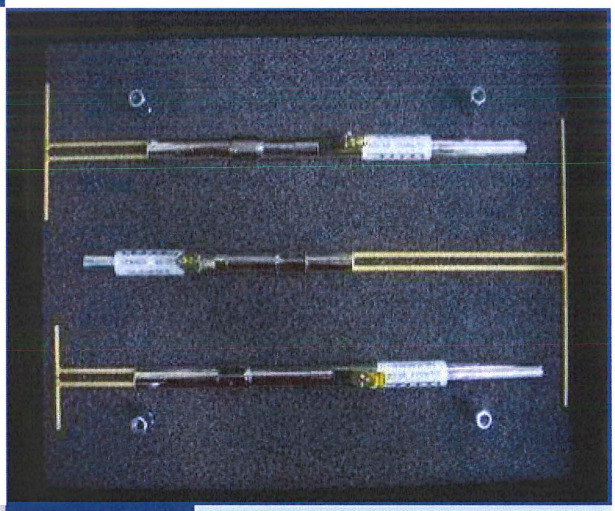
# SAR Dipole

# Performance Measurement Report

ISSUED BY
Shenzhen BALUN Technology Co., Ltd.

FOR

Validation Dipoles



Tested by: Zong Liyao (Engineer)

Approved by: Liao Jianming (Technical Director)

| | |
|---|---|
| Report No.: | LW-SZ2060015-701 |
| EUT Type: | SAR Validation Dipole |
| Model Name: | D835V2, D1750V2<br>D1900V2, D2450V2, D2600V2 |
| Brand Name: | Speag |
| Test Conclusion: | Pass |
| Test Date: | Sep. 12, 2019 ~ Jun 02, 2020 |
| Date of Issue: | Jun 03, 2020 |

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# 1 GENERAL INFORMATION

## 1.1 Introduction

This document contains a summary of the requirements set forth by the IEEE 1528, FCC KDB 865664 D01 for reference dipoles used for SAR measurement system validations. Instead of the typical annual calibration recommended by measurement standards, the reference dipoles were demonstrated that the SAR target, impedance and return loss have remain stable, so the longer calibration interval is acceptable.

## 1.2 General Description for Equipment under Test (EUT)

| | |
|---|---|
| EUT Type | DASY 5 Reference Dipoles |
| Manufacturer | Speag |

| Parameter | EUT 2 | EUT 3 | EUT 4 | EUT 5 | EUT 6 |
|---|---|---|---|---|---|
| Model | D835V2 | D1750V2 | D1900V2 | D2450V2 | D2600V2 |
| Frequency | 835 MHz | 1750 MHz | 1900 MHz | 2450MHz | 2600 MHz |
| Serial Number | SN 4d187 | SN 1130 | SN 5d193 | SN 952 | SN 1095 |
| Product Condition (New/ Used) | Used | Used | Used | Used | Used |
| Last Cal. Date | 2019/6/11 | 2018/09/13 | 2019/6/11 | 2019/6/10 | 2018/11/05 |
| Current meas. Date | 2020/6/01 | 2019/09/12 | 2020/6/01 | 2020/6/02 | 2019/11/04 |

## 1.3 EUT Photos

| D835V2 |
| --- |
| |
| D1750V2 |
| |
| D1900V2 |
| |
| D2450V2 |
| |
| D2600V2 |
| |

## 2 DIPOLE IMPEDANCE AND RETURN LOSS

The dipoles are designed to have low return loss when presented against a flat phantom at the specified distance. A Vector Network Analyser was used to perform a return loss measurement on the specific dipole when in the measurement location against the phantom and the distance was specified by the manufacturer with a special, low loss and low relative permittivity spacer.
The impedance was measured at the SMA-connector with the network analyser.

The measurement of verification with return loss should not deviate by more than 20% and minimum of 20 dB of the return loss, and the impedance (real or imaginary parts) should not deviate by more than 5 Ohms from the previous measurement using network analyzer.

