



# NDK Catalogue - Aldinet

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# **Aldinet**

Crystal Unit (32.768kHz)

Crystal Unit with built in thermistor

Crystal Unit (MHz,PIN Type)

SPXO - SPXO

TCXO

VCXO -88909:

осхо —

Frequency Synthesizer

Millimeter-wave converter

Optical Component

QCM Sensor

Ultrasonic Probe (Transducer)

SAW Devices

# CRYSTAL PRODUCTS

Issued 2022

NIHON DEMPA KOGYO CO.,LTD.



This catalog shows products and specifications of our main range. Please contact our sales representatives or visit our website (https://www.ndk.com/) with your inquires.

# ■ Crystal Unit (32.768kHz)

NX1610SA (1.6×1.0×0.45mm) NX2012SA (2.0×1.2×0.55mm) NX3215SA (3.2×1.5×0.8mm)	SA168	Ultra compact size tuning fork crystal unit (kHz range) Nominal Frequency : 32.768kHz Frequency Tolerance : ±20×10 <sup>-6</sup> Operating Temperature Range : -40 to +85°C	
NX2012SA (2.0×1.2×0.55mm) NX3215SA (3.2×1.5×0.8mm)	(BA1648)	Compact size tuning fork crystal unit (kHz range) for Automotive Nominal Frequency : 32.768kHz Frequency Tolerance : ±20×10 <sup>-6</sup> Operating Temperature Range : -40 to +125°C Conforms to AEC-Q200	
NX3215SD (3.2×1.5×0.8mm)	@4067 nt	Compact size tuning fork crystal unit (kHz range) for Automotive. Enhanced products of solder cracking resistance.  Nominal Frequency: 32.768kHz Frequency Tolerance: ±20×10 <sup>-6</sup> Operating Temperature Range: -40 to +125°C Conforms to AEC-Q200	
NX1610SE (1.6×1.0×0.45mm) NX2012SE (2.0×1.2×0.55mm) NX3215SE (3.2×1.5×0.8mm)	(SA 7N) (SA 7N	Ultra compact size tuning fork crystal unit (kHz range) with low ESR (Equivalent Series Resistance) Nominal Frequency: 32.768kHz Frequency Tolerance: ±20×10 <sup>-6</sup> Operating Temperature Range: -40 to +85°C	
NX2012SF NEW (2.0×1.2×0.55mm) NX3215SF (3.2×1.5×0.8mm)	@AMOVED	Compact size tuning fork crystal unit (kHz range) for specially controlled medical devices class 3  Nominal Frequency: 32.768kHz  Frequency Tolerance: ±20×10 <sup>-6</sup> Operating Temperature Range: -40 to +125°C	

# ■ Crystal Unit with built in thermistor

NX1210AC (1.2×1.0×0.55mm)	76.8	Ultra compact size crystal unit with built-in thermistor Nominal Frequency Range: 38.4 to 96MHz Frequency Tolerance: ±12×10 <sup>-6</sup> Frequency Temperature Characteristics: ±12×10 <sup>-6</sup> / -30 to +85°C
NX1612SD (1.6×1.2×0.65mm)	(3) (3) (3) (4) (4) (4) (4) (4) (4) (4) (4) (4) (4	Ultra compact size crystal unit with built-in thermistor Nominal Frequency Range: 26 to 76.8MHz Frequency Tolerance: ±10×10 <sup>-6</sup> Frequency / Temperature Characteristics: ±12×10 <sup>-6</sup> / -30 to +85°C
NX2016SF (2.0×1.6×0.65mm)	19 200 G 36 9	Compact size crystal unit with built-in thermistor Nominal Frequency Range: 19.2 to 55.2MHz Frequency Tolerance: ±10×10 <sup>-6</sup> Frequency / Temperature Characteristics: ±12×10 <sup>-6</sup> / -30 to +85°C
NX2016SF (2.0×1.6×0.65mm)	19 200 a 509	Compact size crystal unit with built-in thermistor for Automotive Nominal Frequency Range: 19.2 to 55.2MHz Frequency Tolerance: ±10×10 <sup>-6</sup> Frequency / Temperature Characteristics: ±25×10 <sup>-6</sup> / -40 to +105°C Conforms to AEC-Q200

