

# CRYSTAL UNITS

## CRYSTAL UNITS FOR MICROPROCESSOR (NR-18)

### ■ Features

- NR-18 crystal units can provide a great number of standard frequencies and have a wide range of applications. In addition, tapping type and gull-wing type are available for automatic mounting.



### ■ Specification

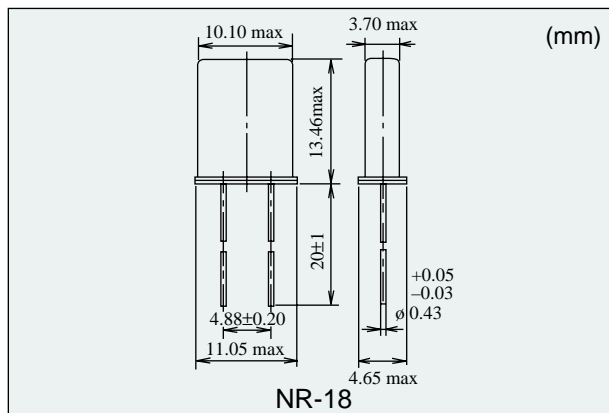
Frequency Range	Table 5 (NR-18)
Overtone	Table 5 (NR-18)
Temperature Characteristics	$\pm 50 \times 10^{-6}$
Operating Temp. Range	-10 ~ +60°C
Frequency Tolerance	$\pm 50 \times 10^{-6}$ (at 25°C)
Equivalent Series Resistance	Table 5 (NR-18)

Measuring Circuit: CI Meter

	Fundamental	3rd Overtone
Drive Level	50 $\mu$ W (1000 $\mu$ W max)	500 $\mu$ W (1000 $\mu$ W max)
Standard Load Capacitance	16pF	Series

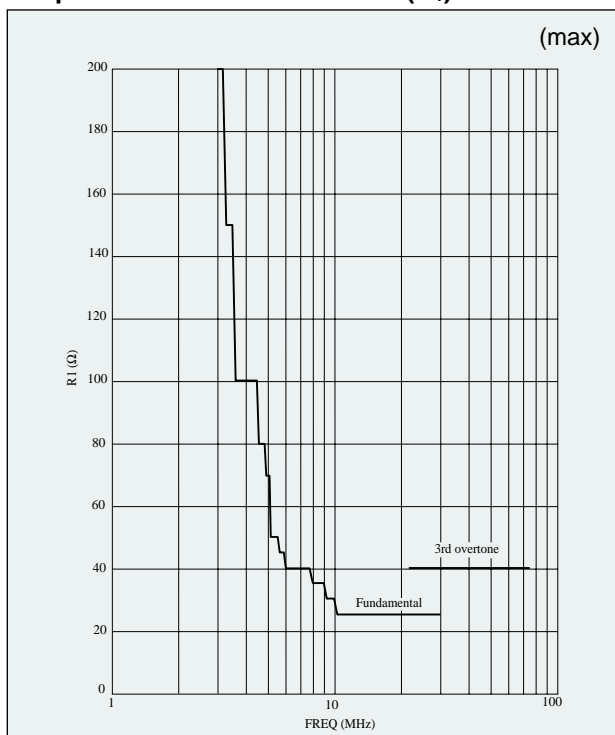
Standard load capacitance may vary depending on the frequency.