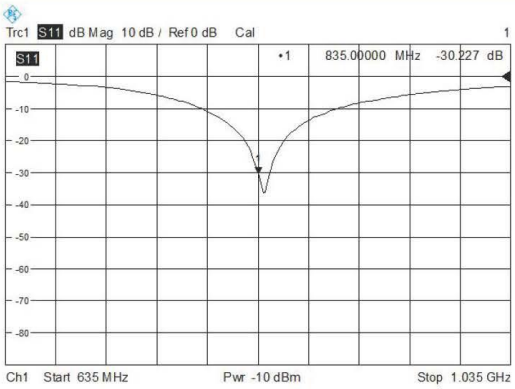
Note:
The "Previous Meas." in the following table refer to dipoles or other equivalent RF sources calibration reports.

## 2.1 D835V2

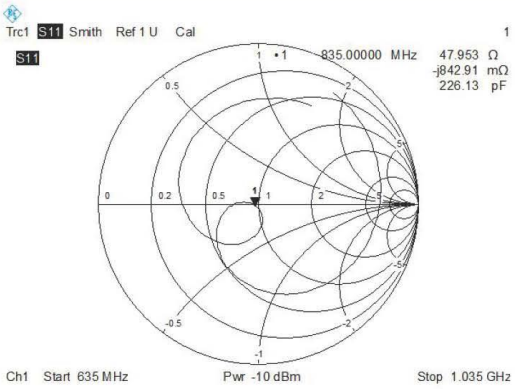
***RETURN LOSS AND IMPEDANCE IN HEAD LIQUID***

| Meas. Results | Current Meas. | Previous Meas. | Max. Deviation |
|---|---|---|---|
| Return Loss(dB) | -30.227 | -28.95 | -4.41% |
| Impedance | 47.953Ω – 0.843 jΩ | 51.919 Ω - 3.091jΩ | -3.966Ω (Real part) |

Return Loss



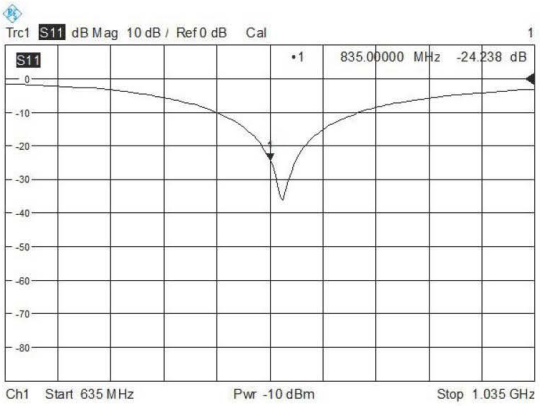

Impedance



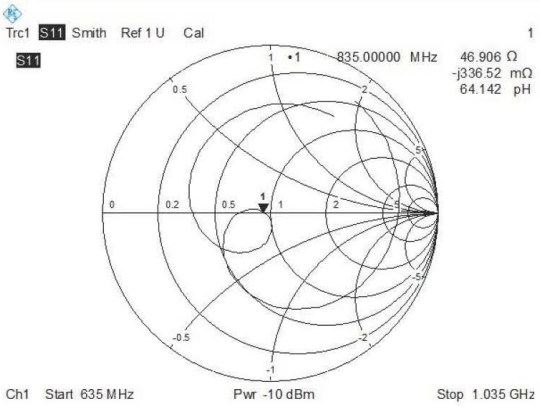
***RETURN LOSS AND IMPEDANCE IN BODY LIQUID***

| Meas. Results | Current Meas. | Previous Meas. | Max. Deviation |
|---|---|---|---|
| Return Loss(dB) | -24.238 | -24.864 | 2.518% |
| Impedance | 46.906 Ω - 0.336 jΩ | 47.302 Ω - 4.868 jΩ | 4.532Ω (Imaginary part) |

