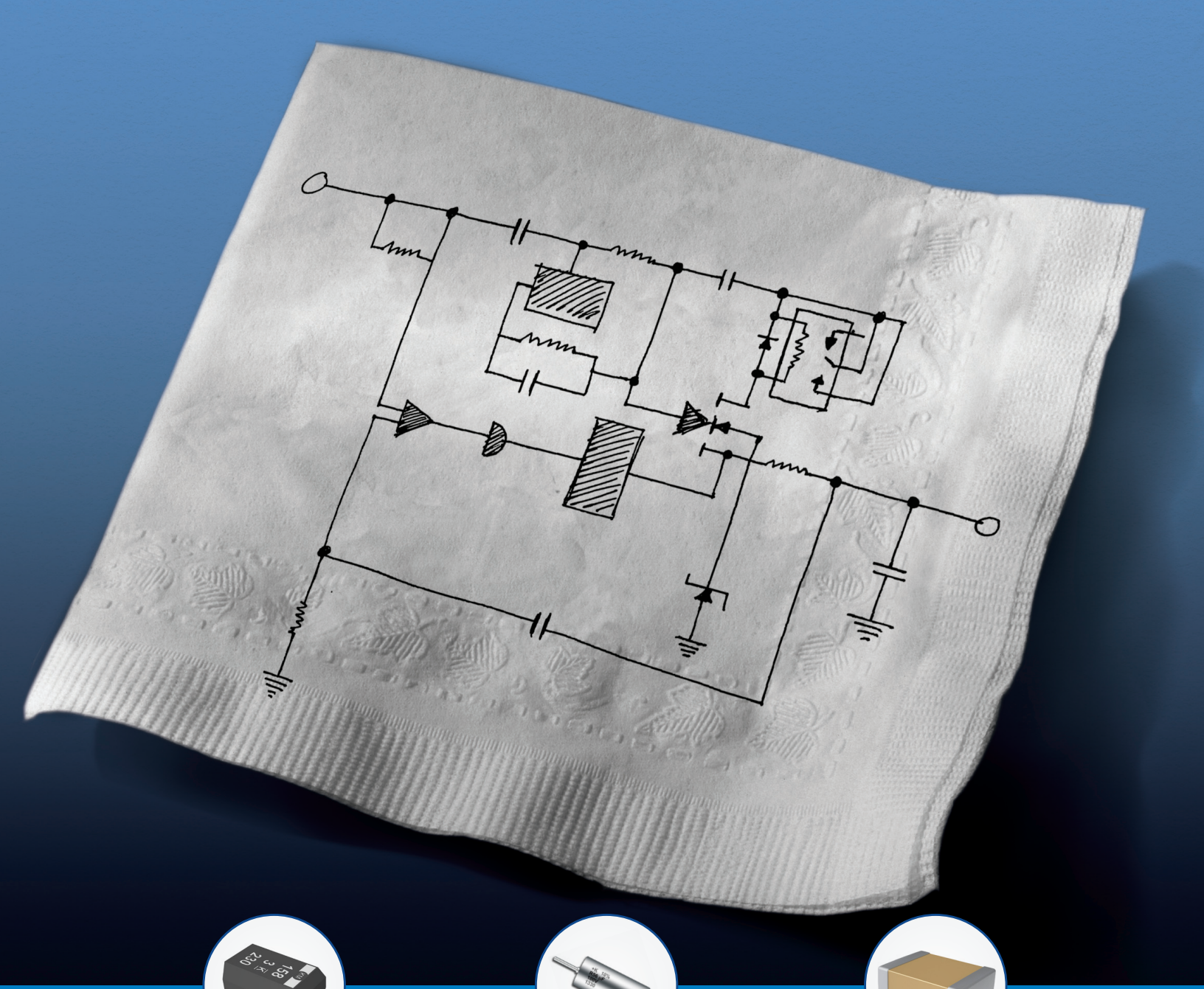


Capacitors for DC Applications

KEMET makes it possible.

Electronic Components
KEMET
CHARGED.

Why Choose KEMET

KEMET Electronics Corporation is a leading global supplier of electronic components. We offer our customers the broadest selection of capacitor technologies in the industry, along with an expanding range of electromechanical devices, electromagnetic compatibility solutions and supercapacitors. Our vision is to be the preferred supplier of electronic component solutions for customers demanding the highest standards of quality, delivery and service.

Electronic Components

KEMET

CHARGED.®

Table of Contents

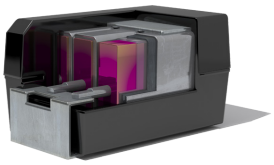
Blade Servers

Trends
- Compact design
- Increased density
- Customizability
- Solid State Drives (SSD)
- Low power

Circuit Conditions
- Storage temperature of +40°C to +65°C
- Working temperature of +10°C to +35°C
- Storage humidity of 5% to 95%
- Working humidity of 8% to 80%
- Input/output voltage of 12 VDC/1 – 5 VDC

Capacitor Requirements
- Low ESR and ESL
- High ripple current capability
- High capacitance
- Surge current capabilities
- Low-profile

Applications
- High speed servers
- DC/DC converters
- Decoupling
- Portable electronics
- Defense and aerospace
- Microprocessors
- High ripple current applications



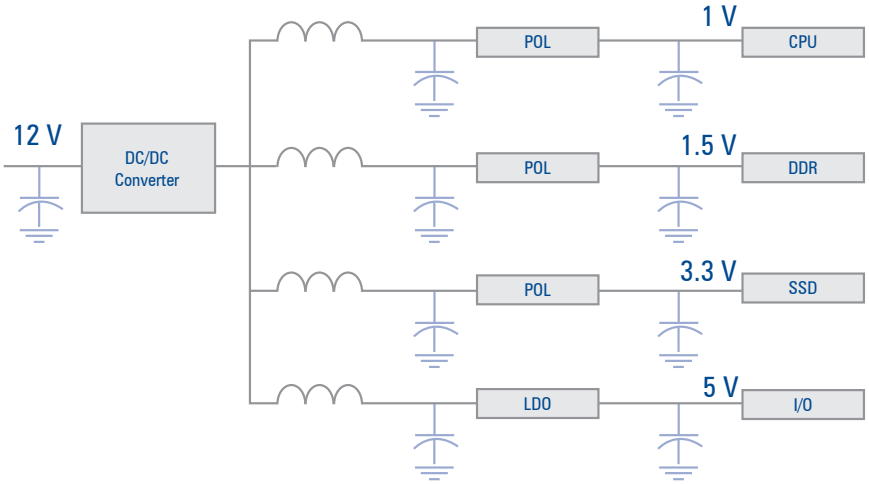
KO-CAP

Overview

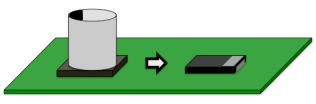
Today's internet applications are hosted on blade servers installed in data centers around the world. The mass proliferation of blade servers demand low-cost components available in low-profile heights. While idle, the blade server CPUs will enter into low-power mode.

