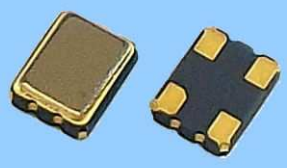
CERAMIC SMD TYPE
18 kHz to 20 kHz
(SCO-32)

- 18.000 kHz to 20.000 kHz in 0.1 kHz steps
- High stability with AT-cut crystal
- External dimensions : 3.2 × 2.5
- 1.8 to 3.3 operating supply voltage range
- CMOS Output
- Tri-state function available



■ PART NUMBERING GUIDE

SCO - 323 20 A D S R – 20.000K

SUPPLY VOLTAGE(V_{DD})
3 : 3.3 V, 2 : 2.5 V, 1 : 1.8 V

FREQUENCY STABILITY
20 : ±20 ppm, 25 : ±25 ppm
50 : ±50 ppm, BLANK : ±100 ppm

OPERATING TEMPERAURE RANGE
A : -40 to 85 ℃, B : -20 to 70 ℃
C : 0 to 70 ℃

DUTY CYCLE
D : 45/55, E : 40/60

FREQUENCY
K : kHz

PACKAGE OPTION
R : TAPE AND REEL
BLANK : BULK

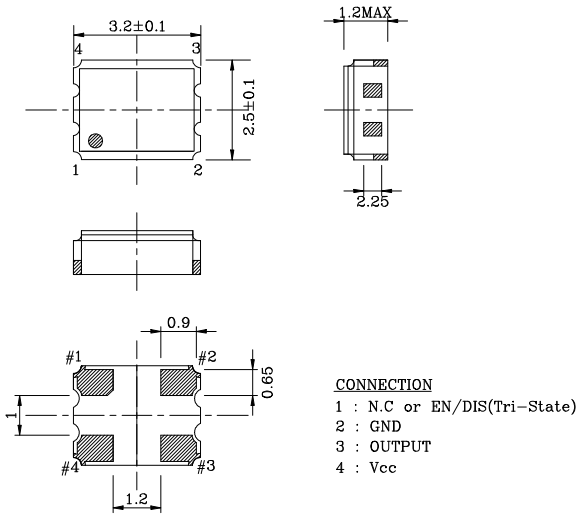
PIN 1 CONNECTION
S : TRI-STATE, E/D
BLANK : NO CONNECTION

■ ELECTRICAL SPECIFICATIONS

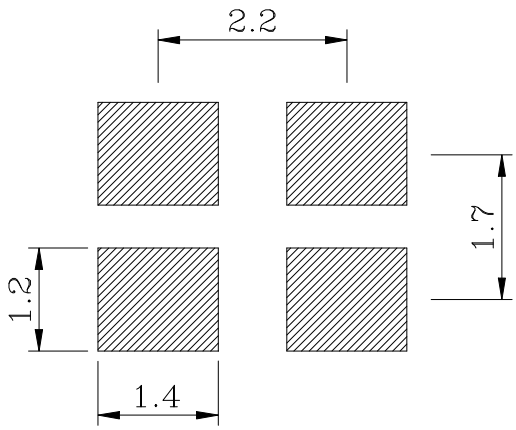
ITEM	Value	Remarks
Output Logic Type	CMOS	CMOS XO
Frequency *	18.000 kHz to 20.000 kHz	
Supply Voltage(V_{DD})	1.8 V_{DC} ±5 %, 2.5 V_{DC} ±5 %, 3.3 V_{DC} ±5 %	
Operating Temperature Range	0 to +70 ℃, -20 to +70 ℃, -40 to +85 ℃	
Storage Temperature Range	-55 to 125 ℃	
Frequency Stability	±20 ppm, ±25 ppm, ±50 ppm, ±100 ppm Max.	Over operating temperature range
Input Current	5 mA Max.	
Output Voltage Logic High(V_{OH})	90 % of V_{DD} Min.	
Output Voltage Logic High(V_{OL})	10 % of V_{DD} Max.	
Rise / Fall Time	100 ns Max.	Measured at 10 % to 90 % of waveform
Duty Cycle	45 to 55 %	Measured at 50 % of waveform
Start-up Time	10 ms Max.	
Output Load Condition(CMOS)	15 pF Max.	
Output Enable Function (VIH and VIL)	70 % of V_{DD} min. to Enable Output 30 % of V_{DD} max. to Enable Output	High Impedance
Frequency Aging	±5 ppm Max.	25℃, First year

* Please contact us about developed standard frequencies

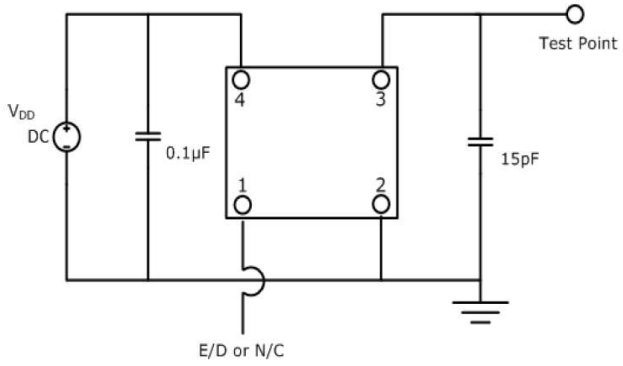
■ MECHANICAL DIMENSIONS (mm)



