


	<p align="center"><b>APPLICATION FOR EXTENSION OF ESCC PROCESS CAPABILITY APPROVAL</b></p> <p><b>PROCESS CAPABILITY DOMAIN: Low Frequency and Power Hybrid Line</b></p> <p><b>Executive Member: ESA</b> <span style="float: right;">Date: 01/04/2025</span></p>		<p>Page 1</p> <p>Appl. No. 349C</p>		
<p>Capability domain submitted for approval: <b>The Hybrid Manufacturing Line of Thales Alenia Space Belgium (TASB) in Charleroi, Low Frequency and Power Hermetic Hybrids</b>, based on thick-film substrate Multi Chip Modules. Hermetic encapsulation is achieved with metal-based or HTCC packages.</p>					
<p>Capability Domain Description</p>	<p>Process Capability Abstract</p>	<p>Based on Technology</p>	<p>Test Structures</p> <p>Component Proposed for Qualification</p>		
<p>Low frequency and Power Hermetic Hybrids</p>	<p>See appendix</p>	<p>See appendix</p>	<p>option 1</p> <p>N.A. (renewal)</p>		
<p>Manufacturer:</p> <p>Thales Alenia Space Belgium (TASB)</p>	<p>Location of manufacturing plant(s):</p> <p>Rue Chapelle Beaussart 101 B-6032 Mont-sur-Marchienne (Charleroi) Belgium</p>	<p>ESCC Specifications used for Process Capability Approval :</p> <p>ESCC 2566000, Issue 3 (2018)</p>			
<p>Report reference:</p> <p>references in box 12</p>	<p>PID used for initial Process Capability Approval:</p> <p>Reference No. : 9100.0683 Issue : 9.1</p> <p>Revision : Date: 19/01/2023</p>				
<p><b>PID Changes since start of Process Capability Approval</b></p> <p>None <input type="checkbox"/></p> <p>Minor* <input checked="" type="checkbox"/></p> <p>Major* <input type="checkbox"/></p>	<p>Current PID verified by: A. Collado, ESA Name of Executive Representative</p> <p>Ref. No.: 9100.0683 Issue / Rev : 10.0</p> <p>Date : 18/12/2024</p>				
<p>Current Manufacturing Facilities and Quality System surveyed by: ESA</p> <p>Executive Agency: ESA      Date: 20/02/2025      Report Reference Number: HYB-GEN-MM-0160-01-00</p> <p>Satisfactory: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>      Corrective Actions Closed Out:      Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input checked="" type="checkbox"/></p>					
<p>Quality and Reliability Data</p> <table border="1" style="width: 100%;"> <tr> <td style="width: 50%;"> <p>Evaluation testing performed      Yes <input checked="" type="checkbox"/>      No <input type="checkbox"/></p> <p>Report Ref. No.: All reports related to the evolution of the PID have been reviewed and accepted to support the extension of certification. dates: see box 12</p> <p>Equivalent data: references in PID (provide details)</p> <p>Certification: yes</p> </td> <td style="width: 50%;"> <p>Failure Analysis, DPA, NCCS:      Yes <input checked="" type="checkbox"/>      No <input type="checkbox"/> (supply data)</p> <p>Ref. Nos. and purpose: DPA for extension of certification, references in box 12.</p> </td> </tr> </table>				<p>Evaluation testing performed      Yes <input checked="" type="checkbox"/>      No <input type="checkbox"/></p> <p>Report Ref. No.: All reports related to the evolution of the PID have been reviewed and accepted to support the extension of certification. dates: see box 12</p> <p>Equivalent data: references in PID (provide details)</p> <p>Certification: yes</p>	<p>Failure Analysis, DPA, NCCS:      Yes <input checked="" type="checkbox"/>      No <input type="checkbox"/> (supply data)</p> <p>Ref. Nos. and purpose: DPA for extension of certification, references in box 12.</p>
<p>Evaluation testing performed      Yes <input checked="" type="checkbox"/>      No <input type="checkbox"/></p> <p>Report Ref. No.: All reports related to the evolution of the PID have been reviewed and accepted to support the extension of certification. dates: see box 12</p> <p>Equivalent data: references in PID (provide details)</p> <p>Certification: yes</p>	<p>Failure Analysis, DPA, NCCS:      Yes <input checked="" type="checkbox"/>      No <input type="checkbox"/> (supply data)</p> <p>Ref. Nos. and purpose: DPA for extension of certification, references in box 12.</p>				

