



深圳市维拓精电科技有限公司
WTL INTERNATIONAL LIMITED



Our
Creative
Service

Quartz Crystal, Always WTL



Rev.1

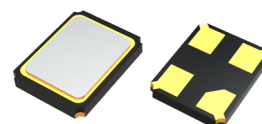
SMD Seam Sealed Crystals

1.6×1.2×0.35 mm

For Automotive

Feature

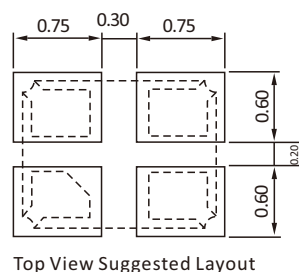
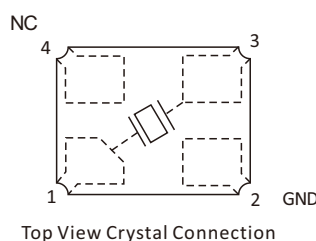
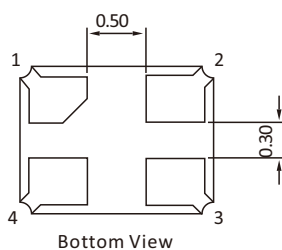
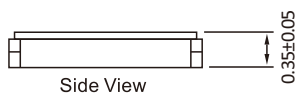
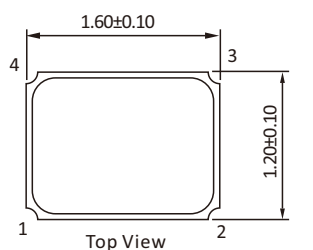
- Size 1.6 × 1.2 , Ultra thin , thickness 0.35mm
- Excellent heat resistance and environmental characteristics
- Designed for automatic mounting and reflow soldering
- RoHS Compliant /Pb Free
- Conforms to AEC-Q200



Electrical Specifications

Item	Specifications		
Frequency Range(MHz)	20~24	24~30	30~50
Mode	AT/Fundamental		
Load Capacitance (CL)	8pF, 10pF, 12pF or Specify		
Frequency Tolerance(at 25°C)	±50ppm or specify		
Operating Temperature Range	-40~+85°C, -40~+105°C, -40~+125°C		
Frequency Stability Over Operating Temperature Range	±50ppm or specify		
Equivalent Series Resistance (ESR) max.	200Ω	100Ω	80Ω
Storage Temperature Range	-55~+125°C		
Shunt Capacitance(C ₀)	3pF Max		
Drive Level (Typical)	1 ~ 200μW (50μW typical)		
Aging @ 25 °C 1st Year (Max)	±3 ppm/year		

Dimension(mm)

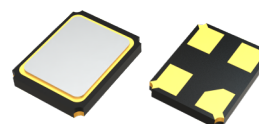


SMD Seam Sealed Crystals 2.0×1.6×0.5 mm

For Automotive

Feature

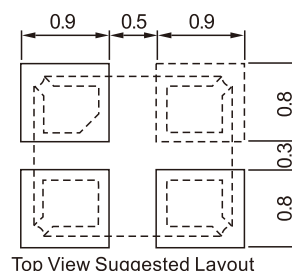
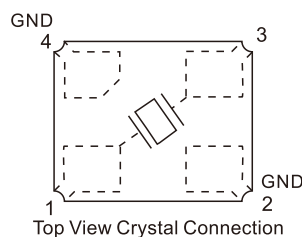
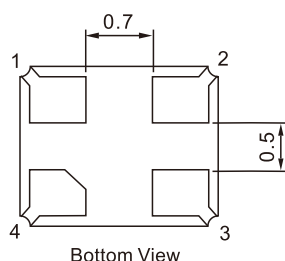
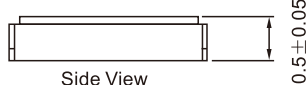
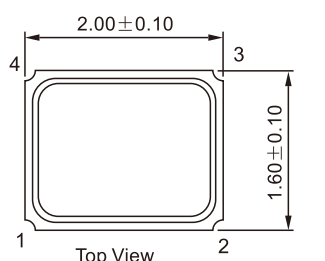
- Size 2.0 × 1.6 , Ultra thin , thickness 0.5mm
- Excellent heat resistance and environmental characteristics
- Designed for automatic mounting and reflow soldering
- RoHS Compliant / Pb Free
- Conforms to AEC-Q200



