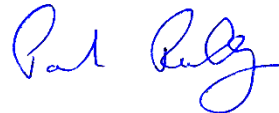


| | |
|-----------------------------------|---|
| Project Num | 21E9406-1a |
| Quotation | Q21-0402-1 |
| Prepared For | ABB Ltd |
| Company Address | Clonshaugh Business & Technology Park, Dublin, D17 A662 |
| Contact | Brendan Collins |
| Contact Email | brendan.collins@ie.abb.com |
| Prepared By | Compliance Engineering Ireland |
| Test Lab Address | Clonross Lane, Derrockstown, Dunshaughlin, Co. Meath, Ireland |
| Tested By | Joy Dalayap / Michael Kirby |
| Test Report By | Michael Kirby |
| FCC Test Firm Registration | 409640 |
| IC Site Registration | IE0001 |
| Date | 16 th Sept 2021 |
| EUT Description | Sensor with Bluetooth Low Energy |
| FCC ID | 2A2UMFA2101 |
| Authorised by | Paul Reilly |
| Authorised Signature: |  |

TEST SUMMARY

The equipment complies with the requirements according to the following standards.

| FCC 15.247 Section | RSS-247 Section | TEST PARAMETERS | Test Result |
|--------------------|-----------------------------|------------------------------|-------------|
| 15.247 (a)2 | RSS-247 5.2a | 6dB bandwidth | Pass |
| 15.247 (e) | RSS-247 5.2b | Power Spectral Density | Pass |
| 15.247 (b)3 | RSS-247 5.4d | Output power Conducted | Pass |
| 15.247 (d) | RSS-247 5.5 | Conducted Spurious Emissions | Pass |
| 15.205 15.209 | RSS Gen 8.9 RSS Gen 8.10 | Radiated Spurious Emissions | Pass |
| | RSS Gen 6.7 | 99% bandwidth | Pass |

RSS 247-2 (Feb 2017)
RSS Gen Issue5 Amd 2 (Feb 2021)

THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL, WITHOUT THE WRITTEN APPROVAL OF COMPLIANCE ENGINEERING IRELAND LTD

Exhibit A – Technical Report

Table of Contents

| | | |
|-----|---|------------------------------|
| 1.0 | EUT DESCRIPTION..... | 4 |
| 1.1 | EUT OPERATION | 5 |
| 1.2 | MODIFICATIONS..... | ERROR! BOOKMARK NOT DEFINED. |
| 1.3 | DATE OF TEST..... | ERROR! BOOKMARK NOT DEFINED. |
| 1.4 | DESCRIPTION OF TEST MODES | 5 |
| 2.0 | EMISSIONS MEASUREMENTS..... | 6 |
| 3.0 | CONDUCTED EMISSIONS ON THE MAINS MEASUREMENTS | 7 |
| 4.0 | CONDUCTED MEASUREMENTS ON THE ANTENNA PORT | 8 |
| 5.0 | SPURIOUS EMISSIONS | 13 |
| 6.0 | MEASUREMENT UNCERTAINTY | 19 |
| 7.0 | LIST OF TEST EQUIPMENT | 20 |

| | | |
|------------|---|--|
| APPENDIX A | SCANS FOR CONDUCTED MEASUREMENTS | |
| APPENDIX B | SCANS FOR RADIATED BAND EDGE /RESTRICTED BAND | |

IN THIS DOCUMENT

| | | |
|------------|---|--|
| APPENDIX C | SCANS FOR RADIATED SPURIOUS EMISSIONS | |
| APPENDIX D | CONDUCTED EMISSIONS ON THE MAINS | |
| APPENDIX E | EUT ORIENTATIONS | |
| APPENDIX F | BLOCK DIAGRAM OF TEST SETUPS | |

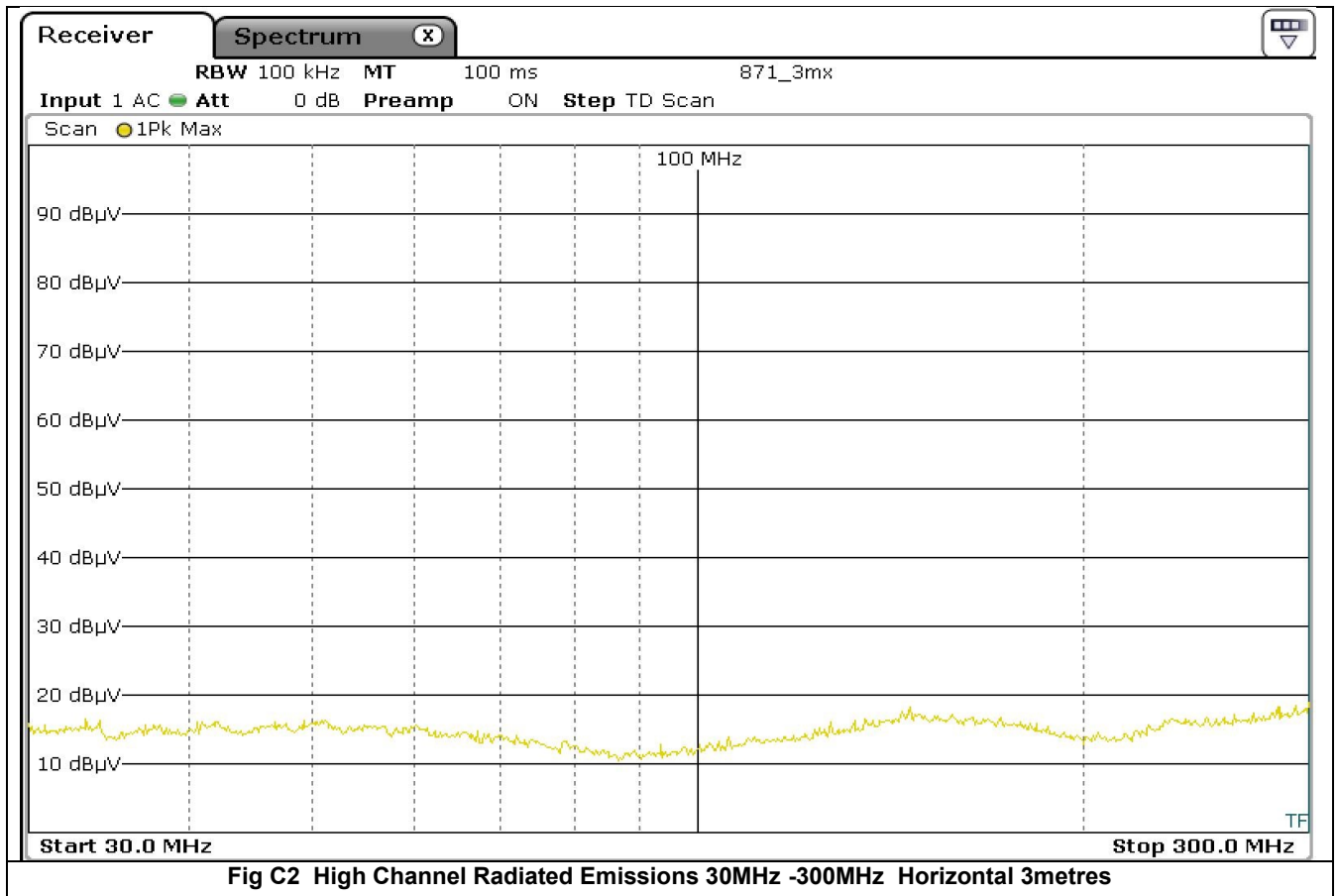
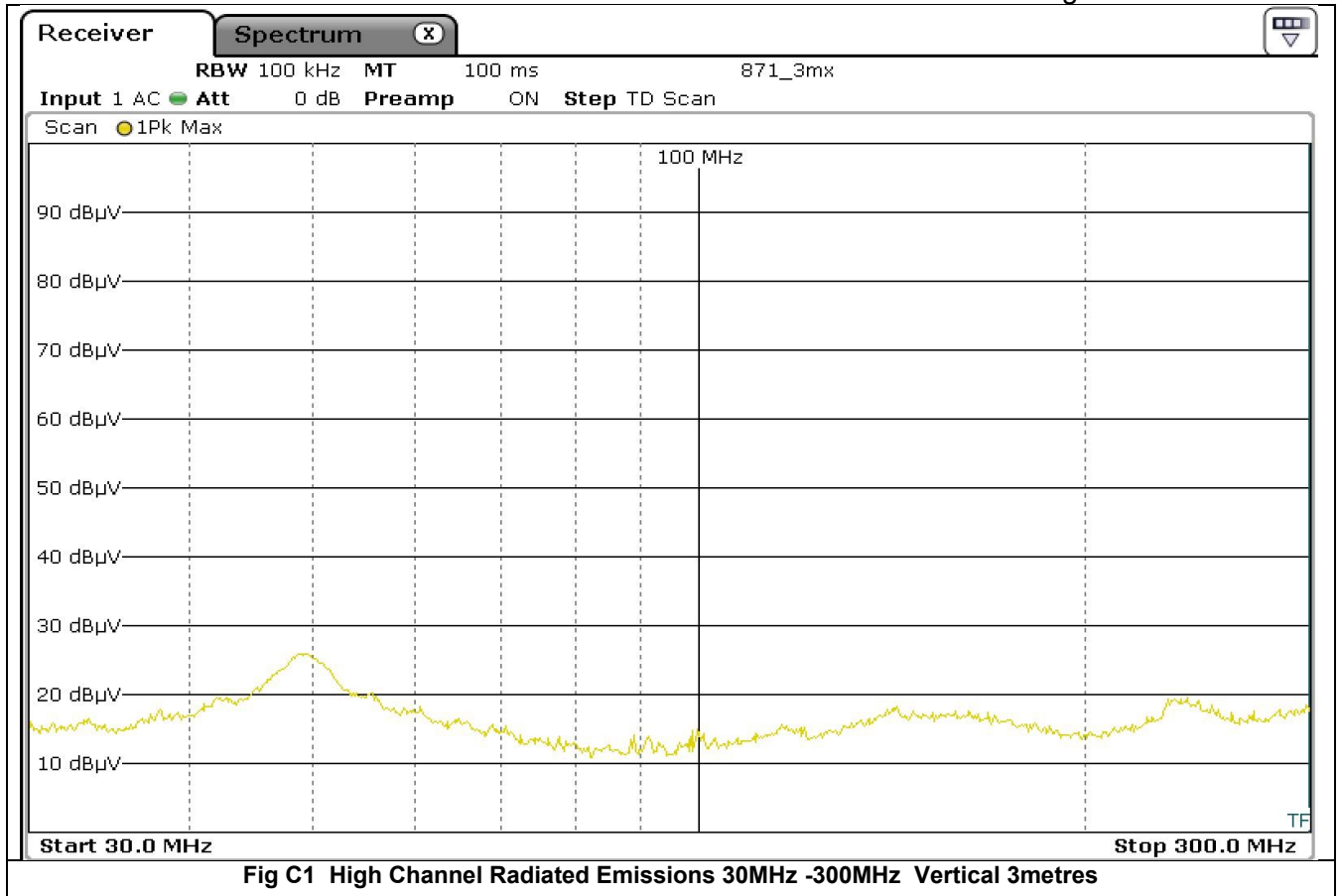
1.0 EUT Description

