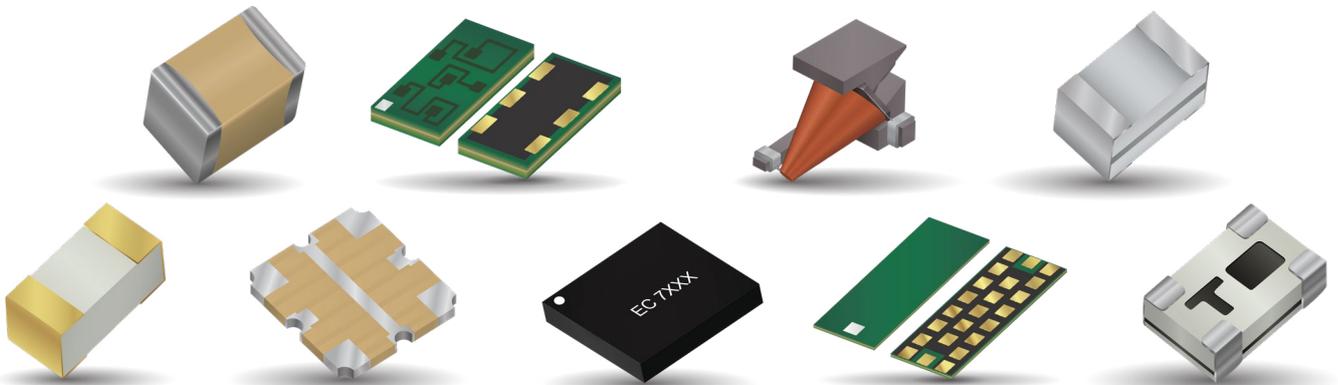




RF/MICROWAVE PRODUCT GUIDE

| CAPACITORS | INDUCTORS | CROSSOVERS | CONDUCTORS | COUPLERS |
| ANTENNAS | RESISTORS | ATTENUATORS | FILTERS |



ABOUT KYOCERA AVX

KYOCERA AVX is a worldwide leading supplier of passive electronic components, connectors, passive and active antennas, and sensing and control devices. We offer a wide range of components manufactured to the highest quality and reliability standards.

Our worldwide manufacturing capability includes facilities located in seventeen countries on four continents, allowing us to continue meeting customer needs on a global basis.

By continuing to invest heavily in R&D and submitting several new patent applications every year, KYOCERA AVX continues to further expand the company's strong technology base with newly innovative, next-generation product solutions.

KYOCERA AVX is committed to support the needs of its customers for future and present applications. Together with continuous quality improvement process, our components continue to provide reliable solutions for demanding application needs.

As a technology leader, KYOCERA AVX will continue to add to its product portfolio on a regular basis. Details of new devices being offered and their specifications will be shown on the KYOCERA AVX website, www.KYOCERA-AVX.com.



RF/MICROWAVE APPLICATIONS

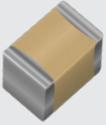
- Automotive
- Consumer
- Industrial
- Telecommunication
- Optical Communications
- Internet of Things (IoT)
- Safety & Security
- Wireless Network
- Healthcare
- Defense
- Aerospace
- Data Processing
- Medical
- Broadband Receivers
- Commercial
- Transportation



GLOBAL TESTING CAPABILITIES

- MIMO Measurement Systems
- Automotive Test Chamber
- SAR Measurement Systems
- Wi-Fi Throughput Evaluation Systems
- Near-field Measurement Systems
- Far-field Measurement Chambers
- mmWave Measurement Chamber
- Extensive Simulation Capabilities
- 5 Global Design Centers

CAPACITORS

PRODUCT		SPECS		FEATURES	APPLICATIONS
	High Q [®] Ultra Low ESR Capacitors	Case Size:	0402, 0603, 0605, 0709, 0805, 1111, 1210, 2325, 3838	<ul style="list-style-type: none"> • Ultra Low ESR • High Self Resonance • High Current Carrying Capability 	<ul style="list-style-type: none"> • RF Power Amplifiers • Low Noise Amplifiers • Filter Networks • MRI Systems
		Voltage:	Up to 7,200V		
		Tolerance:	±0.05pF / ±0.20%		
		Capacitance:	0.1 – 5,100pF		
	MOS Capacitors	Size:	0.01 – 0.07Sq.Inches	<ul style="list-style-type: none"> • Ideal Low-Cost Alternative to Ceramic SLCs • High Design Flexibility / Short Turn Around Cycle Times • Low RF Insertion Loss 	<ul style="list-style-type: none"> • Hybrid Circuits • Bias Networks • TOSA & ROSA • Test & Measurement Equipment • System in Package
		Voltage:	25 – 200WVDC		
		Frequency:	Up to 20GHz		
		Capacitance:	Up to 1,000pF		
	Tight Tolerance Capacitors	Case Size:	01005, 0201, 0402, 0603, 0805, 1210	<ul style="list-style-type: none"> • Repeatability, IoT to IoT • Ultra Tight Cap. Tolerances • High Stability with Respect to Time, Temp., and Frequency 	<ul style="list-style-type: none"> • Matching Network for Antenna, PA • 5G AAU Active Antenna System • High Order Discrete Filters • Cellular Communications
		Frequency:	Up to 26.5GHz		
		Tolerance:	As Tight as ±0.01pF		
		Capacitance:	Starting 0.05pF (with 0.05pF Increments)		