# ■ Crystal Unit (MHz)

<b>NX1008AA</b> (1.0×0.8×0.25mm)	
RoHS Pb free rougher	I AB

Ultra compact size crystal unit (1.0×0.8mm) Nominal Frequency Range : 32 to 80MHz Frequency Tolerance : ±10×10<sup>-6</sup>

Frequency / Temperature Characteristics :  $\pm 10 \times 10^{-6}$  / -30 to +85°C (32 to 60MHz)  $\pm 15 \times 10^{-6}$  / -30 to +85°C (60 to 80MHz)



NX1210AB (1.2×1.0×0.25mm)	40.000 836128	Ultra compact size crystal unit (1.2×1.0mm)  Nominal Frequency Range: 26 to 52MHz  Frequency Tolerance: ±10×10 <sup>-6</sup> Frequency / Temperature Characteristics: ±15×10 <sup>-6</sup> / -30 to +85°C	
NX1612SA (1.6×1.2×0.3mm)	<b>199</b>	Ultra compact size crystal unit (1.6×1.2mm)  Nominal Frequency Range: 24 to 80MHz  Frequency Tolerance: ±10×10 <sup>-6</sup> Frequency / Temperature Characteristics: ±15×10 <sup>-6</sup> / -30 to +85°C	
NX2016SA (2.0×1.6×0.45mm)	24.000 88 15 H	Compact size crystal unit (2.0×1.6mm)  Nominal Frequency Range: 16 to 80MHz  Frequency Tolerance: ±10×10 <sup>-6</sup> Frequency / Temperature Characteristics: ±25×10 <sup>-6</sup> / -40 to +85°C	
NX2520SA (2.5×2.0×0.5mm)	26,000	Compact size crystal unit (2.5×2.0mm)  Nominal Frequency Range: 16 to 80MHz  Frequency Tolerance: ±15×10 <sup>-6</sup> Frequency / Temperature Characteristics: ±25×10 <sup>-6</sup> / -40 to +85°C	
NX1612SA (1.6×1.2×0.3mm)	6,78	Ultra compact size crystal unit (1.6×1.2mm) for Automotive Nominal Frequency Range: 24 to 80MHz Frequency Tolerance: ±15×10 <sup>-6</sup> Frequency / Temperature Characteristics: ±50×10 <sup>-6</sup> / -40 to +125°C Conforms to AEC-Q200	
NX2016GC (2.0×1.6×0.70mm)		Compact size crystal unit (2.0×1.6mm) for Automotive Nominal Frequency Range: 16 to 54MHz Frequency Tolerance: ±50×10 <sup>-6</sup> Frequency / Temperature Characteristics: ±150×10 <sup>-6</sup> / -40 to +150°C Conforms to AEC-Q200	
NX2016SA (2.0×1.6×0.45mm)	24.000 8e 15 H	Compact size crystal unit (2.0×1.6mm) for Automotive Nominal Frequency Range: 16 to 80MHz Frequency Tolerance: ±15×10 <sup>-6</sup> Frequency / Temperature Characteristics: ±50×10 <sup>-6</sup> / -40 to +125°C Conforms to AEC-Q200	
NX3225GA (3.2×2.5×0.75mm)		Crystal unit for Automotive (Excellent environment-resistant performance) Nominal Frequency Range: 9.8 to 50MHz Frequency Tolerance: ±50×10 <sup>-6</sup> Frequency / Temperature Characteristics: ±150×10 <sup>-6</sup> / -40 to +150°C Conforms to AEC-Q200	
NX3225GB (3.2×2.5×0.75mm)		Crystal unit for Automotive (High resistance to solder cracking) Nominal Frequency Range: 12 to 50MHz Frequency Tolerance: ±50×10 <sup>-6</sup> Frequency / Temperature Characteristics: ±150×10 <sup>-6</sup> /-40 to +150°C Conforms to AEC-Q200	
NX3225SA (3.2×2.5×0.55mm)	20.0 8065° 78	Compact size crystal unit (3.2×2.5mm) for Automotive Nominal Frequency Range: 12 to 50MHz Frequency Tolerance: ±15×10 <sup>-6</sup> Frequency / Temperature Characteristics: ±50×10 <sup>-6</sup> / -40 to +125°C Conforms to AEC-Q200	
■ Crystal Unit (PIN Type)			
RC-8		High reliability crystal unit for OCXO with excellent frequency stability	

