SUNTSU

Ceramic SMT 4 Pad Crystal

SXT104 Series

1.2mm x 1.0mm

Features

- ±10ppm/±10ppm (Tolerance/Stability) Available
- Ultra-Miniature Package
- AT-Cut Fundamental
- Tape and Reel

Applications

- Bluetooth
- Wireless LAN
- High Density Applications

Part Numbering Guide

SXT 10 4 10 A A 48 - 40.000M

- **SUNTSU CRYSTAL**
- **1.2mm x 1.0mm**
- **4 PAD**
- **LOAD CAPACITANCE**
  - 5-10 : 5pF - 10pF
- **FREQUENCY TOLERANCE**
  - A : ±50ppm
  - B : ±30ppm
  - C : ±25ppm
  - D : ±20ppm
  - E : ±15ppm
  - F : ±10ppm
- **FREQUENCY STABILITY**
  - A : ±50ppm
  - B : ±30ppm
  - C : ±25ppm
  - D : ±20ppm
  - E : ±15ppm
  - F : ±10ppm*
- **OPERATING TEMPERATURE RANGE****
  - 07 : 0°C - +70°C
  - 16 : -10°C - +60°C
  - 17 : -10°C - +70°C
  - 27 : -20°C - +70°C
  - 38 : -30°C - +85°C
  - 48 : -40°C - +85°C
- **FREQUENCY**
  - MHz

RoHS COMPLIANT

Cage Code: 4GUT4

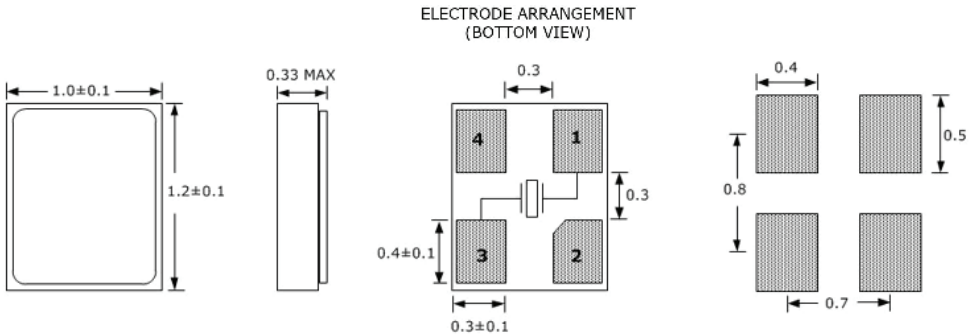
To customize your parameters contact a Suntsu representative.

* For frequency stability option F contact a Suntsu representative. ** For operating temperatures of -55-125°C a Suntsu representative.

Electrical Parameters	Units	Minimum	Typical	Maximum	Remarks
Frequency Range	MHz	36		80	AT-Cut Fundamental.
Frequency Tolerance at +25°C	ppm	-10		+10	See part numbering guide for options.
Frequency Stability vs. Op Temp	ppm	-10		+10	See part numbering guide for options.
Frequency Stability vs. Aging	ppm	-2		+2	First year @ +25°C.
Operating Temperature	°C	-40		+85	See part numbering guide for options.
Storage Temperature	°C	-40		+125	
Load Capacitance	pF	5		10	
Shunt Capacitance	pF			5	See part numbering guide for options.
Drive Level	µW		10	100	
Insulation Resistance	MΩ	500			@ 100VDC ± 15V.
8.000MHz ~ 11.999MHz	Ω			150	AT-Cut Fundamental
ESR - 12.000MHz ~ 19.999MHz	Ω			80	AT-Cut Fundamental
20.000MHz ~ 29.999MHz	Ω			60	AT-Cut Fundamental

Outline Drawing & Recommended Landed Pattern

All dimensions are in millimeters (mm) unless otherwise noted. Drawings are not to scale.



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SUNTSU

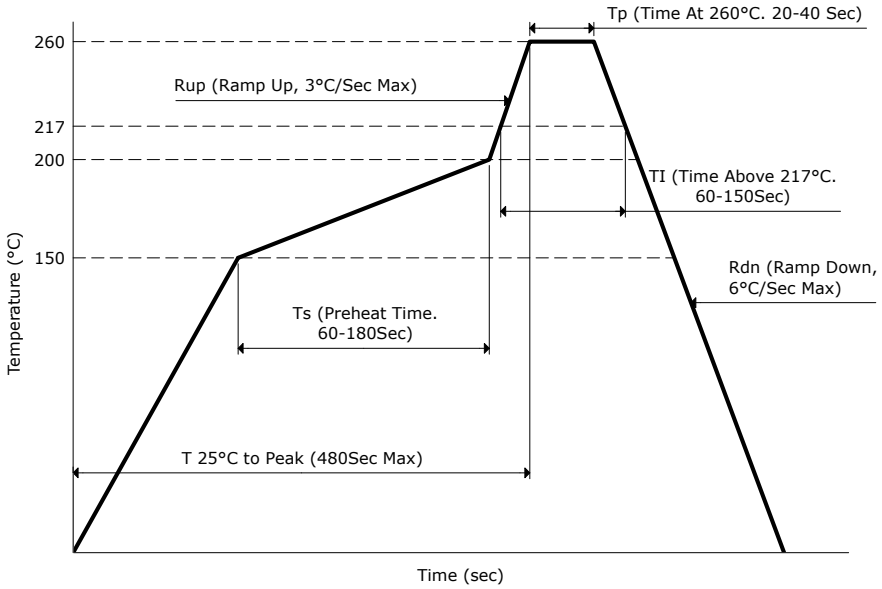
Ceramic SMT 4 Pad Crystal

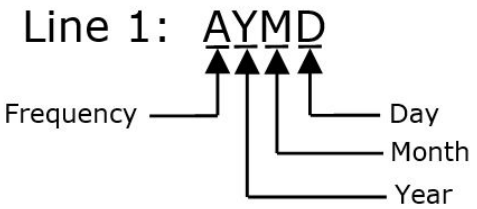
SXT104 Series

1.2mm x 1.0mm

Environmental Specifications		Mechanical Specifications	
Temperature Cycling	MIL-STD-883, Method 1010, Condition B	Mechanical Shock	MIL-STD-202, Method 213, Condition B
Fine Leak Test	MIL-STD-883, Method 1014, Condition A	Vibration	MIL-STD-883, Method 2007, Condition A
Gross Leak Test	MIL-STD-883, Method 1014, Condition C	Resistance to Soldering Heat	MIL-STD-202, Method 210, Condition K
Moisture Resistance	MIL-STD-883, Method 1004	Resistance to Solvents	MIL-STD-202, Method 215
Moisture Sensitivity	J-STD-020, MSL 1	Solderability	MIL-STD-883, Method 2003

Reflow Profile & Part Marking





Tape And Reel Dimensions

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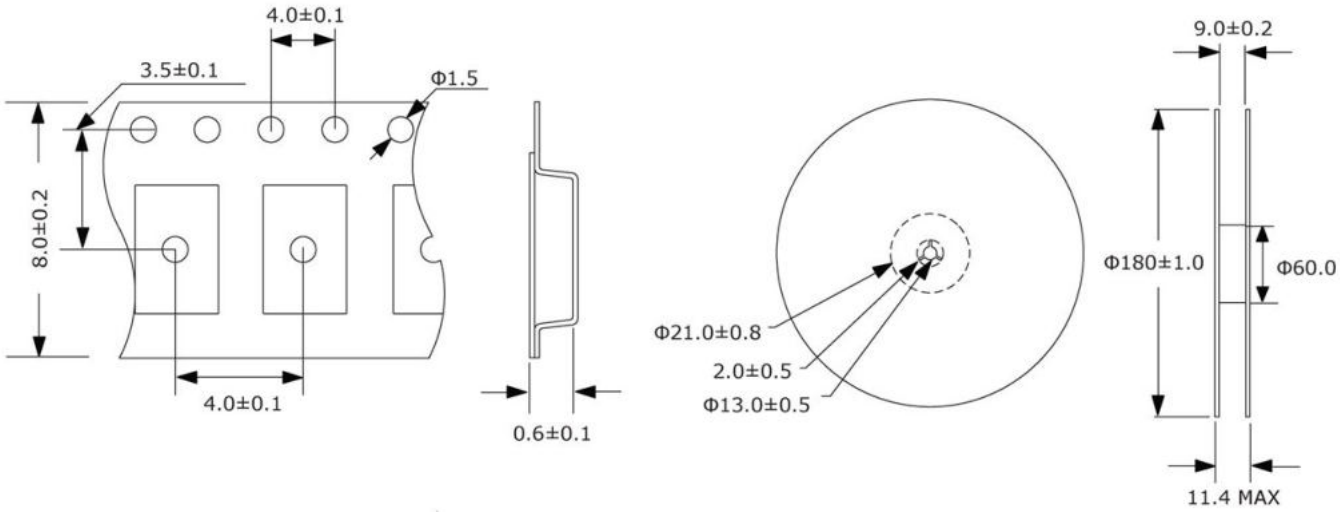
5,000pcs / Reel



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SUNTSU

Ceramic SMT 4 Pad Crystal

SXT214 Series

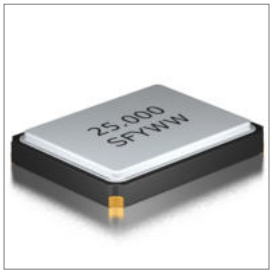
2.0mm x 1.6mm

Features

- ±10ppm/±10ppm (Tolerance/Stability) Available
- Ultra-Miniature Package
- AT-Cut Fundamental
- Tape and Reel

Applications

- Office Automation
- Audio/Visual Bluetooth
- Small Communication Devices
- SSD
- USB



Part Numbering Guide

SXT 21 4 18 A A 48 - 25.000M

- **SUNTSU CRYSTAL**
- **2.0mm x 1.6mm**
- **4 PAD**
- **LOAD CAPACITANCE**
  - S : Series
  - 8-32 : 8pF - 32pF
- **FREQUENCY TOLERANCE**
  - A : ±50ppm
  - B : ±30ppm
  - C : ±25ppm
  - D : ±20ppm
  - E : ±15ppm
  - F : ±10ppm
- **FREQUENCY STABILITY**
  - A : ±50ppm
  - B : ±30ppm
  - C : ±25ppm
  - D : ±20ppm
  - E : ±15ppm
  - F : ±10ppm*
- **OPERATING TEMPERATURE RANGE****
  - 07 : 0°C - +70°C
  - 16 : -10°C - +60°C
  - 17 : -10°C - +70°C
  - 27 : -20°C - +70°C
  - 38 : -30°C - +85°C
  - 48 : -40°C - +85°C
- **FREQUENCY**
  - MHz

RoHS COMPLIANT

Cage Code: 4GUT4

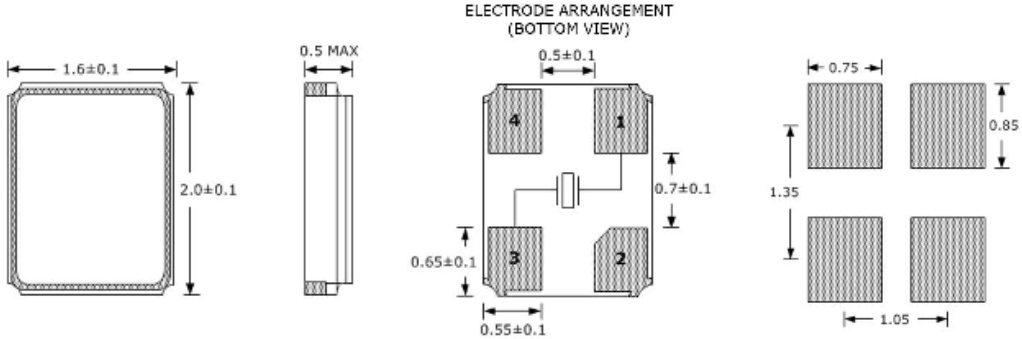
To customize your parameters contact a Suntsu representative.

* For frequency stability option F contact a Suntsu representative. ** For operating temperatures of -55-125°C a Suntsu representative.

Electrical Parameters	Units	Minimum	Typical	Maximum	Remarks
Frequency Range	MHz	16		60	AT-Cut Fundamental.
Frequency Tolerance at +25°C	ppm	-10		+10	See part numbering guide for options.
Frequency Stability vs. Op Temp	ppm	-10		+10	See part numbering guide for options.
Frequency Stability vs. Aging	ppm	-2		+2	First year @ +25°C.
Operating Temperature	°C	-40		+85	See part numbering guide for options.
Storage Temperature	°C	-40		+125	
Load Capacitance	pF	8		16	See part numbering guide for options.
Shunt Capacitance	pF			5	
Drive Level	µW		50	100	
Insulation Resistance	MΩ	500			@ 100VDC ± 15V.
16.000MHz ~ 20.999MHz	Ω			200	AT-Cut Fundamental
ESR - 21.000MHz ~ 25.999MHz	Ω			120	AT-Cut Fundamental
26.000MHz ~ 40.999MHz	Ω			100	AT-Cut Fundamental
41.000MHz ~ 60.000MHz	Ω			60	AT-Cut Fundamental

Outline Drawing & Recommended Landed Pattern

All dimensions are in millimeters (mm) unless otherwise noted. Drawings are not to scale.



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SUNTSU

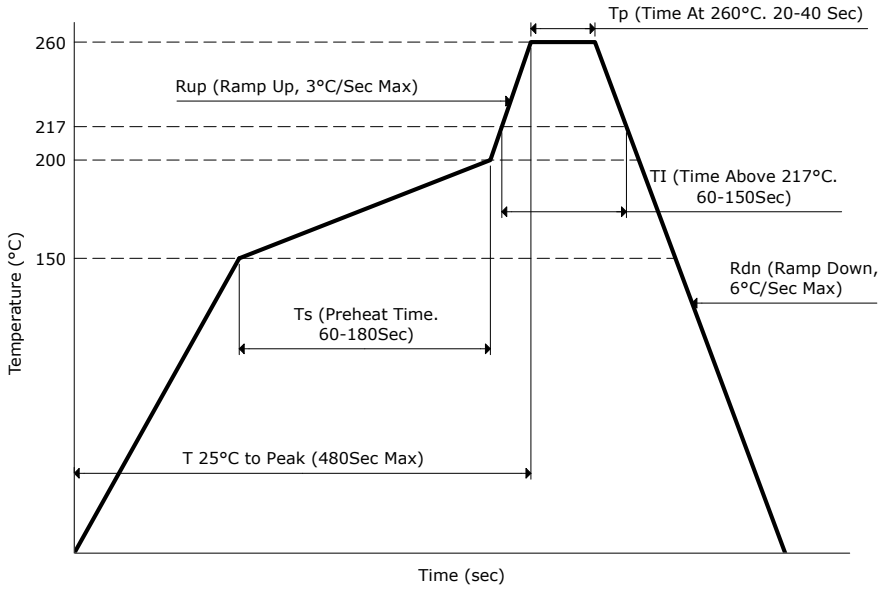
Ceramic SMT 4 Pad Crystal

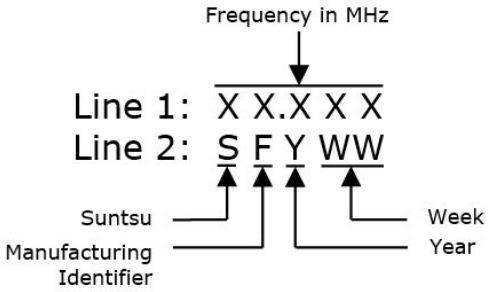
SXT214 Series

2.0mm x 1.6mm

Environmental Specifications		Mechanical Specifications	
Temperature Cycling	MIL-STD-883, Method 1010, Condition B	Mechanical Shock	MIL-STD-202, Method 213, Condition B
Fine Leak Test	MIL-STD-883, Method 1014, Condition A	Vibration	MIL-STD-883, Method 2007, Condition A
Gross Leak Test	MIL-STD-883, Method 1014, Condition C	Resistance to Soldering Heat	MIL-STD-202, Method 210, Condition K
Moisture Resistance	MIL-STD-883, Method 1004	Resistance to Solvents	MIL-STD-202, Method 215
Moisture Sensitivity	J-STD-020, MSL 1	Solderability	MIL-STD-883, Method 2003

Reflow Profile & Part Marking





Tape And Reel Dimensions

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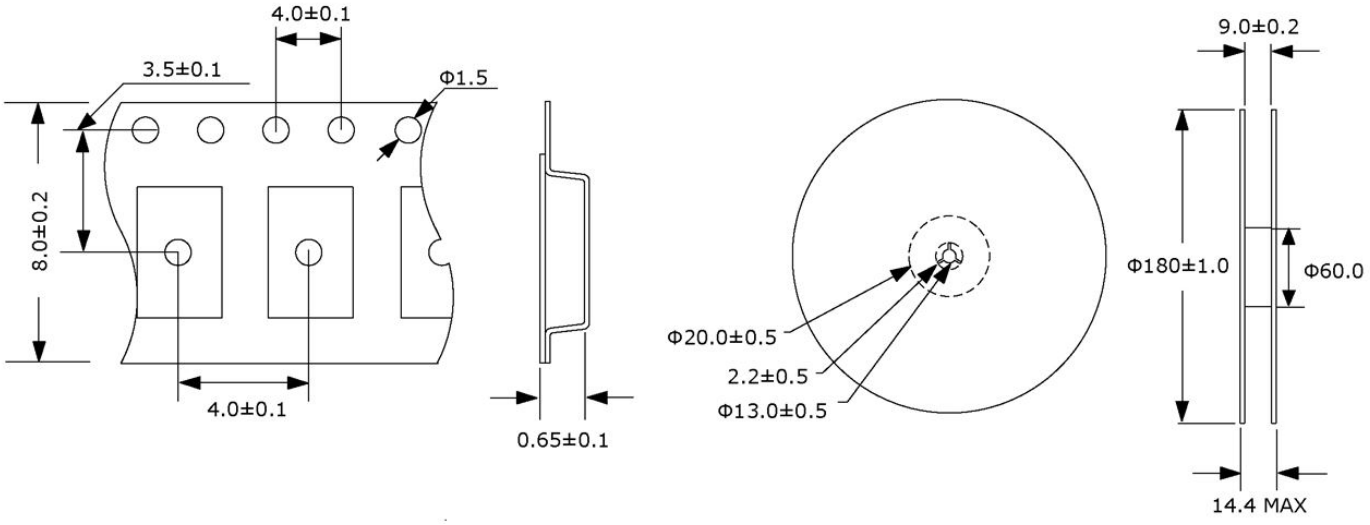
3,000pcs / Reel



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SUNTSU

Glass Sealed SMT 4 Pad Crystal

SXT3G4 Series

3.2mm x 2.5mm

Features

- ±10ppm/±10ppm (Tolerance/Stability) Available
- Ultra-Miniature Package
- Glass Sealed
- AT-Cut Fundamental
- Tape and Reel

Applications

- Automotive Applications
- PCMCIA
- Wireless Applications
- High Density Applications

Part Numbering Guide

SXT 3G 4 18 A A 48 - 16.000M

SUNTSU CRYSTAL

3.2mm x 2.5mm Glass Sealed

4 PAD

LOAD CAPACITANCE
S : Series
7-30 : 7pF - 30pF

FREQUENCY TOLERANCE
A : ±50ppm
B : ±30ppm
C : ±25ppm
D : ±20ppm
E : ±15ppm
F : ±10ppm

FREQUENCY STABILITY
A : ±50ppm
B : ±30ppm
C : ±25ppm
D : ±20ppm
E : ±15ppm
F : ±10ppm*

OPERATING TEMPERATURE RANGE**
07 : 0°C - +70°C
16 : -10°C - +60°C
17 : -10°C - +70°C
27 : -20°C - +70°C
38 : -30°C - +85°C
48 : -40°C - +85°C

FREQUENCY
MHz

RoHS COMPLIANT

Cage Code: 4GUT4
To customize your parameters contact a Suntsu representative.
* For frequency stability option F contact a Suntsu representative. ** For operating temperatures of -55-125°C a Suntsu representative.

Electrical Parameters	Units	Minimum	Typical	Maximum	Remarks
Frequency Range	MHz	10		60	AT-Cut Fundamental.
Frequency Tolerance at +25°C	ppm	-10		+10	See part numbering guide for options.
Frequency Stability vs. Op Temp	ppm	-10		+10	See part numbering guide for options.
Frequency Stability vs. Aging	ppm	-3		+3	First year @ +25°C.
Operating Temperature	°C	-40		+85	See part numbering guide for options.
Storage Temperature	°C	-40		+125	
Load Capacitance	pF	7		30	See part numbering guide for options.
Shunt Capacitance	pF			5	
Drive Level	µW		10	200	
Insulation Resistance	MΩ	500			@ 100VDC ± 15V.
10.000MHz ~ 10.999MHz	Ω			250	AT-Cut Fundamental
11.000MHz ~ 15.999MHz	Ω			100	AT-Cut Fundamental
ESR - 16.000MHz ~ 25.999MHz	Ω			70	AT-Cut Fundamental
26.000MHz ~ 29.999MHz	Ω			60	AT-Cut Fundamental
30.000MHz ~ 60.000MHz	Ω			50	AT-Cut Fundamental

Outline Drawing & Recommended Landed Pattern

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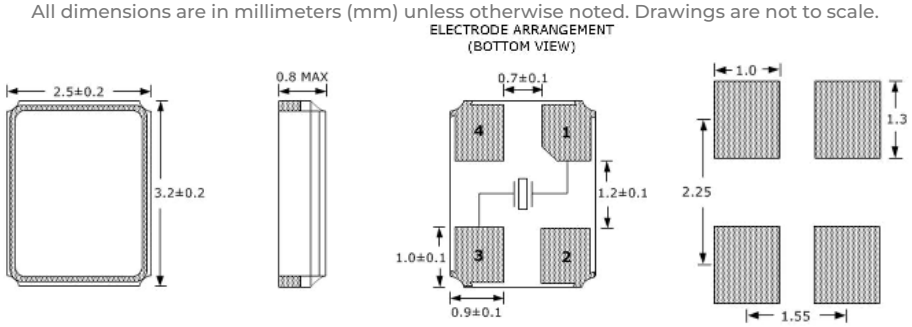

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SUNTSU

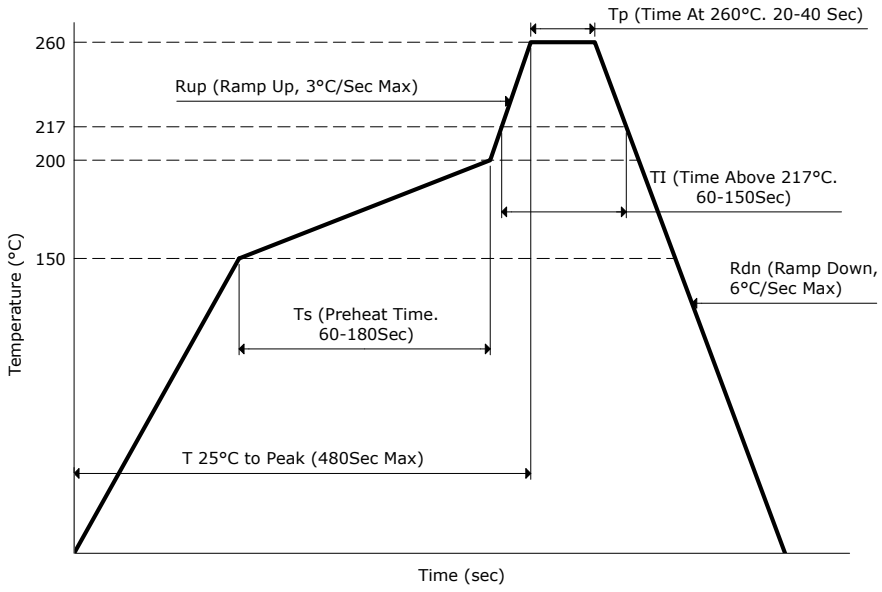
Glass Sealed SMT 4 Pad Crystal

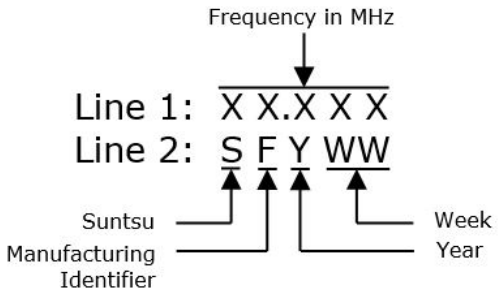
SXT3G4 Series

3.2mm x 2.5mm

Enviromental Specifications		Mechcanical Specifications	
Temperature Cycling	MIL-STD-883, Method 1010, Condition B	Mechanical Shock	MIL-STD-202, Method 213, Condition B
Fine Leak Test	MIL-STD-883, Method 1014, Condition A	Vibration	MIL-STD-883, Method 2007, Condition A
Gross Leak Test	MIL-STD-883, Method 1014, Condition C	Resistance to Soldering Heat	MIL-STD-202, Method 210, Condition K
Moisture Resistance	MIL-STD-883, Method 1004	Resistance to Solvents	MIL-STD-202, Method 215
Moisture Sensitivity	J-STD-020, MSL 1	Solderability	MIL-STD-883, Method 2003

Reflow Profile & Part Marking





Tape And Reel Dimensions

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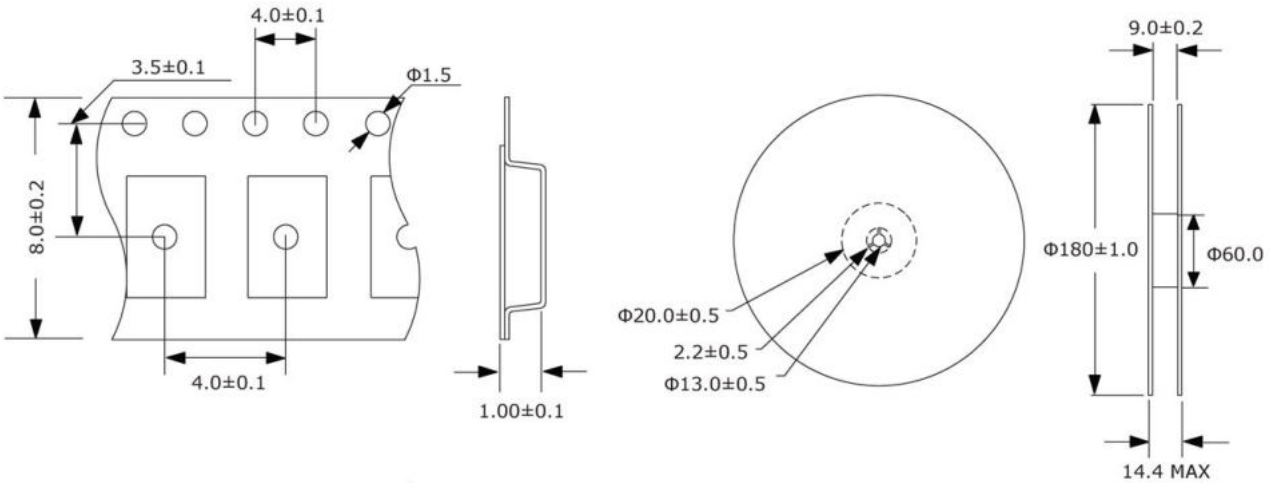
3,000pcs / Reel



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SUNTSU

Glass Sealed SMT 2 Pad Crystal

SXT5G2 Series

5.0mm x 3.2mm

Features

- ±10ppm/±10ppm (Tolerance/Stability) Available
- Ultra-Miniature Package
- Glass Sealed
- AT-Cut Fundamental
- Tape and Reel

Applications

- Automotive Applications
- PCMCIA
- Wireless Applications
- High Density Applications

Part Numbering Guide

SXT 5G 2 18 A A 48 - 16.000M

SUNTSU CRYSTAL

5.0mm x 3.2mm Glass Sealed

2 PAD

LOAD CAPACITANCE
S : Series
7-30 : 7pF - 30pF

FREQUENCY TOLERANCE
A : ±50ppm
B : ±30ppm
C : ±25ppm
D : ±20ppm
E : ±15ppm
F : ±10ppm

FREQUENCY STABILITY
A : ±50ppm
B : ±30ppm
C : ±25ppm
D : ±20ppm
E : ±15ppm
F : ±10ppm*

OPERATING TEMPERATURE RANGE**
07 : 0°C - +70°C
16 : -10°C - +60°C
17 : -10°C - +70°C
27 : -20°C - +70°C
38 : -30°C - +85°C
48 : -40°C - +85°C

FREQUENCY
MHz

RoHS COMPLIANT

Cage Code: 4GUT4
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* For frequency stability option F contact a Suntsu representative. ** For operating temperatures of -55-125°C a Suntsu representative.

Electrical Parameters	Units	Minimum	Typical	Maximum	Remarks
Frequency Range	MHz	8		54	AT-Cut Fundamental.
Frequency Tolerance at +25°C	ppm	-10		+10	See part numbering guide for options.
Frequency Stability vs. Op Temp	ppm	-10		+10	See part numbering guide for options.
Frequency Stability vs. Aging	ppm	-3		+3	First year @ +25°C.
Operating Temperature	°C	-40		+85	
Storage Temperature	°C	-40		+125	See part numbering guide for options.
Load Capacitance	pF	7		30	See part numbering guide for options.
Shunt Capacitance	pF			7	
Drive Level	µW		100	300	
Insulation Resistance	MΩ	500			@ 100VDC ± 15V.
8.000MHz ~ 11.999MHz	Ω			100	AT-Cut Fundamental
12.000MHz ~ 19.999MHz	Ω			80	AT-Cut Fundamental
ESR - 20.000MHz ~ 29.999MHz	Ω			70	AT-Cut Fundamental
30.000MHz ~ 54.000MHz	Ω			50	AT-Cut Fundamental
40.000MHz ~ 100.000MHz	Ω			70	3rd Overtone.

