



	IEMIG IBBZGRIADIAOKAL
TEST REPORT NUMBER	DBN 1604TEL539-D
TEST REPORT DATE	11-Mar-2016
TEST REPORT VERSION	1.0
MANUFACTURER	Cambium Networks
PRODUCT NAME	ePMP2000
PRODUCT MODEL	C050900P031A
CONDITION OF EUT WHEN RECEIVED	GOOD and in proper working condition
ISSUED TO	Cambium Networks, 3800 Golf Road, Suite 360,
	Rolling Meadows, IL, USA 60008
Issued By	TARANG Lab Wipro Technologies, SJP2, Survey#70,77,78/8A, Dodda Kanelli, Sarjapur road, Bangalore. Karnataka. India - 560 035 Tel: +91-80-30292929 l'ax: +91-80-30298200 Email: tarang.planet@wipro.com Web: www.wipro.com





## AMENDMENT HISTORY

Amendment	Amendment	Author of Amendinent	Previous Report	Previous
Number	Date		Version	Report Date
Amendment Details				





## TABLE OF CONTENTS

1	TEST REPORT SUMMARY12
2	GENERAL INFORMATION13
2.1 2.2	ACCREDITATION DETAILS
3	INSTRUMENTATION AND CALIBRATION14
3.1 3.2	TEST AND MIASURING EQUIPMENT
4	PRODUCT INFORMATION
4.1 4.2	DESCRIPTION OF THE PRODUCT
5	TEST DETAILS16
5.1,1 5.1,2 5.1,3 5.2 5.3 5.3,1 5.3,2 5.3,3 5.3,4 6.3,5 6.3,5 6.3,6 6.3,7	PRODUCT AND TEST SETUP
INNE	XURE I: EUT SOFTWARE SETTINGS
NNE:	XURE II: ACRONYMS





LIST OF FIGURES	17
Figure 1 Block diagram of the EUT test setup	.17
Figure 2 Typical test setup for Conducted RF Test	17
Figure 3 Measured ON time	20
Figure 4 Measured Transmission Period (T).	20
Figure 5 Typical test setup for Conducted RF Test	22.
Figure 6 6dB Bandwidth measured at Ch.0	22.
Figure 7 6dB Bandwidth measured at Ch.1	.24
Figure 8 6 dB Bandwidth measured at Ch.0	.24
Figure 9 6 dB Bandwidth measured at Ch.1	.25
Figure 10 6 dB Bandwidth measured at Ch.0	.23 26
Figure 11 6 dB Bandwidth measured at Ch.1	.20 26
Figure 12 6 dB Bandwidth measured at Ch.0	, 40 27
Figure 13 6 dB Bandwidth measured at Ch.1	.27
Figure 14 6 dB Bandwidth measured at Ch.0	20
Figure 15 6 dB Bandwidth measured at Ch.1	,20 20
Figure 16 6 dB Bandwidth measured at Ch.0	20
Figure 17 6 dB Bandwidth measured at Ch.1	. 45 190
Figure 18 6 dB Bandwidth measured at Ch.0	.27
Figure 19 6 dB Bandwidth measured at Ch.1	.3U 20
Figure 20 6 dB Bandwidth measured at Ch.0	.30 21
Figure 21 6 dB Bandwidth measured at Ch.1	).I
Figure 22 6 dB Bandwidth measured at Ch.0	21
Figure 23 6 dB Bandwidth measured at Ch.1	.34 22
Figure 24 6 dB Bandwidth measured at Ch.0	34 22
Figure 25 6 dB Bandwidth measured at Ch.1	
Figure 26 6 dB Bandwidth measured at Ch.0	.33
Figure 27 6 dB Bandwidth measured at Ch 1	.34
Figure 28 6 dB Bandwidth measured at Ch.0	34 24
Figure 29 6 dB Bandwidth measured at Ch.1	33
Figure 30 Typical test setup for Conducted RF Test	,,,, 20
Figure 31 Maximum Conducted Output power measured at Ch.0 & Ch.1	<i>30</i>
Figure 32 Maximum Conducted Output power measured at Ch.0 & Ch.1	<i></i>
Figure 33 Maximum Conducted Output power measured at Ch.0 & Ch.1	39 40
Figure 34 Maximum Conducted Output power measured at Ch.0 & Ch.1	40 40
Figure 35 Maximum Conducted Output power measured at Ch.0 & Ch.1	40 41
Figure 36 Maximum Conducted Output power measured at Ch.0 & Ch.1	<del></del>
Figure 37 Maximum Conducted Output power measured at Ch.0 & Ch.1	41 40
Figure 38 Maximum Conducted Output power measured at Ch.0 & Ch.1	42 42
Figure 39 Maximum Conducted Output power measured at Ch.0 & Ch.1	42
Figure 40 Maximum Conducted Output power measured at Ch.0 & Ch.1	73 13
Figure 41 Maximum Conducted Output power measured at Ch.0 & Ch.1	 AA
Figure 42 Maximum Conducted Output power measured at Ch.0 & Ch.1	<del></del> 17
Figure 43 Typical test setup for Conducted Test	48
Figure 44 Power Spectral density measured at Ch. 0	40 49
Figure 45 Power Spectral density measured at Ch. 1	to
Figure 46 Power Spectral density measured at Ch. 0	AC
Figure 47 Power Spectral density measured at Ch. 1	42 57
Figure 48 Power Spectral density measured at Ch. 0	
Figure 49 Power Spectral density measured at Ch. 1	
Figure 50 Power Spectral density measured at Ch. 0	
Figure 51 Power Spectral density measured at Ch. 1	
Figure 52 Power Spectral density measured at Ch. 0.	2





Figure 53 Power Spectral density measured at Ch. 1	52
Discover 54 Denvice Spectral density measured at Ch. 0.	3.9
Figure 55 Power Spectral density measured at Ch. 1	33
Figure 56 Power Spectral density measured at Ch. 0	54
Figure 57 Power Spectral density measured at Ch. 1	.J11
Figure 58 Power Spectral density measured at Ch. 0	55
Figure 59 Power Spectral density measured at Ch. 1	56
Figure 60 Power Spectral density measured at Ch. 0	56
Figure 61 Power Spectral density measured at Ch. 1	57
Figure 62 Power Spectral density measured at Ch. 0	57
Figure 63 Power Spectral density measured at Ch. 1 Figure 64 Power Spectral density measured at Ch. 0	.58
Figure 64 Power Spectral density incasured at Ch. 0	.58
Figure 65 Power Spectral density measured at Ch. 0	.59
Figure 66 Power Spectral density measured at Ch. 1	.59
Figure 67 Power Spectral density measured at Ct. 1. Figure 68: Typical test sclup for Conducted Test setup	.61
Figure 68: Band edge measured at Ch. 0-Average detector	.62
Figure 69: Band edge measured at Ch. 1-Average detector	.62
Figure 70: Band edge measured at Ch. 0-Average detector	.63
Figure 71: Band edge measured at Ch. 1-Average detector	.63
Figure 72: Band edge measured at Ch. 0-Average detector	.64
Visco 72: Bond adea recovered at Ch. 1-Average delector	.04
Times 74: Dand adoe measured at Ch. 0-Average detector.	.OJ
Diame 75. Dand adap meseurad at Ch. 1-Average defector.	.os
Warrange Rand adap processed at Cla D. Average detector	.00
Pierro 77. Bond adea maserred at Ch. 1-Aversee detector.	ao,
Figure 78: Nand adva measured at Ch. 0-Average detector	.01
18 To Dand adea measured at Ch. L. Average detector	.67
Times 90. Band adap manurad at Ch. 0-Average detector	, on
Dimes C1. Dand also measured at Ch. 1-Average detector	.00
22 82. Band adapt massured at Cl. 9-Average delector	.09
Figure 83: Band edge measured at Ch. 1-Average detector	,69 70
Elma R4. Dand ados maneurad at Ch. (). Average detector	. 70
18 man 95. Band adda measured at Ch. 1-Average detector	. 70
Figure 86: Band edge measured at Ch. 0-Average detector	71
Figure 87: Band edge measured at Ch. 1-Average detector	72
Figure 88: Band edge measured at Ch. 0-Average detector	77
Figure 89: Band edge measured at Ch. 1-Average defector	73
Figure 90: Band edge measured at Ch. 0-Average detector	.73
Figure 91: Band edge measured at Ch. 1-Average detector  Figure 92: Typical test setup for Conducted Test setup	.74
Figure 93: Spurious emission 9 KHz to 1 GHz measured at Ch. 0	75
Figure 94: Spurious emission 1 GHz to 40 GHz measured at Ch. 0	75
Figure 94: Spurious emission 1 GHz to 40 GHz measured at Ch. 1	76
Figure 95: Spurious emission 9 Ktt2 to 1 GHz measured at Ch. 1	76
Figure 97: Spurious emission 9 KHz to 1 GHz measured at Ch. 0	77
on an invitation 1 CU- to 40 CHz materined at Ch. 0	71
Eigen 00 Continue emission 9 KHz to 1 GHz measured at Ch. 1	/0
Time 100. Company amission 1 GUz to 40 GHz measured at Cl).	/ 0
Element 41. Complete enviseren 9 KHz to 1 GHz measured at Ch. 0	17
Elema 100 Consider emission 1 OHz to 40 OHz measured at Ch. 0	., (3
Times 102. Consider Amission 9 KHz to 1 GHz measured at Ch. 1	00
Figure 104: Spurious emission 1 GHz to 40 GHz measured at Ch. 1	80
TiBras to the branches and the state of the	





Figure 105: Spurious emission 9 KHz to 1 GHz measured at Ch. 0	81
Pigers 106: Spurious emission 1 GHz to 40 GHz measured at Ch. 0	81
Figure 107 Specions emission 9 KHz to 1 GHz measured at Ch. 1	82
Pigarra 108 Sourious emission I GHz to 40 GHz measured at Ch. 1	82
Figure 100. Services emission 9 kHz to 1 GHz measured at Ch. 0	83
Figure 110: Specious emission 1 GHz to 40 GHz measured at Ch. 0	83
Pigner 111 - Sourious emission 9 kHz to 1 GHz messured at Ch. 1	84
Figure 132. Survious emission 1 GHz to 40 GHz measured at Ch. 1	84
Figure 112 Seprence emission 9 VHz to 1 GHz measured at Ch. 0	83
Views 114. Semicone emission I GHz to 40 GHz measured at Ch. 0	85
Flores 115 Services emission 9 kHz to 1 GHz measured at Ch. 1	86
Figure 116: Seprious envission 1 GHz to 40 GHz measured at Ch. 1	80
Rouge 117 Services emission 9 kHz to 1 GHz measured at Ch. 0.	87
Figure 119, Couring enjection 1 CHz to 40 GHz measured at Ch 0	87
Figure 119: Spurious emission 9 kHz to 1 GHz measured at Ch. I	88
Figure 120: Spurious emission 1 GHz to 40 GHz measured at Ch. 1	88
Figure 121 Spurious emission 9 kHz to 1 GHz measured at Ch. 0	89
Figure 122: Spurious emission 1 (7Hz to 40 GHz measured at Ch. 0	89
Figure 122: Spurious emission 9 kHz to 1 GHz measured at Ch. 1	90
Figure 124: Spurious emission 1 GHz to 40 GHz measured at Ch. 1	90
Figure 124: Spurious emission 9 kHz to 1 GHz measured at Ch. 0	91
Figure 126: Spurious emission 1 GHz to 40 GHz measured at Ch. 0	91
Figure 126: Spurious emission 1 GHz to 40 GHz measured at Ch. 1	92
Figure 128: Spurious emission 1 GHz to 40 GHz measured at Ch. 1	92
Figure 128: Spurious emission 1 GHz to 40 GHz measured at Cn. 1	03
Figure 129 Spurious emission 9 kHz to 1 GHz measured at Ch. 0	03
Figure 130: Spurious emission 1 GHz to 40 GHz measured at Ch. 0	9.4
Figure 131 Spurious emission 9 kHz to 1 GHz measured at Ch. 1	0.4
Figure 132: Spurious emission I GHz to 40 GHz measured at Ch. I	05
Figure 132: Sponious emission 9 kHz to 1 Gflz measured at Ch. 0	55
Figure 134: Spurious emission 1 GHz to 40 GHz measured at Ch. 0	73
Figure 135 Spurious emission 9 kHz to 1 GHz measured at Ch. 1	90
Figure 136: Sparious emission 1 GHz to 40 GHz measured at Ch. 1	
Figure 137 Spurious emission 9 kHz to 1 GHz measured at Ch. 0	77
Figure 138: Spurious emission 1 GHz to 40 GHz measured at Ch. 0	
Figure 139 Spurious emission 9 kHz to 1 GHz measured at Ch. 1	98
Figure 140: Spurious emission 1 GHz to 40 GHz measured at Ch. 1	98
Figure 142 Typical test setup for Conducted Test	100
Figure 143 Emission measured with Peak Detector from 9 kHz to 150 kHz at Ch. 0	101
Figure 144 Emission magazined with Peak Detector from 150 kHz to 30 MHz at Ch. 0	101
Figure 145 Emission measured with Peak Detector from 30 MHz to 1 GHz at Ch. 0	102
Figure 146 Emission measured with Average Detector from 1 GHz to 18 GHz at Ch. 0	102
Figure 147 Emission measured with Average Detector from 18 GHz to 26.5 GHz at Ch. 9	103
Figure 348 Enviscion measured with Average Detector from 26.5 GHz to 40 GHz at Ch. 0	103
Director 149 Profession measured with Peak Detector from 1 GHz to 18 GHz at Clt. 0	104
Nimma 150 Emission measured with Peak Detector from 18 GHz to 26.5 GHz at Ch. 0	194
Figure 151 Emission measured with Peak Detector from 26.5 GHz to 40 GHz at Ch. 0	105
Figure 152 Emission measured with Peak Detector from 9 kHz to 150 kHz at Ch. 1	105
Bigme 153 Emission measured with Peak Detector from 150 kHz to 30 MHz at Ch. I	106
Figure 154 Emission measured with Peak Detector from 30 MHz to 1 GHz at Ch. 1	106
Figure 155 Roussian measured with Average Detector from 1 GHz to 18 GHz at Ch. 1	107
Figure 156 Registron measured with Average Detector from 18 GHz to 26.5 GHz at Ch. 1	107
Storge 157 Emission measured with Average Detector from 26.5 GUz to 40 GHz at Ch. 1	108
Figure 158 Emission measured with Peak Detector from 1 GHz to 18 GHz at Ch. 1	108
T.IETH - 3-D PRINCIPAL MEDICAL MAN V	





	100
Figure 159 Emission measured with Peak Detector from 18 GHz to 26.5 GHz at Ch. 1	109
Figure 160 Emission measured with Peak Detector from 26.5 GHz to 40 GHz at Ch. I	., 109
Figure 161 Emission measured with Peak Detector from 9 kHz to 150 kHz at Ch. 0	110
Figure 162 Emission measured with Peak Detector from 150 kHz to 30 MHz at Ch. 0	110
Signer 163 Emission measured with Prak Detector from 30 MHz to 1 GHz at Ch. 0	.,111
Figure 164 Emission measured with Average Detector from 1 GHz to 18 GHz at Ch. 0	111
Figure 165 Emission measured with Average Detector from 18 GHz to 26.5 GHz at Ch. 0	
Riome 166 Emission measured with Average Detector from 26.5 GHz to 40 GHz at Ch. 0	., 112
Figure 167 Emission repaymed with Peak Delector from 1 GHz to 18 GHz at Ch. 0	113
Figure 168 Emission measured with Peak Detector from 18 GHz to 26.5 GHz at Ch. 0	113
Higgs 169 Emission measured with Peak Detector from 26.5 GHz to 40 GHz at Ch. 0	.,114
Figure 170 Figures on measured with Peak Detector from 9 kHz to 150 kHz at Ch. 1	114
Figure 171 Emission measured with Peak Detector from 150 kHz to 30 MHz at Ch. 1	
Vigure 172 Emission measured with Posk Detector from 30 MHz to 1 GHz at Ch. 1	.,,.,115
Figure 173 Funission measured with Average Detector from 1 GHz to 18 GHz at Ch. 1	116
Figure 174 Emission measured with Average Detector from 18 GHz to 26.5 GHz at Ch. 1	116
Figure 175 Emission measured with Average Detector from 26.5 GHz to 40 GHz at Ch. 1	117
Figure 176 Emission measured with Peak Detector from 1 GHz to 18 GHz at Ch. 1	117
Figure 177 Emission measured with Peak Detector from 18 GHz to 26.5 GHz at Ch. 1	118
Figure 178 Emission measured with Peak Detector from 26.5 GHz to 40 GHz at Ch. 1	118
Figure 179 Jimission measured with Peak Detector from 9 kHz to 150 kHz at Ch. 0	119
Figure 180 Emission measured with Peak Detector from 150 k()z to 30 MHz at Ch. 0	119
Figure 181 Emission measured with Peak Detector from 30 MHz to 1 GHz at Ch. 0	120
Figure 182 Emission measured with Average Detector from 1 GHz to 18 GHz at Ch. 0	120
Figure 183 Emission measured with Average Detector from 18 GHz to 26.5 GHz at Ch. 0	121
Figure 184 Emission measured with Average Detector from 26.5 GHz to 40 GHz at Ch. 0	121
Figure 185 Bmission measured with Peak Detector from 1 GHz to 18 GHz at Ch. 0	122
Figure 186 Emission measured with Peak Detector from 18 GHz to 26.5 GHz at Ch. 0	122
Figure 187 Emission measured with Peak Detector from 26.5 GHz to 40 GHz at Cl. 0	123
Figure 188 Emission measured with Peak Detector from 9 kHz to 150 kHz at Ch. 1	
Figure 189 Emission measured with Peak Detector from 150 kHz to 30 MHz at Ch. 1	124
Figure 190 Emission measured with Peak Defector from 30 MHz to 1 GHz at Ch. 1	124
Figure 191 Emission measured with Average Detector from 1 GHz to 18 GHz at Ch. 1	125
Figure 192 Emission measured with Average Detector from 18 GHz to 26.5 GHz at Ch. 1	125
Figure 193 Emission measured with Average Detector from 26.5 GHz to 40 GHz at Ch. 1	126
Figure 194 Emission measured with Peak Detector from 1 GHz to 18 GHz at Ch. 1	126
Figure 195 Emission measured with Peak Detector from 18 GHz to 26.5 GHz at Ch. 1	127
Figure 196 Emission measured with Peak Detector from 26.5 GHz to 40 GHz at Ch. 1	127
Figure 196 Emission measured with Peak Detector from 9 kHz to 150 kHz at Ch. 0	128
Figure 198 Emission measured with Peak Detector from 150 kHz to 30 MHz at Ch. 0	128
Figure 198 Emission measured with Peak Detector from 30 MHz to 1 GHz at Ch. 0	129
Figure 199 Emission measured with Peak Detector from 1 GHz to 18 GHz at Ch. 0	129
Figure 200 Jamission measured with Average Detector from 18 GHz to 26.5 GHz at Ch. 0	130
Figure 201 Emission measured with Average Detector Hobit in Ciriz to 20.5 Citiz to City of China and City of C	130
Figure 202 Emission measured with Average Detector from 26.5 GHz to 40 GHz at Ch. 0	171
Figure 203 Binission measured with Peak Detector from 1 GHz to 18 GHz at Ch. 0	131
Figure 204 Emission measured with Peak Detector from 18 GHz to 26.5 GHz at Ch. 0	122
Figure 205 Emission measured with Peak Detector from 26.5 GHz to 40 GHz at Ch. 0	132
Pigure 206 Emission measured with Peak Detector from 9 kHz to 150 kHz at Ch. 1	134 199
Pigure 207 Russision measured with Peak Detector from 150 kHz to 30 MHz at Ch. 1	122
Figure 208 Emission measured with Peak Detector from 30 MHz to 1 GHz at Ch. 1	124
Figure 209 Emission measured with Average Detector from 1 GHz to 18 GHz at Ch. 1	L34 4 c s
Figure 210 Emission measured with Average Detector from 18 GHz to 26.5 GHz at Ch. 1	125
Figure 211 Emission measured with Average Detector from 26.5 GHz to 40 GHz at Ch. 1	133





