



TEST REPORT

Report Number. : 14093500-E8V2

Applicant : SONOS INC.
614 CHAPALA ST.
SANTA BARBARA, CA, 93101, U.S.A.

Model : S41

Brand : SONOS

FCC ID : SBVRM041

IC : 5373A-RM041

EUT Description : 802.11 a/b/g/n/ac/ax 2x2 Client Device with BT and BLE

Test Standard(s) : FCC 47 CFR PART 15 SUBPART E
ISED RSS-248 ISSUE 1
ISED RSS-GEN ISSUE 5 + A1 +A2

Date Of Issue:

2022-10-24

Prepared by:

UL Verification Services Inc.
47173 Benicia Street
Fremont, CA 94538 U.S.A.
TEL: (510) 319-4000
FAX: (510) 661-0888



REPORT REVISION HISTORY

Rev.	Issue Date	Revisions	Revised By
V1	2022-10-13	Initial Issue	---
V2	2022-10-24	Updated Section 9	K.Kedida

TABLE OF CONTENTS

REPORT REVISION HISTORY	2
TABLE OF CONTENTS	3
1. ATTESTATION OF TEST RESULTS	12
2. TEST RESULT SUMMARY	14
3. TEST METHODOLOGY	15
4. FACILITIES AND ACCREDITATION	16
5. DECISION RULES AND MEASUREMENT UNCERTAINTY	17
5.1. <i>METROLOGICAL TRACEABILITY</i>	<i>17</i>
5.2. <i>DECISION RULES.....</i>	<i>17</i>
5.3. <i>MEASUREMENT UNCERTAINTY.....</i>	<i>17</i>
6. EQUIPMENT UNDER TEST	18
6.1. <i>EUT DESCRIPTION</i>	<i>18</i>
6.2. <i>EUT DEVICE CLASS.....</i>	<i>18</i>
6.3. <i>MAXIMUM OUTPUT POWER.....</i>	<i>19</i>
UNII-5 BAND 802.11 ax MODE 2TX.....	19
UNII-6 BAND 802.11 ax MODE 2TX.....	19
UNII-7 BAND 802.11 ax MODE 2TX.....	20
UNII-8 BAND 802.11 ax MODE 2TX.....	20
6.4. <i>DESCRIPTION OF AVAILABLE ANTENNAS</i>	<i>21</i>
6.5. <i>SOFTWARE AND FIRMWARE.....</i>	<i>21</i>
6.6. <i>WORST-CASE CONFIGURATION AND MODE.....</i>	<i>22</i>
6.7. <i>DESCRIPTION OF TEST SETUP.....</i>	<i>23</i>
TEST SETUP.....	23
SETUP DIAGRAM	24
7. MEASUREMENT METHOD.....	25
8. TEST AND MEASUREMENT EQUIPMENT	26
9. ANTENNA PORT TEST RESULTS	27
9.1. <i>ON TIME AND DUTY CYCLE.....</i>	<i>27</i>
9.2. <i>26 dB BANDWIDTH.....</i>	<i>30</i>
9.2.1. 802.11ax HE20 MODE 2TX IN THE UNII-5 BAND	31
2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 242-Tones, RU Index 61	31

9.2.2. 802.11ax HE40 MODE 2TX IN THE UNII-5 BAND33
2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 484-Tones, RU Index 65 33

9.2.3. 802.11ax HE80 MODE 2TX IN THE UNII-5 BAND35
2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 996-Tones, RU Index 67 35

9.2.4. 802.11ax HE20 MODE 2TX IN THE UNII-6 BAND37
2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 242-Tones, RU Index 61 37

9.2.5. 802.11ax HE40 MODE 2TX IN THE UNII-6 BAND39
2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 484-Tones, RU Index 65 39

9.2.6. 802.11ax HE80 MODE 2TX IN THE UNII-6 BAND41
2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 996-Tones, RU Index 67 41

9.2.7. 802.11ax HE20 MODE 2TX IN THE UNII-7 BAND42
2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 242-Tones, RU Index 61 42

9.2.8. 802.11ax HE40 MODE 2TX IN THE UNII-7 BAND44
2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 484-Tones, RU Index 65 44

9.2.9. 802.11ax HE80 MODE 2TX IN THE UNII-7 BAND46
2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 996-Tones, RU Index 67 46

9.2.10. 802.11ax HE20 MODE 2TX IN THE UNII-8 BAND48
2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 242-Tones, RU Index 61 48

9.2.11. 802.11ax HE40 MODE 2TX IN THE UNII-8 BAND50
2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 484-Tones, RU Index 65 50

9.2.12. 802.11ax HE80 MODE 2TX IN THE UNII-8 BAND52
2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 996-Tones, RU Index 67 52

9.3. 99% BANDWIDTH.....53

9.3.1. 802.11ax HE20 MODE 2TX IN THE UNII-5 BAND54
2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 242-Tones, RU Index 61 54

9.3.2. 802.11ax HE40 MODE 2TX IN THE UNII-5 BAND56
2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 484-Tones, RU Index 65 56

9.3.3. 802.11ax HE80 MODE 2TX IN THE UNII-5 BAND58
2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 996-Tones, RU Index 67 58

9.3.4. 802.11ax HE20 MODE 2TX IN THE UNII-6 BAND60
2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 242-Tones, RU Index 61 60

9.3.5. 802.11ax HE40 MODE 2TX IN THE UNII-6 BAND62
2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 484-Tones, RU Index 65 62

9.3.6. 802.11ax HE80 MODE 2TX IN THE UNII-6 BAND64
2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 996-Tones, RU Index 67 64

9.3.7. 802.11ax HE20 MODE 2TX IN THE UNII-7 BAND65
2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 242-Tones, RU Index 61 65

9.3.8. 802.11ax HE40 MODE 2TX IN THE UNII-7 BAND67
2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 484-Tones, RU Index 65 67

9.3.9. 802.11ax HE80 MODE 2TX IN THE UNII-7 BAND69

2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 996-Tones, RU Index 67 69

9.3.10. 802.11ax HE20 MODE 2TX IN THE UNII-8 BAND 71
2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 242-Tones, RU Index 61 71

9.3.11. 802.11ax HE40 MODE 2TX IN THE UNII-8 BAND 73
2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 484-Tones, RU Index 65 73

9.3.12. 802.11ax HE80 MODE 2TX IN THE UNII-8 BAND 75
2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 996-Tones, RU Index 67 75

9.4. OUTPUT POWER AND PSD 76

9.4.1. 802.11ax HE20 MODE 2TX IN THE UNII-5 BAND 77
2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 26-Tones, RU Index 0 77
2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 26-Tones, RU Index 4 78
2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 26-Tones, RU Index 8 79
2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 242-Tones, RU Index 61 80
2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: SU, Single User 82

9.4.2. 802.11ax HE40 MODE 2TX IN THE UNII-5 BAND 83
2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 26-Tones, RU Index 0 83
2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 26-Tones, RU Index 8 84
2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 26-Tones, RU Index 17 85
2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 484-Tones, RU Index 65 86
2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: SU, Single User 88

9.4.3. 802.11ax HE80 MODE 2TX IN THE UNII-5 BAND 89
2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 26-Tones, RU Index 0 89
2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 26-Tones, RU Index 18 90
2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 26-Tones, RU Index 36 91
2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 996-Tones, RU Index 67 92
2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: SU, Single User 94

9.4.4. 802.11ax HE20 MODE 2TX IN THE UNII-6 BAND 95
2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 26-Tones, RU Index 0 95
2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 26-Tones, RU Index 4 96
2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 26-Tones, RU Index 8 97
2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 242-Tones, RU Index 61 98
2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: SU, Single User 100

9.4.5. 802.11ax HE40 MODE 2TX IN THE UNII-6 BAND 101
2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 26-Tones, RU Index 0 101
2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 26-Tones, RU Index 17 103
2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 484-Tones, RU Index 65 104

2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: SU, Single User 106

9.4.6. 802.11ax HE80 MODE 2TX IN THE UNII-6 BAND 107

2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 26-Tones, RU Index 0 107

2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 26-Tones, RU Index 18 108

2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 26-Tones, RU Index 36 109

2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 996-Tones, RU Index 67 110

2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: SU, Single User 111

9.4.7. 802.11ax HE20 MODE 2TX IN THE UNII-7 BAND 112

2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 26-Tones, RU Index 0 112

2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 26-Tones, RU Index 4 113

2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 26-Tones, RU Index 8 114

2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 242-Tones, RU Index 61 115

2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: SU, Single User 117

9.4.8. 802.11ax HE40 MODE 2TX IN THE UNII-7 BAND 118

2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 26-Tones, RU Index 0 118

2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 26-Tones, RU Index 8 119

2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 26-Tones, RU Index 17 120

2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 484-Tones, RU Index 65 121

2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: SU, Single User 123

9.4.9. 802.11ax HE80 MODE 2TX IN THE UNII-7 BAND 124

2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 26-Tones, RU Index 0 124

2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 26-Tones, RU Index 18 125

2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 26-Tones, RU Index 36 126

2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 996-Tones, RU Index 67 127

2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: SU, Single User 129

9.4.10. 802.11ax HE20 MODE 2TX IN THE UNII-8 BAND 130

2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 26-Tones, RU Index 0 130

2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 26-Tones, RU Index 4 131

2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 26-Tones, RU Index 8 132

2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 242-Tones, RU Index 61 133