Polymer electrolytic capacitors provide the energy needed when active components transition into high-performance modes at a moment's notice. The KEMET T520 Polymer and T530 High Capacitance Polymer Electrolytic Series offer excellent volumetric efficiencies, reliable operation and long life. The T528 Low ESL Facedown Terminal Polymer Electrolytic can be used specifically for decoupling a high performance CPU with an impressive low-profile height.

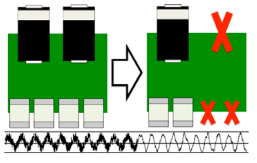
For operating temperatures below 85°C, X5R is a good choice for high capacitance ceramics. Surface mount aluminum electrolytic capacitors such as the KEMET EXV Series can provide the large bulk capacitance needed for decoupling from backplane power rails.



Feature Highlights



Low Profile



Low ESR Low ESR/ESL

Frequently Selected Part Numbers: Input (12 V – 48 V)

Series	Part Number	Capacitance (µF)	Voltage (VDC)	ESR (mΩ)	Ripple (A_{rms})	Size
T521	T521V686M016ATE050	68	16	50	1.9	7343-20
T521	T521D107M016ATE050	100	16	50	2.1	7343-31
T521	T521X337M016ATE025	330	16	25	3.1	7343-43
T521	T521X156M063ATE035	15	63	35	2.6	7343-43

Frequently Selected Part Numbers: CPU/DDR (1.0 V – 1.9 V)

Series	Part Number	Capacitance (µF)	Voltage (VDC)	ESR (mΩ)	Inductance	Ripple (A_{rms})	Size
T520	T520V477M2R5ATE006	470	2.5	6	1.8 nH at 20 MHz	5.6	7343-19
T528	T528Z477M2R5ATE005	470	2.5	5	.5 nH at 20 MHz	8.1	7343-17
T528	T528B277M2R5ATE005	270	2.5	5	.5 nH at 20 MHz	3.9	3528-20
T530	T530Y687M2R5ATE005	680	2.5	5	2.2 nH at 20 MHz	7.3	7343-40
T530	T530X158M2R5ATE005	1,500	2.5	5	2.4 nH at 20 MHz	7.3	7343-43

Frequently Selected Part Numbers: I/O / USB / SSD (3.3 V – 5.0 V)

Series	Part Number	Capacitance (µF)	Voltage (VDC)	ESR (mΩ)	Ripple (A_{rms})	Size
T520	T520B157M006ATE035	150	6.3	35	1.9	3528-20
T520	T520B227M006ATE025	220	6.3	25	2.3	3528-20
T520	T520V337M006ATE015	330	6.3	15	3.5	7343-19
T545	T545H108M006ATE055	1,000	6.3	55	1.8	7260-20
T545	T545H158M006ATE055	1,500	6.3	55	1.8	7260-20

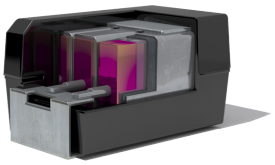
Embedded Controllers

Trends
- CPU enhancements
- Low power
- Weight reduction
- Thinner

Circuit Conditions
- Input voltage of 12 VDC
- CPU voltage of 0.9 – 1.05 VDC
- Off-chip memory storage voltage of 1.5 VDC
- Input/output and USB voltage of 3.3 – 5 VDC

Capacitor Requirements
- Long life
- Lower profile
- High reliability
- Low ESR
- High voltage

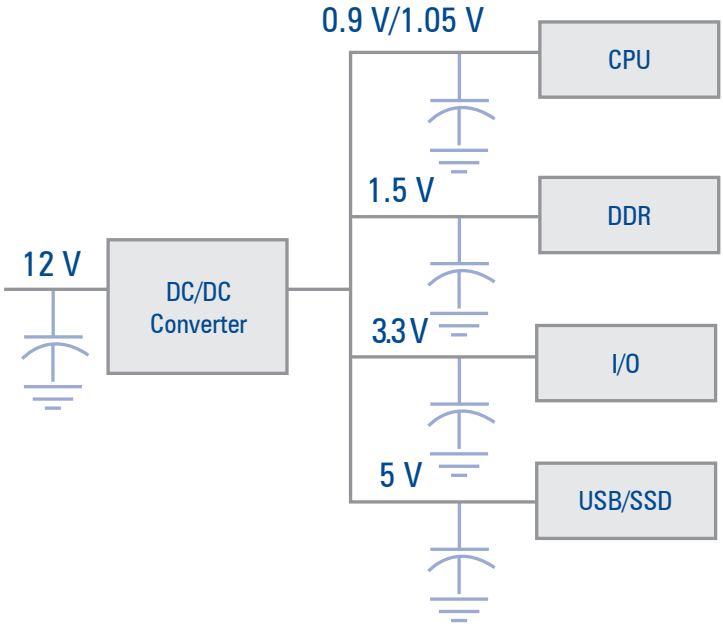
Applications
- High speed servers
- DC/DC converters
- Decoupling
- Portable electronics
- Defense and aerospace
- Microprocessors
- High ripple current applications



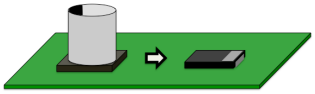
KO-CAP

Overview

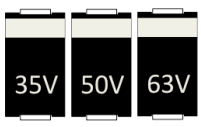
Embedded controllers are available in a range of form factors for various application areas. Regardless of the form factor, they are all powered by a large supply voltage which needs to be converted down to the low voltage rails of the controller. In low-profile applications, polymer electrolytic capacitors offer high capacitance in a reduced footprint. When board space is not at a premium, X7R ceramic capacitors can be utilized. Both polymer and X7R capacitors can be combined with KEMET's C0G ceramics for high frequency decoupling.



