Approved by:
Checked by:
Issued by:

SPECIFICATION

Product: **1-port SAW Resonator**
Model: **NDR423.22S2**

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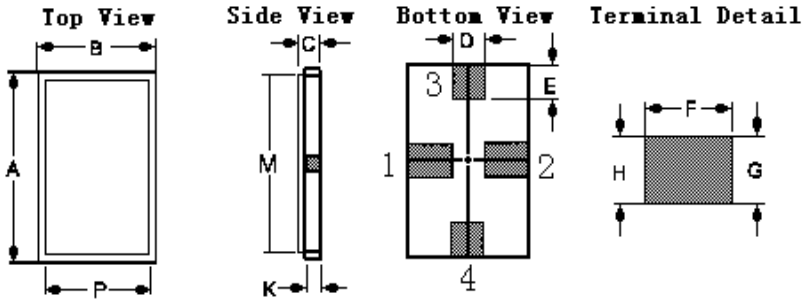
1.Package Dimension (SM-2)



Pin Configuration

1	Input/Output
2	Output/Input
3,4	Ground

	Millimeters	
		Max.
A		6.30
B		4.44
C		2.08
D	0.94	1.10
E	0.83	1.20
F	1.16	1.53
G	0.94	1.10
H	0.43	0.59
K	1.96	2.00
M		4.8
P		2.9

2. Marking

NDR423.22S2

2-1.Colour: White

2-2.Center Frequency (MHz): 423.22

3. Performance

3-1.Maximum Rating

DC Voltage V_{DC}	±30V
Case Temperature	-40℃to +85℃
RF Power Dissipation	0 dBm
Soldering Temperature	+250℃

3-2Electronic Characteristics

Characteristic		Sym	Minimum	Typical	Maximum	Units
Center Frequency (+25℃)	Absolute Frequency	fc	423.145		423.295	MHz
	Tolerance from 423.22 MHz	Δfc			±75	kHz
Insertion Loss		IL		1.1	1.9	dB
Quality Factor	Unloaded Q	Q_U		15,300		
	50 Ω Loaded Q	Q_L		1,800		
Temperature Stability	Turnover Temperature	T_0	10	25	40	℃
	Turnover Frequency	f_0		fc		kHz
	Frequency Temperature Coefficient	FTC		0.032		ppm/℃^{2}
Frequency Aging	Absolute Value during the First Year	|FA|		10		ppm/yr
DC Insulation Resistance between Any Two Pins			1.0			MΩ
RF Equivalent RLC Model	Motional Resistance	R_M		13	29	Ω
	Motional Inductance	L_M		72.1451		μH
	Motional Capacitance	C_M		1.8532		fF
	Pin 1 to Pin 2 Static	C_o		1.9		pF

☺ **CAUTION: Electrostatic Sensitive Device. Observe precautions for handling**

NOTE:

1. Frequency aging is the change in f_C with time and is specified at +65°C or less. Aging may exceed the specification for prolonged temperatures above +65°C.Typically, aging is greatest the first year after manufacture, decreasing in subsequent years.
2. The center frequency, f_C , is measured at the minimum insertion loss point, IL_{MIN}, with the resonator in the 50 Ω test system (VSWR ≤ 1.2:1). The shunt inductance, L_{TEST}, is tuned for parallel resonance with C_O at f_C . Typically, $f_{oscillator}$ or $f_{transmitter}$ is approximately equal to the resonator f_C.
3. Typically, equipment utilizing this device requires emissions testing and government approval, which is the responsibility of the equipment manufacturer.
4. Unless noted otherwise, case temperature TC = +25°C±2°C.
5. The design, manufacturing process, and specifications of this device are subject to change without notice.
6. Derived mathematically from one or more of the following directly measured parameters: f_C, IL, 3 dB bandwidth, f_C versus T_C, and C_O.
7. Turnover temperature, T_O, is the temperature of maximum (or turnover) frequency, f_O. The nominal frequency at any case temperature, TC, may be calculated from: $f = f_0 [1 - FTC (T_O - T_C)2]$. Typically *oscillator* T_O is approximately equal to the specified *resonator* T_O.
8. This equivalent RLC model approximates resonator performance near the resonant frequency and is provided for reference only. The capacitance C_O is the static (nonmotional) capacitance between the two terminals measured at low frequency (10 MHz) with a capacitance meter. The measurement includes parasitic capacitance with "NC" pads unconnected. Case parasitic capacitance is approximately 0.05 pF. Transducer parallel capacitance can by calculated as:$C_P \approx C_O$ - 0.05 pF.

4. Reliability

4.1 Mechanical Shock: The components shall remain within the electrical specifications after 1000 shocks, acceleration 392m/s^2,duration 6 milliseconds.

4.2 Vibration Fatigue: The components shall remain within the electrical specifications after loaded vibration at 20 Hz , amplitude 1.5mm , for 2 hours.

4.3 Terminal Strength: The components shall remain within the electrical specifications after pulled 2 Kgs weight for 10 seconds towards an axis of each terminal.

4.4 High Temperature Storage: The components shall remain within the electrical specifications after being kept at the 85℃±2℃for 48 hours, then kept at room temperature for 2 hours.

4.5 Low Temperature Storage: The components shall remain within the electrical specifications after being kept at the -25℃±2℃for 48 hours ,then kept room temperature for 2 hours.

4.6 Temperature Cycle: The components shall remain within the electrical specifications after 5 cycles of high and low temperature testing(one cycle: 80℃for 30 minutes →25℃ for 5 minutes → -25℃for 30 minutes) than kept at room temperature for 2 hours.

4.7 Solder-heat Resistance : The components shall remain within the electrical specifications after dipped in the solder at 260℃for 10±1seconds,then kept at room temperature for 2 hours .(Terminal must be dipped leaving 1.5 mm from the case).

4.8 Solder ability: Solder ability of terminal shall be kept at more than 80% after dipped in the solder flux at 230℃ ± 5℃for 5±1 seconds.

5. Remarks

5.1 Static voltage

Static voltage between signal load & ground may cause deterioration & destruction of the component. Please avoid static voltage .

5.2 Ultrasonic cleaning

Ultrasonic vibration may cause deterioration & destruction of the component. Please avoid ultrasonic cleaning.

5.3 Soldering

Only leads of component may be soldered. Please avoid soldering another part of component.