PASSIVE COMPONENTS for Energy Harvesting

Capacitors, SuperCapacitor, Schottky Diode, Inductors & Connectors

AVX ordering PN: KIT-ENERGY HARVEST

ENERGY HARVESTING INTRODUCTION

Energy harvesting is becoming a more practical solution to providing circuit power for a variety of reasons.

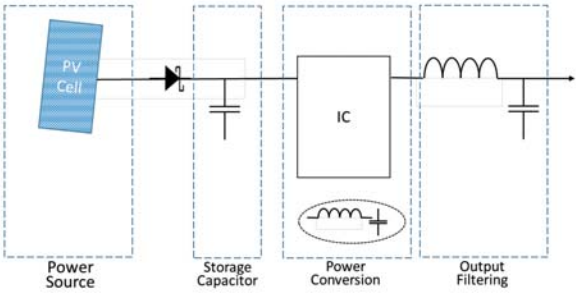
First – IC and general circuit power needs are generally dropping – sometimes to levels unheard of just a few years ago. Next, the cost of energy harvester sources is dropping. Energy harvester efficiency and size are also improving dramatically thus allowing smaller, lighter & more reliable generator sources to be utilized. TEGS, solar cells, piezoelectric and micro wind turbines are all becoming viable energy sources.

Storage capacitor cost and size are both dropping while the number of capacitor types & styles are increasing.

A wide variety of ICs are now on the market that make energy harvesting as easy as selecting a source, sizing a storage capacitor and filtering the output.

This kit is intended to serve as the passive glue for most energy harvesting sources & ICs. The kit contains low loss components intended for energy storage, blocking, IC support, output filtering and external connections.

BLOCK DIAGRAM

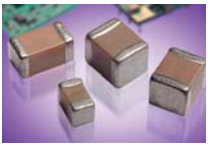


For design suggestions, part recommendations, or other assistance, please contact your local AVX sales representative, visit us at www.avx.com, or call us at 864-967-2150.

IN THIS DESIGN KIT...

For more detailed part information please email us at inquiry@avx.com

X5R DIELECTRICS

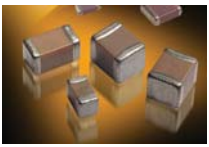


X5R dielectric is a Class II type dielectric suitable for higher capacitance applications. This dielectric offers high volumetric efficiency. Small case size X5R capacitors are well suited for decoupling and filtering applications in mobile devices and other applications with size constraints.

X5R DIELECTRIC CAPACITORS

AVX PN	Size	Capacitance (µF)	Rated Voltage (V)	Note
0603ZD105MAT2A	0603	1	10	Contact AVX for availability of Termination and Tolerance options
0603ZD106MAT2A	0603	10	10	
0603ZD225MAT2A	0603	2.2	10	
0603ZD475MAT2A	0603	4.7	10	
08053D226MAT2A	0805	22	25	
1206ZD476MAT2A	1206	47	10	
1210YD106MAT2A	1210	10	16	

X7R DIELECTRICS



X7R formulations are called “temperature stable” ceramics and fall into EIA Class II materials. X7R is the most popular of these intermediate dielectric constant materials. Its temperature variation of capacitance is within ±15% from -55°C to +125°C. This capacitance change is non-linear.

X7R DIELECTRIC CAPACITORS

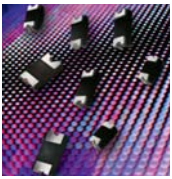
AVX PN	Size	Capacitance (µF)	Rated Voltage (V)	Note
06035C102MAT2A	0603	1000pF	50	Contact AVX for availability of Tolerance options
06035C103MAT2A	0603	0.01µF	50	
06035C104MAT2A	0603	0.1µF	50	
06035C331MAT2A	0603	330pF	50	
06035C471MAT2A	0603	470pF	50	
08055C101MAT2A	0805	100pF	50	

SCC SERIES SUPERCAPS

The new series of cylindrical electrochemical double-layer capacitors offers excellent pulse power handling characteristics based on the combination of very high capacitance and very low ESR. Used by themselves or in conjunction with primary or secondary batteries, they provide extended back up time, longer battery life, and provide instantaneous power pulses as needed. Offers great solutions to hold up, energy harvesting, and pulse power applications.

