



RE: CAWG final set of specification is ready
Sauveplane Jean-Baptiste

to:

LILLER, Simon, olivier.Berenfeld@radiall.com, c.roux@axon-cable.fr, dmurchie@wlgore.com, francoise.depeyre@thalesalieniaspace.com, g.rouchaud@axon-cable.com, jparfrey@teledyne.com, juergen.riedinger@tesat.de, sven-erik.norberg@ruag.com, thmeyer@wlgore.com, Anne.Barbet@rosenberger.de, gunnar.armbrecht@rosenberger.de, s.thacker@morphe.eu, Denis.Lacombe@esa.int, leo.farhat@esa.int, Fernando.Martinez.Martin@esa.int, kdacosta@teledyne.com, mhodges@teledyne.com, e.fournaise@axon-cable.com, David Raboso, m.benahmed@axon-cable.com, GORECKI, Ian, mpyne@wlgore.com, roland.kappeler@hubersuhner.com
18/05/2016 09:44

Cc:

"Lay Philippe", "Anastasia Pesce / ESTEC"

Hide Details

From: "Sauveplane Jean-Baptiste" <Jean-Baptiste.Sauveplane@cnes.fr> Sort List...

To: "LILLER, Simon" <simon.liller@airbus.com>, "olivier.Berenfeld@radiall.com" <olivier.Berenfeld@radiall.com>, "c.roux@axon-cable.fr" <c.roux@axon-cable.fr>, "dmurchie@wlgore.com" <dmurchie@wlgore.com>, "francoise.depeyre@thalesalieniaspace.com" <francoise.depeyre@thalesalieniaspace.com>, "g.rouchaud@axon-cable.com" <g.rouchaud@axon-cable.com>, "jparfrey@teledyne.com" <jparfrey@teledyne.com>, "juergen.riedinger@tesat.de" <juergen.riedinger@tesat.de>, "sven-erik.norberg@ruag.com" <sven-erik.norberg@ruag.com>, "thmeyer@wlgore.com" <thmeyer@wlgore.com>, "Anne.Barbet@rosenberger.de" <Anne.Barbet@rosenberger.de>, "gunnar.armbrecht@rosenberger.de" <gunnar.armbrecht@rosenberger.de>, "s.thacker@morphe.eu" <s.thacker@morphe.eu>, "Denis.Lacombe@esa.int" <Denis.Lacombe@esa.int>, "leo.farhat@esa.int" <leo.farhat@esa.int>, "Fernando.Martinez.Martin@esa.int" <Fernando.Martinez.Martin@esa.int>, "kdacosta@teledyne.com" <kdacosta@teledyne.com>, "mhodges@teledyne.com" <mhodges@teledyne.com>, "e.fournaise@axon-cable.com" <e.fournaise@axon-cable.com>, "David Raboso" <david.raboso@esa.int>, "m.benahmed@axon-cable.com" <m.benahmed@axon-cable.com>, "GORECKI, Ian" <ian.gorecki@airbus.com>, "mpyne@wlgore.com" <mpyne@wlgore.com>, "roland.kappeler@hubersuhner.com" <roland.kappeler@hubersuhner.com>
Cc: "Lay Philippe" <Philippe.Lay@cnes.fr>, "Anastasia Pesce / ESTEC" <Anastasia.Pesce@esa.int>

1 Attachment



ESCC No. 3408 Draft 1 Rev H (S.Thacker 2016-05-12) for review (with chan...docx

Dear Cable Assembly working group members

You will find include in the mail the last revision of the generic specification.

All modifications are highlighted in yellow and commented in the document.

They are two major modifications:

- 1- DPA has been included in the chart for qualification and periodic testing
- 2- CA to be used for power test will not be submitted to Cable retention force, Bending and Endurance tests.

If you still have some comments please provide to me.

Note that this is your last-last chance to modify the generic specification.

Please provide comments by the end of the month.

