

# Very High Power TNC connectors

Artes 3-4 Contract 4000107438/12/NL/US



# Introduction

- Radiall has developed and qualified a new TNC range of connector :
  - ARTES 5.1 contract 20951/07/NL/GLC
    - Design and evaluation. Completed in 2012
  - ARTES 3 Contract 4000107438/12/NL/US
    - Industrialization and qualification. Completed in 2016

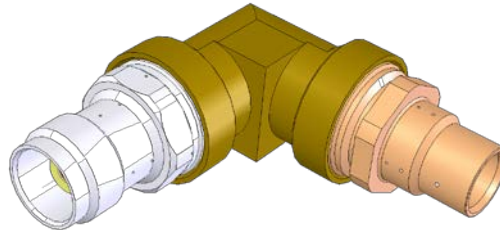
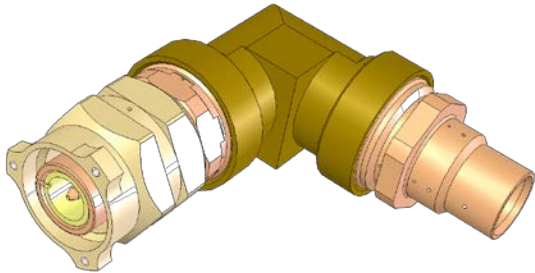
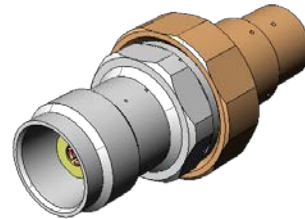
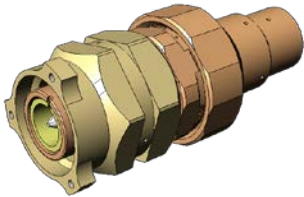


=>Very High Power TNC connector

- 14 variants have been selected to cover the market need

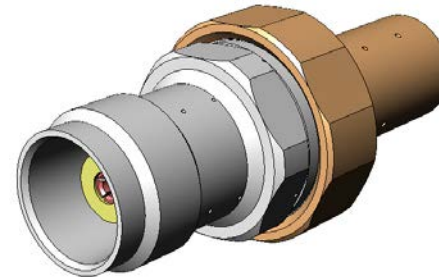
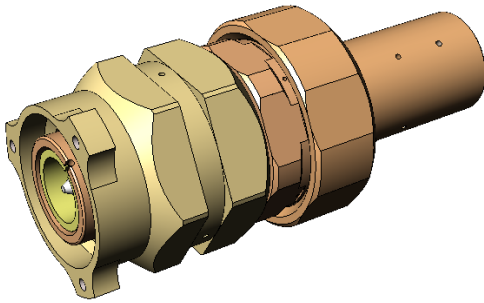
# List of variants

- 4 variants for flexible cable (SHF8MS :7.6mm diameter):



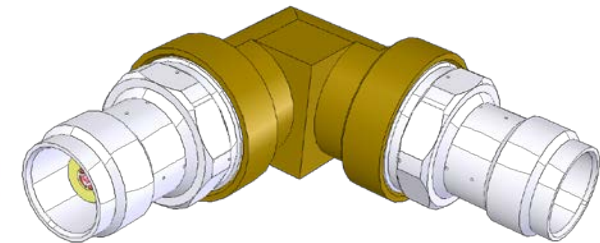
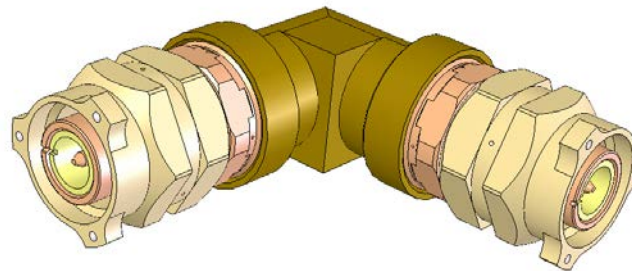
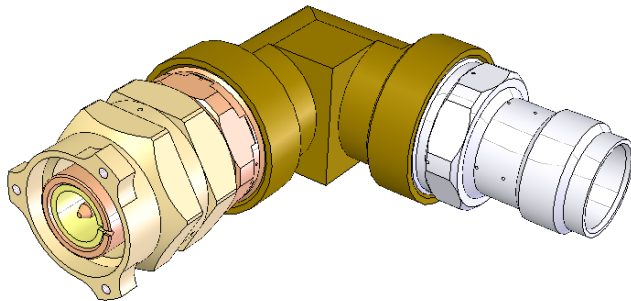
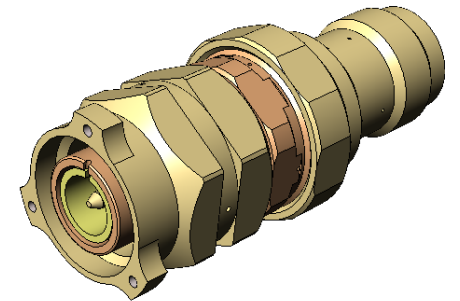
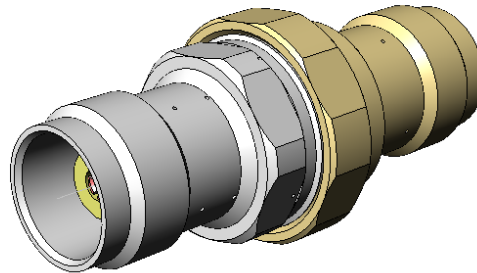
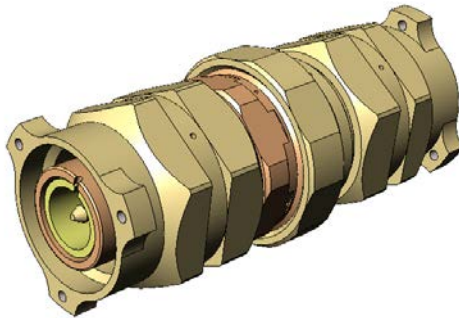
# List of variants

