

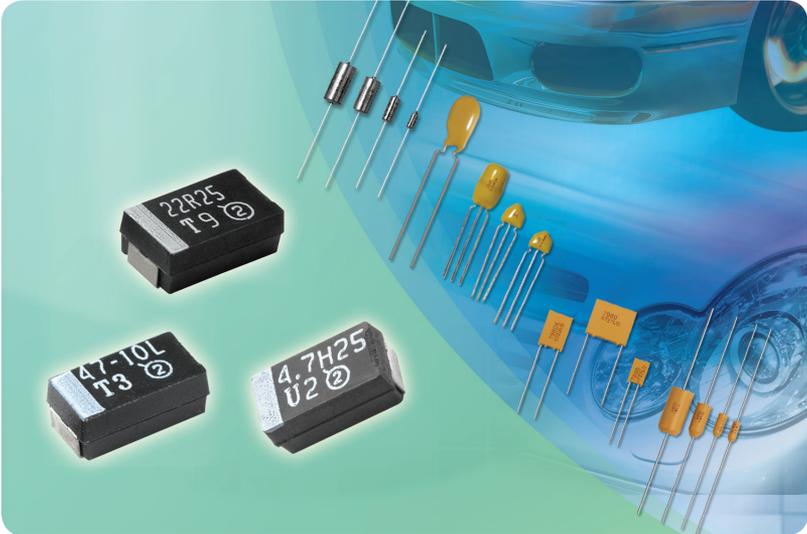


CAPACITORS

Tantalum

High-Quality Automotive Qualified Tantalum Capacitors

Tantalum Capacitor Solutions For Automotive Applications



Vishay is a respected component manufacturer whose reputation for reliability and quality is complemented by a decades-long record of service to the automotive industry. The company’s products are used throughout the typical vehicle to provide functions including power management; electric motor control; data / audio / video signal switching; and infrared (IR) communications.

APPLICATIONS

- Body Electric and Comfort Electric
- Chassis Electric
- Powertrain (underhood)
- Electric Power Distribution
- Lighting Systems
- Tire Pressure Monitoring System (TPMS)

RESOURCES

- Datasheets: <http://www.vishay.com/capacitors/tantalum/automotive/>
- Reliability calculator: <http://www.vishay.com/capacitors/tantalum/capacitors/tantalum/tantalum-wet/tantalum-reliability-calculator-list/>
- Technical support: tantalum@vishay.com
- Sales contacts: www.vishay.com/doc?99914
- Material categorization: For definitions of compliance please see <http://www.vishay.com/doc?99912>

RoHS
COMPLIANT



One of the World's Largest Manufacturers of
Discrete Semiconductors and Passive Components