Outline Drawing & Recommended Landed Pattern

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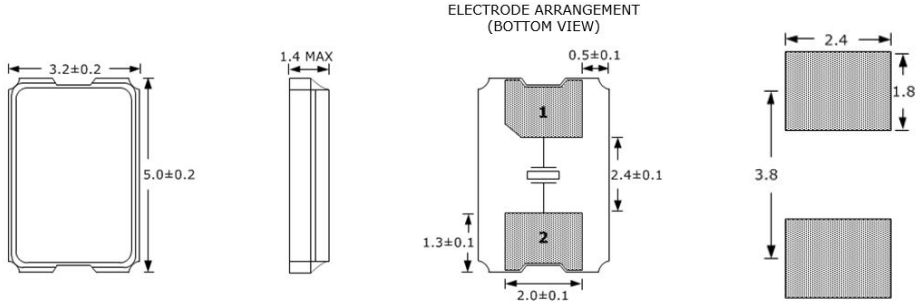

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SUNTSU

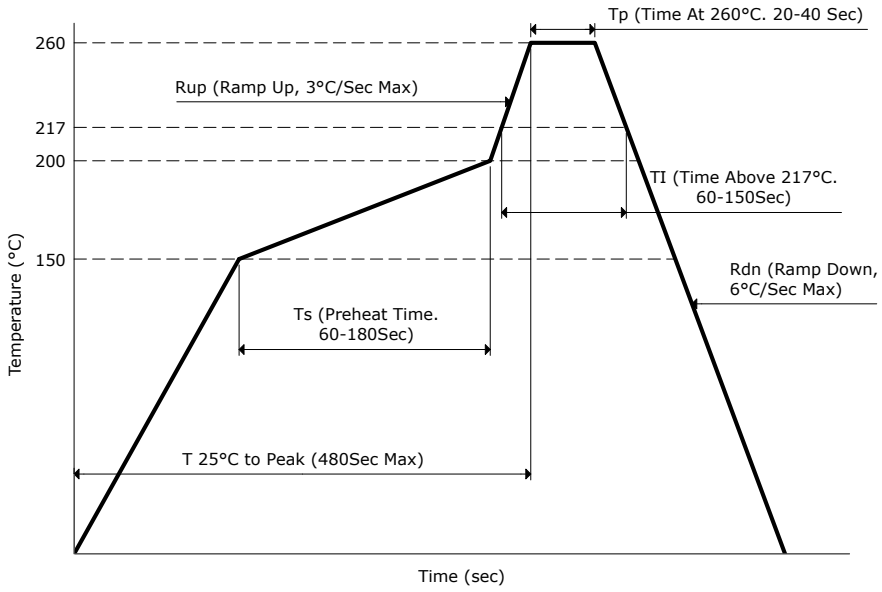
Glass Sealed SMT 2 Pad Crystal

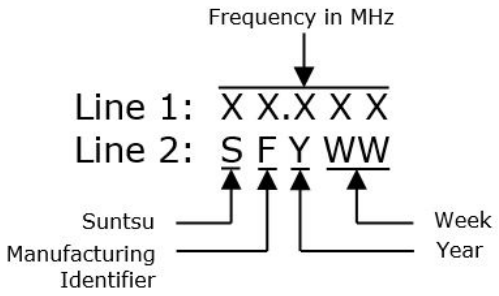
SXT5G2 Series

5.0mm x 3.2mm

Enviromental Specifications		Mechcanical Specifications	
Temperature Cycling	MIL-STD-883, Method 1010, Condition B	Mechanical Shock	MIL-STD-202, Method 213, Condition B
Fine Leak Test	MIL-STD-883, Method 1014, Condition A	Vibration	MIL-STD-883, Method 2007, Condition A
Gross Leak Test	MIL-STD-883, Method 1014, Condition C	Resistance to Soldering Heat	MIL-STD-202, Method 210, Condition K
Moisture Resistance	MIL-STD-883, Method 1004	Resistance to Solvents	MIL-STD-202, Method 215
Moisture Sensitivity	J-STD-020, MSL 1	Solderability	MIL-STD-883, Method 2003

Reflow Profile & Part Marking





Tape And Reel Dimensions

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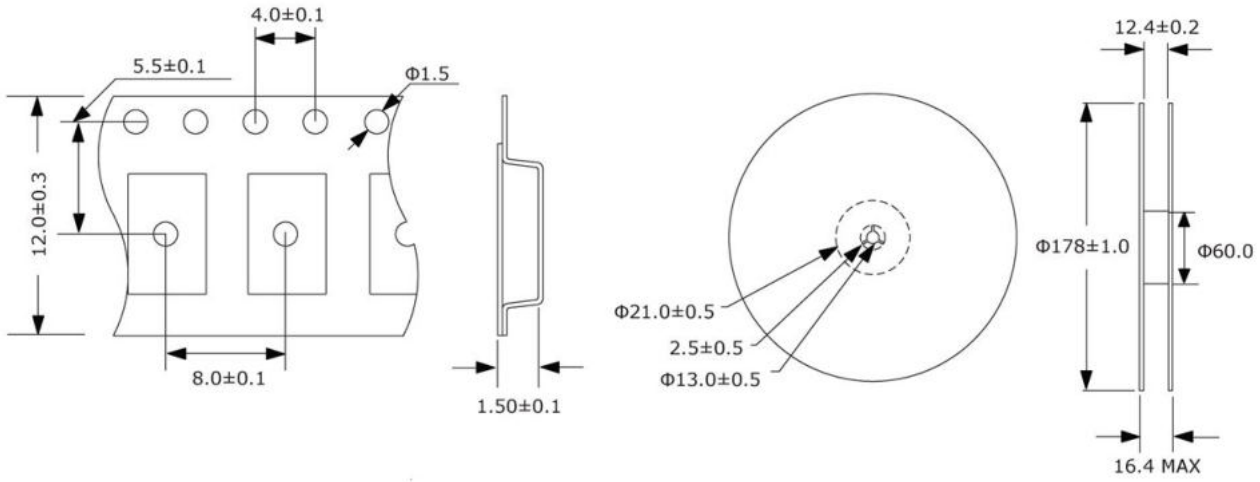
1,000pcs / Reel



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SUNTSU

Glass Sealed SMT 2 Pad Crystal

SXT6G2 Series

6.0mm x 3.5mm

Features

- ±10ppm/±10ppm (Tolerance/Stability) Available
- Ultra-Miniature Package
- Glass Sealed
- AT-Cut Fundamental
- Tape and Reel

Applications

- Microprocessors
- PCMCIA
- Communication
- Test Equipment

Part Numbering Guide

SXT 6G 2 18 A A 48 T - 24.000M

- **SUNTSU CRYSTAL**
- **6.0mm x 3.5mm Glass Sealed**
- **2 PAD**
- **LOAD CAPACITANCE**
  - S : Series
  - 7-30 : 7pF - 30pF
- **FREQUENCY TOLERANCE**
  - A : ±50ppm
  - B : ±30ppm
  - C : ±25ppm
  - D : ±20ppm
  - E : ±15ppm
  - F : ±10ppm
- **FREQUENCY STABILITY**
  - A : ±50ppm
  - B : ±30ppm
  - C : ±25ppm
  - D : ±20ppm
  - E : ±15ppm
  - F : ±10ppm*
- **OPERATING TEMPERATURE RANGE****
  - 0 : 0°C - +70°C
  - 16 : -10°C - +60°C
  - 17 : -10°C - +70°C
  - 27 : -20°C - +70°C
  - 38 : -30°C - +85°C
  - 48 : -40°C - +85°C
- **MODE OF OPERATION**
  - BLANK : Fundamental
  - T : 3rd Overtone
- **FREQUENCY**
  - MHz

RoHS COMPLIANT

Cage Code: 4GUT4

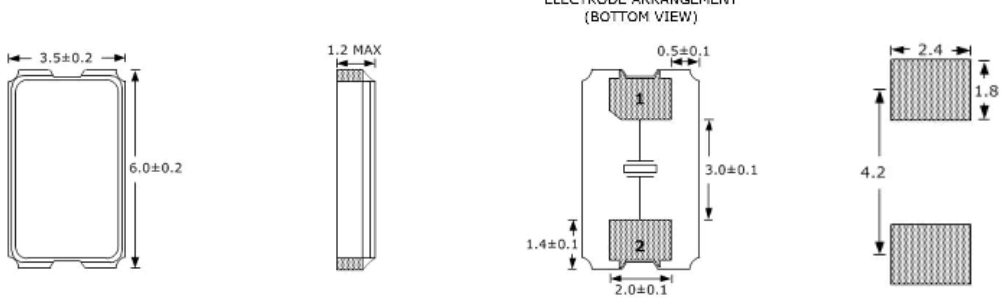
To customize your parameters contact a Suntsu representative.

* For frequency stability option F contact a Suntsu representative. ** For operating temperatures of -55-125°C a Suntsu representative.

Electrical Parameters	Units	Minimum	Typical	Maximum	Remarks
Frequency Range	MHz	8		50	AT-Cut Fundamental.
Frequency Range	MHz	40		80	3rd Overtone.
Frequency Tolerance at +25°C	ppm	-10		+10	See part numbering guide for options.
Frequency Stability vs. Op Temp	ppm	-10		+10	First year @ +25°C.
Frequency Stability vs. Aging	ppm	-3		+3	
Operating Temperature	°C	-40		+85	See part numbering guide for options.
Storage Temperature	°C	-40		+125	
Load Capacitance	pF	7		30	See part numbering guide for options.
Shunt Capacitance	pF			7	
Drive Level	µW		100	500	
Insulation Resistance	MΩ	500			@ 100VDC ± 15V.
8.000MHz ~ 9.999MHz	Ω			100	AT-Cut Fundamental
ESR - 10.000MHz ~ 15.999MHz	Ω			60	AT-Cut Fundamental
16.000MHz ~ 50.999MHz	Ω			40	AT-Cut Fundamental
40.000MHz ~ 80.000MHz	Ω			70	3rd Overtone.

Outline Drawing & Recommended Landed Pattern

All dimensions are in millimeters (mm) unless otherwise noted. Drawings are not to scale.



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SUNTSU

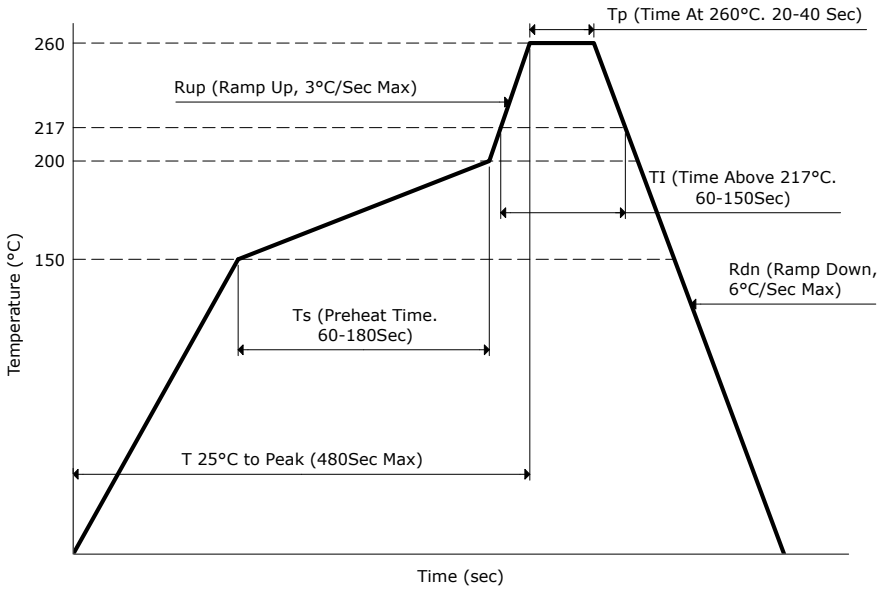
Glass Sealed SMT 2 Pad Crystal

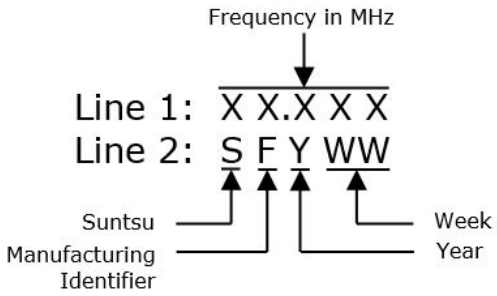
SXT6G2 Series

6.0mm x 3.5mm

Environmental Specifications		Mechanical Specifications	
Temperature Cycling	MIL-STD-883, Method 1010, Condition B	Mechanical Shock	MIL-STD-202, Method 213, Condition B
Fine Leak Test	MIL-STD-883, Method 1014, Condition A	Vibration	MIL-STD-883, Method 2007, Condition A
Gross Leak Test	MIL-STD-883, Method 1014, Condition C	Resistance to Soldering Heat	MIL-STD-202, Method 210, Condition K
Moisture Resistance	MIL-STD-883, Method 1004	Resistance to Solvents	MIL-STD-202, Method 215
Moisture Sensitivity	J-STD-020, MSL 1	Solderability	MIL-STD-883, Method 2003

Reflow Profile & Part Marking

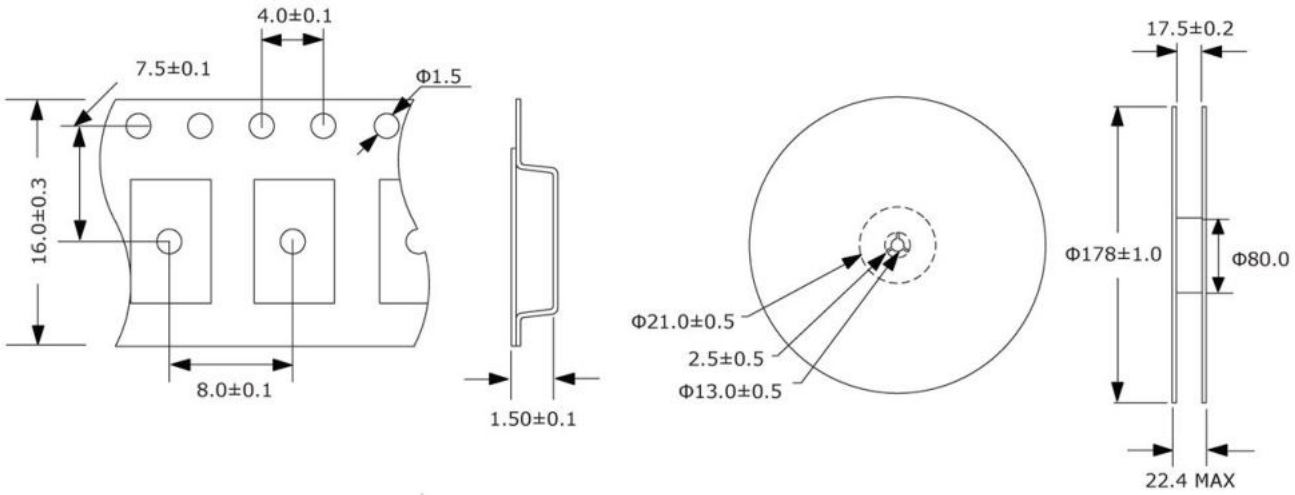




Tape And Reel Dimensions

All dimensions are in millimeters (mm) unless otherwise noted. Drawings are not to scale.

3,000pcs / Reel



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SUNTSU

Ceramic SMT 4 Pad Crystal

SXT224 Series

2.5mm x 2.0mm

Features

- ±10ppm/±10ppm (Tolerance/Stability) Available
- Ultra-Miniature Package
- AT-Cut Fundamental
- Tape and Reel

Applications

- Bluetooth
- PCMCIA
- Wireless Applications
- Computers and Modems
- High Density Applications

Part Numbering Guide

SXT 22 4 18 A A 48 - 20.000M

SUNTSU CRYSTAL

2.5mm x 2.0mm

4 PAD

LOAD CAPACITANCE
S : Series
8-20 : 8pF - 20pF

FREQUENCY TOLERANCE
A : ±50ppm
B : ±30ppm
C : ±25ppm
D : ±20ppm
E : ±15ppm
F : ±10ppm

FREQUENCY STABILITY
A : ±50ppm
B : ±30ppm
C : ±25ppm
D : ±20ppm
E : ±15ppm
F : ±10ppm*

OPERATING TEMPERATURE RANGE**
07 : 0°C - +70°C
16 : -10°C - +60°C
17 : -10°C - +70°C
27 : -20°C - +70°C
38 : -30°C - +85°C
48 : -40°C - +85°C

FREQUENCY
MHz

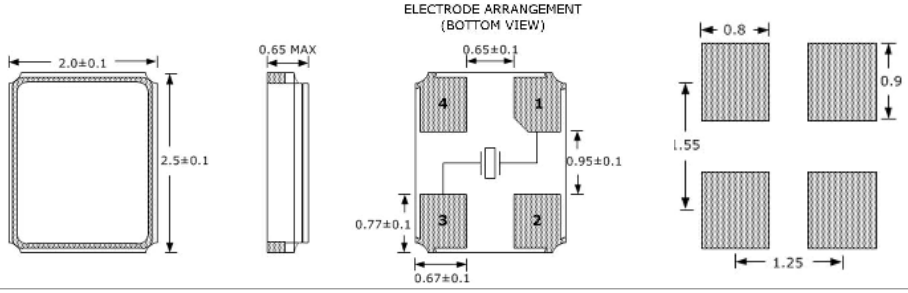
RoHS COMPLIANT

Cage Code: 4GUT4
To customize your parameters contact a Suntsu representative.
* For frequency stability option F contact a Suntsu representative. ** For operating temperatures of -55-125°C a Suntsu representative.

Electrical Parameters	Units	Minimum	Typical	Maximum	Remarks
Frequency Range	MHz	12		66	AT-Cut Fundamental.
Frequency Tolerance at +25°C	ppm	-10		+10	See part numbering guide for options.
Frequency Stability vs. Op Temp	ppm	-10		+10	See part numbering guide for options.
Frequency Stability vs. Aging	ppm	-2		+2	First year @ +25°C.
Operating Temperature	°C	-40		+85	See part numbering guide for options.
Storage Temperature	°C	-40		+125	
Load Capacitance	pF	8		20	See part numbering guide for options.
Shunt Capacitance	pF			5	
Drive Level	µW		50	100	
Insulation Resistance	MΩ	500			@ 100VDC ± 15V.
12.000MHz ~ 15.999MHz	Ω			120	AT-Cut Fundamental
16.000MHz ~ 19.999MHz	Ω			100	AT-Cut Fundamental
ESR - 20.000MHz ~ 29.999MHz	Ω			80	AT-Cut Fundamental
30.000MHz ~ 39.999MHz	Ω			60	AT-Cut Fundamental
40.000MHz ~ 66.000MHz	Ω			50	AT-Cut Fundamental

Outline Drawing & Recommended Landed Pattern

All dimensions are in millimeters (mm) unless otherwise noted. Drawings are not to scale.



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SUNTSU

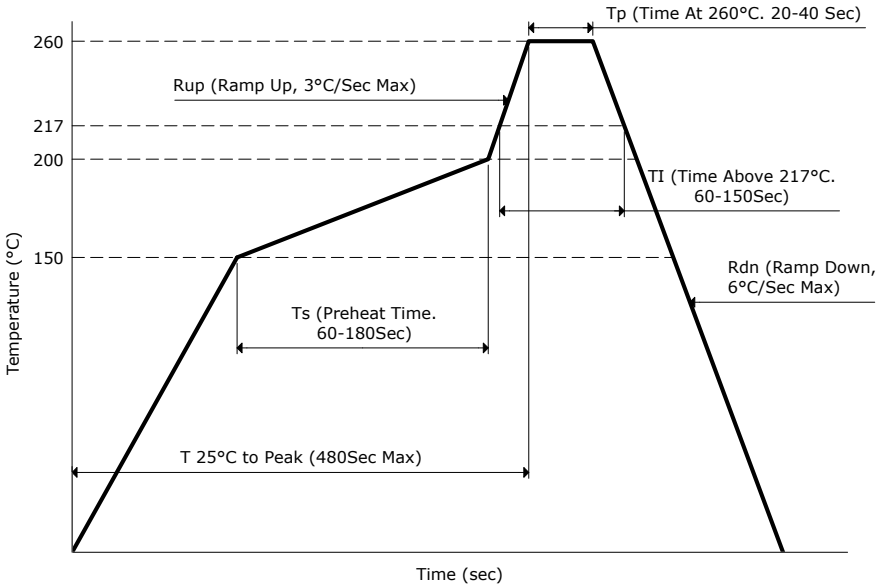
Ceramic SMT 4 Pad Crystal

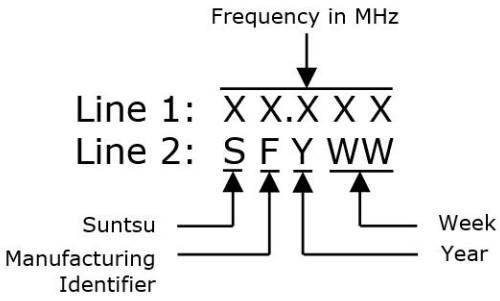
SXT224 Series

2.5mm x 2.0mm

Environmental Specifications		Mechanical Specifications	
Temperature Cycling	MIL-STD-883, Method 1010, Condition B	Mechanical Shock	MIL-STD-202, Method 213, Condition B
Fine Leak Test	MIL-STD-883, Method 1014, Condition A	Vibration	MIL-STD-883, Method 2007, Condition A
Gross Leak Test	MIL-STD-883, Method 1014, Condition C	Resistance to Soldering Heat	MIL-STD-202, Method 210, Condition K
Moisture Resistance	MIL-STD-883, Method 1004	Resistance to Solvents	MIL-STD-202, Method 215
Moisture Sensitivity	J-STD-020, MSL 1	Solderability	MIL-STD-883, Method 2003

Reflow Profile & Part Marking

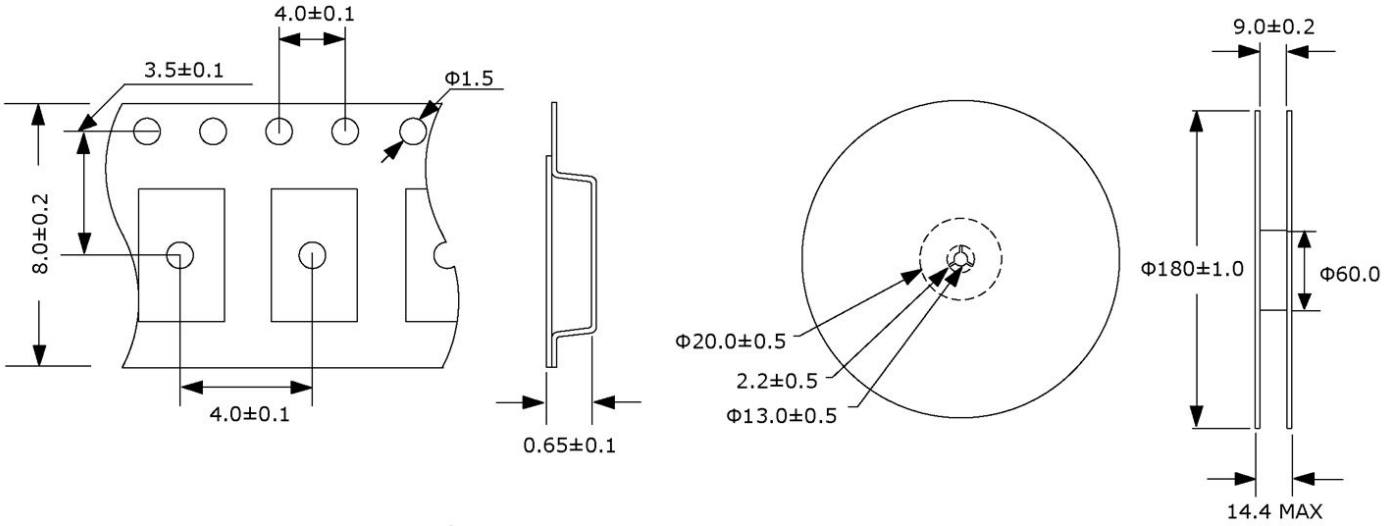




Tape And Reel Dimensions

All dimensions are in millimeters (mm) unless otherwise noted. Drawings are not to scale.

3,000pcs / Reel



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SUNTSU

Ceramic SMT 4 Pad Crystal

SXT324 Series

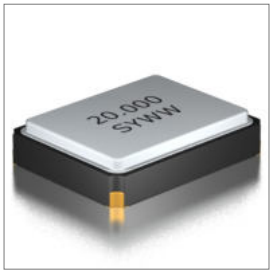
3.2mm x 2.5mm

Features

- ±10ppm/±10ppm (Tolerance/Stability) Available
- Ultra-Miniature Package
- AT-Cut Fundamental
- Tape and Reel

Applications

- High Density Applications
- PCMCIA
- Wireless Applications
- Computers and Modems



Part Numbering Guide

SXT 32 4 18 A A 48 T - 20.000M

- **SUNTSU CRYSTAL**
- **3.2mm x 2.5mm**
- **4 PAD**
- **LOAD CAPACITANCE**
  S : Series
  7-32 : 7pF - 32pF
- **FREQUENCY TOLERANCE**
  A : ±50ppm
  B : ±30ppm
  C : ±25ppm
  D : ±20ppm
  E : ±15ppm
  F : ±10ppm
- **FREQUENCY STABILITY**
  A : ±50ppm
  B : ±30ppm
  C : ±25ppm
  D : ±20ppm
  E : ±15ppm
  F : ±10ppm*
- **OPERATING TEMPERATURE RANGE****
  07 : 0°C - +70°C
  16 : -10°C - +60°C
  17 : -10°C - +70°C
  27 : -20°C - +70°C
  38 : -30°C - +85°C
  48 : -40°C - +85°C
- **MODE OF OPERATION**
  Blank : Fundamental
  T : 3rd Overtone
- **FREQUENCY**
  MHz

RoHS COMPLIANT

Cage Code: 4GUT4

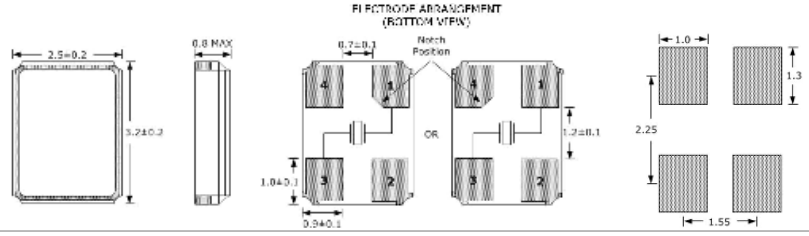
To customize your parameters contact a Suntsu representative.

* For frequency stability option F contact a Suntsu representative. ** For operating temperatures of -55-125°C a Suntsu representative.

Electrical Parameters	Units	Minimum	Typical	Maximum	Remarks
Frequency Range	MHz	10		70	AT-Cut Fundamental.
Frequency Range	MHz	60		170	3rd Overtone
Frequency Tolerance at +25°C	ppm	-10		+10	See part numbering guide for options.
Frequency Stability vs. Op Temp	ppm	-10		+10	See part numbering guide for options.
Frequency Stability vs. Aging	ppm	-2		+2	First year @ +25°C.
Operating Temperature	°C	-40		+85	See part numbering guide for options.
Storage Temperature	°C	-40		+125	
Load Capacitance	pF	7		32	See part numbering guide for options.
Shunt Capacitance	pF			5	
Drive Level	µW		10	100	
Insulation Resistance	MΩ	500			@ 100VDC ± 15V.
10.000MHz ~ 11.999MHz	Ω			250	AT-Cut Fundamental
12.000MHz ~ 15.999MHz	Ω			100	AT-Cut Fundamental
16.000MHz ~ 19.999MHz	Ω			70	AT-Cut Fundamental
ESR - 20.000MHz ~ 29.999MHz	Ω			50	AT-Cut Fundamental
30.000MHz ~ 49.999MHz	Ω			40	AT-Cut Fundamental
50.000MHz ~ 70.000MHz	Ω			35	AT-Cut Fundamental
60.000MHz ~ 170.000MHz	Ω			80	3rd Overtone

Outline Drawing & Recommended Landed Pattern

All dimensions are in millimeters (mm) unless otherwise noted. Drawings are not to scale.



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SUNTSU

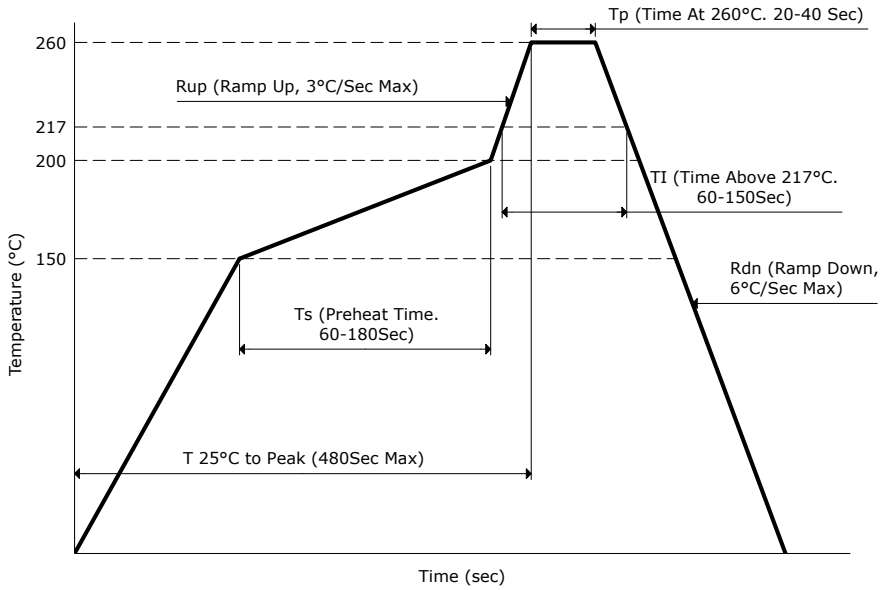
Ceramic SMT 4 Pad Crystal

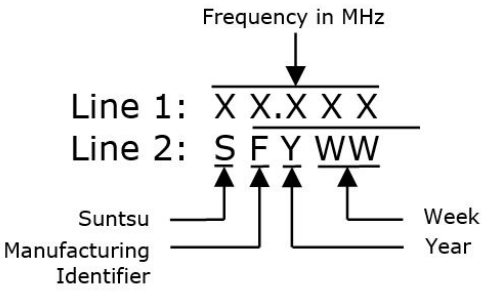
SXT324 Series

3.2mm x 2.5mm

Environmental Specifications		Mechanical Specifications	
Temperature Cycling	MIL-STD-883, Method 1010, Condition B	Mechanical Shock	MIL-STD-202, Method 213, Condition B
Fine Leak Test	MIL-STD-883, Method 1014, Condition A	Vibration	MIL-STD-883, Method 2007, Condition A
Gross Leak Test	MIL-STD-883, Method 1014, Condition C	Resistance to Soldering Heat	MIL-STD-202, Method 210, Condition K
Moisture Resistance	MIL-STD-883, Method 1004	Resistance to Solvents	MIL-STD-202, Method 215
Moisture Sensitivity	J-STD-020, MSL 1	Solderability	MIL-STD-883, Method 2003

Reflow Profile & Part Marking

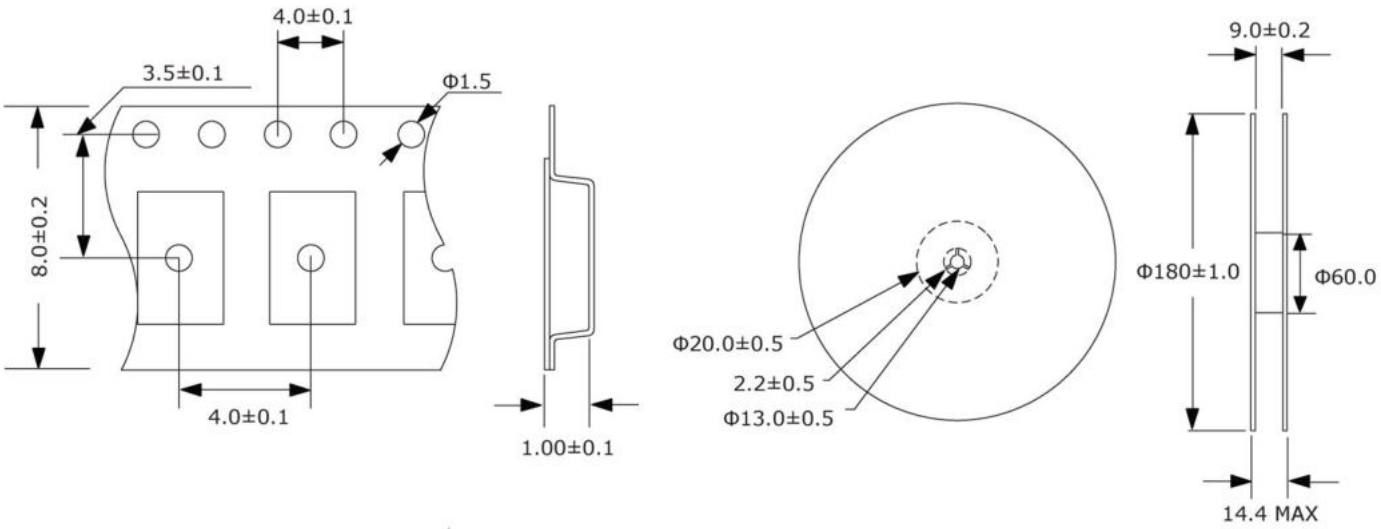




Tape And Reel Dimensions

All dimensions are in millimeters (mm) unless otherwise noted. Drawings are not to scale.