- 4 variants for flexible cable (SHF8MS :7.6mm diameter):
- 2 variants for SR .250" cable



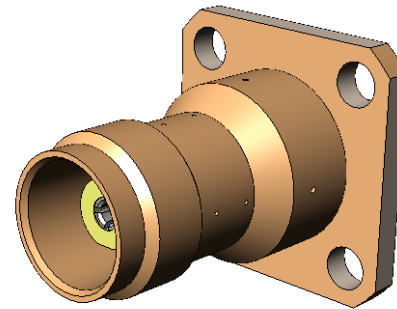
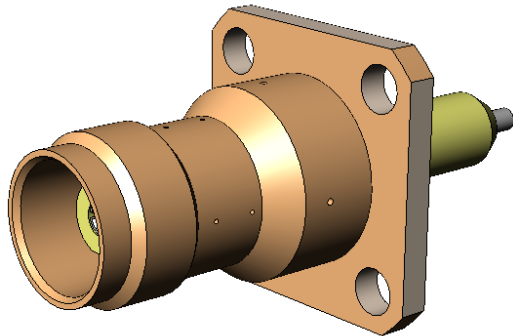
# List of variants

- 4 variants for flexible cable (SHF8MS :7.6mm diameter:)
- 2 variants for SR .250" cable
- 6 variants for adaptors



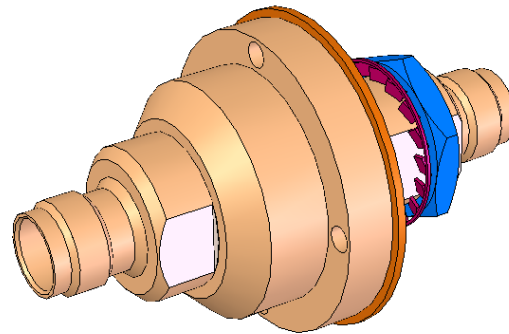
# List of variants

- 4 variants for flexible cable (SHF8MS :7.6mm diameter:)
- 2 variants for SR .250" cable
- 6 variants for adaptors
- 2 variants for equipment



# List of variants

- 4 variants for flexible cable (SHF8MS :7.6mm diameter:)
- 2 variants for SR .250” cable
- 6 variants for adaptors
- 2 variants for equipment
- A hermetic adaptor for thermal vacuum chamber (tooling, not a Flight Model)