Return Loss




Impedance

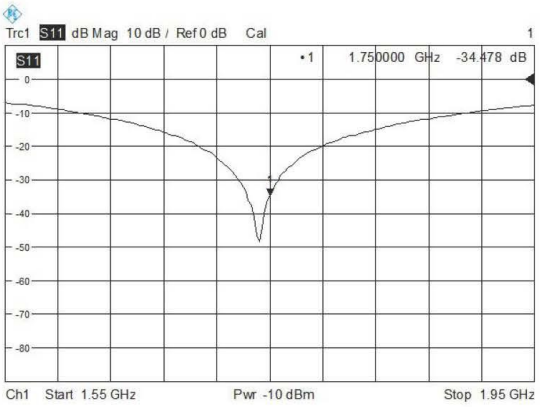


## 2.23.3 D1750V2

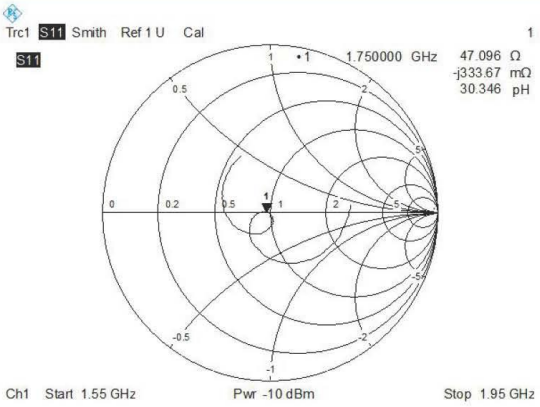
***RETURN LOSS AND IMPEDANCE IN HEAD LIQUID***

| Meas. Results | Current Meas. | Previous Meas. | Max. Deviation |
|---|---|---|---|
| Return Loss(dB) | -34.478 | -32.43 | 6.32% |
| Impedance | 47.096 Ω -0.334 jΩ | 50.193 Ω - 2.388 jΩ | 3.097Ω (Real part) |

Return Loss



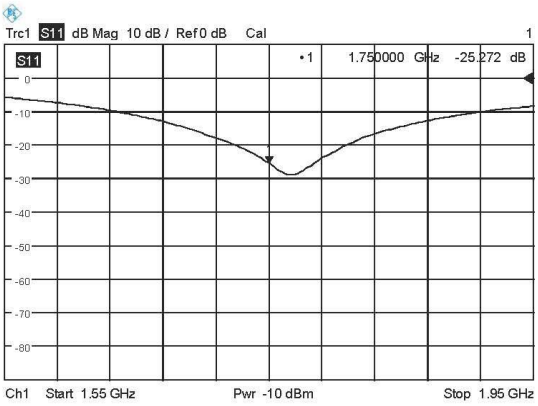

Impedance



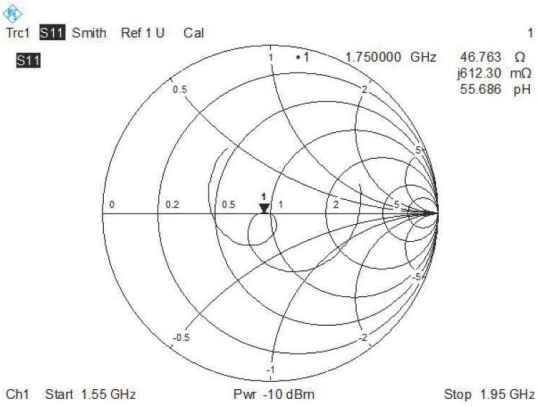
***RETURN LOSS AND IMPEDANCE IN BODY LIQUID***

| Meas. Results | Current Meas. | Previous Meas. | Max. Deviation |
|---|---|---|---|
| Return Loss(dB) | -25.272 | -24.825 | 1.81% |
| Impedance | 46.763 Ω +0.612 jΩ | 45.20 Ω - 2.611 jΩ | 3.223Ω (Real part) |