Regards

Jean-baptiste

De : Sauveplane Jean-Baptiste

Envoyé : mardi 9 février 2016 10:27

À : 'LILLER, Simon'; 'olivier.Berenfeld@radiall.com'; 'c.roux@axon-cable.fr'; 'dmurchie@wlgore.com'; 'francoise.depeyre@thalesalieniaspace.com'; 'g.rouchaud@axon-cable.com'; 'jparfrey@teledyne.com'; 'juergen.riedinger@tesat.de'; 'sven-erik.norberg@ruag.com'; 'thmeyer@wlgore.com'; 'Anne.Barbet@rosenberger.de'; 'gunnar.armbrecht@rosenberger.de'; 's.thacker@morphe.eu'; 'Denis.Lacombe@esa.int'; 'leo.farhat@esa.int'; 'Fernando.Martinez.Martin@esa.int'; 'kdacosta@teledyne.com'; 'mhodges@teledyne.com'; 'e.fournaise@axon-cable.com'; 'David Raboso'; 'm.benahmed@axon-cable.com'; 'GORECKI, Ian'; 'mpyne@wlgore.com'; 'roland.kappeler@hubersuhner.com'

Cc : Lay Philippe; Anastasia Pesce / ESTEC

Objet : RE: CAWG final set of specification is ready

Importance : Haute

Dear All

Please find attached to the mail the last issue of the generic specification 3408 for the qualification of RF cable assembly. (one word document with track changes and a PDF without track changes)

Some modifications **were requested by CA manufacturer to limit cost**. Modifications are listed below:

- A&B test is only performed on cable to be used for manufacturing CA for qualification and maintenance of qualification only
- Coating, Adhesion of conductor and Conductor resistance tests are performed once on each cable lot
- After completion of harsh test (VRT, vibration...) only VSWR and Insertion loss are measured
- Insulation resistance is not measured at final production (only dielectric withstanding voltage is) but IR is requested on completion of some harsh test (Radiation, power handling, power cycling...)
- Some minor editorial changes

If you still have some comments please provide to me.

Note that this is your last chance to modify the generic specification.

Thank you

Regards

Jean-baptiste

De : Sauveplane Jean-Baptiste

Envoyé : vendredi 16 octobre 2015 17:19

À : 'LILLER, Simon'; 'olivier.Berenfeld@radiall.com'; 'c.roux@axon-cable.fr'; 'dmurchie@wlgore.com'; 'francoise.depeyre@thalesalieniaspace.com'; 'g.rouchaud@axon-cable.com'; 'jparfrey@teledyne.com'; 'juergen.riedinger@tesat.de'; 'Lortal Jean-Luc'; 'sven-erik.norberg@ruag.com'; 'thmeyer@wlgore.com'; 'Anne.Barbet@rosenberger.de'; 'gunnar.armbrecht@rosenberger.de'; 's.thacker@morphe.eu'; 'Denis.Lacombe@esa.int'; 'Fernando.Martinez.Martin@esa.int'; 'kdacosta@teledyne.com'; 'mhodges@teledyne.com'; 'e.fournaise@axon-cable.com'; 'David Raboso'; 'm.benahmed@axon-cable.com'; 'GORECKI, Ian'; 'mpyne@wlgore.com'; 'roland.kappeler@hubersuhner.com'

Cc : Lay Philippe

Objet : RE: CAWG final set of specification is ready

Importance : Haute

Dear cable assembly working group members

You will find attached to the mail the last set of specification after modification by the technical writer.

Most of the modification were editorial and other for consistency. You can track the changes and comments by looking into the documents with the names that finished by ...tracks and comments.

Please note that:

For the generic spec:

- Max temp of CA during Radiation testing is 60°C to allow a quick test for high dosage. No risk of PTFE curing at 60°C is expected according to our material expert.
- DPA has been removed for chart IV and V has it is not a pass or fail test. Construction analysis is done in evaluation so in case of anomaly a DPA can be performed on the CA.
- Power handling test temperature will be defined in the detail specification

For the evaluation:

- Mechanical shock definition has been improved and level have been increased to be coherent with other RF component.
- Max temp of CA during Radiation testing is 60°C to allow a quick test for high dosage. No risk of PTFE curing at 60°C is expected according to our material expert.