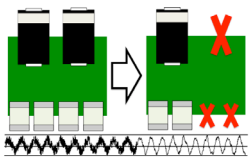
Feature Highlights



Low Profile



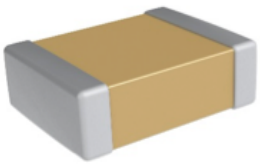
Higher Voltage Options



Low ESR Low ESR/ESL

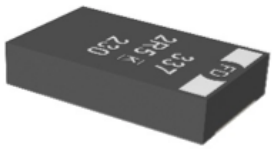
KEMET Products

Product Family	KEMET Series	Voltage (VDC)	Capacitance	Form Factor
High Frequency/Low Inductance				
Multilayer Ceramic	C0G, X7R	6.3 – 250	10 pF – 47 µF	Surface Mount
Low ESR Polymer Electrolytic	T520, T521	Up to 63	Up to 330 µF	Surface Mount
Low ESR/Inductance Polymer Electrolytic	T528	2 – 10	33 µF – 470 µF	Facedown Surface Mount
Low ESR/High Reliability				
Low ESR Polymer Electrolytic	T520, T521	Up to 63	Up to 330 µF	Surface Mount
Low ESR/Inductance Polymer Electrolytic	T528	2 – 10	33 µF – 470 µF	Facedown Surface Mount



C0G, X7R

T520, T521



T528

Frequently Selected Part Numbers

Application	Series	Part Number	Capacitance (µF)	Voltage (VDC)	ESR (mΩ)	ESL (nH)	Ripple (A_{rms})	Case Size
12 V Input	**T521**	T521D107M016ATE050	100	16	50	1.8	2.1	7343-31
12 V Input	**T521**	T521X337M016ATE025	330	16	25	1.8	3.1	7343-43
CPU	**T520**	T520V477M2R5ATE006	470	2.5	6	1.8	5.6	7343-19
CPU	**T528**	T528Z477M2R5ATE005	470	2.5	5	0.5	8.1	7343-17
CPU	**T528**	T528B277M002ATE005	270	2	5	0.5	3.9	3528-20
CPU	**T520**	T520D108M2R5ATE006	1,000	2.5	6	1.8	5.9	7343-30
I/O USB/SSD	**T520**	T520B227M006ATE025	220	6.3	25	1.2	2.3	3528-20
I/O USB/SSD	**T520**	T520B157M006ATE035	150	6.3	25	1.8	2.3	3528-20
I/O USB/SSD	**T520**	T520V477M006ATE035	470	6.3	35	1.8	2.3	7343-20

RoHS Pb Lead-free HF Halogen Free

Infotainment & Advanced Driver Assist Systems

Trends

- Infotainment integration
  - More features
  - Faster response
- Downsizing
  - High performance CPU
  - Smaller components
- Connectivity
  - RFID
  - Wireless technologies
  - Quick response code

Circuit Conditions

- Input/output voltage
  - 12 V/1 – 5 V
- Extreme environment
  - High temperature
  - High vibration
  - Long life

Capacitor Requirements

- Low ESR
  - < 100 mΩ
- Automotive manufacturing qualification (ISO/TS 16949)
- High capacitance
  - 22 – 470 µF
- High reliability

Applications

- In-cabin vehicle infotainment: audio, video, navigation
- Internet connectivity: WiFi, Bluetooth
- Adaptive Cruise Control (ACC)
- Blind Spot Detection (BSD)
- Rear Cross Traffic Alert (RCTA)
- Lane Departure Warning (LDW)

Overview

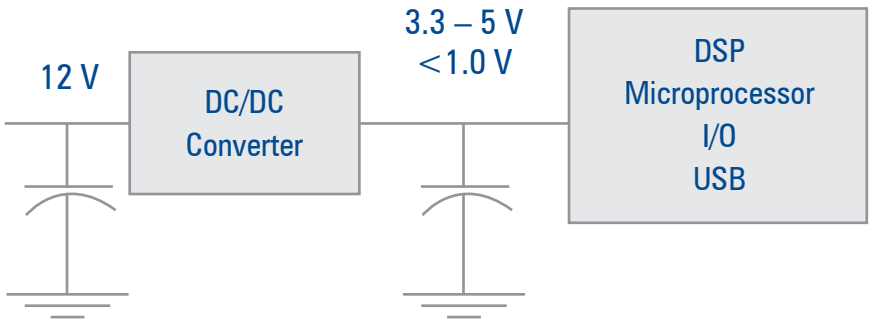
Components in automotive applications must be able to endure extreme environmental factors and electrical conditions. Whether the components are used in the drive train, advanced driver assist systems, or infotainment, high reliability and long operational life are critical.

An increasing number of microprocessors are utilized in all automotive systems resulting in the need for smaller components that are able to support higher performance CPUs. Ideal choices include X7R and C0G ceramics which often feature low parasitics such as low ESR and ESL.

High capacitance is available in small packages with KEMET's T495 Surge Robust MnO_2 and T591 High Performance Polymer surface mount capacitors. The T591 is the first polymer electrolytic solution from KEMET with polymer counter electrode designed specifically for automotive applications.

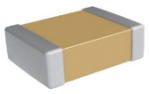
Wireless technologies such as in-cabin WiFi and Bluetooth enabled audio benefit from KEMET's Ceramic HiQ-CBR Series.

The Flex Suppressor® EMI Suppression Sheets also play an important factor in eliminating EMI in all of these sensitive systems.



Flex Suppressor® is a registered trademark of NEC TOKIN Corporation.