# Power performances

- Specified Power performances: Maximum ratings

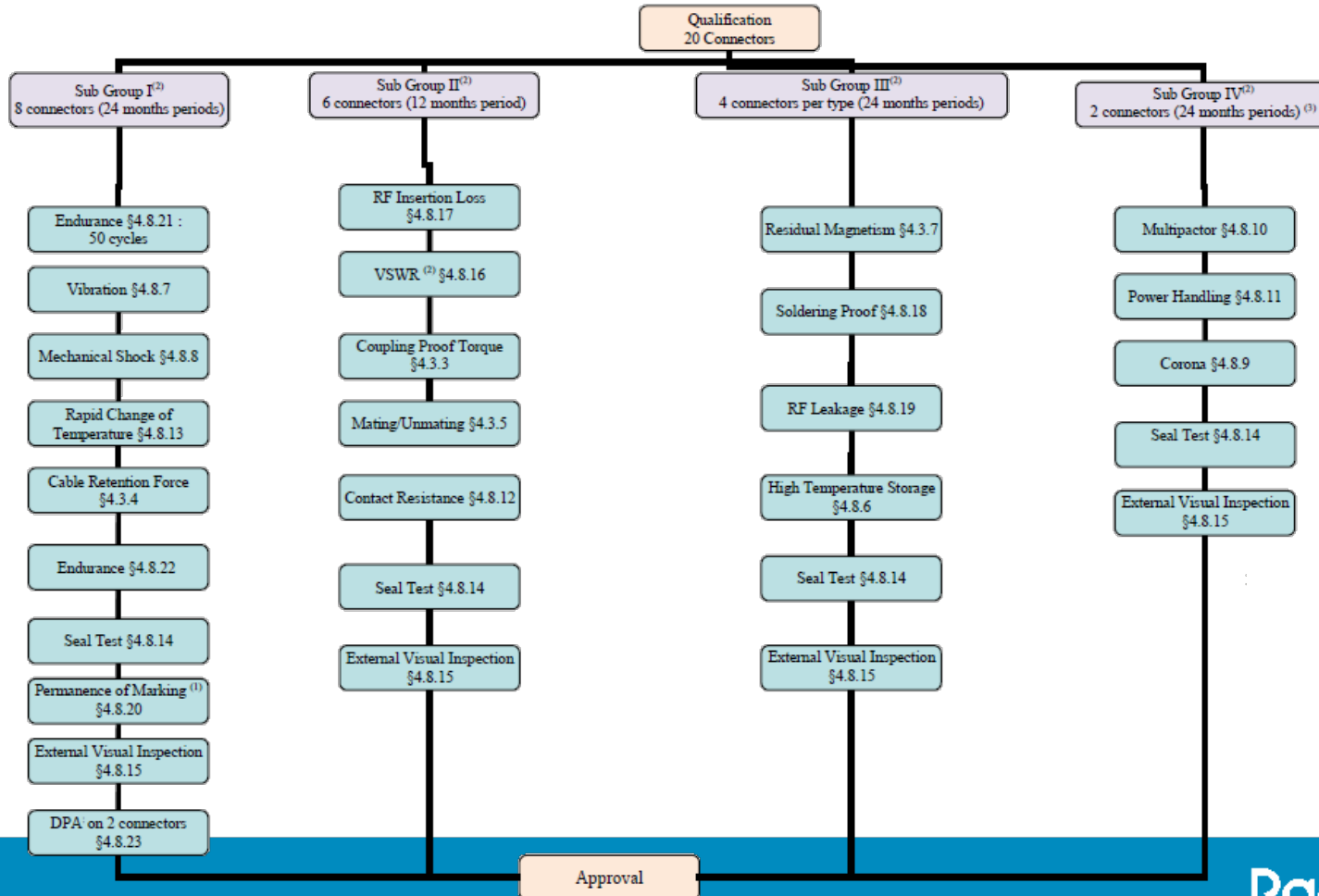
	Corona		Power Handling		Multipaction
Test Frequency	1GHz	4GHz	2GHz	4GHz	1GHz
Maximum Input Power for SR cable (WCW)	120	100	250	150	>2000Wpp with pluse of 20μs, PRF 1000Hz
Maximum Input Power for SHF cable (WCW)	120	100	400	300	>2000Wpp with pluse of 20μs, PRF 1000Hz
Maximum Input Power for connectors (WCW)	120	100	400	300	>2000Wpp with pluse of 20μs, PRF 1000Hz
Temperature of the DUT* (without power)	+22°C		+100°C		-65°C and +100°C