Figure 213 Emission measured with Peak Detector from 26.5 GHz to 40 GHz at Ch. 1. 136 Figure 214 Emission measured with Peak Detector from 26.5 GHz to 40 GHz at Ch. 1. 136 Figure 215 Emission measured with Peak Detector from 9 kHz to 150 kHz at Ch. 0. 137 Figure 216 Bmission measured with Peak Detector from 150 kHz to 30 kHz at Ch. 0. 137 Figure 217 Emission measured with Peak Detector from 10 kHz to 16 kHz at Ch. 0. 138 Figure 218 Emission measured with Average Detector from 16 kHz to 18 GHz at Ch. 0. 138 Figure 218 Emission measured with Average Detector from 16 kHz to 18 GHz at Ch. 0. 139 Figure 229 Emission measured with Average Detector from 16 kHz to 18 GHz at Ch. 0. 139 Figure 222 Emission measured with Peak Detector from 16 GHz to 18 GHz at Ch. 0. 139 Figure 222 Emission measured with Peak Detector from 16 GHz to 18 GHz at Ch. 0. 140 Figure 222 Emission measured with Peak Detector from 26.5 GHz to 40 GHz at Ch. 0. 140 Figure 222 Emission measured with Peak Detector from 26.5 GHz to 18 GHz at Ch. 0. 140 Figure 222 Emission measured with Peak Detector from 26.5 GHz to 40 GHz at Ch. 0. 140 Figure 225 Emission measured with Peak Detector from 26.5 GHz to 40 GHz at Ch. 0. 141 Figure 225 Imission measured with Peak Detector from 36 kHz to 150 kHz at Ch. 1. 141 Figure 225 Imission measured with Peak Detector from 36 kHz to 150 kHz at Ch. 1. 141 Figure 225 Emission measured with Peak Detector from 36 kHz to 16 kHz at Ch. 1. 142 Figure 225 Emission measured with Average Detector from 16 GHz to 18 GHz at Ch. 1. 142 Figure 225 Emission measured with Average Detector from 16 GHz to 18 GHz at Ch. 1. 143 Figure 225 Emission measured with Peak Detector from 26.5 GHz to 40 GHz at Ch. 1. 144 Figure 232 Emission measured with Peak Detector from 26.5 GHz to 40 GHz at Ch. 1. 145 Figure 232 Emission measured with Peak Detector from 26.5 GHz to 40 GHz at Ch. 1. 145 Figure 232 Emission measured with Peak Detector from 16 GHz to 18 GHz at Ch. 0. 146 Figure 248 Emission measured with Peak Detector from 26.5 GHz to 40 GHz at Ch.	Figure 212 Emission measured with Peak Detector from 1 GHz to 18 GHz at Ch. 1	135
Figure 215 Emission measured with Peak Detector from 26.5 GHz to 40 GHz at Ch. 0	Figure 213 Enviseion measured with Posk Detector from 18 GHz to 26.5 GHz at Ch. 1	130
Figure 215 Emission measured with Peak Detector from 10 kHz to 150 kHz at Ch. 0	Rigging 214 Engineering management with Deak Detector from 26.5 GHz to 40 GHz at Ch. 1	130
Figure 21   Simission measured with Peak Detector from 15 of MHz to 1 GHz at Ch. 0.   138	Vigure 215 Emission measured with Peak Detector from 9 kHz to 150 kHz at Ch. 0	15/
Figure 21 Finission measured with Average Detector from 10 MHz to 1 GHz at Ch. 0	Times 214 Vericeian represented with Deak Detector from 150 kHz to 30 MHz at Ch. O	15/
Figure 218 Emission measured with Average Detector from 1 GHz to 18 GHz at Ch. 0	Elimon 212 Emission and with Peak Detector from 30 MHz to 1 GHz at Ch. 0	138
Figure 221 Emission measured with Average Detector from 18 GHz to 2.6.5 GHz at Ch. 0	Figure 219 Envisoing recovered with Average Detector from 1 GHz to 18 GHz at Ch. U	1.70
Figure 221 Emission measured with Average Detector from 26.5 GHz to 40 GHz at Ch. 0	Figure 210 Periodical systems with Average Detector from 18 GHz to 26.5 GHz at Ch. 9	139
Figure 221 Emission measured with Peak Detector from 18 GHz to 26.5 GHz at Ch. 0. [40] Figure 222 Imission measured with Peak Detector from 18 GHz to 26.5 GHz at Ch. 0. [41] Figure 223 Emission measured with Peak Detector from 9 kHz to 150 kHz at Ch. 1. [41] Figure 224 Emission measured with Peak Detector from 9 kHz to 150 kHz at Ch. 1. [42] Figure 225 Emission measured with Peak Detector from 150 kHz to 150 kHz at Ch. 1. [42] Figure 226 Emission measured with Peak Detector from 150 kHz to 161 R GHz at Ch. 1. [42] Figure 227 Emission measured with Average Detector from 16 Et to 18 GHz at Ch. 1. [43] Figure 228 Emission measured with Average Detector from 18 GHz to 26.5 GHz at Ch. 1. [43] Figure 229 Emission measured with Average Detector from 16 Et to 18 GHz at Ch. 1. [44] Figure 230 Emission measured with Peak Detector from 16 Et to 18 GHz at Ch. 1. [44] Figure 231 Imission measured with Peak Detector from 16 GHz to 18 GHz at Ch. 1. [44] Figure 232 Emission measured with Peak Detector from 16 GHz to 18 GHz at Ch. 1. [45] Figure 233 Emission measured with Peak Detector from 18 GHz to 26.5 GHz at Ch. 1. [45] Figure 234 Emission measured with Peak Detector from 18 GHz to 26.5 GHz at Ch. 1. [45] Figure 235 Emission measured with Peak Detector from 18 GHz to 26.5 GHz at Ch. 0. [46] Figure 236 Emission measured with Peak Detector from 18 GHz to 150 kHz at Ch. 0. [46] Figure 237 Imission measured with Peak Detector from 18 GHz to 26.5 GHz at Ch. 0. [47] Figure 238 Emission measured with Average Detector from 18 GHz to 26.5 GHz at Ch. 0. [47] Figure 239 Emission measured with Average Detector from 18 GHz to 26.5 GHz at Ch. 0. [48] Figure 241 Emission measured with Average Detector from 18 GHz to 26.5 GHz at Ch. 0. [49] Figure 242 Emission measured with Peak Detector from 18 GHz to 26.5 GHz at Ch. 0. [49] Figure 243 Emission measured with Peak Detector from 18 GHz to 26.5 GHz at Ch. 0. [49] Figure 244 Emission measured with Peak Detector from 18 GHz to 26.5 GHz at Ch. 0. [49] Figure 245 Emission measured with Peak Dete	Pigure 219 Emission measured with Average Betestor from 26.5 GHz to 40 GHz at Ch. 0	139
Figure 223 Emission measured with Peak Detector from 26.5 GHz to 40 GHz at Ch. 0. [41] Figure 224 Emission measured with Peak Detector from 9 kHz to 150 kHz at Ch. 1. [41] Figure 225 Emission measured with Peak Detector from 9 kHz to 150 kHz at Ch. 1. [42] Figure 226 Emission measured with Peak Detector from 100 kHz to 16 kHz at Ch. 1. [42] Figure 227 Emission measured with Average Detector from 100 kHz to 18 GHz at Ch. 1. [43] Figure 228 Imission measured with Average Detector from 16 GHz to 18 GHz at Ch. 1. [43] Figure 229 Emission measured with Average Detector from 16 GHz to 18 GHz at Ch. 1. [43] Figure 230 Emission measured with Peak Detector from 16 GHz to 18 GHz at Ch. 1. [44] Figure 231 Emission measured with Peak Detector from 16 GHz to 18 GHz at Ch. 1. [44] Figure 232 Emission measured with Peak Detector from 16 GHz to 18 GHz at Ch. 1. [44] Figure 233 Emission measured with Peak Detector from 18 GHz to 26.5 GHz at Ch. 1. [45] Figure 234 Emission measured with Peak Detector from 18 GHz to 26.5 GHz at Ch. 1. [45] Figure 235 Emission measured with Peak Detector from 18 GHz to 26.5 GHz at Ch. 0. [46] Figure 236 Emission measured with Peak Detector from 150 kHz at Oh. 0. [46] Figure 237 Emission measured with Peak Detector from 150 kHz at Oh. 0. [46] Figure 238 Emission measured with Peak Detector from 16 GHz to 18 GHz at Ch. 0. [47] Figure 239 Emission measured with Peak Detector from 16 GHz to 18 GHz at Ch. 0. [47] Figure 230 Emission measured with Average Detector from 18 GHz to 26.5 GHz at Ch. 0. [48] Figure 230 Emission measured with Average Detector from 18 GHz to 26.5 GHz at Ch. 0. [48] Figure 231 Emission measured with Peak Detector from 18 GHz to 26.5 GHz at Ch. 0. [48] Figure 243 Emission measured with Peak Detector from 18 GHz to 26.5 GHz at Ch. 0. [48] Figure 244 Emission measured with Peak Detector from 18 GHz to 26.5 GHz at Ch. 0. [49] Figure 245 Emission measured with Peak Detector from 18 GHz to 26.5 GHz at Ch. 0. [49] Figure 246 Emission measured with Peak Detector from 18 GHz to 26.5 GHz	Figure 220 Emission measured with Pearly Detector from 1 GHz to 18 GHz at Ch. 0	140
Figure 223 Emission measured with Peak Detector from 9 kHz to 150 kHz at Ch. 1	Figure 221 Emission pleasured with Peak Detector from 18 GHz to 26 S GHz at Ch. 0	140
Figure 224 Emission measured with Peak Detector from 19 kHz to 150 kHz at Ch. 1	Figure 2/2 Immission measured with Peak Detector from 26 5 GHz to 40 GHz at Cl. 0	141
Figure 225 Imission measured with Peak Detector from 150 kHz to 30 MHz at Ch. 1	Figure 223 Emission measured with reak Detector from 2010 of 150 vil.z at Ch. 1	141
Figure 226 Emission measured with Average Detector from 16 Hz to 18 GHz at Ch. 1	Figure 274 Emission measured with Peak Detector from 150 kHz to 30 MHz at Ch. 1	142
Figure 227 Emission measured with Average Detector from 1 GHz to 18 GHz at Ch. 1	Figure 225 Jemission measured with Peak Detector from 130 MHz to 1 GHz at Ch. 1	142
Figure 228 Imission measured with Average Detector from 18 GHz to 26.5 GHz at Ch. 1	Figure 226 Emission measured with Peak Detector from 50 WHZ to 1 CH at Ch. 1	143
Figure 230 Emission measured with Peak Detector from 1 GHz to 18 GHz at Ch. 1	Figure 227 Emission measured with Average Derector from 1 Criz to 16 th 2 at Ch. 1	143
Figure 230 Emission measured with Peak Detector from 1 GHz to 18 GHz at Ch. 1	Figure 228 Emission incastured with Average Detector from 18 GHz to 20.5 GHz at Ch. 1 and 18 GHz to 20.5 GHz at Ch. 2 GHz to 20.5 GH	144
Figure 231 Emission measured with Peak Detector from 18 GHz to 26.5 GHz at Ch. 1	Figure 229 Emission measured with Average Detector from 20.3 G/12 to 40 OHz at Ch. 1	144
Figure 232 Emission measured with Peak Detector from 26.5 GHz to 40 GHz at Ch. 0	Figure 230 Emission measured with Peak Detector from 1 GHz to 18 GHz at Cu. 1	145
Figure 234 Emission measured with Peak Detector from 9 kHz to 150 kHz at Ch. 0	Figure 231 Hunission measured with Peak Detector from 18 GHz to 26.5 GHz at Ch. 1	145
Figure 234 limission measured with Peak Detector from 150 kHz to 30 MHz at Ch. 0. 147 Figure 235 Emission measured with Average Detector from 30 MHz to 1 GHz at Ch. 0. 147 Figure 236 Emission measured with Average Detector from 1 GHz to 18 GHz at Ch. 0. 148 Figure 238 Emission measured with Average Detector from 126.5 GHz to 40 GHz at Ch. 0. 148 Figure 239 Emission measured with Peak Detector from 1 GHz to 18 GHz at Ch. 0. 148 Figure 239 Emission measured with Peak Detector from 1 GHz to 18 GHz at Ch. 0. 149 Figure 240 Imission measured with Peak Detector from 1 GHz to 18 GHz at Ch. 0. 149 Figure 241 Emission measured with Peak Detector from 26.5 GHz to 40 GHz at Ch. 0. 149 Figure 242 Emission measured with Peak Detector from 9 kHz to 150 kHz at Ch. 1. 150 Figure 243 Imission measured with Peak Detector from 150 kHz to 30 MHz at Ch. 1. 150 Figure 244 Emission measured with Peak Detector from 150 kHz to 30 MHz at Ch. 1. 151 Figure 245 Emission measured with Average Detector from 1 GHz to 18 GHz at Ch. 1. 151 Figure 246 Emission measured with Average Detector from 1 GHz to 18 GHz at Ch. 1. 151 Figure 247 Emission measured with Average Detector from 16 GHz to 26.5 GHz at Ch. 1. 152 Figure 248 Emission measured with Average Detector from 16 GHz to 26.5 GHz at Ch. 1. 152 Figure 249 Emission measured with Peak Detector from 16 GHz to 26.5 GHz at Ch. 1. 152 Figure 249 Emission measured with Peak Detector from 16 GHz to 26.5 GHz at Ch. 1. 153 Figure 249 Emission measured with Peak Detector from 16 GHz to 26.5 GHz at Ch. 1. 153 Figure 250 Emission measured with Peak Detector from 26.5 GHz to 40 GHz at Ch. 1. 154 Figure 251 Emission measured with Peak Detector from 26.5 GHz to 30 MHz at Ch. 1. 154 Figure 251 Emission measured with Peak Detector from 26.5 GHz to 40 GHz at Ch. 1. 154 Figure 251 Emission measured with Peak Detector from 26.5 GHz to 40 GHz at Ch. 0. 155 Figure 253 Emission measured with Peak Detector from 16 GHz to 150 kHz to 30 MHz at Ch. 0. 156 Figure 255 Emission measured with Peak Detector from 16 GHz to	Figure 232 Emission measured with Peak Detector from 26.5 GHz to 40 GHz at Ch. 1,	146
Figure 235 Emission measured with Average Detector from 30 MHz to 1 GHz at Ch. 0	Figure 233 Emission measured with Peak Detector from 9 kHz to 150 kHz at Ch. 0	146
Figure 236 Emission measured with Average Detector from 1 GHz to 18 GHz at Ch. 0	Figure 234 limission measured with Peak Detector from 150 kHz to 30 MHz at Ch. 0	140
Figure 236 Emission measured with Average Detector from 1 GHz to 18 GHz at Ch. 0	Figure 235 Emission measured with Peak Detector from 30 MHz to 1 GHz at Ch. 0	147
Figure 237 Jamission measured with Average Detector from 18 GHz to 26.5 GHz at Ch. 0	The control of the second with Average Districtor from 1 GHz 10 18 GHz 3f Cit. 9.	147
Pigure 238 Emission measured with Peak Detector from 26.5 GHz to 40 GHz at Ch. 0	Eigen 227 Uniceian movemed with Augrage Detector from 18 GHz to 26.5 GHz at Ch. U	140
Figure 239 Emission measured with Peak Detector from 1 GHz to 18 GHz at Ch. 0	Vienes 329 Emission massured with Averson Detector from 26.5 GHz to 40 GHz at Ch. V.	140
Figure 240 Ilmission measured with Peak Detector from 18 GHz to 26.5 GHz at Ch. 0	Times 220 Emission exactored with Peak Detector from 1 GHz to 18 GHz at Ch. 0	ኒሳን
Figure 241 Emission measured with Peak Detector from 26.5 GHz to 40 GHz at Ch. 0. 150 Figure 242 Emission measured with Peak Detector from 9 kHz to 150 kHz at Ch. 1. 151 Figure 243 Emission measured with Peak Detector from 150 kHz to 30 MHz at Ch. 1. 151 Figure 244 Emission measured with Peak Detector from 30 MHz to 1 GHz at Ch. 1. 151 Figure 245 Emission measured with Average Detector from 1 GHz to 18 GHz at Ch. 1. 152 Figure 246 Emission measured with Average Detector from 1 GHz to 18 GHz at Ch. 1. 152 Figure 247 Emission measured with Average Detector from 18 GHz to 26.5 GHz at Ch. 1. 153 Figure 248 Emission measured with Peak Detector from 1 GHz to 18 GHz at Ch. 1. 153 Figure 249 Emission measured with Peak Detector from 1 GHz to 18 GHz at Ch. 1. 153 Figure 249 Emission measured with Peak Detector from 18 GHz to 26.5 GHz at Ch. 1. 154 Figure 250 Emission measured with Peak Detector from 26.5 GHz to 40 GHz at Ch. 1. 154 Figure 251 Emission measured with Peak Detector from 26.5 GHz to 40 GHz at Ch. 0. 155 Figure 252 Emission measured with Peak Detector from 150 kHz to 30 MHz at Ch. 0. 155 Figure 253 Emission measured with Average Detector from 1 GHz to 18 GHz at Ch. 0. 156 Figure 254 Emission measured with Average Detector from 1 GHz to 18 GHz at Ch. 0. 156 Figure 255 Emission measured with Average Detector from 1 GHz to 18 GHz at Ch. 0. 156 Figure 256 Emission measured with Average Detector from 1 GHz to 18 GHz at Ch. 0. 156 Figure 257 Emission measured with Peak Detector from 1 GHz to 18 GHz at Ch. 0. 156 Figure 258 Emission measured with Peak Detector from 1 GHz to 18 GHz at Ch. 0. 157 Figure 259 Emission measured with Peak Detector from 1 GHz to 18 GHz at Ch. 0. 158 Figure 259 Emission measured with Peak Detector from 1 GHz to 18 GHz at Ch. 0. 158 Figure 259 Emission measured with Peak Detector from 1 GHz to 18 GHz at Ch. 0. 158 Figure 259 Emission measured with Peak Detector from 1 GHz to 18 GHz at Ch. 0. 159 Figure 260 Emission measured with Peak Detector from 1 GHz to 16 GHz at Ch. 0. 159 Figure 261 Em	Eigene 240 University recovered with Peak Detector from 18 GHz to 26.5 GHz at Ch. U	147
Figure 242 Emission measured with Peak Detector from 9 kHz to 150 kHz at Ch. 1	18 area 241 Emission programed with Pask Cutester from 26.5 GHz to 40 GHz at Ch. U	.130
Figure 243 Ismission measured with Peak Detector from 150 kHz to 30 MHz at Ch. 1 151 Figure 244 Emission measured with Peak Detector from 30 MHz to 1 GHz at Ch. 1 151 Figure 245 Emission measured with Average Detector from 1 GHz to 18 GHz at Ch. 1 152 Figure 246 Emission measured with Average Detector from 18 GHz to 26.5 GHz at Ch. 1 152 Figure 247 Emission measured with Average Detector from 16 GHz to 18 GHz at Ch. 1 153 Figure 248 Emission measured with Peak Detector from 1 GHz to 18 GHz at Ch. 1 153 Figure 249 Ismission measured with Peak Detector from 18 GHz to 26.5 GHz at Ch. 1 153 Figure 250 Emission measured with Peak Detector from 26.5 GHz to 40 GHz at Ch. 1 154 Figure 251 Emission measured with Peak Detector from 9 kHz to 150 kHz at Ch. 0 155 Figure 252 Ismission measured with Peak Detector from 150 kHz to 30 MHz at Ch. 0 155 Figure 253 Emission measured with Peak Detector from 30 MHz to 1 GHz at Ch. 0 156 Figure 254 Emission measured with Average Detector from 16 GHz to 18 GHz at Ch. 0 156 Figure 255 Emission measured with Average Detector from 18 GHz to 18 GHz at Ch. 0 157 Figure 256 Emission measured with Peak Detector from 16 GHz to 18 GHz at Ch. 0 157 Figure 257 Emission measured with Peak Detector from 16 GHz to 18 GHz at Ch. 0 157 Figure 258 Emission measured with Peak Detector from 16 GHz to 18 GHz at Ch. 0 158 Figure 259 Emission measured with Peak Detector from 16 GHz to 18 GHz at Ch. 0 158 Figure 259 Emission measured with Peak Detector from 26.5 GHz to 40 GHz at Ch. 0 158 Figure 259 Emission measured with Peak Detector from 26.5 GHz to 40 GHz at Ch. 0 158 Figure 260 Emission measured with Peak Detector from 9 kHz to 150 kHz at Ch. 0 159 Figure 261 Emission measured with Peak Detector from 160 kHz to 18 GHz at Ch. 1 160 Figure 262 Emission measured with Peak Detector from 160 kHz to 18 GHz at Ch. 1 160 Figure 263 Emission measured with Peak Detector from 160 kHz to 18 GHz at Ch. 1 160 Figure 263 Emission measured with Peak Detector from 160 kHz to 18 GHz at Ch. 1 160	T' at 2 Emilian engage of with Peak Detector from 9 kHz to 150 kHz at Ch. 1	, 130
Figure 244 Emission measured with Peak Detector from 30 MHz to 1 GHz at Ch. 1 152 Figure 245 Emission measured with Average Detector from 1 GHz to 18 GHz at Ch. 1 152 Figure 246 Pmission measured with Average Detector from 18 GHz to 26.5 GHz at Ch. 1 152 Figure 247 Emission measured with Average Detector from 1 GHz to 18 GHz at Ch. 1 153 Figure 248 Emission measured with Peak Detector from 1 GHz to 18 GHz at Ch. 1 153 Figure 249 Emission measured with Peak Detector from 18 GHz to 26.5 GHz at Ch. 1 154 Figure 250 Emission measured with Peak Detector from 26.5 GHz at Ch. 1 154 Figure 251 Emission measured with Peak Detector from 9 kHz to 150 kHz at Ch. 0 155 Figure 252 Emission measured with Peak Detector from 30 MHz to 16 GHz at Ch. 0 155 Figure 253 Emission measured with Average Detector from 30 MHz to 1 GHz at Ch. 0 156 Figure 254 Emission measured with Average Detector from 1 GHz to 18 GHz at Ch. 0 156 Figure 255 Emission measured with Average Detector from 18 GHz to 18 GHz at Ch. 0 157 Figure 256 Emission measured with Average Detector from 18 GHz to 26.5 GHz at Ch. 0 157 Figure 257 Emission measured with Peak Detector from 1 GHz to 18 GHz at Ch. 0 157 Figure 258 Emission measured with Peak Detector from 16 GHz to 18 GHz at Ch. 0 158 Figure 259 Emission measured with Peak Detector from 26.5 GHz to 40 GHz at Ch. 0 158 Figure 259 Emission measured with Peak Detector from 26.5 GHz to 40 GHz at Ch. 0 158 Figure 259 Emission measured with Peak Detector from 26.5 GHz to 40 GHz at Ch. 0 158 Figure 259 Emission measured with Peak Detector from 26.5 GHz to 40 GHz at Ch. 0 159 Figure 260 Emission measured with Peak Detector from 26.5 GHz to 40 GHz at Ch. 0 159 Figure 261 Emission measured with Peak Detector from 26.5 GHz to 40 GHz at Ch. 0 159 Figure 262 Emission measured with Peak Detector from 26.5 GHz to 40 GHz at Ch. 0 159 Figure 263 Emission measured with Peak Detector from 26.5 GHz to 30 MHz to 10 GHz at Ch. 1 160	Dimes 242 Unication recovered with Park Detector from 150 kHz to 30 MHz at Cli. 1	.131
Figure 245 Emission measured with Average Detector from 1 GHz to 18 GHz at Ch. 1	Vicerca 244 Emission magazined with Peak Detector from 30 MHz to 1 GHz at Ch. J.	121
Figure 246 limission measured with Average Detector from 18 GHz to 26.5 GHz at Ch. 1	Thomas 245 Emission measured with Average Distoctor from 1 GHz to 18 GHz at Cli. 1	,,22
Figure 247 Emission measured with Average Detector from 26.5 GHz to 40 GHz at Ch. 1	Elema 246 Projection macroped with Average Detector from 18 GHz to 26.5 GHz at Cl. 1	. 152
Figure 248 Emission measured with Peak Detector from 1 GHz to 18 GHz at Ch. 1	242 Factories manufact with Assessed Detector from 26.5 GHz to 40 GHz at Ca. 1	. 133
Figure 249 Emission measured with Peak Detector from 18 GHz to 26.5 GHz at Ch. 1	Figure 649 Emission pressured with Peak Detector from 1 GHz to 18 GHz at Ch. 1	, , 33
Figure 250 Emission measured with Peak Detector from 26.5 GHz to 40 GHz at Ch. 1	Figure 240 Principles recognised with Peak Detector from 18 GHz to 26.5 GHz at Ch. 1	.134
Figure 251 Emission measured with Peak Detector from 9 kHz to 150 kHz at Ch. 0	250 Emission measured with Peak Detector from 26.5 GHz to 40 GHz at Ch. 1	. 104
Figure 252 Emission measured with Peak Detector from 150 kHz to 30 MHz at Ch. 0	Thomas 351 Projection measured with Peak Detector from 9 kHz to 150 kHz at Ch. 0	.133
Figure 253 Emission measured with Peak Detector from 30 MHz to 1 GHz at Ch. 0	Pierre 252 Reviseion magened with Peak Detector from 150 kHz to 30 MHz at Ch. 0	.155
Figure 254 Emission measured with Average Detector from 1 GHz to 18 GHz at Ch. 0	Figure 252 Espisation measured with Peak Detector from 30 MHz to 1 GHz at Ch. 0	.156
Figure 255 Emission measured with Average Detector from 18 GHz to 26.5 GHz at Ch. 0	Figure 25.5 Emission measured with Average Detector from 1 GHz to 18 GHz at Ch. 0	.156
Figure 256 Emission measured with Average Detector from 26.5 GHz to 40 GHz at Ch. 0	Pigote 2.54 Emission pressured with Average Detector from 18 GHz to 26.5 GHz at Cit. 0	.157
Figure 257 Emission measured with Peak Detector from 1 GHz to 18 GHz at Ch. 0	Figure 255 Entission measured with Average Detector from 26 5 CHz to 40 GHz at Ch. 0	.157
Figure 258 Emission measured with Peak Detector from 18 GHz to 26.5 GHz at Ch. 0	Figure 250 Emission measured with Peak Detector from 1 GHz to 18 GUz at Ch. 0	.158
Figure 259 Emission measured with Peak Detector from 26.5 GHz to 40 GHz at Ch. 0	Figure 23 ( Eminastral menamend with Week Dataclor from 18 GHz to 26 5 GHz at Ch. 0.	,158
Figure 260 Emission measured with Peak Detector from 9 kHz to 150 kHz at Ch. 1  Figure 261 Emission measured with Peak Detector from 150 kHz to 30 MHz at Ch. 1  Figure 262 Emission measured with Peak Detector from 30 MHz to 1 GHz at Ch. 1  Figure 263 Emission measured with Average Detector from 1 GHz to 18 GHz at Ch. 1  160	Figure 258 Enussion measured with Peak Detector from 26.5 GUz to 40 GHz at Ch. O.	.159
Figure 261 Emission measured with Peak Detector from 150 kHz to 30 MHz at Ch. 1	Figure 259 Enthston measured with Feak Detector from 0 l/Uz to 150 l/Uz at Ch 1	.159
Figure 262 Emission measured with Peak Detector from 30 MHz to 1 GHz at Ch. 1	Figure 260 Emission measured with Peak Detector from 150 kHz to 20 MHz at Ch. 1	.160
Pierre 262 Eurissian measured with Average Detector from 1 GHz to 18 GHz at Ch. 1	Figure 201 Emission measured with reak percent from 150 kHz to 50 Mg/s of Ch. 1	. 160
Figure 263 Emission measured with Average Detector from 18 GHz to 26.5 GHz at Ch. 1	Figure 262 Emission incastred with Peak Detector from 50 Mriz to 1 Griz to the Children College of Children Children College of Children College of Children College of Children Children College of Children Children College of Children Children Children Children Chil	.161
Figure 264 Emission measured with Average Detector from 18 GHz to 26.5 GHz at Cit. 1	Figure 263 Emission measured with Average Detector from 1 G112 to 18 G12 at Cl., 1	161
	Figure 264 Emission measured with Average Detector from 18 GHz to 26.5 GHz at Cit. 1	, , , , , ,