SCC SERIES SUPERCAPACITOR					
AVX PN	Diameter (mm)	Length (mm)	Capacitance (F)	Rated Voltage (V)	ESR Max @ DC (mΩ)
SCCQ12B105SRB	6.3	12	1	2.7	500

SD SERIES SCHOTTKY DIODES



AVX Schottky rectifier diodes offer unique lead-less chip packaging technology which eliminates the lead frame wire bond to give the chip top-bottom symmetry for fewer mounting problems, better heat transfer, and current handling capability (compared to SOD devices). EIA 1206 size Schottky diodes with forward voltage as low as 0.38V and working voltage range of 20V to 100V. All AVX SD Series diodes are equivalent in footprint to JEDEC sizes.

SD SERIES SCHOTTKY DIODE				
AVX PN	Size	Max Forward Current (A)	Max Reverse Voltage (V)	Note
SD1206S020S0R5	1206	0.5	20	Standard thinkness

LMXN SERIES (STYLE B) INDUCTORS

AVX provides a wide variety of inductors for the industrial, consumer, computer and telecommunication markets. These inductors provide a robust offering which includes Power and RF products with high quality solutions and new technologies. Non-Shielded SMD Power Inductors with ferrite core and sizes ranging from 7.5 x 5.2 x 3.2 (mm) to 22.35 x 16.26 x 8.00 (mm). Inductance ranges from 0.47 to 470µH and rated current ranges from 0.53 to 30A.

LMXN SERIES (STYLE B) INDUCTORS

AVX PN	Size	Inductance (µH)	Tolerance	I_{sat} Max (A)	Note
LMXN0705M1R5BTAS	0705	1.5	±20%	0.050	Non-Shielded
LMXN0705M4R7BTAS	0705	4.7	±20%	0.090	
LMXN0705M100BTAS	0705	10	±20%	0.160	
LMXN0705M220BTAS	0705	22	±20%	0.370	

CONNECTORS

Series 9286 Wire-to-Wire: 18-24AWG
The development of an active stainless steel spring contact eliminates the need for push button activation to insert and remove wires which offers a significant cost savings. The mechanical properties of this contact provide maximum wire retention across a broad range of solid and stranded wire gauges, making this connector very versatile in field installations.

Series 9296 Wire-to-Board Poke Home: 12-28AWG
The new dual-beam boxed contact system from AVX surface mounts to a PCB and provides a simple and reliable wire termination without soldering of the wire. This family of 4mm, 3mm, 2mm and 1.7mm closed box contacts accept either solid or stranded wires ranging from 12AWG to 28AWG with current ratings up to 20Amps.

Series 9175/6/7 Wire-to-Board IDC: 12-28AWG

AVX's STRIPT™, insulation displacement naked contact technology provides cost effective, insulator-less, wire-to-board connection for discrete wire applications. Designed from the ground up to function just like a traditional insulated connector, these UL certified contacts have been industry proven for many years.

CONNECTORS	
Series 9286 Wire-to-Wire: 18-24AWG *	Voltage Rating: 300 VAC Operating Temperature: -40°C to +130°C Insulator Material: Glass-Filled Nylon 46; UL94V0 Fixed Contact Material: Copper Alloy Flexing Contact: Stainless Steel Fixed Contact Plating: Tin over Nickel
Series 9296 Wire-to-Board Poke Home: 12-28AWG *	Voltage Rating: 300V (Based on placement distance) Operating Temperature: -40°C to +125°C Contact Material: Phosphor Bronze Contact Plating: Pure Tin
Series 9175/ 6/ 7 Wire-to-Board IDC: 12-28AWG	Voltage Rating: 600 VAC Current Rating: 15 Operating Temperature: -40°C to +125°C Contact Material: Phosphor Bronze Contact Plating: Pure Tin over Nickel

* See datasheets for different Current Ratings

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