KEMET Products

KEMET Series	Voltage (VDC)	Capacitance	Temperature	Form Factor
Multilayer Ceramic				
C0G	10 – 200	0.5 pF – 0.47 µF	-55°C to +125°C	Surface Mount 
X7R	6.3 – 250	10 pF – 47 µF	-55°C to +125°C	
X5R	4 – 50	0.01 µF – 100 µF	-55°C to +85°C	
Polymer & MnO_2 Automotive Grade				
T491 AUTO	6.3 – 50	0.1 µF – 470 µF	-55°C to +125°C	Surface Mount 
T495 AUTO	6.3 – 50	0.1 µF – 680 µF	-55°C to +125°C	
T591 AUTO	2.5 – 50	33 µF – 330 µF	-55°C to +105/125°C	

Frequently Selected Part Numbers: 12 V Input

Series	Description	Part Number	Capacitance (µF)	Voltage (VDC)	ESR (mΩ)	Temperature (°C)	Size
T491	MnO_2 Automotive	T491D106K035ATAUTO	10	35	1,000	125	7343-31
T491	MnO_2 Automotive	T491X106K050ATAUTO	10	50	800	125	7343-43
T495	MnO_2 Automotive	T495D106K035ATA260	10	35	260	125	7343-31
T495	MnO_2 Automotive	T495X226K035ATA200	22	35	200	125	7343-43
T591	Polymer Automotive	T591D107M016ATE050	100	16	50	125	7343-31
T591	Polymer Automotive	T591D106M035ATE120	10	35	120	125	7343-31

Frequently Selected Part Numbers: 0.9 – 5 V Output

Series	Description	Part Number	Capacitance (µF)	Voltage (VDC)	ESR (mΩ)	Temperature (°C)	Size
T495	MnO_2 Automotive	T495C226K016ATA350	22	16	350	125	6032-28
T495	MnO_2 Automotive	T495B476K010ATA650	47	10	650	125	3528-21
T591	Polymer Automotive	T591V337M2R5ATE012	330	2.5	12	105	7343-20
T591	Polymer Automotive	T591D227M010ATE025	220	10	25	125	7343-31
T591	Polymer Automotive	T591B476M010ATE070	47	10	70	125	3528-20

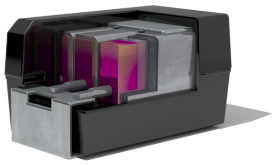
Liquid Crystal Display (LCD) Panels

Trends
- Increasing screen sizes
- Low power
- Weight reduction
- Thinner

Circuit Conditions
- Temperature < 70°C
- T-CON board voltage:
  - 12 – 15 VDC
  - 30 – 35 VDC
- Component height limitations:
  - ≤ 1.5 mm
  - ≤ 2.0 mm
- Input/output and USB voltage of 3.3 – 5 VDC

Capacitor Requirements
- High capacitance
- Low-profile
- High voltage > 16 V
- Long life

Applications
- EMI filters
- Output capacitors
- DC/DC converters
- Decoupling
- Portable electronics
- Telecommunications

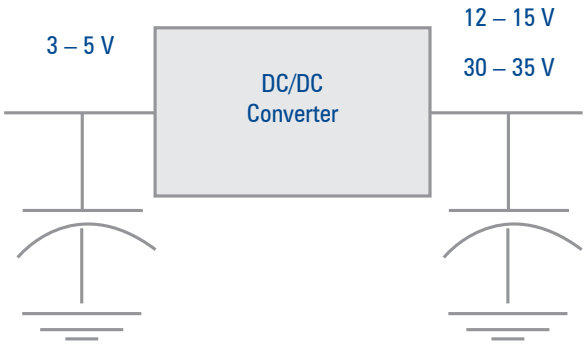


KO-CAP

Overview

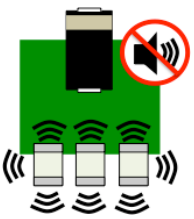
The transition to ultra-high definition displays such as 2K and 4K place more demands on LCD driver circuits. With increasing voltage and decreasing panel thicknesses demands, traditional components are no longer sufficient.

Backlights are generally modulated in the audible frequency range, which can result in noise from X5R and X7R ceramic capacitors. In circuits where piezoelectric noise isn't acceptable, polymer electrolytic capacitors offer quiet operation and long life in very slim packages. When 35 – 50 V rated components are needed with low-profiles, polymer electrolytic capacitors can be utilized in place of traditional V-chip aluminum surface mount capacitors.

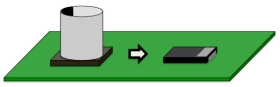


LCD Panel T-CON Board

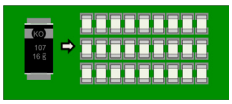
Feature Highlights



No Piezo Noise



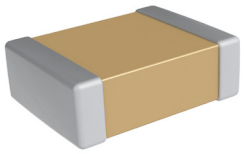
Low Profile



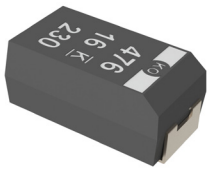
High Capacitance

KEMET Products

Product Family	KEMET Series	Voltage	Capacitance	Form Factor
Filtering & Decoupling				
Multilayer Ceramic	X7R	6.3 – 250 V	10 pF – 47 µF	Surface Mount
Low ESR Polymer Electrolytic	T520, T521	Up to 63 V	Up to 330 µF	Surface Mount



X7R



T520

T521

Frequently Selected Part Numbers

Application Voltage (VDC)	Series	Part Number	Capacitance (µF)	Voltage (VDC)	ESR (mΩ)	Case Size
3 – 5	**T520**	T520B107M006ATE040	100	6.3	40	3528-20
12 – 14	**T521**	T521W476M016ATE045	47	16	45	7343-15
12 – 14	**T521**	T521V476M016ATE070	47	16	70	7343-20
12 – 14	**T521**	T521V107M016ATE050	100	16	50	7343-20
12 – 14	**T521**	T521D157M016ATE050	150	16	50	7343-30
14 – 18	**T521**	T521W476M020ATE050	47	20	50	7343-15
15 – 20	**T521**	T521V336M025ATE060	33	25	60	7343-20
30 – 40	**T521**	T521V106M050ATE090	10	50	90	7343-20

RoHS Pb Lead-free HF Halogen Free

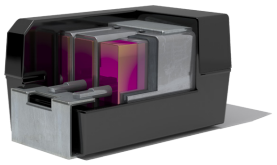
Network Infrastructure Equipment

Trends
- Increasing speed of 40 gigabytes per second
- Longer reliability
- Higher humidity and temperature breakdown
- Reduced energy consumption
- Thinner

Circuit Conditions
- Input/output voltage of 12 – 48 VDC/1 – 70 VDC
- Increasing temperature
- Increasing humidity
- Reduced dimensions

Capacitor Requirements
- Low ESR
- Low-profile
- High capacitance

Applications
- High speed servers
- DC/DC converters
- Microprocessor decoupling
- High ripple current applications
- Solid State Drives (SSD)
- Telecommunications



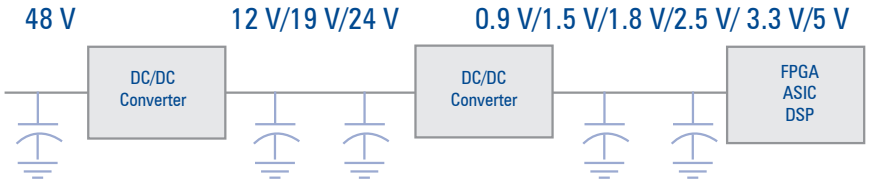
KO-CAP

Overview

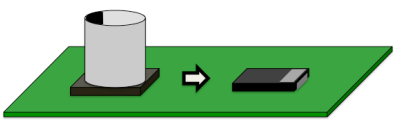
As network communication speeds increase, so do the demands of the ASICs found in the equipment supporting the infrastructure. These high performance ICs require high performance passive components to support continuous reliable operation. KEMET T520 and T521 Polymer Electrolytic capacitors provide high capacitance with a wide operational temperature range and low ESR. When lower ESR is needed, X7R and C0G ceramic capacitors can be used in parallel.