Figure 265 Emission measured with Average Detector from 26.5 GHz to 40 GHz at Ch. 1	162
Figure 266 Panission measured with Peak Detector from 1 GHz to 18 GHz at Ch. 1	162
Figure 267 Emission measured with Peak Detector from 18 GHz to 26.5 GHz at Ch. 1	163
Figure 268 Emission measured with Peak Detector from 26.5 GHz to 40 GHz at Ch. 1	163
Figure 269 Emission measured with Peak Detector from 9 kHz to 150 kHz at Ch. 0	164
Figure 270 Emission measured with Peak Detector from 150 kUz to 30 MHz at Ch. 0	164
Figure 271 Emission measured with Peak Detector from 30 MHz to 1 GHz at Ch. 0	165
Figure 272 Emission measured with Average Detector from 1 GHz to 18 GHz at Ch. 0	165
Figure 273 Emission measured with Average Detector from 18 GHz to 26.5 GHz at Ch. 0	166
Figure 274 Emission measured with Average Detector from 26.5 GHz to 40 GHz at Ch. 0	)66
Figure 275 Emission measured with Peak Detector from 1 GHz to 18 GHz at Ch. 0	167
Figure 276 Emission measured with Peak Detector from 18 GHz to 26.5 GHz at Ch. 0	167
Figure 277 Emission measured with Peak Detector from 26.5 GHz to 40 GHz at Ch. 0	168
Figure 278 Emission measured with Peak Detector from 9 kHz to 150 kHz at Ch. 1	168
Figure 279 Emission measured with Peak Detector from 150 kHz to 30 MHz at Ch. 1	169
Figure 280 Emission measured with Peak Detector from 30 MHz to 1 GHz at Ch. 1	169
Figure 281 Emission measured with Average Detector from 1 GHz to 18 GHz at Ch. 1	170
Figure 282 Emission measured with Average Detector from 18 GHz to 26.5 GHz at Ch. 1	170
Figure 283 Emission measured with Average Detector from 26.5 GHz to 40 GHz at Ch. 1	171
Figure 284 Emission measured with Peak Detector from 1 GHz to 18 GHz at Ch. 1	171
Figure 285 Emission measured with Peak Detector from 18 GHz to 26.5 GHz at Ch. 1	172
Figure 286 Envission measured with Peak Detector from 26.5 GHz to 40 GHz at Ch. 1	172
Figure 287 Emission measured with Peak Detector from 9 kHz to 150 kHz at Ch. 0	173
Figure 288 Emission measured with Peak Detector from 150 kUz to 30 MHz at Ch. 0	173
Pignre 289 Emission measured with Peak Detector from 30 MHz to 1 GHz at Ch. 0.	174
Figure 290 Emission measured with Average Detector from 1 GHz to 18 GHz at Ch. 0	174
Figure 291 Emission measured with Average Detector from 18 GHz to 26.5 GHz at Ch. 0	175
Figure 292 Emission measured with Average Detector from 26.5 GHz to 40 GHz at Ch. 0	175
Figure 293 Emission measured with Peak Detector from 1 GHz to 18 GHz at Ch. 0	176
Figure 294 Emission measured with Peak Detector from 18 GHz to 26.5 GHz at Ch. 0	176
Figure 295 Emission measured with Peak Detector from 26.5 GHz to 40 GHz at Ch. 0	177
Figure 296 Principles on measured with Peak Detector from 9 kHz to 150 kHz at Ch. 1	177
Figure 297 Emission measured with Peak Detector from 150 kHz to 30 MHz at Ch. 1	178
Figure 298 Emission measured with Peak Detector from 30 MHz to 1 GHz at Ch. 1	178
Figure 299 Pmission measured with Average Detector from 1 GHz to 18 GHz at Ch. 1	179
Figure 300 Emission measured with Average Detector from 18 GHz to 26.5 GHz at Ch. I	179
Figure 301 Emission measured with Average Detector from 26.5 GHz to 40 GHz at Ch. 1	180
Figure 302 Unitssion measured with Peak Detector from 1 GHz to 18 GHz at Ch. 1	180
Figure 303 Emission measured with Peak Detector from 18 GHz to 26.5 GHz at Ch. 1	181
Figure 304 Emission measured with Peak Detector from 26.5 GHz to 40 GHz at Ch. 1	181
Figure 305 Emission measured with Peak Detector from 9 kHz to 150 kHz at Ch. 0	182
Figure 306 Emission measured with Peak Detector from 150 kHz to 30 MHz at Ch. 0	182
Figure 307 Emission measured with Peak Detector from 30 MHz to 1 GHz at Ch. 0	183
Figure 308 Emission measured with Average Detector from 1 GHz to 18 GHz at Ch. 0	183
Figure 309 Emission measured with Average Detector from 18 GHz to 26.5 GHz at Ch. 0	184
Figure 310 Emission measured with Average Detector from 26.5 GHz to 40 GHz at Ch. 0	184
Figure 311 Envission measured with Peak Detector from 1 GHz to 18 GHz at Ch. 0	185
Figure 312 Emission measured with Peak Detector from 18 GHz to 26.5 GHz at Ch. 0	185
Figure 313 Emission measured with Peak Detector from 26.5 GHz to 40 GHz at Ch. 0	186
Figure 314 Emission measured with Peak Detector from 9 kHz to 150 kHz at Ch. 1	186
Figure 315 Emission measured with Peak Detector from 150 kHz to 30 MHz at Ch. 1	187
Figure 316 Emission measured with Peak Detector from 30 MHz to 1 GHz at Ch. 1	187
Figure 317 Emission measured with Average Detector from 1 GHz to 18 GHz at Ch. 1	188
TRUNG A P. AMERICAN MEDITAR A LIN COLORES CONTRACTOR A COLOR TO A	





Figure 318 Emission measured with Average Detector from 18 GHz to 26.5 GHz at Ch. 1	188
Figure 319 Emission measured with Average Detector from 26.5 GHz to 40 GHz at Ch. 1	189
Figure 320 Emission measured with Peak Detector from 1 GHz to 18 GHz at Cl. 1	189
Figure 321 Emission measured with Peak Detector from 18 GHz to 26.5 GHz at Ch. 1	190
Figure 321 Emission measured with Peak Detector from 26.5 GHz to 40 GHz at Ch. 1	190
Figure 322 Emission measured with Peak Detector from 20.5 GHz to 40 GHz at Ch. Tamasan and Ch. Ch. O.	191
Figure 322 Emission measured with Peak Detector from 9 kHz to 150 kHz at Ch. 0	191
Figure 324 Emission measured with Peak Detector from 150 kHz to 30 MHz at Ch. 0	192
Figure 325 Emission measured with Peak Detector from 30 MHz to 1 GHz at Ch. 0	107
Figure 326 Emission measured with Average Detector from 1 Gifz to 18 GHz at Ch. 0	102
Figure 327 Emission measured with Average Detector from 18 GHz to 26.5 GHz at Ch. 0	102
Figure 328 Emission measured with Average Detector from 26.5 GHz to 40 GHz at Ch. 0	173
The same and the decision managed with Dark Detector from 1 GHz to 18 GHz at Ch. 0	LY4
visses 226 Periodic marround with Deak Detector from 18 (iHz to 26.) GHz at Un. Usersamment marround	-,. 174
Diame 221 Emission massured with Peak Detector from 26.5 GHz to 40 GHz at Ch. U	17.>
22 120 Emission programmy with Book Detector from 9 kHz to 150 kHz at Ch. 1	175
Element 22.2 Profession angergred with Beak Detector from 150 kHz to 30 MHz at Ch. I and a communication and the communication of the c	190
224 Emission managed with Dook Detector from 30 MHz to 1 GHz at Ch. 1	170
rd 205 Eindian magnified with Average Detector from 1 GHz to 1X GHz 8I CD, 1	191
returns 22.4 Parissing managered with Average Detector from 18 GHz to 26.5 GHz at Ch. Language approximation	, 137
Warran 227 Emission manused with Average Detector from 26.5 GHz to 40 GHz at Cit. 1	170
Electro 229 Envisoion measured with Peak Detector from 1 GHz to 18 GHz at Ch. 1	TSG
Elema 220 Projector manning with Peak Detector from 18 GHz to 26.5 GHz at Ch. 1	199
240 Endering managed with Book Detector from 26.5 GHz to 40 GHz at Ch. 1	177
Eleman 1.41 Emission programmed with Dock Detector from 9 kHz to 150 kHz at Ch. 0	200
The page Variation and provide Book Detector from 150 kHz to 30 MHz at Ch. 0	200
Figure 342 Emission measured with Peak Detector from 30 MHz to 1 GHz at Ch. 0	201
Figure 344 Emission measured with Average Detector from 1 GUz to 18 GHz at Ch. 0	201
Figure 345 Emission measured with Average Detector from 18 GHz to 26.5 GHz at Ch. 0	202
Rigure 346 Emission measured with Average Detector from 26.5 GHz to 40 GHz at Ch. 0	202
Figure 345 Emission measured with Peak Detector from 1 GHz to 18 GHz at Ch. 0	203
Figure 347 Emission measured with Peak Detector from 18 GHz to 26,5 GHz at Ch. 0	203
Figure 348 Emission measured with Peak Detector from 26.5 GHz to 40 G/lz at Ch. 0	204
Figure 349 Emission measured with Peak Detector Hourzon, and 210 days and Ch. of the Ch.	204
Figure 350 Emission measured with Peak Detector from 9 kHz to 150 kHz at Ch. 1	205
Figure 350 Emission measured with Peak Detector from 150 kHz to 30 MHz at Ch. 1	205
Figure 352 Emission measured with Peak Detector from 30 MHz to 1 GHz at Ch. 1	206
Figure 352 Emission measured with Average Detector from 1 Gliz to 18 GHz at Ch. 1	206
The 254 Design magnified with Average Detector from 18 GHZ to 26.3 UHZ & U.B. 1 manusary and approximately	<b>2</b> VV
Figure 355 Emission measured with Average Detector from 26.5 GHz to 40 GHz at Ch. 1	207
There 256 Enviroing responsed with Deak Delector from 1 GHz to 18 GHz at Clt. 1	207
Figure 2.57 Emission measured with Peak Detector from 18 GHz to 26.5 GHz at Cl. L.	200
Biomes 358 Emission measured with Peak Detector from 26.5 GHz to 40 GHz at Ch. I	200
250 tAnd 22 confication screenshot	413
Piones 360 (ffp.432 application initialization root screenshot	Z13
Ligares 361 Tera term amplication screenshot.	A 14
Eines 342 Tars term amplication Login screenshot	
Pinner 252 Initializing IIIT screenthot	Z13
Diama 264 Attacon Radio Test GHI screenshot-1	Z13
Figure 365 Atheros Radio Test GUI screenshot -2	216
T. Series and a se	





T	IST	$\mathbf{OF}$	<b>TABLES</b>	
_		•		

Table 1 List of Equipment used for Conducted RF Test	14
Table 2 1007 details	
Table 3: List of cables	
Table 4 Result for 6 dB Bandwidth in both 40 MHz and 5 MHz modulation bandwidth	,36
Table 5 Max RP out power for 17 dBi configuration.	45
Table 6 Consolidated values across channels and final power for 17 dBi configuration	
Table 7 Max RF out power for 6 dBi configuration	40
Table 8 Consolidated values across channels and final power for 6 dibi configuration	46
Table 9 Result of PSD for 17 dBi configuration for both 40 MHz and 5 MHz modulation bandwidth	60
Table 10 Result of PSD for 6dBi configuration for both 40 MHz and 5 MHz modulation bandwidth	60
Table 11: Unwanted emission Limit	99
Table 12: General Field strength limit below 30MHz	
Table 13: General Field strength limit above 30MHz.	.,99
Table 14 Result for 17 dBi configuration 40 MHz modulation bandwidth	209
Table 15 Result for 17 dBi configuration - 5 MHz modulation bandwidth	210
Table 16 Result for 6 dBi configuration – 40 MHz modulation bandwidth	,211
Table 17 People for 6 dili configuration -5 MHz modulation bandwidth	212





#### 1 TEST REPORT SUMMARY

Applicant	Cambium Networks
Manufacturer	Cambium Networks
Product Name	ePMP2000
Product Model	C050900P031A
Product Serial Number	000456D18458
Date of Test	24th Jan 2016 to 15th Feb 2016
Venue of Test	Tarang Lab

Applicable Standard	Description	Results
47 CFR Part 15 Feb	Duty cycle and Transmission Duration	NA
2016	§15.407 (a) (3)- 6 dB Bandwidth measurement	PASS
	§15.407 (a) (3)- Maximum conducted Output Power	PASS
	§15.407 (a) (3)- Power Spectral Deasity	PASS
	§15.247 (d)- Operating Band edge measurements	PASS
	§15.247 (d)- Radio frequency power in any 100 kHz bandwidth outside the Intentional band	PASS
	§15.407 b (3) -Transmission Unwanted emission (Conducted)	PASS

ePMP2000 was tested by Tarang Lab as per the standards that are listed in the table above. Based on the observations during the test and interpretations by Tarang lab, results have been indicated. The test results produced in this report shall apply only to the above sample that has been tested under the specific conditions and modes of testing as described in the report. Other similar equipment may not necessarily reproduce same result due to production tolerances and measurement uncertainties. Any measurement uncertainties listed in this report are for information purpose only.

The results shall stand invalid, in case there are any modifications / additions / removals to the hardware or software or end use atmosphere to the product tested. This report shall not be modified or in any way revised unless it is expressly permitted and endorsed by Tarang lab, through a duly authorized representative. Particulars on Manufacturer / Supplier / Product configuration / performance criteria, given in this report, are based on the information given by the customer, along with test request. Tarang does not assume any responsibility for the correctness of such information for the above mentioned equipment under test.

Customer acknowledges that this is a test report and not a certificate to gain market access for the product. To gain market access, Customer needs appropriate clearance from the Government or authorized agency for the target market. For markets that allow self-declaration, customer needs to follow the procedure defined by the target market.

Prepared by	Reviewed by	Approved by
10 hays	Danker	A Ladher
Nishanth P C	Narendra Babu M	Satheesh I
EMI/EMC Test Engineer	Lead EMI/EMC Test Engineer	Technical Manager

Report Number: DBN 1604TEL539-D	EMC TEST REPORT	Page 12 of 217
		·





## 2 GENERAL INFORMATION

## 2.1 ACCREDITATION DETAILS

Following are the accreditation and listing details for Tarang.

Accreditation / Listing body	Registration / Company / Certificate Number
NABL, India	Certificate No: T-1533, T-1534
	http://www.nabl-india.org/
FCC (Federal Communications	Registration Number: 799247
Commission)	http://www.fcc.gov/
IC (Industry Canada)	Company Number: 9023A-1
10 (2000)	latp://www.ic.gc.ca

## 2.2 MEASUREMENT UNCERTAINTY

The following measurement uncertainties are applicable to the relevant tests that are mentioned below:

Name of the test	Measurement Uncertainty
Radiated Emission from 30 MHz to 1 GHz at 3 meter	± 4.6687 dB
Radiated Emission from 1 GHz to 18 GHz at 3 meter	± 3.2297 dB
Radiated Emission from 18 GHz to 26.5 GHz at 3 meter	± 3.7832 dB
Radiated Emission from 26.5 GHz to 40 GHz at 3 meter	± 3.7962 dB
Conducted Emission from 150 kHz to 30 MHz	± 1.6160 dB





## 3 INSTRUMENTATION AND CALIBRATION

## 3.1 TEST AND MEASURING EQUIPMENT

The list of following measuring equipment used for this testing conforms to the applicable standards. Performance of all test and measuring equipment including any accessories are checked periodically to ensure accuracy.

