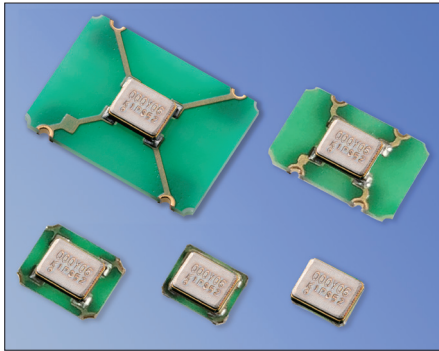




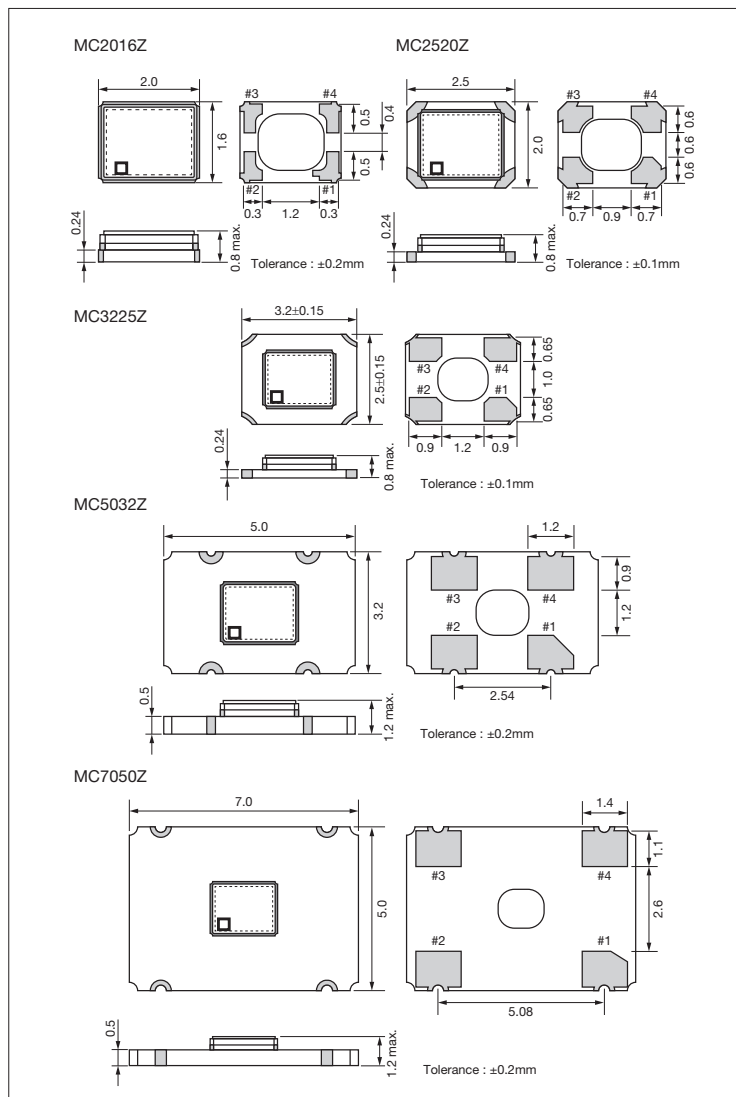
CMOS/ 1.8V, 2.5V, 3.3V / 2.0×1.6, 2.5×2.0, 3.2×2.5, 5.0×3.2, 7.0×5.0mm for Automotive