Can you please send me a formal agreement or disagreement on these specifications?

If you do not have much time please focus on the generic specification. As said by Simon the evaluation is interesting for science purposes but for flight qualification it is the generic one that is going to be used.

Do not hesitate to call me to discuss about the modifications, it will be more efficient than multiple exchange of email.

Regards

Jean-baptiste

De : LILLER, Simon [<mailto:simon.liller@airbus.com>]

Envoyé : mardi 22 septembre 2015 17:33

À : Sauveplane Jean-Baptiste; olivier.Berenfeld@radiall.com; c.roux@axon-cable.fr; dmurchie@wlgore.com; francoise.depevre@thalesaleniaspace.com; g.rouchaud@axon-cable.com; jparfrev@teledvne.com; juergen.riedinger@tesat.de; Lortal Jean-Luc; sven-erik.norberg@ruag.com; thmever@wlgore.com; Anne.Barbet@rosenberger.de; gunnar.armbrecht@rosenberger.de; s.thacker@morphe.eu; Denis.Lacombe@esa.int; Fernando.Martinez.Martin@esa.int; kdacosta@teledvne.com; mhodes@teledvne.com; e.fournaise@axon-cable.com; [David.Raboso](mailto:David.Raboso@axon-cable.com); m.benahmed@axon-cable.com; GORECKI, Ian; mpvne@wlgore.com; roland.kappeler@hubersuhner.com

Cc : Lay Philippe

Objet : RE: CAWG final set of specification is ready

Jean-Baptiste

Thank you for the update. I understand these specification may be reviewed tomorrow, Wednesday 23rd? so I will reply to the comments below, I cannot review both the entire documents in time. Many of the comments will be well known to you and the CAWG. Please understand we believe the development of a specification for Coaxial Cable assemblies will be a valuable addition to the ESCC library, but it must be relevant and achievable. First may I make a general comment, the evaluation plan is very interesting and though, it creates very good science and background information, but we have difficulty in correlating the extreme requirements specified with our 'real world' scenario's in which coaxial cable are used. The expense in following the entire evaluation plan would be very high. My comments are based on the understanding was the coaxial cable specification should be applicable to the majority of coaxial cables assemblies procured for spaceflight use?, we procure many hundreds of cable per year and we must be sure there is significant advantage from these specification's, particularly for Telecom payload use, specific scientific and environmental missions may have more stringent requirements, but I suggest there are fewer of these cables. Only if we make the specification realistic and applicable will it be used.

Please see my comments below with regard to the particular changes you have highlighted.

From: Sauveplane Jean-Baptiste [<mailto:Jean-Baptiste.Sauveplane@cnes.fr>]

Sent: Friday, September 18, 2015 1:27 PM

To: olivier.Berenfeld@radiall.com; c.roux@axon-cable.fr; dmurchie@wlgore.com; francoise.depevre@thalesaleniaspace.com; g.rouchaud@axon-cable.com; jparfrev@teledvne.com; juergen.riedinger@tesat.de; Lortal Jean-Luc; sven-erik.norberg@ruag.com; thmever@wlgore.com; Anne.Barbet@rosenberger.de; gunnar.armbrecht@rosenberger.de; s.thacker@morphe.eu; Denis.Lacombe@esa.int; Fernando.Martinez.Martin@esa.int; kdacosta@teledvne.com; mhodes@teledvne.com; e.fournaise@axon-cable.com; [David.Raboso](mailto:David.Raboso@axon-cable.com); m.benahmed@axon-cable.com; LILLER, Simon; mpvne@wlgore.com; roland.kappeler@hubersuhner.com

Cc: Lay Philippe

Subject: CAWG final set of specification is ready

Dear All

There is a long time since you have no new from the working group... I apologize but I was involved in two CNES projects related to RF cable assembly qualification and so I have tried to use the set of specification (in collaboration with the manufacturer also involved in the project) to see if the specification were coherent, detailed enough and how much will it cost to evaluate and qualified a RF cable assembly.

It took a long time but this exercise is now finished and it has led to several "major" changes on which I would like to have your opinion.