INDUCTORS

PRODUCT		SPECS		FEATURES	APPLICATIONS
	SMT Ultra- Broadband Inductors	Inductance:	0.47 – 10.7uH	<ul style="list-style-type: none"> • Flat Frequency Response from 400KHz to 40+GHz • Excellent Return Loss Through 40+GHz • Rugged Powdered Iron Core 	<ul style="list-style-type: none"> • Optical Comm. System • Ultra-Broadband DC Decoupling • Bias Tee • Broadband Amplifier
		Insertion Loss:	< 0.4dB Typical		
		Return Loss:	> 20dB Typical		
		DC Current:	150 – 815mA		
	Tight Tolerance Inductors – Thin Film	Size:	0201, 0402, 0603, 0805	<ul style="list-style-type: none"> • Thin Film Multilayer Technology • Tightest Tolerances Offered in the Industry • Std. Surface Mount Terminations 	<ul style="list-style-type: none"> • Mobile Communications • Satellite TV Receivers • Matching Network • High Order Discrete Filters
		Inductance:	0.33 – 22nH		
		Tolerance:	As Tight as 0.05nH		
		SRF:	Up to 35GHz		

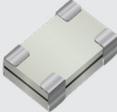
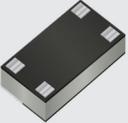
CONDUCTORS

PRODUCT		SPECS		FEATURES	APPLICATIONS
	Q-Bridge Thermal Conductors	Thermal Resistance:	10 – 32 (°C / W)	<ul style="list-style-type: none"> • High Thermal Conductivity • Low Thermal Resistance • Low Capacitance 	<ul style="list-style-type: none"> • GaN Power Amplifiers • High RF Power Amplifiers • Switch Mode Power Supplies • Pin & Laser Diodes
		Thermal Conductivity:	30 – 153 (mW / °C)		
		Cap. Value:	0.04 – 0.13pF		
		Case Size:	0302, 0402, 0603, 0805		

CROSSOVERS

PRODUCT		SPECS	FEATURES	APPLICATIONS
	RF-DC / RF Crossovers - MLO®	Insertion Loss: 0.05 – 0.15dB	<ul style="list-style-type: none"> • DC – 6.0 GHz • Surface Mountable • Available in RF / RF and DC / RF Crossover 	<ul style="list-style-type: none"> • Mobile Communications • Satellite Communication • RF Line Crossing a DC Line • RF Line Crossing a RF Line
		Voltage: 20 – 50dB		
		Power Rating: 9 – 30W		
		Return Loss: 10 – 20dB		

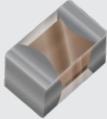
COUPLERS

PRODUCT		SPECS	FEATURES	APPLICATIONS
	Hybrid 3dB Couplers	Case Size: 0603, 0805	<ul style="list-style-type: none"> • Smallest Size in the Market • Optimum Heat Dissipation, Low Parasitic • Dedicated Test Jigs Available 	<ul style="list-style-type: none"> • Power Amplifier • Indoor and Outdoor WLAN • Antenna Distribution • RF Module
		Frequency: 0.7 – 6.0GHz		
		Insertion Loss: Typical 0.25dB		
		Power Rating: 3W, 10W		
	Hybrid 3dB Couplers MLO®	Case Size: 2025	<ul style="list-style-type: none"> • Excellent Isolation • Expansion Matched to PCB • 30 Watt Max. Power 	<ul style="list-style-type: none"> • Mobile Communications • Combiner / Divider • High RF Power Amplifiers • Switch Networks
		Frequency: 1.5 – 2.1GHz / 2.1 – 2.7GHz		
		Insertion Loss: Max 0.25dB		
		Power Rating: 30W		
	Directional Couplers	Case Size: 0402, 0603, 0805	<ul style="list-style-type: none"> • Inherent Low Profile • Tightest Coupling Tolerance Available (± 0.5dB) • Any Coupling Factor within 5 – 40dB is Readily Available 	<ul style="list-style-type: none"> • Power Amplifiers • Satellite Receivers • Telecom Communications • Wireless Base Station
		Frequency: Sub-6G and mmWave Band Available		
		Coupling: 5 – 40dB		
		Power Rating: 3W, 10W		