Combining daughter cards into a single design often places height limitations on components. KEMET chip style capacitors can assist with combining more components in a smaller footprint.

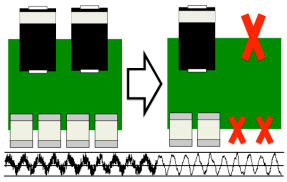
Solid state capacitor technologies such as polymer aluminum, polymer electrolytic, and multilayer ceramic are best suited for the long term reliability needs for network communication equipment.



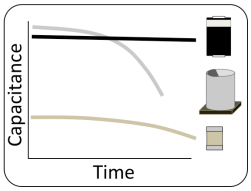
Feature Highlights



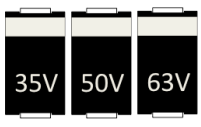
Low Profile



Low ESR Low ESR/ESL

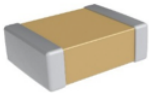


Long Life and Stable Capacitance



Higher Voltage Options

KEMET Products

Product Family	KEMET Series	Voltage (VDC)	Capacitance	Form Factor
Power Management/High Voltage				
Multilayer Ceramic	X7R	6.3 – 250	10 pF – 47 µF	Surface Mount 
	C0G	10 – 200	0.5 pF – 0.47 µF	
Low ESR Polymer Electrolytic	T520, T521	Up to 63	Up to 330 µF	Surface Mount 
Low Voltage / Low ESR				
Solid Polymer Aluminum	A700	2 – 16	6.8 – 560	

Frequently Selected Part Numbers

Application Voltage (VDC)	Series	Part Number	Capacitance (µF)	Voltage (VDC)	ESR (mΩ)	Ripple (A_{rms})	Case Size
0.9 – 1.8	**A700**	A700X567M002ATE005	560	2	5	3,900	7343-43
0.9 – 2.2	**T520**	T520V477M2R5ATE006	470	2.5	6	5.6	7343-19
3.3 – 5	**T520**	T520B227M006ATE025	220	6.3	25	2.3	3528-20
48	**T521**	T521D475M063ATE075	4.7	63	75	1.7	7343-31
12	**T521**	T521D157M016ATE050	150	16	50	1.9	7343-30
12	**T521**	T521X337M016ATE025	330	16	25	3.1	7343-43
19	**T521**	T521D336M025ATE060	33	25	60	1.9	7343-30
0.9 – 2.2	**T528**	T528Z477M2R5ATE005	470	2.5	5	8.1	7343-17
0.9 – 2.2	**T520**	T520D108M2R5ATE006	1,000	2.5	6	5.9	7343-30
3.3 – 5	**T520**	T520V477M006ATE035	470	6.3	35	2.3	7343-20
3.3 – 5	**T520**	T520B157M006ATE035	150	6.3	35	2.3	3528-20
24	**T521**	T521V156M035ATE100	15	35	100	1.4	7343-20
24	**T521**	T521X476M035ATE030	47	35	30	2.9	7343-43

RoHS Pb Lead-free HF Halogen Free

Powertrain, Chassis & Safety Applications

Trends
- Higher temperatures
- Downsizing
  - Higher performance
  - Smaller components
- Weight reduction

Circuit Conditions
- Powertrain input: 12 – 48 V
- Powertrain output: 3.3 – 5 V
- Chassis and safety input: 12 – 48 V
- Chassis and safety output: 1 – 5 V
- Extreme environments (high temperature, high vibration)

Capacitor Requirements
- High reliability
  - Temperatures up to 175°C
- Automotive manufacturing qualification (ISO/TS 16949)
- AEC-Q200 compliance

Applications
- Electronic engine controls
- Battery control units
- Starter generators
- Throttle control valves
- Electric drive systems
- Hydraulic control
- Airbags
- Electronic Stability Control (ESC)
- Tire Pressure Monitoring Systems (TPMS)

Overview

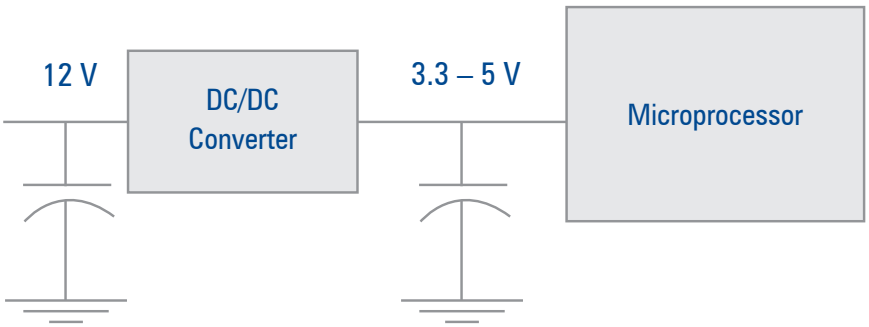
Automotive powertrains require capacitors that can withstand harsh temperatures up to 200°C and beyond. KEMET offers high temperature options in ceramic, MnO_2 and aluminum electrolytic dielectrics.

Ceramic capacitors can operate up to 150ºC with X8L and X8R components, while C0G is offered in styles that can withstand up to 200ºC. X8L and X8R are available with AEC-Q200 qualifications.

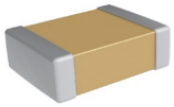
High temperature tantalum MnO_2 capacitors with AEC-Q200 qualifications include the T498 150ºC, T499 175ºC and T500 200ºC.

