

Circuit Protection

Circuit Protection

TransGuard®/MultiGuard, Transient Voltage Suppressor

- Sub ns response time
- Bipolar protection
- Off state EMI filter, on state transient protection
- High peak current and transient energy capability

StaticGuard, Transient Voltage Suppressor

- General purpose ESD protection
- Low capacitance, low leakage current
- ESD failure voltage >200V
- 15kV ESD pulse generates <20mJ
- Fast turn-on time <1ns
- General purpose clamping <200V suitable for ESD transients up to 15kV

USB Series, Transient Voltage Suppressor

- Low capacitance for high speed data line ESD protection
- Bi-directional device
- Low clamping voltage
- Fast turn-on time <1ns
- Discrete, Dual and Quad packages

CANbus Series, Transient Voltage Suppressor

- Designed to protect the Controlled Area Network, AEC Q200 qualified
- High ESD capability (25kV)
- High In Rush current (4A @ 8X20us)
- EMI/RFI attenuation
- Discrete, Dual and Quad packages

AntennaGuard, Transient Voltage Suppressor

- Ultra low capacitance for RF circuit protection
- Fastest response time to ESD strikes
- Single chip solution equals space savings
- Low insertion loss

Sub pF Varistor, Transient Voltage Suppressor

- Sub 1pF capacitance to minimize signal distortion at very high data rates and RF frequency
- Low profile 0402 package
- Low leakage current
- Multiple strike capability

UltraGuard, Transient Voltage Suppressor

- Extremely low leakage (2uA)
- Protection for battery operated devices, high clock speed integrated circuits, and optic circuits
- Discrete, Dual, and Quad packages

TransFeed, LCT Transient Voltage Suppressor Filter

- Narrow band, high attenuation filter
- Bi-directional TVS
- Fastest sub ns turn on time
- EMI filtering over broader frequency spectrum

Glass Encapsulated Varistor, Industrial Range

- Low DC leakage current
- Bi-directional protection
- Off state EMI filter, on state transient protection
- Multiple strike capability
- 1206 to 3220 case size

Glass Encapsulated Varistor, Telecom Range

- CCITT 10/1000µs Pulse test specified
- Effective SMD alternative to MOV between 60 and 90 Vrms
- High energy ratings up to 6J
- Provide EMC capacitance

Glass Encapsulated Varistor, Automotive Range

- Specified with Load dump and Jump Start requirements of ISO 7637
- AEC Q200 compliant
- Off state EMI filter, on state transient protection
- Energy absorption 1.5 to 25J

Single Layer Varistor, Transient Voltage Suppressor

- SMD 3220 size
- Voltage ratings 175Vrms to 300Vrms
- Replacement for radial leaded varistors
- Acid resistance against harsh environments
- Hybrid Ag terminations, plated terminations in development

AccuGuard, Surface Mount Fuse

- Extremely accurate thin film technology
- Fast response time
- Repeatable lot to lot performance
- Post fusing resistance >20Mohm
- UL, cUL approvals

Surface Mount NTC, Thermistors

- Negative Temperature Coefficient
- Precision tolerance available
- Multiple temperature stability options
- Fast thermal response time

Leaded NTC, Thermistors

- Negative Temperature Coefficient
- Precision tolerance available
- Multiple temperature stability options
- Fast thermal response time

CapGuard, High Voltage TVS

- Ideal for high transient applications
- User defined capacitor and varistor
- Ultra low ESR/ESL
- Fast Turn on time
- Multiple Strike capability
- Very high current handling capability



Terminology Guide

Circuit Protection

Working Voltage (V_w)

voltage at which the part can operate indefinitely

Breakdown Voltage (V_b)

voltage at which the part draws 1 ma of current

Clamping Voltage (V_c)

voltage the part limits to when subjected to an 8x20µs waveform (current varies with energy rating)

Peak Current (I_p)

maximum 8x20µs repetitive strike (500 pulses) current rating

Transient Energy (E_t)

maximum 10x1000µs energy in Joules

Electro Magnetic Interference (EMI)

any electrical disturbance that interferes with normal operation of electrical equipment

Electro Magnetic Compatibility (EMC)

the ability for one electronic device to function next to another electronic device without interference.

Electrostatic discharge (ESD)

the sudden and momentary electric current that flows when an excess of electric charge, stored on an electrically insulated object, finds a path to an object at a different electrical potential

Over Voltage

undesirable surge in voltage on a line causing it to exceed the maximum rated operating conditions

Over Current

undesirable surge in current on a line causing it to exceed the maximum rated operating conditions