Electrical Specifications

Item	Specifications		
Frequency Range(MHz)	16~19.2	19.2~30	30~50
Mode	AT/Fundamental		
Load Capacitance (CL)	8pF, 10pF, 12pF or Specify		
Frequency Tolerance(at 25°C)	±20ppm or specify		
Operating Temperature Range	-40~+85°C, -40~+105°C, -40~+125°C		
Frequency Stability Over Operating Temperature Range	±50ppm or specify		
Equivalent Series Resistance (ESR) max.	200Ω	100Ω	80Ω
Storage Temperature Range	-55~+125°C		
Shunt Capacitance(C ₀)	3pF Max		
Drive Level (Typical)	1 ~ 200μW (50μW typical)		
Aging @25°C 1st Year (Max)	±3 ppm/year		

Dimension(mm)



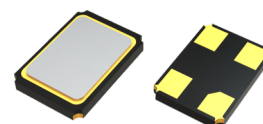
SMD Seam Sealed Crystals

2.5×2.0×0.55 mm

For Automotive

Feature

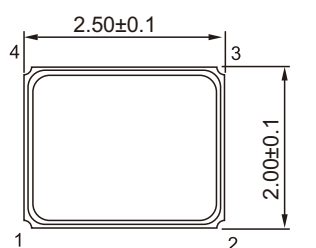
- Size 2.5 × 2.0, Ultra thin, thickness 0.55mm
- Excellent heat resistance and environmental characteristics
- Designed for automatic mounting and reflow soldering
- RoHS Compliant / Pb Free
- Conforms to AEC-Q200



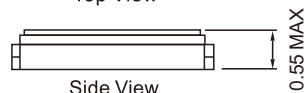
Electrical Specifications

Item	Specifications	
Frequency Range(MHz)	12~24	24~50
Mode	AT/Fundamental	
Load Capacitance (CL)	8pF, 10pF, 12pF or Specify	
Frequency Tolerance(at 25°C)	±20ppm or specify	
Operating Temperature Range	-40~+85°C, -40~+105°C, -40~+125°C	
Frequency Stability Over Operating Temperature Range	±50ppm or specify	
Equivalent Series Resistance (ESR) max.	100Ω	80Ω
Storage Temperature Range	-55~+125°C	
Shunt Capacitance(C ₀)	3pF Max	
Drive Level (Typical)	1 ~100 μW (10μW typical)	
Aging @ 25°C 1st Year (Max)	±3 ppm/year	

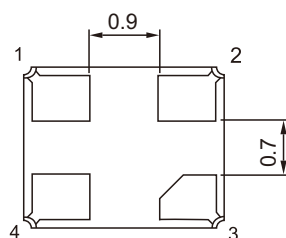
Dimension(mm)