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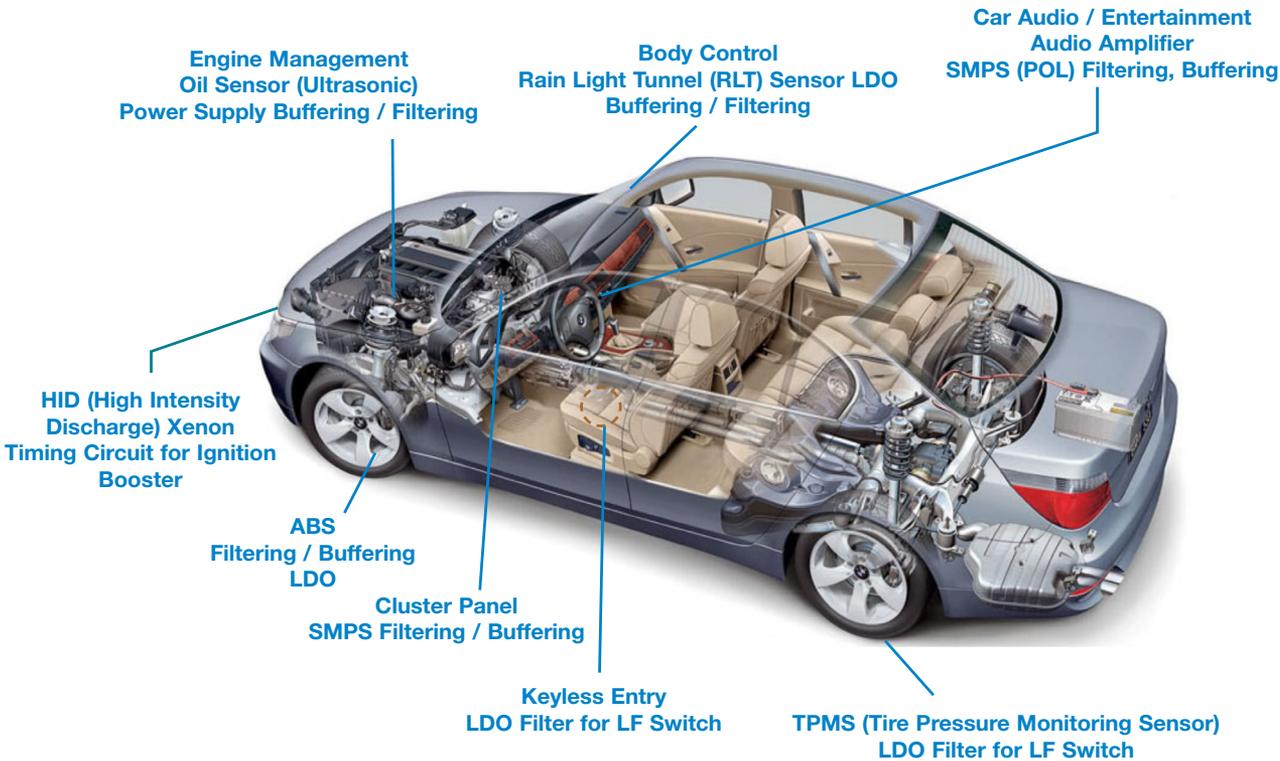
Typical Applications

Body Electric and Comfort Electric

- Sensors
- Immobilizer and Security Systems
- Door / Window / Sunroof Control
- Seat Adjust and Memory
- HVAC (Heating, Ventilating, Air Conditioning)
- Climate Control
- Dashboard and Interior Illumination
- Passive Safety (Airbag, Restraint Systems)
- Reversible Wiper Drives
- Keyless Entry, Passive Entry, Passive Start, Bluetooth Communication
- Car TV and DVD Systems (Multimedia)

Chassis Electric

- Active Safety (ESP, ABS, ASR, USC)
- EPB (Electric Park Brake)
- Electrical Transmission (CVT, ASG, Double Clutch Shifting)
- EAGR, Electrical Catalytic Converter, Diesel Particle Filter
- Active Suspension, Dynamic Control
- Sensors
- Tire Pressure Monitoring
- Electrical Hydraulic Power Steering (EHPS)
- Electrical Power Steering (EPS)





Powertrain (Underhood)

Common Rail Diesel Electrical Control
Piezoelectric-Injection Driver
Engine Control Unit (ECU)
Turbo Charger Control Unit
Ignition Electrical Drive
Engine Sensors
Electrical Water Pump
ISG (Integrated Starter Generator 14 V / 42 V)
Board Load-Control Unit
Boardnet Management
Engine Cooling (Electrical Fan Control)

Driver Information

Driver Information System
Bluetooth Communication
GPS Car Navigation and Audio System
SDARS / Antenna / Amplifier System
Tire Pressure Monitoring System (TPMS)

Lighting Systems

Sensors (ACC, LIDAR)
Headlight Leveling Control and Advanced Front
Lighting Headlight Cleaning System
LED Lighting (Front and Rear)
HID Electrical (Xenon Driver)
Sensors (Night Vision Systems, Fog Detection)
Ambient Lighting

Select Application Examples

Power Management and Conversion

Tantalum capacitor options include devices in a broad variety of case sizes and with the high temperature ratings required by the automotive environment. Tantalum capacitors are available in radial, axial, and SMD formats to provide effective filtering in switchmode power supplies at temperatures up to 150 °C and vibration levels up to 20 G. Molded tantalum capacitors deliver exceptionally stable, high-capacitance performance over a long life and in high-temperature (under-the-hood) environments.