EN 61000-4-2

Electrostatic discharge immunity test

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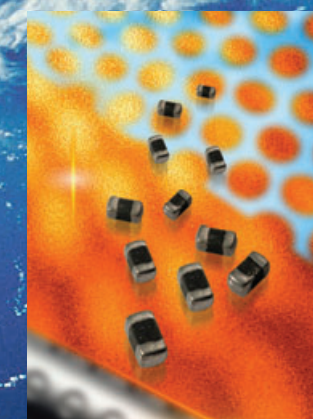
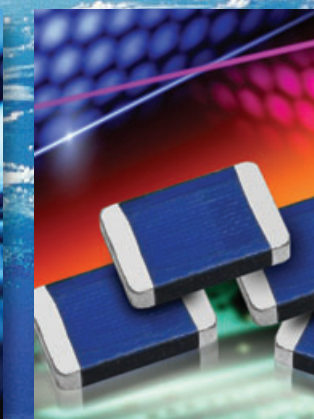
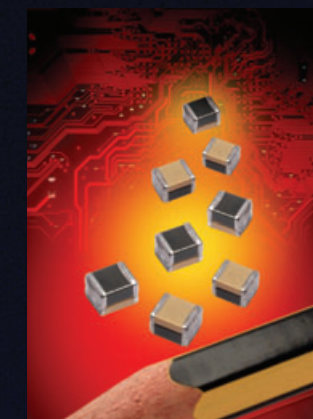
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Application Guide

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CIRCUIT PROTECTION



For all the latest information on innovations from AVX Corporation, visit our website at www.avx.com

VARISTORS	PC	Communications	Consumer	Industrial	Healthcare	Energy	Transportation	Lighting	Security	Military	Automotive	Avionics
TransGuard/ MultiGuard	USB RS232 Fingerprint Reader I/O Ports Notebook Sound Card Wireless Card Wireless Scanner Graphics Card Keyboard	Cell/Mobile/PDA Base Station Wireless Card Key Pads	PDA Set Top Controllers White Goods Test Equipment Bar Code Scanner Key Pad GPS Data Input	Industrial Controllers Automation Heavy Equipment	Hearing Aid Instrumentation Diagnostics RFID Analysis Key Pads	SMART Grid SMART Meter Nuclear Energy	GPS Tracking Systems Fleet Management GPS Input Data	LED OLED HID Agricultural Architectural Landscaping Food Processing Stadium Retail Warehouse Office/Commercial	LED Modules Key Pads Video Camera Motion Detector	Communications Aerospace Vehicles	Safety Body Electronics Drive Train Comfort & Convenience HEV Modules, Monitors, & GF1	Data Lines
Axial Leaded			White Goods		X-Ray	DC Motor Turn Off Surge Suppression Solar/Wind Inverters Nuclear Energy	DC Motor Turn Off Surge Suppression			Communications Aerospace Vehicles	DC Motor Turn Off Surge Suppression	DC Motor Turn Off Surge Suppression
AntennaGuard	Notebook Graphics Card	Cell/Mobile/PDA RF Amplifiers	RF Amplifiers		RF Amplifiers		Sensors RF Link			Sensors Power Amplifiers	Keyless Entry High Voltage DC Data Lines Firewire BUS	Radar
Sub pF AntennaGuard	USB 3.0 Port Graphics Card Ethernet Line	Cell/Mobile/PDA USB 2.0/3.0	HDMI GPS		3D Imaging					High Speed Video Bus	GPS RF Circuits FlexRay	
UltraGuard	Hand Held PDA Backlit Display	Cell/Mobile/PDA	Backlit Display PDA Battery Power Device		Sensors, Hand Held Equipment			Low Power LED Drivers		Hardened Hand Held Devices		
Max Cap				Heavy Equipment Automation		SMART Grid	DC Motor Driver Commercial Vehicle Heavy Equipment			DC Motor Driver	DC Motor Driver Commercial Automotive	DC BUS Suppression
USB Series	Notebook LCD Monitors Video Card Ethernet Lines Universal Serial BUS Graphics Card	USB Port	LCD TV		Diagnostic Equipment	SMART Meter	Diagnostics Port				Diagnostics Port MP3 Charge Port	
CAN Series		CAN Bus				Solar RF/CAN Interface	CAN BUS			CAN BUS	CAN BUS	
150°C Series				Downhole Exploration		Peak Power Trackers Inverters	Heavy Equipment Commercial Vehicle	LED Drivers		Hardened Hand Held Devices	Underhood Modules	

GLASS COATED VARISTORS

Standard Series					X-Ray Pacemaker	61000-4-5 Surge		Architectural Stadium Street Lamps Agricultural HID				Cockpit Instrumentation
Automotive Series						Small Power Inverters	Load Dump/Jump Start				Load Dump/Jump Start Water Pump Seat Weight Sensor Airbag GPS Car Audio	
Telecom Series		Phone Lines ADSL Lines Telecom Circuits										
Industrial Series			White Goods Controllers	Industrial Controllers Automation Downhole Exploration Geophysical Equipment Heavy Equipment		Solar/Wind Inverters Power Conditioning Power Supply SMART Meters	Electronic Toll					Industrial Controllers Automation Downhole Exploration Geophysical Equipment

TVS PROTECTION & EMI ATTENUATION

TransFeed	Finger Print ID Multi-Media Add on Cards		Bar Code Scanners		Instrumentation Monitoring Imaging		Programmable Agriculture Equipment GPS Tracking System		Video Camera Motion Detector	I/O Ports	LCD Dashboard Driver	Communication BUS
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LIGHTNING/HEAVY SURGE PROTECTION