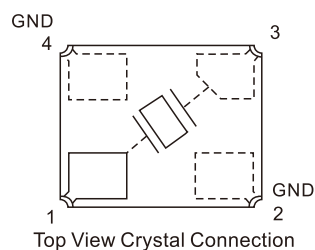
Top View



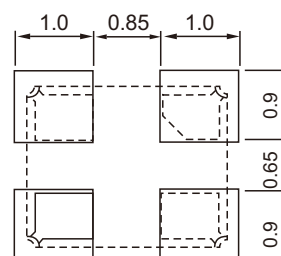
Side View



Bottom View



Top View Crystal Connection



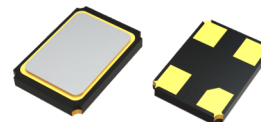
Top View Suggested Layout

SMD Seam Sealed Crystals 3.2×2.5×0.7 mm

For Automotive

Feature

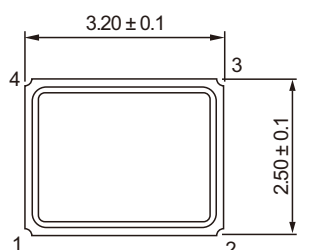
- Size 3.2×2.5, Ultra thin , thickness 0.7mm
- Excellent heat resistance and environmental characteristics
- Designed for automatic mounting and reflow soldering
- RoHS Compliant /Pb Free
- Conforms to AEC-Q200



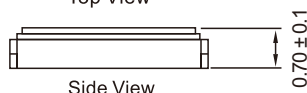
Electrical Specifications

Item	Specifications		
Frequency Range(MHz)	8~10	10~24	24~50
Mode	AT/Fundamental		
Load Capacitance (CL)	8pF, 9pF, 10pF, 12pF, 18pF, 20pF, or Specify		
Frequency Tolerance(at 25°C)	±20ppm or specify		
Operating Temperature Range	-40~+85°C, -40~+105°C, -40~+125°C		
Frequency Stability Over Operating Temperature Range	±150ppm or specify		
Equivalent Series Resistance (ESR) max.	200Ω	120Ω	80Ω
Storage Temperature Range	-55~+125°C		
Shunt Capacitance(C0)	3pF Max		
Drive Level (Typical)	1~ 100 μW (50μW typical)		
Aging @25°C 1st Year (Max)	±3 ppm/year max		

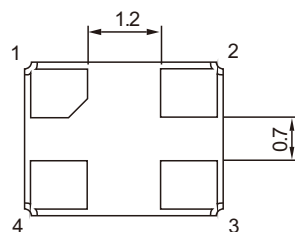
Dimension(mm)



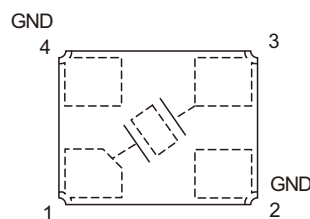
Top View



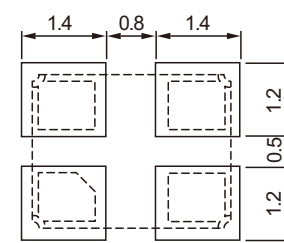
Side View



Bottom View



Top View Crystal Connection



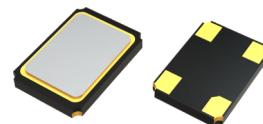
Top View Suggested Layout

SMD Seam Sealed Crystals 5.0×3.2×0.9 mm

For Automotive

Feature

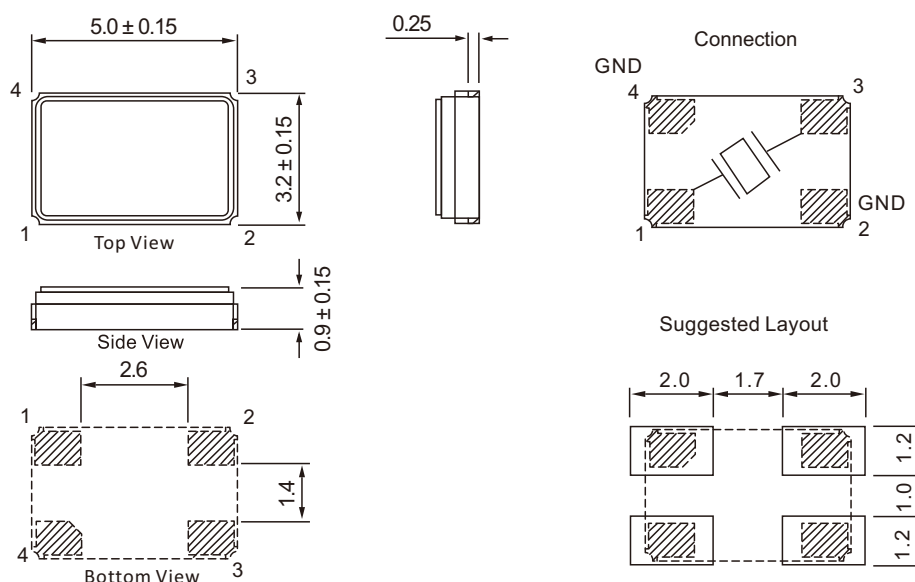
- Size 5.0×3.2, thickness 0.9mm
- Excellent heat resistance and environmental characteristics
- Designed for automatic mounting and reflow soldering
- RoHS Compliant / Pb Free
- Conforms to AEC-Q200