2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: SU, Single User 135

9.4.11. 802.11ax HE40 MODE 2TX IN THE UNII-8 BAND 136

2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 26-Tones, RU Index 0 136

2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 26-Tones, RU Index 8 137

2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 26-Tones, RU Index 17 138

2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 484-Tones, RU Index 65 139

2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: SU, Single User 141

9.4.12. 802.11ax HE80 MODE 2TX IN THE UNII-8 BAND 142

2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 26-Tones, RU Index 0 142

2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 26-Tones, RU Index 18 143

2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 26-Tones, RU Index 36 144

2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 996-Tones, RU Index 67 145

2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: SU, Single User 146

9.5. SPURIOUS EMISSIONS IN-BAND – EMISSION MASK..... 147

9.5.1. 802.11ax HE20 MODE 2TX IN THE UNII-5 BAND 148

2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 26-Tones, RU Index 0 148

2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 26-Tones, RU Index 4 148

2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 26-Tones, RU Index 8 149

2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 242-Tones, RU Index 61 149

9.5.2. 802.11ax HE40 MODE 2TX IN THE UNII-5 BAND 151

2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 26-Tones, RU Index 0 151

2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 26-Tones, RU Index 8 151

2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 26-Tones, RU Index 17 152

2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 484-Tones, RU Index 65 152

9.5.3. 802.11ax HE80 MODE 2TX IN THE UNII-5 BAND 154

2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 26-Tones, RU Index 0 154

2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 26-Tones, RU Index 18 154

2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 26-Tones, RU Index 36 155

2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 996-Tones, RU Index 67 155

9.5.4. 802.11ax HE20 MODE 2TX IN THE UNII-6 BAND 157

2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 26-Tones, RU Index 0 157

2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 26-Tones, RU Index 4 157

2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 26-Tones, RU Index 8 158

2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 242-Tones, RU Index 61 158

9.5.5. 802.11ax HE40 MODE 2TX IN THE UNII-6 BAND 160

2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 26-Tones, RU Index 0 160

2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 26-Tones, RU Index 17 160

2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 484-Tones, RU Index 65 161

9.5.6. 802.11ax HE80 MODE 2TX IN THE UNII-6 BAND 163

2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 26-Tones, RU Index 0 163

2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 26-Tones, RU Index 18 163

2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 26-Tones, RU Index 36 164

2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 996-Tones, RU Index 67 165

9.5.7. 802.11ax HE20 MODE 2TX IN THE UNII-7 BAND 166

2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 26-Tones, RU Index 0 166

2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 26-Tones, RU Index 4 166

2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 26-Tones, RU Index 8 167

2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 242-Tones, RU Index 61 168

9.5.8. 802.11ax HE40 MODE 2TX IN THE UNII-7 BAND 170

2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 26-Tones, RU Index 0 170

2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 26-Tones, RU Index 8 170

2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 26-Tones, RU Index 17 171

2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 484-Tones, RU Index 65 172

9.5.9. 802.11ax HE80 MODE 2TX IN THE UNII-7 BAND 174

2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 26-Tones, RU Index 0 174

2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 26-Tones, RU Index 18 174

2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 26-Tones, RU Index 36 175

2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 996-Tones, RU Index 67 176

9.5.10. 802.11ax HE20 MODE 2TX IN THE UNII-8 BAND 178

2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 26-Tones, RU Index 0 178

2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 26-Tones, RU Index 4 178

2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 26-Tones, RU Index 8 179

2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 242-Tones, RU Index 61 179

9.5.11. 802.11ax HE40 MODE 2TX IN THE UNII-8 BAND 181

2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 26-Tones, RU Index 0 181

2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 26-Tones, RU Index 8 181

2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 26-Tones, RU Index 17 182

2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 484-Tones, RU Index 65 182

9.5.12. 802.11ax HE80 MODE 2TX IN THE UNII-8 BAND 184

2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 26-Tones, RU Index 0 184

2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 26-Tones, RU Index 18 184

2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 26-Tones, RU Index 36 185

2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 996-Tones, RU Index 67 186

