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EMC-EMF Safety Approvals

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## **FIELD STRENGTH TEST REPORT**

**Report Number: M151108-2**

**Test Sample:** Patch'd Smartchip

**Model number:** Patch'd Smartchip Samsung S4, S5

**Tested For:** Brainwave Technology Pty Ltd

**Date of Issue:** 17 December 2015

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**EMC Technologies Report No: M1151108-2**

**Issue Date: 17 December 2015**

**Test Sample:** Patch'd Smartchip  
**Model number:** Patch'd Smartchip Samsung S4, S5

**Tested for:** Brainwave Technology Pty Ltd  
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**Test Requirements:** Field strength measurements on Samsung Galaxy S5 with and without Patch'd Smartchip

**Test Dates:** 6<sup>th</sup> – 10<sup>th</sup> November 2015

**Test Engineer:**



\_\_\_\_\_  
**Larry Phuah**



**Authorised Signature:** \_\_\_\_\_  
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## Electric Field Strength Test Report

### EMC Technologies Report M151108-2

## 1.0 INTRODUCTION

Electric Field Strength Measurements (Peak and Polar) were from a Samsung Galaxy S5 with and without the Patch'd Smartchip fitted. The results were compared to determine if there was a reduction in the transmitted electric field strength when the Samsung Galaxy S5 was fitted with the Patch'd Smartchip.

The test sample (and Samsung Galaxy S5) was provided by the client. The results herein apply only to the test sample.

## 2.0 TEST SAMPLE DESCRIPTION and TEST SETUP DETAILS

(Information supplied by the Client)

**Test Sample:** Patch'd Smartchip  
**Model Number:** Patch'd Smartchip for Samsung S4, S5

### 2.1 Product Description

The Patch'd Smartchip contains a micro-thin printed circuit board designed to channel harmful radiation away from the user's head and body without adversely affecting the signal field strength (connectivity).

### 2.2 Operating Conditions

The Samsung Galaxy S5 (Equipment Under Test) were operated using a Rhode & Schwarz CMU200 Radio Communication Tester to simulate a call made on the EUT. The channel bands utilised in the measurements are shown in the table below. The power level set as below ensures the actual transmit power for the EUT is set to maximum and constant.

Band (MHz)	Uplink Frequency	Band Channel	Band Power Class	Nominal Power (dBm)
850	846.6 MHz	5	1	30
900	897.6 MHz	8	4	33

### 2.3 Test Setup

Measurements were made inside a compliant CISPR 16-1-4 semi-anechoic chamber meeting the requirements for a test volume of 2m x 2m x 2m at 3 and 10 metre distances over the frequency range 30 MHz to 6000 MHz.

The EUT was placed vertically upright with a foam block at a height of 1.5m above the ground plane in the centre of the turn table with the front face of the EUT facing the 0° angle of the turn table. The antenna height was varied to maximise emissions.

The placement of the Patch'd chip on the EUT was confirmed by the client prior to commencement of test.

### 3.0. RESULTS

The results of the tests are contained on polar plot graphs 1 and 2 in Appendix B. In each graph, the difference between the two traces is the difference in the electric field strength measured at 10 metres from the EUT while it is in normal use.

Comparisons of the electric field strength from the EUT shows that with the Patch'd Smartchip fitted, there was an overall decrease in the transmitted electric field strength.