Axial leaded aluminum electrolytic capacitors are available with operational temperatures up to 150ºC. These devices are designed to be vibration resistant and provide both high voltage and high capacitance in a small package with industry-leading low ESR.

Chassis and safety applications require capacitors with high reliability and conservative designs. In Tire Pressure Monitoring Systems (TPMS), the T498 Series Automotive Grade MnO_2 150°C offers a solution.



KEMET Products

KEMET Series	Voltage (VDC)	Capacitance	Temperature	Form Factor
Multilayer Ceramic				
C0G	10 – 200	0.5 pF – 0.47 µF	-55°C to +125°C	Surface Mount 
X7R	6.3 – 250	10 pF – 47 µF	-55°C to +125°C	
X8L	10 – 50	0.01 µF – 10 µF	-55°C to +150°C	
X8R	25 – 100	10 pF – 0.22 µF	-55°C to +150°C	
MnO_2 Automotive Grade				
T491 AUTO	6.3 – 50	0.1 µF – 470 µF	-55°C to +125°C	Surface Mount 
T495 AUTO	6.3 – 50	0.1 µF – 680 µF	-55°C to +125°C	
T498 AUTO	6 – 50	0.47 µF – 220 µF	-55°C to +125°C	
T499 AUTO	6 – 50	0.15 µF – 220 µF	-55°C to +175°C	
T510 AUTO	4 – 50	10 µF – 1,000 µF	-55°C to +125°C	
Aluminum Electrolytic				
Radial	Up to 63	Up to 6,300 µF	Up to +150°C	Radial Crown 

Frequently Selected Part Numbers: Powertrain, Input (12 V)

Series	Description	Part Number	Capacitance (µF)	Voltage (VDC)	ESR (mΩ)	Temperature	Case Size
T491	MnO_2 Automotive	T491D106K035ATAUTO	10	35	1,000	125	7343-31
T498	MnO_2 Automotive 150°C	T498D106K035ATE700	10	35	700	150	7343-31
T498	MnO_2 Automotive 150°C	T498C335K035ATE1K7	3.3	35	1,700	150	6032-28
T499	MnO_2 Automotive 175°C	T499D106K035ATE700	10	35	700	175	7343-31
T499	MnO_2 Automotive 175°C	T499D335K050ATE2K0	3.3	50	2,000	175	7343-31

RoHS Pb Lead-free HF Halogen Free

Frequently Selected Part Numbers: Powertrain, Output (3.3 – 5 V)

Series	Description	Part Number	Capacitance (µF)	Voltage (VDC)	ESR (mΩ)	Temperature	Case Size
T495	MnO_2 Automotive	T495B226K010ATA2K3	10	10	2,300	125	3528-21
T495	MnO_2 Automotive	T495B106K010ATE1K8	10	10	1,800	125	3528-21
T498	MnO_2 Automotive 150°C	T498B106K010ATE1K8	10	10	1,800	150	3528-21
T498	MnO_2 Automotive 150°C	T498C476K016ATE300	47	16	300	150	6032-28
T498	MnO_2 Automotive 150°C	T498B106K016ATE3K0	10	16	3,000	150	3528-21
T498	MnO_2 Automotive 150°C	T498C226K016ATE600	22	16	600	150	6032-28

Frequently Selected Part Numbers: Chassis and Safety Applications, Input (12 V)

Series	Description	Part Number	Capacitance (µF)	Voltage (VDC)	ESR (mΩ)	Temperature	Case Size
T491	MnO_2 Automotive	T491D106K035ATAUTO	10	35	1,000	125	7343-31
T498	MnO_2 Automotive 150°C	T498D106K035ATE700	10	35	700	150	7343-31
T498	MnO_2 Automotive 150°C	T498C335K035ATE1K7	3.3	35	1,700	150	6032-28
T498	MnO_2 Automotive 150°C	T498X226K035ATE500	22	35	500	150	7343-43

Frequently Selected Part Numbers: Chassis and Safety Applications, Output (3.3 – 5 V)

Series	Description	Part Number	Capacitance (µF)	Voltage (VDC)	ESR (mΩ)	Temperature	Case Size
T489	MnO_2 Automotive Low Leakage	T489B476K010AT400	47	10	1,400	125	3528-21
T495	MnO_2 Automotive	T495B226K010ATA2K3	10	10	2,300	125	3528-21
T498	MnO_2 Automotive 150°C	T498B106K010ATE1K8	10	10	1,800	150	3528-21
T495	MnO_2 Automotive	T495B106K010ATE1K8	10	10	1,800	125	3528-21
T498	MnO_2 Automotive 150°C	T498C476K016ATE300	47	16	300	150	6032-28
T498	MnO_2 Automotive 150°C	T498C226K016ATE600	22	16	600	150	6032-28
T498	MnO_2 Automotive 150°C	T498X107M016ATE100	100	16	100	150	7343-43

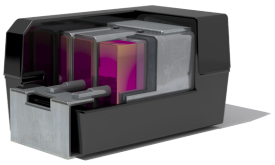
Smart Meter Controllers

Trends
- Energy conservation
- Real-time monitoring
- Longer life time
- Wireless connectivity

Circuit Conditions
- High humidity
- Operating temperature of +10°C to +35°C
- Approximately 10 to 15 years of operational life
- Hold-up bank

Capacitor Requirements
- Long life
- Low ESR and ESL
- Input/output voltage of 12 – 24 V/ 1.05 – 5 V
- Hold-up to 1,500 µF

Applications
- AC series power supplies
- EMI/RFI suppression
- Portable electronics
- Decoupling
- Microprocessors
- High ripple current applications



