

# 0603 Active Filter Series



## GENERAL DESCRIPTION

AVX has developed the Active Filter Series to address the emissions and susceptibility problems typical of today's high speed digital circuits. The Active Filter Series is the equivalent of back-to-back Zener diodes and an EMC capacitor integrated into a single 0603 SMT case size. In its off state the Active Filter Series can be used to attenuate EMI/RFI. Typical values of attenuation at 3dB are 450MHz - 5000MHz, and typical values of attenuation at 10dB are 950MHz - 2600MHz. A more definitive representation of the filter effect is shown in the  $S_{21}$  curve. One of the specific advantages of the Active Filter Series is a consistent EMI attenuation across a large bandwidth (without multiple frequency poles occurring). This makes compliance to Electromagnetic Susceptibility and Emission Specifications such as FCC Part 68, SAE J1113 and IEC 61000-4-2 a much easier task for the designer.



## HOW TO ORDER

### AFS

**Style**  
Active  
Filter  
Series

### 0001

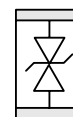
**Case Size**  
0001 = 0603 Discrete

### D

**Packaging Code  
(Reel Size)**  
D = 7" Reel (1,000 pcs.)  
R = 7" Reel (4,000 pcs.)  
T = 13" Reel (10,000 pcs.)

### P

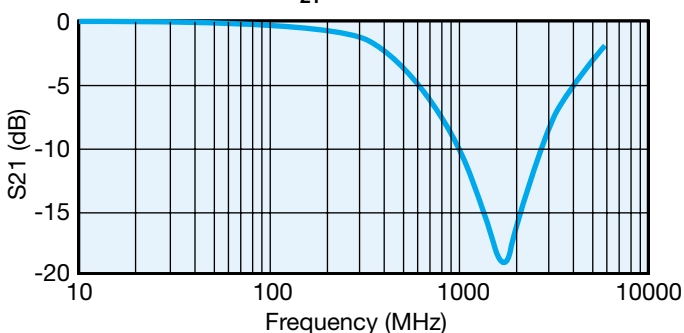
**Termination**  
P = Plated (Ni/Sn Alloy)



## PERFORMANCE CHARACTERISTICS

PARAMETER	TEST CONDITION	LIMIT
Peak Pulse	1ms, $T_a \leq 25^\circ\text{C}$	7.5 W
Power Dissipation	$T_a \leq 25^\circ\text{C}$ , FR-4	225 mW
Power Dissipation	$T_a \leq 25^\circ\text{C}$ , Alumina	300 mW
Zener Voltage	1mA	80 V
Device Capacitance	1 MHz	27 pF (max)
Peak Current		2.5 A
Reverse Recovery Time		$\leq 600$ pS
Turn On Time		$\leq 600$ pS
Operating Temperature		-65 to +150°C
Storage Temperature		-65 to +150°C

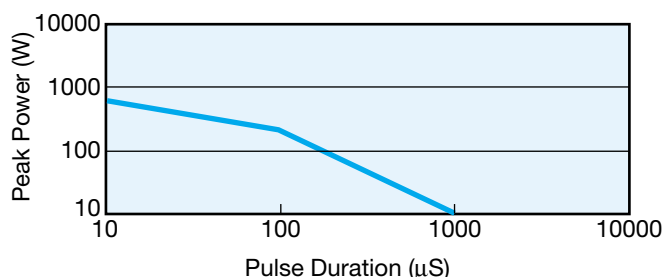
$S_{21}$  Curve



## MECHANICAL SPECIFICATIONS

CTE (PPM / °C)	6.1 ppm/°C
Thermal Conductivity	0.5 (W/cm)/°C

Typical Pulse Rating Curve



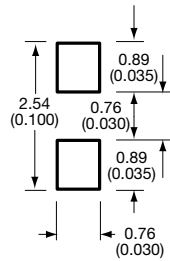
# 0603 Active Filter Series



## PHYSICAL DIMENSIONS millimeters (inches)

Length	1.6 ±0.15 (0.063 ±0.006)
Width	0.8 ±0.15 (0.031 ±0.006)
Thickness	0.9 Max. (0.035 Max.)
Term Band Width	0.35 ±0.15 (0.014 ±0.006)
Term Separation	0.7 (0.028)

## SOLDER PAD DIMENSIONS millimeters (inches)

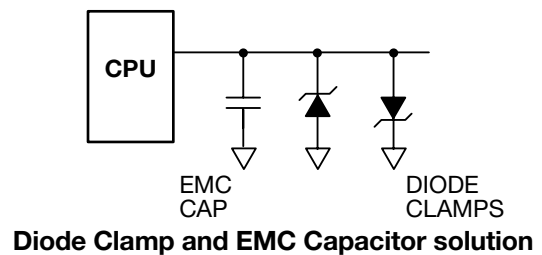
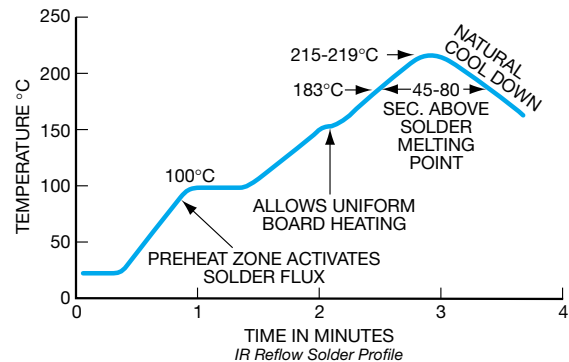