	<b>APPLICATION FOR ESCC CAPABILITY APPROVAL (or its EXTENSION)</b> <b>CAPABILITY DOMAIN: Low Frequency and Power Hybrid Line</b> <b>Executive Member: ESA</b> <b>Date: 01/04/2025</b>	Page 2 Application No. <b>349C</b>
<p>The undersigned hereby certifies on behalf of the ESCC Executive, that the above information is correct; that the appropriate documentation has been evaluated; that full compliance to all ESCC requirements is evidenced except as stated in box 13; that the reports and data are available at the ESCC Executive and therefore applies for ESCC Capability Approval status to be given to the capability domain defined herein.</p> <p>Date: <b>Denis Lacombe</b> Digitally signed by Denis Lacombe Date: 2025.08.04 16:15:31 +02'00'</p> <p>(D. Lacombe, ESCC Executive Coordinator)</p>		11
<p>Continuation of Boxes above:</p> <p>from box [5]</p> <p>qualification reports:</p> <p><b>-TASB-IND-TPL-220101</b> issue 2 <i>Qualification plan on the use of Vishay shunts for space hybrid applications (01/03/2023)</i></p> <p><b>-TASB-IND-RE-230066</b> issue 1 <i>Qualification test report on the use of a shunt from Vishay in space hybrid applications (23/05/2023)</i></p> <p><b>-IND_TCH_HYB_TN-240003</b> issue 1 <i>Qualification test plan to validate the glass-frit seal process applied to a HTCC hybrid package. (and results) (04/07/2024)</i></p> <p>from box [10]</p> <p>DPA reports:</p> <p>Conclusion Meeting#1 on 20/02/2025:</p> <p>ESA doesn't request additional DPA on specific Hybrids and will use existing LAT results report to status about TAS-B capability.</p>		12

	<p style="text-align: center;"><b>APPLICATION FOR ESCC CAPABILITY APPROVAL (or its EXTENSION)</b></p> <p><b>CAPABILITY DOMAIN: Low Frequency and Power Hybrid Line</b></p> <p><b>Executive Member:</b>      <b>ESA</b>      <b>Date:</b> 01/04/2025</p>	<p>Page 3</p> <p>Application No.</p> <p style="color: blue;">349C</p>	
<div style="display: flex; justify-content: space-between;"> <span>Non compliance to ESCC requirements:</span> <span style="border: 1px solid black; padding: 2px 5px;">13</span> </div>			
No.:	Specification	Paragraph	Non compliance
<div style="display: flex; justify-content: space-between;"> <span>Additional tasks required to achieve full compliance for ESCC Capability Approval or rationale for acceptability of non compliance:</span> <span style="border: 1px solid black; padding: 2px 5px;">14</span> </div> <p>N/A</p>			
<div style="display: flex; justify-content: space-between;"> <span><b>Disposition:</b></span> <span style="border: 1px solid black; padding: 2px 5px;">15</span> </div> <p>Application Approval:    Yes    <input checked="" type="checkbox"/>    No    <input type="checkbox"/></p> <p>Action/Remarks:</p> <div style="height: 150px; margin-top: 10px;"></div> <div style="display: flex; justify-content: space-between; margin-top: 20px;"> <div style="width: 30%;"> <p>Date:    30 August 2025</p> </div> <div style="width: 60%; text-align: center;">  <hr style="width: 100%; border: 0.5px solid black;"/> <p>A. Zadeh, Head of the Avionics and EEE Division</p> </div> </div>			



## APPLICATION FOR ESCC CAPABILITY APPROVAL

CAPABILITY DOMAIN: Low Frequency and Power Hybrid Line

Page 4

Application No.

