



Minutes of P-2.1 Committee on Ceramic Dielectric Capacitors

Wednesday 08 October 2003 Marriott Rivercenter San Antonio, TX

P-2.1 Committee's Scope: (approved 10/13/99): All types of Ceramic Dielectric Capacitors

Attendees:

NAME		COMPANY
Susan	Barkal	KEMET
Michael	Cannon	TDK
Terry	Charles	Panasonic
Yumi	Chiong Aihara	KRFM America Inc.
Michael	Griffith	KOA
Frank B.	Hayward	American Technical Ceramics
Kuni fumi	Komiya	KRFM America Inc.
Masanori	Kujiraoka	Taiyo Yuden
Patrick	Kyne	DSCC
Carl	Lindquist	San-O Industrial Corp
Laird	Macomber	Cornell Dubilier
Maher	Mahmud	IBM
Karun	Malhotra	Murata Electronics, NA
Len	Metzger	Panasonic Ind'l Co
Edward	Mikoski	EIA/ECA
Chris	Reynolds	AVX
Dave	Ritchey	Yageo/Phycomp

The meeting was called-to-order by Chairman Michael Cannon at 10:00am.

1.0 Introductions

Attendance was taken, a sign-in roster was circulated, and it was determined that a quorum was present.

<u>Member Organizations Present</u>	<u>Present at this meeting</u>	<u>Present at previous meeting?</u>	<u>Present at meeting prior to previous?</u>
American Technical Ceramics	Y	Y	Y
AVX	Y	Y	N
Cornell Dubilier	Y	Y	Y
DSCC	Y	N	Y

IBM	Y	Y	Y
KEMET	Y	N	Y
KOA	Y	N	Y
KRFM America Inc.	Y	n/a	n/a
Murata Electronics, NA	Y	N	Y
Panasonic	Y	Y	Y
Taiyo Yuden	Y	N	N
TDK	Y	Y	Y
Yageo/Phycomp	Y	Y	Y

<u>Member Organizations Absent</u>	<u>Present at This Meeting?</u>	<u>Present at previous meeting?</u>	<u>Present at meeting prior to previous?</u>
AEM	N	Y	N
Presidio	N	Y	Y
Vishay	N	Y	Y
Wright Capacitors	N	Y	N

* Not counted in determination of quorum due to non-attendance

<u>Other Organizations Present</u>
EIA/ECA
San-O Industrial Corp

1.1 Approval of Spring Meeting Minutes from Tempe, Arizona.

One minor change in Murata attendee's last name.

The minutes were unanimously approved with corrections.

1.2 Review of Agenda for Present Meeting

The committee unanimously accepted the Agenda as presented.

1.3 Correspondence & Review of Committee's Scope

No Correspondence was received.

1.4 Report of task groups, committees, and DSCC efforts

DSCC

DSCC is trying to include 0603 and 0402 to MIL-55681, but there has been some reluctance from most ceramic manufacturers. The concern is the requirements for group C test, the environment test. Mike Dacky removed the pure time termination from MIL-PRF-123C.

The MIL-STD-202G is now available on DSCC website for downloading.

(www.dscclia.mil/programs/milspec/docsearch.asp)

ACH

EIA 81 has placed a cautionary statement concerning the effects of ESD(Electro-static discharge).

U-1

During the U1 meeting, KRFM gave a presentation on their new technology. There was only 1 user in attendance for this session. The 2004 Fall meeting will be in San Diego and the 2005 Spring meeting will be in either New Orleans or Denver.

2.0 Old Business

2.1 Status of balloting latest revision of EIA-595-A (SP-4622)

Edward Mikoski/ECA/EIA advised that EIA-595-A is moving forward to ANSI. Pat Kyne requested explanation of what was EIA-595-A. Chairman M. Cannon commented that EIA-595-A is the visual mechanical standard.

2.2 Status of EIA-469-D (PN-4621) revision balloting and ANSI public review.

This project is finalized and is ready for EIA ballot which is DPA.

2.3 Status of EIA-198-F “Ceramic Dielectric Capacitors Classes I, II, III, & IV”

2.3.1-Part II: Test Methods- revision release status

Changes will be discussed as part of our new business. The committee needs to finalize this during the next meeting.

2.3.2-Part III: Individual Specifications- PN status

Chairman M. Cannon/TDK has the begun working on the individual specifications for the high voltage capacitors and reversed geometry as part of the slash sheets. Chairman M. Cannon solicited assistance from the committee members.

2.3.2.1 Establish team for SMD high voltage slash sheet

Karun Malhotra/Murata – SMD high voltage capacitors

2.3.2.2 Establish team for leaded high voltage slash sheet

Karun Malhotra/Murata - Leaded High voltage capacitors

2.3.2.3 Establish team for low inductance reverse geometry slash sheet

Dave Ritchey/Yageo/Phycomp, Chris Reynolds/AVX, and Masanori Kujiraoka/Taiyo Yuden will handle reverse geometry.

2.4 Status of IEC/EIA 521

Susan Barkal/Kemet will follow up on IEC/EIA 521 with Dick Thompson’s replacement.

