



October 26th, 2020
Nihon Dempa Kogyo Co., Ltd.
Representative Director and President
Hiromi Katoh

**Development of millimeter-wave frequency down converter
for automotive radar measurement**

Nihon Dempa Kogyo Co., Ltd., has jointly developed with Tektronix ^(*1), to develop a frequency-down converter for radar-measuring systems for preventing collisions in the 77-GHz and 79-GHz bands. We will begin receiving orders in October 2020.

In recent years, the adoption of millimeter-wave radars in the 77GHz and 79GHz bands has been accelerating in the Advanced Driving Support System (ADAS ^{*2}) for vehicles, which does not deteriorate detection performance even in the event of poor visibility due to automated braking and anti-collision systems. In particular, by using a wideband in the 79GHz band (77-81GHz) in the future, attention is focused on the realization of higher resolution and higher precision, which are regarded as important for a radar performance.

FMCW ^(*3) modulation is used as one of the millimeter-wave radars. This modulation transmits a signal whose frequency changes linearly with time and receives the reflected signal to estimate the relative distance, velocity, and direction to the object. A solution to accurately analyze superior radar characteristics requires a measurement environment with a low noise and stable signal source.

Using our high-frequency oscillator technology and an ultra-low phase noise local signal source for millimeter-wave signals from 76GHz to 81GHz, we have made it possible to provide a low-cost measurements converted to frequency from 2GHz to 7GHz frequencies. By combining with Tektronix's oscilloscope, this system enables the analysis of highly accurate automotive radars, and is expected to expand the use of mass production lines as well as R & D and trial purpose.

In the future, we will use our newly developed millimeter-wave technology to provide solutions for high-frequency mobile high-speed communications, wireless communications, and other applications.

(*1) Tektronix : Headquartered in the U.S., a measuring instrument manufacturer that has provided test/measurement monitoring solutions at the forefront of electronic measurement for over 70 years

(*2) ADAS : Advanced Driver-Assistance Systems

(*3) FMCW : Frequency Modulated Continuous Wave

<Messages from Tektronix Company>

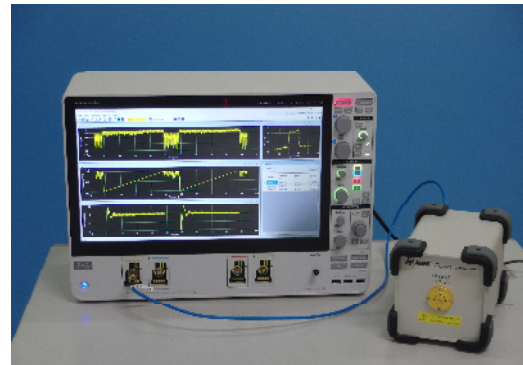
For this announcement, we received the following message from Mr. Kent Chon, Vice President of Tektronix's Japan/Korea Regional.

"Tektronix welcomes the announcement of NIHON DEMPA KOGYO CO., LTD.'s "Development of millimeter-wave frequency down converter for automotive radar measurement." Our 6-Series mixed-signal oscilloscopes have provided high signal fidelity with top-class low noise, high resolution, and high-performance touch screens. We expect that this combination with NIHON DEMPA KOGYO CO., LTD.'s millimeter-wave frequency down converters for automotive radar measurement will enable more customers to utilize our products and contribute to measurements in the field of ADAS for vehicles. "

[Down Converter Appearance]
Model C076G081GA



[Appearance of
Automotive Radar Analysis System]
Tektronix 6 Series MSOs
Mixed Signal Oscilloscope



[Features]

- Suitable for measurement of 77 GHz and 79GHz band high-resolution in-vehicle radar
- Covers a wide band from 76 GHz to 81GHz with low spurious (-60 dBc)
- Easy connection to each device with a built-in local oscillator
- Internal local oscillator automatically synchronizes with external input signal (10MHz)
- Small (H:138mm × L:138mm × W:214mm) and light (3kg) with excellent portability

[Main Specifications]

| Item | Min. | Typ. | Max. |
|--|------|------|------|
| RF Input Frequency [GHz] | 76 | - | 81 |
| IF Output Frequency [GHz] | 2 | - | 7 |
| Local Frequency [GHz] | - | 74 | - |
| Local Signal Phase Noise (1MHz Detuning Point) [dBc/Hz] | - | - | -114 |
| Noise Figure [dB] | - | 16 | 20 |
| Conversion Gain [dB] | 7 | - | 13 |
| Conversion Gain Deviation [dB] | -3 | - | +3 |
| IF Spurious [dBc] | - | - | -60 |
| Operating Temperature Range [deg.C] | 0 | - | +55 |

[Features of Tektronix's 6-Series MSO Mixed Signal Oscilloscope]

- High-speed sample rates of 8GHz in the highest frequency band and 25GS/s for all channels
- World's highest level of low noise performance enables detailed observation of minute signals
- With 12-bit ADC, up to 16-bit vertical axis resolution
- Comfortable touch operation with class's largest 15.6-inch HD resolution display

[Linked to Tektronix's website](#)

<https://info.tek.com/EN-AUTOMOTIVE-RADAR-SOLUTIONS-EM.html>

<Please get the **Automotive Radar Solutions Brochure**.>

[Contact Info]

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