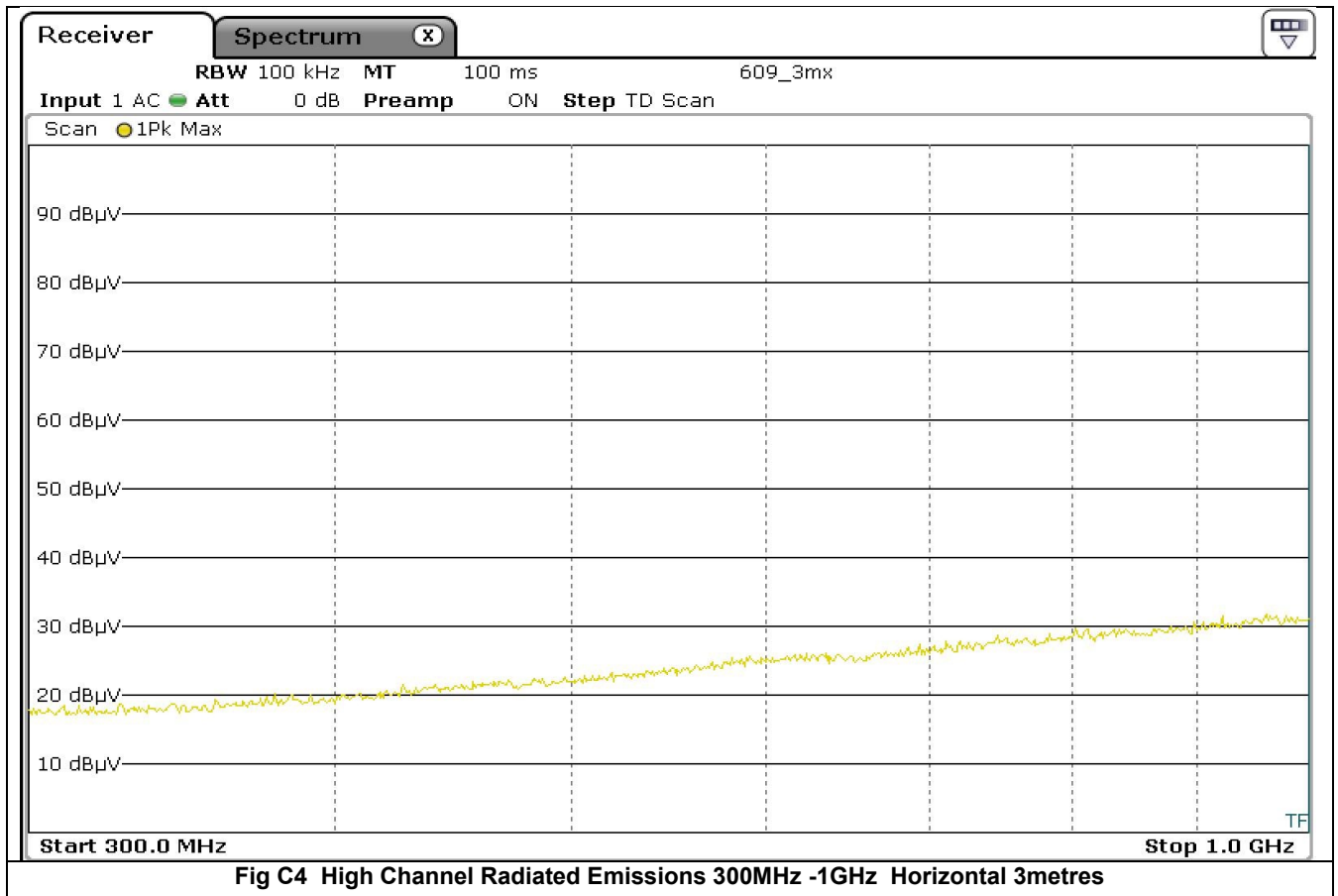
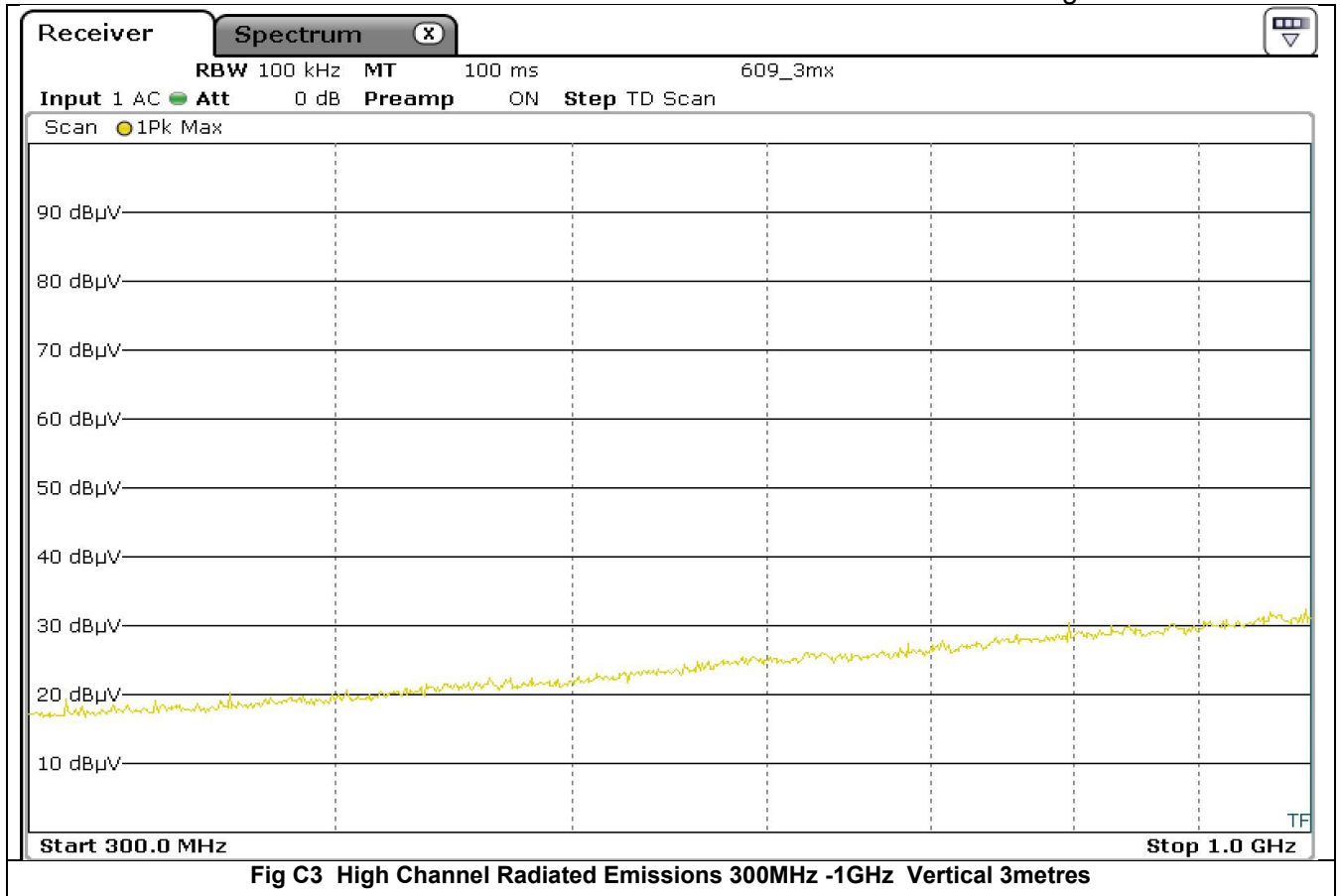
| | |
|--------------------------------------|---|
| Type: | Sensor with Bluetooth Low Energy |
| Type of radio: | Stand-alone |
| Transmitter Type: | Bluetooth Low Energy |
| Operating Frequency Range(s): | 2.402 GHz - 2.480GHz |
| Number of Channels: | 39 |
| Antenna: | Integral |
| Power configuration: | 12 v DC |
| Ports: | None |
| Classification: | DTS |
| BLE Antenna Type : | Pcb printed antenna |
| BLE Antenna Gain Max: | 2.4 dBi |
| BLE Antenna Impedance: | 50 ohms |
| Test Standards: | 15.247 RSS-247 |
| Test Methodology: | Measurements performed according to the procedures in ANSI C63.10-2013 KDB 558074 V5 R02 |