AEC-Q100/ 200 RoHS Compliant

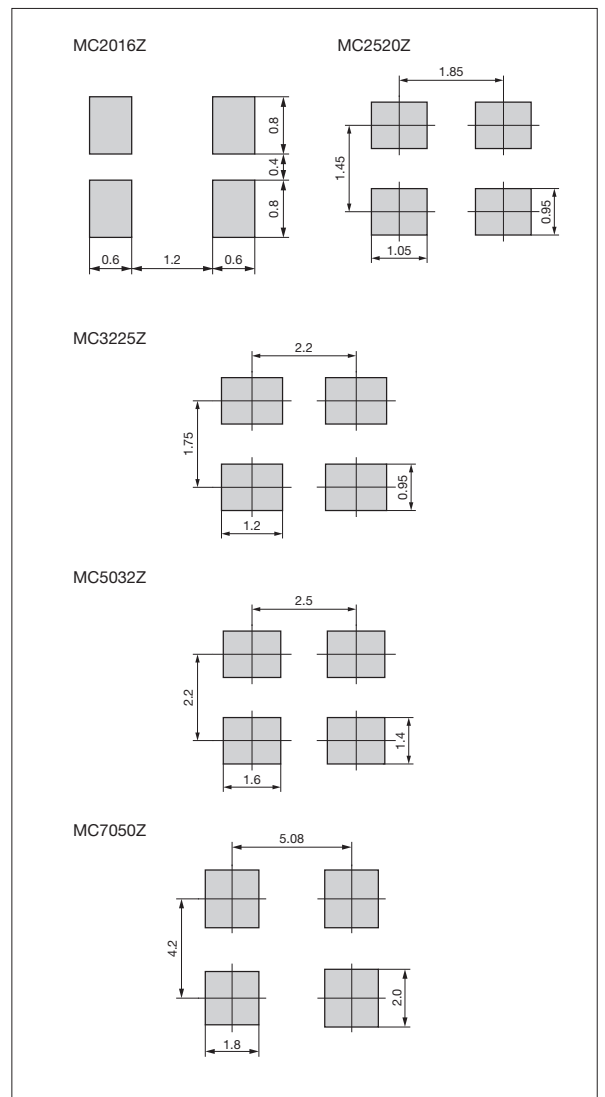
**Dimensions**

(Unit : mm)



**Recommended Land Pattern**

(Unit : mm)



Crystal Oscillators

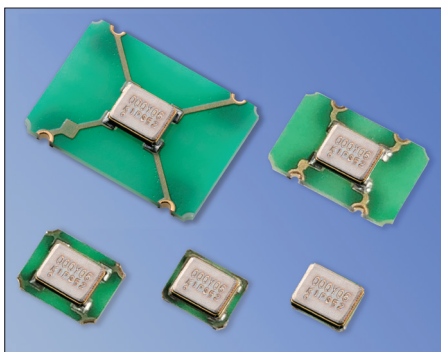


Pad Connections	
#1	INH
#2	Case GND
#3	Output
#4	Vcc

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**

Freq. Code	Tol. $\times 10^{-6}$	Operating Temperature Range (°C)	Note
G	$\pm 50$	-40 to +85	For additional stability, please contact us.
H	$\pm 30$		
J	$\pm 25$		
K	$\pm 20$	-40 to +105	
6	$\pm 50$		
5	$\pm 30$		
X	$\pm 100$	-40 to +125	
Z	$\pm 50$		
9	$\pm 30$		

**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%
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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**