2.4.1 VCC graph additions

2.4.2 Low voltage editorial changes

2.4.3 PN status

2.5 Status of ESL Capacitor test method

Karun Malhotra/Murata advised the committee on the feedback from Japan concerning ESL testing. The vendors in Japan would like to standardized measurement techniques (i.e. usage of same/similar equipment and measuring techniques)

All Japanese manufacturers will advise the latest information on this issue during the next meeting.

2.6 Report from Ceramic Capacitor Working Group (meeting 10/06/03, 10am)

The committee decided to keep the ceramic capacitor working group meeting to 4 hours. Below are some of the concerns/questions in the industry concerning MLCC's.

1) Life Test Condition

- a. "not just 2X anymore". Due to higher capacitance, thinner layers.
- b. 217 => AF(Acceleration Factor) empirical, 20~30 yrs old
- c. Section III/3 in 198, we could add 2 groups for generating specification based on application for:
 - i. Commercial
 - ii. High reliability

IEC specification reflects that 1.5X rated voltage is standard.

Possible Option is to have the specification vary depending on industry: EIA 1, 2, 3.

In conjunction with Life test, we would like to address the Initial as-rated test condition as outlined in EIA 198 -2-E, Test method 101.

EIA 198 -2-E, Test method 101

Test Conditions

100pF < C ≤ 10uF	1kHz	1V
>10uF	120Hz	0.5Vrms
≤ 10uF ≤6.3V	1kHz	0.5V
C≤100uF	1Mhz	1V

Action: (Ceramic Working Group) - Develop Component Bulletin (this bulletin will act as an advisor notice of what direction the Ceramic capacitors manufacturers will take in regards to Life Test.)

Ed Mikoski/EIA/ECA will download the open activities that IEC are working on and will present at the official P-2.1 meeting.

Karun Malhotra /Murata – presented the differences between specification in EIA 198 and IEC 60384. There need to be some consistence between the 2 specifications.

Ed Mikoski/EIA/ECA recommended that we get comments to present to the IEC TC40 committee before requesting a meeting in conjunction with ECA.

Karun/Murata showed a presentation from JEITA on whisker growth. The presentation should be available on JEITA website.

Mike Cannon is suggesting we pass the whiskers issue to the Soldering Technology Committee, however, Ed Mikoski suggested we write a paper on this subject matter to counter the NASA comments found on their website. Below are the steps we will take to address this issue.

2) Sn(Tin) Whiskers

- a. * Ceramic Working Group to issue Engineering Bulletin for MLCC response
- b. Submit to STC group for other components
- c. Combat NASA with ECA website posting of this paper.*
- d. P.4 mechanical outline post as “related documents”
- e. Definitions: * finish *reflow
* substrate *epoxy/solder

Potential titles for the Bulletins to be released by the Ceramic Committee:

For item 1)

Low Voltage MLCC

Test Conditions

For item 2)

Carl Lindquist/San-O recommended we obtain papers from Soldering Technology Committee on the issue of Whiskers.

Members to work on Low Voltage Bulletin

Dave Ritchey/Yageo, Karun Malhotra/Murata, Masanori Kujiraoka/TDK, Mike Cannon/TDK, Chris Reynolds/AVX

Members to work on Whiskers Bulletin

Dave Ritchey/Yageo, Karun Malhotra/Murata, Masanori Kujiraoka/TDK, Mike Cannon/TDK, Chris Reynolds/AVX, Kemet(someone from the organization)

2.7 Status on Electro-static Discharge (ESD) teleconference.

2.7.1 ESD test procedure collection

2.7.2 Schedule decision

Mike Cannon/TDK will follow up with Ed Mikoski/EIA/ECA to make this teleconference happen. Karun Malhotra/Murata indicated that there are no guidelines for ESD protection(coated and uncoated)., but there should be Murata and TDK, Kemet will be on the task force for this issue.

3.0 New Business

3.1 Review of Documents

3.1.1 Status PN author/primary contact column to Active Projects file

The committee would like to add PN author/primary contact to active project list in order to help facilitate who is the responsible party. Ed Mikoski/EIA/ECA requested the committee to supply the author(s) who are responsible for the existing projects. Mike Cannon/TDK will follow up to determine what PN do not have an author listed.

3.1.2 Automatic updating method

Mike Cannon/TDK will discuss how we should proceed.

3.2 Working Group status report and proposed agenda items for next meeting.

3.2.1 Establishment of supplier and user task force to discuss life test conditions for low voltage MLCC's

The committee agreed to generate bulletins on high/low voltage MLCC life test conditions. It was recommended as a task for the working group. Karun Malhotra/Murata suggested that all manufacturers should make a presentation on an issue.

Karun Malhotra/Murata would like the committee to make comments based on the IEC documents concerning the differences between documents from IEC versus EIA.

4.0 Time and Place of next meeting

The next meeting will be held the week of 19-22 April 2004 at the Hilton Tampa Westshore, Tampa, FL.

5.0 Adjournment

The meeting was adjourned at approximately at 11.20am.

This meeting was conducted in accordance with the EIA Legal Guidelines and the Manual of Organization and Procedures.

Michael Cannon
Chairman

Edward F. Mikoski, Jr.
Acting Secretary