



TECHNICAL INFORMATION

SOLDER REFLOW MOUNTING
“TACmicrochip” TANTALUM CAPACITOR

SOLDER REFLOW MOUNTING “TACmicrochip” TANTALUM CAPACITOR

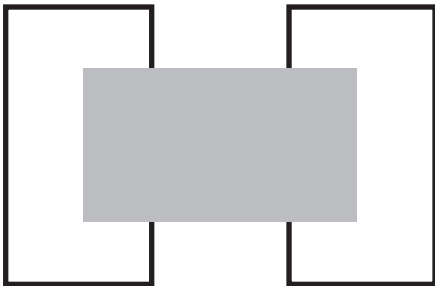
Solder reflow mounting of the small 0603 “TACmicrochip” requires a rethink from the established mounting of the 0603 ceramic chip or molded TAJ R type tantalum capacitors.

The new design of the 0603 chip tantalum capacitor has only end faces metallized to accept the solder connection, unlike the ceramic which has end faces and edges metallized. The change to only end face metallization means that the mounting pad footprint design has to be changed to allow for no edge soldering.

Footprint pad design has two major differences:

PRINTED CIRCUIT BOARD PAD AREA COMPARISON FOR 0603 CAPACITOR

STANDARD CERAMIC PAD DESIGN



TOTAL PAD AREA 3.36mm Sq

NEW TANTALUM DESIGN



TOTAL PAD AREA 2.18mm Sq

1. The width of the pad can be the same as the capacitor as there is no requirement of edge solder fillets. The pad design will therefore require less PCB board area thus increasing package density on the PCB.

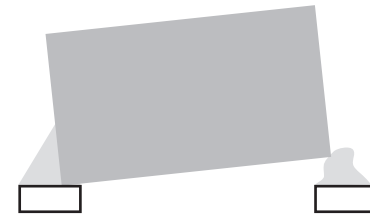
2. Distance between pads under the capacitor has to be increased (when compared with the ceramic) in order to reduce the mass of solder under the end of the capacitor. Reducing this mass will stop the capacitor floating away from the PCB on a ball of solder, inhibiting soldering to the end face termination.

SOLDER PAD DESIGN

CORRECT PAD DESIGN



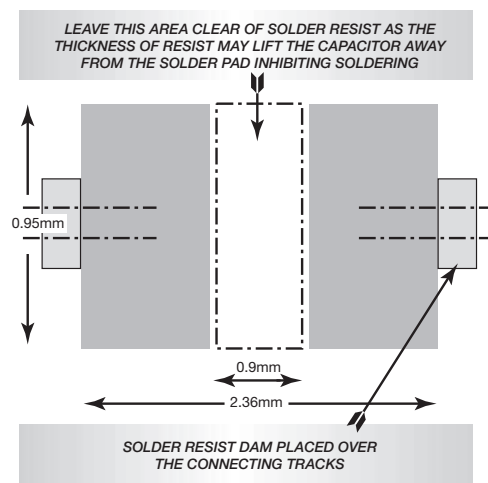
INCORRECT PAD DESIGN



EXCESS PAD EXTENDING UNDER THE CAPACITOR WILL RESULT IN CAPACITOR LIFTING AWAY FROM SUBSTRATE

It also has a beneficial effect on minimizing the electrical leakage current path under the capacitor by increasing the path length between the pads. This will become more important as the capacitors become smaller.

The suggested pad design for the 0603 TACmicrochip:



The small pad area required for this size of capacitor makes solder mass added to the pad critical. To obtain the correct solder fillet, it is important to restrict solder flowing into or out of the pad area by the use of solder resist dams, which will block the movement of solder to and from the connecting solder tracks.

In order to obtain the correct solder fillet on the end connections, the mass of solder added to the pad is important.



VERY SMALL FILLET WILL GIVE A POOR SOLDER YIELD



CORRECT SOLDER FILLET



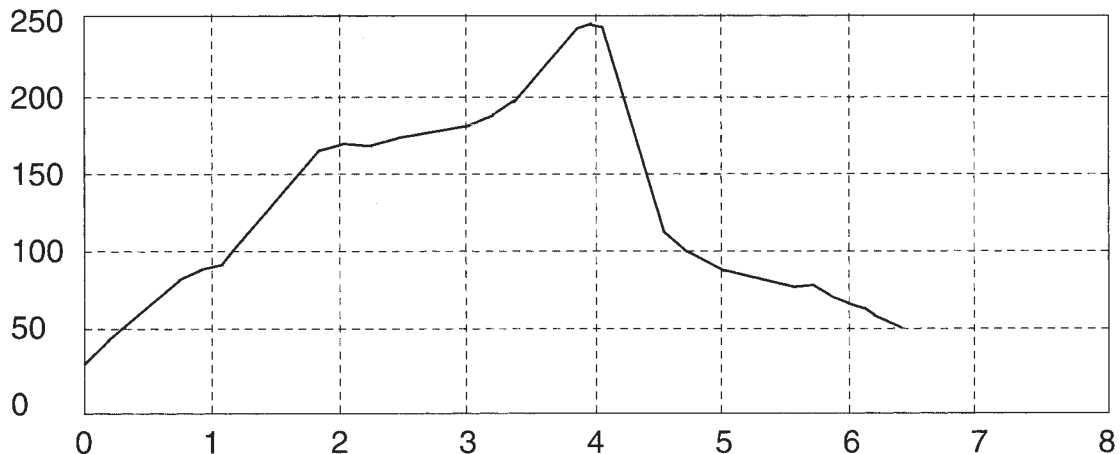
LARGE SOLDER FILLET CAN CAUSE TOMBSTONING

Unfortunately it is not a simple matter to give the weight of solder required to form the correct solder fillet. We have found that the flux added to the solder by the various suppliers can vary from 1% to 60%. Loss of flux and other volatiles control the resulting mass of solder after solder reflow process.

In AVX tests Solder Plus ESP 62 RA-A has been found satisfactory for the 0603 capacitor (0.015 grams \pm 0.005 grams was found to give results).

The solder heating profile used peaked at 235°C, details of the profile is given below.

SOLDER REFLOW TEMPERATURE CYCLE



USA

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

AVX Northwest, WA
Tel: 360-699-8746
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: 919-878-6223
FAX: 919-878-6462

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

EUROPE

**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

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

Contact:

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.

© AVX Corporation



<http://www.avxcorp.com>

S-SRMT00M301-N