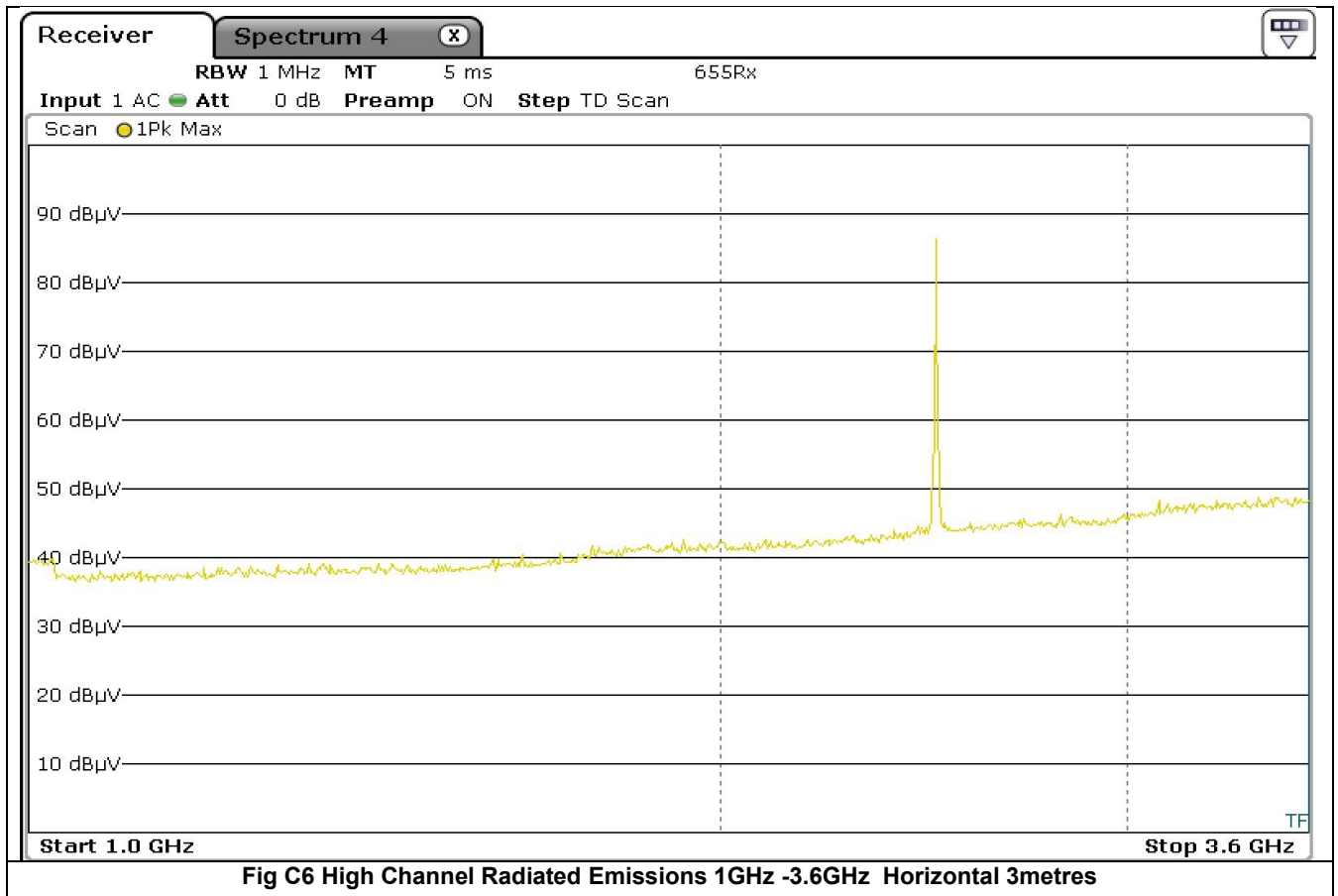
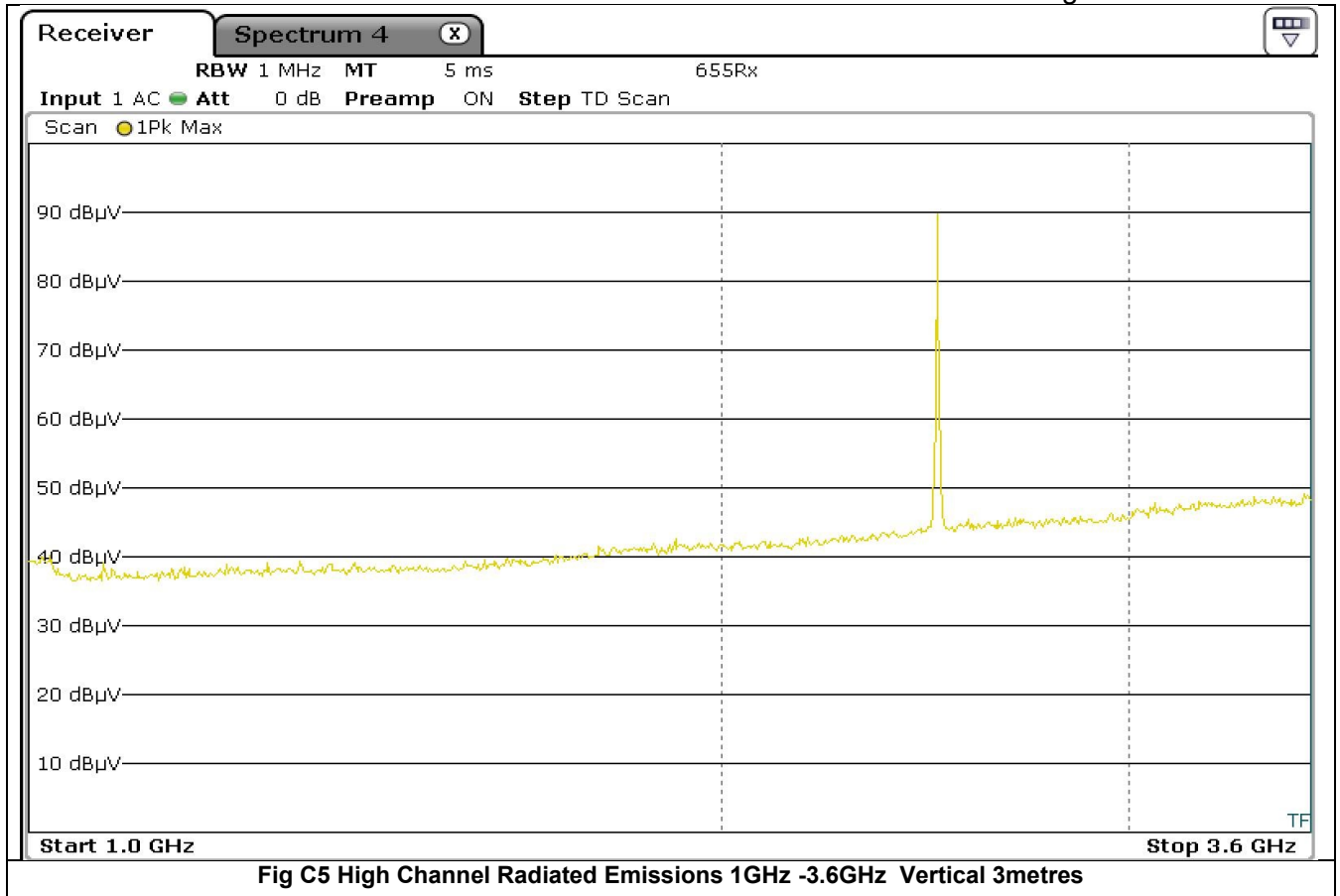
The EUT was a /sensor with BLE connectivity