#### 3.1 Peak Field Strength Measurement Results

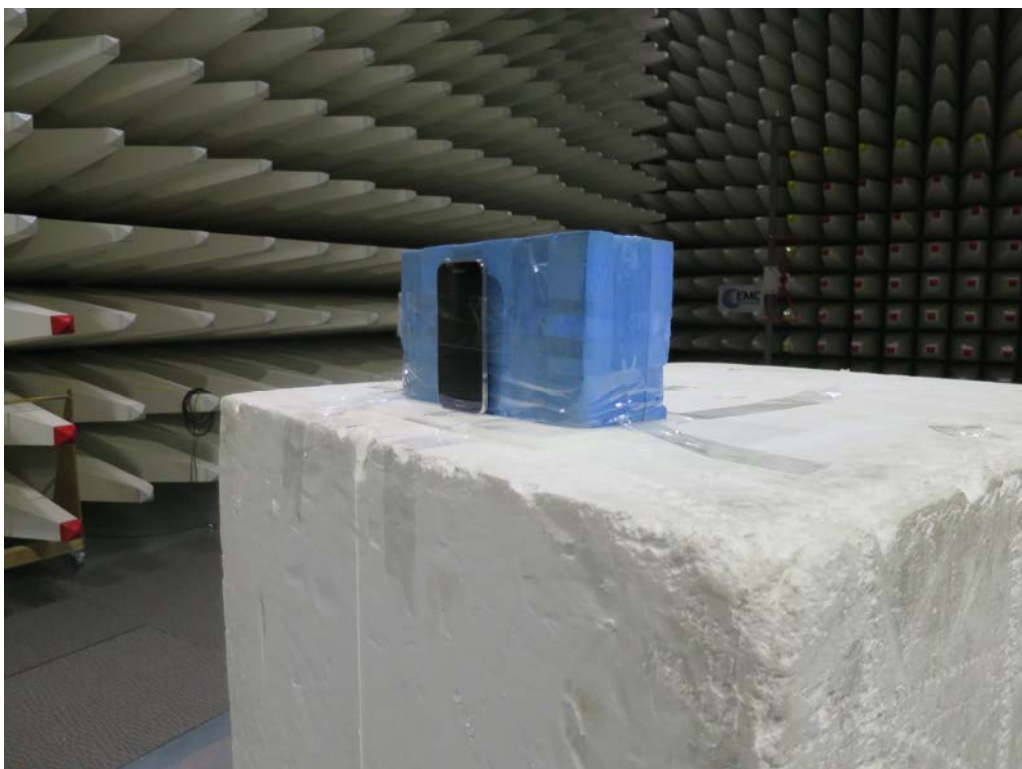
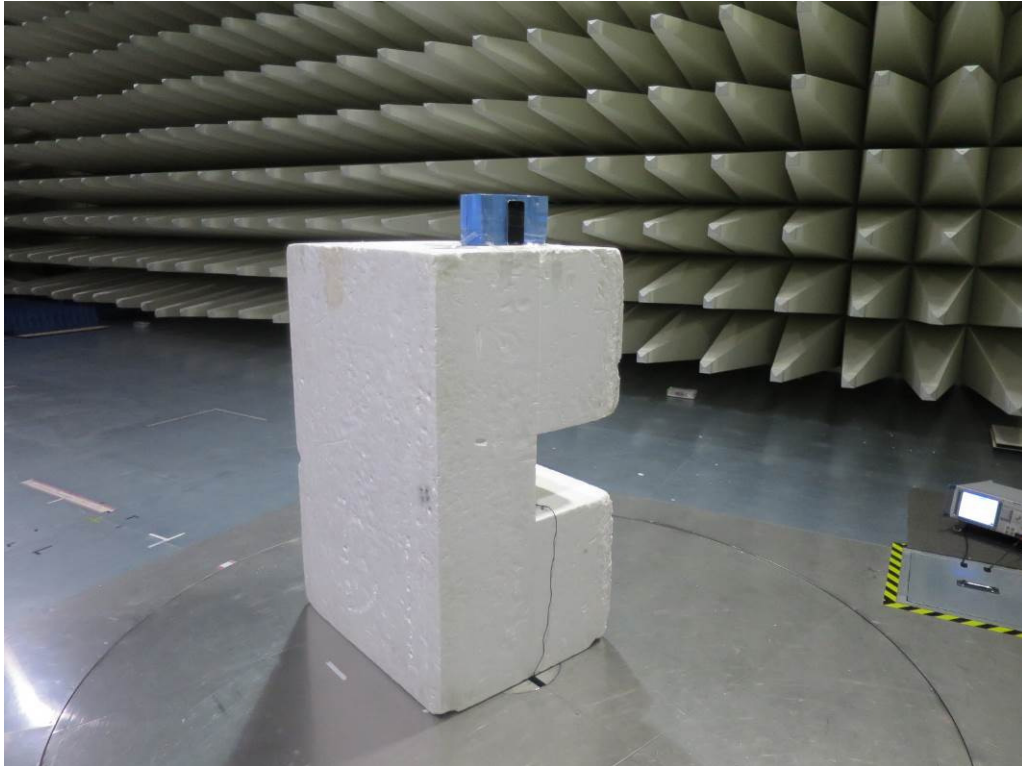
Test Band	Uplink Frequency (MHz)	Radiated Electric Field Strength Measurement @ 10m		Overall Reduction of Strength (Peak)	Overall Reduction of Strength (Average)
		With Patch'd	No Patch'd		
850	846.6	73.89 dB $\mu$ V/m	76.11 dB $\mu$ V/m	2.2 dB	2.2 dB
900	897.6	72.47 dB $\mu$ V/m	73.31 dB $\mu$ V/m	0.8 dB	0.8 dB

### 4.0 CONCLUSION

The Patch'd Smartchip, tested on behalf of Brainwave Technology Pty Ltd, was found to have minimal impact to the signal field strength of the Samsung Galaxy S5.