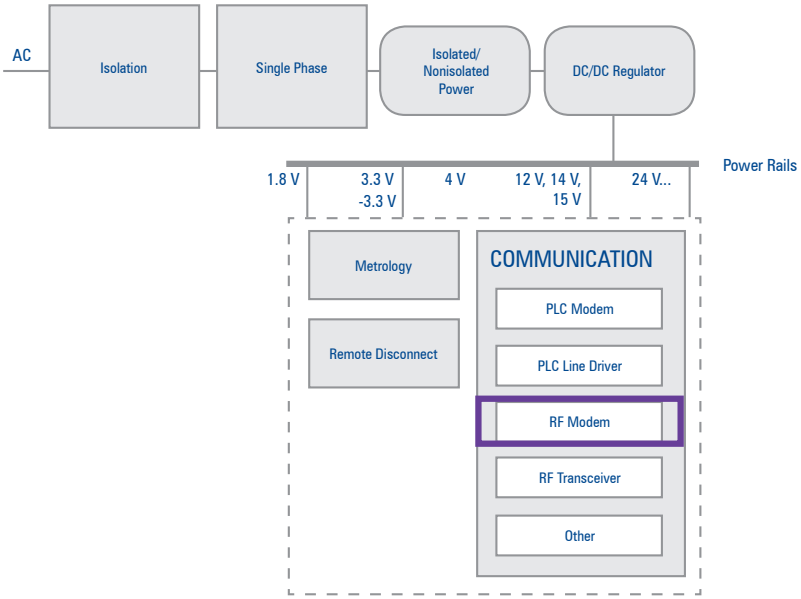
KO-CAP

Overview

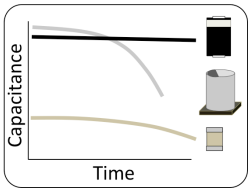
Smart meters have expected operational lifetime of 10 to 15 years once installed. As a result, components with long life and virtually no-wear out mechanism in high humidity environments are required.

After AC coupling, internal smart meter power rails can range from 1.8 V to 24 V. KEMET T521 High Voltage Polymer Electrolytic capacitors are well-suited for bulk decoupling on these high voltage DC rails. With no electrolyte to wear-out, T521 devices will provide long operational life.

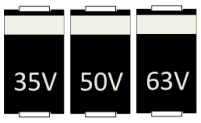
Hold-up energy reserves for RF modem (and power loss situations) can be provided by either a KEMET Supercapacitor (EDLC) or T520 Polymer Electrolytic capacitor, depending on the height available. These same high energy capacitors can also be used to provide peak current to the RF modem during communication.



Feature Highlights



Long Life and Stable Capacitance

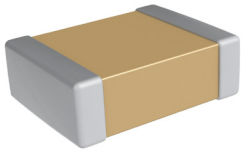


Higher Voltage Options

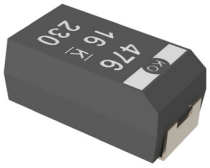
Smart Meter Controllers

KEMET Products

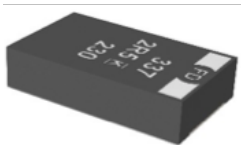
Product Family	KEMET Series	Voltage (VDC)	Capacitance	Form Factor
High Frequency/Low Inductance				
Multilayer Ceramic	X5R	4 – 50	0.01 μF – 100 μF	Surface Mount
	X7R	6.3 – 250	10 pF – 47 μF	Surface Mount
Low ESR Polymer Electrolytic	T520, T521	Up to 63	Up to 330 μF	Surface Mount
Low ESR/Inductance Polymer Electrolytic	T528	2 – 10	33 μF – 470 μF	Facedown Surface Mount
Electric Double-Layer Capacitors	HVZ	2.5 and 2.7	Up to 200 F	Snap-in
Low ESR/High Reliability				
Polymer Electrolytic	T520, T521	Up to 63	Up to 330 μF	Surface Mount
Low ESR/Inductance Polymer Electrolytic	T528	2 – 10	33 μF – 470 μF	Facedown Surface Mount



X5R, X7R



T520, T521



T528

HVZ

Frequently Selected Part Numbers

Series	Part Number	Capacitance (μF)	Voltage (VDC)	ESL (nH)	ESR (mΩ)	Ripple (A_{rms})	Case Size
T520	T520B227M006ATE035	220	6.3	1.8	35	1.9	3528-20
T520	T520H158M006ATE055	1,500	6.3	1.8	55	1.8	7260-20
T520	T520V477M2R5ATE006	470	2.5	1.8	6	5.6	7343-19
T521	T521X476M035ATE030	47	35	1.8	30	2.9	7343-43
T521	T521V686M016ATE050	68	16	1.8	50	1.9	7343-20
T528	T528Z477M2R5ATE005	470	2.5	0.5	5	8.1	7343-17

Trends

- Increasing storage: from gigabyte to terabyte
- Long life: 5 years minimum for SATA and PCIe interfaces
- Increasing hold-up time needs

Circuit Conditions

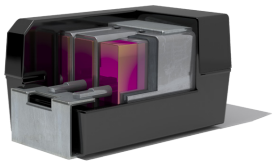
- NAND flash memory < 70°C
- Component height limitations: 1.2 – 2.0 mm
- Input voltage/current of 5 VDC or 12 VDC/1 – 2 A
- Drive start-up time in ms
- Redundancy in capacitance bank

Capacitor Requirements

- High energy density
- Low-profile
- Long life at < 70°C

Applications

- EMI filters
- DC/DC converters
- Defense
- Portable electronics
- Telecommunications

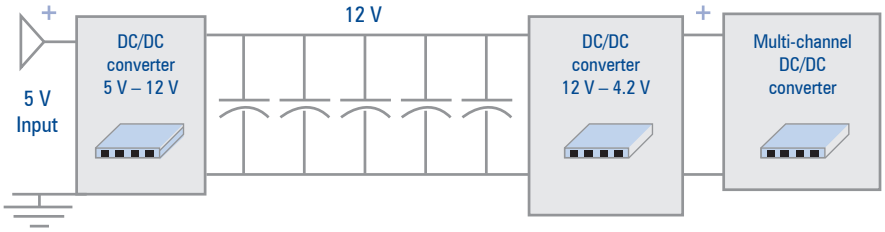


KO-CAP

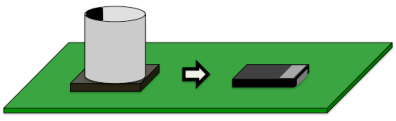
Overview

In the world of big data, Solid State Drives (SSDs) are becoming increasingly larger. Higher performance SSDs use larger buffers, which are volatile. When power is lost, they require a large bank of energy to finish flushing out those buffers.

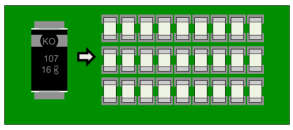
The long life at high temperature requirements (up to 85°C and occasionally higher) drive the need for solid capacitor technologies such as KEMET's T545 High Energy Polymer Electrolytic. These capacitors offer the highest energy densities with profile heights as low as 1.2 mm. With virtually no wear-out mechanism, the T545 Series offers long operational life at temperatures beyond 70°C.