## 3.2 EQUIPMENTS USED

Name of Equipment	Manufacturer	Model No	Serial No	Calibration Due
Spectman Analyzer	Keysight Technologies	N9020A	MY54420183	31 <sup>st</sup> Mar 2016
X series USB Peak and	Keysight Technologies	U2021XA	MY55050001	31st Mar 2016
Average Power sensor				
X series USB Peak and	Keysight Technologies	U2021XA	MY54390014	31 <sup>st</sup> Mar 2016
Average Power sensor	•			
EMI Test Receiver	R&S	ESIB40	100306	21 <sup>st</sup> Jan 2017

Table 1 List of Equipment used for Conducted RF Test





## 4 PRODUCT INFORMATION

## 4.1 DESCRIPTION OF THE PRODUCT

EUT is a point to point & point to multipoint fixed outdoor Transceiver with the following defined channels.

40 MHz channel for 17 dBi and 6 dBi autenna	5 MHz channel for 17 dBi and 6 dBi autenna		
Low - 5750 MHz	Low - 5735 MHz		
Mid - 5775 MHz	Mid – 5775 MIIz		
High - 5825 MHz	High - 5840 MHz.		

Product	ePMP2000
Model Number	C050900P031A
Serial Number	000456D18458
Product Category / Type of Equipment	TTE
EUT Operating Voltage	120 V AC / 230 V AC
EUT Operating frequency range	60 Hz / 50 Hz
Max EUT Operating Current	<1 A

#### Table 2 EUT details

Cable No.	Cable Name	Cable Længth	Power / Interconnection cable	Shielded / Uushielded	Cable photos
Cable - 1	Power cable	0.8 meter	Power	Unshielded	Figure 9 of EMC Test Report_DBN 1604TEL539-C.pdf
Cable - 2	Ethernet Cable	1,5 meter	Interconnection	Unshielded	Figure 10 of EMC Test Report_DBN 1604TEL539-C.pdf
Cable - 3	Ethernet Cable	3.05 meter	Interconnection	Unshielded	Figure 11 of EMC Test Report DBN 1604TEL539-C.pdf

Table 3: List of cables

# 4.2 SOFTWARE AND FIRMWARE DETAILS

Atheros Radio Test 2 (ART2-GUI) Version 2.3

Report Number: DBN 1604TEL539-D	EMC TEST REPORT	Page 15 of 217
---------------------------------	-----------------	----------------





#### 5 TEST DETAILS

#### 5.1 PRODUCT AND TEST SETUP

## 5.1.1 PRODUCT CONFIGURATION

The EUT was powered through AC power supply (120 V AC / 60 Hz). The EUT was connected to Ethernet switch by using RJ45 cable. Figure 1 shows the product configuration during the tests. POE module was used during the test to power ON the EUT.

The 5.8 GHz ePMP Integrated Radio was configured with test software and configured to have the following settings during the course of testing:

- 40 MHz modulation bandwidth for low, mid & high channels
  - o Rate HT40,
  - o 54 Mbps OFDM, MCS15 / 270 Mbps
  - Tx Power is 17.5 dBm for 17 dBi antenna configuration-Low channel
  - Tx Power is 18 dBm for 17 dBi antenna configuration-Mid channel
  - o Tx Power is 18 dBm for 17 dBi antenna configuration-High channel
  - Tx Power is 24 dBm for 6 dBi antenna configuration-Low channel
  - Tx Power is 29 dBm for 6 dBi antenna configuration-Mid channel
  - Tx Power is 27 dBm for 6 dBi antenna configuration-High channel
- 5 MHz modulation bandwidth for low, mid & high channels
  - Rate Legacy,
  - 54 Mbps OFDM, MCS15 / 130 Mbps
  - Tx Power is 18 dBm for 17 dBi antenna configuration-Low channel
  - Tx Power is 18 dBm for 17 dBi antenna configuration-Mid channel
  - o Tx Power is 17 dBm for 17 dBi antenna configuration-High channel
  - Tx Power is 28 dBm for 6 dBi antenna configuration-Low channel
     Tx Power is 29 dBm for 6 dBi antenna configuration-Mid channel
  - O Tx Power is 28 dBm for 6 dBi antenna configuration-High channel

The unit was continuously monitored for transmission using an auxiliary antenna during the radiated tests.



# 5.1.2 TEST SETUP DETAILS

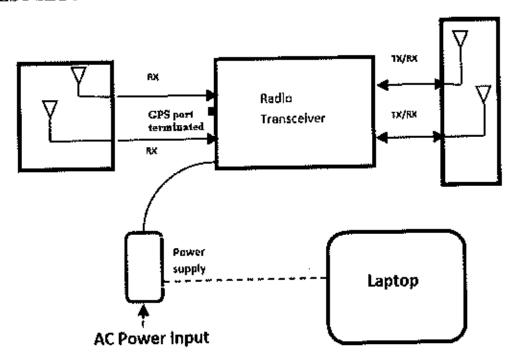


Figure 1 Block diagram of the EUT (est setup





## 5.1.3 ACCESSORIES

Name of the Equipment	Manufacturer	Model Number	Serial Number
17 dBi Antenna Beam steer- Rx	Cambium Networks	C050900D020A	NA
17 dBi Antenna sector-Tx	Cambium Networks	C050900D021A	NA
Power Supply	Cambium Networks	NET P30 56	031-326-6719
6 dBi Antenna	Cambium Networks	C005095D360A	NA
Switching Power Supply Gigabit Compatible	Cambium Networks	NET-P30-56	N000000L034A

## 5.2 APPLICABLE TESTS

Applicable Standard	Description	Test level / Test Voltage	Applicability
47 CFR Part 15, Fcb 2016	Duty Cycle and transmission duration 6 dB Bandwidth measurement	NA ≥ 500 kHz	Antenna port Antenna port
	Maximum Conducted Output Power Power Spectral Density	≤1 Watts  Power spectral density should be ≤30 dBm in 500 kHz bandwidth	Antenna port Antenna port
	Operating Band edge Radio frequency power in any 100 kHz bandwidth outside the Intentional band	5725 MHz to 5850 MHz 30 dB below intentional frequency power measured in any 100 kHz bandwidth	Antenna port Antenna port
	Transmitter Unwanted emission Conducted)	9 kHz to 40 GHz	Antenna port





#### 5.3 TEST RESULT

## 5.3.1 DUTY CYCLE (X) AND TRANSMISSION DURATION (T)

#### 5.3.1.1 TEST SPECIFICATION

Test Standard	47 CFR, Part 15 Feb 2016		
Test Procedure	789033 D2 General U-NII Test Procedures New Rule V01r01		
Resolution Bandwidth	8 MHz		
Video Bandwidth	50 MIIz		
Sweep Time	Auto		
Attenuation	Anto		
Test Mode	Conducted		
Detector	RMS		
Input Voltage	120 V AC		
Input Frequency	60 Hz		
Temperature	21.0 °C		
Humidity	54.0 %		
Tested By	Nishanth		
Test Date	24 <sup>th</sup> Jan 2016		

#### 5.3.1.2 LIMITS

NA.

#### 5.3.1.3 TEST SETUP

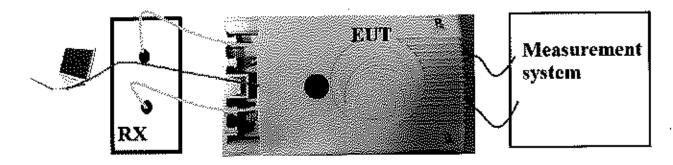


Figure 2 Typical test setup for Conducted RF Test

#### 5.3.1.4 TEST PROCEDURE

The Conducted test was performed using the Spectrum analyzer. Measurements were done as per section II B of "789033 D2 General U-NH Test Procedures New Rule V01r01". The RF output of the EUT was connected to the input port of Spectrum analyzer using an attenuator. The graph and data captured from spectrum analyzer and recorded.

Report Number: DEM 10043 (1235) D	Report Number: DBN 1604TE1.539 D E	MC TEST REPORT	Page 19 of 217
-----------------------------------	------------------------------------	----------------	----------------





## 5.3.1.5 MEASUREMENT GRAPHS / DATA

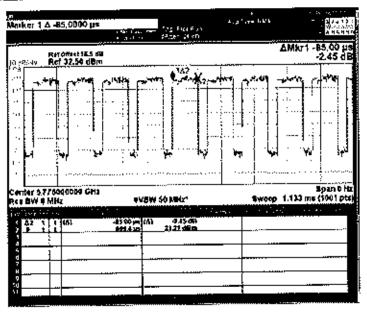


Figure 3 Measured ON time

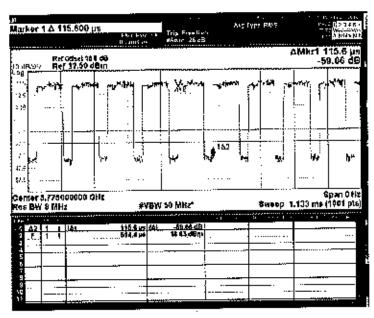


Figure 4 Measured Transmission Period (T)





#### 5.3.1.6 RESULT

The Duty cycle and Transmission duration data were recorded.

					T
	ON fime	T	Duty Cycle X	Duty Cycle	50/T
Mode	(usec)	(usec)	(Linear)	(%)	Minimum RBW and VBW (kHz)
Tx ON	85	115.6	0.735	73.5%	432.52
1X OIL	45	110.0	10,120		

Note: Duty cycle = (ON time / Period)\*100





# 5.3.2 6 DB BANDWIDTH MEASUREMENT

#### 5.3.2.1 TEST SPECIFICATION

Test Standard	47 CFR Part 15 Subpart E Feb 2016		
Test Procedure	789033 D2 General U-NII Test Procedures New Rule V01r01		
Resolution Bandwidth	100 kHz		
Video Bandwidth	300 kHz		
Sweep Time	100ms		
Aftenuation	Auto		
Test Mode	Conducted		
Detector	Peak		
Input Voltage	120 V AC		
Input Frequency	60 Hz		
Temperature	21.0 °C		
Humidity	54.0 %		
Tested By	Nishanth/Suresh GN		
Test Date	24 <sup>th</sup> Jan 2016		

#### 5.3.2.2 LIMITS

Standard	Reference section		Limit (min. 6 dB Bandwidth)
47 CFR, Part 15,	§15.407 (a) (3)	5725 MHz to 5850 MHz	≥ 500 kHz
Subpart E Feb 2016			

#### 5.3.2.3 TEST SETUP

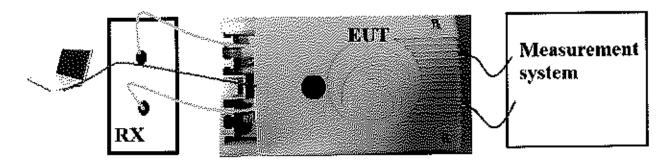


Figure 5 Typical test setup for Conducted RF Test





#### 5.3.2.4 TEST PROCEDURE

The Conducted test was performed using the Spectrum analyzer. Measurements were done as per the "789033 D2 General U-NII Test Procedures New Rule V01r01". The RF output of the EUT was connected to the input port of Spectrum analyzer using an attenuator. The graph and data captured from spectrum analyzer and recorded.

## 5.3.2.5 MEASUREMENT GRAPHS / DATA

# 5.3.2.5.1 40 MIIZ MODULATION BANDWIDTH FOR 17 dBi POWER SETTINGS LOW CHANNEL\_5750 MHz

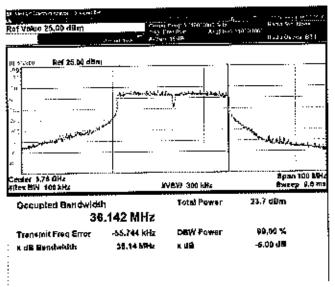


Figure 6 6dB Bandwidth measured at Ch.



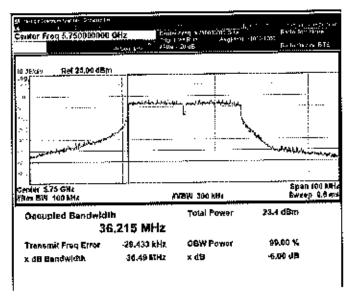


Figure 7 6dB Bandwidth measured at Ch.1

#### MID CHANNEL 5775 MHZ

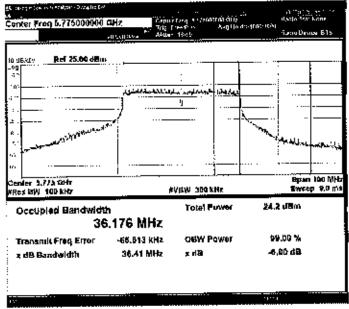


Figure 8 6 dB Bandwidth measured at Ch.0





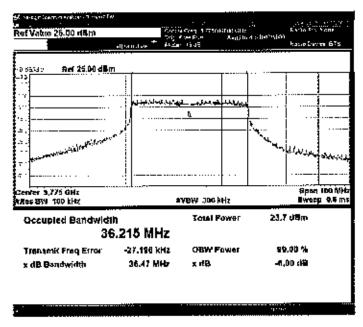


Figure 9 6 dB Bandwidth measured at Ch.1

## HIGH CHANNEL\_5825 MHZ

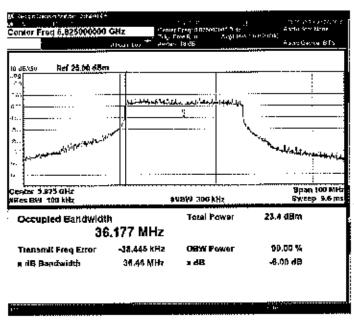


Figure 10 6 dB Bandwidth measured at Ch.0





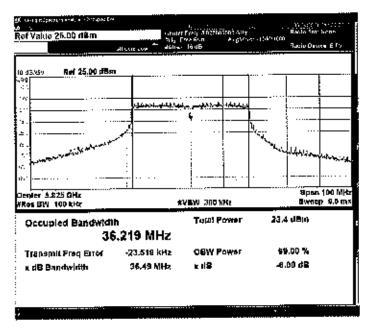


Figure 11 6 dB Bandwidth measured at Ch.1

# 5.3.2.5.2 40 MIIZ MODULATION BANDWIDTH FOR 6 dBi POWER SETTINGS LOW CHANNEL, 5750 MIIZ

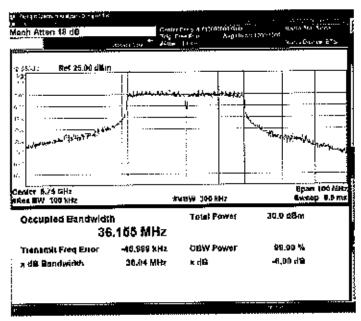


Figure 12 6 dB Randwidth measured at Ch.0



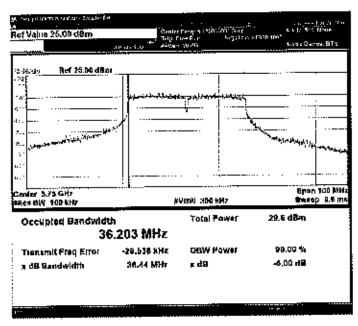


Figure 13 6 dB Bandwidth measured at Ch.1

#### MID CHANNEL\_5775 MHz

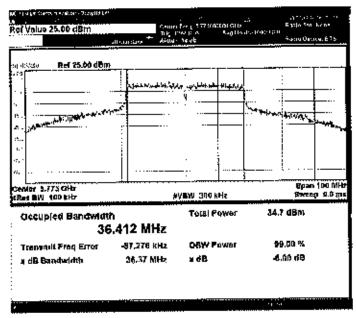


Figure 14 6 dB Bandwidth measured at Ch.0





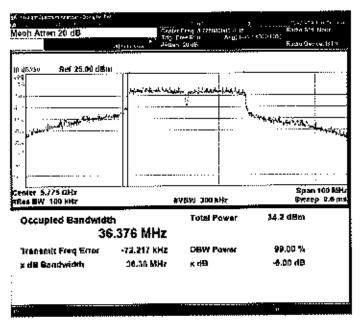


Figure 15 6 dB Bandwidth measured at Ch.1

#### HIGH CHANNEL\_5825 MHz

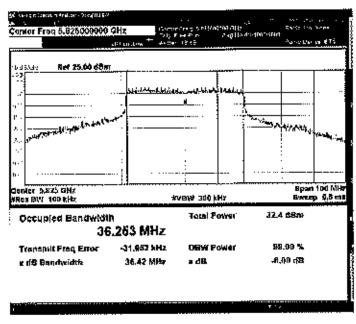


Figure 16 6 dB Bandwidth measured at Ch.0





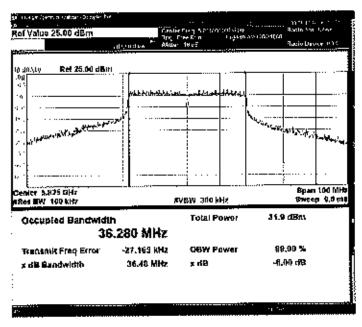


Figure 17 6 dB Bandwidth measured at Ch.1

# 5.3.2.5.3 5 MHz MODULATION BANDWIDTH FOR 17 dBi POWER SETTINGS LOW CHANNEL\_5735 MHz

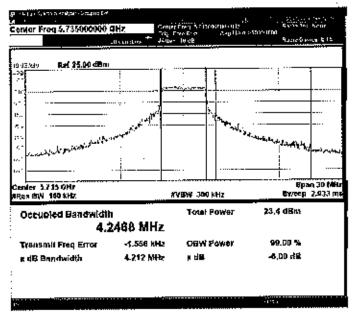


Figure 18 6 dB Bandwidth measured at Ch.0



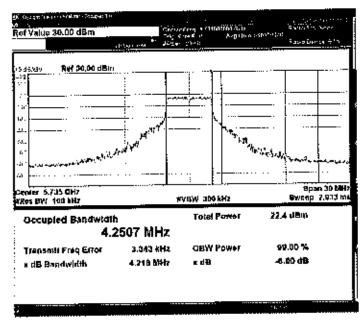


Figure 19 6 dB Bandwidth measured at Ch.1

## MID CHANNEL\_5775 MHz

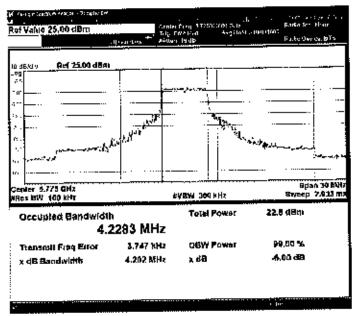


Figure 20 6 dB Bandwidth measured at Ch.0



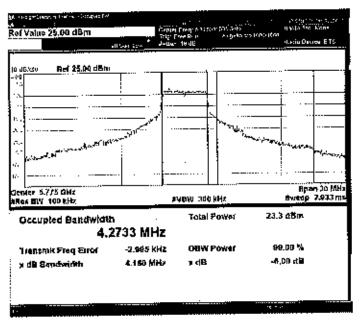


Figure 21 6 dB Bandwidth measured at Ch.1

## HIGH CHANNEL\_5840 MHz

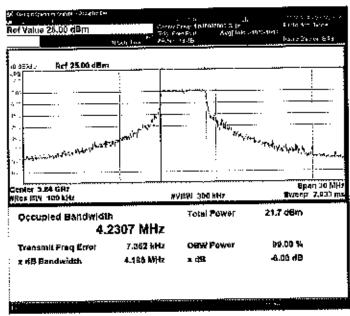


Figure 22 6 dB Bandwidth measured at Ch.0



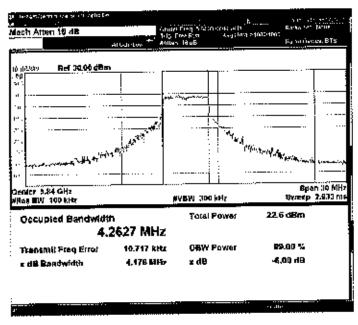


Figure 23 6 dB Bandwidth measured at Ch.1

# 5.3.2.5.4 5 MHz MODULATION BANDWIDTH FOR 6 dBi POWER SETTINGS LOW CHANNEL\_5735 MHz

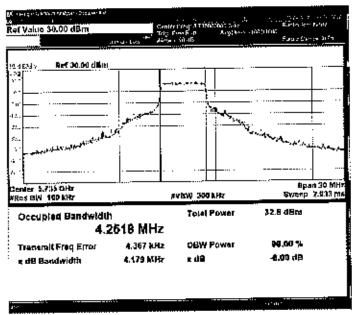


Figure 24 6 dB Bandwidth measured at Ch.0



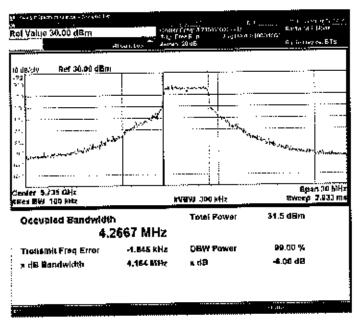


Figure 25 6 dB Bandwidth measured at Ch.1

## MID CHANNEL\_5775 MHz

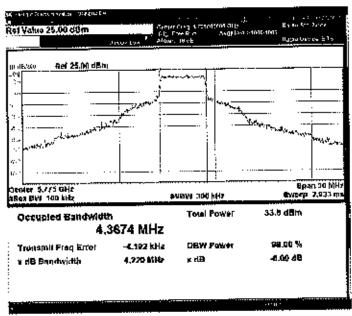


Figure 26 6 dB Randwidth measured at Ch.0



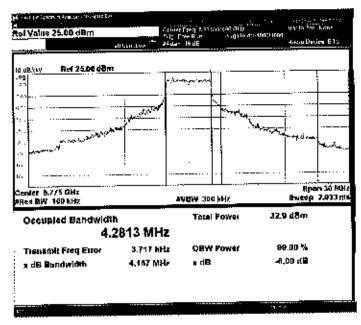


Figure 27 6 dB Bandwidth mensured at Ch.1

## HIGH CHANNEL\_5840 MHz

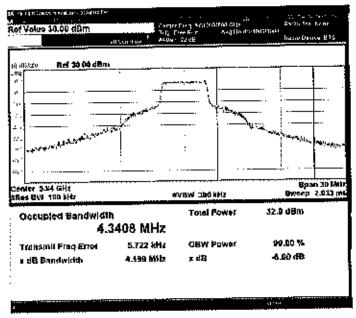


Figure 28 6 dB Bandwidth measured at Ch.0



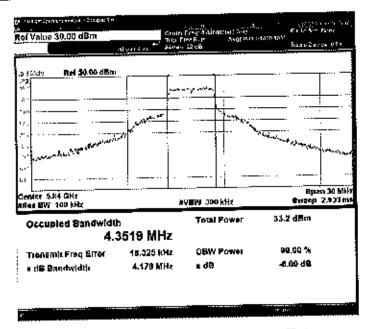


Figure 29 6 dB Bandwidth measured at Ch.1





#### 5.3.2.6 RESULT

The 6 dB bandwidth for all channels in both 40 MHz & 5 MHz modulation bandwidth is more than 500 kHz.