### ● Dimensions

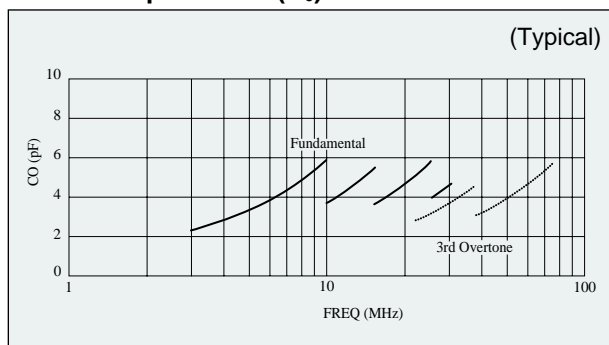


### ■ Technical Guidance (NR-18)

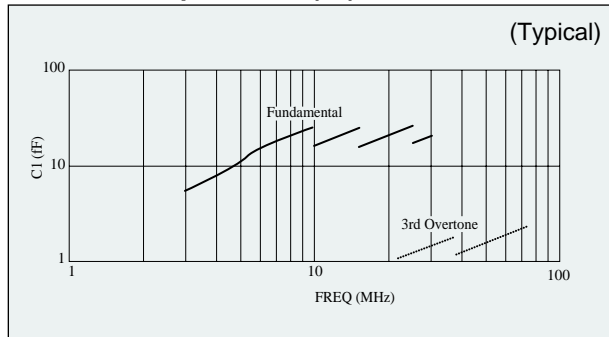
#### ● Equivalent Series Resistance ( $R_1$ )



#### ● Shunt Capacitance ( $C_0$ )



#### ● Motional Capacitance ( $C_1$ )



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■ Table 5  
Standard Frequencies and Specifications (NR-18)

## <Fundamental>

Standard Frequency (MHz)	
3.000	8.388608
3.072	8.4672
3.120	8.6436
3.146024	8.775
3.1884	8.867238
-----	
3.200	9.000
3.2764	9.216
3.2768	9.600
3.330	9.800
3.4944	10.000
-----	
3.500	10.200-10.500
3.515	10.600
3.541	10.700-11.000
3.546894	11.0592
3.557837	11.880
-----	
3.575611	11.9808
3.579545	11.98135
3.582056	12.000
3.600	12.2
3.601	
-----	
3.6864	*1
3.79545	
3.840	
3.900952	
3.932160	
-----	
3.975	*1
3.9936	
4.000	
4.032	
4.096	
-----	
4.14	30.000
4.194304	
4.296503	
4.332	
4.433619	
-----	
4.500	
4.608	
4.78272	
4.800	
4.9152	
-----	
5.000	
5.0688	
5.120	
5.185	
5.5296	
-----	
5.700	
5.7143	
5.760	
6.000	
6.144	
-----	
6.176	
6.250	
6.400	
6.5536	
7.000	
-----	
7.15909	
7.162109	
7.200	
7.300	
7.3728	
-----	
7.500	
7.600	
8.000	
8.192	
8.388	

## <3rd overtone>

Standard Frequency (MHz)	
22.000	
*2	
	60.000
	61.250
62.305	
-----	
67.7376	
70.000	
71.700	
75.875	

## <5th overtone>

Standard Frequency (MHz)	
60.4256	
62.3067	
65.050	
70.000	
73.9944	
-----	
75.000	
76.2875	
78.4667	
79.865	
80.550	
-----	
81.050	
81.745	
82.285	
82.655	
84.000	
-----	
84.672	
85.700	
86.400	
89.750	
91.555	
-----	
94.556	
95.325	
98.325	
98.550	
100.000	
-----	
104.550	
105.7342	
115.000	
118.700	
122.912	
-----	
122.880	
130.000	
132.000	

## <Equivalent Series Resistance (Ω)>

Overtone	Standard Frequency (MHz)	Equivalent Series Resistance (Ω)
Fundamental	3.0~3.2	200max
	3.2~3.5	150max
	3.5~4.6	100max
	4.6~4.9	80max
	4.9~5.1	70max
	5.1~5.7	50max
	5.7~6.0	45max
	6.0~8.0	40max
	8.0~9.0	35max
	9.0~10.0	30max
	10.0~30.0	25max
3rd overtone	22.0~76.0	40max
5th overtone	60.0~132.0	80max

\*1 All frequencies from 12.2 to 30.0 MHz can be manufactured.

\*2 All frequencies from 22 to 60 MHz (3rd Overtone) can be manufactured.