Electrical Specifications

Item	Specifications		
Frequency Range(MHz)	8~12	12~20	20~50
Mode	AT/Fundamental		
Load Capacitance (CL)	8pF, 16pF, 20pF, 30pF, or Specify		
Frequency Tolerance(at 25°C)	±20ppm or specify		
Operating Temperature Range	-40~+85°C, -40~+105°C, -40~+125°C		
Frequency Stability Over Operating Temperature Range	±150ppm or specify		
Equivalent Series Resistance (ESR) max.	120Ω	80Ω	60Ω
Storage Temperature Range	-55~+125°C		
Shunt Capacitance(C ₀)	5pF Max		
Drive Level (Typical)	1 ~ 100 μW (10μW typical)		
Aging @ 25 °C 1st Year (Max)	±3 ppm/year		

Dimension(mm)

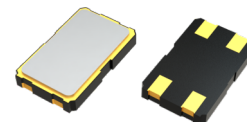


SMD Seam Sealed Crystals 7.0×5.0×1.1 mm

For Automotive

Feature

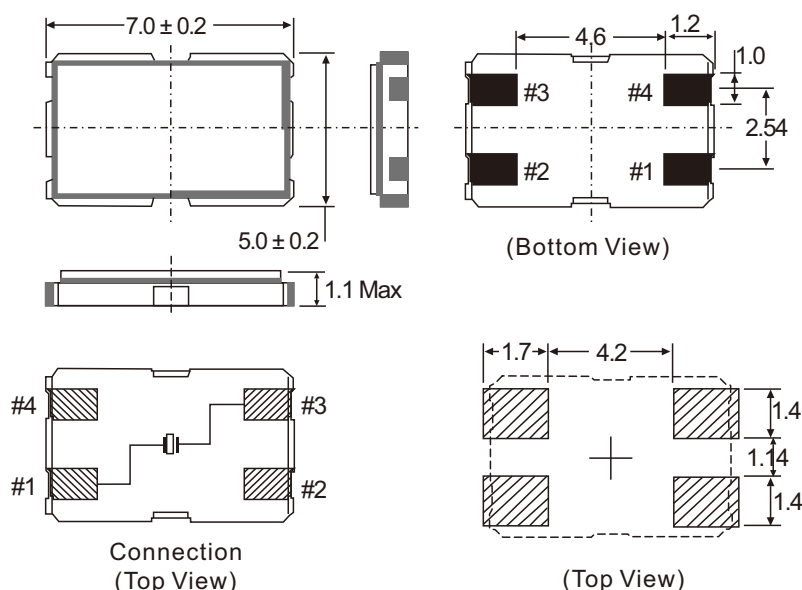
- SMD type crystal units
- Excellent heat resistance and environmental characteristics
- Designed for automatic mounting and reflow soldering
- RoHS Compliant / Pb Free
- Conforms to AEC-Q200