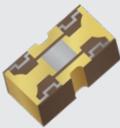
ANTENNAS

PRODUCT		SPECS	FEATURES
	On Board	Frequency: 433, 868, 915MHz, 600 MHz – 2.7 GHz, 3.3 – 3.8 GHz, and 5 – 8.5 GHz	<ul style="list-style-type: none"> • Standard SMT antennas using different technologies for easy implementation and fast time-to-market • Ceramic, PCB-based, stamped metal, and patch
		Technology: Cellular, LTE, 5G, Wi-Fi 6E, BLE, NB-IoT, LTE-M, LoRa, ISM, GNSS, V2X, and UWB	
	Off Board	Frequency: 433, 868, 915MHz, 600 MHz – 2.7 GHz, 3.3 – 3.8 GHz, and 5 – 8.5 GHz	<ul style="list-style-type: none"> • Standard antennas using different technologies for easy implementation and fast time-to-market • FPC and PCB with cable • Different connectors: w.fl or u.fl compatible, SMA, MMCX, and MHF4L
		Technology: Cellular, LTE, 5G, Wi-Fi 6E, BLE, NB-IoT, LTE-M, LoRa, ISM, GNSS, V2X, and UWB	
	External	Frequency: 433, 868, 915MHz, 600 MHz – 2.7 GHz, 3.3 – 3.8 GHz, and 5 – 8.5 GHz	<ul style="list-style-type: none"> • Standard and custom external antennas covering a wide range of applications • Cabled, direct connection, screw mounted, and magnet mounted • Indoors and outdoors use • Ruggedized mechanics for critical environment • Multi-band Solutions: 2-in-1, 3-in-1, and 5-in-1
		Technology: Cellular, LTE, 5G, Wi-Fi 6E, BLE, NB-IoT, LTE-M, LoRa, ISM, GNSS, and V2X	
	Customer Specific	Frequency: 433, 868, 915MHz, 600 MHz – 2.7 GHz, 3.3 – 3.8 GHz, 5 – 8.5 GHz, and 20 – 67 GHz	<ul style="list-style-type: none"> • Custom antennas in different manufacturing technologies: LDS, two-shot molding, and insert molding • Smart antennas for high performance applications: Active Steering Antenna technology, Active Antenna Band Switching, and P-sensor hybrid antenna • Testing services: simulations and measurements in anechoic chamber
		Technology: Cellular, LTE, 5G, Wi-Fi 6E, BLE, NB-IoT, LTE-M, LoRa, ISM, GNSS, V2X, RFID, NFC, and UWB	

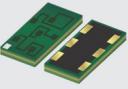
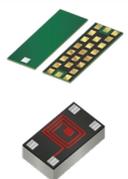
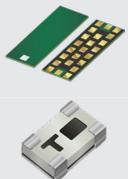
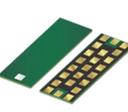
RESISTORS

PRODUCT		SPECS	FEATURES	APPLICATIONS
	Ultra-Broadband Resistors	Resistance: From 25 – 400Ω	<ul style="list-style-type: none"> EIA 0402 Case Size 100% Laser Trimming for Tight Tolerances Terminations: (Ag / Epoxy) NiSn Plated, Ni/Au Gold Plated 	<ul style="list-style-type: none"> Broadband Receiver Optical Transceiver Modules TOSA / ROSA Wide-Band Test Equipment MMIC Amplifiers
		Power Rating: 125mW		
		Tolerance: 0.5%, 1%, 2%		
		Frequency: DC to 20GHz		

ATTENUATORS

PRODUCT		SPECS	FEATURES	APPLICATIONS
	SMT Attenuators	Size: 0603	<ul style="list-style-type: none"> Thin Film Design Characterized to 20 GHz AIN Construction 	<ul style="list-style-type: none"> Microwave Radio ISM Satellite Communications Telecommunications
		Frequency: Up to 20GHz		
		Power Rating: Up to 1W		
		Attenuation: 0 – 10dB (1dB Increments)		