\* DUT: Device Under Test



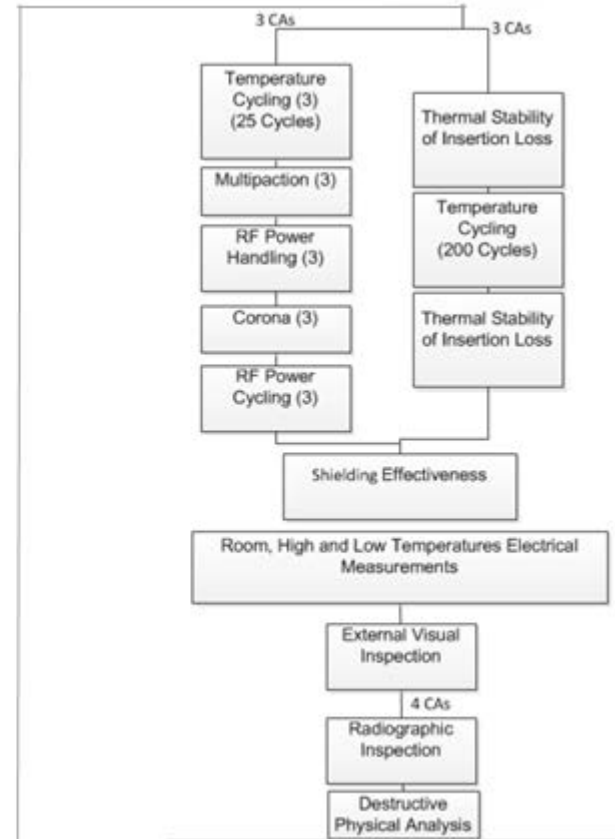
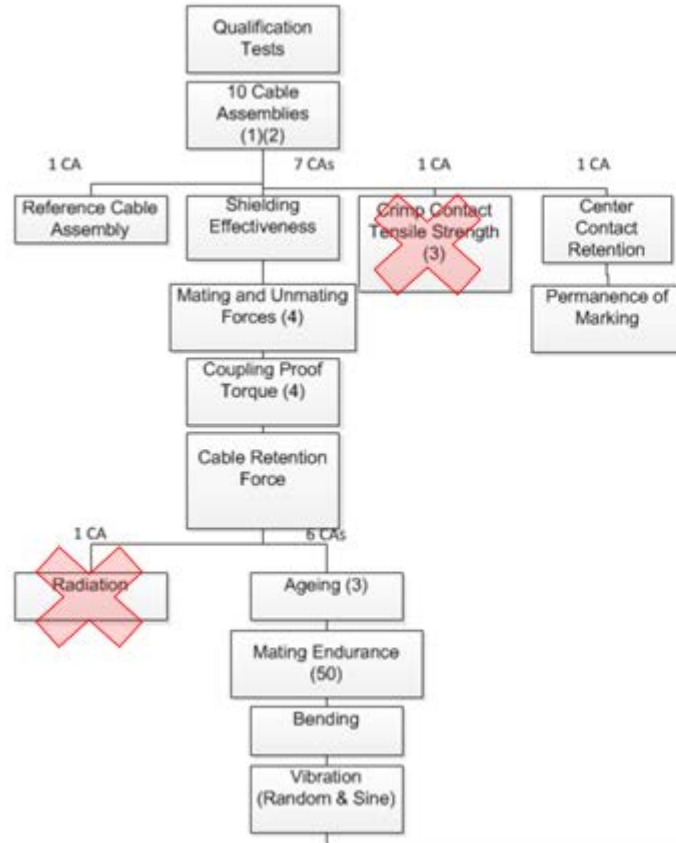
# Qualification Test Plan: ESCC3402

- Adaptors and connectors for equipment:



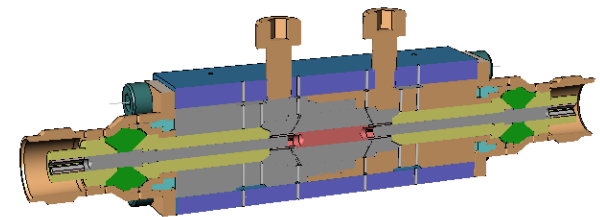
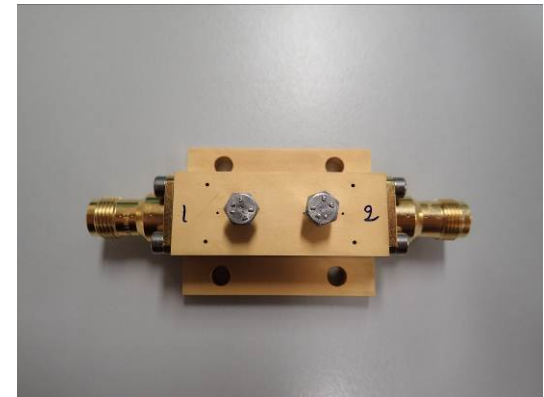
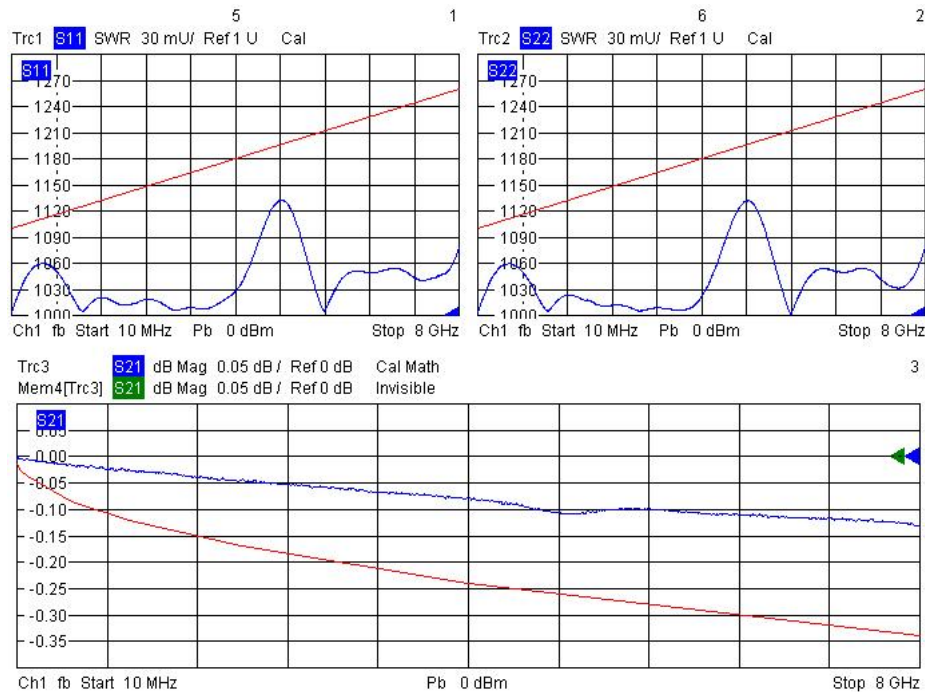
# Qualification Test Plan: ESCC3408

- Cable assemblies:



# Typical performances

- VSWR and Insertion Loss for 2 x R143416604

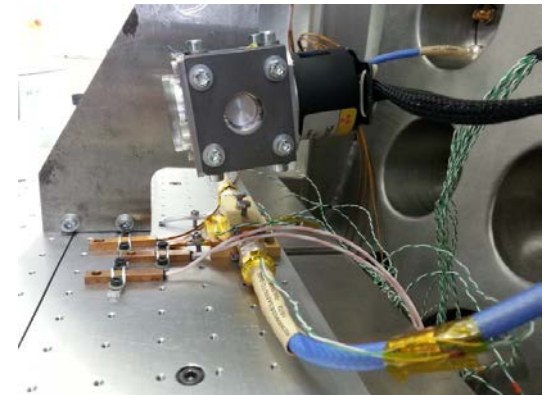
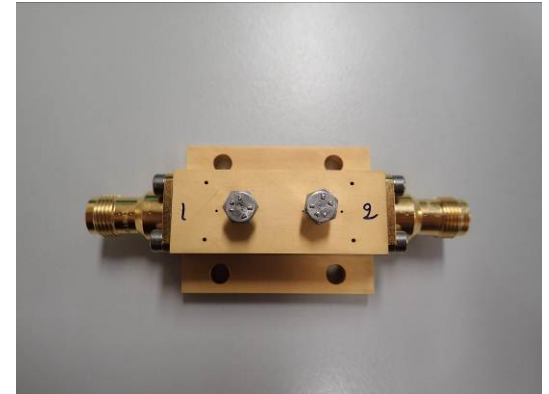


The value on the graph is for 2 connectors + test jigs  
The limits marked on the graph is for 1 connector