Solid tantalum capacitors in EIA-size SMD packages make an ideal solution for high-volume PCB and hybrid automotive applications. Tantalum molded SMD capacitors in tape-and-reel packaging are widely used for filtering low frequency noise. Vishay also offers a complete line of tantalum capacitors that can be used in through-hole board applications.

Whatever the automotive application, Vishay's extensive tantalum capacitor product offering includes the right part for the job. Throughout automotive electronic systems, Vishay supplies designers and manufacturers with reliable, high-performing, and space-saving capacitors that improve the quality of today's automobiles.

Energy Storage

Today's automotive circuitry requires stability under various loads and peak power requirements. Vishay tantalum capacitors provide a low cost bulk energy storage solution for power bus hold-up applications.

Coupling

Automotive analog circuitry, including audio, sensor, and telematics applications, requires a coupling capacitor to connect two circuits so that only the AC signal passes from the first circuit to the next. The capacitor, often called a blocking capacitor, blocks the DC signal, isolating the DC bias of the two coupled circuits. Vishay tantalum capacitors offer the requisite capacitance, DC leakage current, and stability over temperature and time for automotive analog coupling.



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Surface-Mount Series	Case Codes	EIA Sizes	Max. Dimensions L x W x H (mm)	Voltage Range	Features
293D 	A	3216-18	3.4 x 1.8 x 1.8	4 V to 63 V	<ul style="list-style-type: none"> - 55 °C to + 125 °C 0.1 µF to 1000 µF 100 % surge current test (D and E sizes) Lead (Pb)-free, RoHS-compliant
	B	3528-21	3.7 x 3.0 x 2.1		
	C	6032-28	6.3 x 6.5 x 2.8		
	D	7343-31	7.6 x 4.6 x 3.1		
	E	7343-43	7.6 x 4.6 x 4.3		
	V	7343-20	7.3 x 4.3 x 2.0		
TR3 	A	3216-18	3.4 x 1.8 x 1.8	4 V to 63 V	<ul style="list-style-type: none"> - 55 °C to + 125 °C 0.47 µF to 1000 µF Low ESR 100 % surge current test (C, D, E, V and W sizes) Lead (Pb)-free, RoHS-compliant
	B	3528-21	3.7 x 3.0 x 2.1		
	C	6032-28	6.3 x 6.5 x 2.8		
	D	7343-31	7.6 x 4.6 x 3.1		
	E	7343-43	7.6 x 4.6 x 4.3		
	V	7343-20	7.3 x 4.3 x 2.0		
	W	2012-12	2.2 x 1.4 x 1.2		
TP3  	A	3216-18	3.4 x 1.8 x 1.8	4 V to 50 V	<ul style="list-style-type: none"> - 55 °C to + 125 °C 0.1 µF to 680 µF Low ESR 100 % surge current test (B,C, D and E sizes) Lead (Pb)-free, RoHS-compliant AEC-Q200 qualified
	B	3528-21	3.7 x 3.0 x 2.1		
	C	6032-28	6.3 x 6.5 x 2.8		
	D	7343-31	7.6 x 4.6 x 3.1		
	E	7343-43	7.6 x 4.6 x 4.3		
TP8  	M	1608-09	1.8 x 1.0 x 0.9	6.3 V to 40 V	<ul style="list-style-type: none"> Small sizes for space constrained applications High reliability solid surface-mount tantalum capacitors Operating temperature: - 55 °C to + 125 °C Capacitance range: 1 µF to 100 µF L-shaped face-down terminations for superior board mounting
	W	2012-12	2.2 x 1.4 x 1.2		
	R	2012-16	2.2 x 1.5 x 1.6		
	P	2414-12	2.5 x 1.5 x 1.2		
	A	3216-18	3.4 x 1.8 x 1.8		
	B	3528-20	3.7 x 3.0 x 2.0		
TH3 Hi-TMP®  	A	3216-18	3.4 x 1.8 x 1.8	6.3 V to 50 V	<ul style="list-style-type: none"> - 55 °C to + 150 °C 0.33 µF to 220 µF High temperature 100 % surge current test (B,C, D and E sizes) Lead (Pb)-free, RoHS-compliant AEC-Q200 qualified
	B	3528-21	3.7 x 3.0 x 2.1		
	C	6032-28	6.3 x 6.5 x 2.8		
	D	7343-31	7.6 x 4.6 x 3.1		
	E	7343-43	7.6 x 4.6 x 4.3		
TH4 Hi-TMP®  	B	3528-21	3.7 x 3.0 x 2.1	6.3 V to 16 V	<ul style="list-style-type: none"> AEC-Q200 qualified Operating temperature up to 175 °C with 50 % voltage derating RoHS-compliant terminations available: matte tin (all cases) Standard EIA 535BAAC case sizes 100 % surge current tested 10 µF to 47 µF Multiple ESR levels for each rating
	C	6032-28	6.3 x 3.5 x 2.8		
	D	7343-31	7.6 x 4.6 x 3.1		