10. RADIATED TEST RESULTS..... 187

10.1. TRANSMITTER OUTSIDE 5.925-7.125 GHz , 1- 18GHz 189

10.1.1. TX ABOVE 1 GHz 802.11ax HE20 MODE IN THE UNII-5 BAND 189

2TX Antenna 1 + Antenna 4 OFDMA MODE: 26-Tones, RU Index 0 189

2TX Antenna 1 + Antenna 4 OFDMA MODE: 26-Tones, RU Index 4 193

2TX Antenna 1 + Antenna 4 OFDMA MODE: 26-Tones, RU Index 8 195

2TX Antenna 1 + Antenna 4 OFDMA MODE: 242-Tones, RU Index 61 197

10.1.2. TX ABOVE 1 GHz 802.11ax HE40 MODE IN THE UNII-5 BAND205

2TX Antenna 1 + Antenna 4 OFDMA MODE: 26-Tones, RU Index 0 205

2TX Antenna 1 + Antenna 4 OFDMA MODE: 26-Tones, RU Index 8 209

2TX Antenna 1 + Antenna 4 OFDMA MODE: 26-Tones, RU Index 17 211

2TX Antenna 1 + Antenna 4 OFDMA MODE: 484-Tones, RU Index 65 213

10.1.3. TX ABOVE 1 GHz 802.11ax HE80 MODE IN THE UNII-5 BAND221

2TX Antenna 1 + Antenna 4 OFDMA MODE: 26-Tones, RU Index 0 221

2TX Antenna 1 + Antenna 4 OFDMA MODE: 26-Tones, RU Index 18 225

2TX Antenna 1 + Antenna 4 OFDMA MODE: 26-Tones, RU Index 36 227

2TX Antenna 1 + Antenna 4 OFDMA MODE: 996-Tones, RU Index 67 229

10.1.4. TX ABOVE 1 GHz 802.11ax HE20 MODE IN THE UNII-6 BAND237

2TX Antenna 1 + Antenna 4 OFDMA MODE: 26-Tones, RU Index 0 237

2TX Antenna 1 + Antenna 4 OFDMA MODE: 26-Tones, RU Index 4 239

2TX Antenna 1 + Antenna 4 OFDMA MODE: 26-Tones, RU Index 8 241

2TX Antenna 1 + Antenna 4 OFDMA MODE: 242-Tones, RU Index 61 243

10.1.5. TX ABOVE 1 GHz 802.11ax HE40 MODE IN THE UNII-6 BAND249

2TX Antenna 1 + Antenna 4 OFDMA MODE: 26-Tones, RU Index 0 249

2TX Antenna 1 + Antenna 4 OFDMA MODE: 26-Tones, RU Index 17 251

2TX Antenna 1 + Antenna 4 OFDMA MODE: 484-Tones, RU Index 65 255

10.1.6. TX ABOVE 1 GHz 802.11ax HE80 MODE IN THE UNII-6 BAND261

2TX Antenna 1 + Antenna 4 OFDMA MODE: 26-Tones, RU Index 0 261

2TX Antenna 1 + Antenna 4 OFDMA MODE: 26-Tones, RU Index 18 263

2TX Antenna 1 + Antenna 4 OFDMA MODE: 26-Tones, RU Index 36 265

2TX Antenna 1 + Antenna 4 OFDMA MODE: 996-Tones, RU Index 67 268

10.1.7. TX ABOVE 1 GHz 802.11ax HE20 MODE IN THE UNII-7 BAND272

2TX Antenna 1 + Antenna 4 OFDMA MODE: 26-Tones, RU Index 0 272

2TX Antenna 1 + Antenna 4 OFDMA MODE: 26-Tones, RU Index 4 274

2TX Antenna 1 + Antenna 4 OFDMA MODE: 26-Tones, RU Index 8 276

2TX Antenna 1 + Antenna 4 OFDMA MODE: 242-Tones, RU Index 61 280

10.1.8. TX ABOVE 1 GHz 802.11ax HE40 MODE IN THE UNII-7 BAND288

2TX Antenna 1 + Antenna 4 OFDMA MODE: 26-Tones, RU Index 0 288

2TX Antenna 1 + Antenna 4 OFDMA MODE: 26-Tones, RU Index 8 290

2TX Antenna 1 + Antenna 4 OFDMA MODE: 26-Tones, RU Index 17 292

2TX Antenna 1 + Antenna 4 OFDMA MODE: 484-Tones, RU Index 65 296

10.1.9. TX ABOVE 1 GHz 802.11ax HE80 MODE IN THE UNII-7 BAND304

2TX Antenna 1 + Antenna 4 OFDMA MODE: 26-Tones, RU Index 0 304

2TX Antenna 1 + Antenna 4 OFDMA MODE: 26-Tones, RU Index 18 306

2TX Antenna 1 + Antenna 4 OFDMA MODE: 26-Tones, RU Index 36 308

2TX Antenna 1 + Antenna 4 OFDMA MODE: 996-Tones, RU Index 67 312

10.1.10. TX ABOVE 1 GHz 802.11ax HE20 MODE IN THE UNII-8 BAND320

2TX Antenna 1 + Antenna 4 OFDMA MODE: 26-Tones, RU Index 0 320

2TX Antenna 1 + Antenna 4 OFDMA MODE: 26-Tones, RU Index 4 322

2TX Antenna 1 + Antenna 4 OFDMA MODE: 26-Tones, RU Index 8 324

2TX Antenna 1 + Antenna 4 OFDMA MODE: 242-Tones, RU Index 61 328

10.1.11. TX ABOVE 1 GHz 802.11ax HE40 MODE IN THE UNII-8 BAND336

2TX Antenna 1 + Antenna 4 OFDMA MODE: 26-Tones, RU Index 0 336

2TX Antenna 1 + Antenna 4 OFDMA MODE: 26-Tones, RU Index 8 338

2TX Antenna 1 + Antenna 4 OFDMA MODE: 26-Tones, RU Index 17 340

2TX Antenna 1 + Antenna 4 OFDMA MODE: 484-Tones, RU Index 65 344

10.1.12. TX ABOVE 1 GHz 802.11ax HE80 MODE IN THE UNII-8 BAND352

2TX Antenna 1 + Antenna 4 OFDMA MODE: 26-Tones, RU Index 0 352

2TX Antenna 1 + Antenna 4 OFDMA MODE: 26-Tones, RU Index 18 354

2TX Antenna 1 + Antenna 4 OFDMA MODE: 26-Tones, RU Index 36 356

2TX Antenna 1 + Antenna 4 OFDMA MODE: 996-Tones, RU Index 67 360

10.2. *WORST CASE BELOW 30MHz*366

10.3. *WORST CASE BELOW 1 GHz*367

10.4. *WORST CASE 18-26 GHz*369

10.5. *WORST CASE 26-40 GHz*371

11. AC POWER LINE CONDUCTED EMISSIONS373

LIMITS..... 373

TEST PROCEDURE..... 373

RESULTS..... 373

12. SETUP PHOTOS.....376

ANTENNA PORT AND AC LINE CONDUCTED SETUP 376

RADIATED RF MEASUREMENT SETUP 377

1. ATTESTATION OF TEST RESULTS

COMPANY NAME: SONOS INC.
614 Chapala St.
Santa Barbara, CA, 93101, U.S.A.

EUT DESCRIPTION: 802.11 a/b/g/n/ac/ax 2x2 Client Device with BT and BLE

MODEL: S41

BRAND: SONOS

SERIAL NUMBER: Radiated Sample: 528B4 and 6B90A
Conducted Sample: 4304F

DATE TESTED: 2022-4-21 to 2022-6-2022


APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 Part 15 Subpart E	Complies
ISED RSS-248 Issue 1	Complies
ISED RSS-GEN Issue 5 + A1 + A2	Complies

UL Verification Services Inc. tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. All samples tested were in good operating condition throughout the entire test program. Measurement Uncertainties are published for informational purposes only and were not taken into account unless noted otherwise.

This document may not be altered or revised in any way unless done so by UL Verification Services Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by A2LA, NIST, any agency of the Federal Government, or any agency of the U.S. government.

Approved & Released For
UL Verification Services Inc. By:



Francisco de Anda
Staff Engineer
Consumer Technology Division
UL Verification Services Inc.

Prepared By:



Glenn Escano
Senior Test Engineer
Consumer Technology Division
UL Verification Services Inc.

1st Reviewed By:



Vien Tran
Senior Laboratory Engineer
Consumer Technology Division
UL Verification Services Inc.

2nd Reviewed By:



Kiya Kedida
Senior Project Engineer
Consumer Technology Division
UL Verification Services Inc.

2. TEST RESULT SUMMARY

This report contains data provided by the customer which can impact the validity of results. UL Verification Services Inc. is only responsible for the validity of results after the integration of the data provided by the customer.

FCC Clause	ISED Clause	Requirement	Result	Comment
See Comment		Duty Cycle	Reporting purposes only	ANSI C63.10 Section 12.2 ...
See Comment	RSS-GEN 6.7	99% BW	Reporting purposes only	ANSI C63.10 Section 6.9.3
§15.407 (a) (10)	---	26dB BW	Compliant	None.
§15.407 (a) (8)	RSS-248 4.6.3	Output Power e.i.r.p.	Compliant	Indoor Client.
§15.407 (a) (8)	RSS-248 4.6.3	PSD e.i.r.p	Compliant	Indoor Client.
§15.407 (b) (6)	RSS-248 4.7.2(a)	Emissions outside 5.925-7.125 GHz band	Compliant	None
§15.407 (b) (7)	RSS-248 4.7.2(b)	Emissions within 5.925-7.125 GHz Band(Emissions Mask)	Compliant	None
§15.205	RSS-GEN 8.10	Unwanted emissions in restricted bands	Compliant	None
§15.209	RSS-GEN 8.9	Radiated Spurious Emissions	Compliant	None
§15.207	RSS-GEN 8.8	AC Mains Conducted Emissions	Compliant	None

3. TEST METHODOLOGY

The tests documented in this report were performed in accordance with:

- FCC CFR 47 Part 2
- FCC CFR 47 Part 15
- FCC KDB 662911 D01 v02r01
- FCC KDB 789033 D01 v01r03
- FCC KDB 789033 D02 v02r01
- FCC KDB 987594 D01 General Requirements v01r03
- FCC KDB 987594 D02 EMC Measurement v01r01
- ANSI C63.10-2013
- RSS-GEN Issue 5 + A1 + A2
- RSS-248 Issue 1

4. FACILITIES AND ACCREDITATION

UL Verification Services Inc. is accredited by A2LA, Certificate Number #0751.05, for all testing performed within the scope of this report. Testing was performed at the locations noted below.

	Address	ISED CABID	ISED Company Number	FCC Registration
<input checked="" type="checkbox"/>	Building 1: 47173 Benicia Street Fremont, CA 94538, U.S.A	US0104	2324A	550739
<input type="checkbox"/>	Building 2: 47266 Benicia Street Fremont, CA 94538, U.S.A	US0104	22541	550739
<input checked="" type="checkbox"/>	Building 4: 47658 Kato Rd Fremont, CA 94538, U.S.A	US0104	2324B	550739

5. DECISION RULES AND MEASUREMENT UNCERTAINTY

5.1. METROLOGICAL TRACEABILITY

All test and measuring equipment utilized to perform the tests documented in this report are calibrated on a regular basis, with a maximum time between calibrations of one year or the manufacturers' recommendation, whichever is less, and where applicable is traceable to recognized national standards.

5.2. DECISION RULES

The Decision Rule is based on Simple Acceptance in accordance with ISO Guide 98-4:2012 Clause 8.2. (Measurement uncertainty is not taken into account when stating conformity with a specified requirement.)

5.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	U _{Lab}
Worst Case Conducted Disturbance, 9KHz to 0.15 MHz	3.78 db
Worst Case Conducted Disturbance, 0.15 to 30 MHz	3.40 db
Worst Case Radiated Disturbance, 9KHz to 30 MHz	2.87 db
Worst Case Radiated Disturbance, 30 to 1000 MHz	6.01 db
Worst Case Radiated Disturbance, 1000 to 18000 MHz	4.73 db
Worst Case Radiated Disturbance, 18000 to 26000 MHz	4.51 db
Worst Case Radiated Disturbance, 26000 to 40000 MHz	5.29 db

Uncertainty figures are valid to a confidence level of 95%.

RADIATED EMISSIONS

Where relevant, the following sample calculation is provided:

Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)

$$36.5 \text{ dBuV} + 18.7 \text{ dB/m} + 0.6 \text{ dB} - 26.9 \text{ dB} = 28.9 \text{ dBuV/m}$$

MAINS CONDUCTED EMISSIONS

Where relevant, the following sample calculation is provided:

Final Voltage (dBuV) = Measured Voltage (dBuV) + Cable Loss (dB) + Limiter Factor (dB) + LISN Insertion Loss.

$$36.5 \text{ dBuV} + 0 \text{ dB} + 10.1 \text{ dB} + 0 \text{ dB} = 46.6 \text{ dBuV}$$

6. EQUIPMENT UNDER TEST

6.1. EUT DESCRIPTION

The EUT is an 802.11 a/b/g/n/ac/ax 2x2 Client Device with BT and BLE.

This report covers ax 6E Wifi radio.

6.2. EUT DEVICE CLASS

	U-NII Bands of Operation			
	5	6	7	8
Indoor Client (6XD)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

6.3. MAXIMUM OUTPUT POWER

The transmitter has a maximum average e.i.r.p. output power as follows:

UNII-5 BAND 802.11 ax MODE 2TX

Frequency Range (MHz)	Mode	e.i.r.p. Power (dBm)	Output Power (mW)
2TX CDD -UNII-5 band			
5955-6415	802.11ax HE20 SU	8.87	7.71
	802.11ax HE20 OFDMA, 242-Tones	9.87	9.71
	802.11ax HE20 OFDMA, 26-Tones	3.72	2.36
5965-6405	802.11ax HE40 SU	11.60	14.45
	802.11ax HE40 OFDMA, 484-Tones	12.71	18.66
	802.11ax HE40 OFDMA, 26-Tones	1.50	1.41
5985-6385	802.11ax HE80 SU	14.16	26.06
	802.11ax HE80 OFDMA, 996-Tones	16.46	44.26
	802.11ax HE80 OFDMA, 26-Tones	1.47	1.40