Electrical Specifications

Item	Specifications	
Frequency Range(MHz)	6~8	8~50
Mode	AT/Fundamental	
Load Capacitance (CL)	8pF, 16pF, 20pF, 30pF, or Specify	
Frequency Tolerance(at 25°C)	±20ppm or specify	
Operating Temperature Range	-40~+85°C, -40~+105°C, -40~+125°C	
Frequency Stability Over Operating Temperature Range	±150ppm or specify	
Equivalent Series Resistance (ESR) max.	100Ω	80Ω
Storage Temperature Range	-55~+125°C	
Shunt Capacitance(C ₀)	5pF Max	
Drive Level (Typical)	1~100 μW	
Aging @ 25°C 1st Year (Max)	±3 ppm/year	

Dimension(mm)

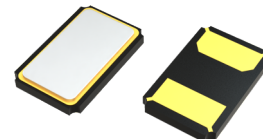


2.0 x 1.2 x 0.6 mm SMD Package

For Automotive

Feature

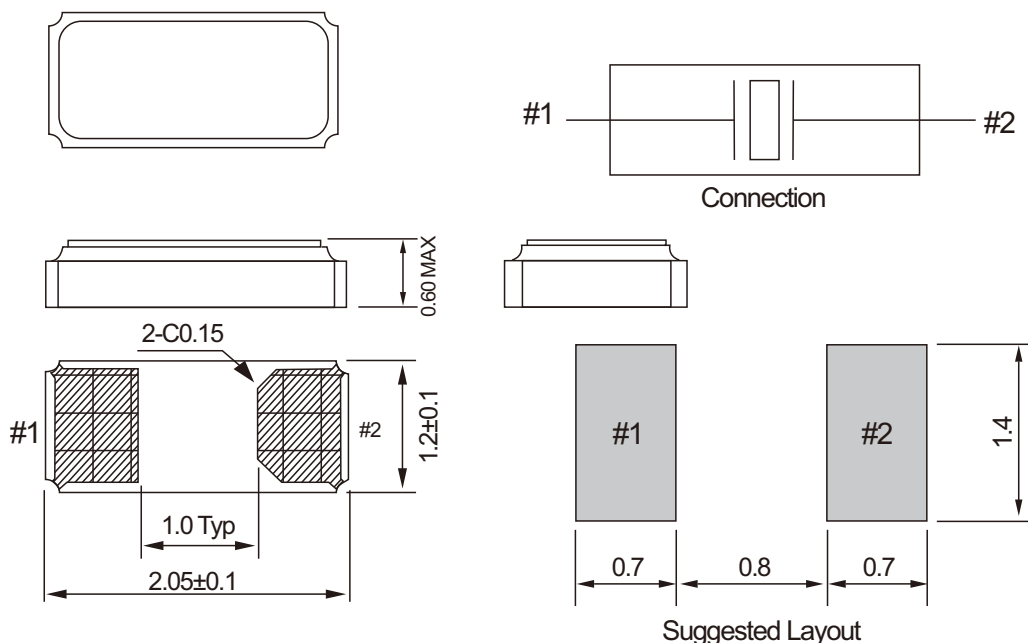
- Ultra small size 2.0*1.2*0.6 mm
- High reliability environmental performance
- Designed for automatic mounting and reflow soldering
- RoHS Compliant / Pb Free
- Conforms to AEC-Q200



Electrical Specifications

Item	Specifications
Frequency	32.768kHz
Load Capacitance (CL)	6pF, 7pF, 9pF, 12.5pF
Frequency Tolerance(at 25°C)	±20ppm
Operating Temperature Range	-40~+85°C, -40~+125°C
Turnover Temperature	25 ± 5°C
Frequency Temperature Curve	$(-0.030 \pm 10\%) \times 10^{-6} / ^\circ\text{C}^2$
Equivalent Series Resistance (ESR) max.	120kΩ
Drive Level (Typical)	0.1μW
Drive Level(Max)	1.0μW
Shunt Capacitance(C ₀)	1.3pF Typ.
Insulation Resistance	More than 500Mohms at DC100V
Storage Temperature Range	-55°C~+125°C
Aging @ 25°C 1st Year (Max)	±3ppm/year

