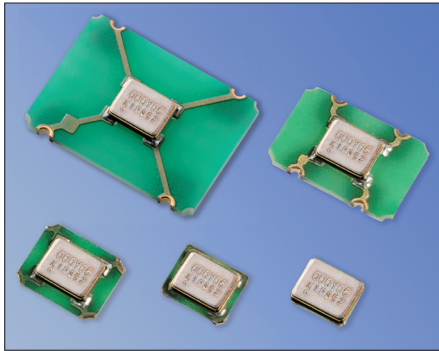




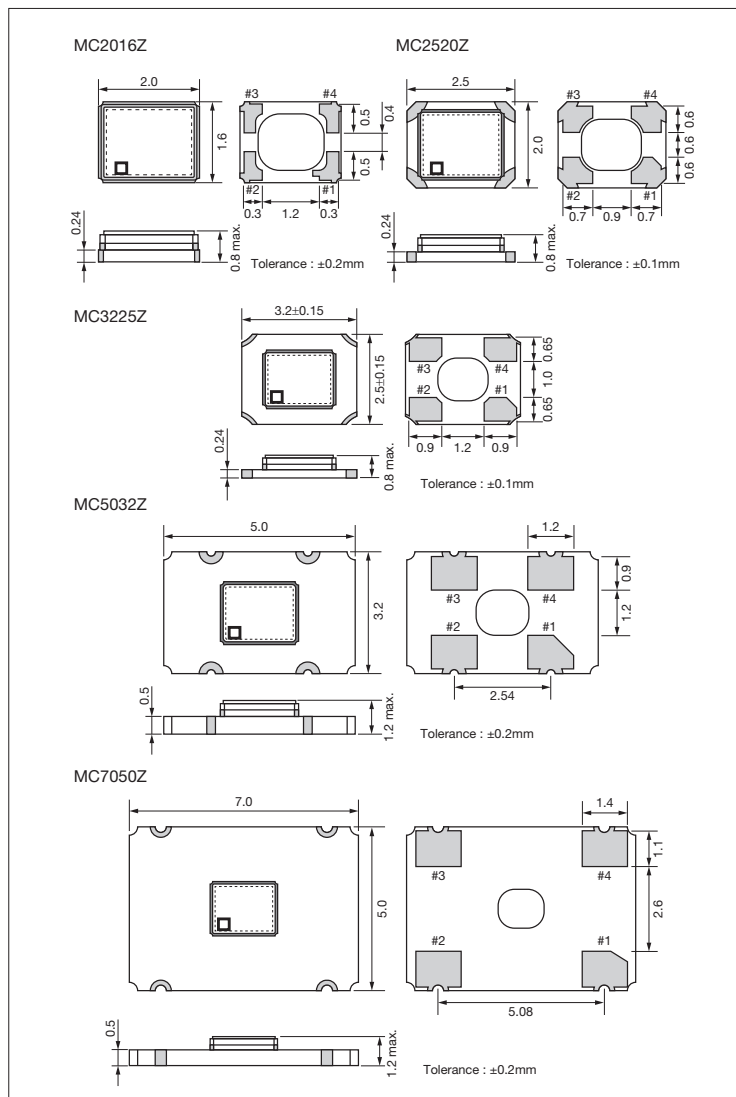
CMOS/ 1.8V, 2.5V, 3.3V / 2.0×1.6, 2.5×2.0, 3.2×2.5, 5.0×3.2, 7.0×5.0mm for Automotive