<b>RC-8</b> (φ15.60×4.80mm)	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	High reliability crystal unit for OCXO with excellent frequency stability HC-37/U equivalent low profile Nominal Frequency Range: 5 to 20MHz Frequency Tolerance: ±3×10 <sup>-6</sup> Operating Temperature Range: -40 to +120°C
NC-18C (11.45×5.00×13.46mm)		High reliability crystal unit for OCXO with excellent frequency stability HC-43/U equivalent Nominal Frequency Range: 10 to 20MHz Frequency Tolerance: ±3×10 <sup>-6</sup> Operating Temperature Range: -40 to +120°C



#### ■ Simple Packaged Crystal Oscillator (SPXO)

#### NZ1612SH / MHz (1.6×1.2×0.6mm)

NZ2016SH / MHz  $(2.0 \times 1.6 \times 0.7 \text{mm})$ 

NZ2520SH / MHz





#### Supports a wide temperature range from -40 to +125°C

Nominal Frequency Range: 2.0 to 80MHz (NZ1612SH) Output Specification: CMOS

1.5 to 80MHz (NZ2016SH) 1.5 to 170MHz (NZ2520SH)

Supply Voltage [V<sub>CC</sub>]: +1.8V, +2.5V, +3.0V, +3.3V Overall Frequency Tolerance: ±100×10<sup>-6</sup> / -40 to +125°C

#### NZ1612SHB / kHz (1.6×1.2×0.6mm)

NZ2016SHB / kHz  $(2.0 \times 1.6 \times 0.7 \text{mm})$ 

NZ2520SHB / kHz

 $(2.5\times2.0\times0.9\text{mm})$ 



#### Low current consumption and wide temperature range from -40 to +125°C

Nominal Frequency: 32.768kHz Output Specification: CMOS

Supply Voltage [Vcc]: +1.8V, +2.5V, +3.0V, +3.3V Overall Frequency Tolerance: ±100×10-6 / -40 to +125°C Current Consumption (During Operation) : Max.  $32 \mu A$ 

#### NZ2016SHA /MHz / kHz $(2.0 \times 1.6 \times 0.7 \text{mm})$

NZ2520SHA / MHz / kHz  $(2.5\times2.0\times0.9\text{mm})$ 





#### High quality and high reliability design for Automotive safety

Nominal Frequency Range: 1.5 to 80MHz 32.768kHz (NZ2016SHA) Output Specification: CMOS 1.5 to 125MHz 32.768kHz (NZ2520SHA)

Supply Voltage [ $V_{cc}$ ] : +1.8 $V_c$ , +2.5 $V_c$ , +3.0 $V_c$ , +3.3 $V_c$  Overall Frequency Tolerance : ±100×10<sup>-6</sup> / -40 to +125 $^{\circ}$ C

Conforms to AEC-Q100/200

#### NZ2520SEB / MHz (2.5×2.0×0.9mm)





#### High precision type

Nominal Frequency Range: 1.5 to 32MHz Output Specification: CMOS

Supply Voltage [ $V_{CC}$ ]: +1.8V, +2.5V, +3.0V, +3.3V Overall Frequency Tolerance: ±25×10<sup>-6</sup> / -40 to +85°C

#### NZ2520SDA / MHz $(2.5 \times 2.0 \times 0.9 \text{mm})$





#### Ultra low phase noise type, ultra low phase jitter type

Nominal Frequency Range: 20 to 50MHz Output Specification : CMOS Phase Noise (22.5792MHz) : Typ. -169dBc / Hz at 100kHz, +3.3V, +25°C Supply Voltage [ $V_{cc}$ ] : +1.8V, +2.5V, +3.0V, +3.3V

Overall Frequency Tolerance: ±50×10<sup>-6</sup> / -40 to +85°C

#### **NP2520SA NEW** (2.5×2.0×0.8mm)

NP2520SAB NEW

(2.5×2.0×0.8mm)





#### Differential output SPXO

Nominal Frequency Range: 100 to 170MHz Output Specification: LVPECL

Supply Voltage [V<sub>CC</sub>]: +2.5V, +3.3V

Overall Frequency Tolerance: Max. ±50×10<sup>-6</sup> / -40 to +85°C

Phase Jitter: Typ. 68fs (SA) Typ. 40fs (SAB)