Refer below table for consolidated data.

Configuration	Modulation Bandwidth (MHz)	Antenna path	Chauuel Frequency (MHz)	Recorded value (MHz)	Limit (kHz)	Result
	40	Ch. 0	5750	36.14	≥ 500	Pass
	40	Ch. 0	5775	36.41	≥ 500	Pass
	40	Ch. 0	5825	36.46	≥ 500	Pass
	40	Ch. 1	57 <b>50</b>	36.49	≥ 500	Pass
	40	Ch. 1	5775	36.47	≥ 500	Pass
	40	Ch. I	5825	36.49	≥ 500	Pass
17 dBi	5	Ch. 0	5735	4.212	≥ 500	Pass
	5	Ch. 0	5775	4.202	≥ 500	Pass
	5	Ch. 0	5840	4.186	≥ 500	Pass
	5	Ch. 1	5735	4.210	≥ 500	Pass
	5	Ch. 1	5775	4.160	≥ 500	Pass
	5	Ch. 1	5840	4,178	≥ 500	Pass
	40	Ch. 0	5750	36.04	≥ 500	Pass
	40	Ch 0	5775	36.37	≥ 500	Pass
	40	Ch. 0	5825	36.42	≥ 500	Pass
	40	Ch. I	5750	36.44	≥ 500	Pass
	40	Ch. I	5775	36.38	≥ 500	Pass
	40	Ch. 1	5825	36.48	≥ 500	Pass
6 dBi	5	Ch. 0	5735	4.179	≥ 500	Pass
	5	Ch. 0	5775	4.220	≥ 500	Pass
	5	Ch. 0	5840	4.199	≥ 500	Pass
	5	Ch. 1	5735	4.164	≥ 500	Pass
	5	Ch. 1	5775	4.167	≥ 500	Pass
	5	Ch. 1	5840	4.178	≥ 500	Pass

Table 4 Result for 6 dB Bandwidth in both 40 MHz and 5 MHz modulation bandwidth





### 5.3.3 MAXIMUM CONDUCTED OUTPUT POWER

#### 5.3.3.1 TEST SPECIFICATION

Test Standard	47 CFR Part 15 Subpart E Feb 2016
Test Procedure	789033 D2 General U-NII Test Procedures New Rule V01r01
Test Mode	Conducted
Defector	Average
Input Voltage	120 V AC
Input Frequency	60 Hz.
Temperature	21.0 °C
Humidity	54.0 %
Tested By	Nishanth / Swesh GN
Test Date	24th Jan 2016

#### 5.3.3.2 LYMITS

Standard	Reference section	Frequency range	Limit
47 CFR Part 15 Subpart E Feb 2016	§15.407 (a)3 905462 D0 6802.11 Channel plans New rules v01	5725 MHz to 5850 MHz	Max conducted Tx power ≤ 30 dBm (1W) Max Limit (for 6 dBi antenna configuration) : ≤ 30 dBm Max Limit (for 17 dBi antenna) : ≤ 19 dBm

#### 5.3.3.3 TEST SETUP

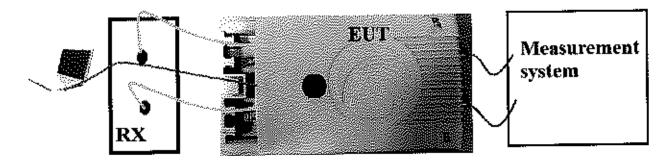


Figure 30 Typical test setup for Conducted RF Test





#### 5,3,3.4 TEST PROCEDURE

The Conducted test was performed using the power meter. Measurements were done as per Section II E 3.b (Method PM-G) of KDB "789033 DO2 General UNII Test Procedures New Rules v01r01". The RF output of the EUT was connected to the input port of Power meter using an attenuator. The graph and data captured from power meter and compared with the limits specified in the standard.

#### 5.3.3.5 MEASUREMENT GRAPHS / DATA

### 5.3.3.5.1 40 MHz MODULATION BANDWIDTH FOR 17 dBi POWER SETTINGS LOW CHANNEL 5750 MHz

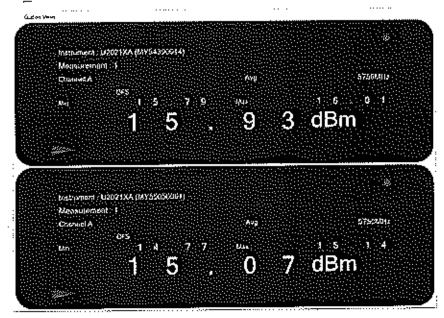


Figure 31 Maximum Conducted Output power measured at Ch.0 & Ch.1





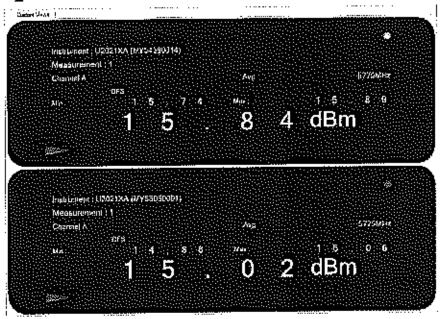


Figure 32 Maximum Conducted Output power measured at Ch.0 & Ch.1

#### HIGH CILANNEL\_5825 MHz

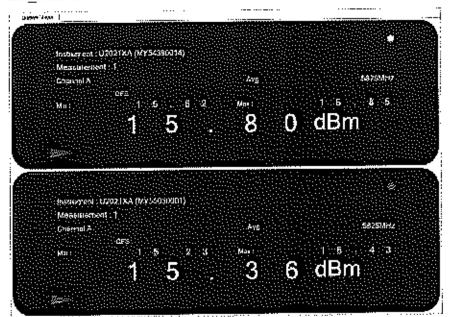


Figure 33 Maximum Conducted Output power measured at Ch.6 & Ch.1





# 5.3.3.5.2 40 MHz MODULATION BANDWIDTH FOR 6 dBi ANTENNA CONDITION LOW CHANNEL\_5750 MHz

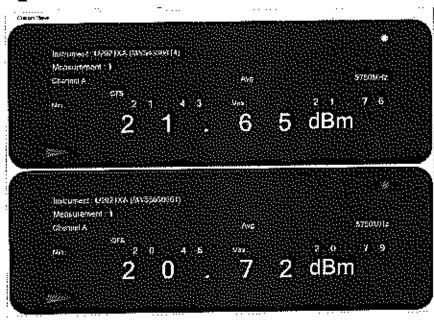


Figure 34 Maximum Conducted Output power measured at Ch.0 & Ch.1

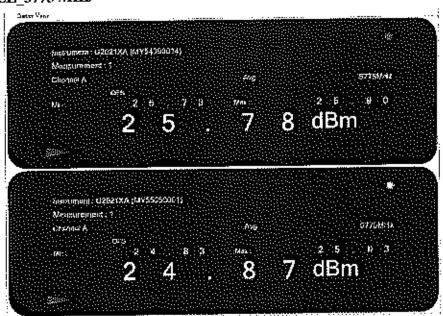


Figure 35 Maximum Conducted Output power measured at Ch.9 & Ch.1





#### HIGH CHANNEL\_5825 MHz

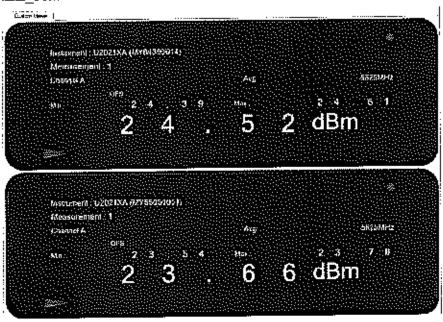


Figure 36 Maximum Conducted Output power measured at Ch.0 & Ch.1

# 5.3.3.5.3 5 MHz MODULATION BANDWIDTH FOR 17 dBi ANTENNA CONDITION LOW CHANNEL\_5735 MHz

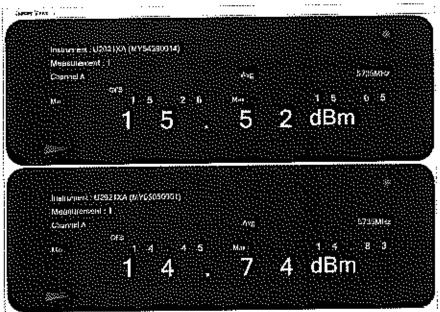


Figure 37 Maximum Conducted Output power measured at Ch.0 & Ch.1





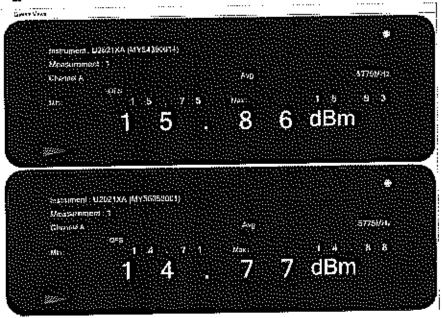


Figure 38 Maximum Conducted Output power measured at Ch.0 & Ch.1

#### HIGH CHANNEL\_5840 MHz



Figure 39 Maximum Conducted Output power measured at Ch.0 & Ch.1





# 5.3.3.5.4 5 MIIZ MODULATION BANDWIÐTH FOR 6 DB1 ANTENNA CONDITION LOW CHANNEL\_5735 MHz

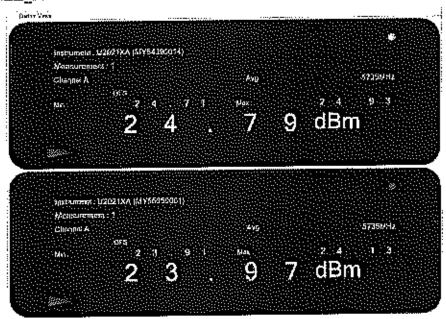


Figure 40 Maximum Conducted Output power measured at Ch.0 & Ch.1

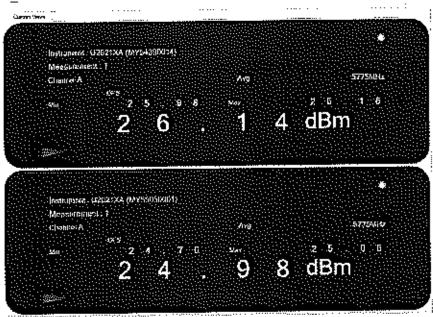


Figure 41 Maximum Conducted Output power measured at Ch.0 & Ch.1





#### HIGH CHANNEL\_5840 MHz

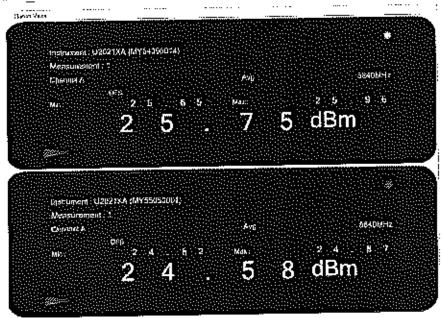


Figure 42 Maximum Conducted Output power measured at Ch.0 & Ch.1





#### 5.3.3.6 RESULT

Maximum Conducted Output Power for all channels in both 40 MHz & 5 MHz modulation bandwidth is within the specified limits. Refer below table for consolidated data.

#### USING 17 DB1 ANTENNA

Modulation Baudwidth (MHz)	Antenna path	Channel Frequency (MHz)	Recorded value (dBm)
40	Ch. 0	5750	15.93
40	Ch. 0	5775	15.84
40	Ch. 0	5825	15.80
40	Ch. 1	5750	15.07
40	Ch. 1	5775	15.02
40	Ch. 1	5825	15.36
5	Ch. 0	5735	15.52
5	Ch. 0	5775	15.86
5	Ch. 0	5840	14.78
5	Ch. I	5735	14.74
Ch. 1		5775	14.77
5	Ch. 1	5840	14.45

Table 5 Max RF out power for 17 dBi configuration

Modulation Bandwidth (MHz)	Antenna path	Channel Frequency (MHz)	Consolidated Power (dBm)	Limit (dBm)	Result
40	Ch, 0 & Ch 1	5750	18.53	19	PASS
40	Ch. 0 & Ch. 1	5775	18.45	19	PASS
40	Ch. 0 & Ch. 1	5825	18.43	19	PASS
5	Ch. 0 & Ch. 1	5735	18.15	19	PASS
5	Ch. 0 & Ch. 1	5775	18.35	19	PASS
5	Ch. 0 & Ch. 1	5840	17.62	19	PASS

Table 6 Consulidated values across channels and final power for 17 dBi configuration





#### USING 6 DB1 ANTENNA CONDITION

Modulation Bandwidth (MHz)	Antenna path	Channel Frequency (MHz)	Recorded value (dBm)
40	Ch. 0	5750	21.65
40	Ch. 0	5775	25.78
40	Ch. 0	5825	24.52
40	Ch. 1	5750	20.72
40	Ch. 1	5775	24.87
40	Ch. 1	5825	23,66
5	Ch. 0	5735	24.79
5	Ch. 0	5775	26,14
5	Ch. 0	5840	25,75
5 Ch. 1		5735	23.97
5 Ch. 1		5775	24.98
5	Ch, 1	5840	24.58

Table 7 Max RF out power for 6 dBi configuration

Modulation Bandwidth (MHz)	Autenna path	Channel Frequency (MHz)	Consolidated Power (dBm)	Limit (dBm)	Result
40	Ch. 0 & Ch. 1	5750	24.22	30	PASS
40	Ch. 0 & Ch. 1	5775	28.35	30	PASS
40	Ch. 0 & Ch. 1	5825	27.12	30	PASS
5	Ch. 0 & Ch. 1	5735	27.41	30	PASS
5	Ch. 0 & Ch. 1	5775	28.60	30	PASS
5	Ch. 0 & Ch. 1	5840	28.21	30	PASS

Table 8 Consolidated values across channels and final power for 6 dBi configuration

The recorded power in dBm was converted into Watt, and then added and convert the result back to dBm dBm to mW = log(mW)\*10 mW to dBm =  $10^{\circ}(dBm/10)$ 





### 5.3.4 POWER SPECTRAL DENSITY

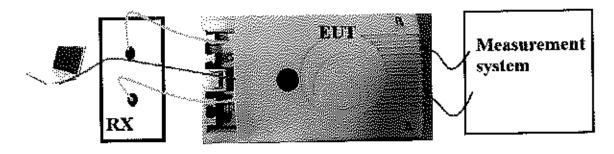
#### 5.3.4.1 TEST SPECIFICATION

	47 CFR, Part 15, Subpart E Feb 2016	
Test Standard	47 CFR, Fait 10, Dispart 2 100 200 2	
Test Procedure	789033 D2 General U-NII Test Procedures New Rule V01r0	
Frequency Range	5725 MHz to 5850 MHz.	
Resolution Bandwidth	1 MHz	
Video Baudwidth	3 MHz	
Sweep Time	1 mas	
Attenuation	Aufo	
Test Made	Conducted	
Detector	RMS	
Iuput Voltage	120 V AC	
Input Frequency	60 Hz	
Temperature	21.0 °C	
Humidity	54.0 %	
Tested By	Nishanth/Suresh GN	
Test Date	25th Jan 2016	

#### 5.3.4.2 LIMUTS

Standard	Reference section	Frequency range	Limit
47 CFR, Part 15, Subpart E	§15.407 a(3)	5725 MHz to 5850 MHz	< 30 dBm in any 500 kHz
Feb 2016			band

#### 5.3.4.3 TEST SETUP



Pigure 43 Typical test setup for Conducted Test

#### 5.3.4.4 TEST PROCEDURE

The Conducted test was performed using the Spectrum analyzer. Measurements were done as per Section II F (PSD) of KDB "789033 D02 General UNII Test Procedures New Rules v01r01". The RF output of the EUT was connected to the input port of Spectrum analyzer using an attenuator. The graph and data captured from spectrum analyzer and compared with the limits specified in the standard.

Report Number: DBN 1604TEL539-D	EMC TEST REPORT	Page 47 of 217
Repart Number: DEN 1004112005-15	2.120 22	43.4