AEC-Q100/ 200 RoHS Compliant

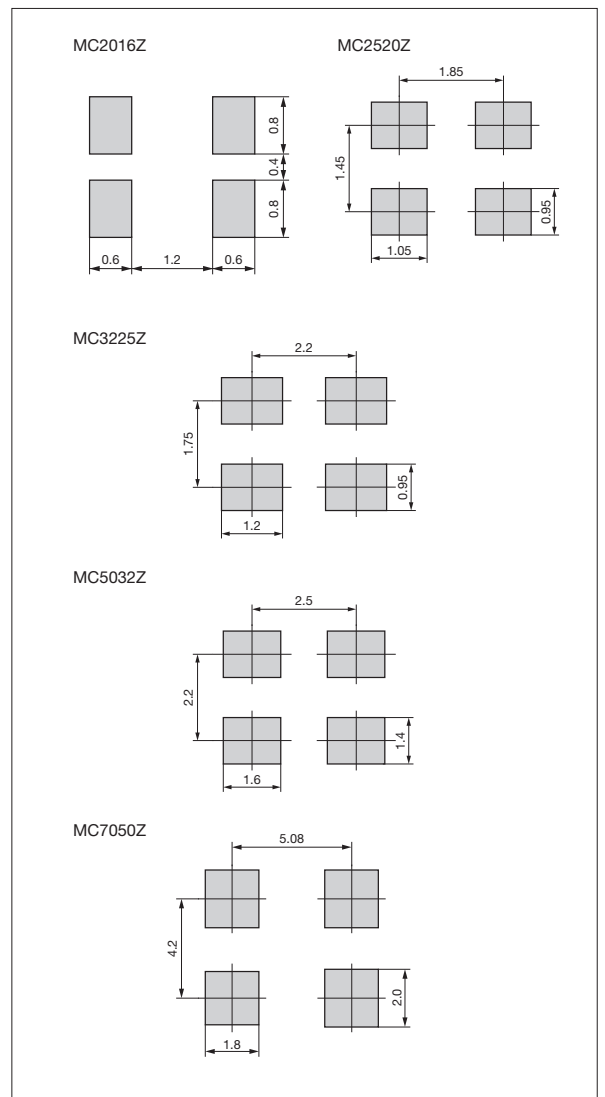
Dimensions

(Unit : mm)



Recommended Land Pattern

(Unit : mm)



Crystal Oscillators

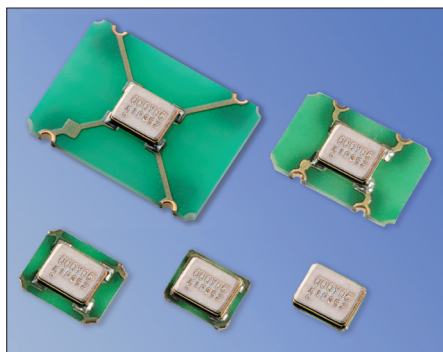


Pad Connections	
#1	INH
#2	Case GND
#3	Output
#4	Vcc

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



CMOS/ 1.8V, 2.5V, 3.3V / 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 0.5 to 170 MHz
- CMOS Output
- Short Lead Time
- Heat resistant up to +125°C

Applications

- Automotive

Table 5

Code	Freq. Tol. × 10 ⁻⁶	Operating Temperature Range (°C)	Note
G	± 50	-40 to +85	For additional stability, please contact us.
H	± 30		
J	± 25		
K	± 20		
L	± 15	-40 to +105	
6	± 50		
5	± 30		
4	± 20	-40 to +125	
X	± 100		
Z	± 50	-40 to +125	
9	± 30		

How to Order

MC□□□□Z 25.0000 C 1 □ X SH
① ② ③ ④ ⑤ ⑥ ⑦

①Series

MC2016Z	2016 Size	MC2520Z	2520 Size
MC3225Z	3225 Size	MC5032Z	5032 Size
MC7050Z	7050 Size		

②Output Frequency (25.0000 : 25MHz)

③Output Type (C : CMOS)

④Supply Voltage

(1 : 1.8V/ 2.5V/ 3.3V Compatible)

⑤Frequency Tolerance (See Table 5)

⑥Symmetry/ INH Function

X	STD 45/ 55%
---	-------------

⑦Individual Specification

(STD Specification is "SH".)

