

EMC Components

TDK expands notch filter lineup with built-in ESD protection function

- New notch filters achieve both ESD protection and noise suppression up to the maximum frequency of 5.3 GHz band
- Suppression of TDMA noise generated in wireless communication and increased wireless signal reception sensitivity
- Strong electrostatic protection capability (compliant with IEC61000-4-2 Level 4)

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TDK Corporation (TSE:6762) announces the release of its newly developed AVRF041A150MT242 and AVRF061D2R4ST532 notch filters with ESD protection function. Volume production of these devices will begin in March 2022.

The new notch filters are compliant with the IEC61000-4-2 Level 4 immunity standard. They are well suited to ensuring EMC requirements are met in the audio circuits of key applications - including smartphones, wireless earbuds (TWS), and smart speakers. Thanks to TDK's proprietary materials and advanced structural design, the new products implement industry-leading attenuation characteristics for specific frequency bands. They are highly effective at noise suppression and improved reception sensitivity in wireless communication. Moreover, the products can simultaneously provide countermeasures against both noise and ESD via one single chip, both reducing costs and using less board real estate.

The AVRF041A150MT242 features a small footprint of only 0.4 x 0.2 x 0.2 mm and delivers ESD protection and noise suppression in the 2.4 GHz band. It has a maximum insertion loss of just -20dB at 2.4GHz, The AVRF061D2R4ST532, which is supplied in 0.6 x 0.3 x 0.3 mm form factor offers ESD protection and noise suppression in the frequency band up to 5.3 GHz. At that frequency, it has a -15dB insertion loss.

With accelerating 5G transition and advanced mutual coordination between connected equipment, the era of IoT is now here. In addition to the conventional demands for lower power consumption and increased functionality, electronic equipment is required to have higher quality design and exhibit ongoing operational reliability. By developing notch filter solutions with significantly smaller footprints and expanded frequency capabilities, TDK is able to address market expectations for more streamlined telecommunication devices, such as smartphones and TWS, while also expanding the frequency band in relation to the latest generation of Wi-Fi transmissions.

Moving forward, TDK will continue to expand its product lineup to meet the needs for diversified telecom applications.

Glossary

- EMC: Electromagnetic compatibility
- ESD: Electrostatic discharge
- TDMA noise: Unpleasant audible noise generated by speakers when high frequency communication signals intrude into a microphone line
- IEC61000-4-2: An immunity standard for electrostatic discharge established by (the International Electrotechnical Commission (IEC)

Main applications

- Protection against noise and ESD for audio equipment using Wi-Fi, Bluetooth and other wireless forms of communication in the frequency band between 1.0 GHz and 5.3 GHz

Main features and benefits

- Providing measures for both ESD protection and noise
- Compliant with IEC61000-4-2 Level 4
- The smallest footprint in the lineup (0402 size format)

Key data

Type	Outer dimensions [mm]	Maximum allowable circuit voltage [V]	Capacitance [pF]	Insertion loss [dB]
AVRF041A150MT242	0.4 x 0.2 x 0.2 (EIA01005)	10 max.	15 pF ± 20 %	-20 max.at 2.4 GHz
AVRF061D2R4ST532	0.6 x 0.3 x 0.3 (EIA0201)	20 max.	2.4 pF ± 0.4 pF	-15 max.at 5.3 GHz

Complete product portfolio of notch filters with built-in ESD protection function

Band of noise suppression	Audio Recommended circuit	0.4 x 0.2 x 0.2 mm [EIA01005]	0.6 x 0.3 x 0.3 mm [EIA0201]	1.0 x 0.5 x 0.5 mm [EIA0402]	1.6 x 0.8 x 0.8 mm [EIA0603]
Measures for Wi-Fi band (5 GHz)	Headphone/ Microphone/ speaker/ receiver		AVRF061D2R4S T532 20V, 5.3 GHz		
Measures for Bluetooth & Wi-Fi band (2.4 GHz)	Headphone/ microphone	AVRF041A1 50MT242 10 V, 2.4 GHz	AVRF060X100LT 242 7 V, 2.4 GHz	AVRF101U6R8 KT242 28 V, 2.4 GHz	
	Speaker/ receiver		AVRF061P160MT 212 12 V, 2.1 GHz		
Measure for cellular band (700 M -2.7 GHz)	Microphone		AVRF060V600MT 102 3.5 V, 1.0 GHz		
	Headphone		AVRF060W650M T102 5.5 V, 1.0 GHz		
	Speaker/ receiver		AVRF061P160MT 212 12 V, 2.1 GHz		
Measure for Class D amplifier noise (100 M -400 MHz)	Speaker/ receiver				AVRF161Q8 61LT201 19 V, 200 MHz

About TDK Corporation

TDK Corporation is a world leader in electronic solutions for the smart society based in Tokyo, Japan. Built on a foundation of material sciences mastery, TDK welcomes societal transformation by resolutely remaining at the forefront of technological evolution and deliberately “Attracting Tomorrow.” It was established in 1935 to commercialize ferrite, a key material in electronic and magnetic products. TDK’s comprehensive, innovation-driven portfolio features passive components such as ceramic, aluminum electrolytic and film capacitors, as well as magnetics, high-frequency, and piezo and protection devices. The product spectrum also includes sensors and sensor systems such as temperature and pressure, magnetic, and MEMS sensors. In addition, TDK provides power supplies and energy devices, magnetic heads and more. These products are marketed under the product brands TDK, EPCOS, InvenSense, Micronas, Tronics and TDK-Lambda. TDK focuses on demanding markets in automotive, industrial and consumer electronics, and information and communication technology. The company has a network of design and manufacturing locations and sales offices in Asia, Europe, and in North and South America. In fiscal 2021, TDK posted total sales of USD 13.3 billion and employed about 129,000 people worldwide.

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