Design patented

# Typical performances

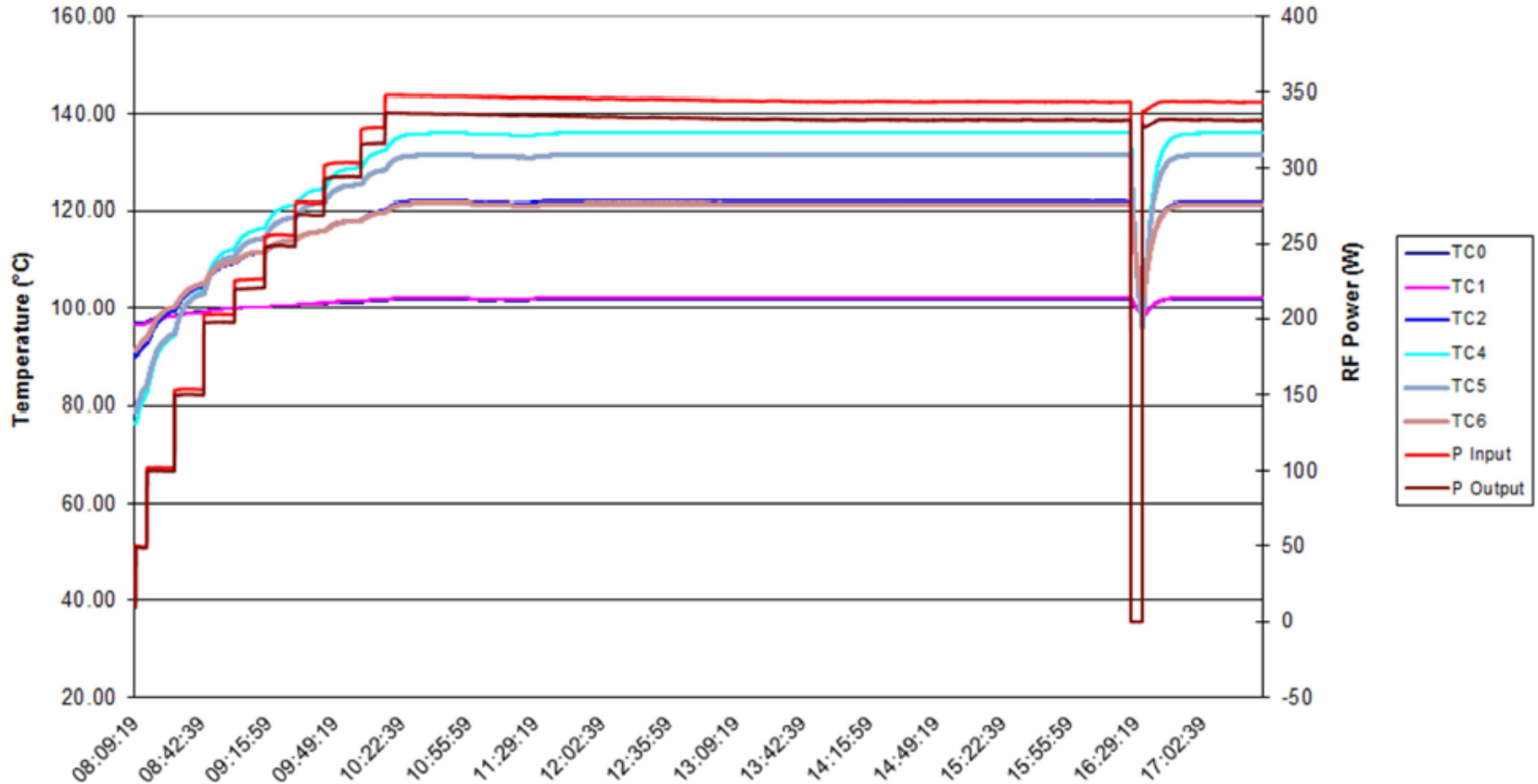
- Power test for 2 x R143416604
  - Power Handling: with  $90^\circ\text{sr}$   
350WCW\* @2GHz @+100°C  
200WCW\* @4GHz @+100°C
  - Multipactor: with  $90^\circ\text{sr}$   
>2000W\* @1GHz @-65°C/+100°C
  - Corona:  
120WCW @1GHz  
100WCW @4GHz
  - PIM: tested with ARTES 5.1  
>-140dBm of 7<sup>th</sup> order, two carriers of 50WCW @ 1.63GHz



\* Limited by the test facilities, not by the product

# Typical performances

Power Handling - TS3 - Temperature and RF Power at 2GHz



# Conclusions

- 3 new ESCC specifications for this series
- A new TNC series fully qualified: ESA QPL coming soon
- Very attractive solution compared to waveguide
- Fully compatible with current TNC series, but to benefit the max power capability, Radiall suggests to work with connectors pairs from this new range.
- => Visit our booth for more details and see samples

- Thanks for your attention
- Thanks ESA/ESTEC and CNES for their support