## APPENDIX A1 TEST SETUP PHOTOGRAPHS

### Test Setup



## APPENDIX A2 TEST SAMPLE PHOTOGRAPHS

### With Patch'd Smartchip



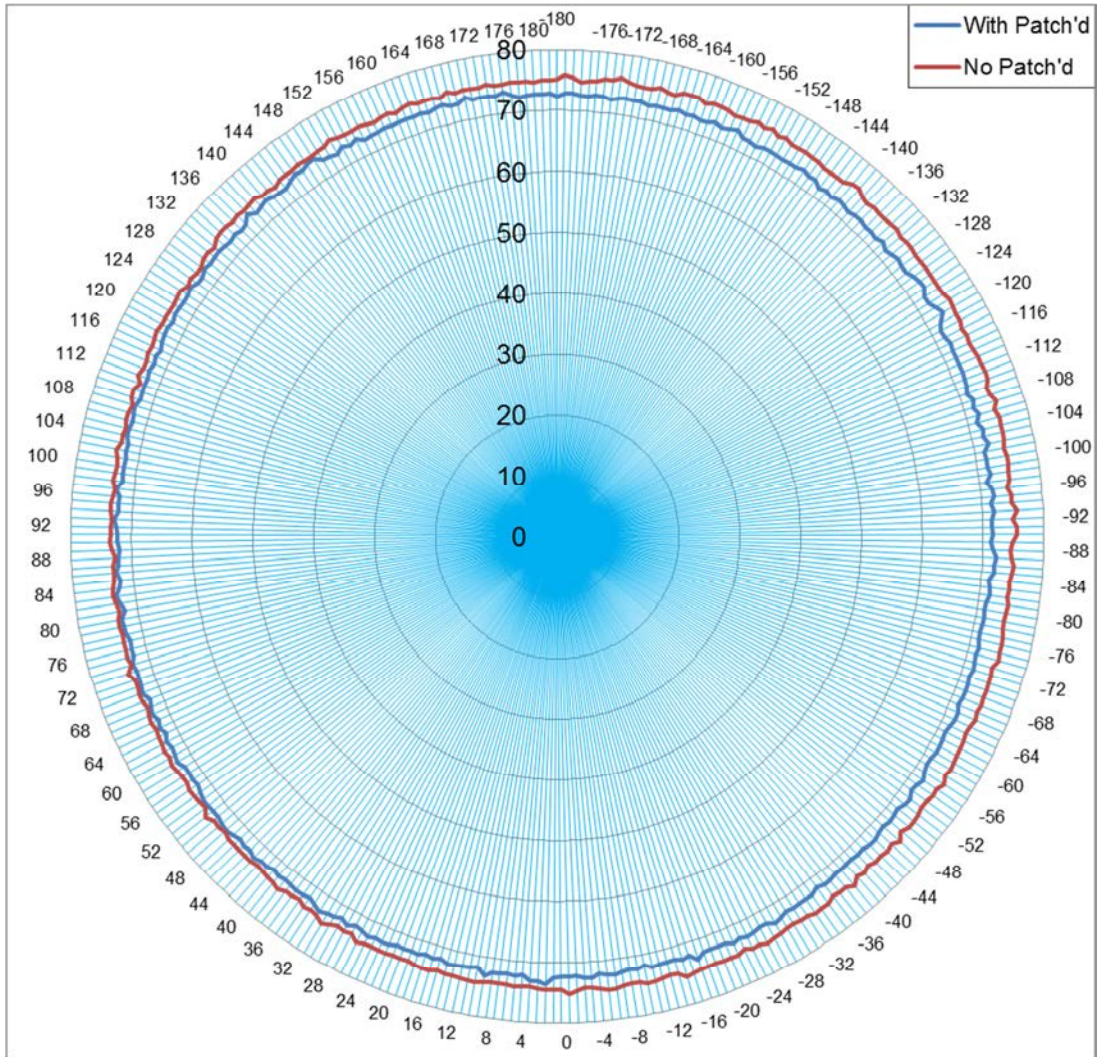