Packaging Tape&Reel

MC7050Z/ MC5032Z	1000 pcs./ reel
MC3225Z/ MC2520Z/ MC2016Z	2000 pcs./ reel

Specifications

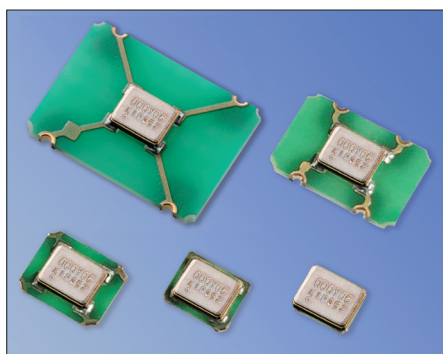
Item	Symbol	Conditions	Min.	Max.	Unit	
Output Frequency Range	fo		0.5	170	MHz	
Frequency Tolerance	f _{tol}	Initial tolerance, Operating temperature range, Rated power supply voltage change, Load change, Aging (1 year @25°C), Shock and vibration	See Table 5			
Storage Temperature Range	T _{stg}		-55	150	°C	
Operating Temperature Range	T _{use}		See Table 5			
Max. Supply Voltage	—		-0.3	4.5	V	
Supply Voltage	V _{cc}		1.71	3.63	V	
Current Consumption (Noload/ 1.71≤V _{cc} ≤2.25)	I _{cc}	0.5≤fo<5MHz	—	5.2	mA	
		5≤fo<15MHz	—	5.8		
		15≤fo<30MHz	—	6.2		
		30≤fo<50MHz	—	6.8		
		50≤fo≤60MHz	—	6.8		
		60<fo<75MHz	—	9		
		75≤fo<105MHz	—	10		
		105≤fo<130MHz	—	10.5		
		130≤fo<160MHz	—	11.5		
160≤fo≤170MHz	—	12.5				
Current Consumption (Noload/ 2.25<V _{cc} ≤2.8)	I _{cc}	0.5≤fo<5MHz	—	5.5	mA	
		5≤fo<15MHz	—	6		
		15≤fo<30MHz	—	6.5		
		30≤fo<50MHz	—	7.2		
		50≤fo≤60MHz	—	7.4		
		60<fo<75MHz	—	10		
		75≤fo<105MHz	—	11.5		
		105≤fo<130MHz	—	12.5		
		130≤fo<160MHz	—	14		
160≤fo≤170MHz	—	15				
Current Consumption (Noload/ 2.8<V _{cc} ≤3.63)	I _{cc}	0.5≤fo<5MHz	—	5.8	mA	
		5≤fo<15MHz	—	6.5		
		15≤fo<30MHz	—	7.3		
		30≤fo<50MHz	—	8		
		50≤fo≤60MHz	—	8.5		
		60<fo<75MHz	—	12.5		
		75≤fo<105MHz	—	14.5		
		105≤fo<130MHz	—	15.5		
		130≤fo<160MHz	—	18		
160≤fo≤170MHz	—	19.5				
Stand-by Current	I _{std}		—	5	μA	
Symmetry	SYM	@50% V _{cc}	45	55	%	
Rise/ Fall Time (20% to 80% Output Level)	Tr/ Tf	0.5≤fo≤60MHz	Loaded/ 1.71≤V _{cc} ≤2.25	—	4	ns
			Loaded/ 2.25<V _{cc} ≤2.8	—	3	
			Loaded/ 2.8<V _{cc} ≤3.63	—	2.5	
		60<fo≤170MHz	Loaded/ 1.71≤V _{cc} ≤2.25	—	1.5	
			Loaded/ 2.25<V _{cc} ≤2.8	—	1.3	
			Loaded/ 2.8<V _{cc} ≤3.63	—	1	
Low Level Output Voltage	V _{OL}	I _{OL} = 4mA	—	10% V _{cc}	V	
High Level Output Voltage	V _{OH}	I _{OH} = -4mA	90% V _{cc}	—	V	
Output Load (CMOS)	L _{CMOS}		—	15	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}		—	200	ns	
Enable Time	t _{ena}		—	5	ms	
Start-up Time	t _{str}	@Minimum operating voltage to be 0 sec.	—	5	ms	

All electrical characteristics are defined at the maximum load and operating temperature range.





CMOS/ 1.8V, 2.5V, 3.3V / 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 0.5 to 170 MHz
- CMOS Output
- Tighter Tolerance
- Short Lead Time
- Heat resistant up to +125°C

Applications

- Automotive

Table 6

Code	Freq. Tol. $\times 10^{-6}$	Operating Temperature Range (°C)	Note
C	± 5	-40 to +85	For additional stability, please contact us.
N	± 15	-40 to +105	

How to Order

MC□□□□Z 25.0000 C □ □ Z SH
① ② ③ ④ ⑤ ⑥ ⑦

①Series

MC2016Z	2016 Size	MC2520Z	2520 Size
MC3225Z	3225 Size	MC5032Z	5032 Size
MC7050Z	7050 Size		

②Output Frequency (25.0000 : 25MHz)

③Output Type (C : CMOS)

④Supply Voltage

1	1.8V	2	2.5V
3	3.3V		

⑤Frequency Tolerance (See Table 6)

⑥Symmetry/ INH Function

Z	STD 45/ 55%
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⑦Individual Specification

(STD Specification is "SH".)