3,000pcs / Reel



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SUNTSU

Ceramic SMT 4 Pad Crystal

SXT424 Series

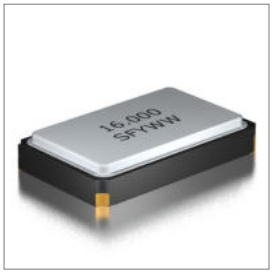
4.0mm x 2.5mm

Features

- ±10ppm/±10ppm (Tolerance/Stability) Available
- Ultra-Miniature Package
- AT-Cut Fundamental
- Tape and Reel

Applications

- High Density Applications
- PCMCIA
- Wireless Applications
- Computers and Modems



Part Numbering Guide

SXT 42 4 18 A A 48 - 16.000M

- **SUNTSU CRYSTAL**
- **4.0mm x 2.5mm**
- **4 PAD**
- **LOAD CAPACITANCE**
  - S : Series
  - 7-32 : 7pF - 32pF
- **FREQUENCY TOLERANCE**
  - A : ±50ppm
  - B : ±30ppm
  - C : ±25ppm
  - D : ±20ppm
  - E : ±15ppm
  - F : ±10ppm
- **FREQUENCY STABILITY**
  - A : ±50ppm
  - B : ±30ppm
  - C : ±25ppm
  - D : ±20ppm
  - E : ±15ppm
  - F : ±10ppm*
- **OPERATING TEMPERATURE RANGE****
  - 07 : 0°C - +70°C
  - 16 : -10°C - +60°C
  - 17 : -10°C - +70°C
  - 27 : -20°C - +70°C
  - 38 : -30°C - +85°C
  - 48 : -40°C - +85°C
- **FREQUENCY**
  - MHz

RoHS COMPLIANT

Cage Code: 4GUT4

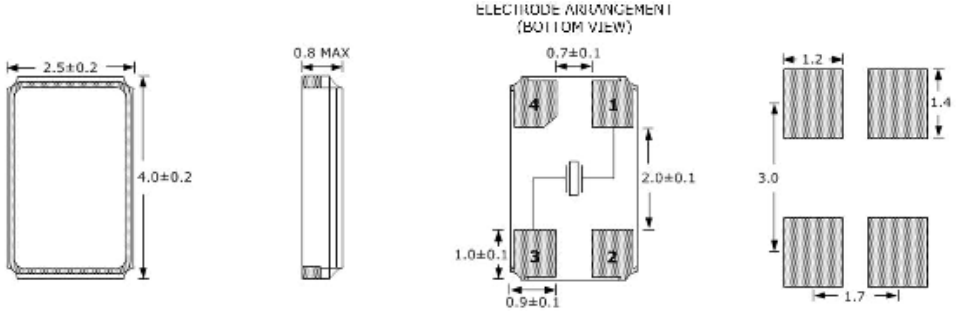
To customize your parameters contact a Suntsu representative.

* For frequency stability option F contact a Suntsu representative. ** For operating temperatures of -55-125°C a Suntsu representative.

Electrical Parameters	Units	Minimum	Typical	Maximum	Remarks
Frequency Range	MHz	12		50	AT-Cut Fundamental.
Frequency Tolerance at +25°C	ppm	-10		+10	See part numbering guide for options.
Frequency Stability vs. Op Temp	ppm	-10		+10	See part numbering guide for options.
Frequency Stability vs. Aging	ppm	-3		+3	First year @ +25°C.
Operating Temperature	°C	-40		+85	See part numbering guide for options.
Storage Temperature	°C	-40		+125	
Load Capacitance	pF	7		32	See part numbering guide for options.
Shunt Capacitance	pF			7	
Drive Level	µW		10	100	
Insulation Resistance	MΩ	500			@ 100VDC ± 15V.
12.000MHz ~ 18.999MHz	Ω			80	AT-Cut Fundamental
19.000MHz ~ 25.999MHz	Ω			60	AT-Cut Fundamental
ESR - 26.000MHz ~ 32.999MHz	Ω			50	AT-Cut Fundamental
33.000MHz ~ 39.999MHz	Ω			40	AT-Cut Fundamental
40.000MHz ~ 50.000MHz	Ω			30	AT-Cut Fundamental

Outline Drawing & Recommended Landed Pattern

All dimensions are in millimeters (mm) unless otherwise noted. Drawings are not to scale.



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SUNTSU

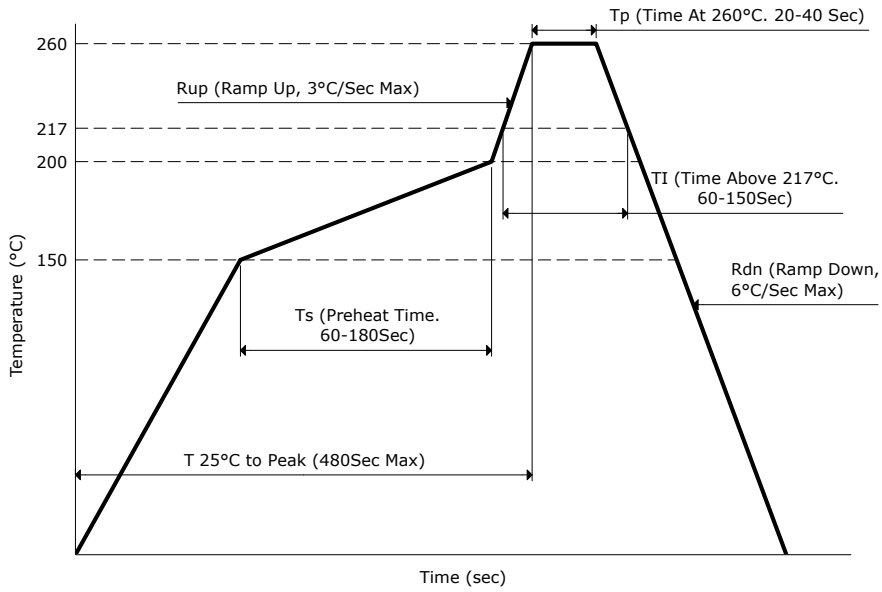
Ceramic SMT 4 Pad Crystal

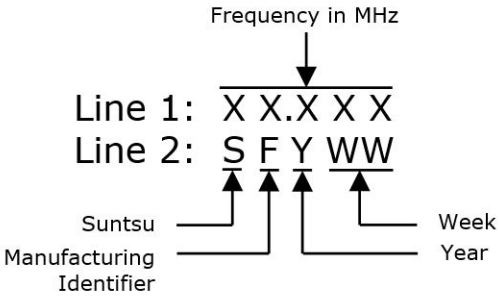
SXT424 Series

4.0mm x 2.5mm

Environmental Specifications		Mechanical Specifications	
Temperature Cycling	MIL-STD-883, Method 1010, Condition B	Mechanical Shock	MIL-STD-202, Method 213, Condition B
Fine Leak Test	MIL-STD-883, Method 1014, Condition A	Vibration	MIL-STD-883, Method 2007, Condition A
Gross Leak Test	MIL-STD-883, Method 1014, Condition C	Resistance to Soldering Heat	MIL-STD-202, Method 210, Condition K
Moisture Resistance	MIL-STD-883, Method 1004	Resistance to Solvents	MIL-STD-202, Method 215
Moisture Sensitivity	J-STD-020, MSL 1	Solderability	MIL-STD-883, Method 2003

Reflow Profile & Part Marking

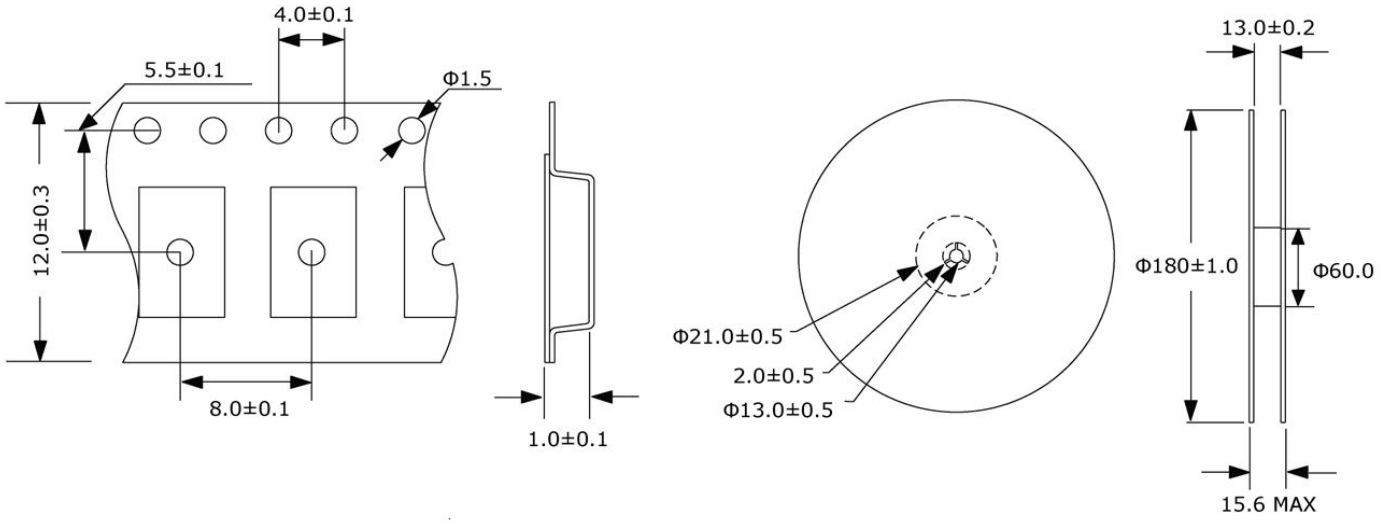




Tape And Reel Dimensions

All dimensions are in millimeters (mm) unless otherwise noted. Drawings are not to scale.

1,000pcs / Reel



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SUNTSU

Ceramic SMT 2 Pad Crystal

SXT532 Series

5.0mm x 3.2mm

Features

- ±10ppm/±10ppm (Tolerance/Stability) Available
- Ultra-Miniature Package
- AT-Cut Fundamental
- Tape and Reel

Applications

- Communication and Test Equipment
- PCMCIA
- Wireless Applications
- High Density Applications

Part Numbering Guide

SXT 53 2 18 A A 48 T - 27.000M

SUNTSU CRYSTAL

5.0mm x 3.2mm

2 PAD

LOAD CAPACITANCE
S : Series
7-30 : 7pF - 30pF

FREQUENCY TOLERANCE
A : ±50ppm
B : ±30ppm
C : ±25ppm
D : ±20ppm
E : ±15ppm
F : ±10ppm

FREQUENCY STABILITY
A : ±50ppm
B : ±30ppm
C : ±25ppm
D : ±20ppm
E : ±15ppm
F : ±10ppm*

OPERATING TEMPERATURE RANGE**
07 : 0°C - +70°C
16 : -10°C - +60°C
17 : -10°C - +70°C
27 : -20°C - +70°C
38 : -30°C - +85°C
48 : -40°C - +85°C

MODE OF OPERATION
Blank : Fundamental
T : 3rd Overtone

FREQUENCY
MHz

RoHS COMPLIANT

Cage Code: 4GUT4

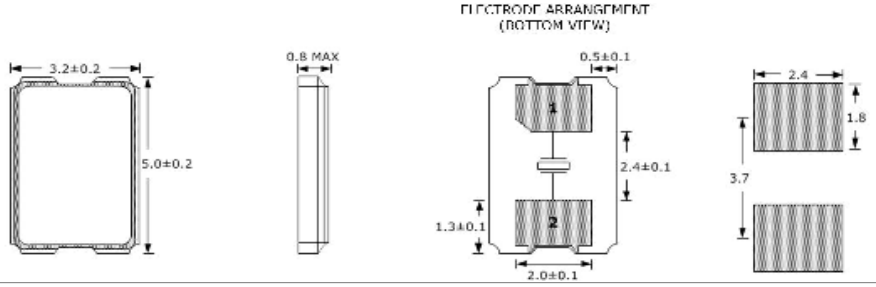
To customize your parameters contact a Suntsu representative.

* For frequency stability option F contact a Suntsu representative. ** For operating temperatures of -55-125°C a Suntsu representative.

Electrical Parameters	Units	Minimum	Typical	Maximum	Remarks
Frequency Range	MHz	8		54	AT-Cut Fundamental.
Frequency Range	MHz	40		100	3rd Overtone
Frequency Tolerance at +25°C	ppm	-10		+10	See part numbering guide for options.
Frequency Stability vs. Op Temp	ppm	-10		+10	See part numbering guide for options.
Frequency Stability vs. Aging	ppm	-3		+3	First year @ +25°C.
Operating Temperature	°C	-40		+85	See part numbering guide for options.
Storage Temperature	°C	-40		+125	
Load Capacitance	pF	7		30	See part numbering guide for options.
Shunt Capacitance	pF			7	
Drive Level	µW		10	100	
Insulation Resistance	MΩ	500			@ 100VDC ± 15V.
8.000MHz ~ 11.999MHz	Ω			100	AT-Cut Fundamental
12.000MHz ~ 19.999MHz	Ω			80	AT-Cut Fundamental
ESR - 20.000MHz ~ 29.999MHz	Ω			70	AT-Cut Fundamental
30.000MHz ~ 54.000MHz	Ω			50	AT-Cut Fundamental
40.000MHz ~ 100.000MHz	Ω			70	3rd Overtone

Outline Drawing & Recommended Landed Pattern

All dimensions are in millimeters (mm) unless otherwise noted. Drawings are not to scale.



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SUNTSU

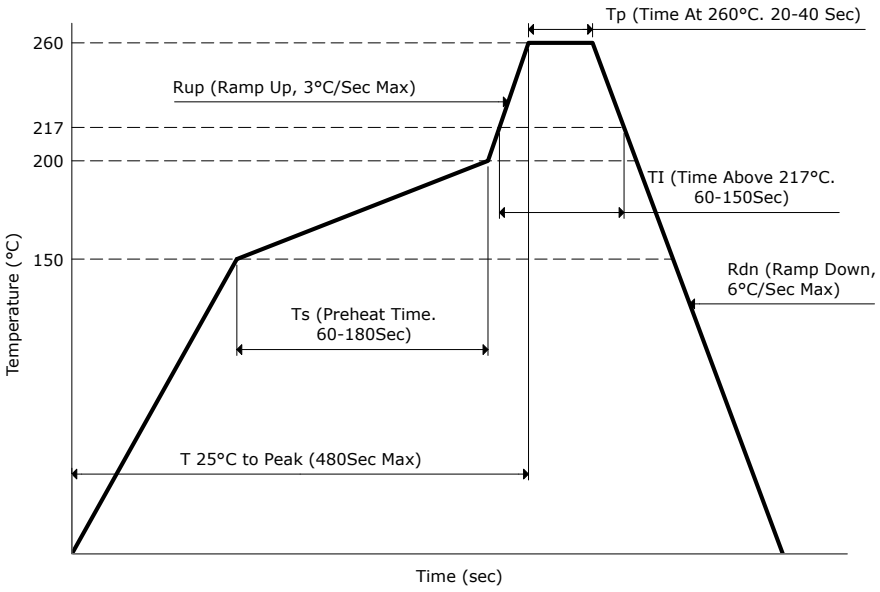
Ceramic SMT 2 Pad Crystal

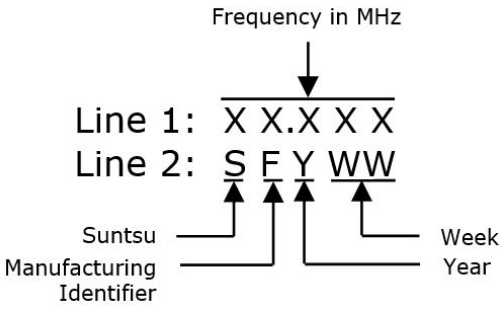
SXT532 Series

5.0mm x 3.2mm

Environmental Specifications		Mechanical Specifications	
Temperature Cycling	MIL-STD-883, Method 1010, Condition B	Mechanical Shock	MIL-STD-202, Method 213, Condition B
Fine Leak Test	MIL-STD-883, Method 1014, Condition A	Vibration	MIL-STD-883, Method 2007, Condition A
Gross Leak Test	MIL-STD-883, Method 1014, Condition C	Resistance to Soldering Heat	MIL-STD-202, Method 210, Condition K
Moisture Resistance	MIL-STD-883, Method 1004	Resistance to Solvents	MIL-STD-202, Method 215
Moisture Sensitivity	J-STD-020, MSL 1	Solderability	MIL-STD-883, Method 2003

Reflow Profile & Part Marking

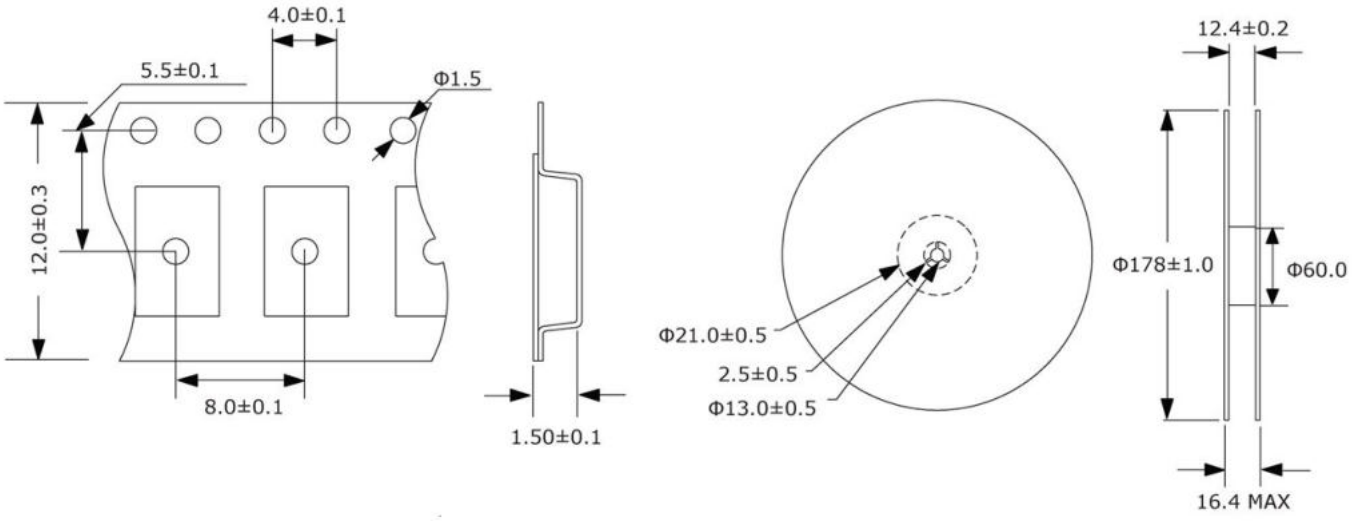




Tape And Reel Dimensions

All dimensions are in millimeters (mm) unless otherwise noted. Drawings are not to scale.

3,000pcs / Reel



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SUNTSU

Ceramic SMT 4 Pad Crystal

SXT534 Series

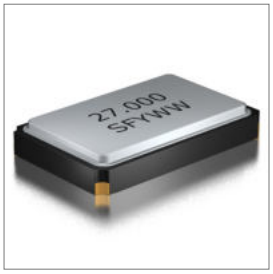
5.0mm x 3.2mm

Features

- ±10ppm/±10ppm (Tolerance/Stability) Available
- Ultra-Miniature Package
- AT-Cut Fundamental
- Tape and Reel

Applications

- Communication and Test Equipment
- PCMCIA
- Wireless Applications
- High Density Applications



Part Numbering Guide

SXT 53 4 18 A A 48 T - 27.000M

- **SUNTSU CRYSTAL**
- **5.0mm x 3.2mm**
- **4 PAD**
- **LOAD CAPACITANCE**
  - S : Series
  - 7-30 : 7pF - 30pF
- **FREQUENCY TOLERANCE**
  - A : ±50ppm
  - B : ±30ppm
  - C : ±25ppm
  - D : ±20ppm
  - E : ±15ppm
  - F : ±10ppm
- **FREQUENCY STABILITY**
  - A : ±50ppm
  - B : ±30ppm
  - C : ±25ppm
  - D : ±20ppm
  - E : ±15ppm
  - F : ±10ppm*
- **OPERATING TEMPERATURE RANGE****
  - 07 : 0°C - +70°C
  - 16 : -10°C - +60°C
  - 17 : -10°C - +70°C
  - 27 : -20°C - +70°C
  - 38 : -30°C - +85°C
  - 48 : -40°C - +85°C
- **MODE OF OPERATION**
  - Blank : Fundamental
  - T : 3rd Overtone
- **FREQUENCY**
  - MHz

RoHS COMPLIANT

Cage Code: 4GUT4

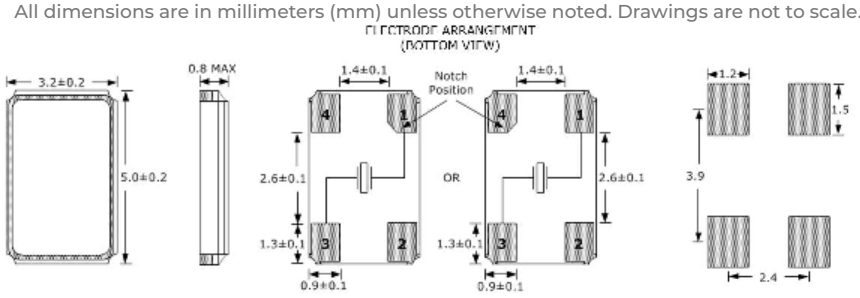
To customize your parameters contact a Suntsu representative.

* For frequency stability option F contact a Suntsu representative. ** For operating temperatures of -55-125°C a Suntsu representative.

Electrical Parameters	Units	Minimum	Typical	Maximum	Remarks
Frequency Range	MHz	7.9921		54	AT-Cut Fundamental.
Frequency Range	MHz	40		125	3rd Overtone
Frequency Tolerance at +25°C	ppm	-10		+10	See part numbering guide for options.
Frequency Stability vs. Op Temp	ppm	-10		+10	See part numbering guide for options.
Frequency Stability vs. Aging	ppm	-3		+3	First year @ +25°C.
Operating Temperature	°C	-40		+85	See part numbering guide for options.
Storage Temperature	°C	-40		+125	
Load Capacitance	pF	7		30	See part numbering guide for options.
Shunt Capacitance	pF			7	
Drive Level	µW		10	100	
Insulation Resistance	MΩ	500			@ 100VDC ± 15V.
8.000MHz ~ 11.999MHz	Ω			100	AT-Cut Fundamental
12.000MHz ~ 19.999MHz	Ω			80	AT-Cut Fundamental
ESR - 20.000MHz ~ 29.999MHz	Ω			70	AT-Cut Fundamental
30.000MHz ~ 54.000MHz	Ω			50	AT-Cut Fundamental
40.000MHz ~ 125.000MHz	Ω			80	3rd Overtone

Outline Drawing & Recommended Landed Pattern

All dimensions are in millimeters (mm) unless otherwise noted. Drawings are not to scale.



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SUNTSU

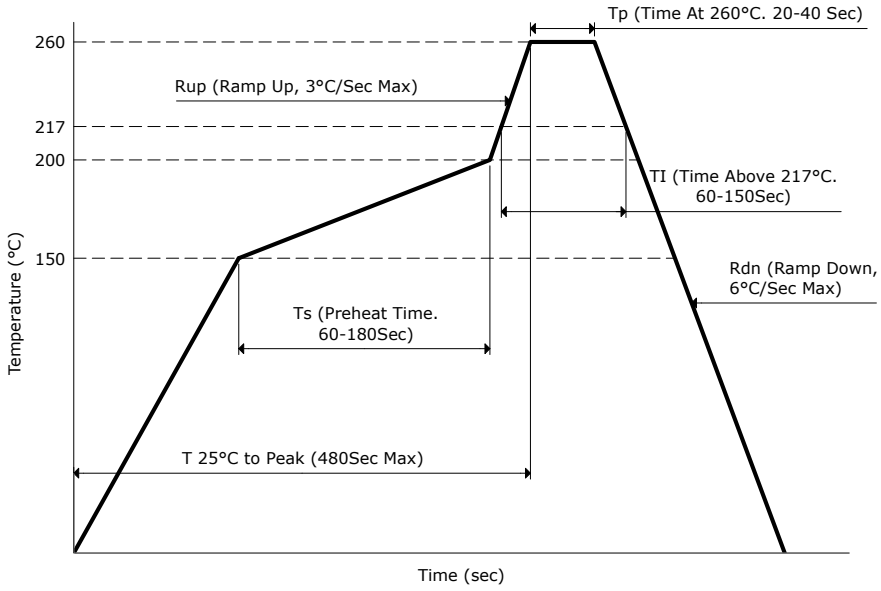
Ceramic SMT 4 Pad Crystal

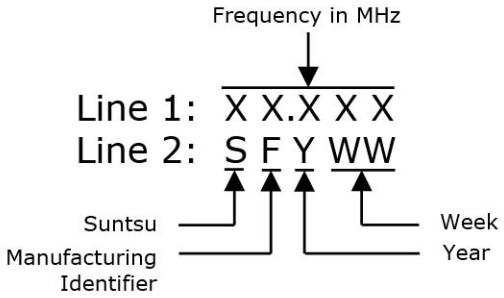
SXT534 Series

5.0mm x 3.2mm

Environmental Specifications		Mechanical Specifications	
Temperature Cycling	MIL-STD-883, Method 1010, Condition B	Mechanical Shock	MIL-STD-202, Method 213, Condition B
Fine Leak Test	MIL-STD-883, Method 1014, Condition A	Vibration	MIL-STD-883, Method 2007, Condition A
Gross Leak Test	MIL-STD-883, Method 1014, Condition C	Resistance to Soldering Heat	MIL-STD-202, Method 210, Condition K
Moisture Resistance	MIL-STD-883, Method 1004	Resistance to Solvents	MIL-STD-202, Method 215
Moisture Sensitivity	J-STD-020, MSL 1	Solderability	MIL-STD-883, Method 2003

Reflow Profile & Part Marking

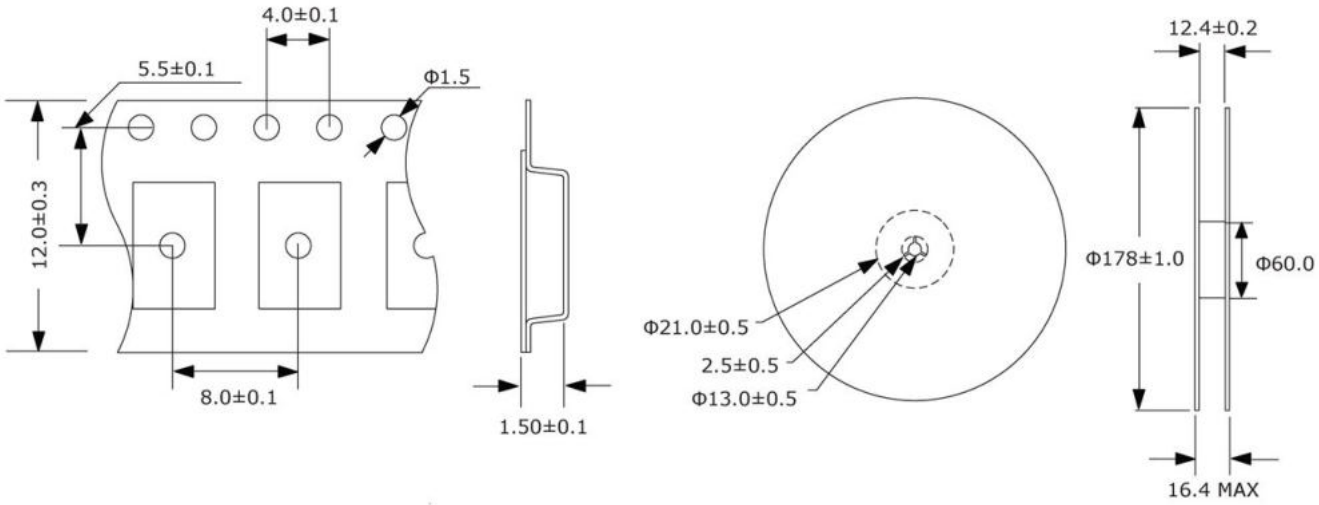




Tape And Reel Dimensions

All dimensions are in millimeters (mm) unless otherwise noted. Drawings are not to scale.

1,000pcs / Reel



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SUNTSU

Ceramic SMT 2 Pad Crystal

SXT632 Series

6.0mm x 3.5mm

Features

- ±10ppm/±10ppm (Tolerance/Stability) Available
- Ultra-Miniature Package
- AT-Cut Fundamental
- Tape and Reel

Applications

- Microprocessors
- PCMCIA
- Communication
- Test Equipment

Part Numbering Guide

SXT 63 2 18 A A 48 T - 20.000M

- **SUNTSU CRYSTAL**
- **6.0mm x 3.5mm**
- **2 PAD**
- **LOAD CAPACITANCE**
  S : Series
  7-30 : 7pF - 30pF
- **FREQUENCY TOLERANCE**
  A : ±50ppm
  B : ±30ppm
  C : ±25ppm
  D : ±20ppm
  E : ±15ppm
  F : ±10ppm
- **FREQUENCY STABILITY**
  A : ±50ppm
  B : ±30ppm
  C : ±25ppm
  D : ±20ppm
  E : ±15ppm
  F : ±10ppm*
- **OPERATING TEMPERATURE RANGE****
  07 : 0°C - +70°C
  16 : -10°C - +60°C
  17 : -10°C - +70°C
  27 : -20°C - +70°C
  38 : -30°C - +85°C
  48 : -40°C - +85°C
- **MODE OF OPERATION**
  Blank : Fundamental
  T : 3rd Overtone
- **FREQUENCY**
  MHz

RoHS COMPLIANT

Cage Code: 4GUT4

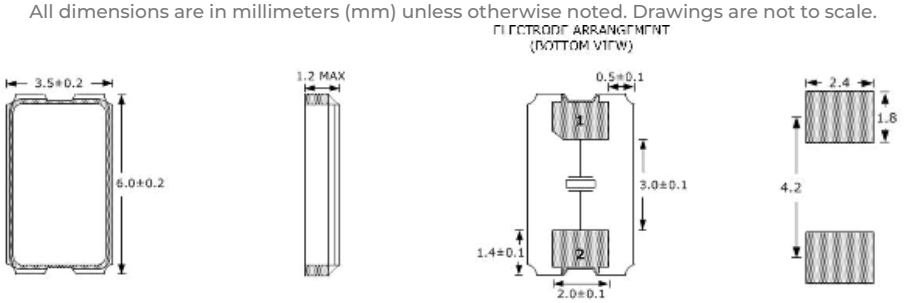
To customize your parameters contact a Suntsu representative.