## APPLICATION

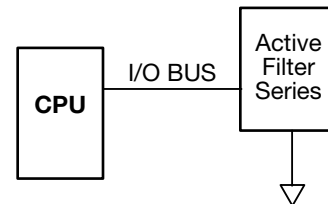
The Active Filter Series is an important step towards integration of several active and passive devices into one package. Integration in turn creates a major size reduction for board layout engineers. Typical size reductions of >90% can be achieved by replacing diode packages and associated EMC capacitors with an AVX Active Filter device. An example of such replacement is shown on the right. In addition, overall system reliability is improved with the AFS due to a FIT of  $\leq 0.1$  failures (per billion hours).

## TYPICAL INFRARED REFLOW PROCESS (IR)

Soldering with IR has the highest yields due to controlled heating rates and solder liquidus times. Only the dwell time and peak temperature limitations of resin-molded components need to be considered. Typical recommended solder paste wet layout is  $\geq 6$  mils.



## Simplified design with the AVX Active Filter Series



NOTICE: Specifications are subject to change without notice. Contact your nearest AVX Sales Office for the latest specifications. All statements, information and data given herein are believed to be accurate and reliable, but are presented without guarantee, warranty, or responsibility of any kind, expressed or implied. Statements or suggestions concerning possible use of our products are made without representation or warranty that any such use is free of patent infringement and are not recommendations to infringe any patent. The user should not assume that all safety measures are indicated or that other measures may not be required. Specifications are typical and may not apply to all applications.

### USA

**AVX Myrtle Beach, SC**  
Corporate Offices  
Tel: 843-448-9411  
FAX: 843-626-5292

**AVX Northwest, WA**  
Tel: 360-669-8746  
FAX: 360-699-8751

**AVX North Central, IN**  
Tel: 317-848-7153  
FAX: 317-844-9314

**AVX Mid/Pacific, MN**  
Tel: 952-974-9155  
FAX: 952-974-9179

**AVX Southwest, AZ**  
Tel: 480-539-1496  
FAX: 480-539-1501

**AVX South Central, TX**  
Tel: 972-669-1223  
FAX: 972-669-2090

**AVX Southeast, NC**  
Tel: 919-878-6357  
FAX: 919-878-6462

**AVX Canada**  
Tel: 905-564-8959  
FAX: 905-564-9728

**AVX Limited, England**  
European Headquarters  
Tel: ++44 (0)1252 770000  
FAX: ++44 (0)1252 770001

**AVX S.A., France**  
Tel: ++33 (1) 69.18.46.00  
FAX: ++33 (1) 69.28.73.87

**AVX GmbH, Germany - AVX**  
Tel: ++49 (0) 8131 9004-0  
FAX: ++49 (0) 8131 9004-44

### EUROPE

**AVX GmbH, Germany - Elco**  
Tel: ++49 (0) 2741 2990  
FAX: ++49 (0) 2741 299133

**AVX srl, Italy**  
Tel: ++390 (0)2 614571  
FAX: ++390 (0)2 614 2576

**AVX Czech Republic, s.r.o.**  
Tel: ++420 (0)467 558340  
FAX: ++420 (0)467 558345

### ASIA-PACIFIC

**AVX/Kyocera, Singapore**  
Asia-Pacific Headquarters  
Tel: (65) 258-2833  
FAX: (65) 350-4880

**AVX/Kyocera, Hong Kong**  
Tel: (852) 2-363-3303  
FAX: (852) 2-765-8185

**AVX/Kyocera, Korea**  
Tel: (82) 2-785-6504  
FAX: (82) 2-784-5411

**AVX/Kyocera, Taiwan**  
Tel: (886) 2-2696-4636  
FAX: (886) 2-2696-4237

**AVX/Kyocera, China**  
Tel: (86) 21-6249-0314-16  
FAX: (86) 21-6249-0313

**AVX/Kyocera, Malaysia**  
Tel: (60) 4-228-1190  
FAX: (60) 4-228-1196

**Elco, Japan**  
Tel: 045-943-2906/7  
FAX: 045-943-2910

**Kyocera, Japan - AVX**  
Tel: (81) 75-604-3426  
FAX: (81) 75-604-3425

**Kyocera, Japan - KDP**  
Tel: (81) 75-604-3424  
FAX: (81) 75-604-3425



A KYOCERA GROUP COMPANY

<http://www.avxcorp.com>

S-AFS2.5M0701-N