Packaging Tape&Reel

MC7050Z/ MC5032Z	1000 pcs./ reel
MC3225Z/ MC2520Z/ MC2016Z	2000 pcs./ reel

Specifications

Item	Symbol	Conditions	Min.	Max.	Unit	
Output Frequency Range	fo		0.5	170	MHz	
Frequency Tolerance	f _{tol}	Initial tolerance, Operating temperature range		See Table 6		
Storage Temperature Range	T _{stg}		-55	150	°C	
Operating Temperature Range	T _{use}			See Table 6		
Max. Supply Voltage	—		-0.3	4.5	V	
Supply Voltage	V _{cc}	Code:① : 1	1.71	1.89	V	
		Code:② : 2	2.25	2.75		
		Code:③ : 3	2.97	3.63		
Current Consumption (Noload/ 1.71≤V _{cc} ≤2.25)	I _{cc}	0.5≤fo<5MHz	—	5.2	mA	
		5≤fo<15MHz	—	5.8		
		15≤fo<30MHz	—	6.2		
		30≤fo<50MHz	—	6.8		
		50≤fo≤60MHz	—	6.8		
		60<fo<75MHz	—	9		
		75≤fo<105MHz	—	10		
		105≤fo<130MHz	—	10.5		
		130≤fo<160MHz	—	11.5		
160≤fo≤170MHz	—	12.5				
Current Consumption (Noload/ 2.25<V _{cc} ≤2.8)	I _{cc}	0.5≤fo<5MHz	—	5.5	mA	
		5≤fo<15MHz	—	6		
		15≤fo<30MHz	—	6.5		
		30≤fo<50MHz	—	7.2		
		50≤fo≤60MHz	—	7.4		
		60<fo<75MHz	—	10		
		75≤fo<105MHz	—	11.5		
		105≤fo<130MHz	—	12.5		
		130≤fo<160MHz	—	14		
160≤fo≤170MHz	—	15				
Current Consumption (Noload/ 2.8<V _{cc} ≤3.63)	I _{cc}	0.5≤fo<5MHz	—	5.8	mA	
		5≤fo<15MHz	—	6.5		
		15≤fo<30MHz	—	7.3		
		30≤fo<50MHz	—	8		
		50≤fo≤60MHz	—	8.5		
		60<fo<75MHz	—	12.5		
		75≤fo<105MHz	—	14.5		
		105≤fo<130MHz	—	15.5		
		130≤fo<160MHz	—	18		
160≤fo≤170MHz	—	19.5				
Stand-by Current	I _{std}		—	5	μA	
Symmetry	SYM	@50% V _{cc}	45	55	%	
Rise/ Fall Time (20% to 80% Output Level)	Tr/ Tf	0.5≤fo≤60MHz	Loaded/ 1.71≤V _{cc} ≤2.25	—	4	ns
			Loaded/ 2.25<V _{cc} ≤2.8	—	3	
			Loaded/ 2.8<V _{cc} ≤3.63	—	2.5	
		60<fo≤170MHz	Loaded/ 1.71≤V _{cc} ≤2.25	—	1.5	
			Loaded/ 2.25<V _{cc} ≤2.8	—	1.3	
			Loaded/ 2.8<V _{cc} ≤3.63	—	1	
Low Level Output Voltage	V _{OL}	I _{OL} = 4mA	—	10% V _{cc}	V	
High Level Output Voltage	V _{OH}	I _{OH} = -4mA	90% V _{cc}	—	V	
Output Load (CMOS)	L _{CMOS}		—	15	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}		—	200	ns	
Enable Time	t _{ena}		—	5	ms	
Start-up Time	t _{str}	@Minimum operating voltage to be 0 sec.	—	5	ms	

All electrical characteristics are defined at the maximum load and operating temperature range.



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MC2520Z1.84320C19XSH	MC2016Z32.0000C19XSH	MC2520Z7.37280C19XSH	MC2520Z10.0000C19XSH
MC2520Z24.0000C19XSH	MC3225Z27.0000C19XSH	MC2520Z28.6364C19XSH	MC2016Z16.0000C19XSH
MC2520Z100.000C19XSH	MC3225Z11.2896C19XSH	MC2520Z26.0000C19XSH	MC2520Z3.68640C19XSH
MC2520Z2.04800C19XSH	MC2016Z25.0000C19XSH	MC3225Z33.3333C19XSH	MC3225Z32.0000C19XSH
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MC3225Z16.0000C19XSH	MC3225Z100.000C19XSH	MC2520Z50.0000C19XSH	MC2016Z24.0000C19XSH
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MC2016Z80.0000C19XSH	MC2016Z7.37280C19XSH	MC2016Z13.5600C19XSH	MC2520Z25.0000C19XSH
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MC3225Z13.5600C19XSH	MC3225Z60.0000C19XSH	MC2016Z100.000C19XSH	MC2016Z12.2880C19XSH
MC3225Z2.04800C19XSH	MC2016Z32.7680C19XSH	MC3225Z75.0000C19XSH	MC3225Z14.3182C19XSH
MC3225Z40.0000C19XSH	MC3225Z12.2880C19XSH	MC2016Z1.84320C19XSH	MC2016Z3.68640C19XSH
MC3225Z32.7680C19XSH	MC2016Z8.00000C19XSH	MC3225Z25.0000C19XSH	MC2520Z16.0000C19XSH
MC2016Z26.0000C19XSH	MC2520Z60.0000C19XSH	MC3225Z1.84320C19XSH	MC3225Z80.0000C19XSH
MC2520Z20.0000C19XSH	MC3225Z48.0000C19XSH	MC2520Z32.0000C19XSH	MC2520Z8.00000C19XSH
MC3225Z28.6364C19XSH	MC3225Z22.5792C19XSH	MC2520Z33.0000C19XSH	MC2520Z12.0000C19XSH
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