* For frequency stability option F contact a Suntsu representative. ** For operating temperatures of -55-125°C a Suntsu representative.

Electrical Parameters	Units	Minimum	Typical	Maximum	Remarks
Frequency Range	MHz	7		54	AT-Cut Fundamental.
Frequency Range	MHz	40		100	3rd Overtone
Frequency Tolerance at +25°C	ppm	-10		+10	See part numbering guide for options.
Frequency Stability vs. Op Temp	ppm	-10		+10	See part numbering guide for options.
Frequency Stability vs. Aging	ppm	-3		+3	First year @ +25°C.
Operating Temperature	°C	-40		+85	See part numbering guide for options.
Storage Temperature	°C	-40		+125	
Load Capacitance	pF	7		30	See part numbering guide for options.
Shunt Capacitance	pF			7	
Drive Level	µW		10	500	
Insulation Resistance	MΩ	500			@ 100VDC ± 15V.
7.000MHz ~ 11.999MHz	Ω			100	AT-Cut Fundamental
12.000MHz ~ 14.999MHz	Ω			60	AT-Cut Fundamental
ESR - 15.000MHz ~ 29.999MHz	Ω			50	AT-Cut Fundamental
30.000MHz ~ 54.000MHz	Ω			40	AT-Cut Fundamental
40.000MHz ~ 100.000MHz	Ω			50	3rd Overtone

Outline Drawing & Recommended Landed Pattern

All dimensions are in millimeters (mm) unless otherwise noted. Drawings are not to scale.



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SUNTSU

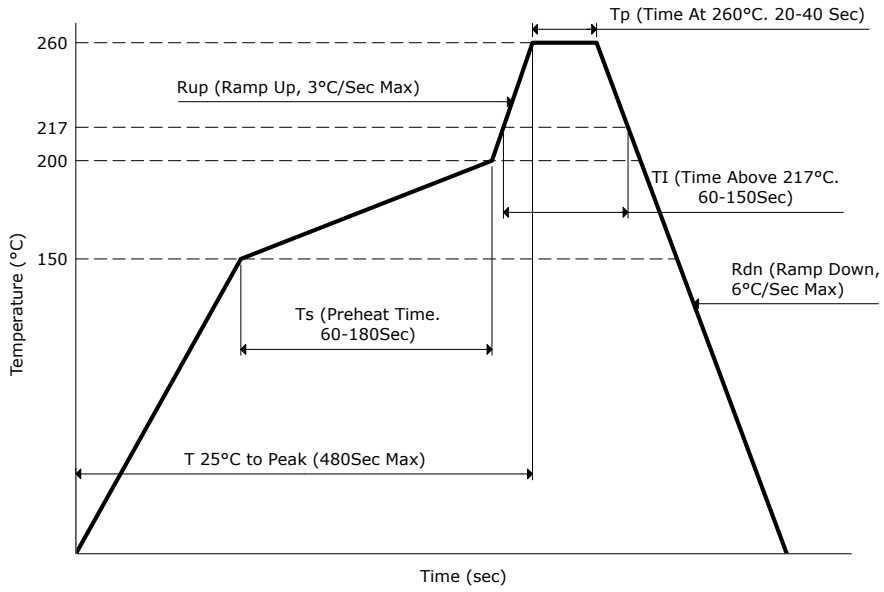
Ceramic SMT 2 Pad Crystal

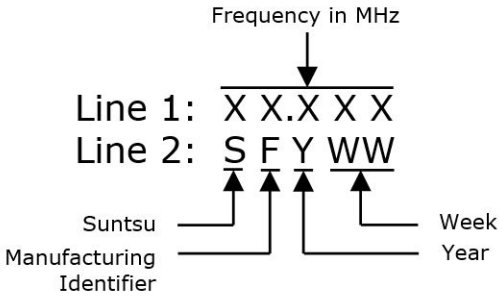
SXT632 Series

6.0mm x 3.5mm

Environmental Specifications		Mechcanical Specifications	
Temperature Cycling	MIL-STD-883, Method 1010, Condition B	Mechanical Shock	MIL-STD-202, Method 213, Condition B
Fine Leak Test	MIL-STD-883, Method 1014, Condition A	Vibration	MIL-STD-883, Method 2007, Condition A
Gross Leak Test	MIL-STD-883, Method 1014, Condition C	Resistance to Soldering Heat	MIL-STD-202, Method 210, Condition K
Moisture Resistance	MIL-STD-883, Method 1004	Resistance to Solvents	MIL-STD-202, Method 215
Moisture Sensitivity	J-STD-020, MSL 1	Solderability	MIL-STD-883, Method 2003

Reflow Profile & Part Marking

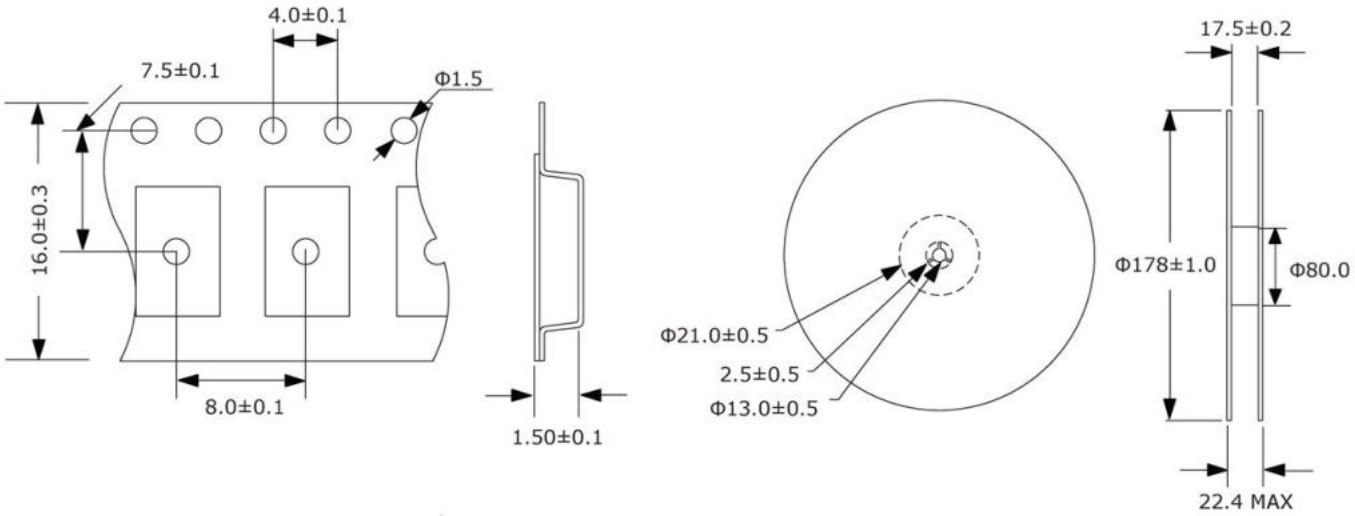




Tape And Reel Dimensions

All dimensions are in millimeters (mm) unless otherwise noted. Drawings are not to scale.

1,000pcs / Reel



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SUNTSU

Ceramic SMT 4 Pad Crystal

SXT634 Series

6.0mm x 3.5mm

Features

- ±10ppm/±10ppm (Tolerance/Stability) Available
- Miniature Package
- AT-Cut Fundamental
- Tape and Reel

Applications

- Microprocessors
- PCMCIA
- Communication
- Test Equipment

Part Numbering Guide

SXT 63 4 18 A A 48 T - 14.318M

- **SUNTSU CRYSTAL**
- **6.0mm x 3.5mm**
- **4 PAD**
- **LOAD CAPACITANCE**
  S : Series
  7-30 : 7pF - 30pF
- **FREQUENCY TOLERANCE**
  A : ±50ppm
  B : ±30ppm
  C : ±25ppm
  D : ±20ppm
  E : ±15ppm
  F : ±10ppm
- **FREQUENCY STABILITY**
  A : ±50ppm
  B : ±30ppm
  C : ±25ppm
  D : ±20ppm
  E : ±15ppm
  F : ±10ppm*
- **OPERATING TEMPERATURE RANGE****
  07 : 0°C - +70°C
  16 : -10°C - +60°C
  17 : -10°C - +70°C
  27 : -20°C - +70°C
  38 : -30°C - +85°C
  48 : -40°C - +85°C
- **MODE OF OPERATION**
  Blank : Fundamental
  T : 3rd Overtone
- **FREQUENCY**
  MHz

RoHS COMPLIANT

Cage Code: 4GUT4

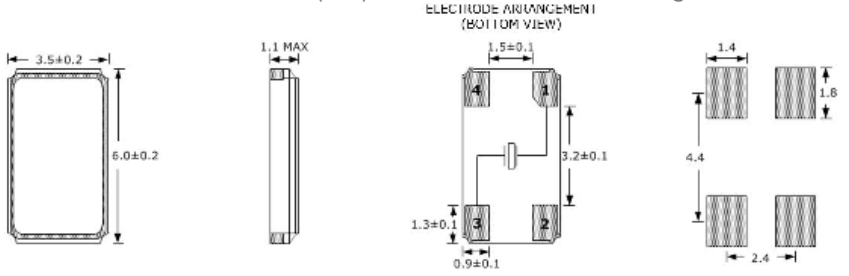
To customize your parameters contact a Suntsu representative.

* For frequency stability option F contact a Suntsu representative. ** For operating temperatures of -55-125°C a Suntsu representative.

Electrical Parameters	Units	Minimum	Typical	Maximum	Remarks
Frequency Range	MHz	8		54	AT-Cut Fundamental.
Frequency Range	MHz	40		80	3rd Overtone
Frequency Tolerance at +25°C	ppm	-10		+10	See part numbering guide for options.
Frequency Stability vs. Op Temp	ppm	-10		+10	See part numbering guide for options.
Frequency Stability vs. Aging	ppm	-3		+3	First year @ +25°C.
Operating Temperature	°C	-40		+85	See part numbering guide for options.
Storage Temperature	°C	-40		+125	
Load Capacitance	pF	7		30	See part numbering guide for options.
Shunt Capacitance	pF			7	
Drive Level	µW		10	300	
Insulation Resistance	MΩ	500			@ 100VDC ± 15V.
7.000MHz ~ 11.999MHz	Ω			100	AT-Cut Fundamental
12.000MHz ~ 14.999MHz	Ω			60	AT-Cut Fundamental
ESR - 15.000MHz ~ 29.999MHz	Ω			50	AT-Cut Fundamental
30.000MHz ~ 54.000MHz	Ω			40	AT-Cut Fundamental
40.000MHz ~ 80.000MHz	Ω			80	3rd Overtone

Outline Drawing & Recommended Landed Pattern

All dimensions are in millimeters (mm) unless otherwise noted. Drawings are not to scale.



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SUNTSU

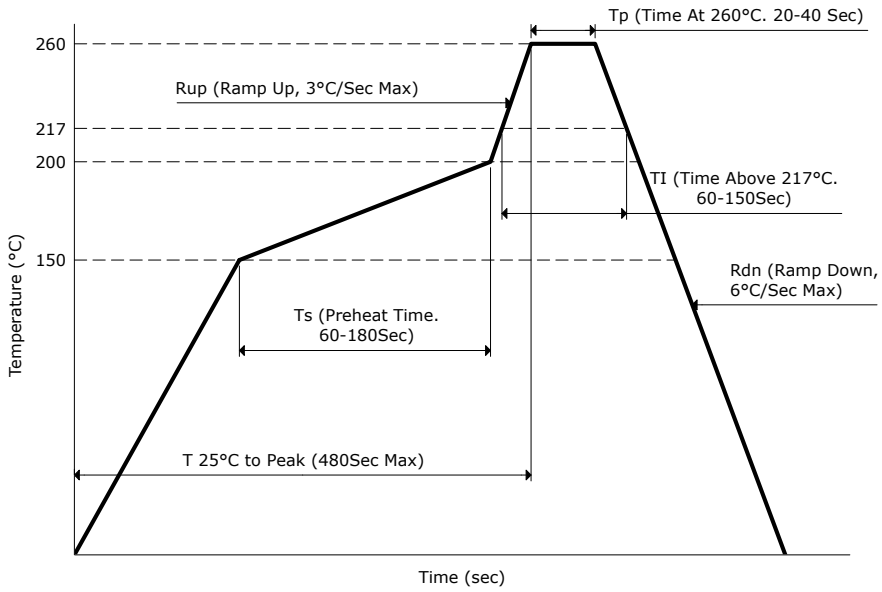
Ceramic SMT 4 Pad Crystal

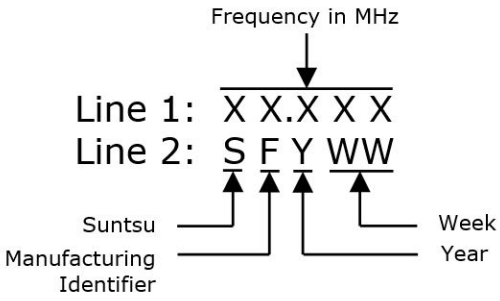
SXT634 Series

6.0mm x 3.5mm

Environmental Specifications		Mechcanical Specifications	
Temperature Cycling	MIL-STD-883, Method 1010, Condition B	Mechanical Shock	MIL-STD-202, Method 213, Condition B
Fine Leak Test	MIL-STD-883, Method 1014, Condition A	Vibration	MIL-STD-883, Method 2007, Condition A
Gross Leak Test	MIL-STD-883, Method 1014, Condition C	Resistance to Soldering Heat	MIL-STD-202, Method 210, Condition K
Moisture Resistance	MIL-STD-883, Method 1004	Resistance to Solvents	MIL-STD-202, Method 215
Moisture Sensitivity	J-STD-020, MSL 1	Solderability	MIL-STD-883, Method 2003

Reflow Profile & Part Marking

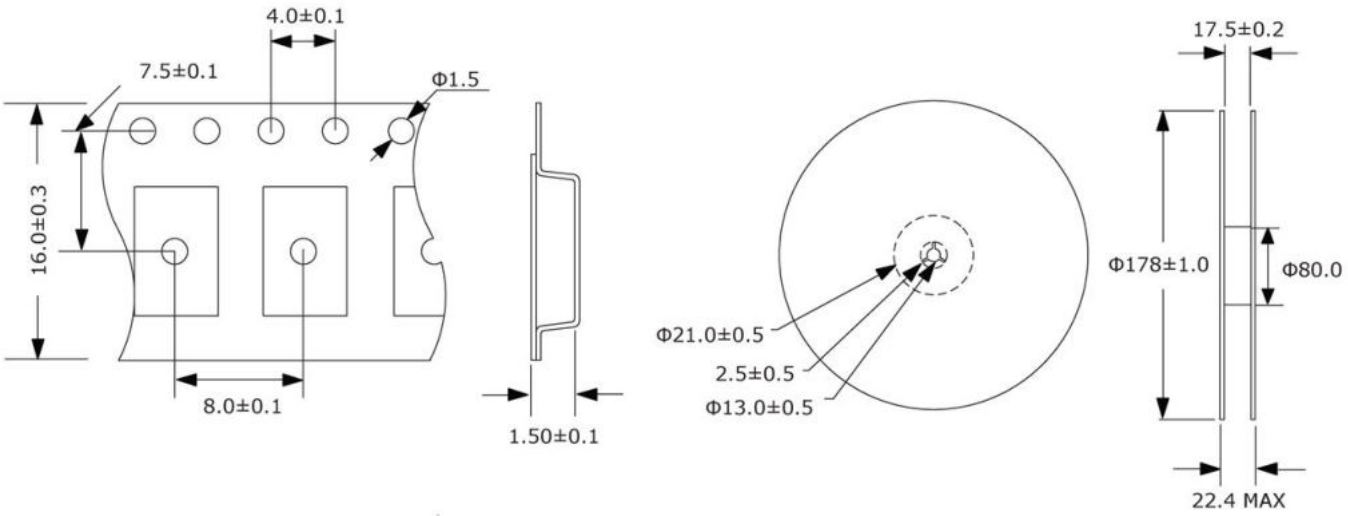




Tape And Reel Dimensions

All dimensions are in millimeters (mm) unless otherwise noted. Drawings are not to scale.

1,000pcs / Reel



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SUNTSU

Cylindrical DIP 2 Lead Crystal

SCM832 Series

8.3mm x 3.2mm

Features

- ±20ppm/±30ppm (Tolerance/Stability) Available
- Wide Frequency Range
- AT-Cut
- Bulk Packing

Applications

- Computer Peripherals
- Microprocessor
- Test Equipment

Part Numbering Guide

SCM 83 2 18 A A 48 T - 48.000M

- **SUNTSU CYLINDRICAL MHz CRYSTAL**
- **8.3mm x 3.2mm**
- **2 LEAD**
- **LOAD CAPACITANCE**
  S : Series
  7-30 : 7pF - 30pF
- **FREQUENCY TOLERANCE**
  A : ±50ppm
  B : ±30ppm
  C : ±25ppm
  D : ±20ppm
- **FREQUENCY STABILITY**
  A : ±50ppm
  B : ±30ppm
- **OPERATING TEMPERATURE RANGE**
  07 : 0°C - +70°C
  16 : -10°C - +60°C
  17 : -10°C - +70°C
  27 : -20°C - +70°C
  38 : -30°C - +85°C
  48 : -40°C - +85°C
- **MODE OF OPERATION**
  BLANK : Fundamental
  T : Third Overtone
- **FREQUENCY**
  MHz

RoHS COMPLIANT

Cage Code: 4GUT4

To customize your parameters contact a Suntsu representative.

Electrical Parameters	Units	Minimum	Typical	Maximum	Remarks
Frequency Range	MHz	3.579545		29.999	AT-Cut Fundamental
Frequency Range	MHz	30		90	3rd Overtone
Frequency Tolerance at +25°C	ppm	-20		+20	See part numbering guide for options.
Frequency Stability vs. Op Temp	ppm	-30		+30	See part numbering guide for options.
Frequency Stability vs. Aging	ppm	-5		+5	First year @ +25°C.
Operating Temperature	°C	-40		+85	See part numbering guide for options.
Storage Temperature	°C	-40		+125	
Load Capacitance	pF	7		30	See part numbering guide for options.
Shunt Capacitance	pF			5	
Drive Level	µW			100	
Insulation Resistance	MΩ	500			@ 100VDC ± 15V.
3.579MHz ~ 3.999MHz	Ω			200	AT-Cut Fundamental
4.000MHz ~ 5.999MHz	Ω			150	AT-Cut Fundamental
6.000MHz ~ 6.999MHz	Ω			100	AT-Cut Fundamental
7.000MHz ~ 8.999MHz	Ω			80	AT-Cut Fundamental
ESR - 9.000MHz ~ 12.999MHz	Ω			60	AT-Cut Fundamental
13.000MHz ~ 19.999MHz	Ω			50	AT-Cut Fundamental
20.000MHz ~ 29.999MHz	Ω			30	AT-Cut Fundamental
30.000MHz ~ 69.999MHz	Ω			100	3rd Overtone
-70.000MHz ~ 90.000MHz	Ω			80	3rd Overtone

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SUNTSU

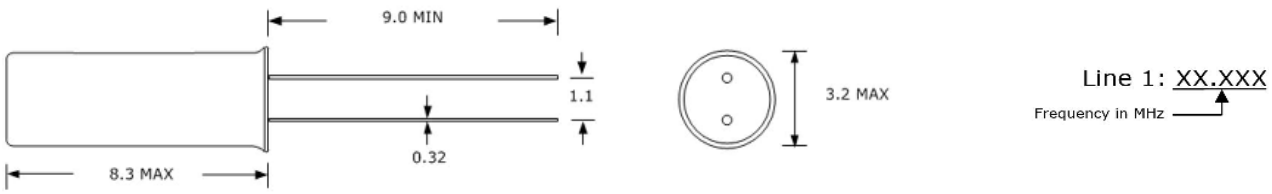
Cylindrical DIP 2 Lead Crystal

SCM832 Series

8.3mm x 3.2mm

Outline Drawing & Part Marking

All dimensions are in millimeters (mm) unless otherwise noted. Drawings are not to scale.



Environmental Specifications		Mechanical Specifications	
Temperature Cycling	MIL-STD-883, Method 1010, Condition B	Mechanical Shock	MIL-STD-202, Method 213, Condition C
Fine Leak Test	MIL-STD-883, Method 1014, Condition A	Vibration	MIL-STD-883, Method 2007, Condition A
Gross Leak Test	MIL-STD-883, Method 1014, Condition C	Resistance to Soldering Heat	MIL-STD-202, Method 210, Condition K
Moisture Resistance	MIL-STD-883, Method 1004	Resistance to Solvents	MIL-STD-202, Method 215
Moisture Sensitivity	J-STD-020, MSL 1	Solderability	MIL-STD-883, Method 2003

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SUNTSU

Ceramic SMT 2 Pad Watch Crystal

SWS112 Series

1.6mm x 1.0mm

Features

- ±20ppm (Tolerance) Available
- Ultra-Miniature Package
- Tape and Reel

Applications

- Real Time Clock
- Measurement instruments
- Wireless Applications

Part Numbering Guide

SWS 11 2 12 D 48 - 32.768K

- SUNTSU WATCH SMT CRYSTAL
- 1.6mm x 1.0mm
- 2 PAD
- LOAD CAPACITANCE
  - 12 : 12.5pF
  - 9 : 9.0pF
  - 7 : 7.0pF
  - 5 : 5.0pF
- FREQUENCY TOLERANCE
  - D : ±20ppm
- OPERATING TEMPERATURE RANGE
  - 16 : -10°C - +60°C
  - 48 : -40°C - +85°C
- FREQUENCY
  - kHz

RoHS COMPLIANT

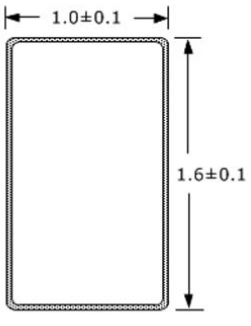
Cage Code: 4GUT4

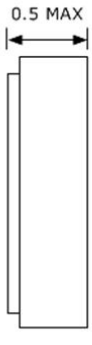
To customize your parameters contact a Suntsu representative.

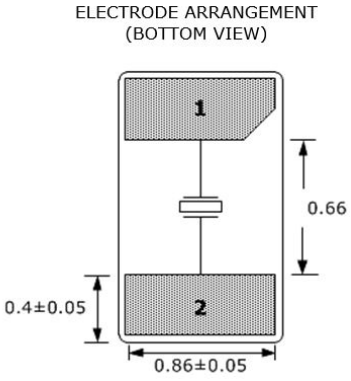
Electrical Parameters	Units	Minimum	Typical	Maximum	Remarks
Frequency Range	kHz		32.768		
Frequency Tolerance at +25°C	ppm	-20		+20	
Frequency Stability vs. Aging	ppm	-3		+3	First year @ +25°C.
Frequency Coefficient (ß)	ppm/T²	-0.040	-0.030	-0.020	
Operating Temperature	°C	-40		+85	See part numbering guide for options.
Turnover Temperature	°C	+20	+25	+30	
Storage Temperature	°C	-55		+125	
Load Capacitance	pF			12.5	See part numbering guide for options.
Shunt Capacitance	pF		1.4		
Drive Level	µW			0.5	
Insulation Resistance	MΩ	500			@ 100VDC ± 15V.
Equivalent Series Resistance	kΩ			90	

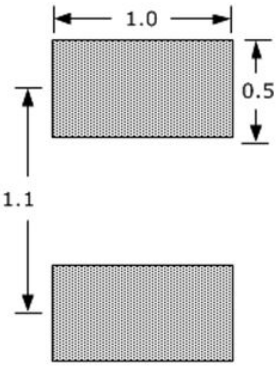
Outline Drawing & Recommended Land Pattern

All dimensions are in millimeters (mm) unless otherwise noted. Drawings are not to scale.









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SUNTSU

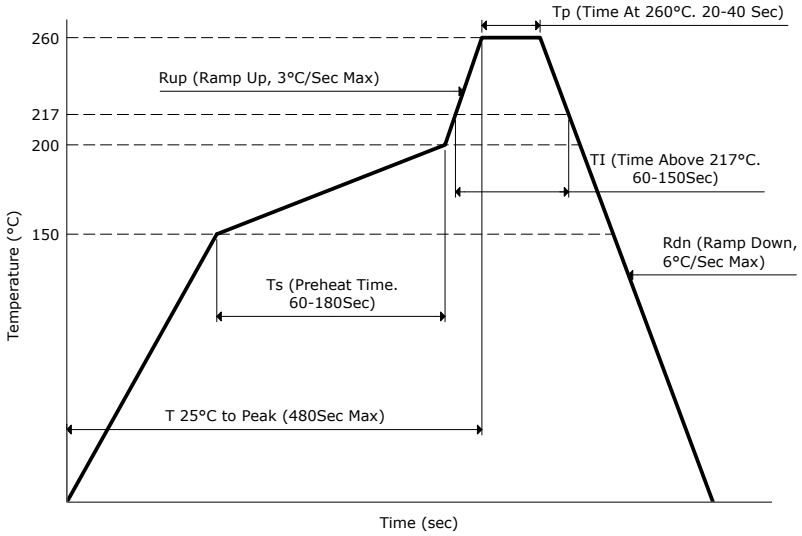
Ceramic SMT 2 Pad Watch Crystal

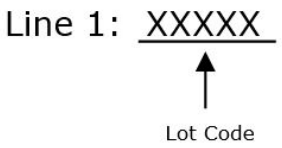
SWS112 Series

1.6mm x 1.0mm

Environmental Specifications		Mechanical Specifications	
Temperature Cycling	MIL-STD-883, Method 1010, Condition B	Mechanical Shock	MIL-STD-202, Method 213, Condition B
Fine Leak Test	MIL-STD-883, Method 1014, Condition A	Vibration	MIL-STD-883, Method 2007, Condition A
Gross Leak Test	MIL-STD-883, Method 1014, Condition C	Resistance to Soldering Heat	MIL-STD-202, Method 210, Condition K
Moisture Resistance	MIL-STD-883, Method 1004	Resistance to Solvents	MIL-STD-202, Method 215
Moisture Sensitivity	J-STD-020, MSL 1	Solderability	MIL-STD-883, Method 2003

Reflow Profile & Part Marking

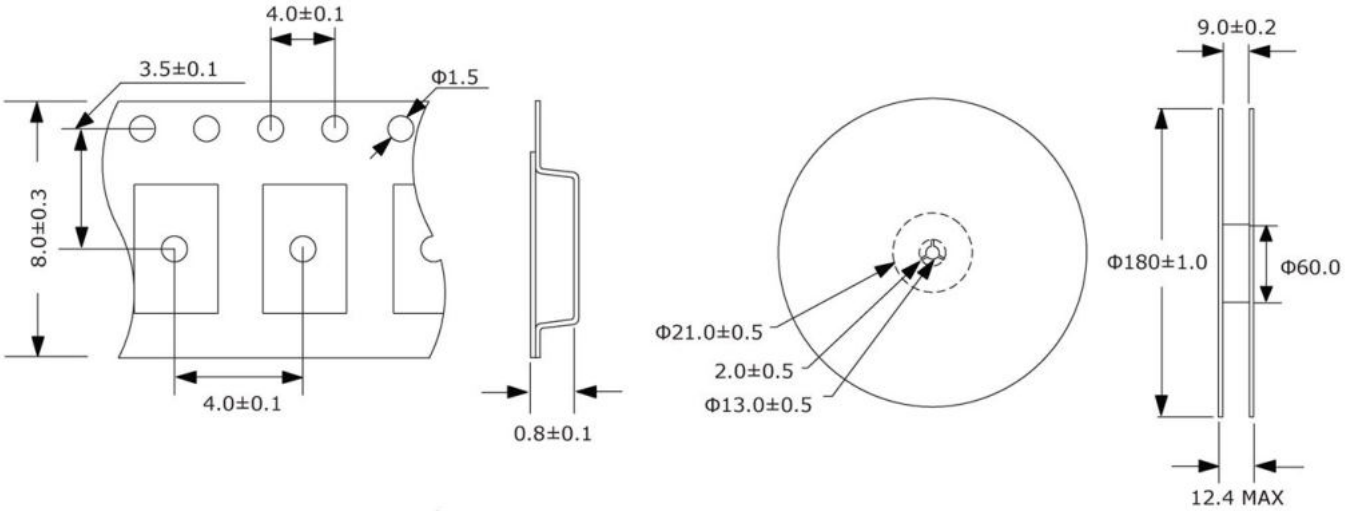




Tape And Reel Dimensions

All dimensions are in millimeters (mm) unless otherwise noted. Drawings are not to scale.

3,000pcs / Reel



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SUNTSU

Ceramic SMT 2 Pad Watch Crystal

SWS312 Series

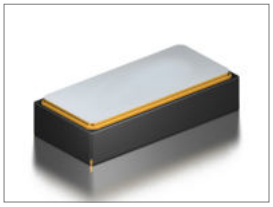
3.2mm x 1.5mm

Features

- ±20ppm (Tolerance) Available
- Ultra-Miniature Package
- Tape and Reel

Applications

- Real Time Clock
- Measurement instruments
- Wireless Applications



Part Numbering Guide

SWS 31 2 12 D 48 - 32.768K

- **SUNTSU WATCH SMT CRYSTAL**
- **3.2mm x 1.5mm**
- **2 PAD**
- **LOAD CAPACITANCE**
  - 12 : 12.5pF
  - 9 : 9.0pF
  - 7 : 7.0pF
  - 6 : 6.0pF
- **FREQUENCY TOLERANCE**
  - D : ±20ppm
  - F : ±10ppm
- **OPERATING TEMPERATURE RANGE**
  - 16 : -10°C - +60°C
  - 48 : -40°C - +85°C
- **FREQUENCY**
  - kHz

RoHS COMPLIANT

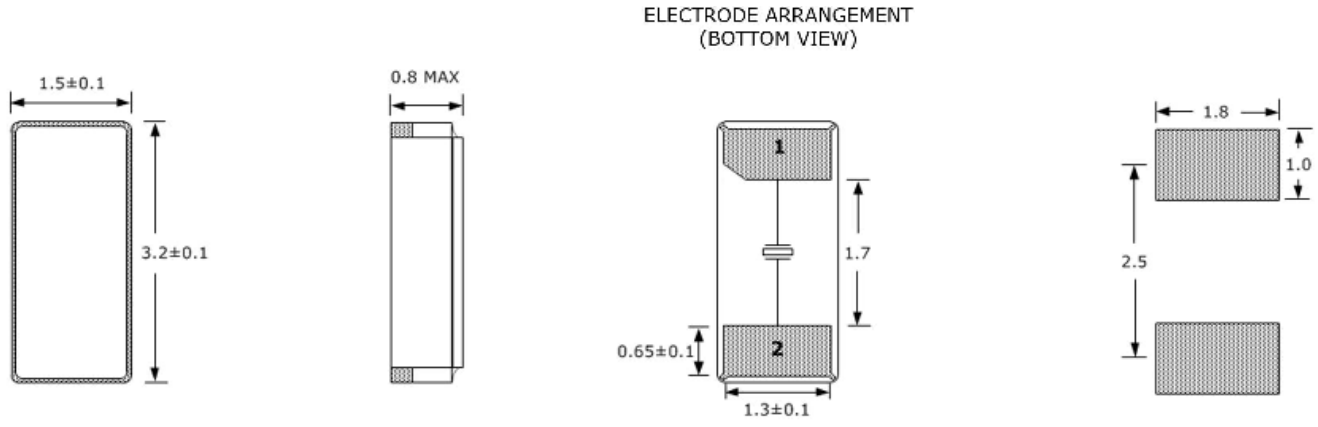
Cage Code: 4GUT4

To customize your parameters contact a Suntsu representative.

