



Newsletter 03/2013

Necessity for DPA on Passive EEE Components

Due to controversial opinions about the necessity for Destructive Parts Analysis (DPA) on passive EEE components, we have analysed our DPA activities for the past five years and presented the results at the Space Passive Components Conference organised by ESA/ESTEC from the 24th to the 26th of September 2013 at Noordwijk, The Netherlands. Since the conference was well attended by manufacturers of passive parts, we wish to share the main message with other stakeholders – especially users of EEE components through this newsletter, in order for them to better appreciate the risk they take by omission of DPA on passive EEE components.

We deduced a total of 2768 lots of passive components from a total of 5700 lots, on which DPA was performed from January 2009 to April 2013. An average non-conformance quota of 5% was obtained for the 2768 lots of passive EEE components, implying that 138 potentially risky lots were procured. Considering that Tesat procures EEE components directly from the manufacturers or from authorised distributors, 5% non-conformance is a relatively large amount, however, not every non-conformance leads to lot rejection. The 138 failed lots were separated into two groups: qualified (QPL listed) and unqualified parts (see table). It was found that qualified parts make up 50.6% of all findings. It should be noted that 55% of the 2768 inspected lots are qualified parts. From these results, we strongly question the exemption of qualified parts from DPA inspection. To our knowledge, there are no statistics of this nature that suggest the exemption of passive or qualified parts from DPA.

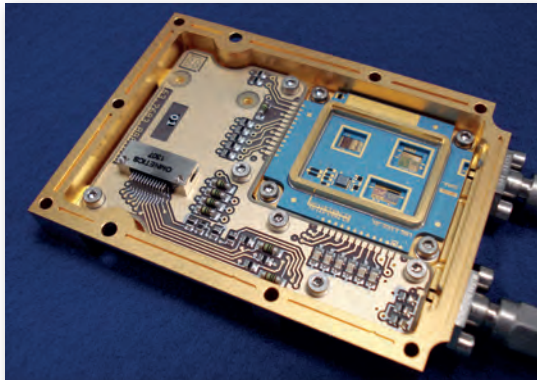
Family code	Family name	No. of findings January 2009 to April 2013	No. of findings on QPL listed parts: (ESCC/MIL)	Finding quota of qualified parts (%)
01	Capacitors	38	14 (11/3)	36.84
02	Connectors	16	9 (5/4)	56.25
05	Filters	1	1 (0/1)	100
07	Inductors	15	15 (14/1)	100
09	Relays	3	3 (3/0)	100
10	Resistors	6	0	0
11	Thermistors	4	1 (0/1)	25
14	Transformers	2	0	0

Table: Finding quota on qualified parts with respect to total number of findings.

Since we employ DPA as a means to monitor manufacturers from whom we routinely procure certain EEE components, major parts manufacturers were listed and the number of findings on their parts was compared with the number of lots procured from these manufacturers and submitted for DPA in the considered period. A non-conformance was found in more than 50% of DPA's performed on lots from a good number of manufacturers. With our continuous feedback to the manufacturers, we aim at helping them supply better quality parts in subsequent production lots and to reduce the risk of parts failure in later project phases, while contributing to the reliability of space equipment and the success of space projects.

For more details on this analysis please contact Dr. Augustine Mofor (che.mofor@tesat.de).

LTCC-Multilayer Technology at Tesat



The development of the Down Converter Prototype was supported by the German Space Agency (DLR).

With „Automated Microwave Hybrid Assembly“ Tesat has the capability to manufacture complex highly integrated LTCC (Low Temperature Co-fired Ceramic) microwave modules within the frequency range 2...77GHz in fully automated ghost-shifts overnight and with very high volume. These services are offered to internal and external customers. The facility covers a clean room area of 300sqm (ISO class 8). A workforce of six highly experienced engineers and technicians provides an annual capacity of about 2.1 million microwave placements.

These microwave R&D and hybrid assembly experts are implementing new microwave designs in terms of highest „Design for Manufacturing“ (DFM) and „Design for Test“ (DFT) levels. This is performed in close co-operation with the microwave R&D engineers beginning on schematic level.

The available LTCC multilayer technology is the key technology to introduce high frequency systems in package (RF-SIP) for future space applications. It will reduce size, weight and cost of next generation satellite microwave modules significantly. Existing production capabilities are also ideally suited for high volume production of T/R-Modules in X-Band radar applications.

Currently an ESA/DLR qualification of the LTCC technology and related assembly & test processes is being carried out. In conjunction to this process capability approval Tesat parts agency is procuring LTCC substrates and LTCC modules “pre-mounted” (hermetic package) as Hi-Rel parts. A sophisticated LTCC substrate evaluation program is currently executed in order to qualify the delta requirements for space as identified based on existing experience from 64.000 TRX-RF-Modules delivered for terrestrial telecommunication to one of the largest network providers worldwide.

Process reliability as achieved for high volume production (92% FTY) will be used now for space projects at low volume but highest quality requirements.

For more information please contact Willibald Konrath (willibald.konrath@tesat.de).

Tesat Passive Components for Space Applications

A new catalogue for Passive Components from Tesat-Spacecom has been issued. Datasheets for Waveguide Switches and Circulators, Coaxial Circulators and Isolators, Waveguide Loads and Couplers can be ordered.

Please contact Dr. Martin Veith (martin.veith@tesat.de)

Dates

24.10. - 25.10.2013 The 26th Microelectronics Workshop (MEWS26), Tsukuba, Japan)

Your Tesat - Parts Agent