Return Loss




Impedance

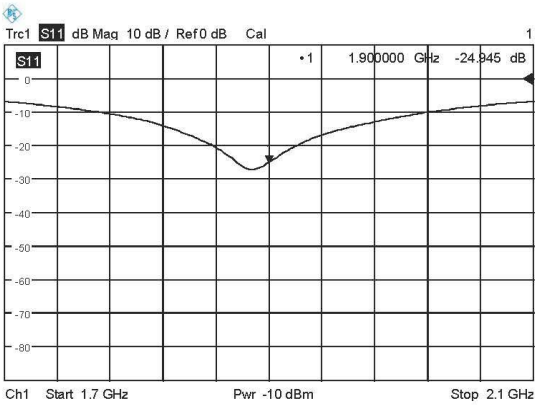


## 2.3 D1900V2

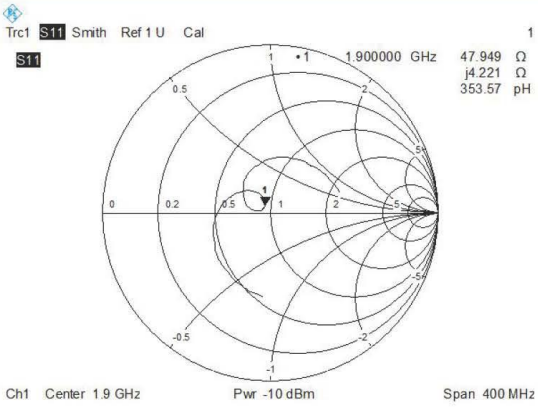
***RETURN LOSS AND IMPEDANCE IN HEAD LIQUID***

| Meas. Results | Current Meas. | Previous Meas. | Max. Deviation |
|---|---|---|---|
| Return Loss(dB) | -24.945 | -24.339 | 2.49% |
| Impedance | 47.949 Ω + 4.221 jΩ | 51.748 Ω + 5.933 jΩ | 3.799Ω (Real part) |

Return Loss



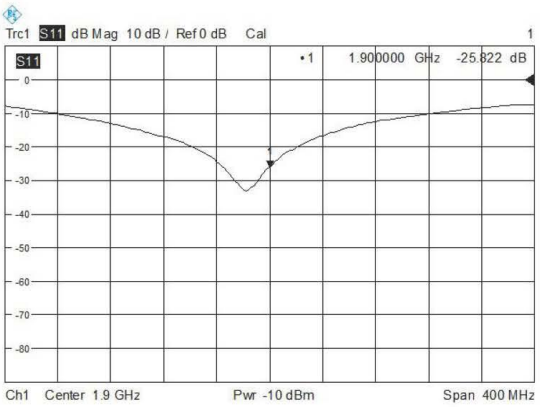

Impedance



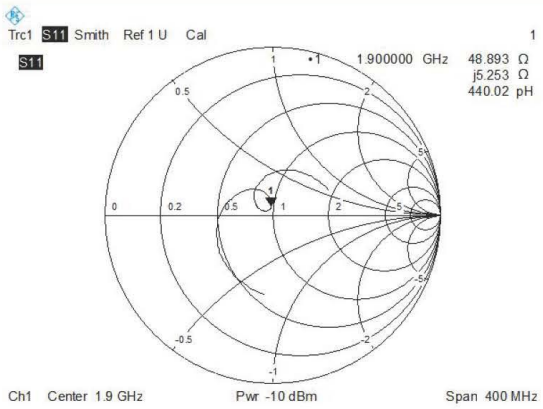
***RETURN LOSS AND IMPEDANCE IN BODY LIQUID***

| Meas. Results | Current Meas. | Previous Meas. | Max. Deviation |
|---|---|---|---|
| Return Loss(dB) | -25.822 | -24.704 | 4.53% |
| Impedance | 48.893 Ω + 5.253 jΩ | 47.771 Ω + 5.242 jΩ | 1.122Ω (Real part) |