(Offset Frequency: 12kHz to 20MHz) @156.25MHz

# **NP3225SA**

 $(3.2 \times 2.5 \times 0.9 \text{mm})$ 

#### NP3225SAB

(3.2×2.5×0.9mm)





#### Differential output SPXO

Nominal Frequency Range: 100 to 220MHz (SA) Output Specification: LVPECL

100 to 170MHz (SAB)

Supply Voltage [V<sub>CC</sub>]: +2.5V, +3.3V

Overall Frequency Tolerance: Max. ±50×10-6 / -40 to +105°C

Phase Jitter: Typ. 90fs (SA)

Typ. 42fs (SAB)

(Offset Frequency: 12kHz to 20MHz) @156.25MHz

#### NP5032S[] (5.0×3.2×1.2mm)

NP7050S[] (7.0×5.0×1.6mm)





#### Multi mode crystal oscillator (Crystal oscillator providing frequency selection function and allowing customization of specifications)

Nominal Frequency Range: 15 to 2100MHz

Frequency Selection Function : Single, Dual, Quad, Any Rate Output Specification: CMOS, LVPECL, LVDS, CML, HCSL

Supply Voltage [V<sub>CC</sub>]: +1.8V, +2.5V, +3.3V Operating Temperature Range: -40 to +85°C Phase Jitter: Typ. 130fs rms (@622.08MHz)

# ■ Temperature Compensated Crystal Oscillator (TCXO)

## NT1612SA

(1.6×1.2×0.55mm)

#### **NT2016SA**

(2.0×1.6×0.8mm)

#### NT2520SB

(2.5×2.0×0.9mm)



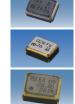


### TCXO for high preceision GPS (TCXO)

Nominal Frequency Range: 26 to 52MHz

Supply Voltage [Vcc]: +1.8V

Frequency / Temperature Characteristics : Max.  $\pm 0.5 \times 10^{-6}$  / -30 to +85°C





Supports a wide temperature range from -40 to +105°C **NT2016SE** for Automotive (TCXO) (2.0×1.6×0.8mm) Nominal Frequency Range : 10 to 52MHz Supply Voltage [V<sub>cc</sub>] : +1.8V **NT2520SE** (2.5×2.0×0.9mm) Frequency / Temperature Characteristics : Max. ±0.5×10<sup>-6</sup> / -40 to +105°C RoHS Pb AEC Q100 free Q200 Conforms to AEC-Q100/200 Ultra-low phase noise characteristics and stand-by function TCXO NT2016SJB for audio equipment (TCXO)  $(2.0\times1.6\times0.8$ mm)Nominal Frequency Range : 16 to 76.8MHz Supply Voltage [ $V_{cc}$ ] : +1.8V Frequency / Temperature Characteristics : Max. ±0.5×10<sup>-6</sup> / -30 to +85°C High Precision TCXO for 5G and Stratum 3 (TCXO) NT5032BB Nominal Frequency Range: 10 to 40MHz Supply Voltage [V<sub>CC</sub>]: +3.3V (5.0×3.2×1.8mm) Frequency / Temperature Characteristics: Max. ±0.1×10<sup>-6</sup> / -40 to +105°C NT7050BB Current Consumption : Max. 10mA (7.0×5.0×2.0mm) With Enable / Disable (Stand-by) function. RoHS Pb Compliant free

