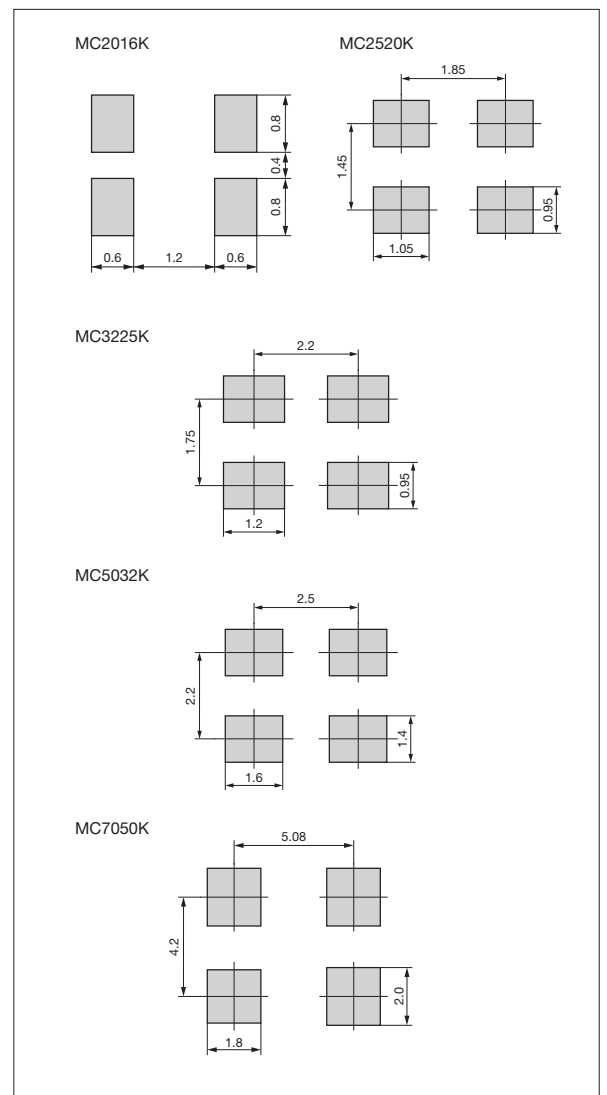
Dimensions

(Unit: mm)



Recommended Land Pattern

(Unit: mm)



Clock Oscillators Surface Mount Type

Clock "MC" Series



CMOS/ 1.8V, 2.5V, 3.3V, 5.0V Compatible/ 2.0x1.6, 2.5x2.0, 3.2x2.5, 5.0x3.2, 7.0x5.0mm for Automotive

Specifications

Item	Symbol	Conditions	Version E (Standard)		Version N (Low Phase Noise)		Units	
			Min.	Max.	Min.(Code U)	Max.(Code U)		
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.: -40 to +85°C/ -40 to +105°C	-50	+50	-50	+50	×10 ⁻⁶
			Op. 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		
Max. Supply Voltage	—		-0.3	+4.0	-0.3	+7.0	V	
Supply Voltage	V _{cc}	Code ④ : 1	+1.60	+3.63	—	—	V	
		Code ④ : 2	—	—	+2.25(+2.38)	+2.75(+2.62)		
		Code ④ : 3	—	—	+2.97(+3.14)	+3.63(+3.46)		
		Code ④ : 5	—	—	+4.50(+4.75)	+5.50(+5.25)		
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		
		N : 4.50<=V _{cc} <=5.50V	—	—	—	24		
Current Consumption (Maximum Loaded/ 24<F ₀ <=40MHz)	I _{cc}	E : 1.6<=V _{cc} <=2.25V	—	3.5	—	—	mA	
		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		
Current Consumption (Maximum Loaded/ 40<F ₀ <=62.5MHz)	I _{cc}	E : 1.6<=V _{cc} <=2.25V	—	5.0	—	—	mA	
		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		
Current Consumption (Maximum Loaded/ 62.5<F ₀ <=80MHz)	I _{cc}	E : 1.6<=V _{cc} <=2.25V	—	6.0	—	—	mA	
		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		
Stand-by Current	I _{std}		—	5	—	10	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		
		N : 4.50<=V _{cc} <=5.50V	—	—	—	8		
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 N (1.5<=F ₀ <=62.5MHz) : I _{OL} = 4mA N (62.5<F ₀ <=80MHz) : I _{OL} = 8mA	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.	—	5	—	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}	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			
Phase Noise @156.25MHz 3.3V Typ.	—		- 77 (@10Hz offset)				dBc/ Hz	
			-103 (@100Hz offset)					
			-133 (@1kHz offset)					
			-143 (@10kHz offset)					
			-149 (@100kHz offset)					
			-149 (@1MHz offset)					

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)