Appendix C

Radiated Spurious Emissions







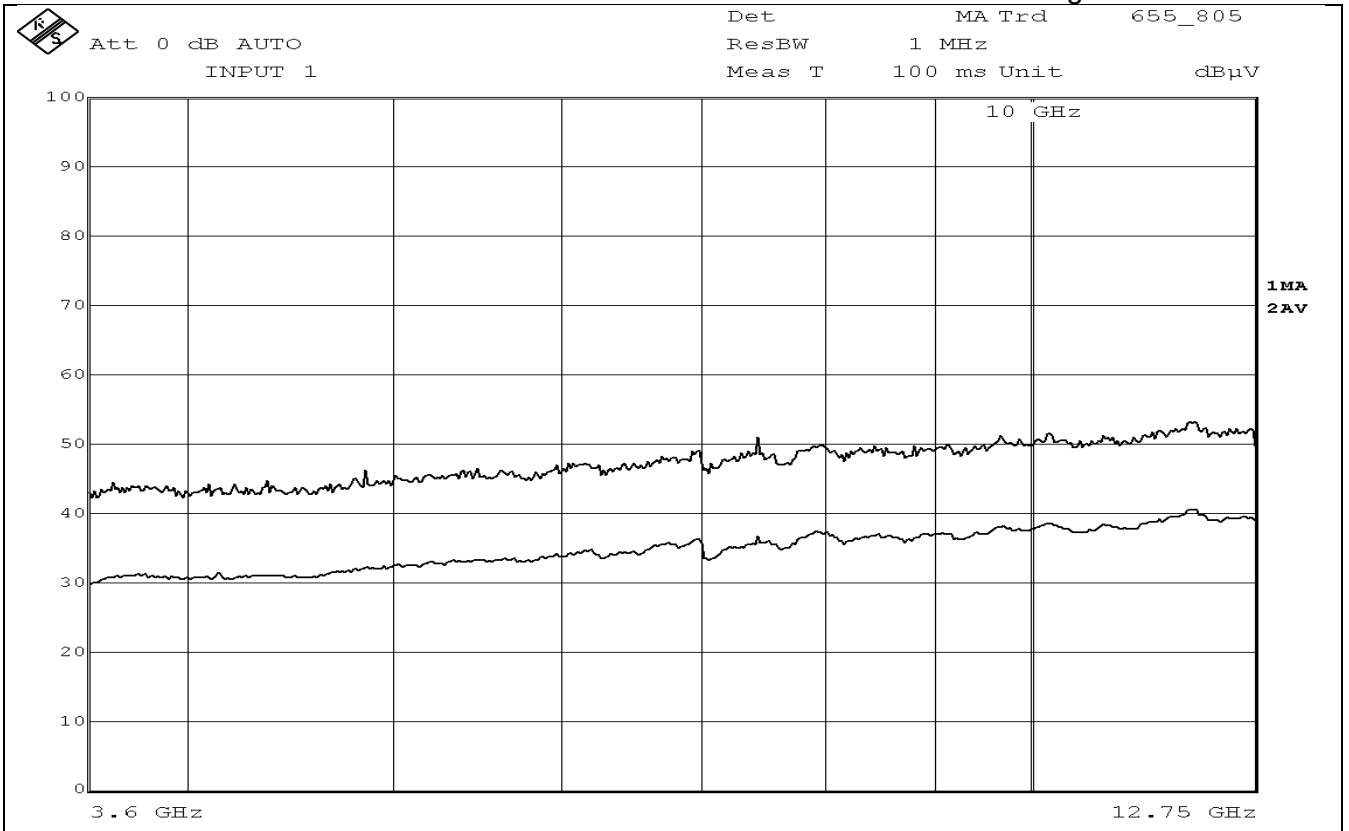


Fig C7 High Channel Radiated Emissions 3.6GHz -12.75GHz Vertical 3metres

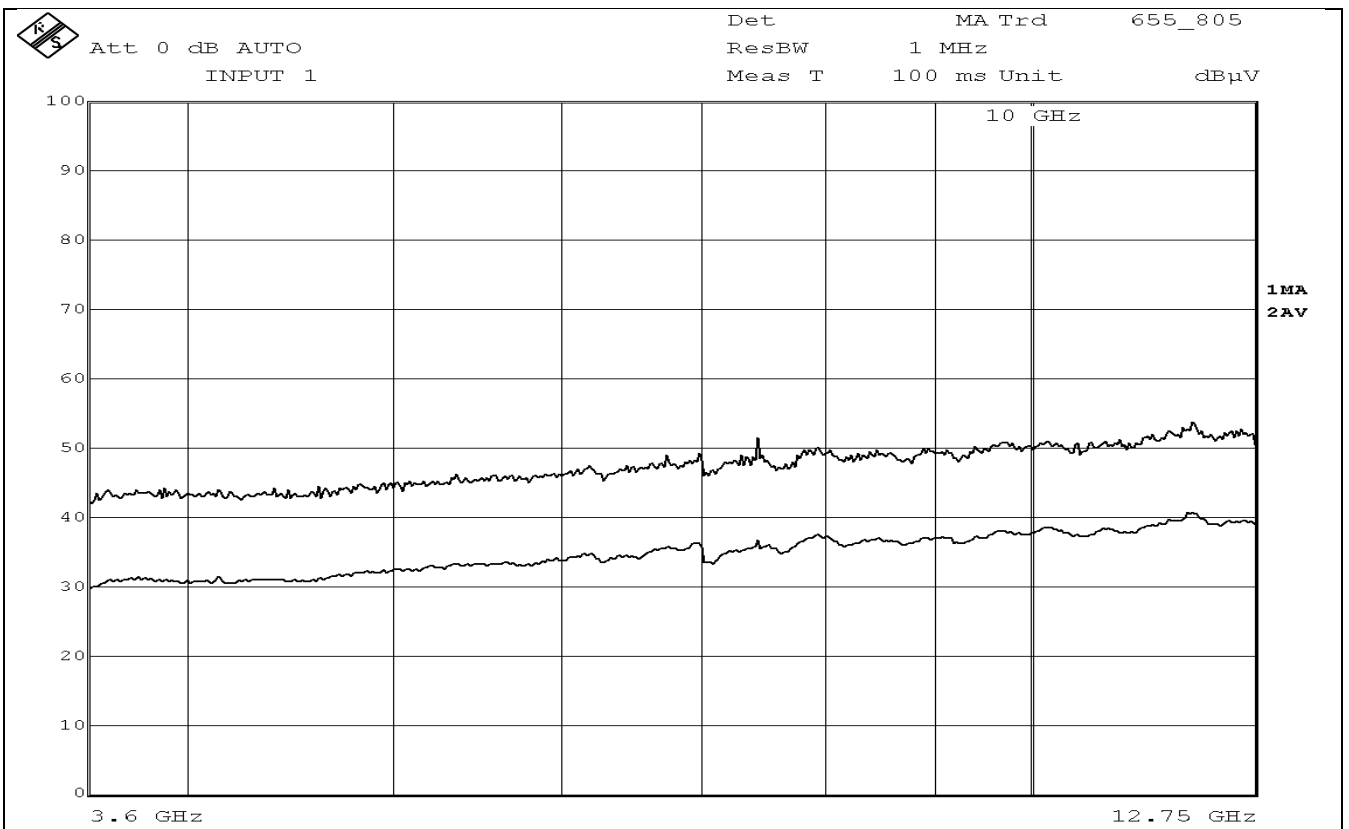