UNII-6 BAND 802.11 ax MODE 2TX

Frequency Range (MHz)	Mode	e.i.r.p. Power (dBm)	Output Power (mW)
2TX CDD -UNII-6 band			
6435-6515	802.11ax HE20 SU	7.86	6.11
	802.11ax HE20 OFDMA, 242-Tones	9.38	8.67
	802.11ax HE20 OFDMA, 26-Tones	3.79	2.39
6445-6485	802.11ax HE40 SU	9.27	8.45
	802.11ax HE40 OFDMA, 484-Tones	10.58	11.43
	802.11ax HE40 OFDMA, 26-Tones	1.85	1.53
6525 (Straddle)	802.11ax HE40 SU	8.91	7.78
	802.11ax HE40 OFDMA, 484-Tones	9.49	8.89
	802.11ax HE40 OFDMA, 26-Tones	2.38	1.73
6465	802.11ax HE80 SU	13.92	24.66
	802.11ax HE80 OFDMA, 996-Tones	15.10	32.36
	802.11ax HE80 OFDMA, 26-Tones	1.08	1.28
6545 (Straddle)	802.11ax HE80 SU	12.92	19.59
	802.11ax HE80 OFDMA, 996-Tones	13.94	24.77
	802.11ax HE80 OFDMA, 26-Tones	0.00	1.00

UNII-7 BAND 802.11 ax MODE 2TX

Frequency Range (MHz)	Mode	e.i.r.p. Power (dBm)	Output Power (mW)
2TX CDD -UNII-7 Band			
6535-6855	802.11ax HE20 SU	7.43	5.53
	802.11ax HE20 OFDMA, 242-Tones	8.20	6.61
	802.11ax HE20 OFDMA, 26-Tones	1.22	1.32
6875 (Straddle)	802.11ax HE20 SU	6.66	4.63
	802.11ax HE20 OFDMA, 242-Tones	7.63	5.79
	802.11ax HE20 OFDMA, 26-Tones	0.93	1.24
6525-6845	802.11ax HE40 SU	7.64	5.81
	802.11ax HE40 OFDMA, 484-Tones	8.53	7.13
	802.11ax HE40 OFDMA, 26-Tones	2.62	1.83
6885(Straddle)	802.11ax HE40 SU	7.59	5.74
	802.11ax HE40 OFDMA, 484-Tones	8.87	7.71
	802.11ax HE40 OFDMA, 26-Tones	5.15	3.27
6545-6785	802.11ax HE80 SU	12.85	19.28
	802.11ax HE80 OFDMA, 996-Tones	14.37	27.35
	802.11ax HE80 OFDMA, 26-Tones	2.79	1.90
6865 (Straddle)	802.11ax HE80 SU	12.18	16.52
	802.11ax HE80 OFDMA, 996-Tones	14.07	25.53
	802.11ax HE80 OFDMA, 26-Tones	0.37	1.09

UNII-8 BAND 802.11 ax MODE 2TX

Frequency Range (MHz)	Mode	e.i.r.p. Power (dBm)	Output Power (mW)
2TX CDD -UNII-8 Band			
6895-7115	802.11ax HE20 SU	9.84	9.64
	802.11ax HE20 OFDMA, 242-Tones	10.57	11.40
	802.11ax HE20 OFDMA, 26-Tones	0.87	1.22
6925-7085	802.11ax HE40 SU	9.60	9.12
	802.11ax HE40 OFDMA, 484-Tones	10.78	11.97
	802.11ax HE40 OFDMA, 26-Tones	0.15	1.04
6945-7025	802.11ax HE80 SU	13.70	23.44
	802.11ax HE80 OFDMA, 996-Tones	15.02	31.77
	802.11ax HE80 OFDMA, 26-Tones	0.33	1.08

6.4. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes a PCB antennas, with a maximum gain as follows.

Frequency Range (MHz)	Peak Antenna Gain (dBi)			
	CHAIN 0		CHAIN 1	
	ANT1 (FR) (Monopole) (dBi)	ANT2 (RL) (Loop) (dBi)	ANT3 (RR) (Loop) (dBi)	ANT4 (FL) (Loop) (dBi)
5925 – 6425	6.1	4.8	4.9	5.9
6425 – 6525	5.7	3.5	4.3	4.3
6525 – 6875	5.5	3.6	4.4	4.7
6875 – 7125	6.3	3.6	3.6	4.5

6.5. SOFTWARE AND FIRMWARE

The EUT firmware installed during testing was 69.1-26251-diag.

The test utility software used during testing was GUI 20220422_V4.

6.6. WORST-CASE CONFIGURATION AND MODE

Radiated emissions below 1GHz, above 18GHz, and power line conducted emission were performed with the EUT set to transmit at the channel with highest output power as worst-case scenario.

The EUT can only be setup in desktop orientation; therefore, all radiated testing was performed with the EUT in desktop orientation.

The fundamental of the EUT was investigated in the antenna combinations, it was determined that ANT1 and ANT4 was the worst case on all bands. Therefore, all final testing was performed with ANT1 and ANT4 as stated above.

Worst-case data rates as provided by the manufacturer were:

802.11ax HE20mode: MCS0

802.11ax HE40mode: MCS0

802.11ax HE80mode: MCS0

Preliminary Investigation were performed for 802.11ax modes were determined by the following:

- Testing was performed on 802.11ax HE20 26T (Lowest Tones) and 242T (Full Tone) to cover HE20 52T,106T.
- Testing was performed on 802.11ax HE40 26T (Lowest Tones) and 484T (Full Tone) to cover HE40 52T,106T and 242T.
- Testing was performed on 802.11ax HE80 26T (Lowest Tones) and 996T (Full Tone) to cover HE80 52T, 106T, 242T and 484T.

According to Preliminary Investigation, conducted power was performed to compare Full RU Tone modes and SU (Single User) Tone modes. It was determined that Full RU Tone modes were worst case over Single User modes in every instance. Therefore, only full tone modes were tested, and they represent SU modes as the worst-case scenario

