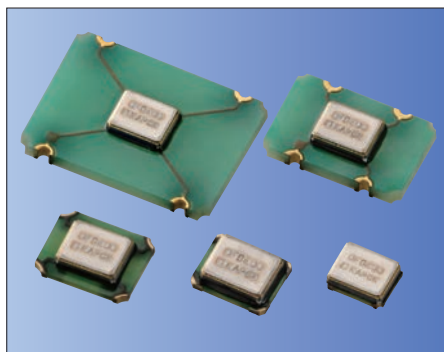


Clock Oscillators Surface Mount Type Clock "MC" Series



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. Tol.		Operating Temperature Range (°C)	Note
Code	× 10 ⁻⁶		
G	± 50	-40 to +85	Standard specifications
6	± 50	-40 to +105	
X	± 100	-40 to +125	

How to Order

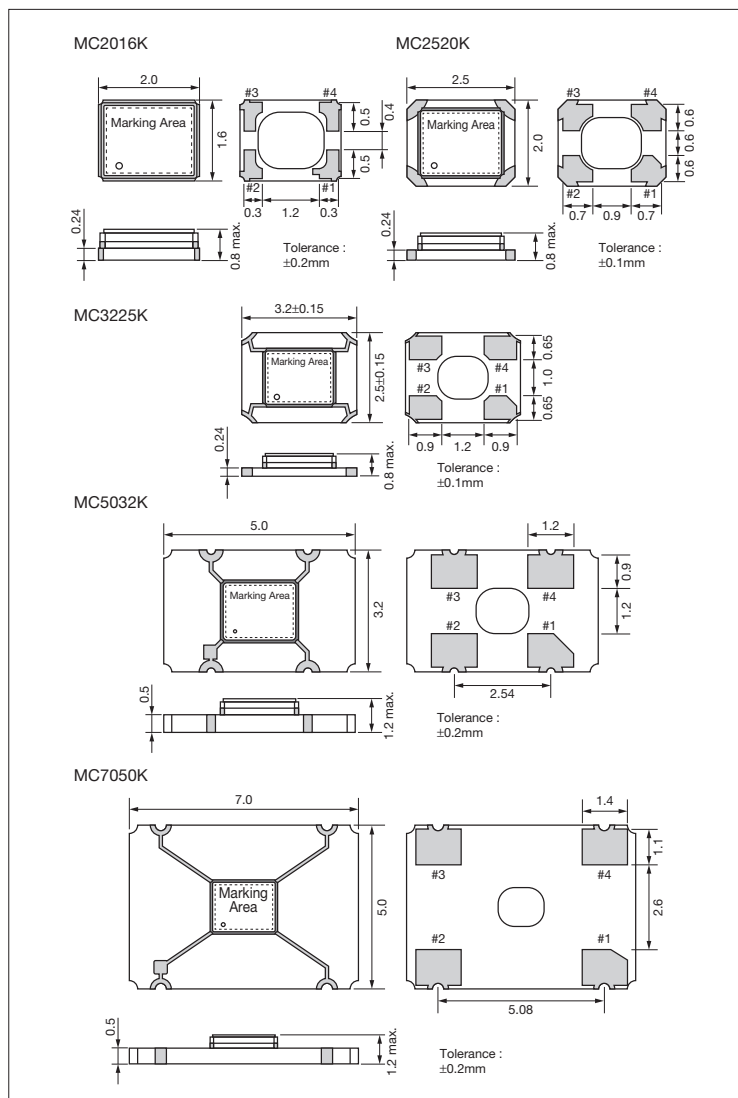
MC2520K 25.0000 C 1 0 E 00
① ② ③ ④ ⑤ ⑥ ⑦

- 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

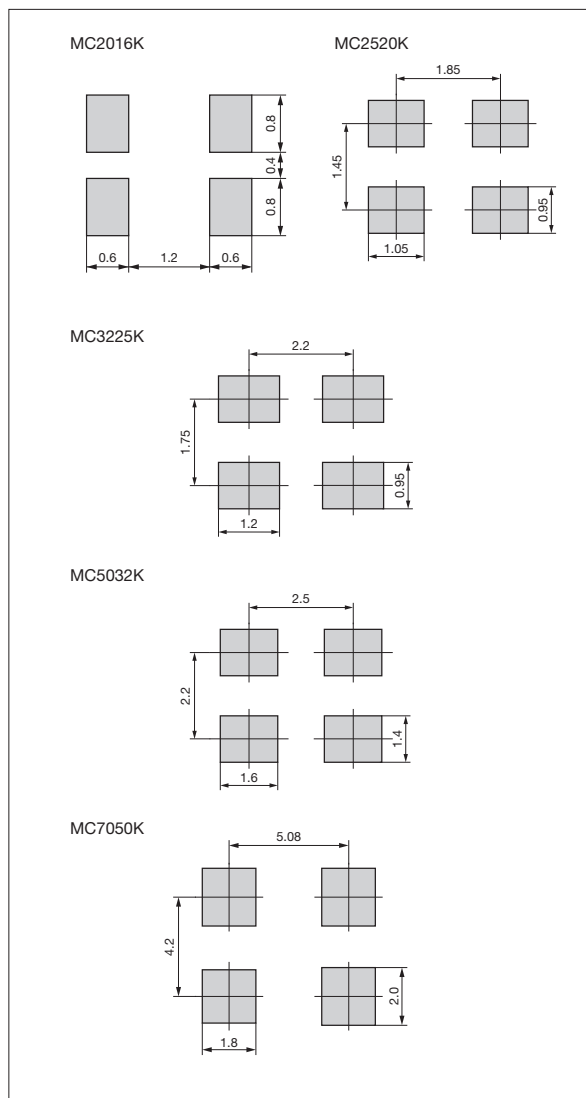
Dimensions

(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/ 2.0×1.6, 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)		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	—			-40	+125	-40	+125	V
				-0.3	+4.0	-0.3	+7.0	
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)		E : 1.6≤V _{CC} ≤2.25V		—	2.5	—	—	
		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)		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	
Current Consumption (Maximum Loaded/ 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	
Current Consumption (Maximum Loaded/ 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	
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		90% V _{CC}	—	90% V _{CC}	—	V
		N (1.5≤F ₀ ≤62.5MHz) : I _{OL} = 4mA N (62.5<F ₀ ≤80MHz) : I _{OL} = 8mA						
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.	—			-162		-170		dBc/ Hz

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)