Fig C8 High Channel Radiated Emissions 3.6GHz -12.75GHz Horizontal 3metres

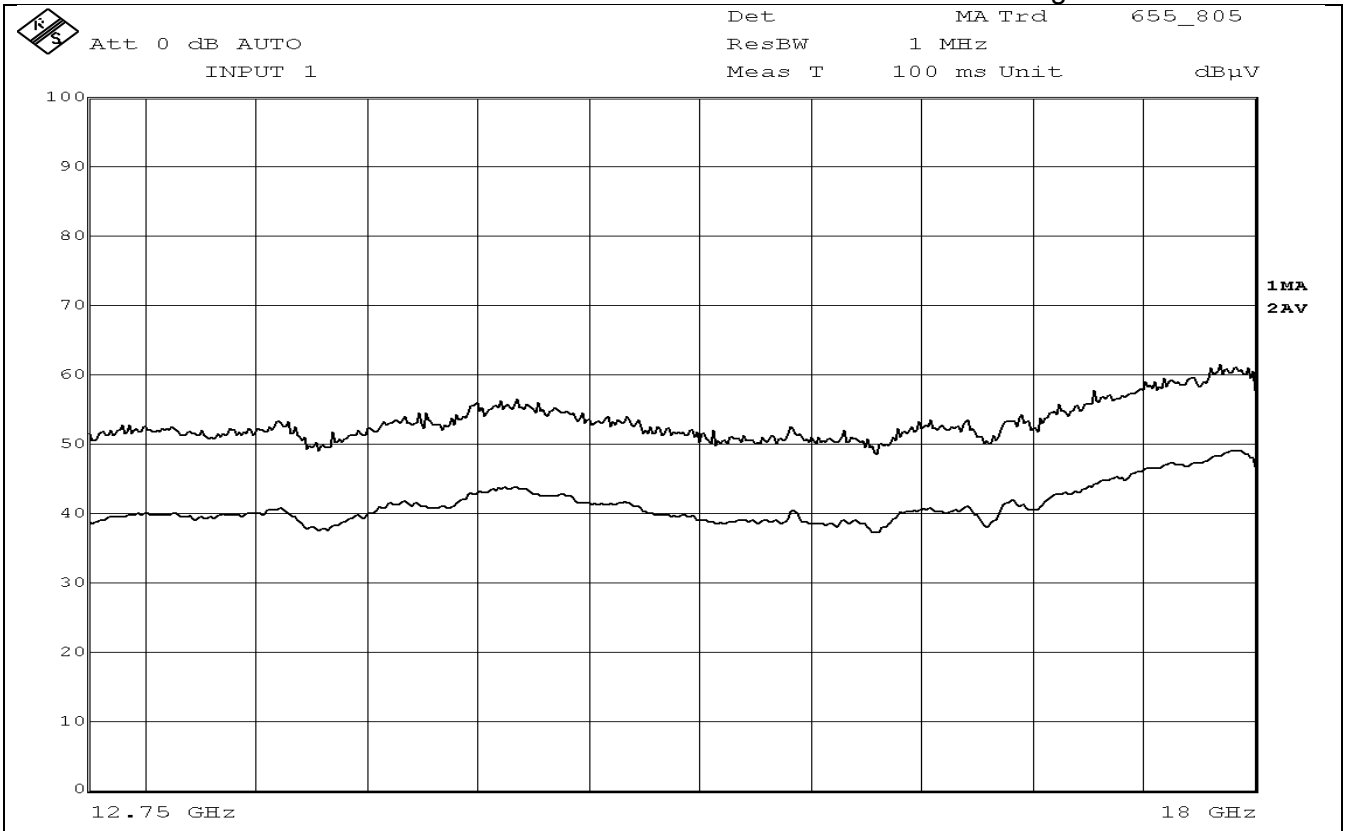


Fig C9 High Channel Radiated Emissions 12.75GHz -18GHz Vertical 3metres