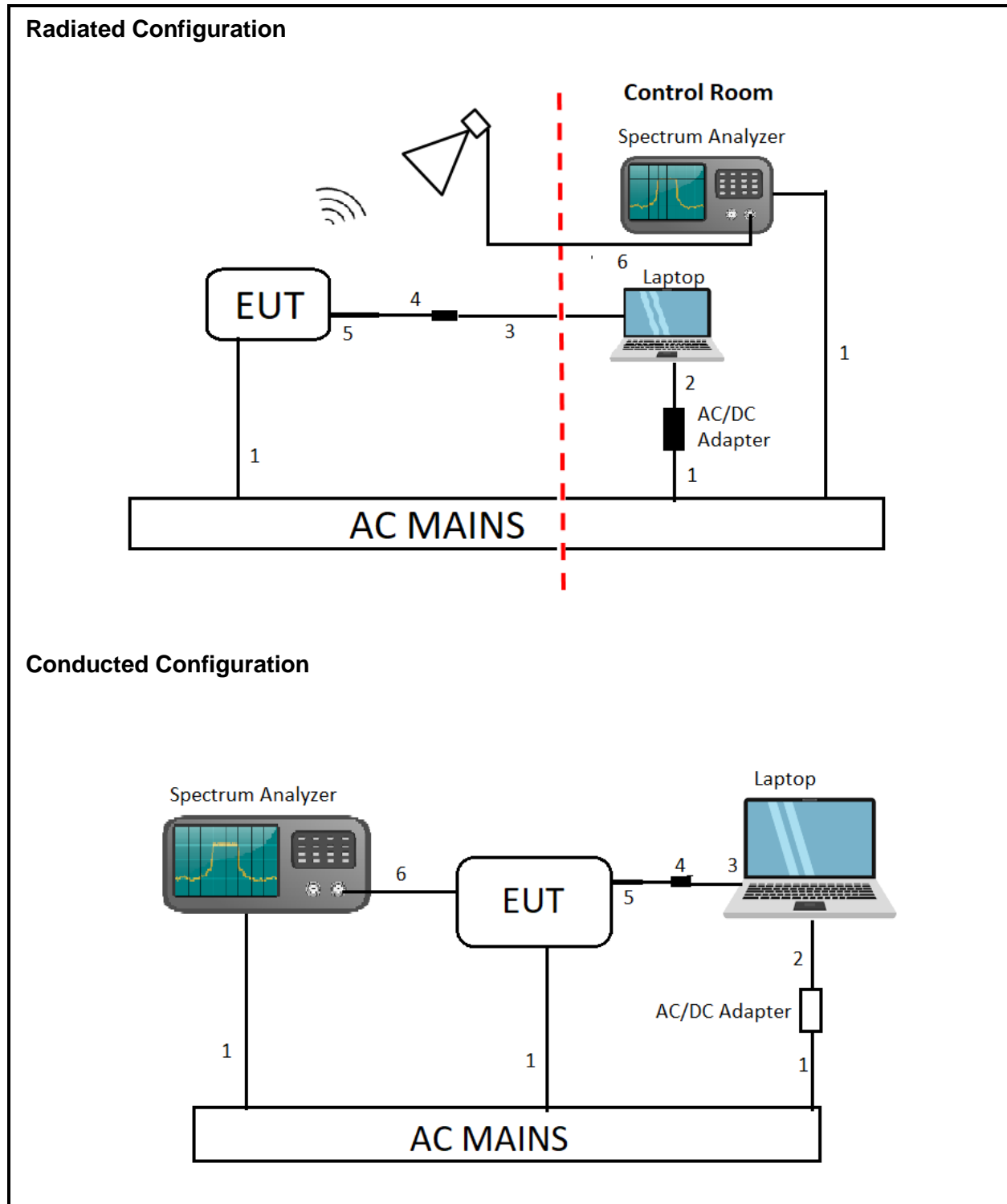
6.7. DESCRIPTION OF TEST SETUP

SUPPORT TEST EQUIPMENT						
Description	Manufacturer	Model	Serial Number	FCC ID/ DoC		
Laptop	Lenovo	T460s	PC0JMBF8	Doc		
Laptop AC/DC Adapter	Lenovo	ADLX90NLC2A	11S45N0247Z1ZSHH448JEY	Doc		
USB-A to Ethernet Adapter	Plugable	USB2-E100	8CAE4CE46AFA	Doc		
USB-C to USB-A Female Adapter	Amazon Basics	L6LUC160-CS-R	N/A	Doc		
I/O CABLES (CONDUCTED TEST)						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	AC	3	AC	Un-shielded	1.25	AC Mains to EUT/Spectrum Analyzer/AC/DC Adapter
2	DC	1	DC	Un-shielded	1	AC/DC Adapter to Laptop
3	Ethernet	1	RJ45	Un-shielded	1.5	Laptop to USB Ethernet Adapter
4	USB-A	1	USB-A	Shielded	0.05	USB EthernetAdapter to USB
5	USB-C	1	USB-C	Shielded	0.05	EUT to USB-C/USB-A Female Adapter
6	SMA Cable	1	SMA	Un-Shielded	0.1	EUT to Spectrum Analyzer
I/O CABLES (RADIATED TEST)						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	AC	3	AC	Un-shielded	1.25	AC Mains to EUT/Spectrum Analyzer/AC/DC Adapter
2	DC	1	DC	Un-shielded	1	AC/DC Adapter to Laptop
3	Ethernet	1	RJ45	Un-shielded	10	Laptop to USB Ethernet Adapter
4	USB-A	1	USB-A	Shielded	0.05	USB EthernetAdapter to USB
5	USB-C	1	USB-C	Shielded	0.05	EUT to USB-C/USB-A Female Adapter
6	SMA Cable	1	SMA	Un-Shielded	10	EUT to Horn Antenna

TEST SETUP

The EUT is a stand-alone unit and the radio is exercised by Sonos Compliance GUI test utility software via ethernet.

SETUP DIAGRAM



7. MEASUREMENT METHOD

On Time and Duty Cycle: KDB 789033 D02 v02r01, Section B.

26 dB Emission BW: KDB 789033 D02 v02r01, Section C.1

Conducted Output Power: KDB 789033 D02 v02r01, Section II E.2.d (Method SA-2).

Conducted Output Power: KDB 789033 D02 v02r01, Section II E.2.d (Method SA-2).
(Output Power (e.i.r.p): Radiated EIRP + DCCF = EIRP)
Radiated method made in lieu of conducted measurements

Power Spectral Density(PSD): KDB 789033 D02 v02r01, Section F
Radiated method made in lieu of conducted measurements

Spurious emissions within 5.925-7.125 GHz Band(Emissions Mask): KDB 987594 D02 EMC
Measurement Section II-J

Unwanted emissions in restricted bands: KDB 789033 D02 v02r01, Sections G.3, G.4, G.5, and G.6.

Unwanted emissions in non-restricted bands: KDB 789033 D02 v02r01, Sections G.3, G.4, and G.5.

AC Power Line Conducted Emissions: ANSI C63.10-2013, Section 6.2.

Radiated Spurious Emissions Below 30MHz: ANSI C63.10-2013 Section 6.4

8. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

TEST EQUIPMENT LIST					
Description	Manufacturer	Model	ID Num	Cal Due	Last Cal
Antenna, Broadband Hybrid, 30MHz to 3GHz	Sunol Sciences Corp.	JB3	171862	2022-09-28	2021-09-28
Amplifier, 10KHz to 1GHz, 32dB	SONOMA INSTRUMENT	310N	29654	2023-04-24	2022-04-24
Antenna, Horn 1-18GHz	ETS-Lindgren (Cedar Park, Texas)	3117	80404	2022-08-04	2021-08-04
RF Filter Box, 1-18GHz	FREMONT	SAC-L1	171013	2023-03-09	2022-03-09
EMI TEST RECEIVER,	Rohde & Schwarz	ESW44	PRE0179367	2023-02-16	2022-02-16
EMI TEST RECEIVER, with B8 option	Rohde & Schwarz	ESW44	PRE0179377	2023-02-20	2022-02-20
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	201499	2023-02-17	2022-02-17
Antenna, Horn 18 to 26.5GHz	ARA	MWH-1826/B	172363	2023-02-17	2022-02-17
Antenna, Horn 26 to 40GHz	ARA	MWH-2640/B	172366	2022-12-07	2021-12-07
Amplifier 18-26.5GHz, +5Vdc, -54dBm P1dB	AMPLICAL	AMP18G26.5-60	171583	2022-12-07	2021-12-07
Amplifier 26-40GHz +5Vdc, -62dBm P1dB	AMPLICAL	AMP26G40-65	172346	2023-02-01	2022-02-01
*Antenna, Passive Loop 30Hz - 1MHz	ELECTRO METRICS	EM-6871	SC-8015	2022-05-24	2021-05-24
*Antenna, Passive Loop 100KHz - 30MHz	ELECTRO METRICS	EM-6872	SC-8014	2022-05-24	2021-05-24
Spectrum Analyzer, PXA, 3Hz to 44GHz	Agilent Technologies	N9030A	80396	2023-01-02	2021-01-02
AC Line Conducted					
LISN	Fischer Custom Communications, Inc	FCC-LISN-50/250-25-2-01-480V	175765	2023-01-26	2022-01-26
EMI TEST RECEIVER	Rohde & Schwarz	ESR	93091	2023-02-21	2022-02-21
Transient Limiter	Com-Power	LIT-930	127455	2022-06-01	2021-06-01
UL TEST SOFTWARE LIST					
Radiated Software	UL	UL EMC	Ver 2016-05-11, 2015-12-29, 2019-10-09, 2021-12-07, 2022-05-18, and 2022-07-06		
Antenna Port Software	UL	UL RF	Ver 2022.8.16		
AC Line Conducted Software	UL	UL EMC	Rev 9.5, 2022-02-17		

*Test performed prior to expiration

9. ANTENNA PORT TEST RESULTS

9.1. ON TIME AND DUTY CYCLE

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

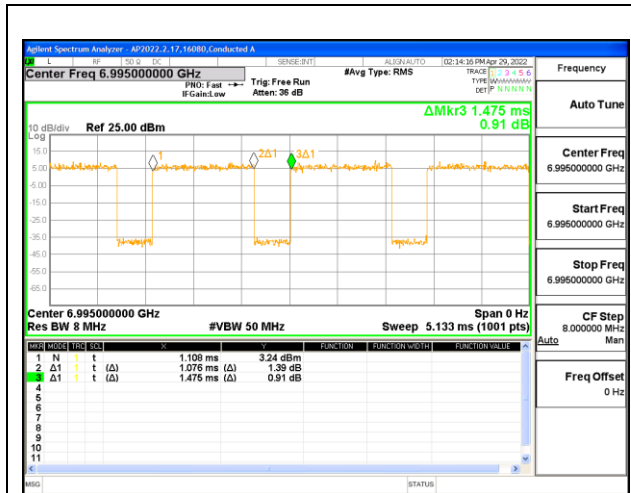
KDB 789033 Zero-Span Spectrum Analyzer Method.

Test Engineer:	AF 19497
Test Date:	4/20 to 4/29/2022

RESULTS

Mode	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/B Minimum VBW (kHz)
802.11ax HE20 OFDMA, SU	1.076	1.475	0.729	72.95%	1.37	0.929
802.11ax HE20 OFDMA, RU size 242T	0.376	0.737	0.510	51.04%	2.92	2.658
802.11ax HE20 OFDMA, RU size 26T	0.578	0.920	0.628	62.83%	2.02	1.730
802.11ax HE40 OFDMA, SU	0.944	1.509	0.625	62.52%	2.04	1.060
802.11ax HE40 OFDMA, RU size 484T	0.368	0.728	0.505	50.55%	2.96	2.717
802.11ax HE40 OFDMA, RU size 26T	0.580	0.921	0.630	62.97%	2.01	1.724
802.11ax HE80 OFDMA, SU	0.305	0.672	0.454	45.44%	3.43	3.278
802.11ax HE80 OFDMA, RU size 996T	0.344	0.739	0.465	46.55%	3.32	2.906
802.11ax HE80 OFDMA, RU size 26T	0.580	0.921	0.629	62.92%	2.01	1.725