Here is the list of major changes:

Evaluation:

- During temperature cycling test, max number of cycle is 500 (instead of 700) (to save money)

Based on a 15 year GEO mission using 200 thermal cycles gives approx 2.5 lifetimes, do we really need >6 lifetime data?

- The dose rate allowed for radiation test with an electron source can be up to 45 MRad/h only if temperature of CA is kept under 60°C

We must be careful to ensure any degradation in performance is linked to Radiation not thermal effects, I would suggest 40°C max.

- Each time it was written "and after a recovery period of 24 ±2 hours" it has been changed by "and after a recovery period of 24 hours minimum" (To give flexibility to manufacturer for testing)

Agreed, provided the environment impact does not degrade over time, for instance there may be a value in testing very soon after radiation?

- The high temperature storage test time is 1000h instead of 2000h (to save money)

We are having difficulty understanding this requirement, our flight storage is very well controlled, if this a material change investigation I suggest this is not the best plan.

- Power handling test is only performed at 100°C, the low temperature test is removed (to save money)

Power handling of a cable assemblies directly linked to the thermal environment, we must understand the cables balance of RF power/Frequency/environment. I would like to see an equation where we can calculate the power handling based on these inputs. In order to achieve this I suggest

the high power test provides the data to validate such an equation.

Qualification:

- Contact engagement and separation forces has be replaced by contact capability test
- Temperature cycling in maintenance of qualification is 100 cycles instead of 50 (TAS required MOQ test to be at 50% of the qualification) and the temperature slope is < 10°/mn instead of 5°/mn (same as ECSS-Q-ST-70-08)

Payload equipment's are typically cycled at 50C/min, why would the cable assemblies be different?

- Power test Sequence of has been changed (corona is after thermal cycling, multipactor is between power handling and power cycling). Chart F4 will be updated by technical writer.

Provided there is no impact from power cycling on multipactor?

Margin philosophy:

Here is the margin philosophy for RF CA.

Test	Eval	Spec max rated	Qualif	Flight (ECSS Q 30-11)
Temperature	Tmax+xstep stress	Tmax	Tmax	Tuse = Tmax-30°C
Rf power	Peval = Pmax to have Tmax	Pspec = Pmax	Pqual =Pspec	Puse = Pspec - 1dB (maximum)
Corona	Pth (threshold)	Pspec = Pth-1dB	Pqual =Pspec	Puse = Pspec - 2dB (maximum)
Mating-unmating	200	NA	50	50 max* (relifing every 10 mating)
Multipactor	As ECSS			

*Every 10 mating a relifing step on the CA is mandatory to check its good health but the total cumulated number of mating cannot exceed 50 based on connector rule and qualification

As we have discussed many times, an arbitrary number for mates/de-mates is providing a false sense of quality, the key factor must be the RF connectors.

The RF connectors must be suitable for application using the correct materials, but before and after every mating they must be inspected.

One RF connections with a poor connector is worse than 50 connections with a good connector.

You will find below the list of actions from the last meeting. I have closed all actions that were done and also the one for which I received no comment. **The only open action for the WG is to review a last time the set of specification.**

No comment will be considered as an approval!!

Please understand these comments are provided to try and make the specifications applicable to customer use and achievable for suppliers, the specification must be such for it to be adopted.

Table of actions:

N	WHO	WHAT	WHEN	STATUS
A11-3	MANUF.	Review ESCC 3401, 3402, 3902 spec to identify potential required changes	2015	Closed
A19-1	MANUF.	To provide input to agencies to organize detail specification (by frequency band, by type of cable, by power)	01/2015	Closed
A19-2	WG	To review generic and basic specifications dedicated to RFCA	10/2015	Open
A19-3	TW	To finalise the generic and basic specifications to be presented to PSWG.	02/2015	Closed
A19-4	ALL	To approve margin approach	01/2015	Closed
A19-5	AGENCIES, USERS	To check Radiation test in Eval and Qual and propose modification if needed	01/2015	Closed
A19-6	USERS	To check thermal stability of insertion loss test and for what kind of CA it is applicable	01/2015	Closed
A19-7	ESA, CNES	To confirm IR can be only applicable in qualification	01/2015	Closed
A19-8	TW	To send a template of detail spec to manuf	01/2015	Open
A19-9	USERS	To check Rx acceptance criteria	01/2015	Closed
A19-10	CNES	Update ESCC website and sharepoint	01/2015	Closed