CapGuard		Base Station		Downhole Exploration Geophysical Equipment Heavy Equipment		Wind/Solar Panels	Inductive Dump Radiated Noise Attenuation	Architectural Stadium Street Lamps Agricultural	Power Lines to Secure Boards	Power Supply	Power Distribution Fuel Pump	Power Supply
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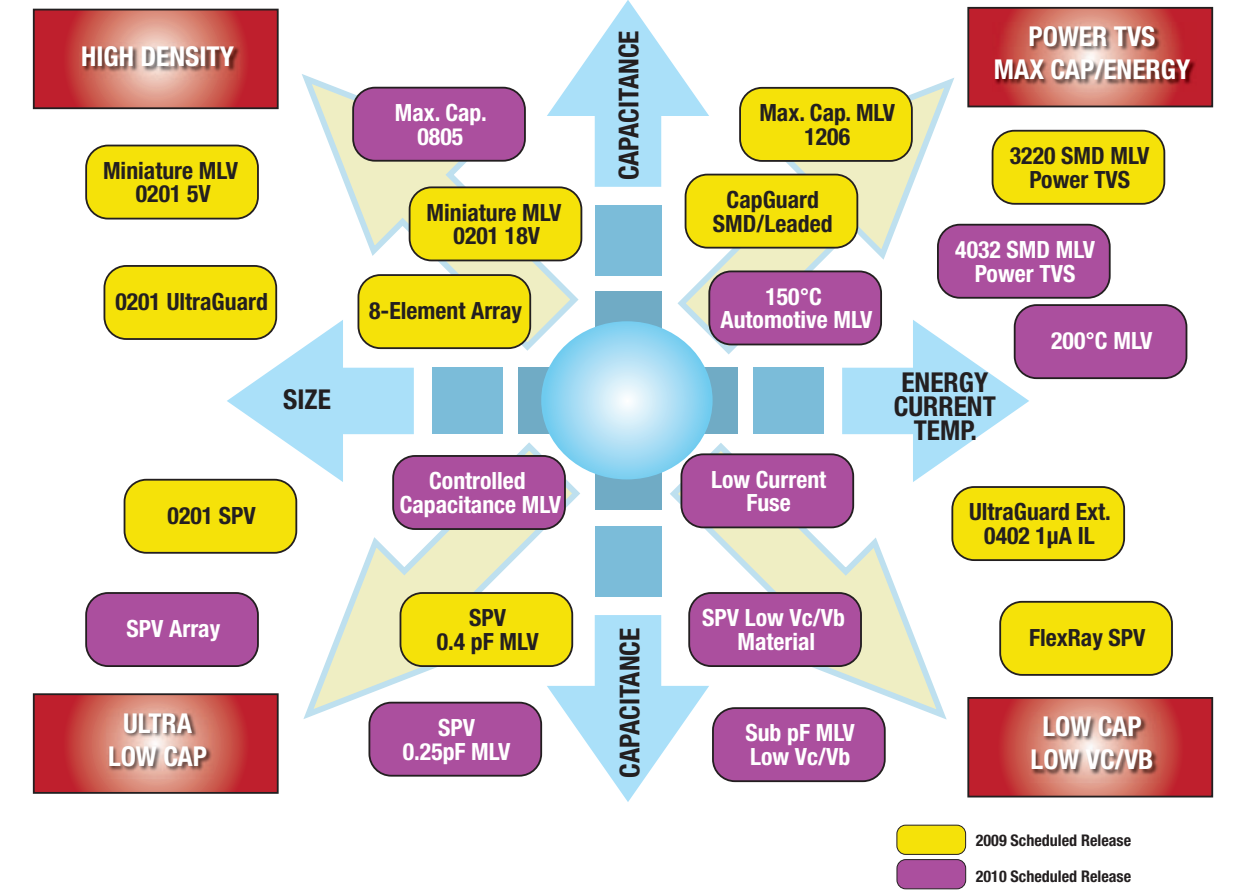
THERMISTORS

Leaded/SMT NTC	Battery Pack	Cell/Mobile/PDA	LCD Compensation Battery Pack CD Player GPS Coil Compensation White Goods Temperature Control Air Conditioning/Heating	Thermostats Boilers Instrumentation Printers Thermal Metering Systems	Temperature Measurement	Solar Power	Temperature Control Sensor Input		LCD Monitor Smoke Detector		Temperature Control Sensors Liquid Level Measurement Temperature Measurement GPS Coil Compensation Engine Management Air Conditioning Automatic Transmission TMPS Audio Compensation	
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FUSES

Thin Film Fuse	HDD/SSD Drives	Cell/Mobile/PDA	Battery Pack LCD Screens	Programmable Controllers	Patient Monitor			LED	Video Camera Home Security	Power Supply	Car Electronics	
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CIRCUIT PROTECTION TECHNOLOGY ROADMAP



MARKETS SERVED BY ROADMAP