Electrical Parameters	Units	Minimum	Typical	Maximum	Remarks
Frequency Range	kHz		32.768		
Frequency Tolerance at +25°C	ppm	-20		+20	See part numbering guide for options.
Frequency Stability vs. Aging	ppm	-3		+3	First year @ +25°C.
Frequency Coefficient (ß)	ppm/T²	-0.040	-0.030	-0.020	
Operating Temperature	°C	-40		+85	See part numbering guide for options.
Turnover Temperature	°C	+20	+25	+30	
Storage Temperature	°C	-55		+125	
Load Capacitance	pF	6		12.5	See part numbering guide for options.
Shunt Capacitance	pF		1.4		
Drive Level	µW			1	
Insulation Resistance	MΩ	500			@ 100VDC ± 15V.
Equivalent Series Resistance	kΩ			70	

Outline Drawing & Recommended Land Pattern

All dimensions are in millimeters (mm) unless otherwise noted. Drawings are not to scale.



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SUNTSU

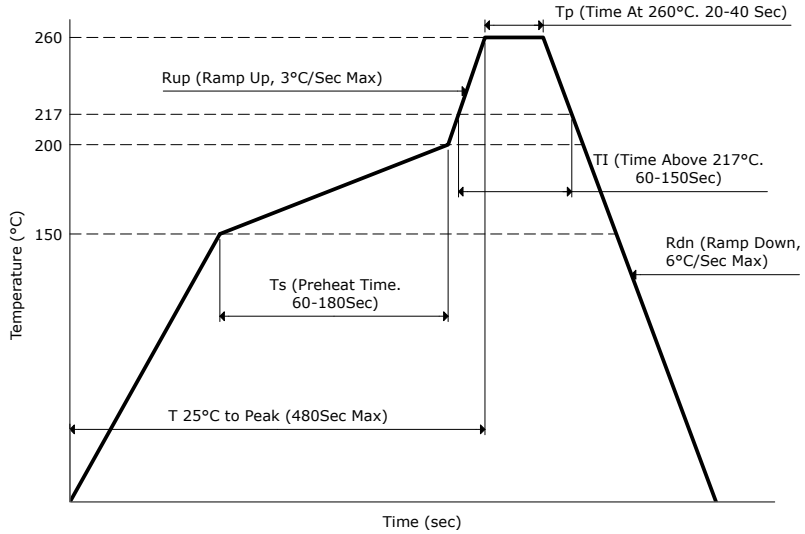
Ceramic SMT 2 Pad Watch Crystal

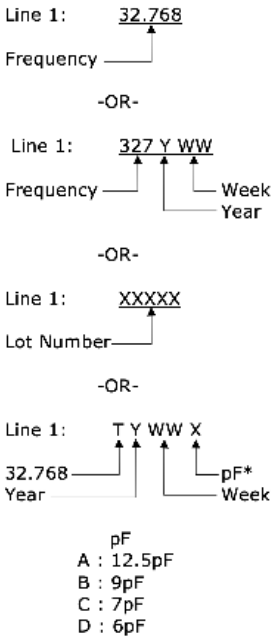
SWS312 Series

3.2mm x 1.5mm

Environmental Specifications		Mechanical Specifications	
Temperature Cycling	MIL-STD-883, Method 1010, Condition B	Mechanical Shock	MIL-STD-202, Method 213, Condition B
Fine Leak Test	MIL-STD-883, Method 1014, Condition A	Vibration	MIL-STD-883, Method 2007, Condition A
Gross Leak Test	MIL-STD-883, Method 1014, Condition C	Resistance to Soldering Heat	MIL-STD-202, Method 210, Condition K
Moisture Resistance	MIL-STD-883, Method 1004	Resistance to Solvents	MIL-STD-202, Method 215
Moisture Sensitivity	J-STD-020, MSL 1	Solderability	MIL-STD-883, Method 2003

Reflow Profile & Part Marking

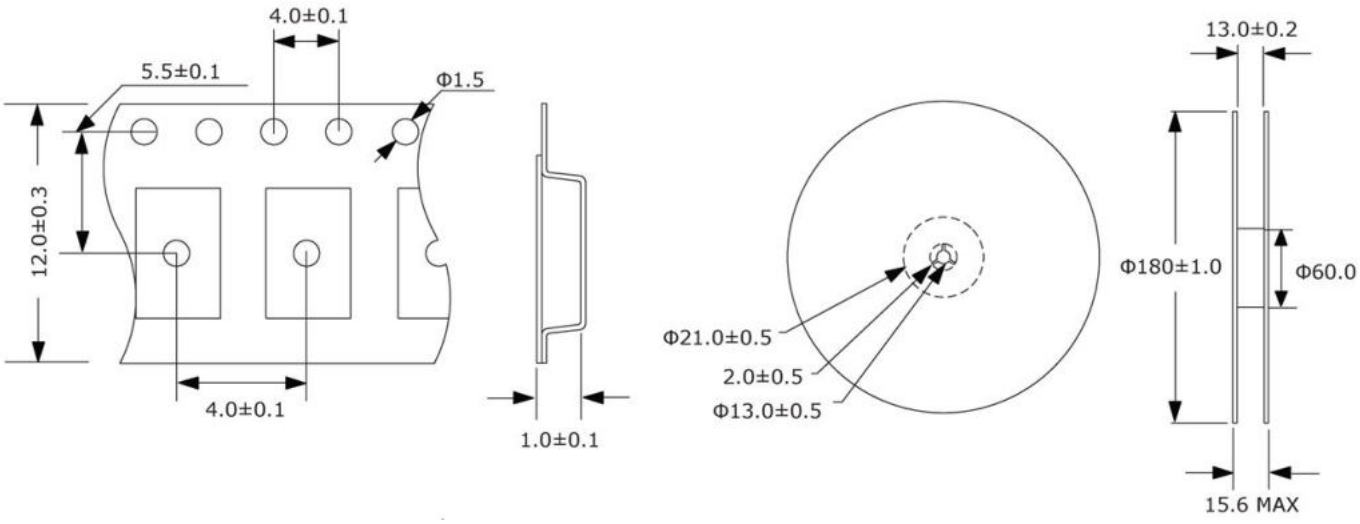




Tape And Reel Dimensions

All dimensions are in millimeters (mm) unless otherwise noted. Drawings are not to scale.

3,000pcs / Reel



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SUNTSU

Ceramic SMT 2 Pad Watch Crystal

SWS412 Series

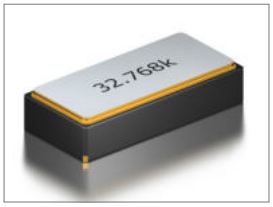
4.1mm x 1.5mm

Features

- ±20ppm (Tolerance) Available
- Ultra-Miniature Package
- Tape and Reel

Applications

- Real Time Clock
- Measurement instruments
- Wireless Applications



Part Numbering Guide

SWS 41 2 12 D 48 - 32.768K

- SUNTSU WATCH SMT CRYSTAL
- 4.1mm x 1.5mm
- 2 PAD
- LOAD CAPACITANCE: 12 : 12.5pF
- FREQUENCY TOLERANCE: D : ±20ppm
- OPERATING TEMPERATURE RANGE: 16 : -10°C - +60°C; 48 : -40°C - +85°C
- FREQUENCY: kHz

RoHS COMPLIANT

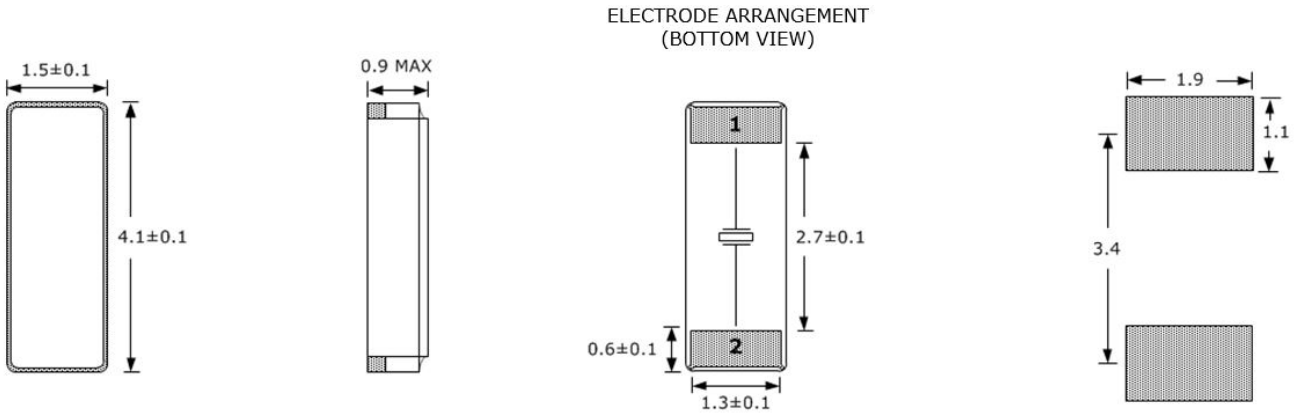
Cage Code: 4GUT4

To customize your parameters contact a Suntsu representative.

Electrical Parameters	Units	Minimum	Typical	Maximum	Remarks
Frequency Range	kHz		32.768		
Frequency Tolerance at +25°C	ppm	-20		+20	
Frequency Stability vs. Aging	ppm	-3		+3	First year @ +25°C.
Frequency Coefficient (ß)	ppm/T²	-0.040	-0.034	-0.028	
Operating Temperature	°C	-40		+85	See part numbering guide for options.
Turnover Temperature	°C	+20	+25	+30	
Storage Temperature	°C	-55		+125	
Load Capacitance	pF			12.5	
Shunt Capacitance	pF		1.33		
Drive Level	µW			1	
Insulation Resistance	MΩ	500			@ 100VDC ± 15V.
Equivalent Series Resistance	kΩ			70	

Outline Drawing & Recommended Land Pattern

All dimensions are in millimeters (mm) unless otherwise noted. Drawings are not to scale.



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SUNTSU

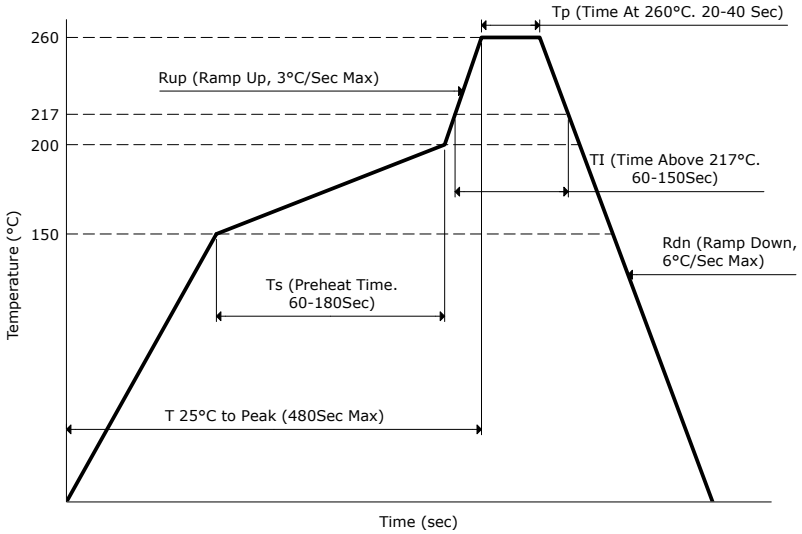
Ceramic SMT 2 Pad Watch Crystal

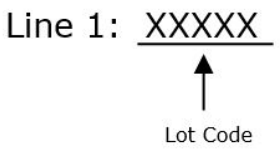
SWS412 Series

4.1mm x 1.5mm

Environmental Specifications		Mechanical Specifications	
Temperature Cycling	MIL-STD-883, Method 1010, Condition B	Mechanical Shock	MIL-STD-202, Method 213, Condition B
Fine Leak Test	MIL-STD-883, Method 1014, Condition A	Vibration	MIL-STD-883, Method 2007, Condition A
Gross Leak Test	MIL-STD-883, Method 1014, Condition C	Resistance to Soldering Heat	MIL-STD-202, Method 210, Condition A
Moisture Resistance	MIL-STD-883, Method 1004	Resistance to Solvents	MIL-STD-202, Method 215
Moisture Sensitivity	J-STD-020, MSL 1	Solderability	MIL-STD-883, Method 2003

Reflow Profile & Part Marking

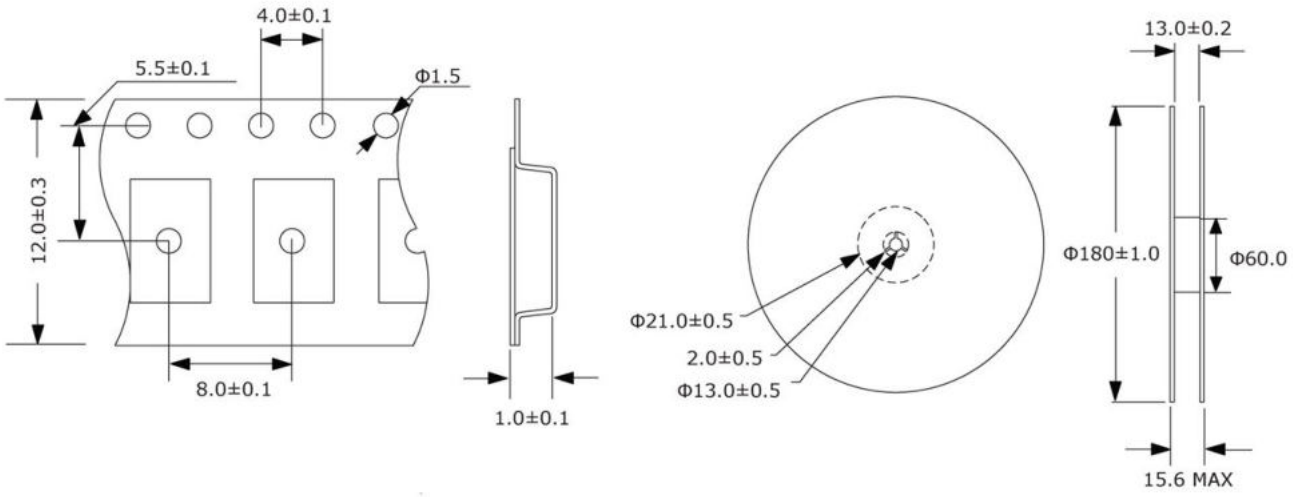




Tape And Reel Dimensions

All dimensions are in millimeters (mm) unless otherwise noted. Drawings are not to scale.

3,000pcs / Reel



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SUNTSU

Ceramic SMT 2 Pad Watch Crystal

SWS512 Series

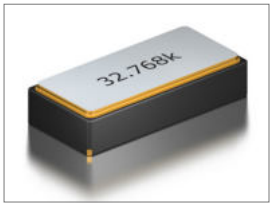
4.9mm x 1.8mm

Features

- ±20ppm (Tolerance) Available
- Ultra-Miniature Package
- Tape and Reel

Applications

- Real Time Clock
- Measurement instruments
- Wireless Applications



Part Numbering Guide

SWS 51 2 12 D 48 - 32.768K

- **SUNTSU WATCH SMT CRYSTAL**
- **4.9mm x 1.8mm**
- **2 PAD**
- **LOAD CAPACITANCE**
  - 12 : 12.5pF
  - 9 : 9.0pF
  - 7 : 7.0pF
- **FREQUENCY TOLERANCE**
  - D : ±20ppm
- **OPERATING TEMPERATURE RANGE**
  - 16 : -10°C - +60°C
  - 48 : -40°C - +85°C
- **FREQUENCY**
  - kHz

RoHS COMPLIANT

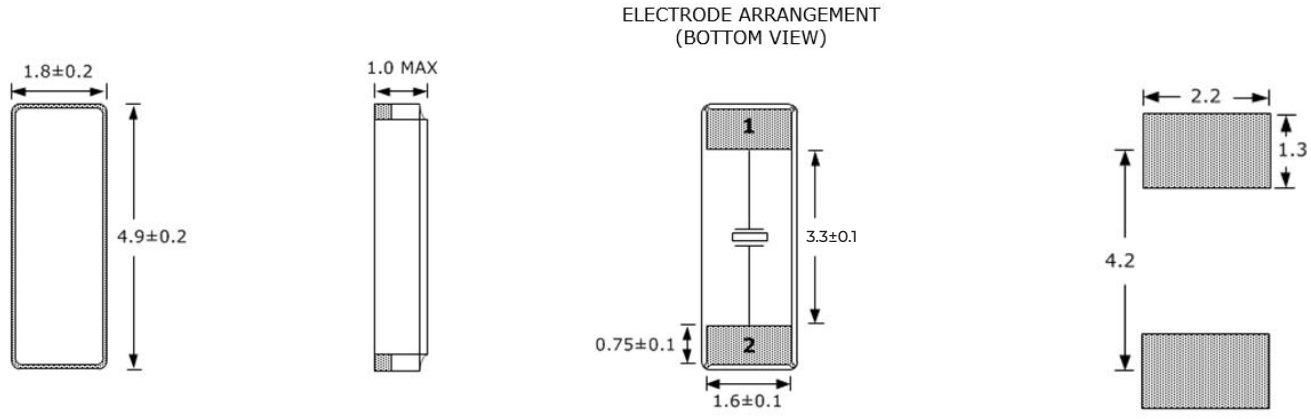
Cage Code: 4GUT4

To customize your parameters contact a Suntsu representative.

Electrical Parameters	Units	Minimum	Typical	Maximum	Remarks
Frequency Range	kHz		32.768		
Frequency Tolerance at +25°C	ppm	-20		+20	
Frequency Stability vs. Aging	ppm	-3		+3	First year @ +25°C.
Frequency Coefficient (ß)	ppm/T²	-0.040	-0.034	-0.028	
Operating Temperature	°C	-40		+85	See part numbering guide for options.
Turnover Temperature	°C	+20	+25	+30	
Storage Temperature	°C	-55		+125	
Load Capacitance	pF	7		12.5	See part numbering guide for options.
Shunt Capacitance	pF		1.33		
Drive Level	µW			1	
Insulation Resistance	MΩ	500			@ 100VDC ± 15V.
Equivalent Series Resistance	kΩ			70	

Outline Drawing & Recommended Land Pattern

All dimensions are in millimeters (mm) unless otherwise noted. Drawings are not to scale.



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SUNTSU

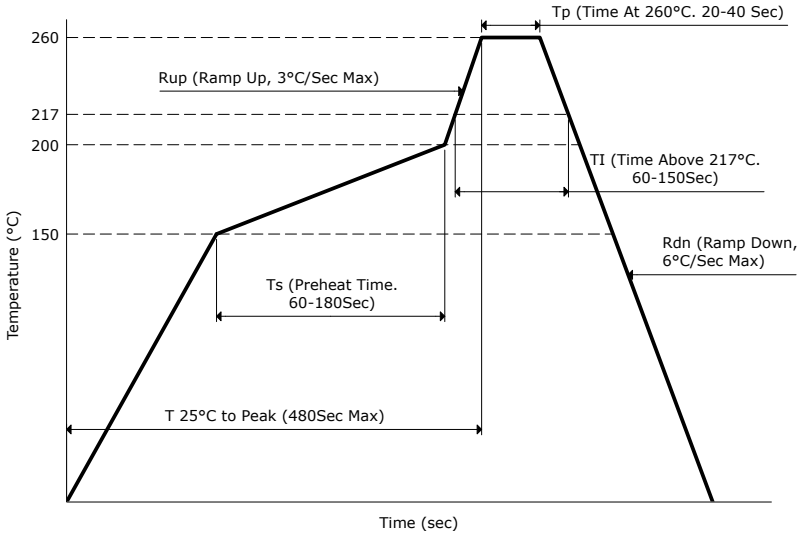
Ceramic SMT 2 Pad Watch Crystal

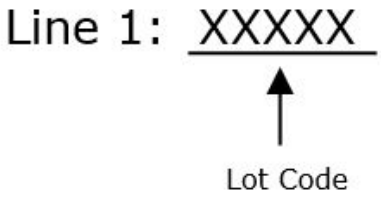
SWS512 Series

4.9mm x 1.8mm

Environmental Specifications		Mechanical Specifications	
Temperature Cycling	MIL-STD-883, Method 1010, Condition B	Mechanical Shock	MIL-STD-202, Method 213, Condition B
Fine Leak Test	MIL-STD-883, Method 1014, Condition A	Vibration	MIL-STD-883, Method 2007, Condition A
Gross Leak Test	MIL-STD-883, Method 1014, Condition C	Resistance to Soldering Heat	MIL-STD-202, Method 210, Condition B
Moisture Resistance	MIL-STD-883, Method 1004	Resistance to Solvents	MIL-STD-202, Method 215
Moisture Sensitivity	J-STD-020, MSL 1	Solderability	MIL-STD-883, Method 2003

Reflow Profile & Part Marking

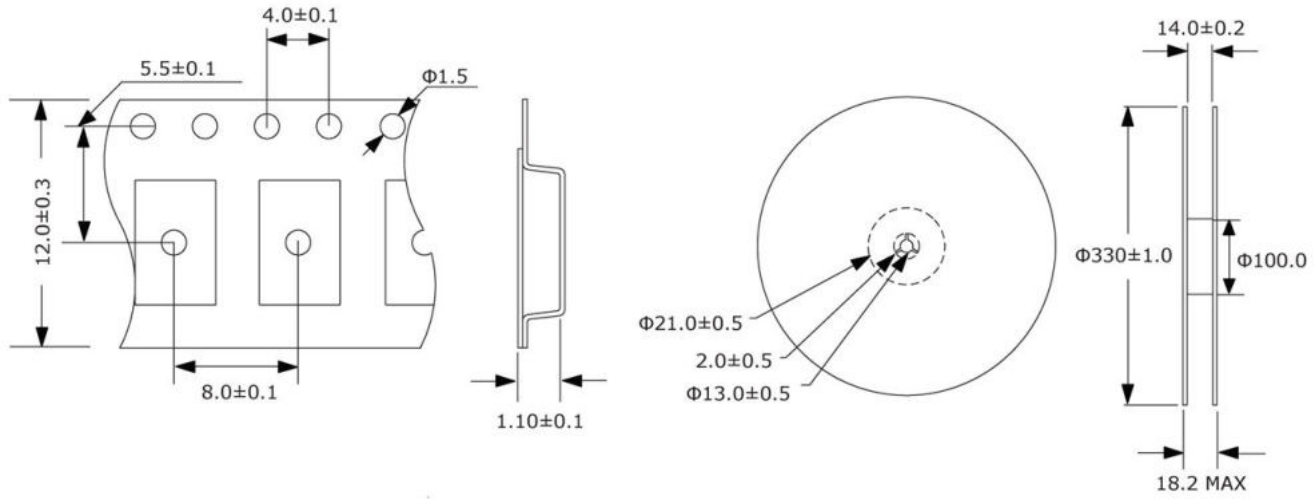




Tape And Reel Dimensions

All dimensions are in millimeters (mm) unless otherwise noted. Drawings are not to scale.

3,000pcs / Reel



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SUNTSU

Plastic SMT 4 Pad Watch Crystal

SWS614 Series

6.9mm x 1.4mm

Features

- ±20ppm (Tolerance) Available
- Plastic SMD Type
- Tape and Reel

Applications

- Real Time Clock
- Measurement instruments
- Wireless Applications

Part Numbering Guide

SWS 61 4 12 D 48 - 32.768K

- SUNTSU WATCH SMT CRYSTAL
- 6.9mm x 1.4mm
- 4 PAD
- LOAD CAPACITANCE
  - 12 : 12.5pF
  - 7 : 7.0pF
- FREQUENCY TOLERANCE
  - D : ±20ppm
- OPERATING TEMPERATURE RANGE
  - 16 : -10°C - +60°C
  - 48 : -40°C - +85°C
- FREQUENCY
  - kHz

RoHS COMPLIANT

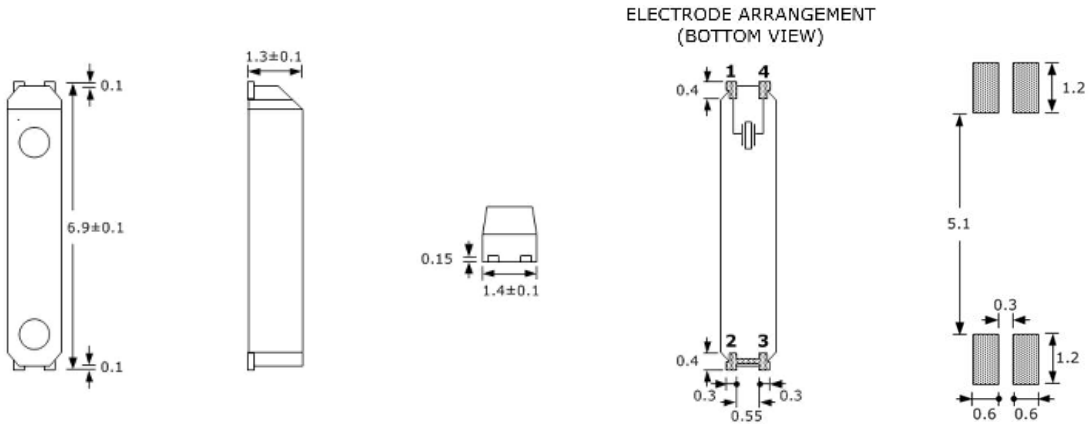
Cage Code: 4GUT4

To customize your parameters contact a Suntsu representative.

Electrical Parameters	Units	Minimum	Typical	Maximum	Remarks
Frequency Range	kHz		32.768		
Frequency Tolerance at +25°C	ppm	-20		+20	
Frequency Stability vs. Aging	ppm	-3		+3	First year @ +25°C.
Frequency Coefficient (ß)	ppm/T²	-0.040	-0.034	-0.028	
Operating Temperature	°C	-40		+85	See part numbering guide for options.
Turnover Temperature	°C	+20	+25	+30	
Storage Temperature	°C	-55		+125	
Load Capacitance	pF	7		12.5	See part numbering guide for options.
Shunt Capacitance	pF		1.2		
Drive Level	µW			1	
Insulation Resistance	MΩ	500			@ 100VDC ± 15V.
Equivalent Series Resistance	kΩ			65	

Outline Drawing & Recommended Land Pattern

All dimensions are in millimeters (mm) unless otherwise noted. Drawings are not to scale.



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SUNTSU

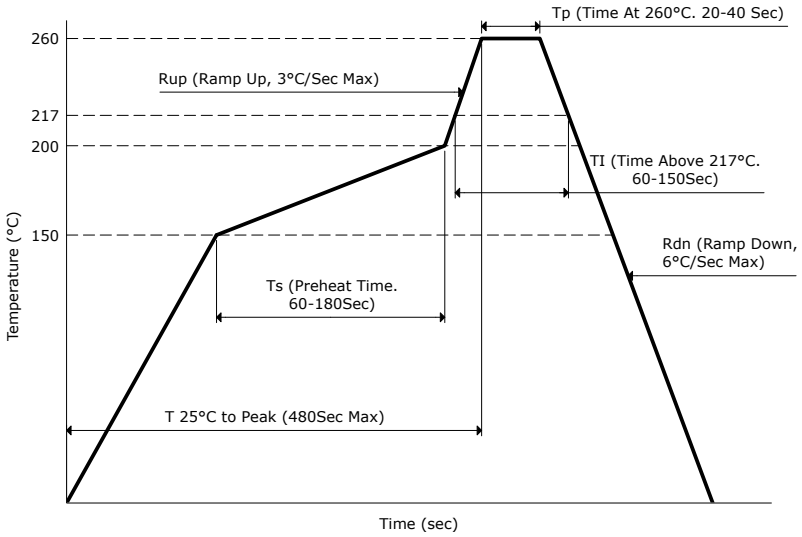
Plastic SMT 4 Pad Watch Crystal

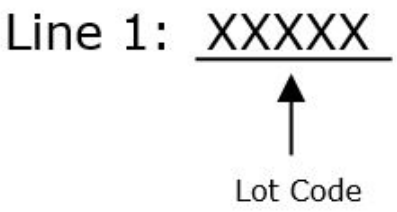
SWS614 Series

6.9mm x 1.4mm

Environmental Specifications		Mechanical Specifications	
Temperature Cycling	MIL-STD-883, Method 1010, Condition B	Mechanical Shock	MIL-STD-202, Method 213, Condition B
Fine Leak Test	MIL-STD-883, Method 1014, Condition A	Vibration	MIL-STD-883, Method 2007, Condition A
Gross Leak Test	MIL-STD-883, Method 1014, Condition C	Resistance to Soldering Heat	MIL-STD-202, Method 210, Condition B
Moisture Resistance	MIL-STD-883, Method 1004	Resistance to Solvents	MIL-STD-202, Method 215
Moisture Sensitivity	J-STD-020, MSL 1	Solderability	MIL-STD-883, Method 2003

Reflow Profile & Part Marking

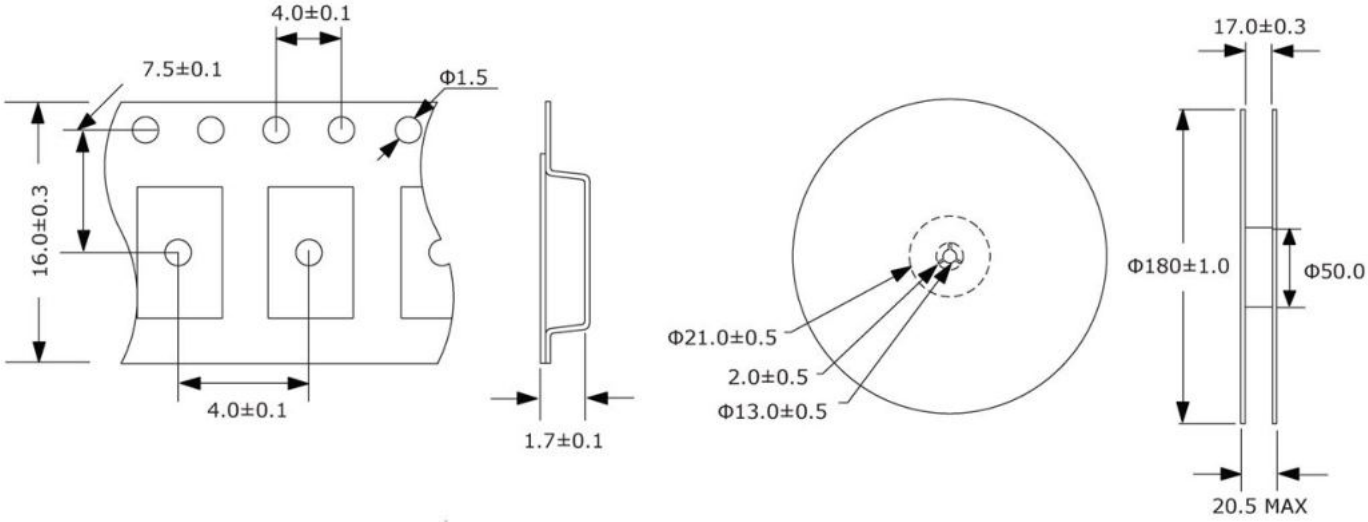




Tape And Reel Dimensions

All dimensions are in millimeters (mm) unless otherwise noted. Drawings are not to scale.

