The choice, definition and procurement of active and passive chips, material and mechanical parts, the incoming inspection and the User-LAT test are performed according to custom specifications or PID procedures.

In-house process capabilities:

- Multilayer thick film printing
- Static and dynamic thick film resistors trimming.
- Single or double-sided hybrids
- Bare dices and SMT components: automatic pick-and-place assembly
- Automatic Wire bonding.
- Seam sealing
- Mix technologies on same hybrid circuit (HTCC+Thick film+Reflow soldering)
- Internal Expertise Laboratory : Destructive Physical Analysis (DPA), Elements characterizations, Failure analysis

5.6 3D PLUS

The Process Capability Approval (PCA) of the Production and Test Line of 3D PLUS in Buc, France, has been certified by ESA in accordance with the requirements of ESCC Basic specification No. 2566001.

The associated PID No. 3300-0546 issue 11 includes 3D PLUS' manufacturing, assembly and test operations which have been approved for the supply of non-hermetic modules for use in ESA space systems.

5.6.1 Contact Information

Address	ESCC Chief Inspector
408, rue Hélène Boucher – Z.I. 78532 BUC Cedex France	Mr. Loïc LE ROY loic.le.roy@3d-plus.com

5.6.2 Process Capability Approval

Current PCA Certificate No.	Certified since:	Type Designation
351	Nov. 2017	3D Stacking Technology Modules

5.6.3 Capability Abstract

The associated Process Identification Document (PID) is Ref. 3300-0546-11 (PID Rev.11).

From the Rev.11 of the PID, ESCC N°2566001 standard is the reference for the definition and evolution of the PCA.

This PCA covers the 3D PLUS Buc activities on manufacturing, tuning, testing, inspection and Quality Assurance of 3D stacked products used for 3D PLUS catalogue products.

According to the PID, the 3D PLUS modules are manufactured by stacking several layers of active and passive components. Two manufacturing flows are defined as follows:

- Flow 1 for the stacking of memories with TSOP packages.
- Flow 2 for the stacking of thin PCBs (Flex) populated with EEE components reported by soldering.

Flow 2 allows a large diversity of packages (TSOP, PQFP, FBGA,…) enabling the design and manufacturing of complex products.

Then, modules are screened, according to the PID, and to the generic procurement specification ECSS-Q-ST-60-05C.

The repair provision conditions as well as the criteria for lot rejection are also given in the PID.

The procurement of passive and active components, materials and mechanical parts are performed following internal procurement specifications and incoming instructions, as detailed in PID. Commercial EEE Active components Evaluation is in conformance with ECSS-Q-ST-60-13C standard.

For Module Lot Acceptance Test (Module LAT), 3D PLUS follows the ECSS-Q-ST-60-05C adapted to non-hermetic and cavity free modules.