## ■ Volltage Controlled Crystral Oscillator (VCXO)

NV2520SA (2.5×2.0×0.9mm)	27.000 GG 000-T	Compact size VCXO (VCXO)  Nominal Frequency Range: 11 to 40MHz  Overall Frequency Tolerance: Max. ±50×10 <sup>-6</sup> / -40 to +85°C  Frequency Control Range / Control Voltage: Min. ±100×10 <sup>-6</sup> / +1.65±1.65V
NV5032SC NEW (5.0×3.2×1.2mm)  Rose Profession (Fig. 1) Profession	N/5035B	VCXO for communication equipment and base station (VCXO)  Nominal Frequency: 122.88MHz Supply Voltage [V <sub>CC</sub> ]: +3.3V  Overall Frequency Tolerance: Max. ±50×10 <sup>-6</sup> / -40 to +85°C  Frequency Control Range / Control Voltage: Min. ±100×10 <sup>-6</sup> / +1.65±1.65V
NV5032S[] (5.0×3.2×1.2mm) NV7050S[] (7.0×5.0×1.6mm)		Multi mode crystal oscillator (crystal oscillator providing frequency selection function and allowing customization of specifications)  Nominal Frequency Range: 15 to 2100MHz  Frequency Selection Function: Single, Dual, Quad, Any Rate  Output Specification: CMOS, LVPECL, LVDS, CML, HCSL  Supply Voltage [Vcc]: +1.8V, +2.5V, +3.3V  Operating Temperature Range: -40 to +85°C  Selection of Frequency Control Range: Min. ±50×10-6 to Min. ±250×10-6  Phase Jitter: Typ. 130fs rms (@622.08MHz)

## ■ Oven Controlled Crystral Oscillator (OCXO)

NH7050SA NEW (7.0×5.0×3.3mm)		Ultra small size OCXO (7×5mm OCXO)  Nominal Frequency: 10,20,30.72,38.88MHz Supply Voltage [V <sub>CC</sub> ]: +3.3V  Frequency / Temperature Characteristics: Max. ±20×10 <sup>-9</sup> / -40 to +95°C  Power Consumption: at stable Max. 0.6W  Long-term Frequency Stability: Max. 300×10 <sup>-9</sup> / year
NH25M22WK (25.4×22×11mm)		Supports wide temperature range OCXO (-40 to +85°C) (OCXO)  Nominal Frequency: 20MHz  Supply Voltage [V <sub>cc</sub> ]: +3.3V  Frequency / Temperature Characteristics: Max. ±10×10 <sup>-9</sup> / -40 to +85°C  Power Consumption: at stable Max. 1.3W  Long-term Frequency Stability: Max. 50×10 <sup>-9</sup> / year  Low Near-carrier Phase Noise Characteristics: -100dBc / Hz at 1Hz offset
NH25M22TE (25.4×22×12.1mm)	-0	Low phase noise and high stability OCXO (OCXO)  Nominal Frequency: 10MHz Supply Voltage [V <sub>CC</sub> ]: +3.3V  Frequency / Temperature Characteristics: Max. ±3×10 <sup>-9</sup> / -40 to +85°C  Power Consumption: at stable Max. 2.0W  Long-term Frequency Stability: Max. 50×10 <sup>-9</sup> / year  Low Near-carrier Phase Noise Characteristics: -100dBc / Hz at 1Hz offset
NH47M47LA (DuCULoN®) (47.2×47×28.5mm)		Low phase noise make this product ideal for high sound quality audio equipment (OCXO)  Ultra Low Phase Noise: Typ171dBc/Hz @100kHz offset  Bipolar driver output that can drive CMOS-IC directly  Frequency: 45.1582MHz (CD sound source system) and 49.152MHz (DVD sound source system)
NH9070WB (9.5×7.3×4.1mm)		Ultra small size OCXO (9×7mm Twin-OCXO)  Nominal Frequency Range: 5 to 40MHz Supply Voltage [V <sub>cc</sub> ]: +3.3V  Frequency / Temperature Characteristics: Max. ±10×10 <sup>-9</sup> / -40 to +85°C  Power Consumption: at stable Max. 0.5W  Long-term Frequency Stability: Max. 300×10 <sup>-9</sup> / year  Excellent Phase Noise Characteristics (20MHz): -148dBc / Hz at 1kHz offset 14×9mm OCXO and a footprint compatible NH9070WA is also available.
NH14M09TA (14.3×9.4×6.5mm)		High precision small size OCXO (Twin-OCXO)  Nominal Frequency Range: 5 to 40MHz Supply Voltage [V <sub>CC</sub> ]: +3.3V  Frequency / Temperature Characteristics: Max. ±10×10 <sup>-9</sup> / -40 to +85°C  Power Consumption: at stable Max. 1.0W



#### NH20M20LB

(21.5×21.5×11mm)





#### High precision OCXO (Twin-OCXO)

Product Shape: Pin type

Nominal Frequency Range: 5 to 40MHz Supply Voltage [Vcc]: +3.3V Frequency / Temperature Characteristics: Max. ±3×10<sup>-9</sup> / -40 to +85°C