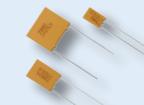


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Through-Hole Product	Case Codes	Max. Height Range (mm)	Voltage Range	Features
173D 	U, V, W, X, Y	2.41 to 7.1	2 V to 50 V	<ul style="list-style-type: none"> - 55 °C to + 125 °C 0.1 μF to 330 μF Miniature axial-leaded Flame retardant molded case construction Lead (Pb)-free, RoHS-compliant
790D 	A, B, C, D	7.3 to 10.5	6.3 V to 50 V	<ul style="list-style-type: none"> - 55 °C to + 125 °C 0.1 μF to 330 μF Standoffs on all radial leaded cases Flame retardant molded case construction Lead (Pb)-free, RoHS-compliant
199D 	A, B, C, D, E, F	7.11 to 16.50	3 V to 50 V	<ul style="list-style-type: none"> - 55 °C to + 125 °C 0.1 μF to 680 μF Low leakage, low dissipation factor Epoxy coated radial-leaded Lead (Pb)-free, RoHS-compliant
299D (TriPole) 	A, B, C, D, E, F	9.14 to 15.74	3 V to 50 V	<ul style="list-style-type: none"> - 55 °C to + 125 °C 0.1 μF to 680 μF Triple-lead design allows reverse installations Epoxy coated radial-leaded Lead (Pb)-free, RoHS-compliant
489D/499D 	A, B, C, D, E, F, H, M, N, R	7.0 to 22.0	3 V to 50 V	<ul style="list-style-type: none"> 489D (- 55 °C to + 85 °C) 499D (- 55 °C to + 125 °C) 0.1 μF to 680 μF Low Z and ESR at high frequencies Epoxy coated radial-leaded Lead (Pb)-free, RoHS-compliant
ETQW (EU style) 	1, 2, 3, 4, 5, 6	7.5 to 20.0	3 V to 50 V	<ul style="list-style-type: none"> - 55 °C to + 125 °C 0.1 μF to 470 μF Flame retardant epoxy resin construction Lead (Pb)-free, RoHS-compliant
150D 	A, B, R, S	3.85 to 9.32	6.3 V to 125 V	<ul style="list-style-type: none"> - 55 °C to + 125 °C 0.47 μF to 330 μF Low leakage, low dissipation factor Exceptional operating stability Hermetically sealed metal case construction Lead (Pb)-free, RoHS-compliant



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