Dimension(mm)

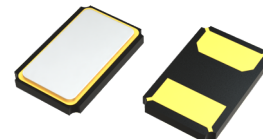


3.2 x 1.5 x 0.75 mm SMD Package

For Automotive

Feature

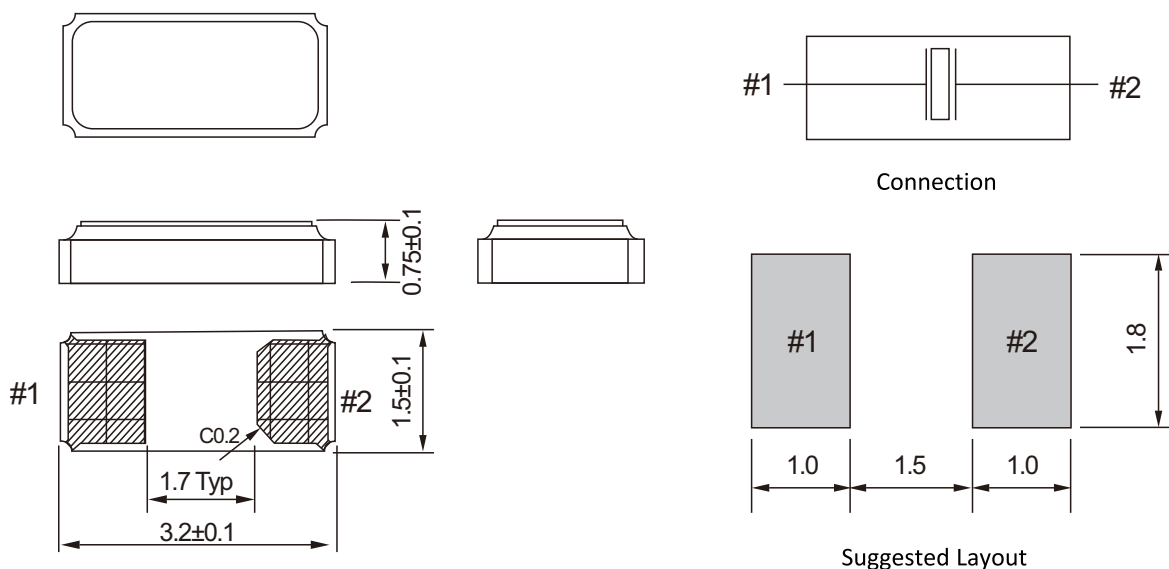
- Ultra small size 3.2*1.5*0.75 mm
- High reliability environmental performance
- Designed for automatic mounting and reflow soldering
- RoHS Compliant / Pb Free
- Conforms to AEC-Q200



Electrical Specifications

Item	Specifications
Frequency	32.768kHz
Load Capacitance (CL)	6pF, 7pF, 9pF, 12.5pF
Frequency Tolerance(at 25°C)	±20ppm
Operating Temperature Range	-40~+85°C, -40~+125°C
Turnover Temperature	25 ± 5°C
Frequency Temperature Curve	$(-0.033 \pm 10\%) \times 10^{-6} / ^\circ\text{C}^2$
Equivalent Series Resistance (ESR) max.	80kΩ
Drive Level (Typical)	0.1μW
Drive Level(Max)	1.0μW
Shunt Capacitance(C ₀)	1.0pF Typ.
Insulation Resistance	More than 500Mohms at DC100V
Storage Temperature Range	-55°C~+125°C
Aging @ 25°C 1st Year (Max)	±3ppm/year

Dimension(mm)



AUTOMOTIVE CRYSTALS



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