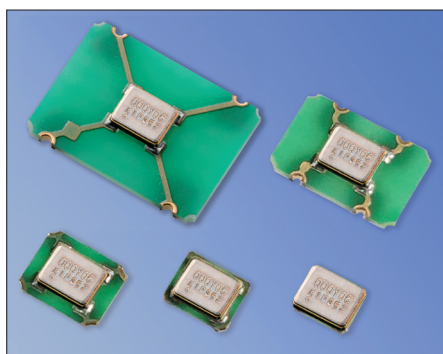
Item	Symbol	Conditions	Min.	Max.	Unit	
Output Frequency Range	fo		0.5	170	MHz	
Frequency Tolerance	f <sub>tol</sub>	Initial tolerance, Operating temperature range, Rated power supply voltage change, Load change, Aging (1 year @25°C), Shock and vibration	See Table 5			
Storage Temperature Range	T <sub>stg</sub>		-55	150	°C	
Operating Temperature Range	T <sub>use</sub>		See Table 5			
Max. Supply Voltage	—		-0.3	4.5	V	
Supply Voltage	V <sub>cc</sub>		1.71	3.63	V	
Current Consumption (Noload/ 1.71<V <sub>cc</sub> <2.25)	I <sub>cc</sub>	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		
Current Consumption (Noload/ 2.25<V <sub>cc</sub> <2.8)	I <sub>cc</sub>	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		
Current Consumption (Noload/ 2.8<V <sub>cc</sub> <3.63)	I <sub>cc</sub>	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		
Stand-by Current	I <sub>std</sub>		—	5	μA	
	SYM	@50% V <sub>cc</sub>	45	55	%	
Rise/ Fall Time (20% to 80% Output Level)	Tr/ Tf	0.5≤fo≤60MHz	Loaded/ 1.71≤V <sub>cc</sub> ≤2.25	—	4	ns
			Loaded/ 2.25<V <sub>cc</sub> ≤2.8	—	3	
			Loaded/ 2.8<V <sub>cc</sub> ≤3.63	—	2.5	
		60<fo≤170MHz	Loaded/ 1.71≤V <sub>cc</sub> ≤2.25	—	1.5	
			Loaded/ 2.25<V <sub>cc</sub> ≤2.8	—	1.3	
			Loaded/ 2.8<V <sub>cc</sub> ≤3.63	—	1	
Low Level Output Voltage	V <sub>OL</sub>	I <sub>OL</sub> = 4mA	—	10% V <sub>cc</sub>	V	
High Level Output Voltage	V <sub>OH</sub>	I <sub>OH</sub> = -4mA	90% V <sub>cc</sub>	—	V	
Output Load (CMOS)	L <sub>CMOS</sub>		—	15	pF	
Low Level Input Voltage	V <sub>IL</sub>		—	30% V <sub>cc</sub>	V	
High Level Input Voltage	V <sub>IH</sub>		70% V <sub>cc</sub>	—	V	
Disable Time	t <sub>dis</sub>		—	200	ns	
Enable Time	t <sub>ena</sub>		—	5	ms	
Start-up Time	t <sub>str</sub>	@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	$\pm 5$	-40 to +85	For additional stability, please contact us.
N	$\pm 15$	-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 <sub>tol</sub>	Initial tolerance, Operating temperature range		See Table 6		
Storage Temperature Range	T <sub>stg</sub>		-55	150	°C	
Operating Temperature Range	T <sub>use</sub>			See Table 6		
Max. Supply Voltage	—		-0.3	4.5	V	
Supply Voltage	Vcc	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≤Vcc≤2.25)	Icc	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<Vcc≤2.8)	Icc	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<Vcc≤3.63)	Icc	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 <sub>std</sub>		—	5	μA	
Symmetry	SYM	@50% Vcc	45	55	%	
Rise/ Fall Time (20% to 80% Output Level)	Tr/ Tf	0.5≤fo≤60MHz	Loaded/ 1.71≤Vcc≤2.25	—	4	ns
			Loaded/ 2.25<Vcc≤2.8	—	3	
			Loaded/ 2.8<Vcc≤3.63	—	2.5	
		60<fo≤170MHz	Loaded/ 1.71≤Vcc≤2.25	—	1.5	
			Loaded/ 2.25<Vcc≤2.8	—	1.3	
			Loaded/ 2.8<Vcc≤3.63	—	1	
Low Level Output Voltage	VoL	I <sub>oL</sub> = 4mA	—	10% Vcc	V	
High Level Output Voltage	VoH	I <sub>oH</sub> = -4mA	90% Vcc	—	V	
Output Load (CMOS)	L CMOS		—	15	pF	
Low Level Input Voltage	ViL		—	30% Vcc	V	
High Level Input Voltage	ViH		70% Vcc	—	V	
Disable Time	t <sub>dis</sub>		—	200	ns	
Enable Time	t <sub>ena</sub>		—	5	ms	
Start-up Time	t <sub>str</sub>	@Minimum operating voltage to be 0 sec.	—	5	ms	

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