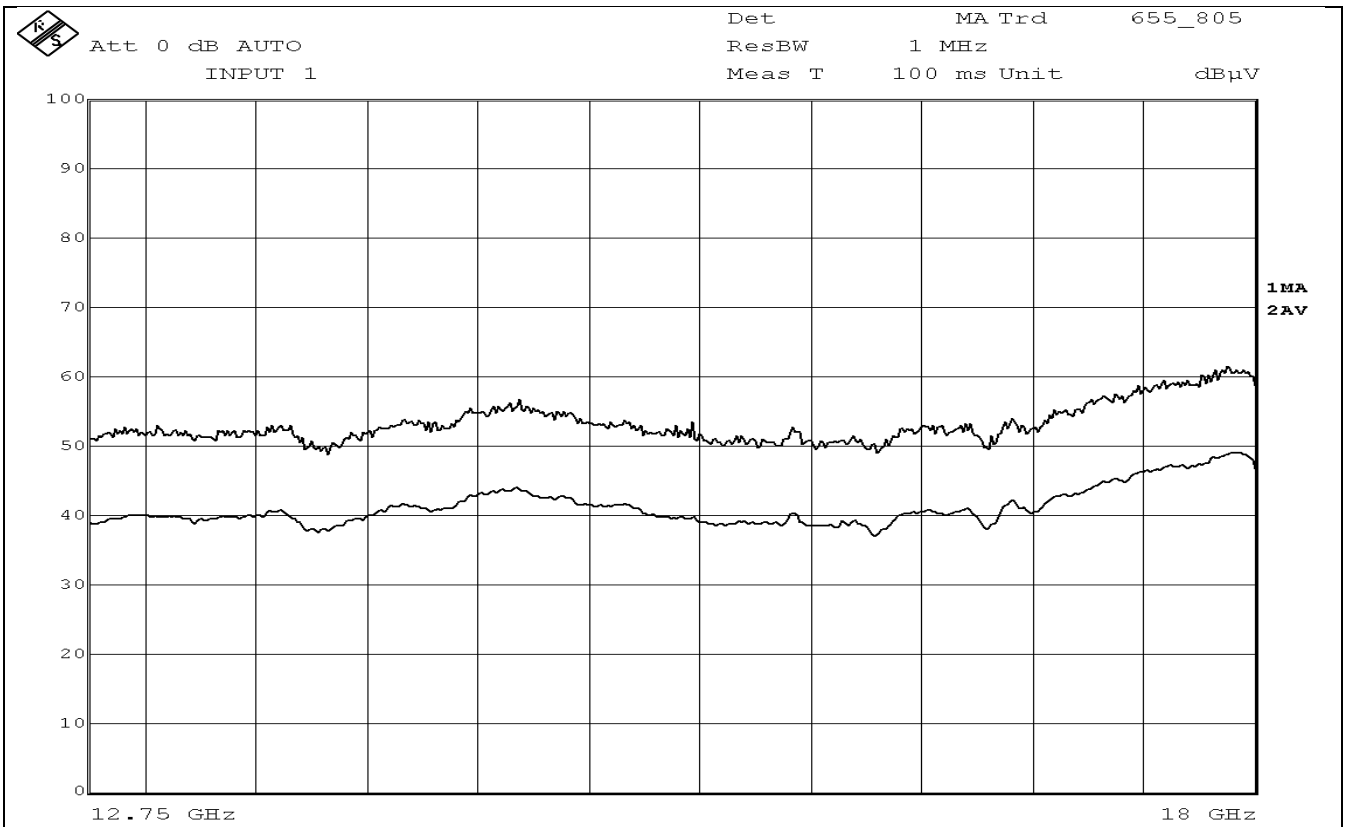


Fig C10 High Channel Radiated Emissions 12.75GHz -18GHz Horizontal 3metres

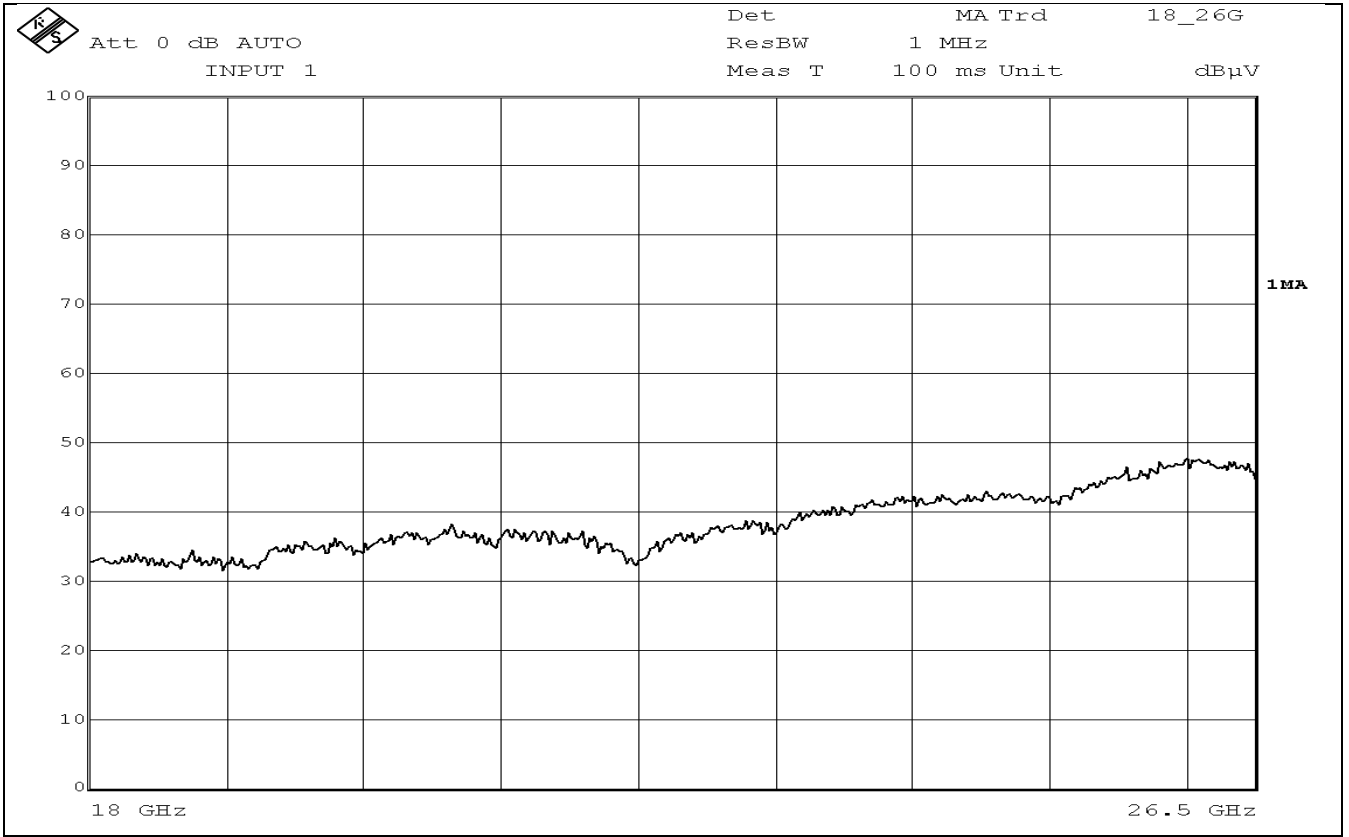


