5.1.2 RHE MICROSYSTEMS

The Process Capability Approval (PCA) of the Hybrid Line RHe Microsystems in Radeberg, Germany, has been certified by ESA in accordance with the requirements of ESCC Basic specification No. 2566000.

The associated PID includes RHe's manufacturing, assembly and test operations which have been approved for the supply of Hermetic Hybrid products for use in ESA space systems as a Category1, Option 1 Manufacturer, in accordance with ECSS-Q-ST-60-05C Rev.1

5.1.2.1 Contact Information

Address	ESCC Chief Inspector
Rhe Miicrosystems Heidestrasse 70 01454 Radeberg Germany	Mr. Robert Müller Robert.Mueller@cicor.com

5.1.2.2 Process Capability Approval

Certificate No.	Certified since:	Type Designation
354	August 2018	Thick Film Hermetic Hybrid Integrated Circuits and HTCC Hermetic Hybrid Integrated Circuits

5.1.2.3 Capability Abstract

RHe's hybrid manufacturing line capabilities are defined within the associated Process Identification Document (PID) L7.103 Issue 07.

This specifiction describes all processes, components/materials and their documentation used by RHe for the production, screening, test and quality control of the following Hybrid types :

- Thick Film Multilayer Hybrid up to 5 conductive layers
- Low /Medium Power, Low-Voltage
- Chip and Wire
- Hermetically sealed Kovar-and Ceramic- Packages.

Processes run on state of the art automated equipment to realize requirements in regard to process capability and volume.

Details to the general Process Capability Domain:

- Substrate information:

Subtechnique	Domain
Substrate Material:	Al_2O_3
Max No. of screen printed conductor layers:	5
Untrimmed Printed resistors: Min sheet resistance Max sheet resistance	 10Ω/sq 1MΩ/sq
Trimmed Printed resistors: Min sheet resistance Max sheet resistance	 10Ω/sq 1MΩ/sq

- Assembly Information:
    - Substrate attach:

Substrate type	Back metallization	Attached to	Attached by	Inter-connection
Thick film alumina	No	Au plated Kovar	Non-conductive Epoxy	Al / Au wire
Thick film alumina	No	Au plated W/Cu	Non-conductive Epoxy	Al / Au wire
Thick film alumina	No	HTCC	Non-conductive Epoxy	Al / Au wire

- Element attach:

Component type	Material	Top metal.	Bottom metal	Attachment	Inter-connection
passive components:					
Resistor	Si	Al	Si	Non-conductive Epoxy	Al wire
Capacitor	Multilayer ceramic	N/A	AgPd	Conductive + Non-conductive epoxy	Conductive epoxy
active components:					
IC	Si	Al	Si	conductive epoxy	Al / Au wire
Transistor	Si	Al	Au	conductive epoxy	Al wire
Transistor	Si	Al	CrNiAg	conductive epoxy	Al wire
Transistor	Si	Al	Ti/Ni/Au	reflow soldering	Al wire
Diode	Si	Al	Au	conductive epoxy	Al wire
Diode	Si	Al	Ti/Ni/Au	reflow soldering	Al wire

- Encapsulation:

Package type	Material	Sealing by
Metal FP	Kovar	Seam welding

	Au finish	
Metal FP	W/Cu base Kovar frame Au finish	Seam welding
Metal Plug In	Kovar Au finish	Seam welding
Ceramic Quad Flat Package (CQFJ)	HTCC base Kovar frame Au finish	Seam welding

- Screening / LAT information:

Screening as well as Lot acceptance testing is performed according to the PID in conformance to the generic procurement specification ECSS-Q-ST-60-05C Rev.1.