3,000pcs / Reel



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SUNTSU

Glass Sealed SMT 2 Pad Crystal

SXT8G2 Series

8.0mm x 4.5mm

Features

- ±10ppm/±10ppm (Tolerance/Stability) Available
- Glass Sealed
- AT-Cut Fundamental
- Tape and Reel

Applications

- Microprocessors
- PCMCIA
- Communication
- Test Equipment

Part Numbering Guide

SXT 8G 2 18 A A 48 T - 24.000M

- **SUNTSU CRYSTAL**
- **8.0mm x 4.5mm Glass Sealed**
- **2 PAD**
- **LOAD CAPACITANCE**
  S : Series
  7-30 : 7pF - 30pF
- **FREQUENCY TOLERANCE**
  A : ±50ppm
  B : ±30ppm
  C : ±25ppm
  D : ±20ppm
  E : ±15ppm
  F : ±10ppm
- **FREQUENCY STABILITY**
  A : ±50ppm
  B : ±30ppm
  C : ±25ppm
  D : ±20ppm
  E : ±15ppm
  F : ±10ppm*
- **OPERATING TEMPERATURE RANGE****
  07 : 0°C - +70°C
  16 : -10°C - +60°C
  17 : -10°C - +70°C
  27 : -20°C - +70°C
  38 : -30°C - +85°C
  48 : -40°C - +85°C
- **MODE OF OPERATION**
  BLANK : Fundamental
  T : 3rd Overtone
- **FREQUENCY**
  MHz

RoHS COMPLIANT

Cage Code: 4GUT4

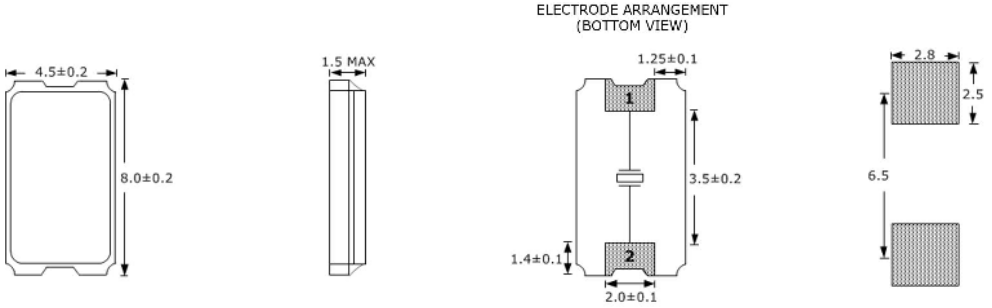
To customize your parameters contact a Suntsu representative.

* For frequency stability option F contact a Suntsu representative. ** For operating temperatures of -55-125°C a Suntsu representative.

Electrical Parameters	Units	Minimum	Typical	Maximum	Remarks
Frequency Range	MHz	6		40	AT-Cut Fundamental.
Frequency Range	MHz	40		80	3rd Overtone.
Frequency Tolerance at +25°C	ppm	-10		+10	See part numbering guide for options.
Frequency Stability vs. Op Temp	ppm	-10		+10	First year @ +25°C.
Frequency Stability vs. Aging	ppm	-3		+3	
Operating Temperature	°C	-40		+85	See part numbering guide for options.
Storage Temperature	°C	-40		+125	
Load Capacitance	pF	7		30	See part numbering guide for options.
Shunt Capacitance	pF			7	
Drive Level	µW		100	300	
Insulation Resistance	MΩ	500			@ 100VDC ± 15V.
6.000MHz ~ 9.999MHz	Ω			100	AT-Cut Fundamental
ESR - 10.000MHz ~ 11.999MHz	Ω			50	AT-Cut Fundamental
12.000MHz ~ 40.000MHz	Ω			40	AT-Cut Fundamental
40.000MHz ~ 80.000MHz	Ω			70	3rd Overtone.

Outline Drawing & Recommended Landed Pattern

All dimensions are in millimeters (mm) unless otherwise noted. Drawings are not to scale.



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SUNTSU

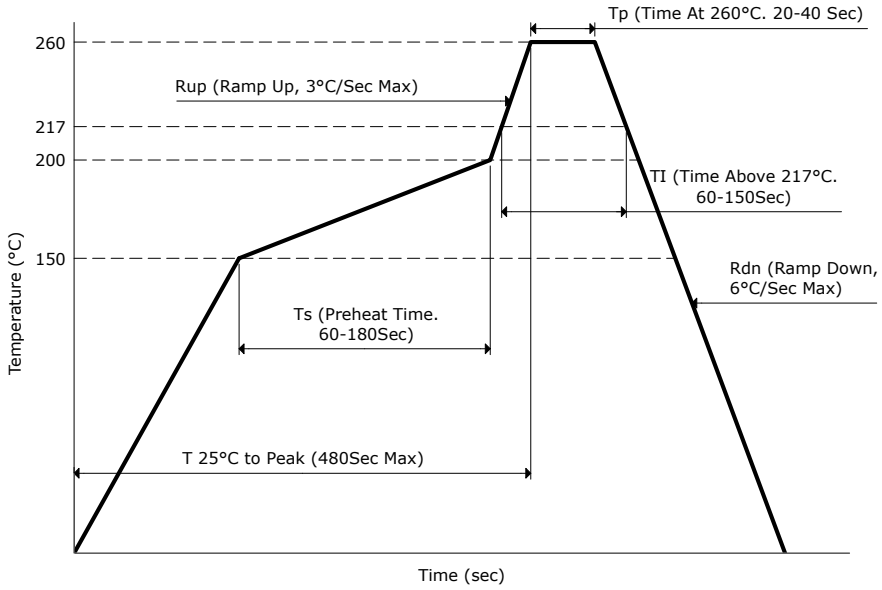
Glass Sealed SMT 2 Pad Crystal

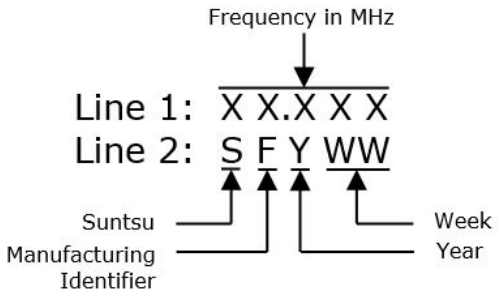
SXT8G2 Series

8.0mm x 4.5mm

Environmental Specifications		Mechanical Specifications	
Temperature Cycling	MIL-STD-883, Method 1010, Condition B	Mechanical Shock	MIL-STD-202, Method 213, Condition B
Fine Leak Test	MIL-STD-883, Method 1014, Condition A	Vibration	MIL-STD-883, Method 2007, Condition A
Gross Leak Test	MIL-STD-883, Method 1014, Condition C	Resistance to Soldering Heat	MIL-STD-202, Method 210, Condition K
Moisture Resistance	MIL-STD-883, Method 1004	Resistance to Solvents	MIL-STD-202, Method 215
Moisture Sensitivity	J-STD-020, MSL 1	Solderability	MIL-STD-883, Method 2003

Reflow Profile & Part Marking

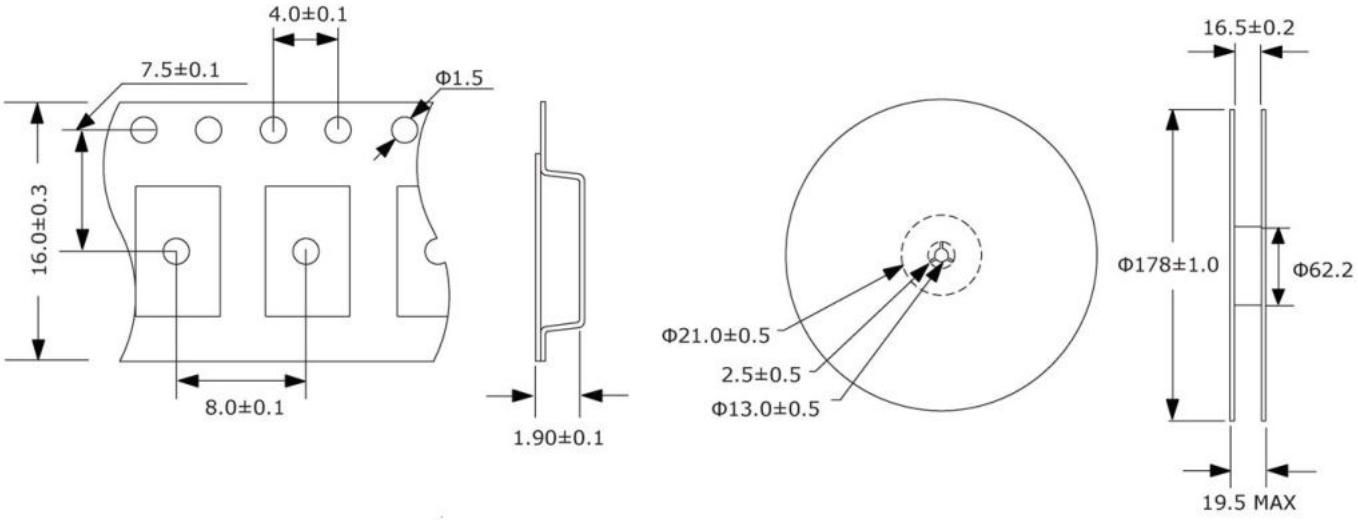




Tape And Reel Dimensions

All dimensions are in millimeters (mm) unless otherwise noted. Drawings are not to scale.

1,000pcs / Reel



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SUNTSU

Ceramic SMT 4 Pad Crystal

SXT754 Series

7.0mm x 5.0mm

Features

- ±10ppm/±10ppm (Tolerance/Stability) Available
- AT-Cut Fundamental
- Tape and Reel

Applications

- Microprocessors
- PCMCIA
- Communication
- Test Equipment

Part Numbering Guide

SXT 75 4 18 A A 48 T - 27.000M

- **SUNTSU CRYSTAL**
- **7.0mm x 5.0mm**
- **4 PAD**
- **LOAD CAPACITANCE**
  S : Series
  7-30 : 7pF - 30pF
- **FREQUENCY TOLERANCE**
  A : ±50ppm
  B : ±30ppm
  C : ±25ppm
  D : ±20ppm
  E : ±15ppm
  F : ±10ppm
- **FREQUENCY STABILITY**
  A : ±50ppm
  B : ±30ppm
  C : ±25ppm
  D : ±20ppm
  E : ±15ppm
  F : ±10ppm*
- **OPERATING TEMPERATURE RANGE****
  07 : 0°C - +70°C
  16 : -10°C - +60°C
  17 : -10°C - +70°C
  27 : -20°C - +70°C
  38 : -30°C - +85°C
  48 : -40°C - +85°C
- **MODE OF OPERATION**
  Blank : Fundamental
  T : 3rd Overtone
- **FREQUENCY**
  MHz

RoHS COMPLIANT

Cage Code: 4GUT4

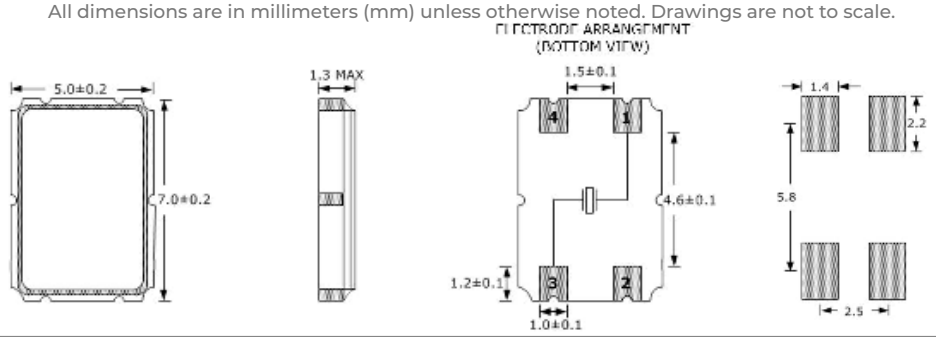
To customize your parameters contact a Suntsu representative.

* For frequency stability option F contact a Suntsu representative. ** For operating temperatures of -55-125°C a Suntsu representative.

Electrical Parameters	Units	Minimum	Typical	Maximum	Remarks
Frequency Range	MHz	6		50	AT-Cut Fundamental.
Frequency Range	MHz	30		125	3rd Overtone
Frequency Tolerance at +25°C	ppm	-10		+10	See part numbering guide for options.
Frequency Stability vs. Op Temp	ppm	-10		+10	See part numbering guide for options.
Frequency Stability vs. Aging	ppm	-3		+3	First year @ +25°C.
Operating Temperature	°C	-40		+85	See part numbering guide for options.
Storage Temperature	°C	-40		+125	
Load Capacitance	pF	7		30	See part numbering guide for options.
Shunt Capacitance	pF			7	
Drive Level	µW		10	500	
Insulation Resistance	MΩ	500			@ 100VDC ± 15V.
6.000MHz ~ 11.999MHz	Ω			100	AT-Cut Fundamental
ESR - 12.000MHz ~ 15.999MHz	Ω			70	AT-Cut Fundamental
16.000MHz ~ 50.000MHz	Ω			50	AT-Cut Fundamental
30.000MHz ~ 125.000MHz	Ω			80	3rd Overtone

Outline Drawing & Recommended Landed Pattern

All dimensions are in millimeters (mm) unless otherwise noted. Drawings are not to scale.



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SUNTSU

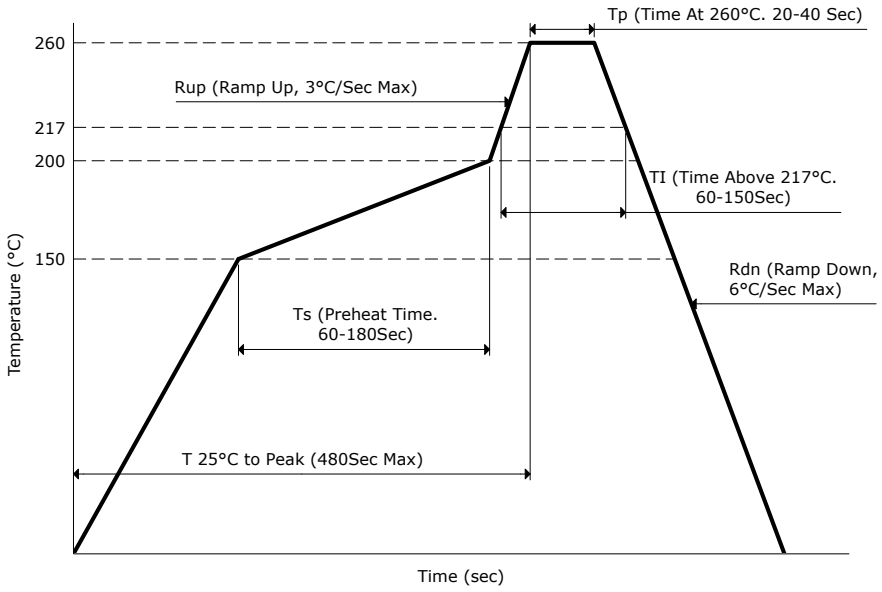
Ceramic SMT 4 Pad Crystal

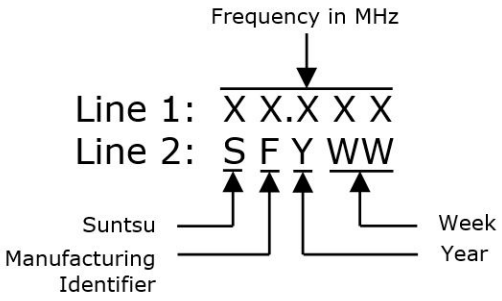
SXT754 Series

7.0mm x 5.0mm

Environmental Specifications		Mechcanical Specifications	
Temperature Cycling	MIL-STD-883, Method 1010, Condition B	Mechanical Shock	MIL-STD-202, Method 213, Condition B
Fine Leak Test	MIL-STD-883, Method 1014, Condition A	Vibration	MIL-STD-883, Method 2007, Condition A
Gross Leak Test	MIL-STD-883, Method 1014, Condition C	Resistance to Soldering Heat	MIL-STD-202, Method 210, Condition K
Moisture Resistance	MIL-STD-883, Method 1004	Resistance to Solvents	MIL-STD-202, Method 215
Moisture Sensitivity	J-STD-020, MSL 1	Solderability	MIL-STD-883, Method 2003

Reflow Profile & Part Marking





Tape And Reel Dimensions

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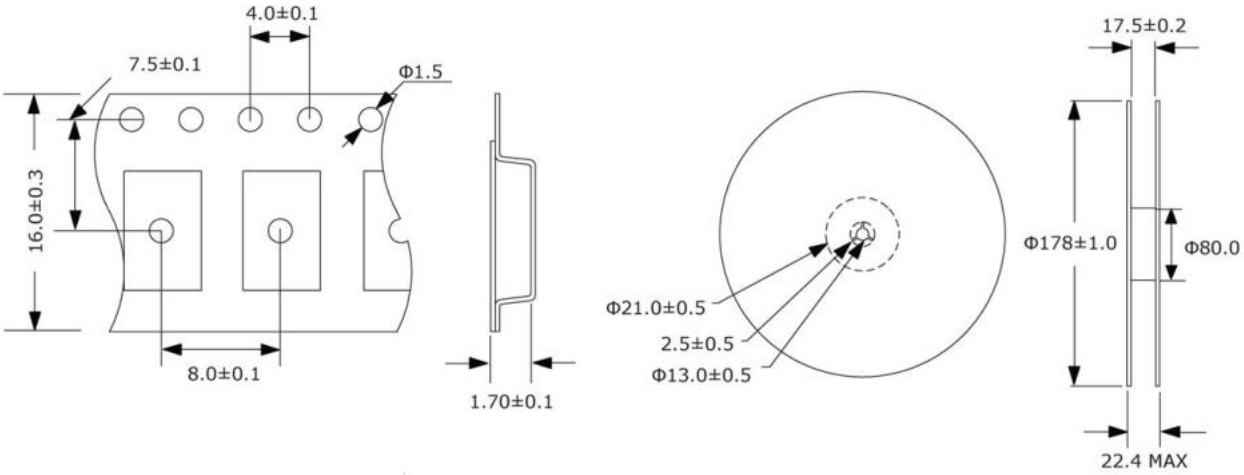
1,000pcs / Reel



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SUNTSU

Gull-Wing SMT Watch Crystal

SWG6J2 Series

6.3mm x 2.5mm

Features

- ±20ppm (Tolerance) Available
- Gull-Wing Leads c/w Metal Jacket SMD Type
- Reflow Capable
- Tape and Reel

Applications

- Real Time Clock
- Measurement instruments
- Wireless Applications

Part Numbering Guide

SWG 6J 2 12 D 48 - 32.768K

- **SUNTSU GULL-WING CRYSTAL**
- **6.3mm x 2.5mm c/w Metal Jacket**
- **2 LEAD**
- **LOAD CAPACITANCE**
  - 12 : 12.5pF
  - 9 : 9.0pF
  - 7 : 7.0pF
  - 6 : 6.0pF
- **FREQUENCY TOLERANCE**
  - D : ±20ppm
  - F : ±10ppm
- **OPERATING TEMPERATURE RANGE**
  - 16 : -10°C - +60°C
  - 48 : -40°C - +85°C
- **FREQUENCY** kHz

RoHS COMPLIANT

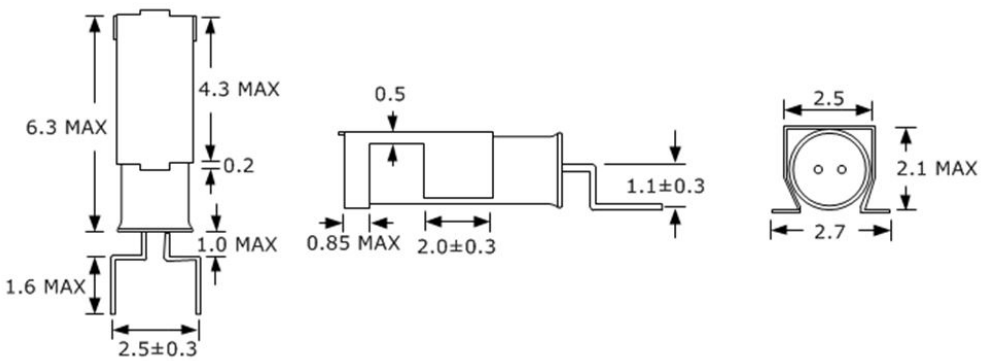
Cage Code: 4GUT4

To customize your parameters contact a Suntsu representative.

Electrical Parameters	Units	Minimum	Typical	Maximum	Remarks
Frequency Range	kHz		32.768		
Frequency Tolerance at +25°C	ppm	-20		+20	See part numbering guide for options.
Frequency Stability vs. Aging	ppm	-3		+3	First year @ +25°C.
Frequency Coefficient (ß)	ppm/T²	-0.040	-0.034	-0.028	
Operating Temperature	°C	-40		+85	See part numbering guide for options.
Turnover Temperature	°C	+20	+25	+30	
Storage Temperature	°C	-55		+125	
Load Capacitance	pF	6		12.5	See part numbering guide for options.
Shunt Capacitance	pF		1.5		
Drive Level	µW			1	
Insulation Resistance	MΩ	500			@ 100VDC ± 15V.
Equivalent Series Resistance	kΩ			50	

Outline Drawing & Recommended Land Pattern

All dimensions are in millimeters (mm) unless otherwise noted. Drawings are not to scale.



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SUNTSU

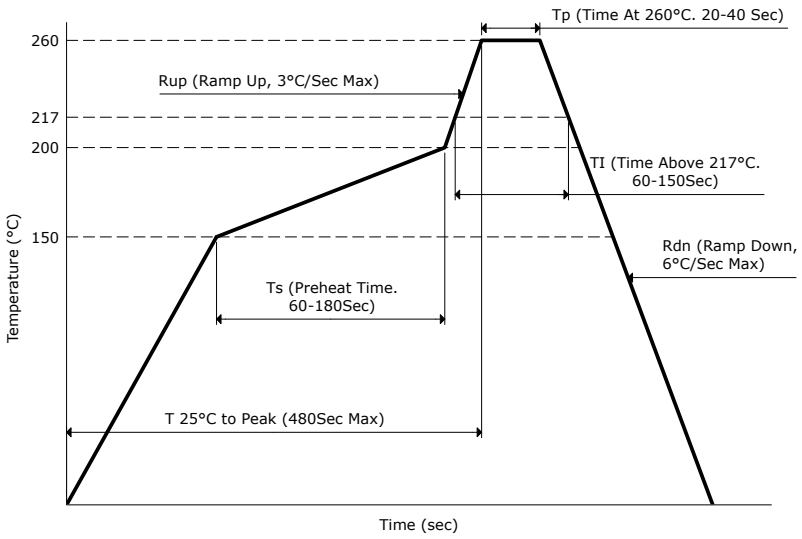
Gull-Wing SMT Watch Crystal

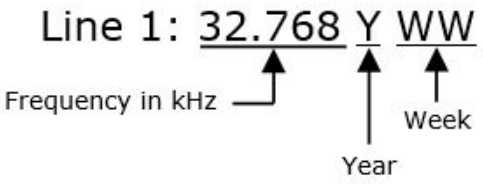
SWG6J2 Series

6.3mm x 2.5mm

Enviromental Specifications		Mechcanical Specifications	
Temperature Cycling	MIL-STD-883, Method 1010, Condition B	Mechanical Shock	MIL-STD-202, Method 213, Condition B
Fine Leak Test	MIL-STD-883, Method 1014, Condition A	Vibration	MIL-STD-883, Method 2007, Condition A
Gross Leak Test	MIL-STD-883, Method 1014, Condition C	Resistance to Soldering Heat	MIL-STD-202, Method 210, Condition B
Moisture Resistance	MIL-STD-883, Method 1004	Resistance to Solvents	MIL-STD-202, Method 215
Moisture Sensitivity	Hermetically Sealed, MSL=N/A: Not Applicable	Solderability	MIL-STD-883, Method 2003

Reflow Profile & Part Marking

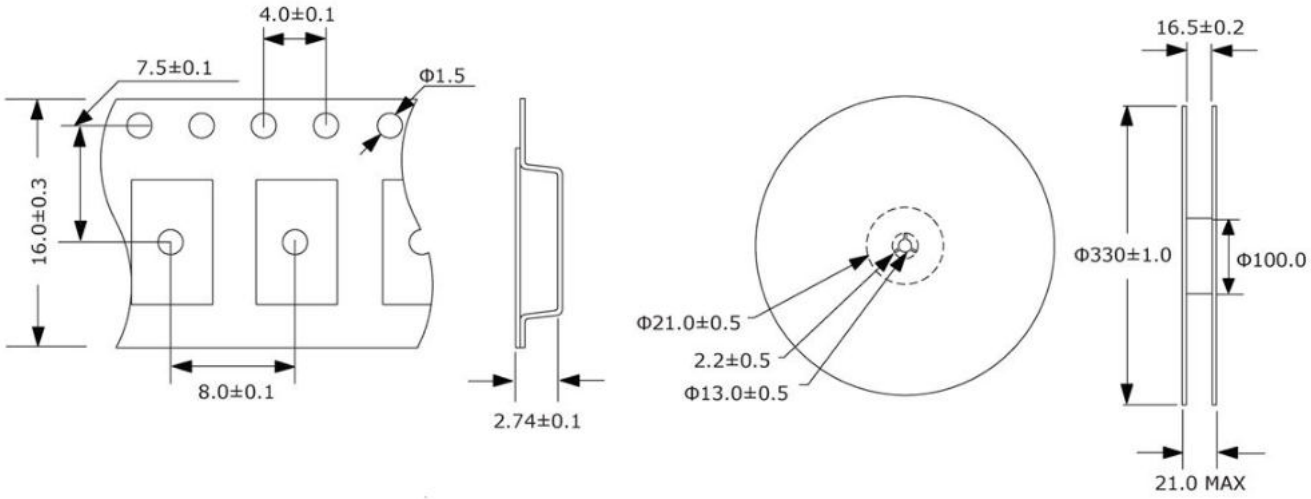




Tape And Reel Dimensions

All dimensions are in millimeters (mm) unless otherwise noted. Drawings are not to scale.

2,000pcs / Reel



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SUNTSU

Plastic SMT 4 Pad Watch Crystal

SWS144 Series

10.4mm x 4.06mm

Features

- ±10ppm (Tolerance) Available
- Plastic SMD Type
- Tape and Reel

Applications

- Real Time Clock
- Measurement instruments
- Wireless Applications

Part Numbering Guide

SWS 14 4 12 D 48 A - 32.768K

- SUNTSU WATCH SMT CRYSTAL
- 10.4mm x 4.06mm
- 4 PAD
- LOAD CAPACITANCE
  - 12 : 12.5pF
  - 9 : 9.0pF
  - 6 : 6.0pF
- FREQUENCY TOLERANCE
  - D : ±20ppm
  - F : ±10ppm
- OPERATING TEMPERATURE RANGE
  - 48 : -40°C - +85°C
- Package Type*
  - A : Type A
  - B : Type B
- FREQUENCY
  - kHz

RoHS COMPLIANT

Cage Code: 4GUT4

* Electrode Arrangement, see outline drawing

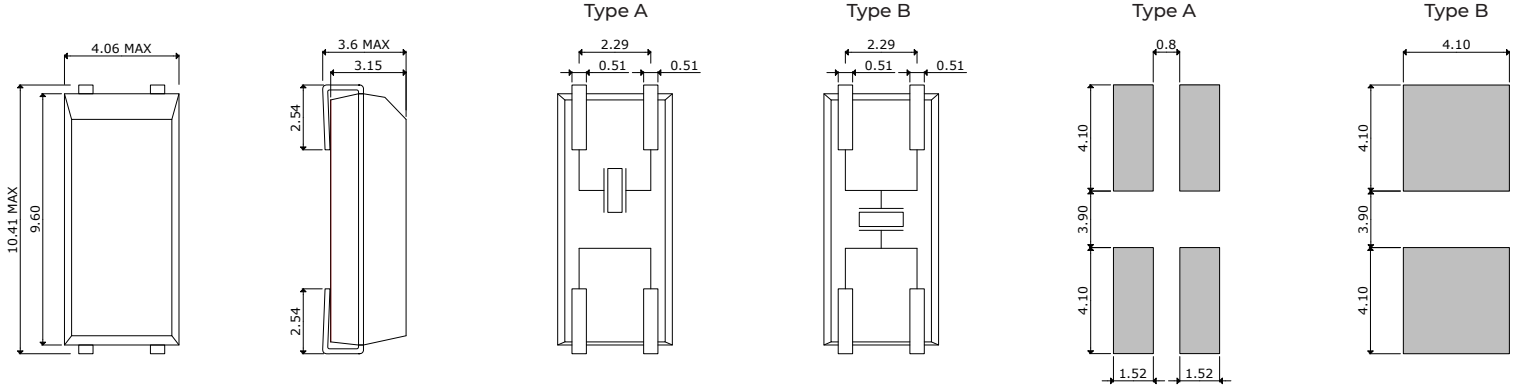
To customize your parameters contact a Suntsu representative.

Electrical Parameters	Units	Minimum	Typical	Maximum	Remarks
Frequency Range	kHz		32.768		
Frequency Tolerance at +25°C	ppm	-20		+20	See part numbering guide for options.
Frequency Stability vs. Aging	ppm	-3		+3	First year @ +25°C.
Frequency Coefficient (ß)	ppm/T²	-0.040	-0.034	-0.028	
Operating Temperature	°C	-40		+85	
Turnover Temperature	°C	+20	+25	+30	
Storage Temperature	°C	-55		+125	
Load Capacitance	pF		12.5		See part numbering guide for options.
Shunt Capacitance	pF		1.9		
Drive Level	µW			1	
Insulation Resistance	MΩ	500			@ 100VDC ± 15V.
Equivalent Series Resistance	kΩ			50	

Outline Drawing & Recommended Land Pattern

All dimensions are in millimeters (mm) unless otherwise noted. Drawings are not to scale.