Fig C11 High Channel Radiated Emissions 18GHz -26.5GHz Vertical 1metre

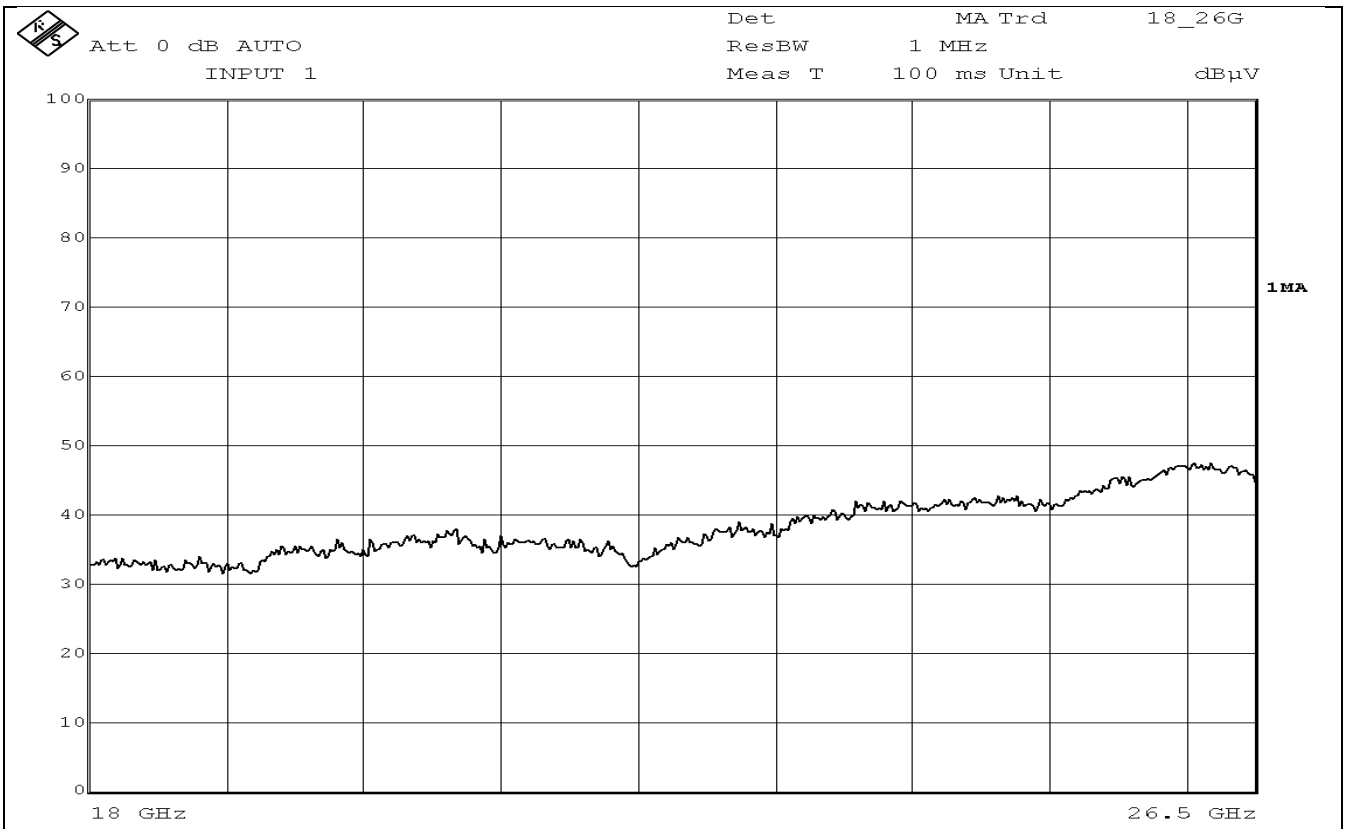
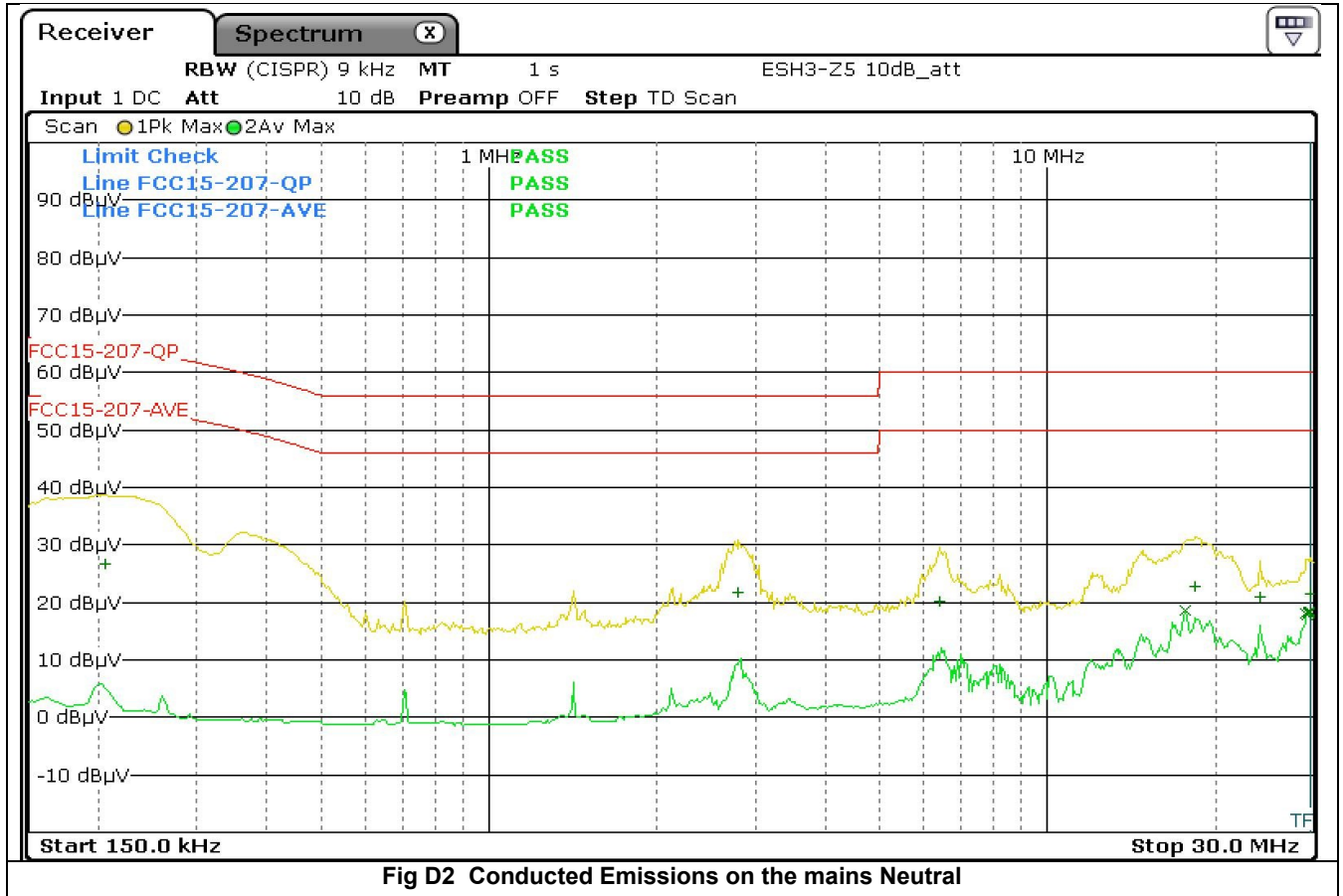
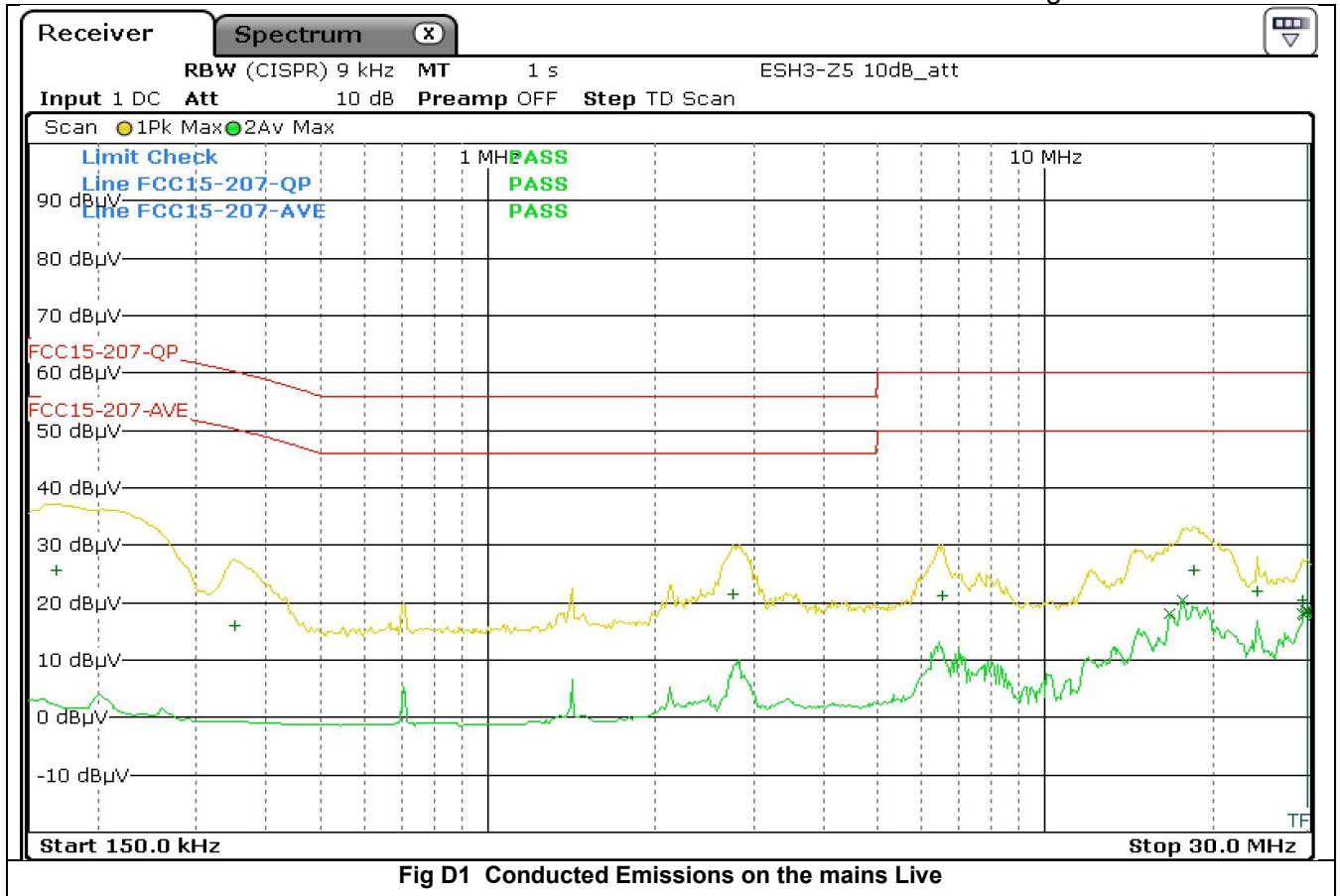