#### 5.3.4.5 MEASUREMENT GRAPHS / DATA

# 5.3.4.5.1 40 MHZ MODULATION BANDWIDTH FOR 17 dBi POWER SETTINGS LOW CHANNEL\_5750 MHz

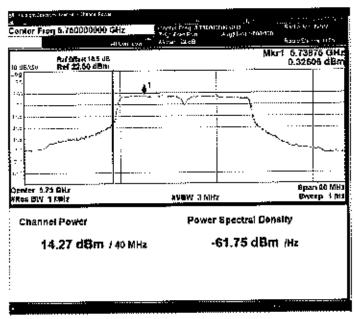


Figure 44 Power Spectral density measured at Ch. 0

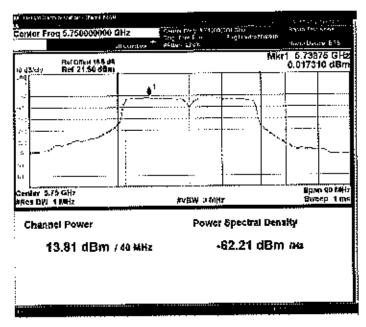


Figure 45 Power Spectral density measured at Ch. 1



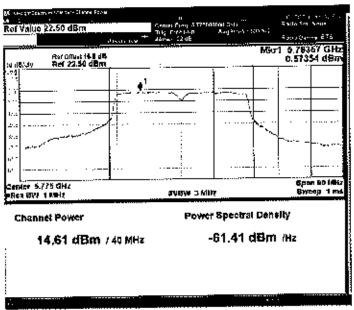


Figure 46 Power Spectral density measured at Ch. 0

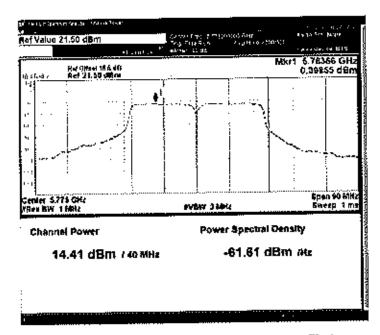


Figure 47 Power Spectral density measured at Ch. 1





#### HIGH CHANNEL\_5825 MHz

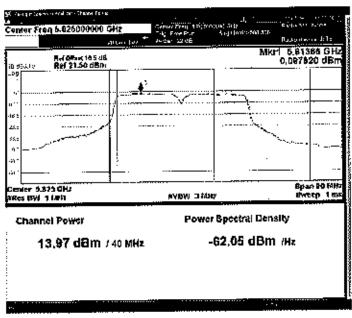


Figure 48 Power Spectral density measured at Ch. 0

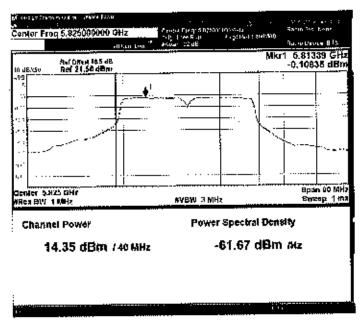


Figure 49 Power Spectral density measured at Ch. 1





### 5.3.4.5.2 40 MHz MODULATION BANDWIDTH 6 dBi ANTENNA CONDITION LOW CHANNEL\_5750 MHz

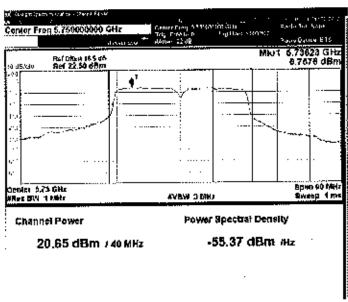


Figure 50 Power Spectral density measured at Ch. 0

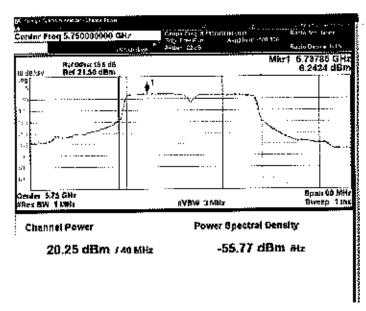


Figure 51 Power Spectral density measured at Ch. 1





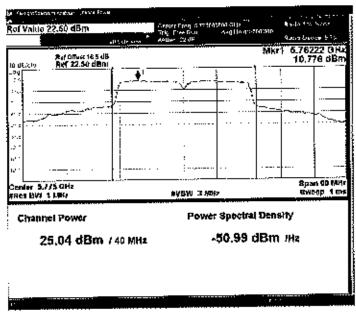


Figure 52 Power Spectral density measured at Ch. 0

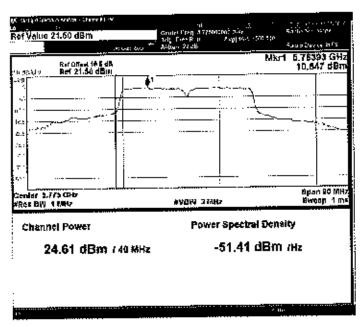


Figure 53 Power Spectral density measured at Ch. 1





#### HIGH CHANNEL\_5825 MIIZ

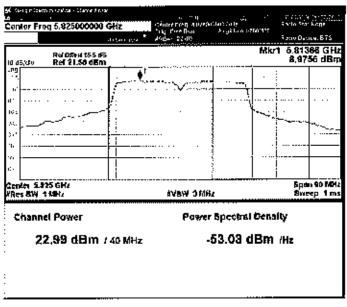


Figure 54 Power Spectral density measured at Ch.  $\theta$ 

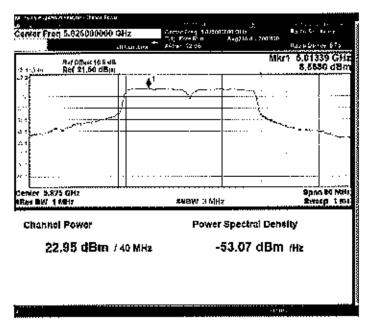


Figure 55 Power Spectral density measured at Ch. 1





### 5.3.4.5.3 5 MHz MODULATION BANDWIDTH 17 dBi ANTENNA CONDITION LOW CHANNEL\_5735 MHz

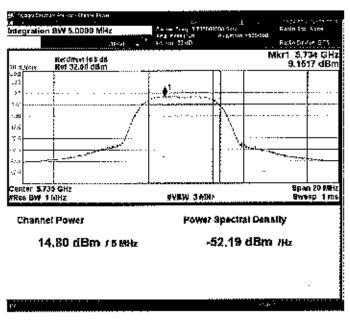


Figure 56 Power Spectral density measured at Ch. 0

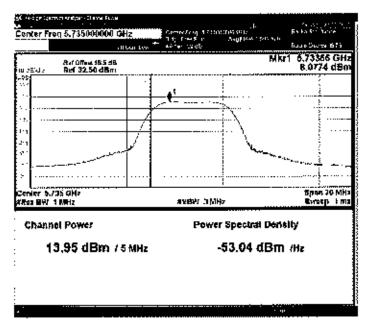


Figure 57 Power Spectral density measured at Ch. 1



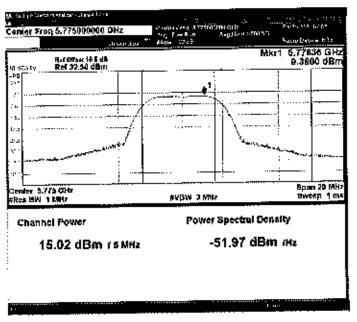


Figure 58 Power Spectral density measured at Ch. 0

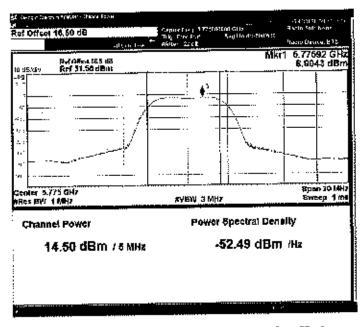


Figure 59 Power Spectral density measured at Ch. 1





#### HIGH CHANNEL\_5840 MHz

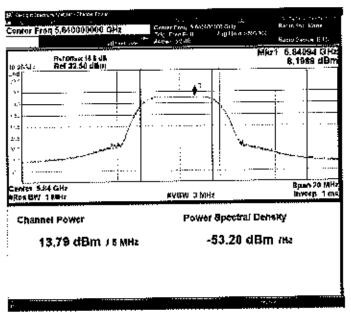


Figure 60 Power Spectral density measured at Ch. 0

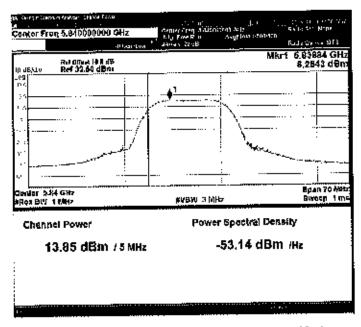


Figure 61 Power Spectral density measured at Ch. 1





## 5.3.4.5.4 5 MHz MODULATION BANDWIDTH 6 dBi ANTENNA CONDITION LOW CHANNEL\_5735 MHz

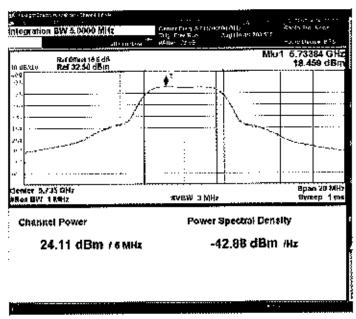


Figure 62 Power Spectral density measured at Ch. 0

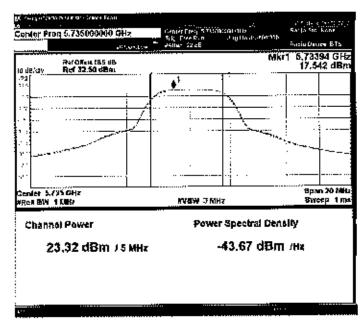


Figure 63 Power Spectral density measured at Ch. 1



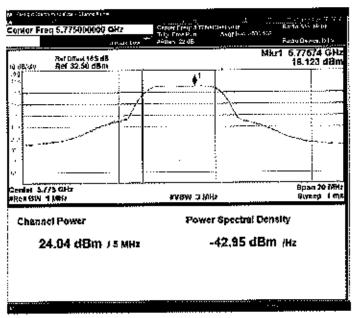
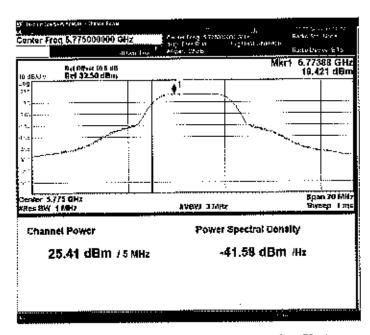


Figure 64 Power Spectral density measured at Ch.  $\theta$ 



Pigure 65 Power Spectral density measured at Ch. 1





#### HIGH CHANNEL\_5840 MHz

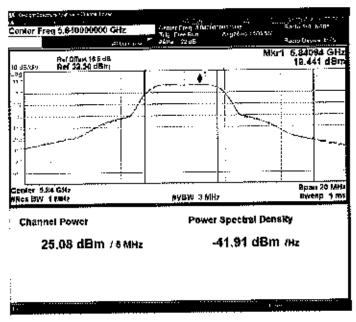


Figure 66 Power Spectral density measured at Ch. 0

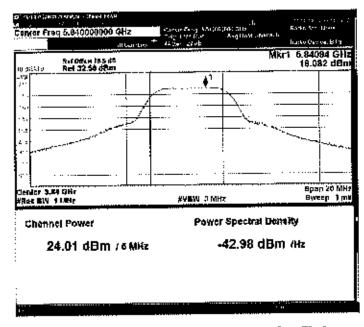


Figure 67 Power Spectral density measured at Ch. 1





#### 5.3.4.6 RESULT

Power Spectral Density for all channels in both 40 MHz & 5 MHz Modulation Bandwidths is within the Specified limit. Refer below table for consolidated result.

#### 17DBI ANTENNA CONDITION

Modulation Bandwidth (MHz)	Antenna path	Channel Frequency (MHz)	Recorded value (dBm/Hz)	Recorded value (dBm/500kHz)	Limit (dBm/500kHz)	Result
40	Ch. 0	5750	-61.75	-4.77	30	Pass
40	Ch. 0	5775	-61.41	-4.43	30	Pass
40	Ch. 0	5825	-62.05	-5.07	30	Pass
40	Ch. 1	5750	-62.21	-5.23	30	Pass
40	Ch. 1	5775	-61.61	-4.63	30	Pass
40	Ch. 1	5825	-61.67	-4.69	30	Pass
5	Ch. 0	5735	-52.19	4.79	30	Pass
5	Ch. 0	5775	-51,97	5,01	30	Pass
5	Ch. 0	5840	-53.20	3.78	30	Pass
5	Ch. I	5735	-53.04	3.94	30	Pass
5	Ch. i	5775	-52.49	4.49	30	Pass
5	Ch. 1	5840	-53.14	3,84	30	Pass

Table 9 Result of PSD for 17 dBi configuration for both 40 MHz and 5 MHz modulation bandwidth

#### 6DBI ANTENNA CONDITION

Modulation Bandwidth (MHz)	Autenn a path	Channel Frequency (MHz)	Recorded value (dBm/Hz)	Recorded value (dBm/500kHz)	Limit (dBm/500kHz)	Result
40	Ch. 0	5750	-55.37	1.61	30	Pass
40	Ch. 0	5775	-50.99	5.99	30	Pass
40	Ch. 0	5825	-53.03	3.95	30	Pass
40	Ch. 1	5750	-55.77	1.21	30	Pass
40	Ch. 1	5775	-51.41	5.57	30	Pass
40	Ch. I	5825	-53.07	3,91	30	Pass
5	Ch. 0	5735	-42.88	14.1	30	Pass
5	Ch. 0	5775	-42.95	14.03	30	Pass
5	Ch 0	5840	-41.91	15.07	30	Pass
5	Ch, 1	5735	-43.67	13.31	30	Pass
5	Ch. 1	5775	-41.58	15.4	30	Pass
5	Ch. 1	5840	-42.98	14	30	Pass

Table 10 Result of PSD for 6dBi configuration for both 40 MHz and 5 MHz modulation bandwidth

dBm/500kHz = dBm/Hz + 10log (500kHz)





#### 5.3.5 OPERATING BAND EDGE MEASUREMENTS

#### 5.3.5.1 TEST SPECIFICATION

Test Standard	47 CFR, Part 15, Subpart C Feb 2016		
Test Procedure	ANSI C63.4-2014		
Frequency Range	As applicable		
Resolution Bandwidth	100 kHz		
Video Bandwidth	300 kHz		
Sweep Time	Aute		
Affenuation	Auto		
Test Mode	Conducted		
Detector	Peak		
Iuput Voltage	120 V AC		
Input Frequency	60 Hz		
Temperature	21.0 °C		
Humidity	54.0 %		
Tested By	Nishanth		
Test Date	25th Jan 2016		

#### 5,3,5,2 LIMITS

Standard	Reference section	<b>Frequency range</b>	Limit
47 CFR, Part 15, Subpart C	§15.247 (d)	5725 MHz to 5825 MHz	30 dB below the maximum
Feb 2016	*		in- band average PSD level

#### 5.3.5.3 TEST SETUP

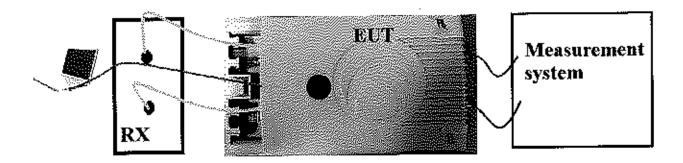


Figure 68: Typical test setup for Conducted Test setup

#### 5.3.5.4 TEST PROCEDURE

The Conducted test was performed using the Spectrum analyzer. Measurements were done as per Section II G3 (d) of KDB ""789033 D2 General II-NII Test Procedures New Rule V01r01". The RF output of the EUT was connected to the input port of Spectrum analyzer using an attenuator. Captured the data from spectrum analyzer and compared with the limits specified in the standard.

Report Number: DBN 1684TEL539-D	EMC TEST REPORT	Page 61 of 217





#### 5,3,5,5 MEASUREMENT GRAPHS / DATA

### 5.3.5.5.1 40 MHz MODULATION BANDWIDTH FOR 17 dBi POWER SETTINGS LOW CHANNEL\_5750 MHz

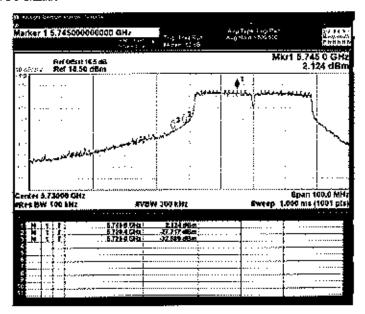


Figure 69: Band edge measured at Ch. 0-Average detector

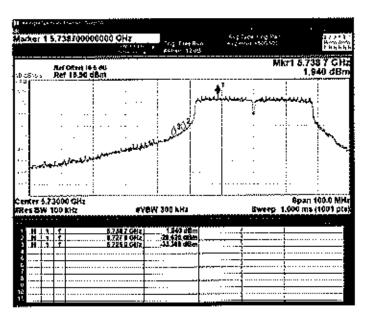


Figure 70: Band edge measured at Ch. 1-Average detector





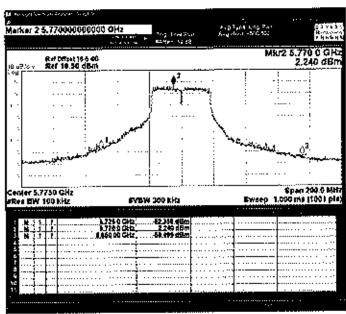


Figure 71: Band edge measured at Ch. 0-Average detector

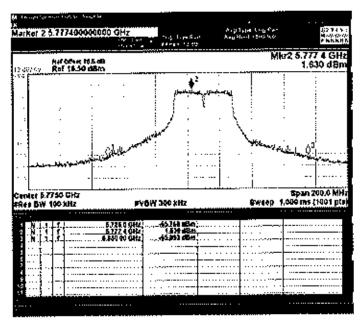


Figure 72: Band edge measured at Ch. 1-Average detector





#### HIGH CHANNEL\_5775 MHz

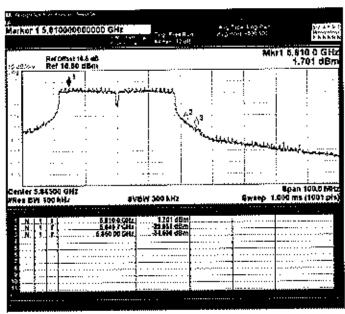


Figure 73: Band edge measured at Ch. 0-Average detector

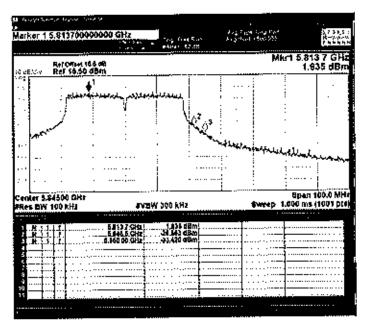


Figure 74: Band edge measured at Ch. 1-Average detector





### 5.3.5.5.2 40 MHz MODULATION BANDWIDTH 6 dBi ANTENNA CONDITION LOW CHANNEL\_5750 MHz

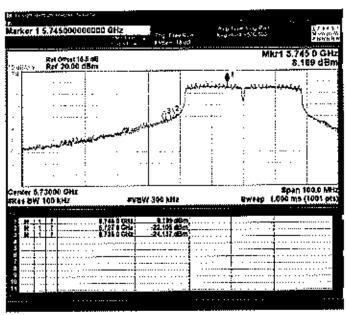


Figure 75: Hand edge measured at Ch. 0-Average detector

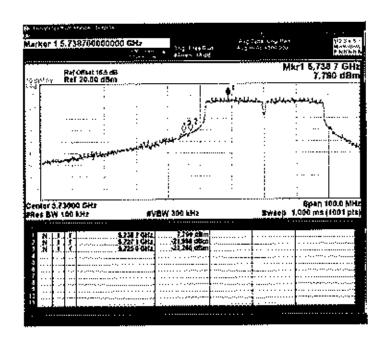


Figure 76: Band edge measured at Ch. 1-Average detector





#### MID CHANNEL\_5775 MIIZ

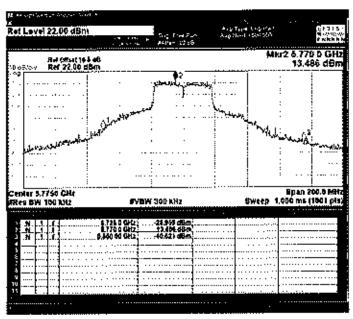


Figure 77: Band edge measured at Ch. 0-Average detector

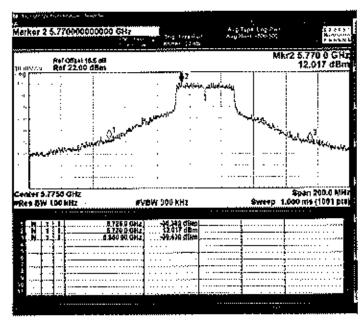


Figure 78: Band edge measured at Ch. 1-Average detector





#### HIGH CHANNEL\_5775 MHz

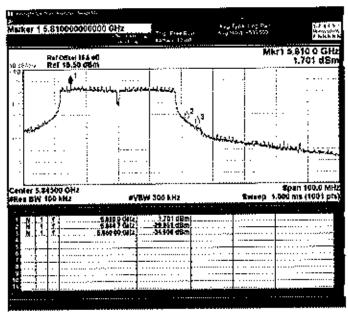


Figure 79: Band edge measured at Ch. 0-Average detector

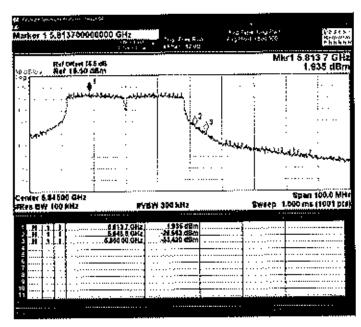


Figure 80: Band edge measured at Ch. 1-Average detector





## 5.3.5.5.3 5 MHz MODULATION BANDWIDTH 17 dBi ANTENNA CONDITION LOW CHANNEL\_5735 MHz

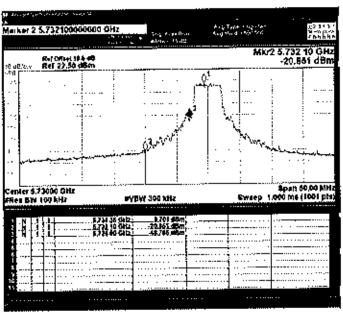


Figure 81: Band edge measured at Ch. 0-Average detector

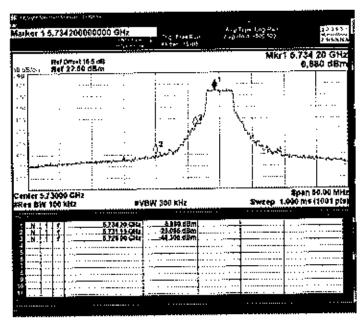


Figure 82: Band edge measured at Ch. 1-Average detector



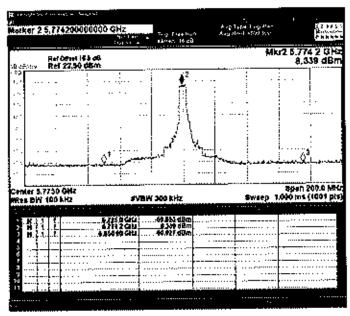


Figure 83: Band edge measured at Ch. 0-Average detector

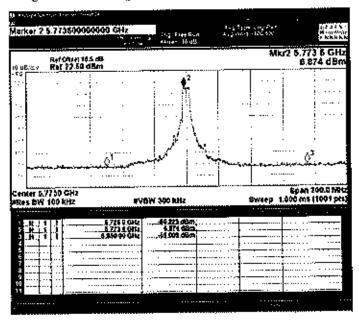


Figure 84: Band edge measured at Ch. 1-Average detector





#### HIGH CHANNEL\_5840 MHz

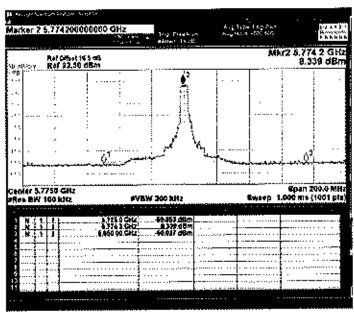


Figure 85: Band edge measured at Ch. 0-Average detector

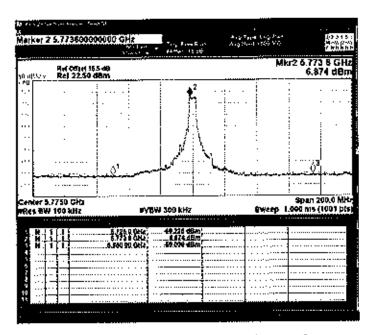


Figure 86: Band edge measured at Ch. I-Average detector





# 5.3.5.5.4 5 MHz MODULATION BANDWIDTH 6 dBi ANTENNA CONDITION LOW CHANNEL\_5735 MHz

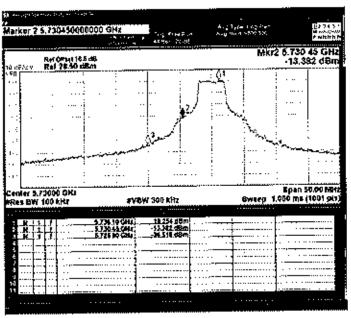


Figure 87: Band edge measured at Ch. 0 Average detector

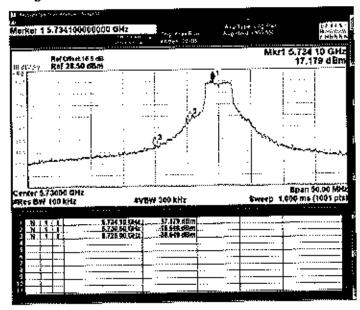
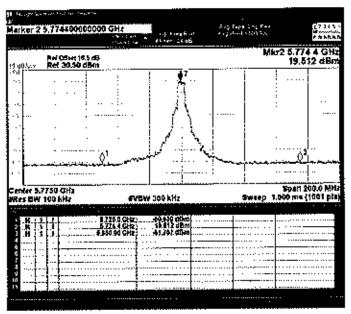