### No Patch'd Smartchip





## APPENDIX B1

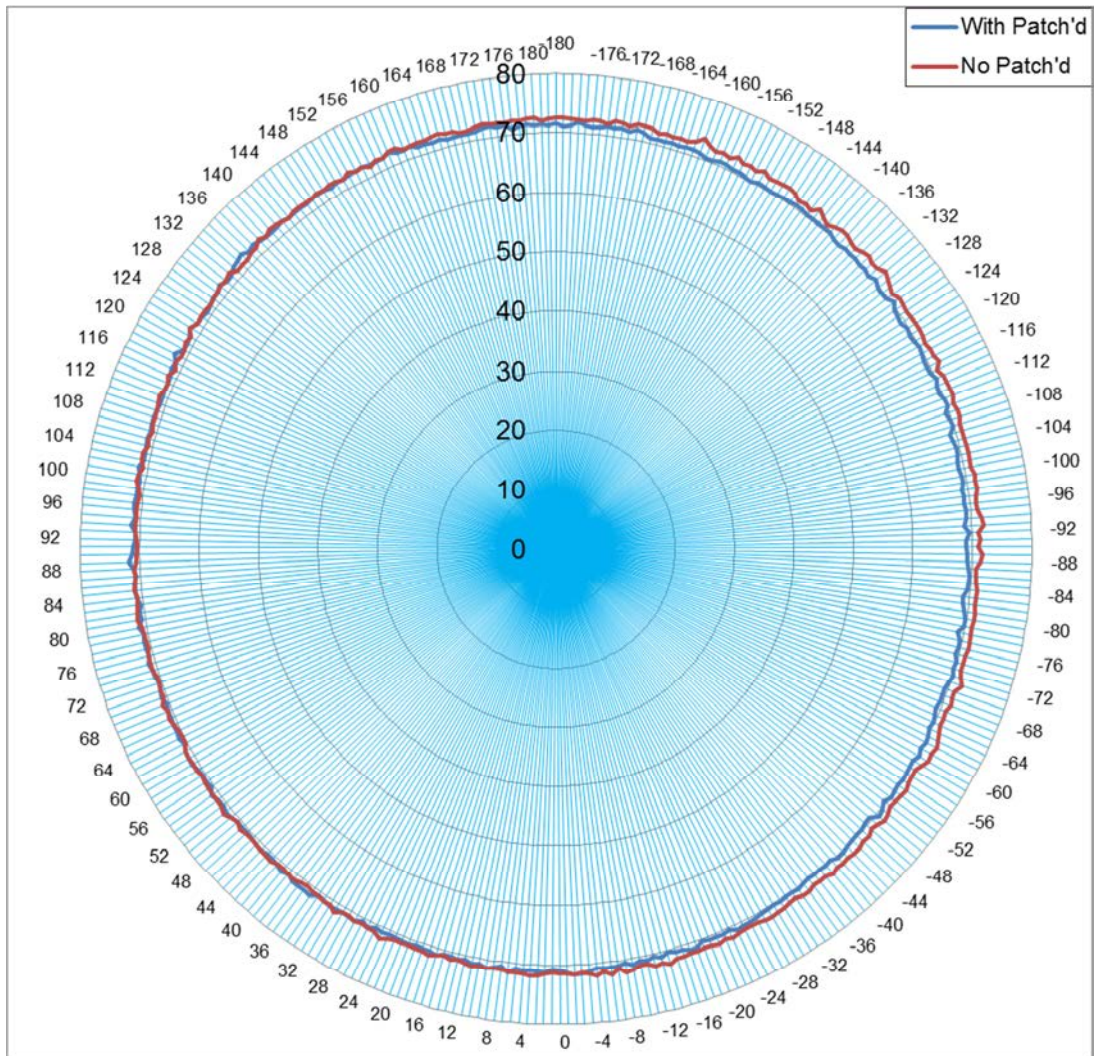
### POLAR RADIATION PATTERN MEASUREMENT



Graph 1 – 850 MHz

## APPENDIX B2

### POLAR RADIATION PATTERN MEASUREMENT



Graph 2 – 900 MHz