

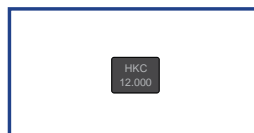
**Frequency Range:**  
12.00MHz to 50.00MHz

**Features:**

- High Reliability & Low Cost Unit
- Tight Stability & Extended Temperature Available
- RoHS Type
- For automotive applications, please contact our sales representative



Actual Size



QUARTZ CRYSTALS

### ■ Standard Specifications

Item	Value
Frequency Range	12.00 to 50.00MHz
Frequency Tolerance	±30ppm (tighter tolerance also available)
Frequency Tolerance over Temperature range	±50ppm (tighter tolerance also available)
Operating Temperature Range	-10 °C to +60 °C (other operating range also available)
Operable Temperature Range	-40 °C to +85 °C
Equivalent Series Resistance (ESR)	Please refer to the ESR Table
Drive Level	50μW (0.001μW to 1000μW also available)
Load Capacitance	12pF (3pF, 4.5pF, 6pF and series also available)
Aging	±5ppm/year

### ■ ESR Table

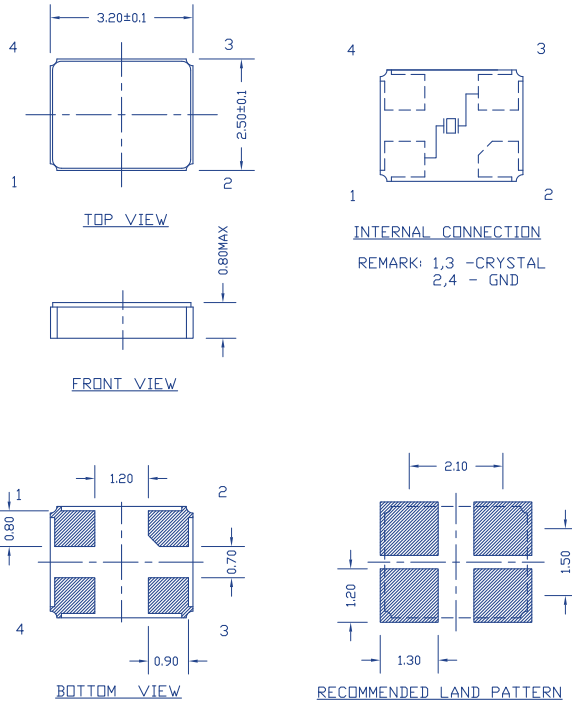
Frequency Range (MHz)	Mode	Standard ESR (Ohm)
12 to 13	AT Cut Fund.	150
13 to 16	AT Cut Fund.	100
16 to 20	AT Cut Fund.	80
20 to 22	AT Cut Fund.	60
22 to 50	AT Cut Fund.	50

Note:

1. Manufacturer reserves the right to change the specification and content of this product for improvement without notification.
2. Custom specification is welcome. Please contact our sales representative for further details.
3. If the crystal is intended for applications which have direct impact on human life and properties, and require a high degree of reliability and safety concerns, customers must provide full information such as but not limit to the application, electrical and reliability specification at the inquiry beginning stage.
4. Customers have to agree to the "Guideline for handling crystal units" and "Standard Terms and Condition of Sales" which is printed this catalog before placing orders to our company or our distributors. There are also unpredictable factors such as applied condition, oscillation margin and etc and customers must check them beforehand. In case of queries, please do not fail to send inquiry to our company before ordering.

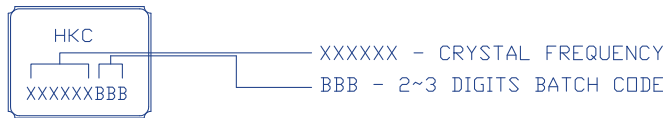


■ Dimensions (mm) and Solder Pad Layout (mm)

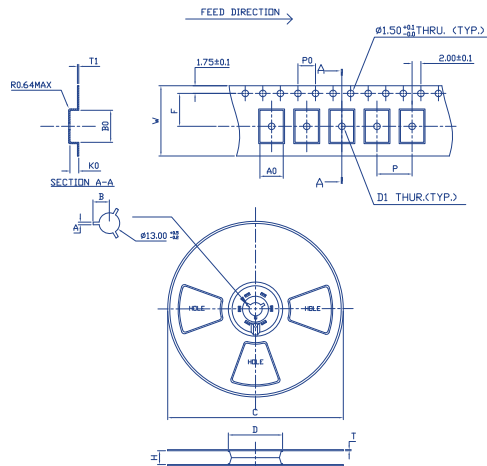


REMARK: 1,3 - CRYSTAL  
2,4 - GND

MARKING INFORMATION



■ Tape & Reel (mm)



	8x4.5 SMD	7x5 SMD	7x5 OSC.	6x3.5 SMD	5x3.2 SMD	4x2.5 SMD	3.2x2.5 SMD
PART NO.	48065002	48065001	48060041	48060036	48065007	48065018	48065011
W	16.00±0.12	16.00±0.12	16.00±0.12	16.00±0.12	16.00±0.12	12.00±0.12	8.00±0.12
P	8.00±0.1	8.00±0.1	8.00±0.1	8.00±0.1	8.00±0.1	8.00±0.10	4.00±0.10
A0	4.80±0.1	5.40±0.1	5.30±0.1	3.75±0.1	3.50±0.1	2.70±0.10	2.80±0.10
B0	8.30±0.1	7.40±0.1	7.80±0.1	6.20±0.1	5.30±0.1	4.20±0.10	3.50±0.10
K0	1.70±0.1	1.65±0.1	2.00±0.1	1.20±0.1	1.00±0.1	1.00±0.10	0.80±0.10
P0	4.00±0.1	4.00±0.1	4.00±0.1	4.00±0.1	4.00±0.1	4.00±0.10	4.00±0.10
F	7.50±0.1	7.50±0.1	7.50±0.1	7.50±0.1	7.50±0.1	5.50±0.10	3.50±0.10
D1	1.50±0.05	1.50±0.05	1.50±0.05	1.50±0.05	1.50±0.05	1.50±0.05	1.00±0.05
T1	0.30±0.05	0.30±0.05	0.30±0.05	0.30±0.05	0.30±0.05	0.30±0.05	0.20±0.05
PART NO.	48060024/48060050				48065020		48065015
C	Ø178.0±1		Ø330±1		Ø178±1		Ø178±1
A	2.0±0.5		2.3±0.3		2.6±0.2		2.6±0.2
B	10.0±0.5		10.75±0.2		10.85±0.20		10.85±0.20
D	50.0±0.5		100.0±1		Ø60.0±0.5		Ø60.0±0.5
H	16.5±0.5		16.5±0.5		13.1±0.2		9.5±0.8
T	1.50±0.2		2.3±0.3		1.2±0.2		1.2±0.2
QTY.	1000PCS/R		4000PCS/R		1000PCS/R		3000PCS/R

REMARK: (1)CAMBERS DO NOT EXCEED 1.0MM IN 100MM  
(2)THE MAXIMUM CUMULATIVE TOLERANCE IS ±0.2MM  
(3)FOR 0.5 SPRING HOLE FITTING  
(4)THICKNESS OF CARRIER TAPE IS 0.3MM  
MATERIAL: BLACK ANTI-STATIC POLYSTYRENE  
THE APPEARANCE OF THE REEL MAY BE DIFFERENT FROM THE DRAWING

QUARTZ  
CRYSTALS