Electrode Arrangement



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SUNTSU

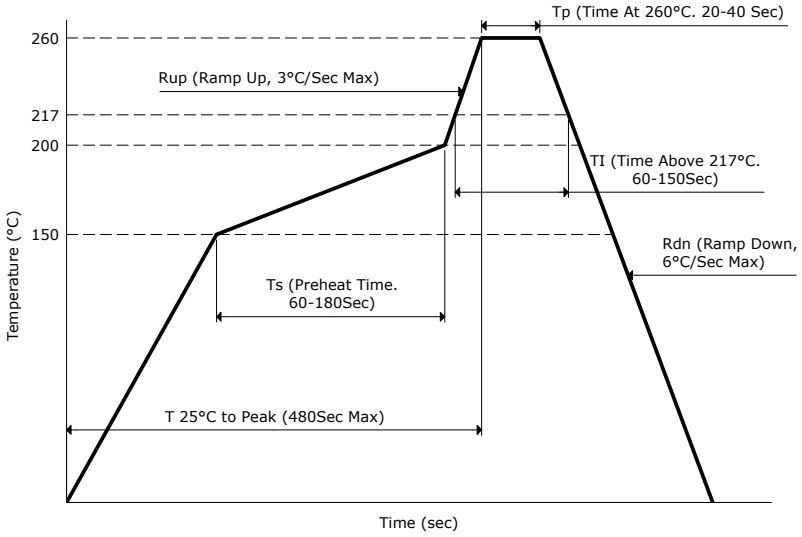
Plastic SMT 4 Pad Watch Crystal

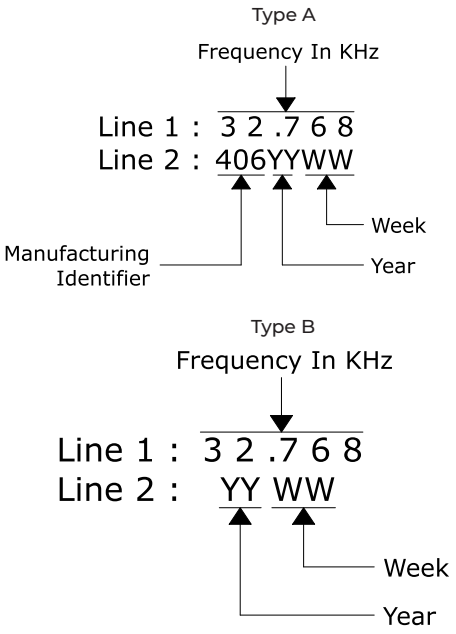
SWS144 Series

10.4mm x 4.06mm

Environmental Specifications		Mechanical Specifications	
Temperature Cycling	MIL-STD-883, Method 1010, Condition B	Mechanical Shock	MIL-STD-202, Method 213, Condition B
Fine Leak Test	MIL-STD-883, Method 1014, Condition A	Vibration	MIL-STD-883, Method 2007, Condition A
Gross Leak Test	MIL-STD-883, Method 1014, Condition C	Resistance to Soldering Heat	MIL-STD-202, Method 210, Condition B
Moisture Resistance	MIL-STD-883, Method 1004	Resistance to Solvents	MIL-STD-202, Method 215
Moisture Sensitivity	J-STD-020, MSL 1	Solderability	MIL-STD-883, Method 2003

Reflow Profile & Part Marking

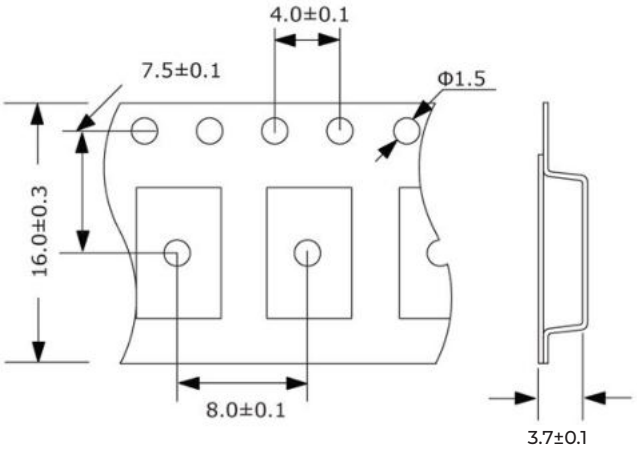


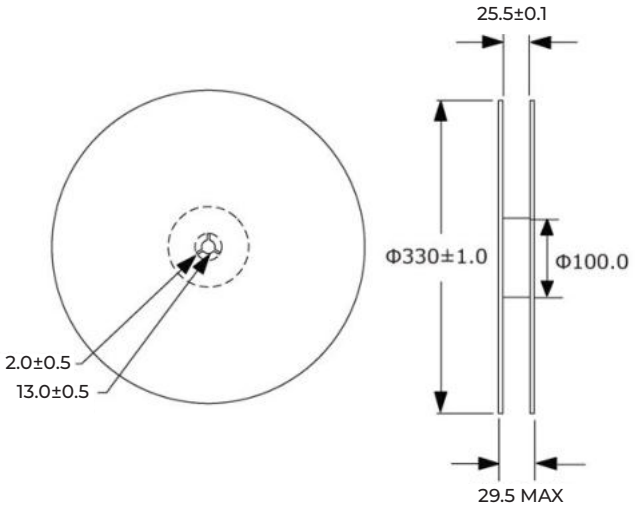


Tape And Reel Dimensions

All dimensions are in millimeters (mm) unless otherwise noted. Drawings are not to scale.

2,000pcs / Reel





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SUNTSU

Plastic SMT 4 Pad Watch Crystal

SWS834 Series

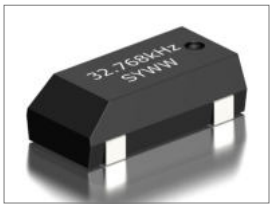
8.0mm x 3.8mm

Features

- ±20ppm (Tolerance) Available
- Plastic SMD Type
- Tape and Reel

Applications

- Real Time Clock
- Measurement instruments
- Wireless Applications



Part Numbering Guide

SWS 83 4 12 D 48 - 32.768K

- **SUNTSU WATCH SMT CRYSTAL**
- **8.0mm x 3.8mm**
- **4 PAD**
- **LOAD CAPACITANCE**
  - 12 : 12.5pF
  - 8 : 8.0pF
  - 6 : 6.0pF
- **FREQUENCY TOLERANCE**
  - D : ±20ppm
  - F : ±10ppm
- **OPERATING TEMPERATURE RANGE**
  - 16 : -10°C - +60°C
  - 48 : -40°C - +85°C
- **FREQUENCY**
  - kHz

RoHS COMPLIANT

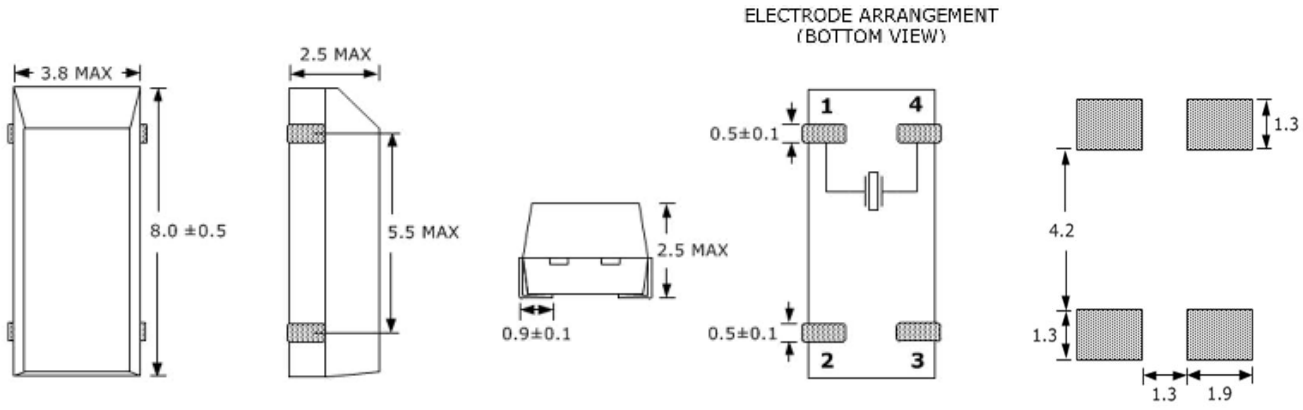
Cage Code: 4GUT4

To customize your parameters contact a Suntsu representative.

Electrical Parameters	Units	Minimum	Typical	Maximum	Remarks
Frequency Range	kHz		32.768		
Frequency Tolerance at +25°C	ppm	-20		+20	See part numbering guide for options.
Frequency Stability vs. Aging	ppm	-3		+3	First year @ +25°C.
Frequency Coefficient (ß)	ppm/T²	-0.040	-0.034	-0.028	
Operating Temperature	°C	-40		+85	See part numbering guide for options.
Turnover Temperature	°C	+20	+25	+30	
Storage Temperature	°C	-55		+125	
Load Capacitance	pF	6		12.5	See part numbering guide for options.
Shunt Capacitance	pF		1.5		
Drive Level	µW			1	
Insulation Resistance	MΩ	500			@ 100VDC ± 15V.
Equivalent Series Resistance	kΩ			50	

Outline Drawing & Recommended Land Pattern

All dimensions are in millimeters (mm) unless otherwise noted. Drawings are not to scale.



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SUNTSU

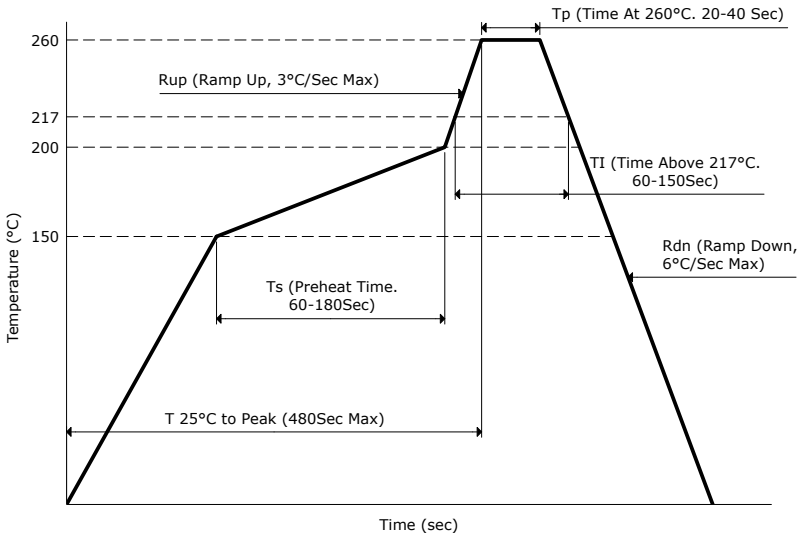
Plastic SMT 4 Pad Watch Crystal

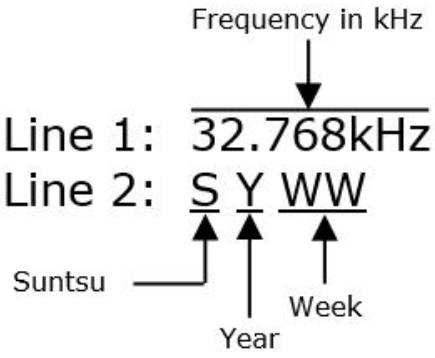
SWS834 Series

8.0mm x 3.8mm

Environmental Specifications		Mechanical Specifications	
Temperature Cycling	MIL-STD-883, Method 1010, Condition B	Mechanical Shock	MIL-STD-202, Method 213, Condition B
Fine Leak Test	MIL-STD-883, Method 1014, Condition A	Vibration	MIL-STD-883, Method 2007, Condition A
Gross Leak Test	MIL-STD-883, Method 1014, Condition C	Resistance to Soldering Heat	MIL-STD-202, Method 210, Condition B
Moisture Resistance	MIL-STD-883, Method 1004	Resistance to Solvents	MIL-STD-202, Method 215
Moisture Sensitivity	J-STD-020, MSL 1	Solderability	MIL-STD-883, Method 2003

Reflow Profile & Part Marking





Tape And Reel Dimensions

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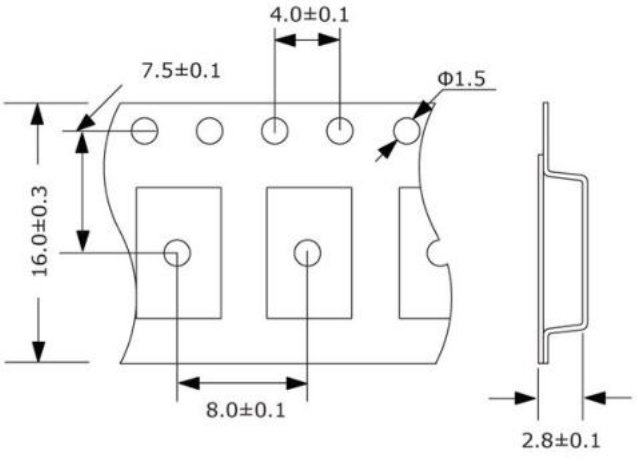
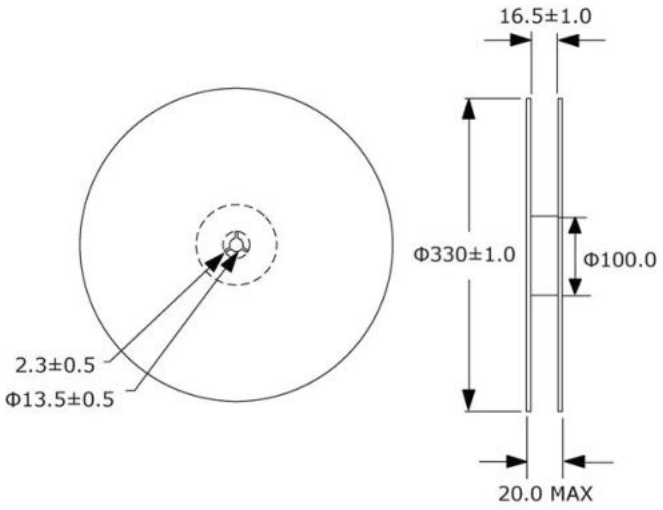
3,000pcs / Reel





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IRVINE, CA 92618

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SUNTSU

Plastic SMT 4 Pad Crystal

SXT144 Series

12.5mm x 4.6mm

Features

- ±15ppm (Tolerance) Available
- Plastic SMD Type
- Tape and Reel

Applications

- Measurement instruments
- Wireless Applications

Part Numbering Guide

SXT 14 4 18 A A 48 - 16.000M

- **SUNTSU CRYSTAL**
- **12.5mm x 4.6mm**
- **4 PAD**
- **LOAD CAPACITANCE**
  6-32 : 6pF - 32pF
- **FREQUENCY TOLERANCE**
  A : ±50ppm
  B : ±30ppm
  C : ±25ppm
  D : ±20ppm
  E : ±15ppm
- **FREQUENCY STABILITY**
  A : ±50ppm
  B : ±30ppm
  C : ±25ppm
  D : ±20ppm
  E : ±15ppm
  F : ±10ppm
- **OPERATING TEMPERATURE RANGE**
  07 : 0°C - +70°C
  16 : -10°C - +60°C
  17 : -10°C - +70°C
  27 : -20°C - +70°C
  38 : -30°C - +85°C
  48 : -40°C - +85°C
- **FREQUENCY**
  MHz

RoHS COMPLIANT

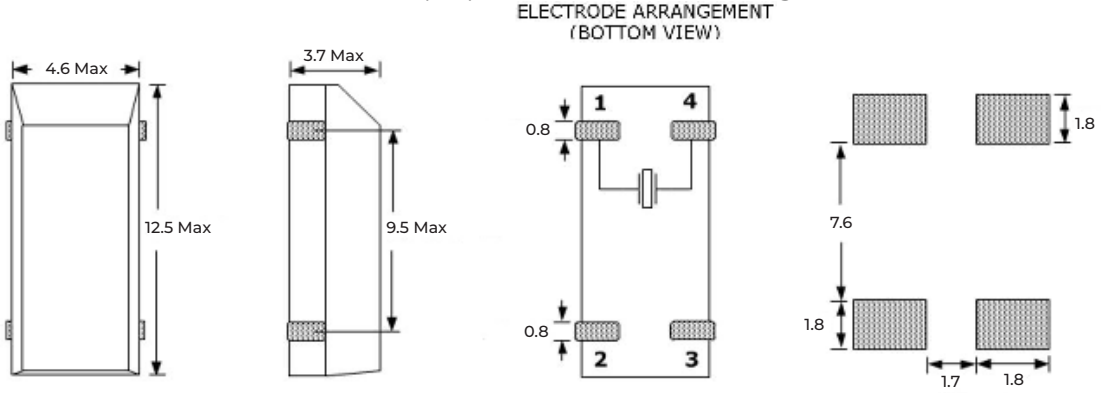
Cage Code: 4GUT4

To customize your parameters contact a Suntsu representative.

Electrical Parameters			Units	Minimum	Typical	Maximum	Remarks
Frequency Range			MHz	3.579		27	
Frequency Tolerance at +25°C			ppm	-15		+15	See part numbering guide for options.
Frequency Stability vs. Op Temp			ppm	-10		+10	See part numbering guide for options.
Frequency Stability vs. Aging			ppm	-5		+5	First year @ +25°C.
Operating Temperature			°C	-40		+85	See part numbering guide for options.
Storage Temperature			°C	-55		+125	
Load Capacitance			pF	6	12.5	32	See part numbering guide for options.
Shunt Capacitance			pF			5	
Drive Level			µW		100		
Insulation Resistance			MΩ	500			@ 100VDC ± 15V.
ESR -	3.500MHz	~ 3.999MHz	Ω			200	Fundamental
	4.000MHz	~ 5.999MHz	Ω			150	Fundamental
	6.000MHz	~ 9.999MHz	Ω			100	Fundamental
	10.000MHz	~ 27.000MHz	Ω			50	Fundamental

Outline Drawing & Recommended Land Pattern

All dimensions are in millimeters (mm) unless otherwise noted. Drawings are not to scale.



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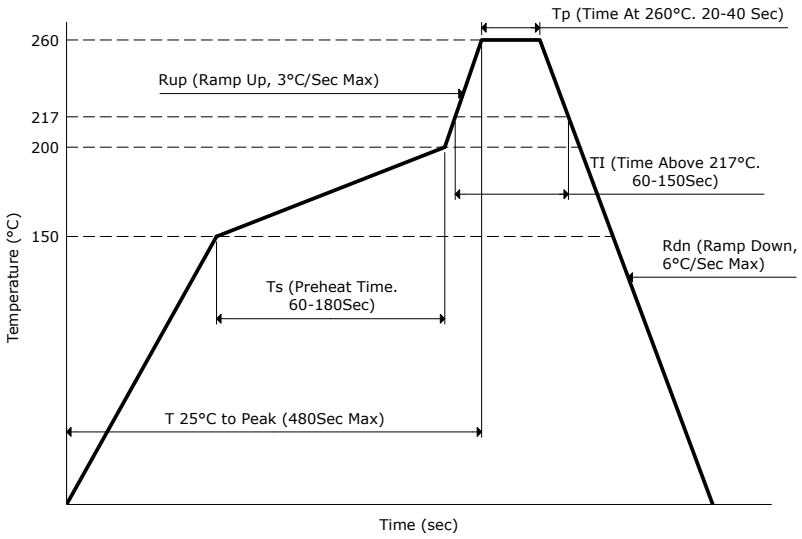
SUNTSU

Plastic SMT 4 Pad Crystal

SXT144 Series

12.5mm x 4.6mm

Reflow Profile & Part Marking



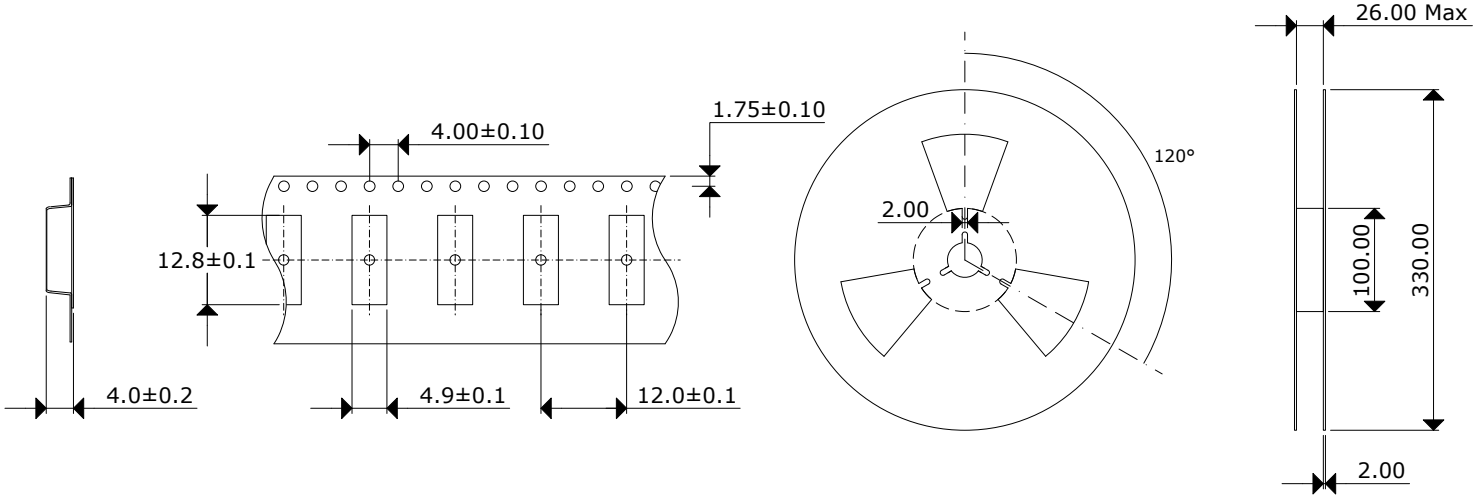
Frequency In MHz

Line 1 : x x . x x x

Tape And Reel Dimensions

All dimensions are in millimeters (mm) unless otherwise noted. Drawings are not to scale.

1,000pcs / Reel



Environmental Specifications		Mechanical Specifications	
Temperature Cycling	MIL-STD-883, Method 1010, Condition B	Mechanical Shock	MIL-STD-202, Method 213, Condition B
Fine Leak Test	MIL-STD-883, Method 1014, Condition A	Vibration	MIL-STD-883, Method 2007, Condition A
Gross Leak Test	MIL-STD-883, Method 1014, Condition C	Resistance to Soldering Heat	MIL-STD-202, Method 210, Condition B
Moisture Resistance	MIL-STD-883, Method 1004	Resistance to Solvents	MIL-STD-202, Method 215
Moisture Sensitivity	J-STD-020, MSL 1	Solderability	MIL-STD-883, Method 2003

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SUNTSU

Metal Can SMT 2 Pad Crystal

SXTHM2 Series

HC-49/US

Features

- ±10ppm/±10ppm (Tolerance/Stability) Available
- RESISTANCE WELD
- AT-Cut or BT-Cut
- Tape and Reel

Applications

- Microprocessors
- Computers
- Modems
- Wireless Applications

Part Numbering Guide

SXT HM 2 18 A A 48 4 T - 4.000M

- **SUNTSU CRYSTAL**
- **HC-49/US SMT**
- **2 PAD**
- **LOAD CAPACITANCE**
  S : Series
  7-30 : 7pF - 30pF
- **FREQUENCY TOLERANCE**
  A : ±50ppm
  B : ±30ppm
  C : ±25ppm
  D : ±20ppm
  E : ±15ppm
  F : ±10ppm
- **FREQUENCY STABILITY**
  A : ±50ppm
  B : ±30ppm
  C : ±25ppm
  D : ±20ppm
  E : ±15ppm
  F : ±10ppm*
- **OPERATING TEMPERATURE RANGE****
  07 : 0°C - +70°C
  16 : -10°C - +60°C
  17 : -10°C - +70°C
  27 : -20°C - +70°C
  38 : -30°C - +85°C
  48 : -40°C - +85°C
- **HEIGHT OF PACKAGE**
  4 : 4.5mm Max
  3 : 3.2mm Max
- **MODE OF OPERATION**
  BLANK : Fundamental
  T : 3rd Overtone
  B : BT-Cut Fundamental
- **FREQUENCY**
  MHz

RoHS COMPLIANT

Cage Code: 4GUT4

To customize your parameters contact a Suntsu representative.

* For frequency stability option F contact a Suntsu representative. ** For operating temperatures of -55-125°C a Suntsu representative.

Electrical Parameters	Units	Minimum	Typical	Maximum	Remarks
Frequency Range	MHz	3		40	AT-Cut Fundamental
Frequency Range	MHz	20		50	BT-Cut Fundamental
Frequency Range	MHz	24		90	3rd Overtone.
Frequency Tolerance at +25°C	ppm	-10		+10	See part numbering guide for options.
Frequency Stability vs. Op Temp	ppm	-10		+10	See part numbering guide for options.
Frequency Stability vs. Aging	ppm	-3		+3	First year @ +25°C.
Operating Temperature	°C	-40		+85	See part numbering guide for options.
Storage Temperature	°C	-40		+125	
Load Capacitance	pF	7		30	See part numbering guide for options.
Shunt Capacitance	pF			7	
Drive Level	µW		100	500	
Insulation Resistance	MΩ	500			@ 100VDC ± 15V.
ESR - 3.000MHz ~ 3.799MHz	Ω			180	AT-Cut Fundamental
3.800MHz ~ 4.499MHz	Ω			150	AT-Cut Fundamental
4.500MHz ~ 5.999MHz	Ω			120	AT-Cut Fundamental
6.000MHz ~ 7.999MHz	Ω			100	AT-Cut Fundamental
8.000MHz ~ 9.999MHz	Ω			80	AT-Cut Fundamental
10.000MHz ~ 12.999MHz	Ω			60	AT-Cut Fundamental
13.000MHz ~ 19.999MHz	Ω			50	AT-Cut Fundamental
20.000MHz ~ 40.000MHz	Ω			30	AT-Cut Fundamental
20.000MHz ~ 50.000MHz	Ω			40	BT-Cut Fundamental
24.000MHz ~ 39.999MHz	Ω			100	3rd Overtone
40.000MHz ~ 90.000MHz	Ω			80	3rd Overtone

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SUNTSU

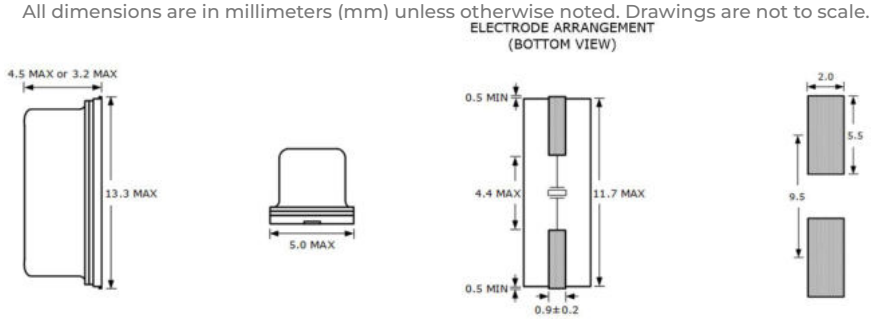
Metal Can SMT 2 Pad Crystal

SXTHM2 Series

HC-49/US

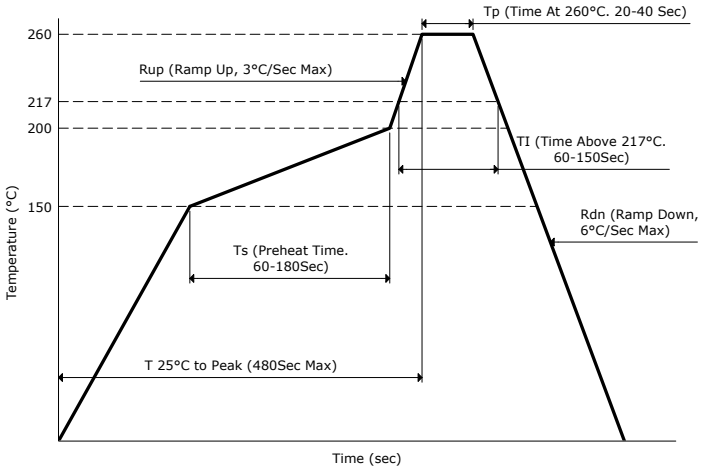
Outline Drawing & Land Pattern

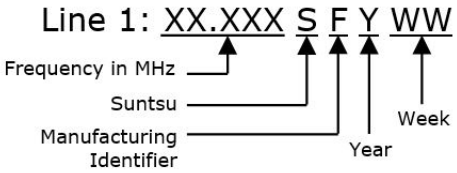
All dimensions are in millimeters (mm) unless otherwise noted. Drawings are not to scale.



Environmental Specifications		Mechanical Specifications	
Temperature Cycling	MIL-STD-883, Method 1010, Condition B	Mechanical Shock	MIL-STD-202, Method 213, Condition C
Fine Leak Test	MIL-STD-883, Method 1014, Condition A	Vibration	MIL-STD-883, Method 2007, Condition A
Gross Leak Test	MIL-STD-883, Method 1014, Condition C	Resistance to Soldering Heat	MIL-STD-202, Method 210, Condition K
Moisture Resistance	MIL-STD-883, Method 1004	Resistance to Solvents	MIL-STD-202, Method 215
Moisture Sensitivity	J-STD-020, MSL 1	Solderability	MIL-STD-883, Method 2003

Reflow Profile & Part Marking

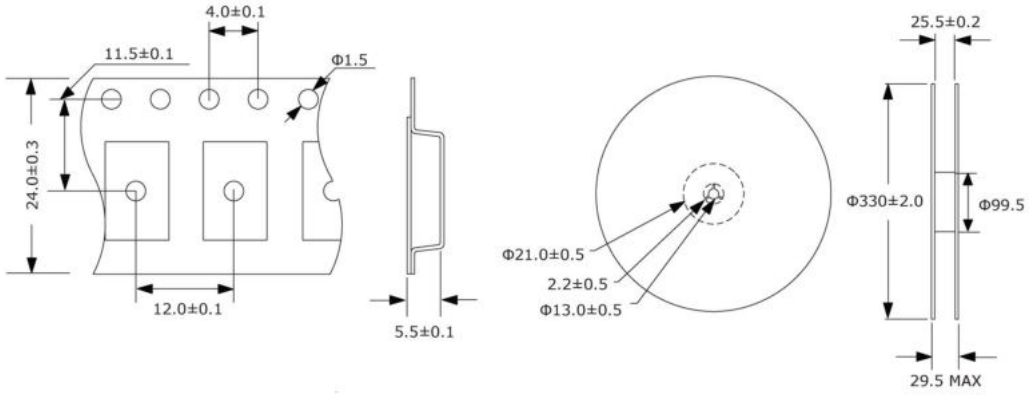




Tape And Reel Dimensions

All dimensions are in millimeters (mm) unless otherwise noted. Drawings are not to scale.

1,000pcs / Reel



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RoHS COMPLIANT

Metal Can SMT 4 Pad Crystal

SXTHM4 Series

HC-49/US

Features

- ±10ppm/±10ppm (Tolerance/Stability) Available
- RESISTANCE WELD
- AT-Cut or BT-Cut
- Tape and Reel

Applications

- Microprocessors
- Computers
- Modems
- Wireless Applications

Part Numbering Guide

SXT HM 4 18 A A 48 A 4 T - 4.000M

- **SUNTSU CRYSTAL**
- **HC-49/US SMT**
- **4 PAD**
- **LOAD CAPACITANCE**
  - S : Series
  - 7-30 : 7pF - 30pF
- **FREQUENCY TOLERANCE**
  - A : ±50ppm
  - B : ±30ppm
  - C : ±25ppm
  - D : ±20ppm
  - E : ±15ppm
  - F : ±10ppm
- **FREQUENCY STABILITY**
  - A : ±50ppm
  - B : ±30ppm
  - C : ±25ppm
  - D : ±20ppm
  - E : ±15ppm
  - F : ±10ppm*
- **OPERATING TEMPERATURE RANGE****
  - 07 : 0°C - +70°C
  - 16 : -10°C - +60°C
  - 17 : -10°C - +70°C
  - 27 : -20°C - +70°C
  - 38 : -30°C - +85°C
  - 48 : -40°C - +85°C
- **PACKAGE TYPE*****
  - A : A-Type
  - B : B-Type
- **HEIGHT OF PACKAGE**
  - 4 : 4.5mm Max
  - 3 : 3.2mm Max
- **MODE OF OPERATION**
  - BLANK : Fundamental
  - T : 3rd Overtone
  - B : BT-Cut Fundamental
- **FREQUENCY**
  - MHz

Cage Code: 4GUT4

To customize your parameters contact a Suntsu representative.