Return Loss




Impedance

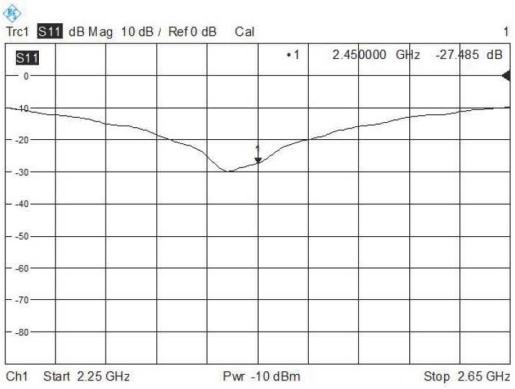


2.4D2450V2

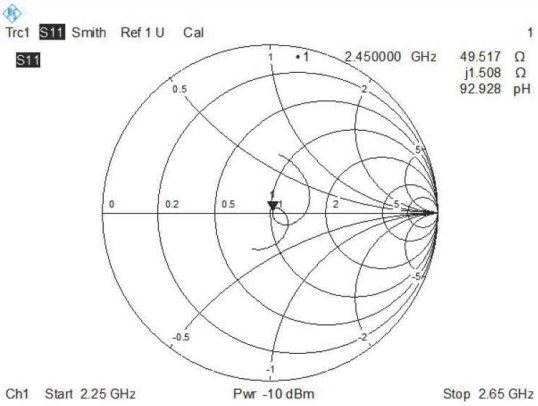
***RETURN LOSS AND IMPEDANCE IN HEAD LIQUID***

| Meas. Results | Current Meas. | Previous Meas. | Max. Deviation |
|---|---|---|---|
| Return Loss(dB) | -27.485 | -26.753 | 2.74% |
| Impedance | 49.517 Ω + 1.508 jΩ | 54.071 Ω + 2.513 jΩ | 4.554Ω (Real part) |

Return Loss



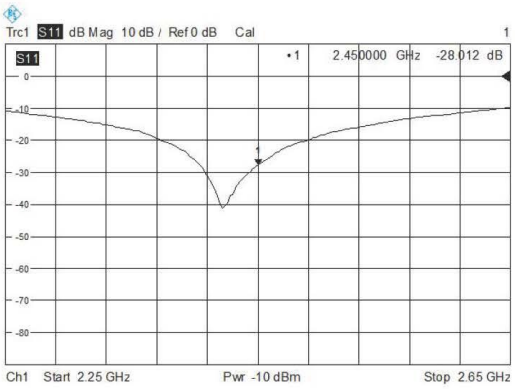

Impedance



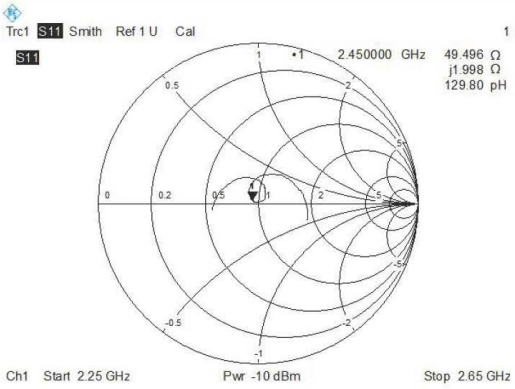
***RETURN LOSS AND IMPEDANCE IN BODY LIQUID***

| Meas. Results | Current Meas. | Previous Meas. | Max. Deviation |
|---|---|---|---|
| Return Loss (dB) | -28.012 | -27.882 | 0.47% |
| Impedance | 49.496 Ω + 1.998 jΩ | 52.349 Ω + 3.40 jΩ | 2.853Ω (Imaginary part) |