Figure 58: Band edge measured at Ch. 1-Average defector







filgure 89: Band edge measured at Ch. 0-Average detector

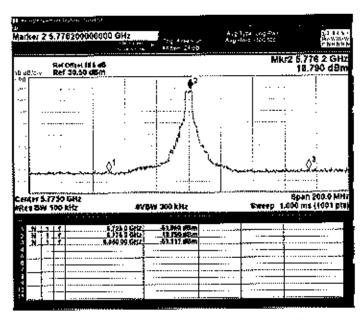


Figure 90: Band edge measured at Ch. 1-Average detector





### HIGH CHANNEL\_5840 MHz

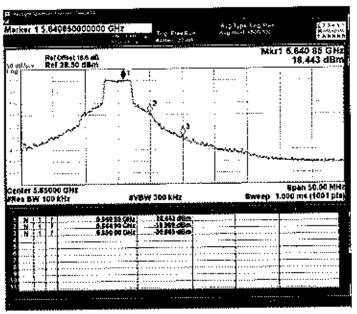


Figure 91: Band edge measured at Ch. 0-Average detector

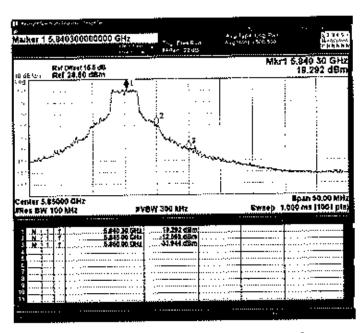


Figure 92: Band edge measured at Ch. 1-Average detector

### 5.3.5.6 RESULT

Emission is below -30 dBc from the carrier in all channels for both 40 MHz & 5 MHz Modulation Bandwidths.

Report Number: DBN 1604TEL539-D	EMC TEST REPORT	Page 73 of 217





# 5.3.6 RADIO FREQUENCY POWER IN ANY 100 KHZ BANDWIDTH OUTSIDE THE INTENTIONAL BAND

### 5.3.6.1 TEST SPECIFICATION

Test Standard	47 CFR, Part 15, Subpart C Feb 2016
Test Procedure	ANSI C63,4-2014
Frequency Range	150 kHz to 40 GHz
Resolution Bandwidth	100 kHz
Video Bandwldth	300 kHz
Sweep Time	Auto
Attenuation	Auto
Test Mode	Conducted
Detector	Pcak
Input Voltage	120 V AC
Input Frequency	60 Hz
Temperature	21.0 °C
Humidity	51.0 %
Tested By	Nishanth
Test Date	25 <sup>th</sup> Jan 2016

#### 5.3.6.2 LIMITS

Standard	Reference section	Frequency range	Limit
47 CFR, Part 15, Subpart C	§15.247 (d)	5725 MHz to 5825 MHz	-30 dBc in any 100 kHz
Feb 2016			band outside the Intentional
	j		band

### **5.3.6.3 TEST SETUP**

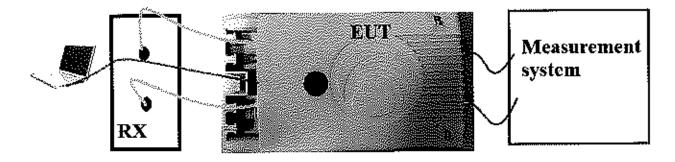


Figure 93: Typical test setup for Conducted Test setup

### 5.3.6.4 TEST PROCEDURE

The Conducted test was performed using the Spectrum analyzer. Measurements were done as per Section 11,3 of 789033 D02 General UNII Test Procedures New Rules v01r01°. The RF output of the EUT was connected to the input port of Spectrum analyzer using an attenuator. Captured the data from spectrum analyzer and compared with the limits specified in the standard

	· · · · · · · · · · · · · · · · · · ·	
Report Number: DBN 1604TEL539-D	EMC TEST REPORT	Page 74 of 217