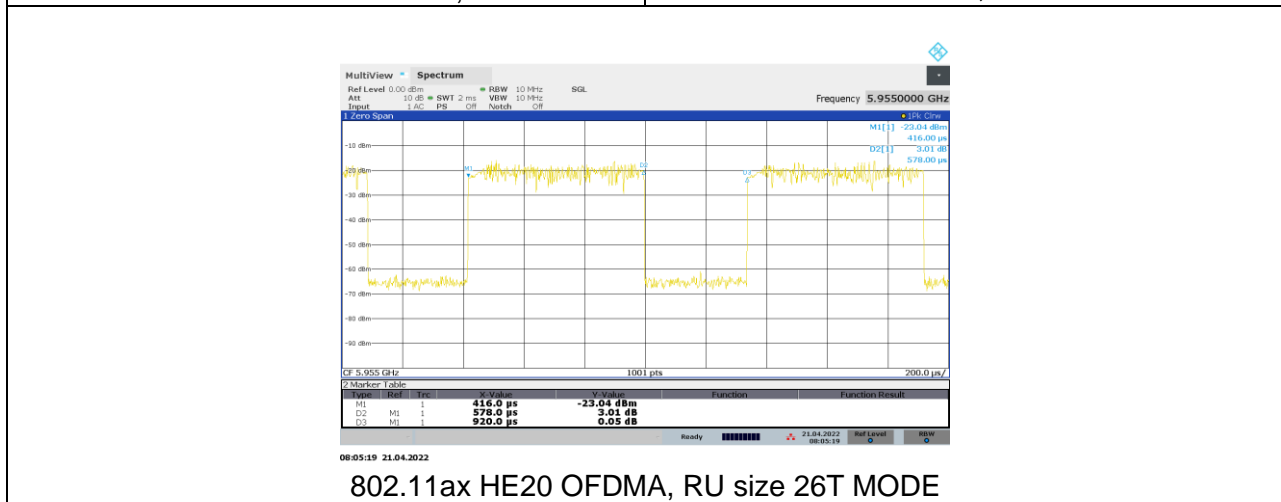
DUTY CYCLE PLOTS



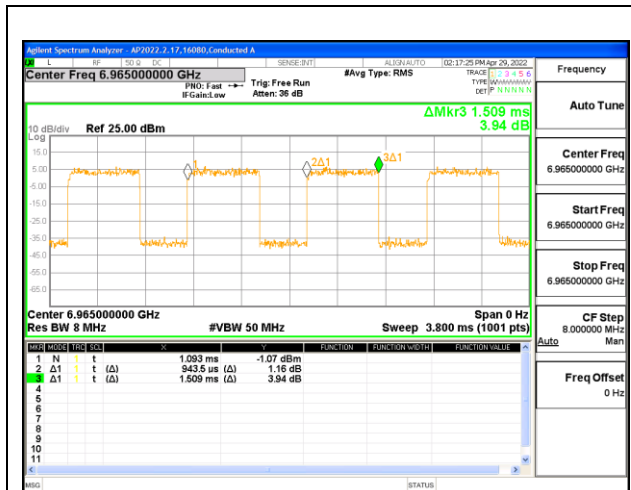
802.11ax HE20 OFDMA, SU



802.11ax HE20 OFDMA, RU size 242T MODE



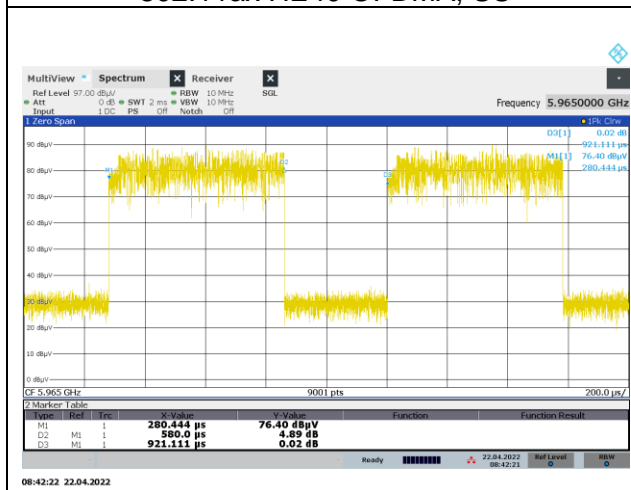
802.11ax HE20 OFDMA, RU size 26T MODE



802.11ax HE40 OFDMA, SU



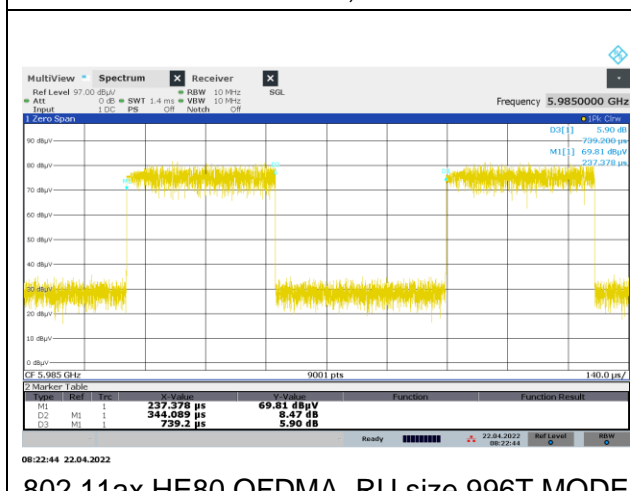
802.11ax HE40 OFDMA, RU size 484T MODE



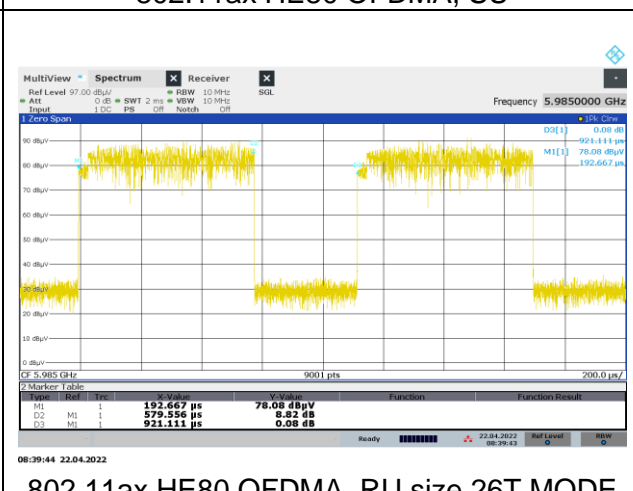
802.11ax HE40 OFDMA, RU size 26T MODE



802.11ax HE80 OFDMA, SU



802.11ax HE80 OFDMA, RU size 996T MODE



802.11ax HE80 OFDMA, RU size 26T MODE

9.2. 26 dB BANDWIDTH

LIMITS

§15.407 (a) (10)

The maximum transmitter channel bandwidth for U-NII devices in the 5.925-7.125 GHz band is 320 megahertz

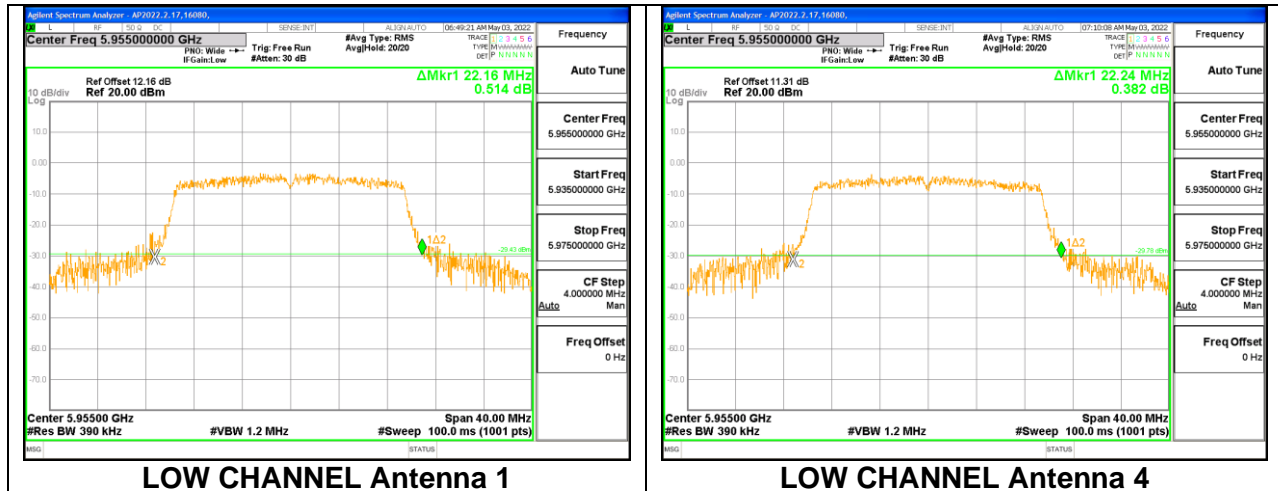
RESULTS

9.2.1. 802.11ax HE20 MODE 2TX IN THE UNII-5 BAND

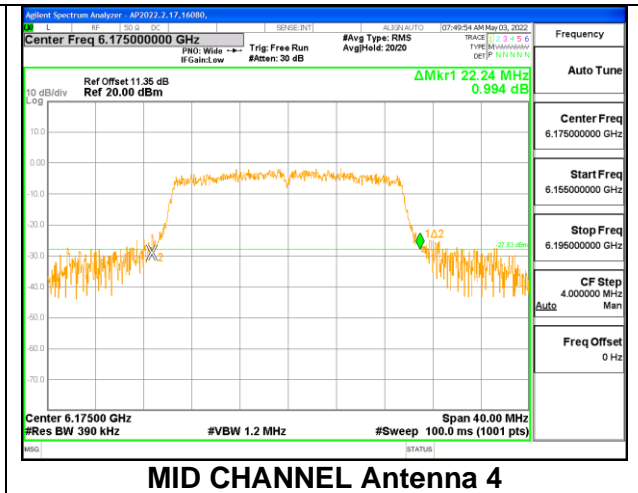
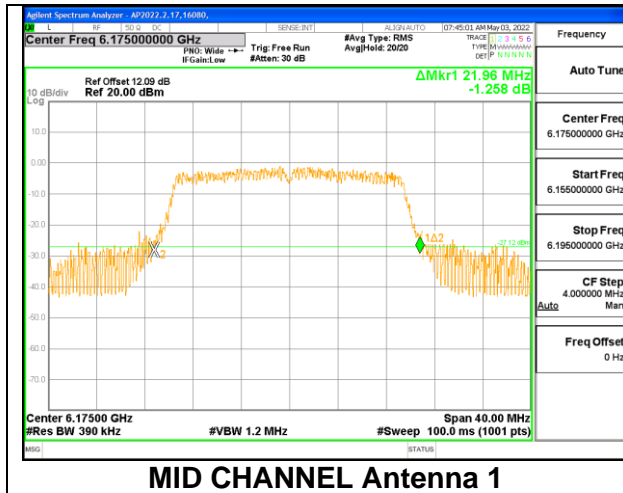
2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 242-Tones, RU Index 61

