

## **Development of Small Size Crystal Oscillators for In-Vehicle Driving Safety Applications, DSO211SX and DSO221SX, and General-Purpose Small size Crystal Oscillators, DSO211SXF and DSO221SXF**

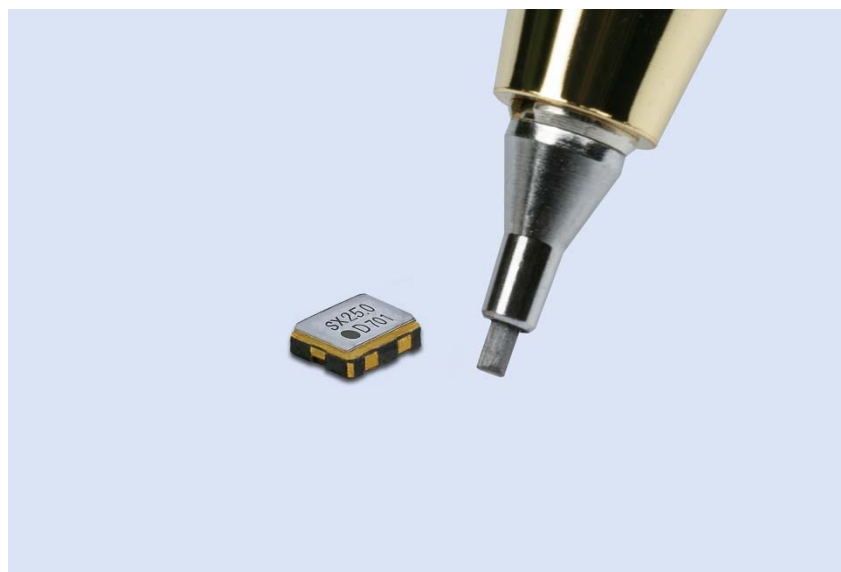
May 23, 2019  
**DAISHINKU CORP.**

DAISHINKU CORP. (President: Sohei Hasegawa) has developed small size (2016- and 2520-size) crystal oscillators, DSO211SX, DSO221SX, DSO211SXF, and DSO221SXF, and are ready to ship samples.

The SX series mainly targets the in-vehicle equipment market, and conforms to Autonomous Driving Level II, and in-vehicle component reliability standard AEC-Q100/AEC-Q200. The SXF series will be principally sold in consumer-product, telecommunications, and industrial markets. Both series feature high frequency stability over a wide range of temperatures with optimal combinations of our proprietary crystal design and ICs with a frequency adjustment function. They also incorporate castellation, which enables automated optical inspection (AOI) when solder-mounted on circuit boards designed by customers. The output frequency range is 1.0 MHz to 125 MHz, power voltage range 1.6 to 3.6 V, and operating temperature range  $-40^{\circ}\text{C}$  to  $+125^{\circ}\text{C}$ , with frequency stability of  $\pm 50 \times 10^{-6}$ . In addition, these crystal oscillators have superior environmental performance including complete elimination of Pb (Pb-free soldering) and are RoHS compliant. With the introduction of new crystal piece forming technology, products with even higher frequency stability,  $\pm 25 \times 10^{-6}$  (at  $-40^{\circ}\text{C}$  to  $+125^{\circ}\text{C}$ ) are under development, which will be completed in October 2019.

With the likelihood that installation of an advanced emergency braking system (AEBS) in new vehicles will become mandatory, the market for autonomous driving including advanced driver-assistance systems (ADAS) is expected to grow. Furthermore, reflecting the demands for miniaturization and performance enhancement in consumer and other electronic equipment markets, the needs for crystal oscillators are expanding in different fields including the IoT market.

The SX and SXF series products respond to various needs of customers in diverse markets.



< Product >

DSO211SX, DSO211SXF, DSO221SX, DSO221SXF

< Features >

- Size: DSO211SX/SXF (2.0×1.6×0.7 mm), DSO221SX/SXF(2.5×2.0×0.8 mm)
- Frequency Stability:  $\pm 50 \times 10^{-6}$  (-40°C to +125°C)  
[Development of the products with frequency stability of  $\pm 25 \times 10^{-6}$  (at -40°C to +125°C) will be completed in October 2019.]
- Frequency Range: 1 to 125MHz
- Supply Voltage: 1.8V/2.5V/2.8V/3.3V
- Output Specification: CMOS
- Package: A ceramic package with a metal lid providing high precision and reliability
- Complete elimination of Pb: Pb-free soldering/RoHS compliant
- Conforms to Autonomous Driving Level II (SX series)
- AEC-Q100/AEC-Q200 Compliant (SX series)