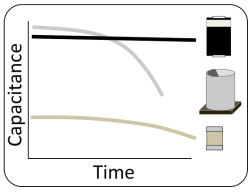
Feature Highlights



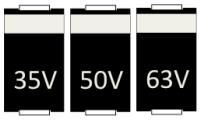
Low Profile



High Capacitance



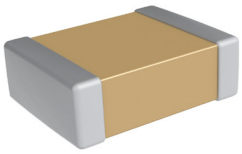
Long Life and Stable Capacitance



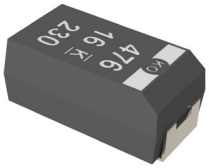
Higher Voltage Options

KEMET Products

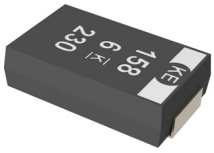
KEMET Series	Voltage (VDC)	Capacitance	Temperature	Form Factor
Multilayer Ceramic				
X7R	6.3 – 250	10 pF – 47 μF	-55°C to +125°C	Surface Mount
Low ESR Polymer Electrolytic				
T520	Up to 63	Up to 330 μF	-55°C to +125°C	Surface Mount
High Energy Polymer Electrolytic				
T545	6.3 – 16	Up to 1,500 μF	-55°C to +125°C	Surface Mount



X7R



T520



T545

Frequently Selected Part Numbers

Application Voltage (VDC)	Voltage	Capacitance (μF)	Case Size	KEMET Part Number	Energy (mJ)
5.67	6.3	1,000	7360-20	T545H108M006ATE055	11.57
5.67	6.3	1,500	7360-20	T545H158M006ATE035	17.36
5.67	6.3	470	7343-15	T545W477M006ATE035	5.44
5.67	6.3	470	7343-15	T545W477M006ATE055	5.44
5.67	6.3	470	7343-20	T545V477M006ATE055	5.44
9	10	220	7343-20	T545V227M010ATE045	7.92
9	10	330	7343-40	T545Y337M010ATE035	11.88
14.4	16	47	7343-15	T545W476M016ATE045	3.64
14.4	16	47	7343-20	T545V476M016ATE070	3.64
14.4	16	150	7343-43	T545X157M016ATE040	11.61
14.4	16	180	7360-20	T545H187M016ATE055	13.94
14.4	16	220	7343-43	T545X227M016ATE035	17.03
14.4	16	330	7343-43	T545X337M016ATE025	25.55
14.4	16	100	7343-20	T545V107M016ATE050	7.74
18	20	47	7343-20	T545V476M020ATE090	5.80

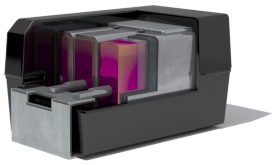
USB Power Bank

Trends
- Faster charging
- Increasing power
- Slim design
- Customizability

Circuit Conditions
- Increasing humidity
- Operating temperature of +40°C to +70°C
- Input/output voltage of < 20 V/4.25 – 5.25 V
- Increasing temperature

Capacitor Requirements
- Low-profile
- Small footprint
- High capacitance
- High ripple current

Applications
- EMI/RFI suppression
- Portable electronics
- Telecommunications
- High ripple current applications
- Microprocessors



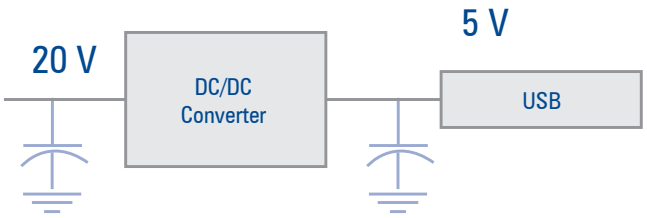
KO-CAP

Overview

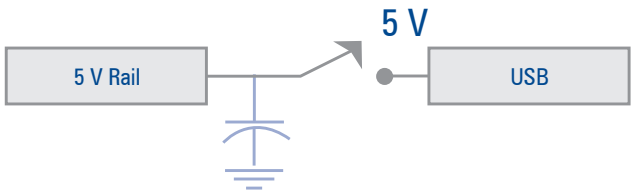
Chargers utilized in today's mobile devices have a well-defined output of approximately 5 V. However, the input can run up to 20 V depending on the design. With mobile devices becoming increasingly power hungry, the need to maintain the rail voltage is critical, driving the need for higher bulk capacitance.

Chargers built into slim ultrabooks and hubs require slim capacitors. KEMET's T520 and T521 Polymer Electrolytic Series provide high capacitance at 5 V in a low profile. For designs with space to spare, X5R and X7R ceramic capacitors are additional options.

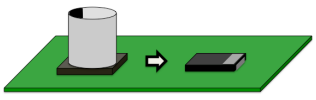
5 V Power Bank



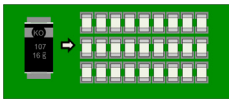
Embedded USB Circuit



Feature Highlights



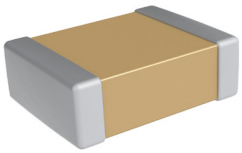
Low-Profile



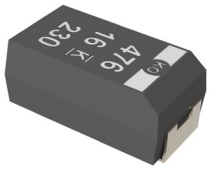
High Capacitance

KEMET Products

Product Family	KEMET Series	Voltage (VDC)	Capacitance	Form Factor
High Ripple/Low Inductance				
Multilayer Ceramic	X7R	6.3 – 250	10 pF – 47 µF	Surface Mount
Low ESR Polymer Electrolytic	T520, T521	Up to 63	Up to 330 µF	Surface Mount
Low ESR/ High Reliability				
Low ESR Polymer Electrolytic	T520, T521	Up to 63	Up to 330 µF	Surface Mount
Low ESR/Inductance Polymer Electrolytic	T528	2 – 10	33 µF – 470 µF	Facedown Surface Mount



X7R



T520, T521

Frequently Selected Part Numbers

Application Voltage (VDC)	Series	Part Number	Capacitance (µF)	Voltage (VDC)	ESR (mΩ)	Ripple (A_{rms})	Case Size
5	**T520**	T520M157M006ATE035	150	6.3	35	1.6	3528-15
5	**T520**	T520B227M006ATE025	220	6.3	25	2.3	3528-20
20	**T521**	T521B156M025ATE090	15	25	90	1.0	3528-20

RoHS
Pb Lead-free
HF Halogen Free

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