Channel	Frequency (MHz)	26 dB Bandwidth Antenna 1 (MHz)	26 dB Bandwidth Antenna 4 (MHz)
Low	5955	22.16	22.24
Mid	6175	21.96	22.24
High	6415	22.16	22.12

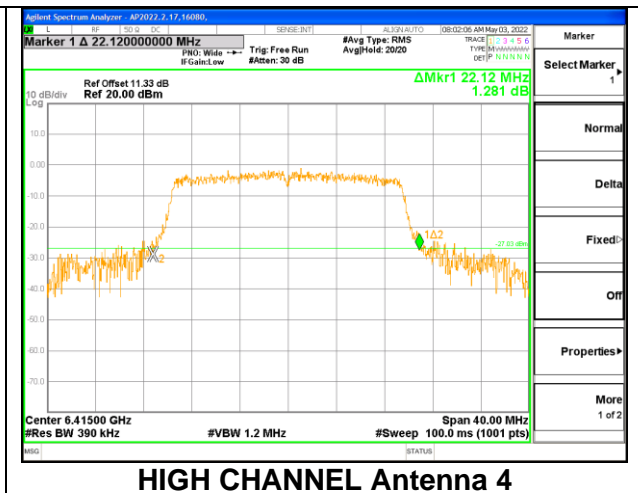
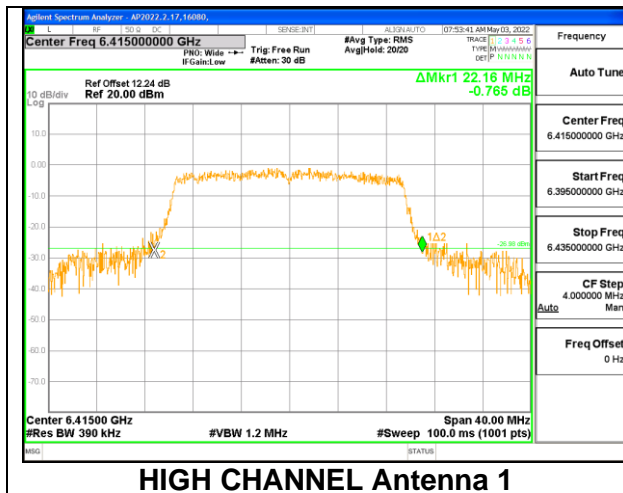
LOW CHANNEL



MID CHANNEL



HIGH CHANNEL

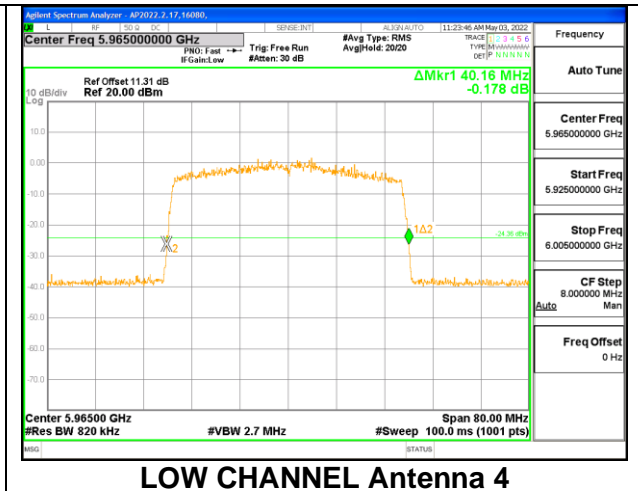
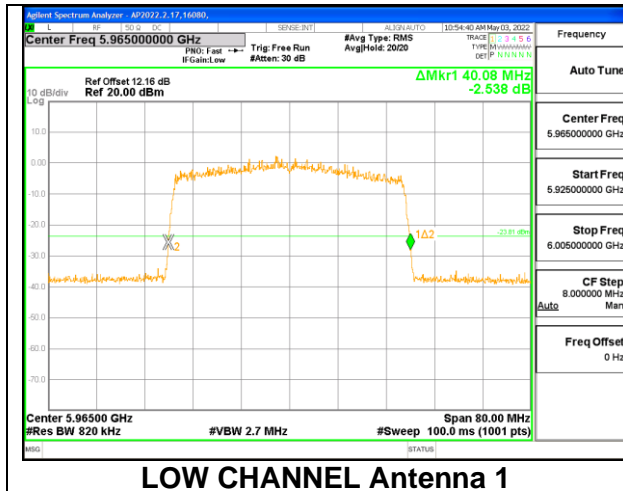


9.2.2. 802.11ax HE40 MODE 2TX IN THE UNII-5 BAND

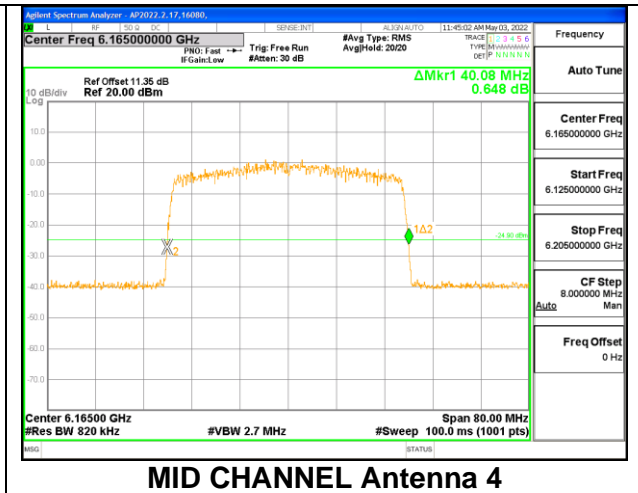
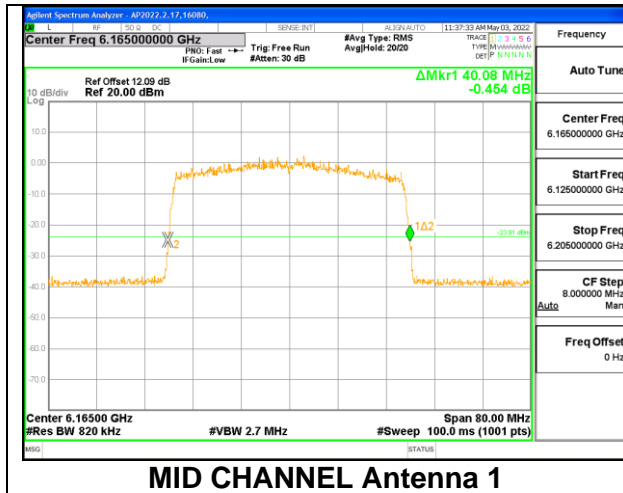
2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 484-Tones, RU Index 65

Channel	Frequency (MHz)	26 dB Bandwidth Antenna 1 (MHz)	26 dB Bandwidth Antenna 4 (MHz)
Low	5965	40.08	40.16
Mid	6165	40.08	40.08
High	6405	40.32	40.08

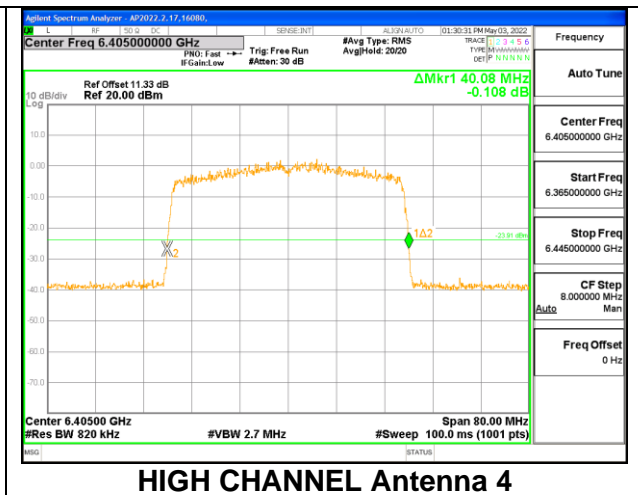
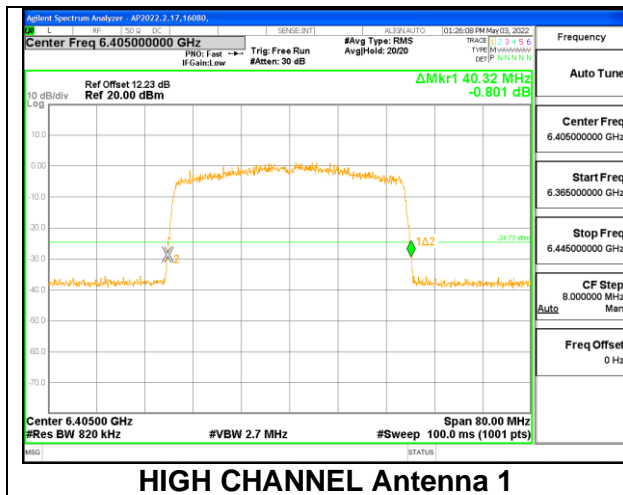
LOW CHANNEL