Power Consumption: at stable Max. 1.2W

#### ■ Frequency Synthesizer

#### S6R6G6R6GA

(140×70×22mm)



# For commercial radio equipment, microwave radio link, and digital

Frequency Range: 6570.50 to 6589.75MHz Frequency Setting Resolution: 125kHz step

Frequency Stability: Depends on External Reference Signal

Within ±5×10<sup>-6</sup> / 10 years (Internal TCXO Stability) SSB Phase Noise: Max. -47dBc (Integrated value of 1kHz to 2MHz)

#### S010G010GA

(110×60×22mm)



#### For local oscillator for microwave radios reference signal of radar system or measurement equipment

Frequency Range: 4GHz to 10GHz Frequency Setting Resolution: 1MHz step

Frequency Stability: Depends on External Reference Signal

Max. ±3×10<sup>-6</sup> / 10 years (Internal TCXO Stability)

Sprious Non-harmonics: Max. -60dBc

SSB Phase Noise: Typ. -80dBc / Hz at 1kHz (@4GHz)

#### ■ Millimeter-wave converter

#### C057G064GB NEW

(138×138×214mm)





#### For measurement of in-vehicle milimeter-wave radar, motion sensor, industrial sensor.

RF Input Frequency Range: 57GHz to 64GHz IF Output Frequency Range: 1GHz to 8GHz

Local Frequency: 56GHz Local Signal Phase Noise Max. -110dBc/Hz at 1MHz

Conversion Gain: 26dB±1.5dB (Room Temp.)

#### C076G081GB NEW

(138×138×214mm)





#### For measurement of in-vehicle milimeter-wave radar

RF Input Frequency Range: 76GHz to 81GHz IF Output Frequency Range: 2GHz to 7GHz

Local Frequency: 74GHz Local Signal Phase Noise Max. -114dBc/Hz at 1MHz

Conversion Gain: 10dB±1.5dB (Room Temp.)

#### Optical Component

#### **Optical Low-pass Filter**







#### An optical low pass filter is used to eliminate false signal that causes color Moiré fringes and false color. You can choose also LiNbO3 wafer other than quartz to reduce total thickness of filter. Additionally, NDK can take care of the bonding with filter glasses and processing of coating, side edge black coating, adhession of the frame.

#### **Crystal Wavelength** Plate **NEW**







According to your request regarding wavelength and phase accuracy, dependence of phase accuracy (temperature, incidence angle, wavelength), you can choose from 3 different waveplate types; Compound zero-order type, Multiple-order type, True zero-order. In addition, Air-gap type which are used High purity quartz crystal and Optical contact type

Filter up to 4 inch is available, taking advantage of the strength of crystal growth in-house.

Optical filter NEW





NDK can provide any designed optical filter by conbining the various wafer line-ups and technologies of coating, bonding, inspection method.

It is also available as sensor cover glass or optical window to adjust the optical characteristics. Wafer: Quartz, Saphire, Synthetic Quartz Glass, Optical Glass, Absorption Glass (UV, IR, ND), etc. Coating technology: UVIR-cut, AR, ND, Band-pass coating, conductive coating, water-repellent coating, etc.

#### QCM Sensor

NAPiCOS (\*1) series / **NAPiCOS Lite & NAPICOS Auto** 



#### NAPICOS series / NAPICOS Lite & NAPICOS Auto

without glue are available as for high-power laser application.

NAPiCOS Lite & NAPiCOS Auto with QCM technology base can be used for real time monitoring for Immuno-reaction, Protein binding, DNA binding, etc. (\*1) NAPiCOS is a coined word created by NDK, combining the words "nano", "pico" and "sensor"

#### Twin-QCM system



#### Twin-QCM System / Outgas sensor "Twin CQCM & TQCM" (Cryogenic and Thermoelectric QCM sensors for QTGA\*)

Quartz crystal sensor captures outgas, measures the total amounts, and analyzer can iedntify the type of absorbed substance. \*QTGA: QCM Thermo-Gravimetric Analysis

## ■ Ultrasonic Probe (Transducer)

#### Product for 2D imaging & 3D imaging





## NDK has a probe line up for each application and can produce customer's designed products

\*Customers can decide a specification (frequency, element pitch and element number etc.) \*NDK can design an outer shape as per customer's request

Moreover, the attestation of "ISO13485:2016" that is International Standard of the quality management system in medical devices acquired, and we will deliver secure, safe and high-quality product for medical devices.