< Main applications >

In-vehicle driving safety applications (millimeter-wave radar, sensing cameras, etc.), Audio equipment, communication equipment, visual equipment, FA equipment, PC, gaming equipment and WiLAN

< Production status >

Sample shipments: From April 2019

Mass production: From June 2019

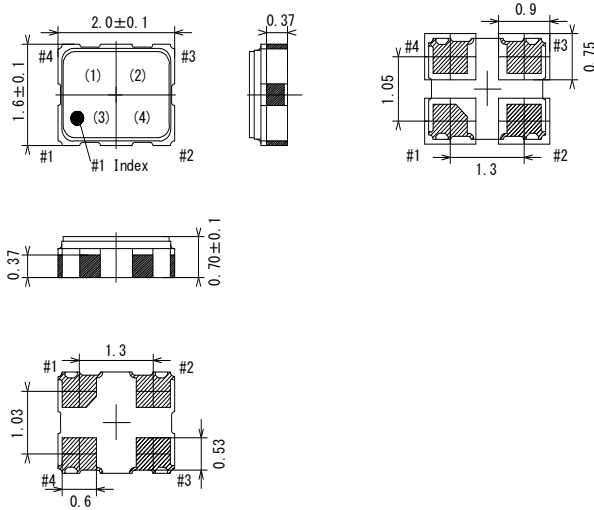
< Electrical specification >

Type	DSO211SX/DSO221SX	DSO211SXF/DSO221SXF
Applications	Automotive market (Driving Safety)	Consumer, Telecommunications and Industrial market
Size	2.0×1.6×0.7[mm], 2.5×2.0×0.8[mm]	
Frequency Range	1MHz to 125MHz	
Output Specification	CMOS	
Operating Temperature Range	-40 to +85°C, -40 to +125°C	
Frequency Stability	$\pm 20 \times 10^{-6}$ (-20°C to +70°C)	
	$\pm 30 \times 10^{-6}$ (-40°C to +85°C)	
	$\pm 50 \times 10^{-6}$ (-40°C to +125°C)	
	$\pm 80 \times 10^{-6}$ (-40°C to +125°C)	
Current Consumption	2.6mA Max. (40MHz/No Load)	
Reliability	AEC-Q100/AEC-Q200	—

Consult our sales representative for other specifications.

<Dimensions>

DSO211SX/DSO211SXF



Pin Connections

Pin No.	Connection
#1	O.E.(Output Enable)
#2	GND
#3	Output
#4	V <sub>CC</sub>

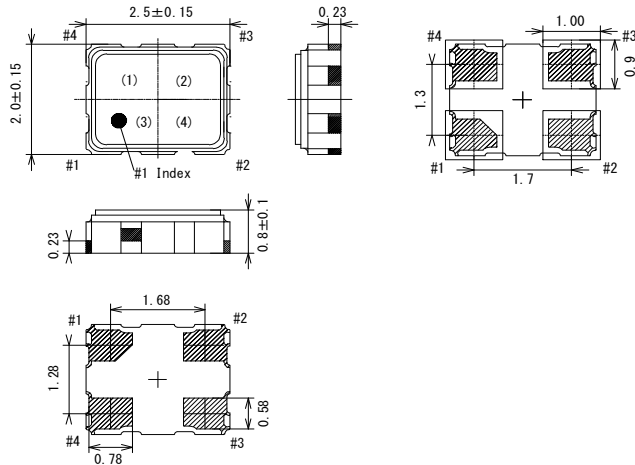
Function

OE(#1) input	#3 output condition
"H"	Oscillation out
"L"	High Z

Marking

(1) Model code	SXXF
(2) Frequency	25.0 (MHz,4digits)
(3) Logo	D
(4) Date code	Year (1digit) +Week (2digits) e.g.2019/1/1 → 901

DSO221SX/DSO221SXF



Pin Connections

Pin No.	Connection
#1	O.E.(Output Enable)
#2	GND
#3	Output
#4	V <sub>CC</sub>

Function

OE(#1) input	#3 output condition
"H"	Oscillation out
"L"	High Z

Marking

(1) Model code	SX/SXF
(2) Frequency	25.0 (MHz,4digits)
(3) Logo	D
(4) Date code	Year (1digit) +Week (2digits) e.g.2019/1/1 → 901