## 5.3.6.5 MEASUREMENT GRAPHS / DATA

# 5.3.6.5.1 40 MHz MODULATION BANDWIDTH FOR 17 DB1 POWER SETTINGS

### LOW CHANNEL\_5750 MIIz

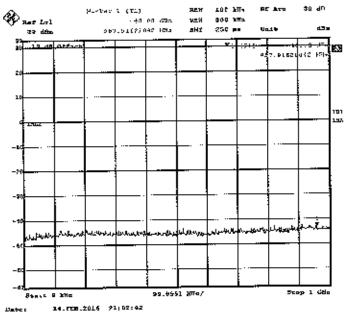


Figure 94: Spurious emission 9 KHz to 1 GHz measured at Ch. 0

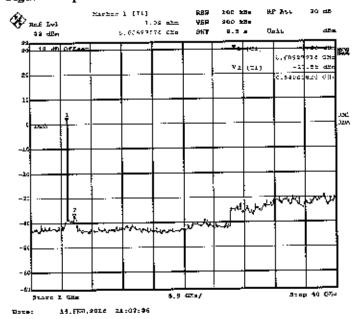


Figure 95: Spurious emission 1 GHz to 40 GHz measured at Ch. 0



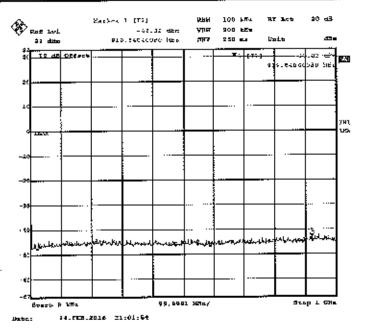


Figure 96: Spurious emission 9 KHz to 1 GHz measured at Ch. 1

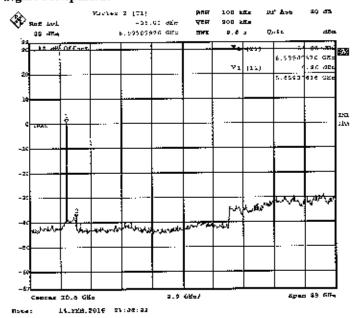


Figure 97 Spurious emission 1 GHz to 40 GHz measured at Ch. 1



## MID CHANNEL\_5775 MHz

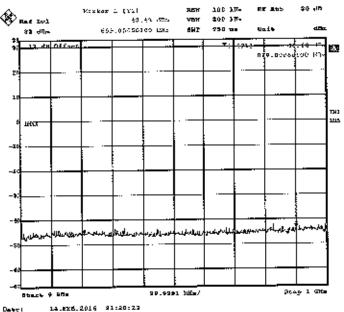


Figure 98: Spurious emission 9 KHz to 1 GHz measured at Ch. 0

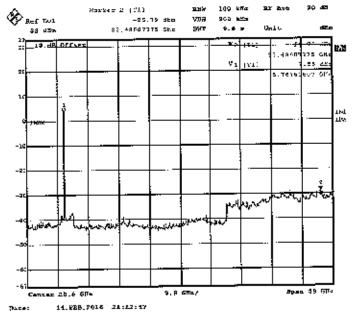


Figure 99; Spurious emission 1 GHz to 40 GHz measured at Ch. 0



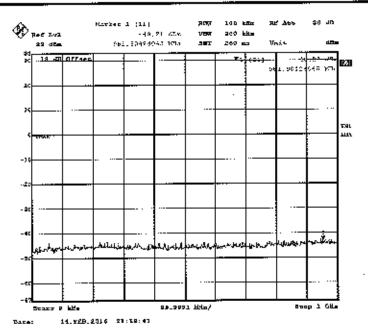


Figure 100 Spurious emission 9 KHz to 1 GHz measured at Ch. 1

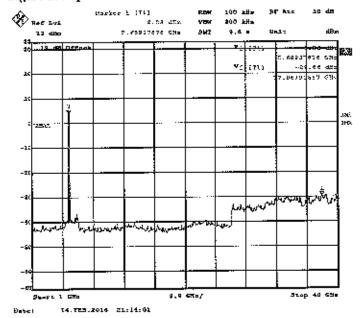


Figure 101: Spurious emission 1 GHz to 40 GHz measured at Ch. 1  $\,$ 



## HIGH CHANNEL\_5825 MHz

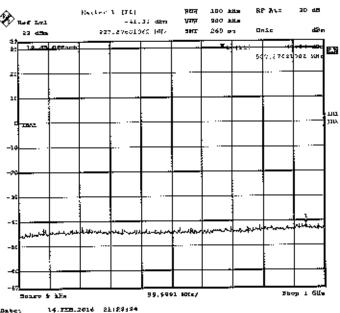


Figure 102: Spurious contaston 9 KHz to 1 GHz measured at Ch. 0

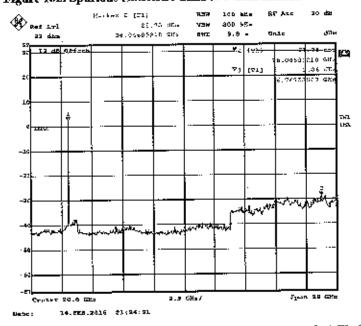


Figure 103:Spurtous emission 1 GHz to 40 GHz measured at Ch. 0



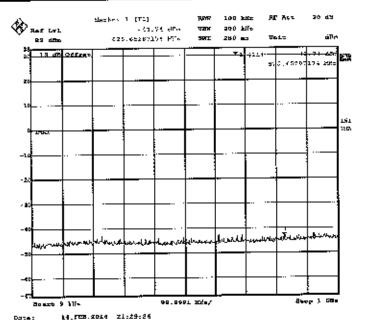


Figure 104: Spurious emission 9 KHz to 1 GHz measured at Ch. 1

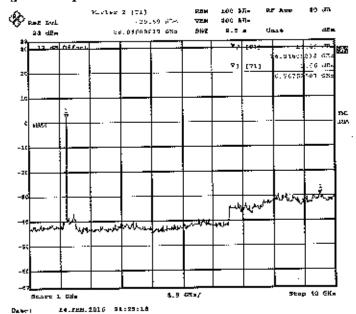


Figure 105: Spurious emission 1 GHz to 40 GHz measured at Ch. 1





# 5.3.6.5.2 40 MHz MODULATION BANDWIDTH FOR 6 pB1 POWER SETTINGS LOW CHANNEL\_5750 MHz

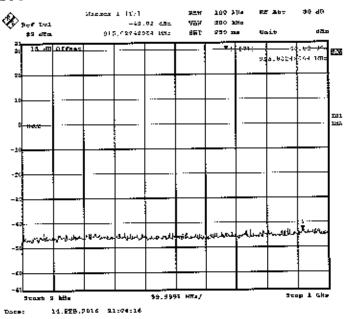


Figure 106: Spurious emission 9 KHz to 1 GHz measured at Ch. 0

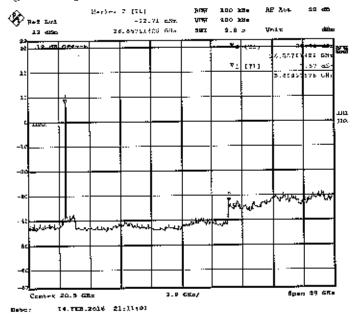


Figure 107: Spurious emission 1 GHz to 40 GHz measured at Ch. 0



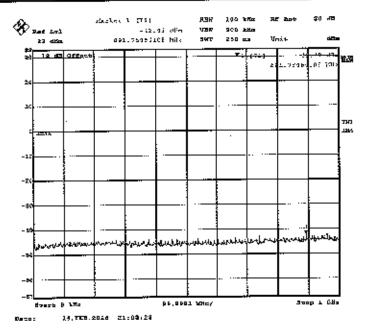


Figure 108 Spurious emission 9 KHz to 1 GHz measured at Ch. 1

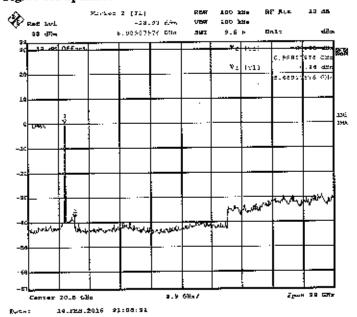


Figure 109 Spurious emission 1 GHz to 40 GHz measured at Ch. 1



### MID CHANNEL\_5775 MHz

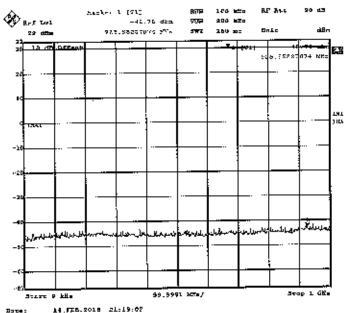


Figure 110: Spurious emission 9 kHz to 1 GHz measured at Ch. 0

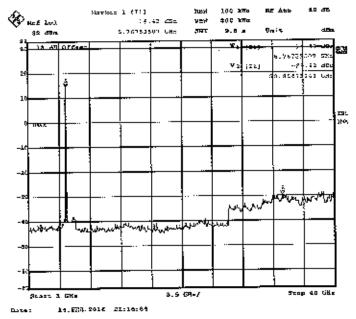


Figure 111: Spurious emission 1 GHz to 40 GHz measured at Ch. 0



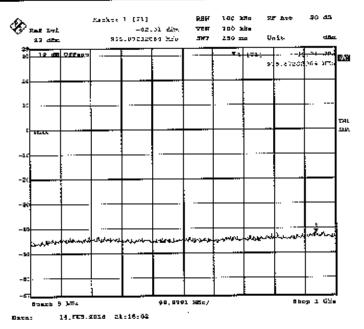


Figure 112 : Spurious emission 9 kHz to 1 GHz measured at Ch. 1

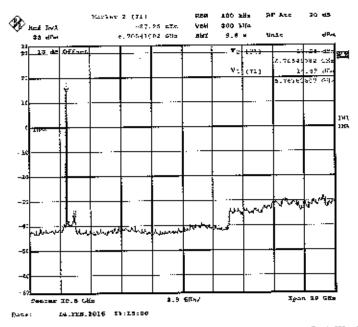


Figure 113: Sparious emission 1 GHz to 40 GHz measured at Ch. 1





### HIGH CHANNEL\_5825 MIIZ

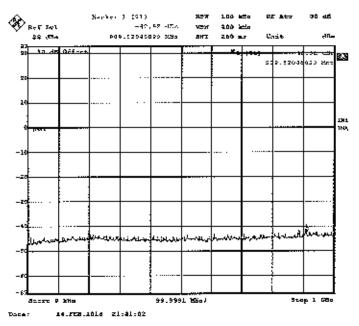


Figure 114 Spurious emission 9 kHz to 1 GHz measured at Ch. 0

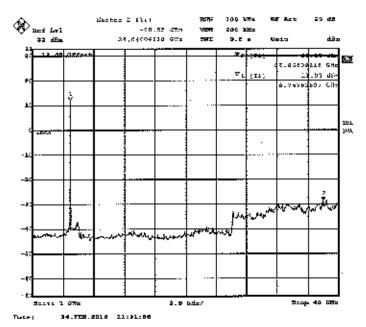


Figure 115: Spurious emission 1 GHz to 40 GHz measured at Ch. 0



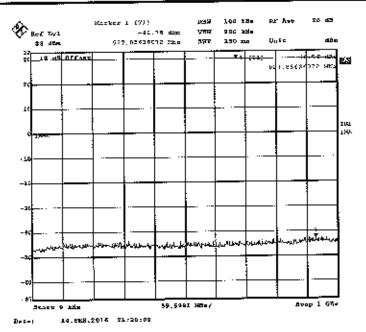


Figure 116 Spurious emission 9 kHz to 1 GHz measured at Ch. 1

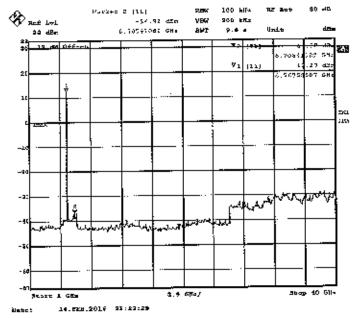


Figure 117: Sparious emission 1 GHz to 40 GHz measured at Ch. 1





# 5.3.6.5.3 5 MHz MODULATION BANDWIDTH FOR 17 DB1 POWER SETTINGS LOW CHANNEL\_5735 MHz

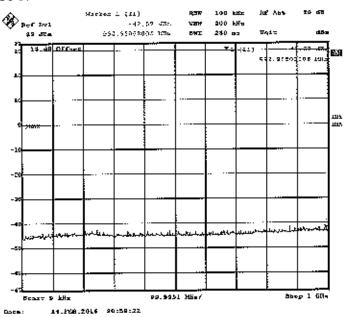


Figure 118 Spurious emission 9 kHz to 1 GHz measured at Ch. 0

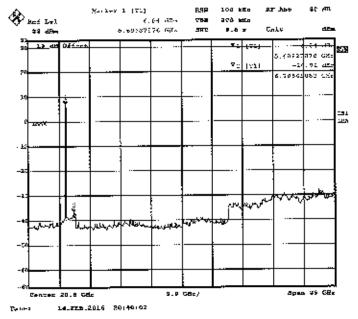


Figure 119: Spartous emission 1 GHz to 40 GHz measured at Ch. 0



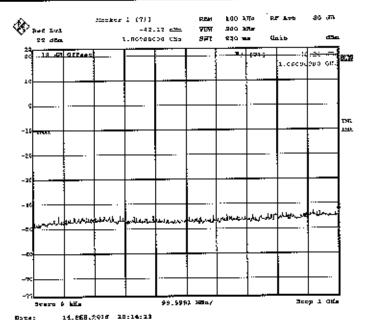


Figure 120; Spurious emission 9 kHz to 1 GHz measured at Ch. 1

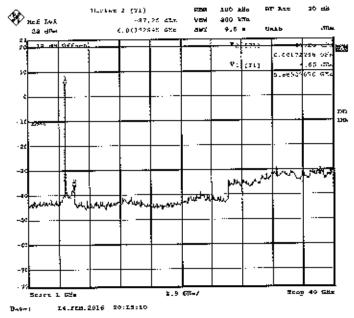


Figure 121: Spurious emission 1 GHz to 40 GHz measured at Ch. 1





### MID CHANNEL\_5775 MHZ

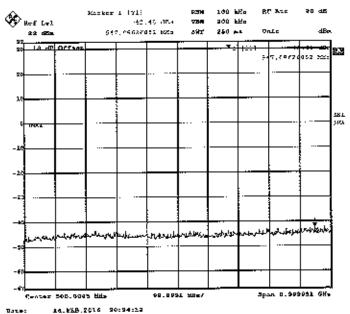


Figure 122 Spurious emission 9 kHz to 1 GHz measured at Ch. 9

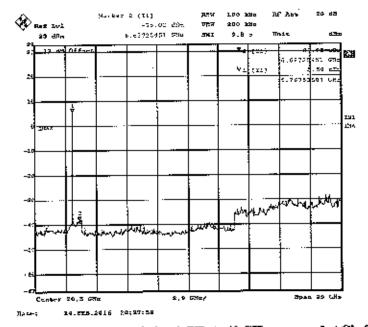


Figure 123: Spurious emission 1 GHz to 40 GHz measured at Ch. 0



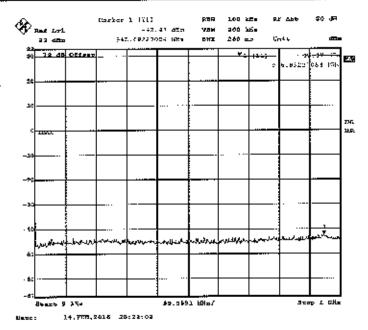


Figure 124 Spurious emission 9 kHz to 1 GHz measured at Ch. 1

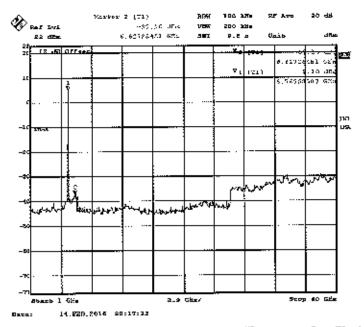


Figure 125: Spurious omission 1 GHz to 40 GHz measured at Ch. 1





## HIGH CHANNEL\_5840 MHz

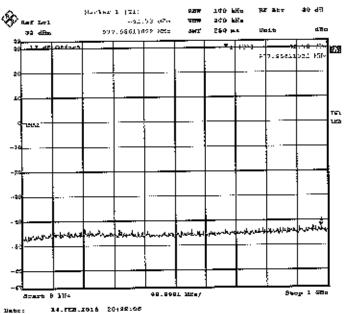


Figure 126 Spurious emission 9 kHz to 1 GHz measured at Ch. 0

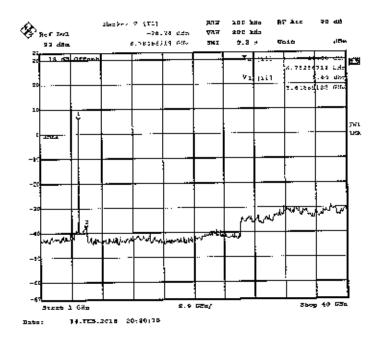


Figure 127: Spurious emission 1 GHz to 40 GHz measured at Ch. 0



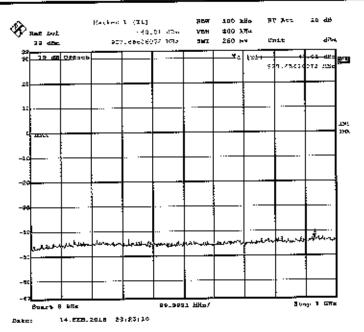


Figure 128 Spurious emission 9 kHz to 1 GHz measured at Ch. I

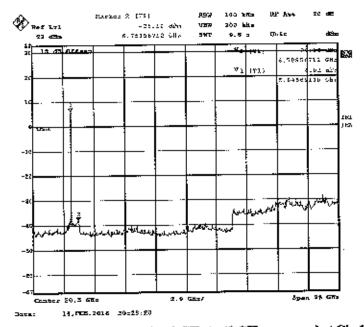


Figure 129: Spurious emission 1 GHz to 40 GHz measured at Ch. 1





# 5.3.6.5.4 5 MHz MODULATION BANDWIDTH FOR 6 pB1 POWER SETTINGS LOW CHANNEL\_5735 MHz

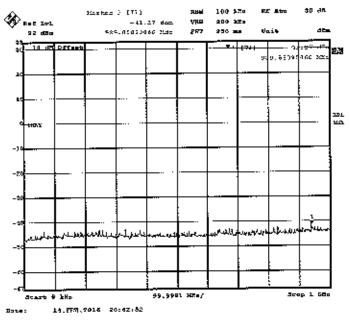


Figure 130 Spurious emission 9 kHz to 1 GHz measured at Ch. 0

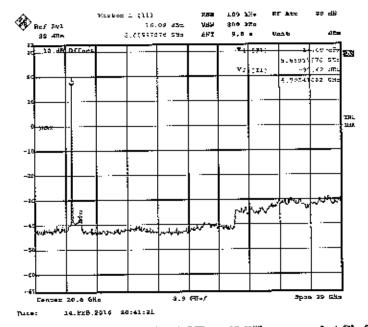


Figure 131: Spurious emission 1 GHz to 40 GHz measured at Ch. 0





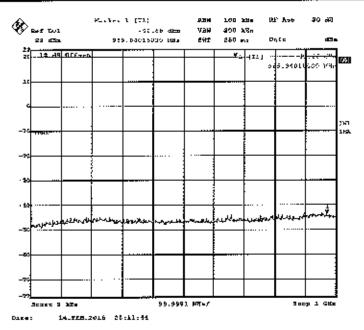


Figure 132 Spurious emission 9 kHz to 1 GHz measured at Ch. 1

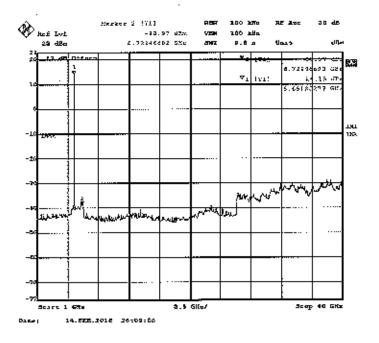


Figure \$33: Spurious emission 1 GHz to 40 GHz measured at Ch. 1





### MID CHANNEL\_5775 MHz

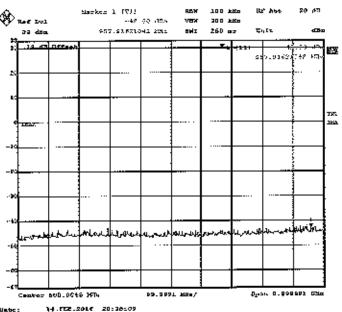


Figure 134 Spurious emission 9 kHz to 1 GHz measured at Ch. 0  $\,$ 

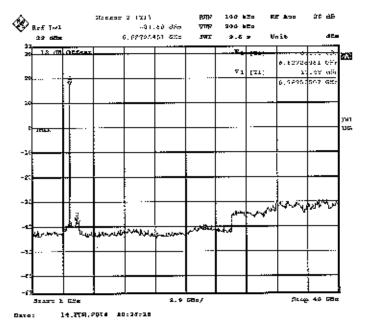


Figure 135: Spurious emission 1 GHz to 40 GHz measured at Ch. 0



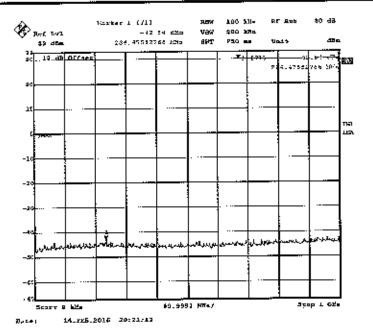


Figure 136 Spurious emission 9 kHz to 1 GHz measured at Ch. 1

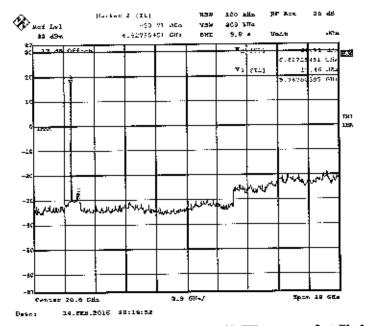


Figure 137: Spurious emission 1 GHz to 40 GHz measured at Ch. 1





## HIGH CHANNEL\_5840 MHz

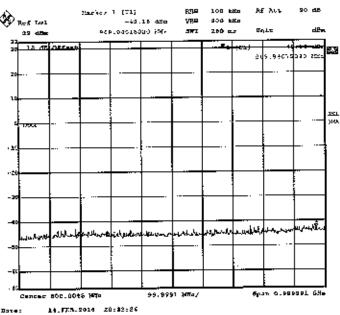


Figure 138 Spurious emission 9 kHz to 1 GHz measured at Ch. 0

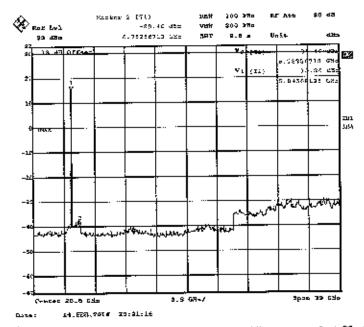


Figure 139: Spurious emission 1 GHz to 40 GHz mensured at Ch. 0



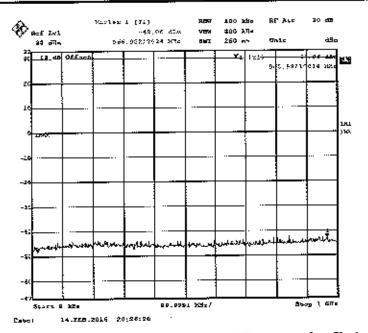


Figure 140 Spurious emission 9 kHz to 1 GHz measured at Ch. 1

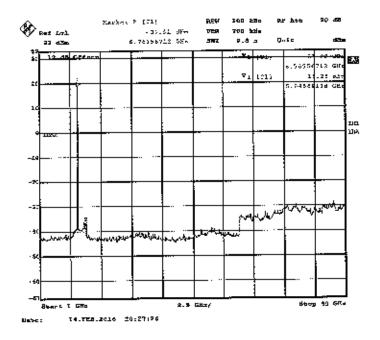


Figure 141: Spurious emission 1 GHz to 40 GHz measured at Ch. 1

#### 5,3.6.6 RESULT

Emission is below -30 dBc from the carrier in all channels for both 40 MHz & 5 MHz Modulation Bandwidths.

	<del></del>	
Report Number: DBN 1604TEL539-D	EMC TEST REPORT	Page 98 of 217





# 5.3.7 TRANSMITTER UNWANTED EMISSIONS (CONDUCTED)

### 5.3.7.1 TEST SPECIFICATION

Test Standard	47 CFR, Part 15 Feb 2016			
Test Procedure	ANSI C63.10-2013			
Frequency Range	9 kHz - 150 kHz	150 kHz -30 MHz	30 MHz-1 GHz	1 GHz - 40 GHz
Resolution Bandwidth	200 IIz	9 kHz	120 kHz	1 MRz
Video Bandwidth	1 kHz	30 kHz	300 kHz	3 MIIz
Sweep Time	Auto	Auto	Auto	Auto
Detector	Peak	Peak	Peak	Peak & Average
Attenuation	Auto			
Test Mode	Conducted			
Input Voltage	120 V AC			
Input Frequency	60 Hz			
Temperature	22,0 ℃			
Humidity	56.0 %			
Tested By	Nishanth /Suresh GN			
Test Date	14 <sup>th</sup> Feb 2016			

### 5.3.7.2 LIMITS

Standard	Reference section	<b>Frequency ганде</b>	Limit (dBµV/m)
47 CFR, Part 15	§15,407 b (3)	Within 5715-5725 MHz & 5850-5860 MHz	89,99
Feb 2016	§15.407 b (6)	Ontside 5715-5860 MHz	79.99

Table 11: Unwanted emission Jamit

Standard	Reference section	Frequency range	Limit (dBµV/m)
47 CFR, Part 15	§15.209	9 kHz to 490 kHz 490 kHz to 1.705 MHz	128.5194 to 93.8003* 73.8003 to 62.9697*
Feb 2016	İ	1.705 MHz to 30 MHz	69.5429

Table 12: General Field strength limit below 30MHz

Note: \* Decreases with the logarithm of the frequency

Standard	Reference section	<b>Frequency</b> range	Limit (dBµV/m) as per Section 15.209
47 CFR, Part 15 Feb 2016	§15.209	30 MHz to 88 MHz 88 MHz to 216 MHz 216 MHz to 960 MHz 960 MHz to 40 GHz	39.54 43.52 46.02 53.98

Tuble 13: General Field strength limit above 30MHz

Above table specifies limit with Average detector above IGHz. 73.98dBµV/m is considered as the limit when Peak detector is employed for the measurements above IGHz.

Report Number: DBN 1604TEL539-D	EMC TEST REPORT	Page 99 of 217





#### 5.3.7.3 TEST SETUP

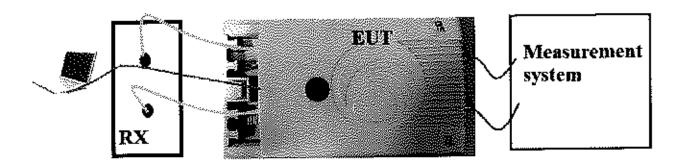


Figure 142 'Typical test setup for Conducted Test

### 5.3.7.4 TEST PROCEDURE

The Conducted test was performed using the Spectrum analyzer/EMI receiver. Measurements were done as per Section II G.0 of KDB "789033 DO2 General UNII Test Procedure New Rules v01r01". The RF output of the EUT was connected to the input port of Spectrum analyzer/EMI receiver using an attenuator. The graph and data captured from spectrum analyzer and performed required calculations to attain the Electric Field value and compared with the limits specified in the standard.

In the frequency range 9 kHz to 1 GHz, the measurement was performed with peak detector. In the frequency range 1 GHz to 40 GHz, measurement was performed employing both peak & average detector as specified in the standard. Detectors were selected based on FCC KDB document.

Peak search option was used to capture the frequency with maximum amplitude in the respective bands and final calculations have been performed on these frequencies to show compliance with the limits specified.





### 5.3.7.5 MEASUREMENT GRAPHS / DATA

# 5.3.7.5.1 40 MHz MODULATION BANDWIDTH FOR 17 dBi POWER SETTINGS LOW CHANNEL\_5750 MHz

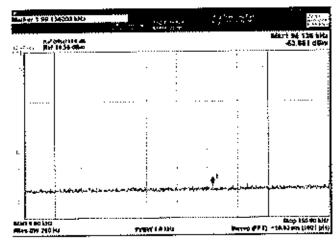
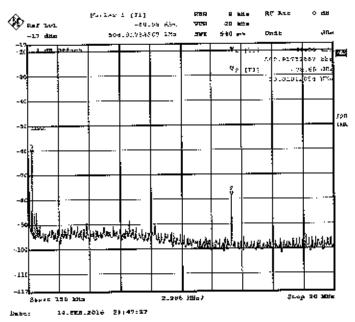


Figure 143 Emission measured with Peak Detector from 9 kHz to 150 kHz at Ch. 0



jügure 144 Emission measured with Peak Detector from 150 kHz to 30 MHz at Cb. 0



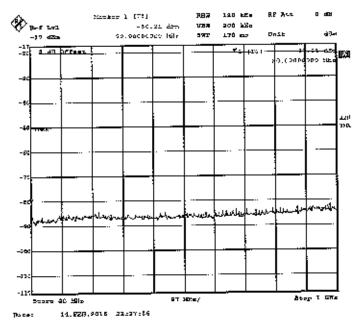


Figure 145 Emission measured with Peak Detector from 30 MHz to 1 GHz at Ch. 0  $\,$ 

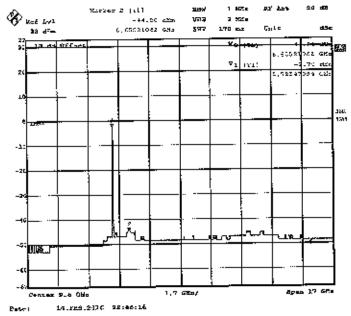


Figure 146 Emission measured with Average Detector from 1 GHz to 18 GHz at Ch. 0



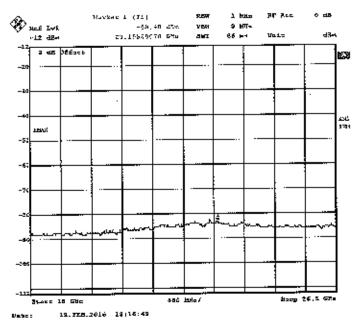


Figure 147 Emission measured with Average Detector from 18 GHz to 26.5 GHz at Ch. 0

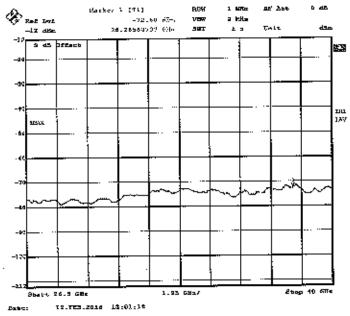


Figure 148 Emission measured with Average Detector from 26.5 GHz to 40 GHz at Ch. 0  $\,$ 



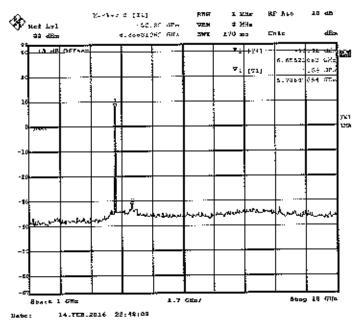


Figure 149 Emission measured with Peak Detector from 1 GHz to 18 GHz at Ch. 0

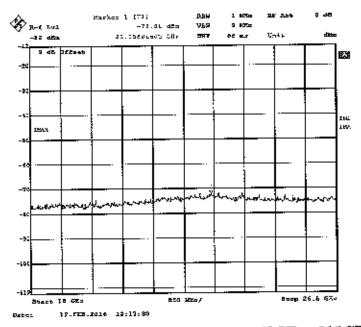


Figure 150 Emission measured with Peak Detector from 18 GHz to 26.5 GHz at Ch. 0



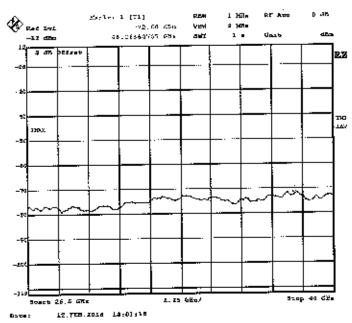


Figure 151 Emission measured with Peak Detector from 26.5 GHz to 40 GHz at Ch. 0

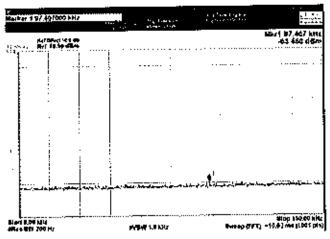


Figure 152 Emission measured with Peak Detector from 9 kHz to 150 kHz at Ch. 1



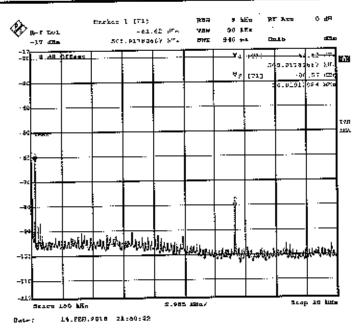


Figure 153 Emission measured with Peak Detector from 150 kHz to 30 MHz at Ch. 1

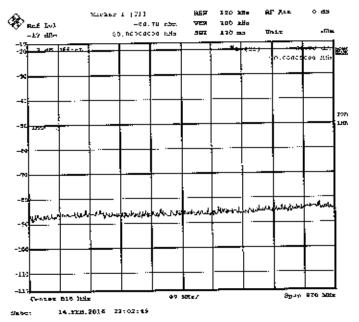


Figure 154 Emission measured with Peak Detector from 30 MHz to 1 GHz at Ch. 1  $\,$ 





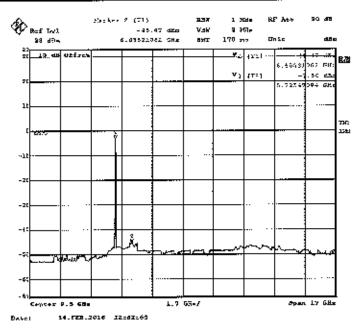


Figure 155 Emission measured with Average Detector from 1 GHz to 18 GHz at Ch. 1

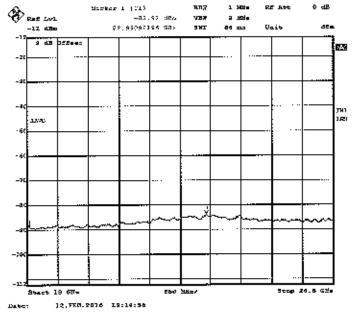


Figure 156 Emission measured with Average Detector from 18 GHz to 26.5 GHz at Ch. 1



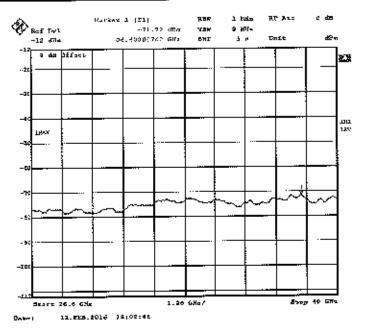


Figure 157 Emission measured with Average Detector from 26.5 GHz to 40 GHz at Ch. 1

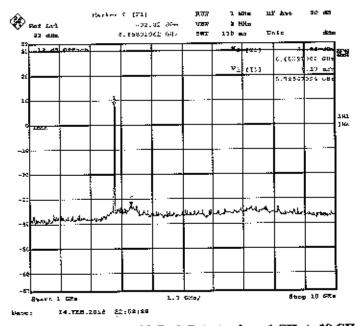


Figure 158 Emission measured with Peak Detector from 1 GHz to 18 GHz at Cl., 1



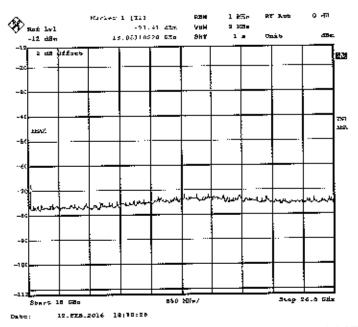


Figure 159 Emission measured with Peak Detector from 18 GHz to 26.5 GHz at Ch. 1

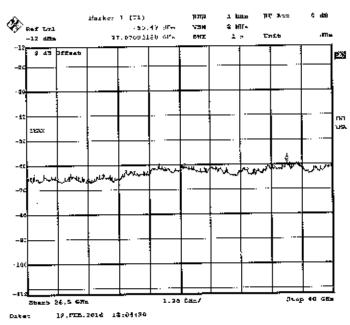


Figure 160 Emission measured with Peak Detector from 26.5 GHz to 40 GHz at Ch. 1