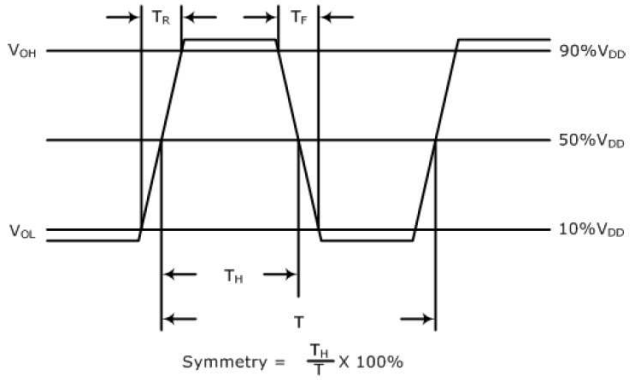
■ LAND PATTERN (mm)



■ TEST CIRCUIT (CMOS)



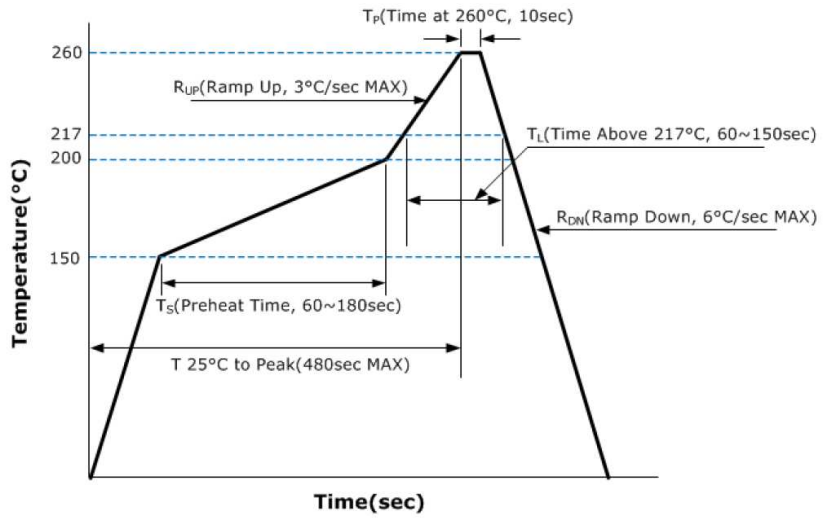
■ WAVEFORM (CMOS)



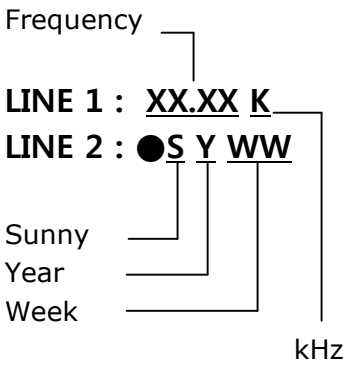
■ ENVIRONMENTAL & MECHANICAL SPECIFICATIONS

Temperature Cycling	MIL-STD-883, Method 1010, Condition B
Fine Leak Test	MIL-STD-883, Method 1014, Condition A
Gross Leak Test	MIL-STD-883, Method 1014, Condition C
Mechanical Shock	MIL-STD-883, Method 2002, Condition B
Vibration	MIL-STD-883, Method 2007, Condition A
Moisture Resistance	MIL-STD-883, Method 1004
Moisture Sensitivity	J-STD-020, MSL 1
Resistance to Soldering Heat	MIL-STD-202, Method 210, Condition K
Solderability	MIL-STD-883, Method 2003

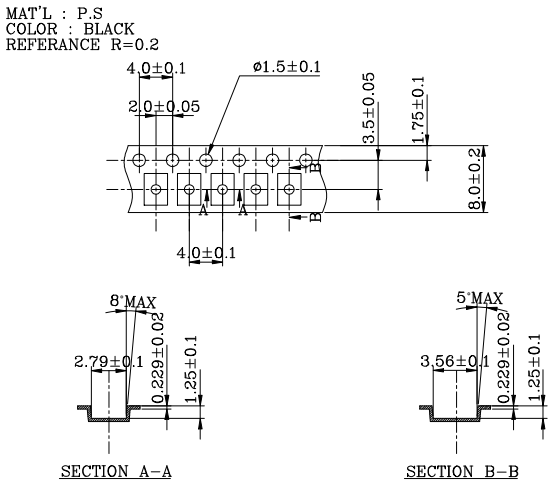
■ REFLOW PROFILE

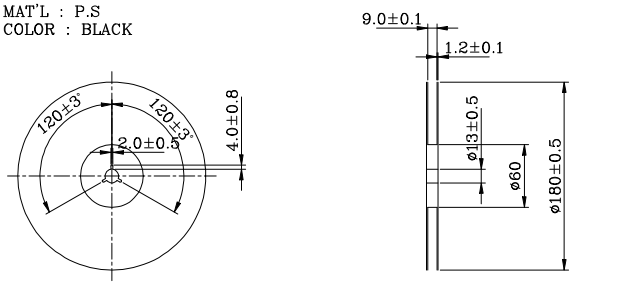


■ MARKING GUIDE



■ TAPE AND REEL DIMENSIONS





NOTE
1.COVER TAPE : 5.4mm(WIDTH)X0.06mm(t) MAT'L : PET
2.COLOR : WHITE