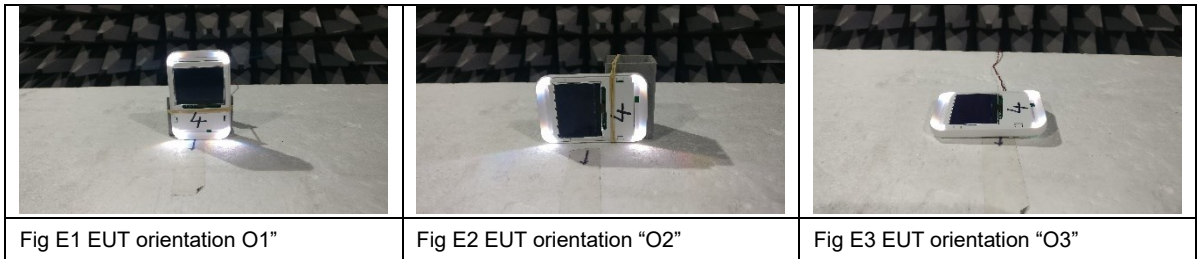
Fig C12 High Channel Radiated Emissions 18GHz -26.5GHz Horizontal 1metre

Appendix D

Conducted Emissions on the mains

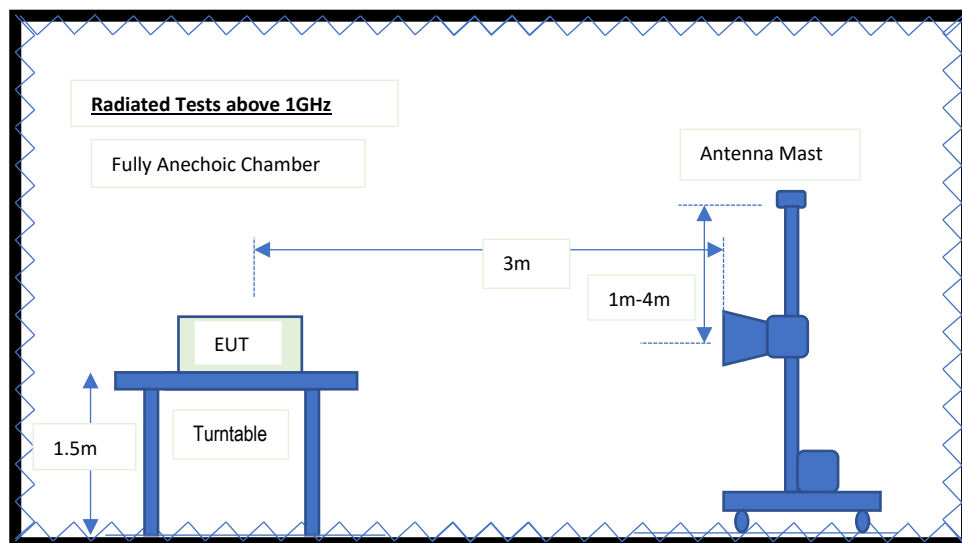
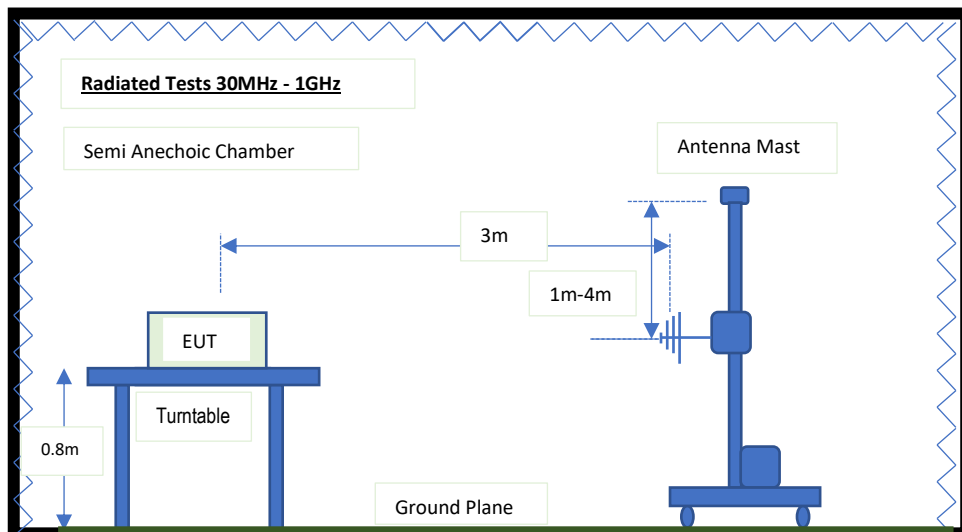
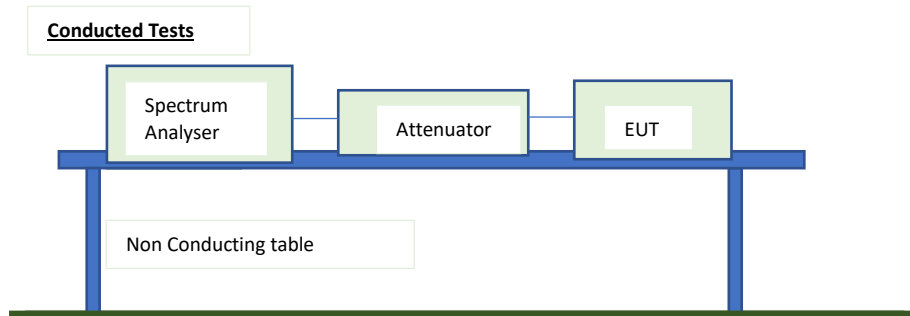


Appendix E



Orientations for Radiated Emissions

Appendix F
Block Diagrams of test set up



End of Report