Best regards

Jean-baptiste

De : Sauveplane Jean-Baptiste

Envoyé : lundi 15 décembre 2014 17:39

À : olivier.Berenfeld@radiall.com; c.roux@axon-cable.fr; dmurchie@wlgore.com; francoise.depeyre@thalesalieniaspace.com; g.rouchaud@axon-cable.com; Sauveplane Jean-Baptiste; jparfrev@teledvne.com; juergen.riedinger@tesat.de; Lortal Jean-LUC; sven-erik.norberg@ruag.com; thmeyer@wlgore.com; Anne.Barbet@rosenberger.de; gunnar.armbrecht@rosenberger.de; s.thacker@morphe.eu; Denis.Lacombe@esa.int; Fernando.Martinez.Martin@esa.int; kdacosta@teledvne.com; mhodes@teledvne.com; c.fourmaise@axon-cable.com; David.Raboso@esa.int; m.benahmed@axon-cable.com; simon.liller@astrium.eads.net; ian.gorecki@astrium.eads.net; mpvne@wlgore.com; roland.kappeler@hubersuhner.com

Cc : Lay Philippe; Olivier.Perat@esa.int

Objet : MoM CAWG #9

Dear All

Please find attached the MoM of our last meeting in Estec and the two updated specifications.

<< Fichier: MoM_CAWG_JBSa.docx >> << Fichier: RF CA Evaluation Issue 1 RevA.docx >> << Fichier: RF CA Generic Spec Issue 1 Rev A.docx >>
If you have comments on the MoM, please provide them before Thursday.

I have think about how we should organize the detail specification and here is my proposal. The name of the detail specification has to be chosen with the following 5 criteria:

0- High Power (optional)

1- Type of cable (flexible or semi rigid)

2- Cable assembly

3- Up to Fmax

4- Based on connector type (SMA, SMA2.9,TNC, 2.4...)

For high power TNC connector the name would be: High Power flexible cable assembly up to 12Ghz based on connector type TNC

For semi rigid SMA the name would be: Semi rigid cable assembly up to 18Ghz based on connector type SMA

Again please provide comments.

Regards

Table of open actions:

N	WHO	WHAT	WHEN	STATUS
A11-3	MANUF.	Review ESCC 3401, 3402, 3902 spec to identify potential required changes	2015	OPEN
A19-1	MANUF.	To provide input to agencies to organize detail specification (by frequency band, by type of cable, by power)	01/2015	NEW
A19-2	WG	To review generic and basic specifications dedicated to RFCA	01/2015	NEW
A19-3	TW	To finalise the generic and basic specifications to be presented to PSWG.	02/2015	NEW (pending A19-2)
A19-4	ALL	To approve margin approach	01/2015	NEW
A19-5	AGENCIES, USERS	To check Radiation test in Eval and Qual and propose modification if needed	01/2015	NEW
A19-6	USERS	To check thermal stability of insertion loss test and for what kind of CA it is applicable	01/2015	NEW
A19-7	ESA, CNES	To confirm IR can be only applicable in qualification	01/2015	NEW
A19-8	TW	To send a template of detail spec to manuf	01/2015	NEW
A19-9	USERS	To check Rx acceptance criteria	01/2015	NEW
A19-10	CNES	Update ESCC website and sharepoint	01/2015	NEW

Jean-baptiste

Dr Jean-baptiste Sauveplane
Ingénieur Expert Composants
Interconnexion et Thermistances
DCT/AQ/CQ

Centre National d'Etudes Spatiales:
18 avenue Edouard Belin
31401 Toulouse Cedex 9
Tel: (33) 5 61 27 34 75
Fax: (33) 5 61 28 13 30

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