FILTERS

PRODUCT		SPECS	FEATURES	APPLICATIONS
	MLO [®] Diplexers	Size: 0603, 0805	<ul style="list-style-type: none"> Designed for Various Wireless Stds. (WiFi, GPS, WLAN, CDMA, WCDMA, and Bluetooth) 4.5 Watts Max Power Capability, CTE Match to PCB Thinnest Size in the Industry 	<ul style="list-style-type: none"> 4G / LTE, WiFi Dual Band Small Cell Base Stations Repeaters
		Power Rating: DC – 6.0GHz		
		Insertion Loss: 0.45dB Typical		
		VSWR: 1.45 Typical		
	Low Pass Filters	Size: 0402 – 5021	<ul style="list-style-type: none"> Small Size, Using Hi-Q Inductors Low Profile Rugged Construction 	<ul style="list-style-type: none"> Telecom Small Cell, Femtocell, and Macro Cell Military Aerospace Radar Wireless Base Station
		Power Rating: 1 – 25W		
		Insertion Loss: Typical 0.25dB		
		Frequency: 55MHz to Sub-6G mmWave Band Available		
	Band Pass Filters	Size: 0805 – 3416	<ul style="list-style-type: none"> Wide Band, High Order, and Low Insertion Loss Steep Roll-Off and High Rejection Out-of-Band Expansion Matched to PCB 	<ul style="list-style-type: none"> Military Radios, EMS Radios Instrumentation Wireless Transmitters and Receivers
		Power Rating: 1 – 8W		
		Insertion Loss: Typical 1 – 2dB		
		Frequency: 110MHz – 9.0GHz (Upon Request)		
	High Pass Filters	Size: 2616 – 6025	<ul style="list-style-type: none"> Designed for Various Wireless Stds. 4 Watts CW Power CTE Match to PCB Thinnest Size in the Industry 	<ul style="list-style-type: none"> Satellite Receiver Test Equipment Base Stations Electronic Warfare Systems
		Frequency: 4W		
		Insertion Loss: 0.5 – 0.8dB		
		VSWR: 55MHz – 8GHz		
	Thin Film Filters	Substrate: Silicon, Quartz, glass, Alumina, and More	<ul style="list-style-type: none"> High Accuracy (No Shrinkage, Precise Patterning) Due to Thin Film Process Customizable Device Size Highly Reproducible 	<ul style="list-style-type: none"> RF / Microwave Medical Military / Defense Telecommunications
		Termination: SMT, Wire Bondable, BGA, and LGA		
		Lumped Element Freq.: 500 – 5GHz		
		Frequency Distribution: 1 – 100+GHz		

MILLIMETER WAVE MEASUREMENT SYSTEM

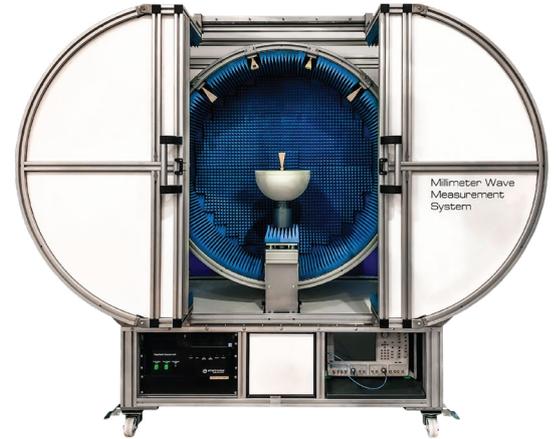
A Cost Effective, Compact, and Adaptable Solution for Testing Antennas / Devices at mmWave Frequencies.

System

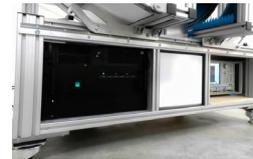
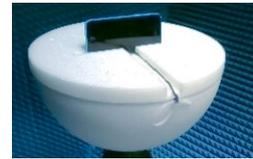
Features:



- Self-Contained Portable System Chamber
- Accurate and Cost Effective Far-Field Measurement
- Suitable for All Testing Needs for mm Wave System Development
- 3D Radiation Pattern in Any Polarization



The KYOCERA AVX Millimeter Measurement System supports multiple combinations of mmWave frequencies with scalability to cover existing and forthcoming 5G mmWave frequencies and bandwidths (18 – 26.5GHz, 26.5 – 40GHz, 33 – 50GHz, 50 – 67GHz). Each measurement frequency band uses a dedicated RF path (high performance RF cables, rectangular waveguides, and horns). Its fully anechoic enclosure provides a shielded environment over a very wide frequency range (from 18GHz – 110GHz) and insures stable gain and phase measurement results. The system can be easily installed into a new or existing test facility by the movable chassis with steerable lifting wheels.



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