* For frequency stability option F contact a Suntsu representative.

** For operating temperatures of -55-125°C a Suntsu representative.

*** Electrode Arrangement, see outline drawing

Electrical Parameters	Units	Minimum	Typical	Maximum	Remarks
Frequency Range	MHz	3		40	AT-Cut Fundamental
Frequency Range	MHz	20		50	BT-Cut Fundamental
Frequency Range	MHz	24		90	3rd Overtone
Frequency Tolerance at +25°C	ppm	-10		+10	See part numbering guide for options.
Frequency Stability vs. Op Temp	ppm	-10		+10	See part numbering guide for options.
Frequency Stability vs. Aging	ppm	-3		+3	First year @ +25°C.
Operating Temperature	°C	-40		+85	See part numbering guide for options.
Storage Temperature	°C	-40		+125	
Load Capacitance	pF	7		30	See part numbering guide for options.
Shunt Capacitance	pF			7	
Drive Level	µW		100	500	
Insulation Resistance	MΩ	500			@ 100VDC ± 15V.
3.000MHz ~ 3.799MHz	Ω			180	AT-Cut Fundamental
3.800MHz ~ 4.499MHz	Ω			150	AT-Cut Fundamental
4.500MHz ~ 5.999MHz	Ω			120	AT-Cut Fundamental
6.000MHz ~ 7.999MHz	Ω			100	AT-Cut Fundamental
8.000MHz ~ 9.999MHz	Ω			80	AT-Cut Fundamental
ESR - 10.000MHz ~ 12.999MHz	Ω			60	AT-Cut Fundamental
13.000MHz ~ 19.999MHz	Ω			50	AT-Cut Fundamental
20.000MHz ~ 40.000MHz	Ω			30	AT-Cut Fundamental
20.000MHz ~ 50.000MHz	Ω			40	BT-Cut Fundamental
24.000MHz ~ 39.999MHz	Ω			100	3rd Overtone
40.000MHz ~ 90.000MHz	Ω			80	3rd Overtone

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SUNTSU

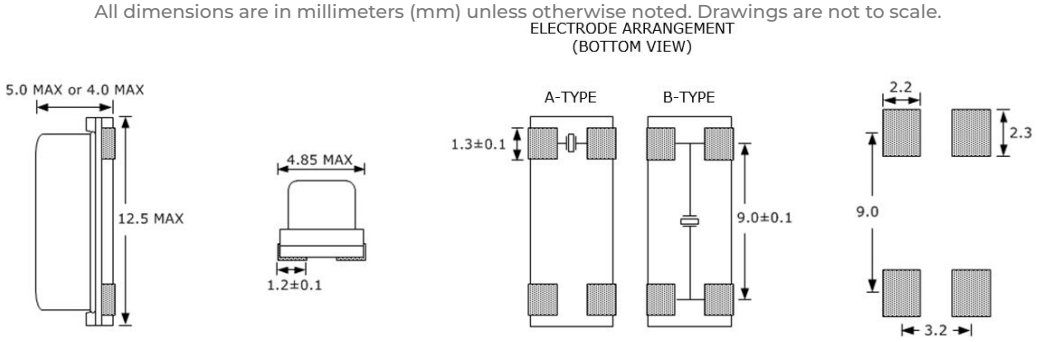
Metal Can SMT 4 Pad Crystal

SXTHM4 Series

HC-49/US

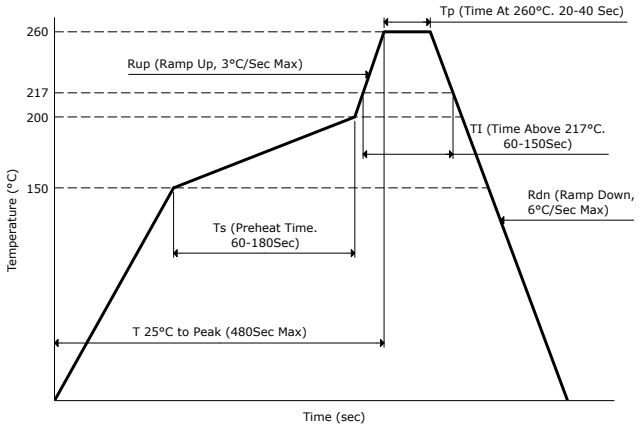
Outline Drawing & Land Pattern

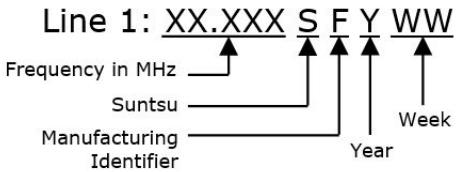
All dimensions are in millimeters (mm) unless otherwise noted. Drawings are not to scale.



Environmental Specifications		Mechanical Specifications	
Temperature Cycling	MIL-STD-883, Method 1010, Condition B	Mechanical Shock	MIL-STD-202, Method 213, Condition C
Fine Leak Test	MIL-STD-883, Method 1014, Condition A	Vibration	MIL-STD-883, Method 2007, Condition A
Gross Leak Test	MIL-STD-883, Method 1014, Condition C	Resistance to Soldering Heat	MIL-STD-202, Method 210, Condition K
Moisture Resistance	MIL-STD-883, Method 1004	Resistance to Solvents	MIL-STD-202, Method 215
Moisture Sensitivity	J-STD-020, MSL 1	Solderability	MIL-STD-883, Method 2003

Reflow Profile & Part Marking

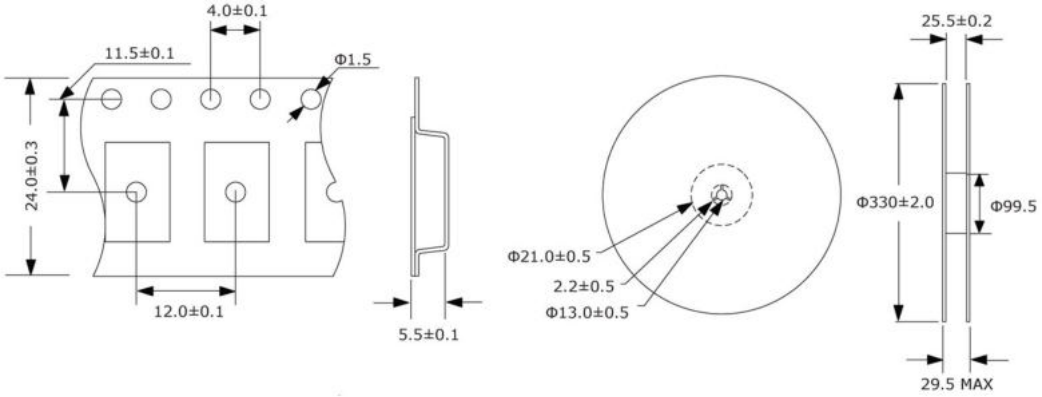




Tape And Reel Dimensions

All dimensions are in millimeters (mm) unless otherwise noted. Drawings are not to scale.

1,000pcs / Reel



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SUNTSU

Metal Can DIP 2 Lead Crystal

SXTUM2 Series

UM-1

Features

- ±10ppm/±10ppm (Tolerance/Stability) Available
- RESISTANCE WELD
- AT-Cut
- Bulk Packing

Applications

- Computer
- Printer
- CPU, Memory
- Data Communication

Part Numbering Guide

SXT UM 2 18 A A 48 T - 72.000M

- **SUNTSU CRYSTAL**
- **UM-1 DIP**
- **2 LEAD**
- **LOAD CAPACITANCE**
  S : Series
  7-30 : 7pF - 30pF
- **FREQUENCY TOLERANCE**
  A : ±50ppm
  B : ±30ppm
  C : ±25ppm
  D : ±20ppm
  E : ±15ppm
  F : ±10ppm
- **FREQUENCY STABILITY**
  A : ±50ppm
  B : ±30ppm
  C : ±25ppm
  D : ±20ppm
  E : ±15ppm
  F : ±10ppm*
- **OPERATING TEMPERATURE RANGE****
  07 : 0°C - +70°C
  16 : -10°C - +60°C
  17 : -10°C - +70°C
  27 : -20°C - +70°C
  38 : -30°C - +85°C
  48 : -40°C - +85°C
- **MODE OF OPERATION**
  BLANK : Fundamental
  T : 3rd Overtone
  F : 5th Overtone
- **FREQUENCY**
  MHz

RoHS COMPLIANT

Cage Code: 4GUT4

To customize your parameters contact a Suntsu representative.

* For frequency stability option F contact a Suntsu representative. ** For operating temperatures of -55-125°C a Suntsu representative.

Electrical Parameters	Units	Minimum	Typical	Maximum	Remarks
Frequency Range	MHz	8		70	AT-Cut Fundamental
Frequency Range	MHz	35		200	3rd Overtone
Frequency Tolerance at +25°C	ppm	-10		+10	See part numbering guide for options.
Frequency Stability vs. Op Temp	ppm	-10		+10	See part numbering guide for options.
Frequency Stability vs. Aging	ppm	-2		+2	First year @ +25°C.
Operating Temperature	°C	-40		+85	See part numbering guide for options.
Storage Temperature	°C	-40		+125	
Load Capacitance	pF	7		30	See part numbering guide for options.
Shunt Capacitance	pF			7	
Drive Level	µW		100	500	
Insulation Resistance	MΩ	500			@ 100VDC ± 15V.
8.000MHz ~ 11.999MHz	Ω			50	AT-Cut Fundamental
12.000MHz ~ 14.999MHz	Ω			30	AT-Cut Fundamental
ESR - 15.000MHz ~ 70.000MHz	Ω			25	AT-Cut Fundamental
35.000MHz ~ 44.999MHz	Ω			50	3rd Overtone
45.000MHz ~ 54.999MHz	Ω			45	3rd Overtone
55.000MHz ~ 200.000MHz	Ω			40	3rd Overtone

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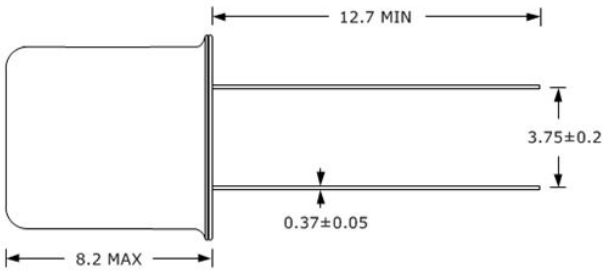
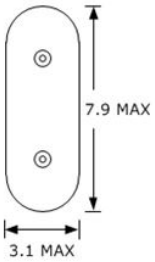
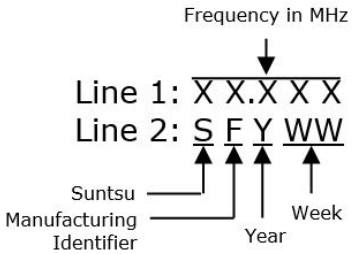
Outline Drawing & Part Marking

All dimensions are in millimeters (mm) unless otherwise noted. Drawings are not to scale.







Environmental Specifications		Mechanical Specifications	
Temperature Cycling	MIL-STD-883, Method 1010, Condition B	Mechanical Shock	MIL-STD-202, Method 213, Condition C
Fine Leak Test	MIL-STD-883, Method 1014, Condition A	Vibration	MIL-STD-883, Method 2007, Condition A
Gross Leak Test	MIL-STD-883, Method 1014, Condition C	Resistance to Soldering Heat	MIL-STD-202, Method 210, Condition K
Moisture Resistance	MIL-STD-883, Method 1004	Resistance to Solvents	MIL-STD-202, Method 215
Moisture Sensitivity	J-STD-020, MSL 1	Solderability	MIL-STD-883, Method 2003

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SUNTSU

Cylindrical DIP 2 Lead Crystal

SCM832 Series

8.3mm x 3.2mm

Features

- ±20ppm/±30ppm (Tolerance/Stability) Available
- Wide Frequency Range
- AT-Cut
- Bulk Packing

Applications

- Computer Peripherals
- Microprocessor
- Test Equipment

Part Numbering Guide

SCM 83 2 18 A A 48 T - 48.000M

- **SUNTSU CYLINDRICAL MHz CRYSTAL**
- **8.3mm x 3.2mm**
- **2 LEAD**
- **LOAD CAPACITANCE**
  S : Series
  7-30 : 7pF - 30pF
- **FREQUENCY TOLERANCE**
  A : ±50ppm
  B : ±30ppm
  C : ±25ppm
  D : ±20ppm
- **FREQUENCY STABILITY**
  A : ±50ppm
  B : ±30ppm
- **OPERATING TEMPERATURE RANGE**
  07 : 0°C - +70°C
  16 : -10°C - +60°C
  17 : -10°C - +70°C
  27 : -20°C - +70°C
  38 : -30°C - +85°C
  48 : -40°C - +85°C
- **MODE OF OPERATION**
  BLANK : Fundamental
  T : Third Overtone
- **FREQUENCY**
  MHz

RoHS COMPLIANT

Cage Code: 4GUT4

To customize your parameters contact a Suntsu representative.

Electrical Parameters	Units	Minimum	Typical	Maximum	Remarks
Frequency Range	MHz	3.579545		29.999	AT-Cut Fundamental
Frequency Range	MHz	30		90	3rd Overtone
Frequency Tolerance at +25°C	ppm	-20		+20	See part numbering guide for options.
Frequency Stability vs. Op Temp	ppm	-30		+30	See part numbering guide for options.
Frequency Stability vs. Aging	ppm	-5		+5	First year @ +25°C.
Operating Temperature	°C	-40		+85	See part numbering guide for options.
Storage Temperature	°C	-40		+125	
Load Capacitance	pF	7		30	See part numbering guide for options.
Shunt Capacitance	pF			5	
Drive Level	µW			100	
Insulation Resistance	MΩ	500			@ 100VDC ± 15V.
3.579MHz ~ 3.999MHz	Ω			200	AT-Cut Fundamental
4.000MHz ~ 5.999MHz	Ω			150	AT-Cut Fundamental
6.000MHz ~ 6.999MHz	Ω			100	AT-Cut Fundamental
7.000MHz ~ 8.999MHz	Ω			80	AT-Cut Fundamental
ESR - 9.000MHz ~ 12.999MHz	Ω			60	AT-Cut Fundamental
13.000MHz ~ 19.999MHz	Ω			50	AT-Cut Fundamental
20.000MHz ~ 29.999MHz	Ω			30	AT-Cut Fundamental
30.000MHz ~ 69.999MHz	Ω			100	3rd Overtone
-70.000MHz ~ 90.000MHz	Ω			80	3rd Overtone

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SUNTSU

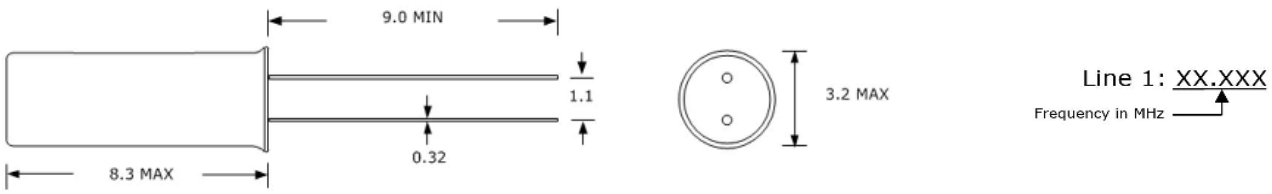
Cylindrical DIP 2 Lead Crystal

SCM832 Series

8.3mm x 3.2mm

Outline Drawing & Part Marking

All dimensions are in millimeters (mm) unless otherwise noted. Drawings are not to scale.



Environmental Specifications		Mechanical Specifications	
Temperature Cycling	MIL-STD-883, Method 1010, Condition B	Mechanical Shock	MIL-STD-202, Method 213, Condition C
Fine Leak Test	MIL-STD-883, Method 1014, Condition A	Vibration	MIL-STD-883, Method 2007, Condition A
Gross Leak Test	MIL-STD-883, Method 1014, Condition C	Resistance to Soldering Heat	MIL-STD-202, Method 210, Condition K
Moisture Resistance	MIL-STD-883, Method 1004	Resistance to Solvents	MIL-STD-202, Method 215
Moisture Sensitivity	J-STD-020, MSL 1	Solderability	MIL-STD-883, Method 2003

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SUNTSU

Cylindrical Tuning Fork Crystal

STF622 Series

6.2mm x 2.1mm

Features

- ±20ppm (Tolerance) Available
- RoHS Compliant
- Low Frequency Tuning Fork
- Miniature Package

Applications

- Real Time Clock
- Measurement instruments
- Wireless Applications

Part Numbering Guide

STF 62 2 B 48 - 48.000K

- **SUNTSU TUNING FORK CRYSTAL**
- **6.2mm x 2.1mm**
- **2 LEAD**
- **FREQUENCY TOLERANCE**
  - B : ±30ppm
  - D : ±20ppm
- **OPERATING TEMPERATURE RANGE**
  - 16 : -10°C - +60°C
  - 48 : -40°C - +85°C
- **FREQUENCY**
  - kHz

RoHS COMPLIANT

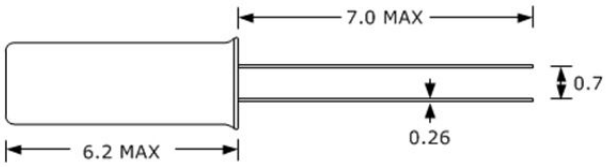
Cage Code: 4GUT4

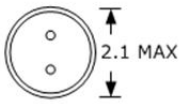
To customize your parameters contact a Suntsu representative.

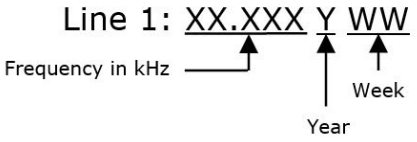
Electrical Parameters	Units	Minimum	Typical	Maximum	Remarks
Frequency Range	kHz	25.000		200.00	
Frequency Tolerance at +25°C	ppm	-20		+20	See part numbering guide for options.
Frequency Stability vs. Aging	ppm	-3		+3	First year @ +25°C.
Frequency Coefficient (ß)	ppm/T²	-0.040	-0.035	-0.030	
Operating Temperature	°C	-40		+85	See part numbering guide for options.
Turnover Temperature	°C	+20	+25	+30	
Storage Temperature	°C	-55		+125	
Load Capacitance	pF		12.5		
Shunt Capacitance	pF		1.5		
Drive Level	µW			1	
Insulation Resistance	MΩ	500			@ 100VDC ± 15V.
Equivalent Series Resistance	kΩ			50	

Outline Drawing & Part Marking

All dimensions are in millimeters (mm) unless otherwise noted. Drawings are not to scale.







Environmental Specifications		Mechanical Specifications	
Temperature Cycling	MIL-STD-883, Method 1010, Condition B	Mechanical Shock	MIL-STD-202, Method 213, Condition C
Fine Leak Test	MIL-STD-883, Method 1014, Condition A	Vibration	MIL-STD-883, Method 2007, Condition A
Gross Leak Test	MIL-STD-883, Method 1014, Condition C	Resistance to Soldering Heat	MIL-STD-202, Method 210, Condition K
Moisture Resistance	MIL-STD-883, Method 1004	Resistance to Solvents	MIL-STD-202, Method 215
Moisture Sensitivity	J-STD-020, MSL 1	Solderability	MIL-STD-883, Method 2003

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SUNTSU

Gull-Wing SMT Watch Crystal

SWG622 Series

6.3mm x 2.5mm

Features

- ±20ppm (Tolerance) Available
- Gull-Wing Leads For SMD Type
- Reflow Capable
- Tape and Reel

Applications

- Real Time Clock
- Measurement instruments
- Wireless Applications

Part Numbering Guide

SWG 62 2 12 D 48 - 32.768K

- **SUNTSU GULL-WING CRYSTAL**
- **6.3mm x 2.5mm**
- **2 LEAD**
- **LOAD CAPACITANCE**
  - 12 : 12.5pF
  - 9 : 9.0pF
  - 7 : 7.0pF
  - 6 : 6.0pF
- **FREQUENCY TOLERANCE**
  - D : ±20ppm
  - F : ±10ppm
- **OPERATING TEMPERATURE RANGE**
  - 16 : -10°C - +60°C
  - 48 : -40°C - +85°C
- **FREQUENCY**
  - kHz

RoHS COMPLIANT

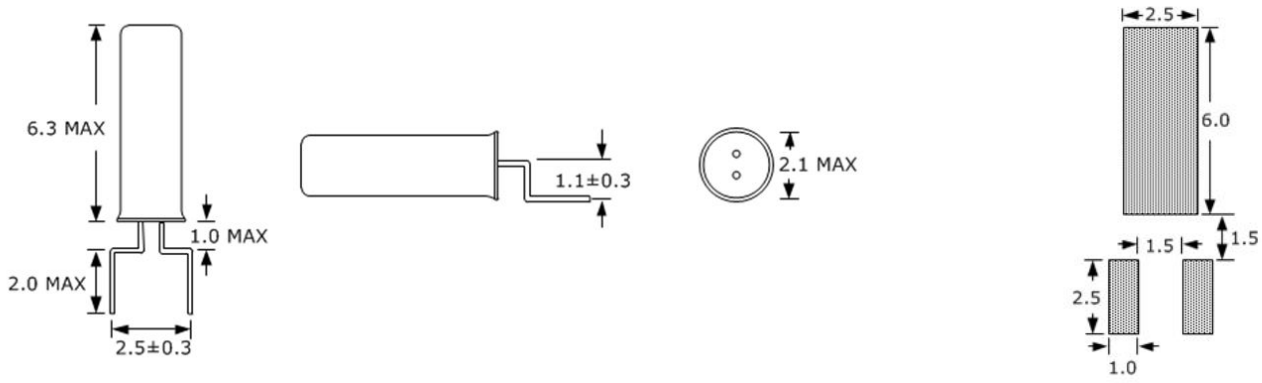
Cage Code: 4GUT4

To customize your parameters contact a Suntsu representative.

Electrical Parameters	Units	Minimum	Typical	Maximum	Remarks
Frequency Range	kHz		32.768		
Frequency Tolerance at +25°C	ppm	-20		+20	See part numbering guide for options.
Frequency Stability vs. Aging	ppm	-3		+3	First year @ +25°C.
Frequency Coefficient (ß)	ppm/T²	-0.040	-0.034	-0.028	
Operating Temperature	°C	-40		+85	See part numbering guide for options.
Turnover Temperature	°C	+20	+25	+30	
Storage Temperature	°C	-55		+125	
Load Capacitance	pF	6		12.5	See part numbering guide for options.
Shunt Capacitance	pF		1.5		
Drive Level	µW			1	
Insulation Resistance	MΩ	500			@ 100VDC ± 15V.
Equivalent Series Resistance	kΩ			50	

Outline Drawing & Recommended Land Pattern

All dimensions are in millimeters (mm) unless otherwise noted. Drawings are not to scale.



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Specifications are subject to change without notice.

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SUNTSU

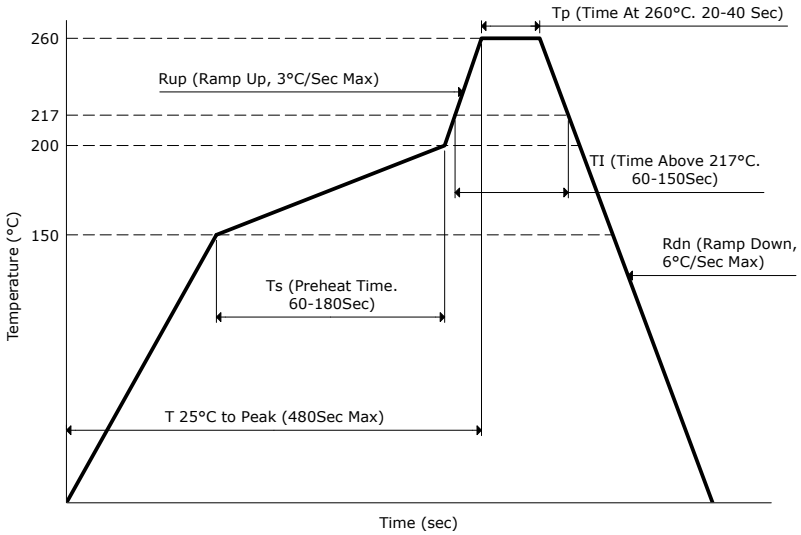
Gull-Wing SMT Watch Crystal

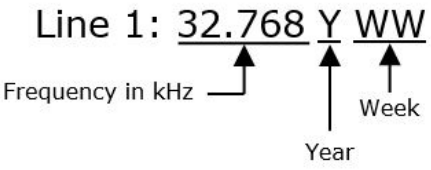
SWG622 Series

6.3mm x 2.5mm

Environmental Specifications		Mechanical Specifications	
Temperature Cycling	MIL-STD-883, Method 1010, Condition B	Mechanical Shock	MIL-STD-202, Method 213, Condition B
Fine Leak Test	MIL-STD-883, Method 1014, Condition A	Vibration	MIL-STD-883, Method 2007, Condition A
Gross Leak Test	MIL-STD-883, Method 1014, Condition C	Resistance to Soldering Heat	MIL-STD-202, Method 210, Condition B
Moisture Resistance	MIL-STD-883, Method 1004	Resistance to Solvents	MIL-STD-202, Method 215
Moisture Sensitivity	Hermetically Sealed, MSL=N/A: Not Applicable	Solderability	MIL-STD-883, Method 2003

Reflow Profile & Part Marking

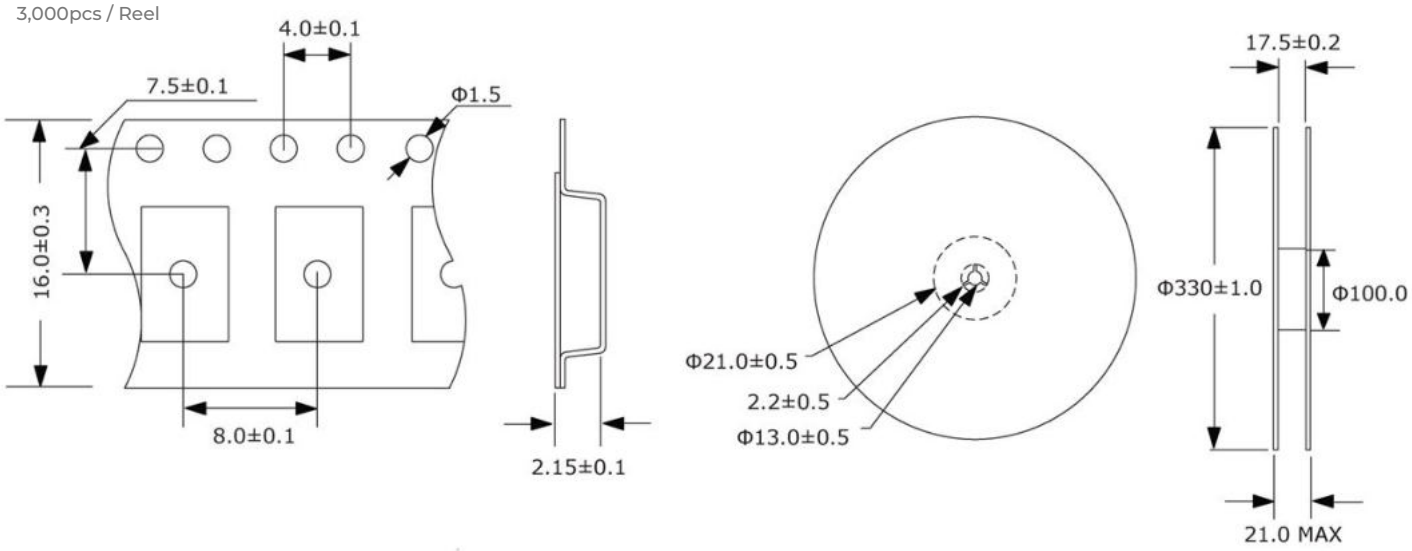




Tape And Reel Dimensions

All dimensions are in millimeters (mm) unless otherwise noted. Drawings are not to scale.

3,000pcs / Reel



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SUNTSU

Cylindrical Watch Crystal

SWT832 Series

8.3mm x 3.2mm

Features

- ±10ppm (Tolerance) Available
- Miniature Package

Applications

- Real Time Clock
- Measurement instruments
- Wireless Applications

Part Numbering Guide

SWT 83 2 12 D 48 - 32.768K

- **SUNTSU WATCH CRYSTAL**
- **8.3mm x 3.2mm**
- **2 LEAD**
- **LOAD CAPACITANCE**
  - 18 : 18.0pF
  - 12 : 12.5pF
  - 10: 10.0pF
  - 8 : 8.0pF
  - 6 : 6.0pF
- **FREQUENCY TOLERANCE**
  - D : ±20ppm
  - F : ±10ppm
- **OPERATING TEMPERATURE RANGE**
  - 16 : -10°C - +60°C
  - 48 : -40°C - +85°C
- **FREQUENCY**
  - kHz

RoHS COMPLIANT

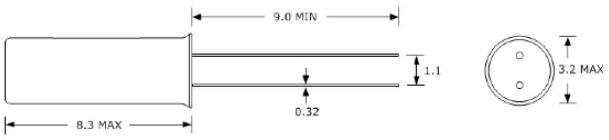
Cage Code: 4GUT4

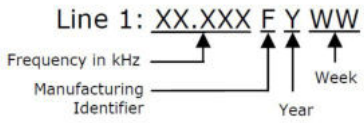
To customize your parameters contact a Suntsu representative.

Electrical Parameters	Units	Minimum	Typical	Maximum	Remarks
Frequency Range	kHz		32.768		
Frequency Tolerance at +25°C	ppm	-20		+20	See part numbering guide for options.
Frequency Stability vs. Aging	ppm	-3		+3	First year @ +25°C.
Frequency Coefficient (ß)	ppm/T²	-0.040	-0.035	-0.030	
Operating Temperature	°C	-40		+85	See part numbering guide for options.
Turnover Temperature	°C	+20	+25	+30	
Storage Temperature	°C	-55		+125	
Load Capacitance	pF	6		18	See part numbering guide for options.
Shunt Capacitance	pF		1.5		
Drive Level	µW			1	
Insulation Resistance	MΩ	500			@ 100VDC ± 15V.
Equivalent Series Resistance	kΩ			35	

Outline Drawing & Part Marking

All dimensions are in millimeters (mm) unless otherwise noted. Drawings are not to scale.





Environmental Specifications		Mechanical Specifications	
Temperature Cycling	MIL-STD-883, Method 1010, Condition B	Mechanical Shock	MIL-STD-202, Method 213, Condition B
Fine Leak Test	MIL-STD-883, Method 1014, Condition A	Vibration	MIL-STD-883, Method 2007, Condition A
Gross Leak Test	MIL-STD-883, Method 1014, Condition C	Resistance to Soldering Heat	MIL-STD-202, Method 210, Condition K
Moisture Resistance	MIL-STD-883, Method 1004	Resistance to Solvents	MIL-STD-202, Method 215
Moisture Sensitivity	Hermetically Sealed, MSL=N/A: Not Applicable	Solderability	MIL-STD-883, Method 2003

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