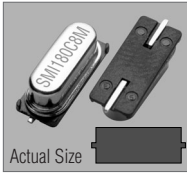


# Quartz Crystal Units

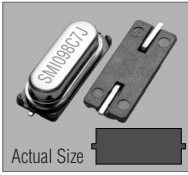
## LB FAMILY

## CUSTOM-DESIGNED HIGH SPEC SMD CRYSTALS

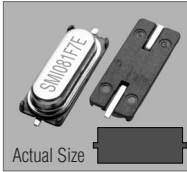
### 4HLB



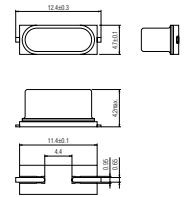
### 3HLB



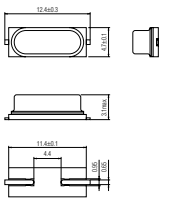
### 25HLB



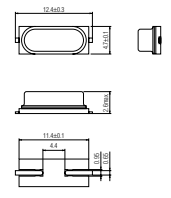
### 4HLB



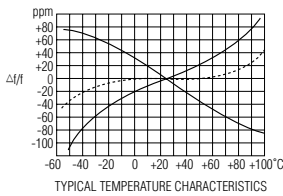
### 3HLB



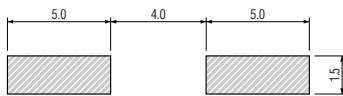
### 25HLB



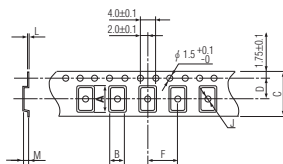
### AT-CUT



### SOLDERING PATTERN



### TAPE SPECIFICATIONS



for 4HLB

A	B	C	D	F	J	L	M	Reel Dia.	Qty/Reel
15.4	5.3	24.0	11.5	12.0	1.7	0.4	4.0	300	1000pcs

for 3HLB & 25HLB

A	B	C	D	F	J	L	M	Reel Dia.	Qty/Reel
15.4	5.3	24.0	11.5	12.0	1.7	0.4	3.1	300	1000pcs

## SPECIFICATIONS

- Package type ..... 4HLB, 3HLB & 25HLB
- Frequency range ..... 3.579545 MHz to 60.000 MHz
- Frequency tolerance ..... O : ±10 ppm at +25°C ±3°C  
Q : ±15 ppm at +25°C ±3°C  
R : ±20 ppm at +25°C ±3°C
- Temperature stability (referred to +25°C) ..... See table below

Ope. Temp. Range	Temperature Stability	PPM												
		±3.0 (FF)	±5.0 (JJ)	±7.5 (LL)	±10 (OO)	±15 (QQ)	±20 (RR)	±30 (TT)	±50 (XX)	±100 (CCI)	±150 (GGI)			
0 ~ +45°C (edd)		○	○	○	○	○	○	○	○	○	○	○	○	○
0 ~ +50°C (eee)														
0 ~ +60°C (egg)			○	○	○	○	○	○	○	○	○	○	○	○
0 ~ +70°C (eii)			○	○	○	○	○	○	○	○	○	○	○	○
-10 ~ +50°C (gee)			○	○	○	○	○	○	○	○	○	○	○	○
-10 ~ +60°C (ggg)				○	○	○	○	○	○	○	○	○	○	○
-10 ~ +70°C (gii)				○	○	○	○	○	○	○	○	○	○	○
-10 ~ +75°C (gjj)					○	○	○	○	○	○	○	○	○	○
-20 ~ +70°C (iii)					○	○	○	○	○	○	○	○	○	○
-20 ~ +75°C (ijj)						○	○	○	○	○	○	○	○	○
-30 ~ +75°C (kii)							○	○	○	○	○	○	○	○
-30 ~ +80°C (kkk)								○	○	○	○	○	○	○
-30 ~ +85°C (kll)									○	○	○	○	○	○
-35 ~ +80°C (lkk)										○	○	○	○	○
-40 ~ +85°C (mll)											○	○	○	○
-40 ~ +90°C (mmm)												○	○	○
-40 ~ +105°C (mpp)													○	○
-40 ~ +125°C (mitt)														○

○: Available (The extremes depend on actual frequencies.)

- Equivalent series resistance (ESR) ..... See table below

Frequency	3.579545 MHz +	4.000 MHz +	5.000 MHz +	6.000 MHz +	7.000 MHz +
ESR	200 Ω max.	150 Ω max.	120 Ω max.	100 Ω max.	80 Ω max.

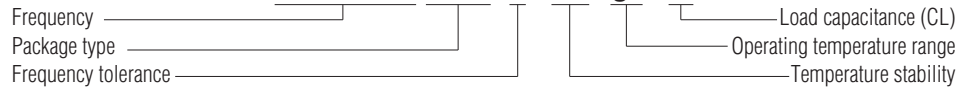
  

Frequency	9.000 MHz	13.000 MHz +	20.000 MHz +	26.690 MHz + (3rd OT)
ESR	60 Ω max.	50 Ω max.	40 Ω max.	70 Ω max.

- Shunt capacitance (Co) ..... 5 pF max.
- Drive level (P) ..... 100 μW max. (10 μW for testing)
- Aging ..... ±5 ppm max. at +25°C ±3°C for first year
- Cut/Oscillation mode ..... AT-Cut/Fundamental ( 3.579545 MHz to 40.000 MHz)  
AT-Cut/3rd overtone (26.690000 MHz to 60.000 MHz)
- Reflow condition ..... 10 seconds max. at +250°C ±10°C

## PART NUMBERING GUIDE

**20.000 MHz 3HLB R / QQ / gii / 18**



### EXAMPLE

SMI PART NO.	Frequency	Package	Frequency tolerance
<b>20.000 MHz 3HLB R/QQ/gii/18</b>	20.000 MHz	3HLB	R = ±20 ppm
<b>6.000MHz 25HLB Q/TT/iii/16</b>	6.000 MHz	25HLB	Q = ±15 ppm

Temperature stability	Operating temperature range	Load capacitance
QQ = ±15 ppm	gii = -10°C to +70°C	CL = 18 pF
TT = ±30 ppm	iii = -20°C to +70°C	CL = 16 pF

## PACKAGE DATA

Item	Package	4HLB	3HLB	25HLB
Cover		Metal	Metal	Metal
Base		Metal	Metal	Metal
Insulator		PPS	PPS	PPS
Sealing		Resistance	Resistance	Resistance
Terminal lead		Alloy (FeNiCo)	Alloy (FeNiCo)	Alloy (FeNiCo)
Terminal plating		SnCu	SnCu	SnCu
RoHS		Compliant (Pb-free)	Compliant (Pb-free)	Compliant (Pb-free)