Return Loss




+Impedance

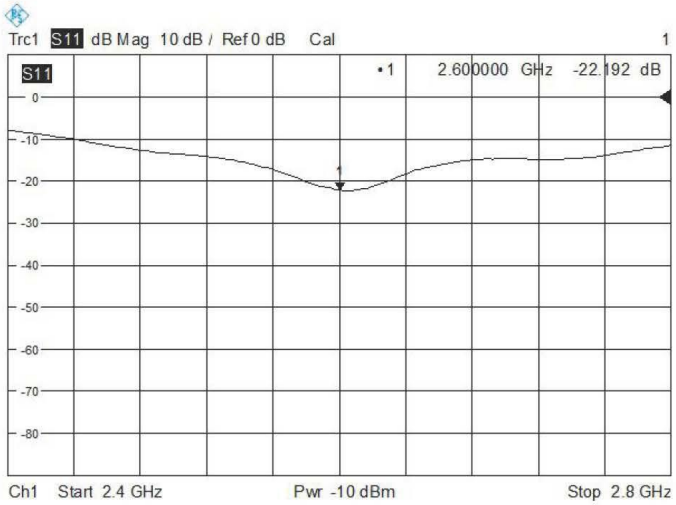


## 2.5 D2600V2

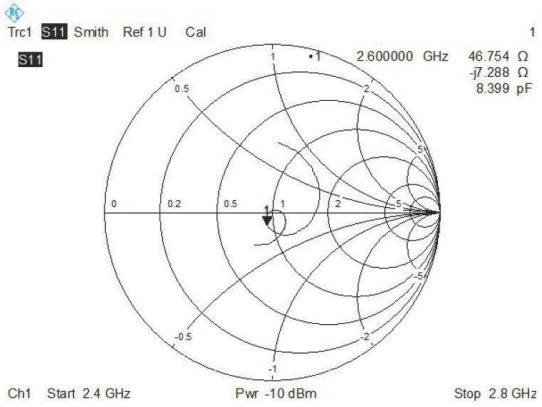
***RETURN LOSS AND IMPEDANCE IN HEAD LIQUID***

| Meas. Results | Current Meas. | Previous Meas. | Max. Deviation |
|---|---|---|---|
| Return Loss(dB) | -22.192 | -25.784 | 13.93% |
| Impedance | 46.754 Ω -7.288 jΩ | 49.443 Ω -5.089jΩ | 2.689Ω (Real part) |

Return Loss



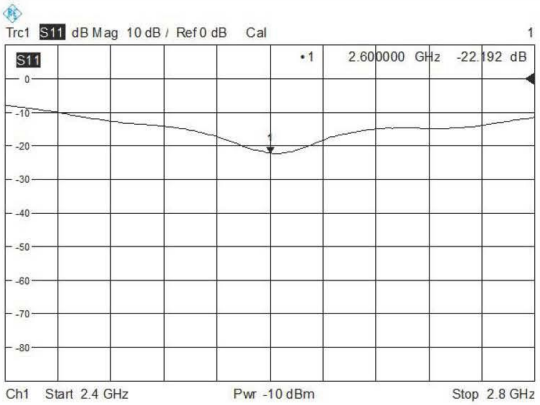

Impedance

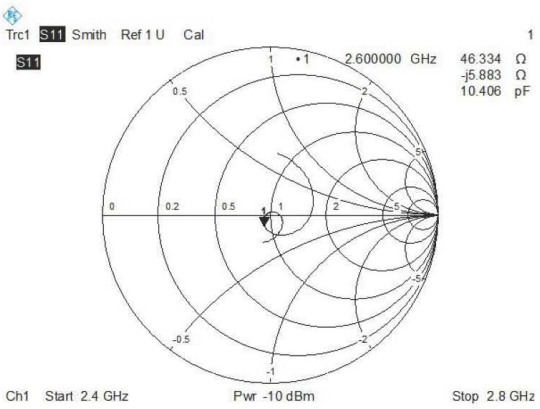


***RETURN LOSS AND IMPEDANCE IN BODY LIQUID***

| Meas. Results | Current Meas. | Previous Meas. | Max. Deviation |
|---|---|---|---|
| Return Loss(dB) | -22.192 | -23.544 | 5.74% |
| Impedance | 46.334 Ω -5.883 jΩ | 46.722 Ω -5.546 jΩ | 0.388Ω (Real part) |

Return Loss




Impedance

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