349C

Executive Member: ESA

Date: 01/04/2025

### NOTES ON THE COMPLETION OF THE APPLICATION FORM FOR ESCC CAPABILITY APPROVAL [or its EXTENSION, see BOX 12 below]

#### GENERAL

Whenever possible, all entries should be typed and in any case be suitable for legible reproduction by normal means.

#### ENTRIES

Form heading

shall indicate: - the [title](#) of the capability domain or the technology as given in the Capability Abstract - the [Executive Member](#); - the entering date; - the serial number and the suffix of the form.

#### Box 1

shall provide under capability domain description the full name or a description statement of the capability domain – the number of the Capability Abstract document – the basic technology used for capability approval – the test structures specification numbers or identification numbers – the components which successfully passed component approval test and are proposed for qualification within the domain.

**N.B.** The capability abstract shall be attached as an Appendix.

#### Box 2 and 3

Manufacturer's name and location of the plant(s) where the capability domain is situated.

#### Box 4

The [ESCC basic](#) specifications ( including issue number and date) used during Process Capability Approval.

#### Box 5

[Reference](#) to test report(s) submitted in support of the application for capability approval and components proposed for qualification.

#### Box 6

Enter details to identify the [PID](#) that was applicable at the time of manufacturing of samples for capability approval testing.

#### Box 7

If the [PID](#) has been changed during or after capability approval testing, adequate details shall be provided together with the reasons for change. Major changes shall be clearly identified.

#### Box 8

The box serves to identify the current PID and the [Executive Representative](#) that has verified it together with the date of this verification.

#### Box 9

The box can be completed only after a physical visit to the plant to confirm that the practices, procedures, material, etc. used in manufacturing the components are as described in the PID. This [audit](#) shall be carried out in accordance with the requirements of ESCC Basic Specification No. 20200 and the results shall be formally recorded. The report number shall be referenced.

#### Box 10

Details entered shall be sufficient to evidenced that an evaluation programme according to ESCC Basic Specification No. 24300 has been performed and that the results thereof are summarised in the audit and test reports. If the evaluation programme has not been carried out according to established ESCC Specifications, the applicant [Executive Member](#) shall provide alternative data and declare the assessed degree of satisfactory compliance with the [ESCC](#) requirements. Reference shall be made to the reports on [Destructive Physical Analysis](#) (DPA), [Failure Analysis](#) reports as well as any Non Conformance ([NCCS](#)) issued during the Evaluation and/or capability approval testing.

#### Box 11

Enter the [name](#) of the [Executive Member](#) (i.e., CNES, DLR, ESTEC, etc.) and the signature and date of the responsible [Executive Coordinator](#).

#### Box 12

To be used when there is a need to [expand](#) any of the boxes from 1 through 10. Identify the Box affected and reference Box 12 in the relevant Box. Box 12 can be broken into 12a, 12b, etc. if several boxes have to be expanded.

In the case of Application for the Extension of Capability Approval, the Box 12 may be used to provide a summary of lots of component types (types, date codes, quantity) manufactured and tested within the capability domain. Refer to ESCC 24300, paragraph 9.4.3 for complete requirements.

#### Box 13

State [noncompliance](#) with reference to specification(s) and paragraph(s). To simplify reference in Box 14 each nonconformance shall be sequentially numbered. If relevant state 'None'.

#### Box 14

Any additional [action](#) deemed necessary by the [Executive Member](#) to bring the submitted data to a standard likely to be accepted by the ESCC Executive should be listed herein or the reason(s) to accept the noncompliance.

#### Box 15

All [Executive Manager recommendations](#) on the application itself, special conditions or restrictions, modifications of the [ESCC](#) QPL entry, letters to the manufacturer, etc. shall be entered clearly in Box 15, signed by the representative for [ESA](#), and dated.