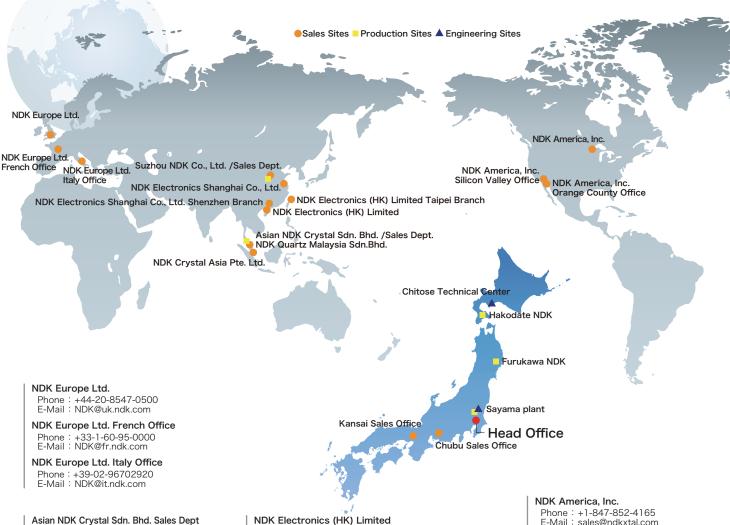


# ■ SAW Devices (NDK SAW devices product)

WFB40F2535CE (3.0×3.0×1.25mm)	· 5#	For base station RF Nominal Frequency: 2535MHz Insertion Attenuation: Max. 3.3dB Pass Bandwidth: Min. 70MHz Operating Temperature Range: -30 to +85°C Terminating Impedance: 50 Ω
WFC11B0922CG (3.0×3.0×1.05mm)	EN S	For land mobile radio system  Nominal Frequency: 922.5MHz Insertion Attenuation: Max. 3.5dB Pass Bandwidth: ±2MHz Operating Temperature Range: -20 to +85°C Terminating Impedance: 50 Ω
WFC93B0429CL (3.0×3.0×1.05mm)	EN EN	For specified low power radio Nominal Frequency: 429.42MHz Insertion Attenuation: Max. 3.5dB Pass Bandwidth: ±0.5MHz Operating Temperature Range: -20 to +70°C Terminating Impedance: 50 Ω
WFC30B0924FF (1.4×1.1×0.5mm)	335	For specified low power radio Nominal Frequency: 924MHz Insertion Attenuation: Max. 3.2dB Pass Bandwidth: 8MHz Operating Temperature Range: -40 to +85°C Terminating Impedance: 50 Ω
WFD79C0925FG (1.4×1.1×0.5mm)	934	For short range wireless Nominal Frequency: 925.8MHz Insertion Attenuation: Max. 3.0dB Pass Bandwidth: Min. 4.6MHz Operating Temperature Range: -25 to +75°C Terminating Impedance: 50 Ω
WFG63D0315CG (3.0×3.0×1.05mm) Ross Pb AEC Pree AEC	EN S	For Automotive RKE (Remote keyless entry system) Nominal Frequency : 315MHz Insertion Attenuation : Max. 2.0dB Pass Bandwidth : 1MHz Operating Temperature Range : -40 to +105°C Terminating Impedance : 50 $\Omega$ Conforms to AEC-Q200
WFC75C1472CE (3.0×3.0×1.05mm) Rolls Pb AEC 2000	EN P	For Automotive Satellite radio Nominal Frequency: 1472MHz Insertion Attenuation: Max. 3.2dB Pass Bandwidth: 40MHz Operating Temperature Range: -40 to +125°C Terminating Impedance: 50 Ω Conforms to AEC-Q200
WFF93A1582UE (1.4×1.1×0.6mm) Rods Pb REC 2000		For Automotive GPS / GLONASS / BEIDOU. Nominal Frequency : 1582.355MHz Insertion Attenuation : Max. 2.0dB Pass Bandwidth : 46.61MHz Operating Temperature Range : -40 to +85°C Terminating Impedance : 50 $\Omega$ Conforms to AEC-Q200

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