MID CHANNEL



HIGH CHANNEL

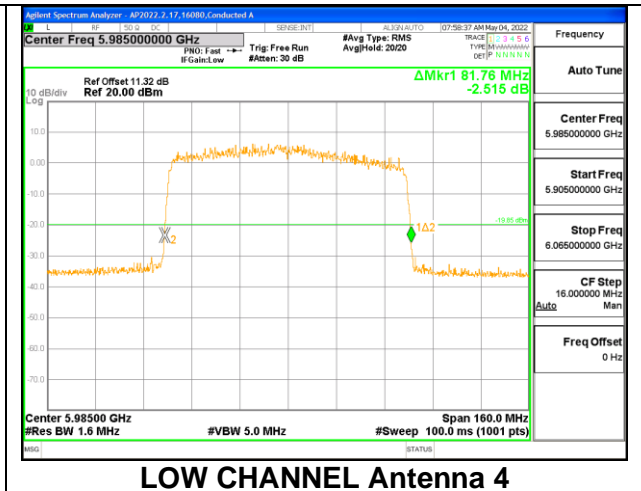
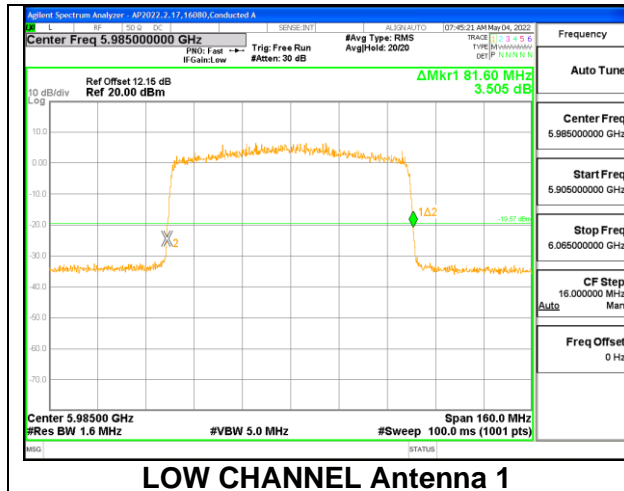


9.2.3. 802.11ax HE80 MODE 2TX IN THE UNII-5 BAND

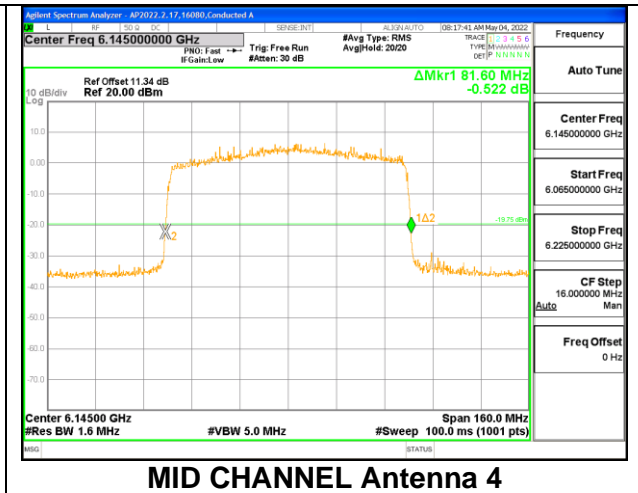
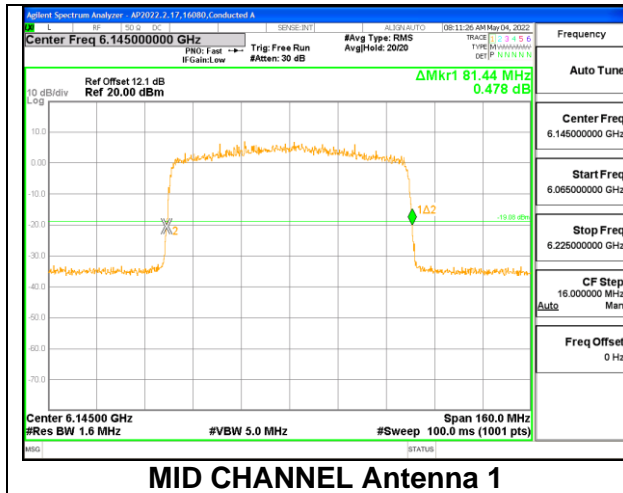
2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 996-Tones, RU Index 67

Channel	Frequency (MHz)	26 dB Bandwidth Antenna 1 (MHz)	26 dB Bandwidth Antenna 4 (MHz)
Low	5985	81.60	81.76
Mid	6145	81.44	81.60
High	6385	81.60	81.60

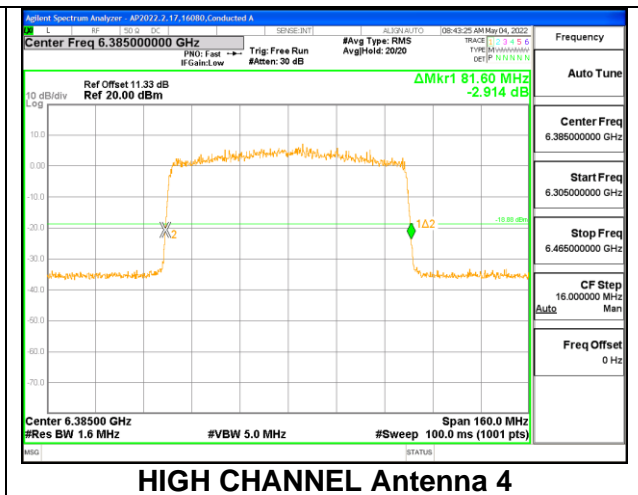
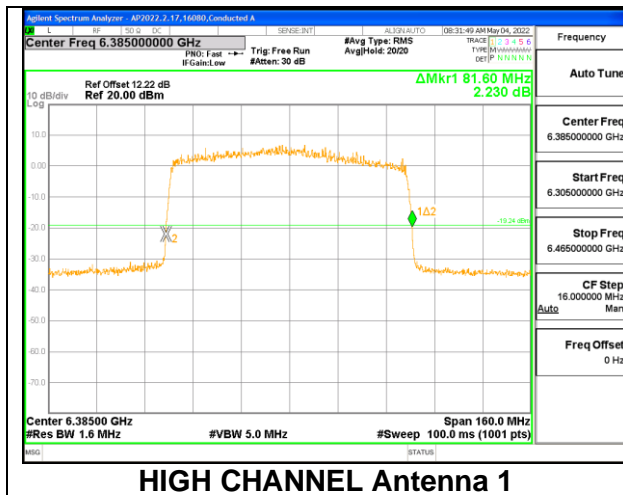
LOW CHANNEL



MID CHANNEL



HIGH CHANNEL

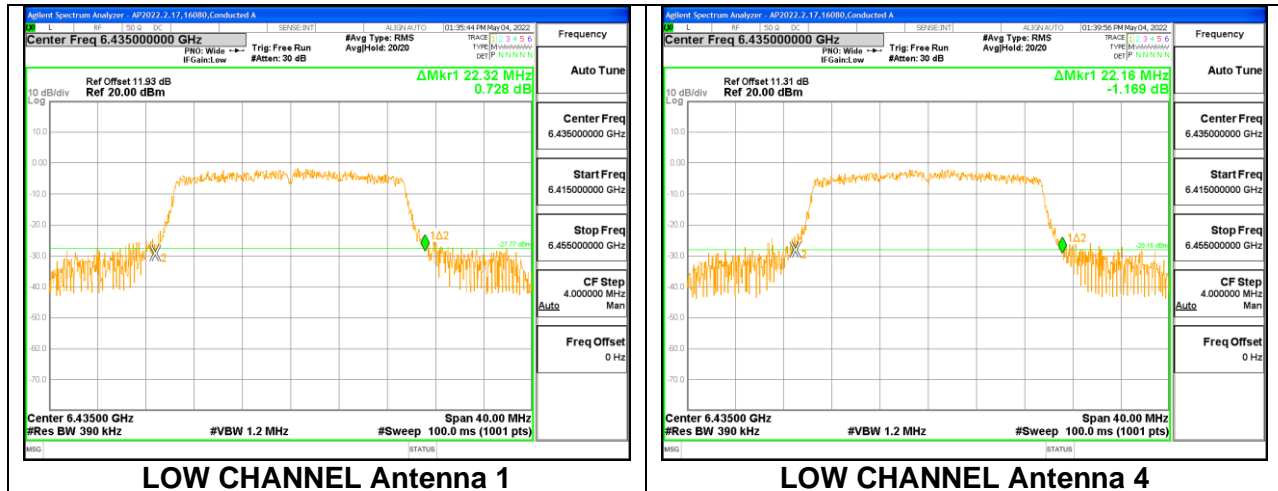


9.2.4. 802.11ax HE20 MODE 2TX IN THE UNII-6 BAND

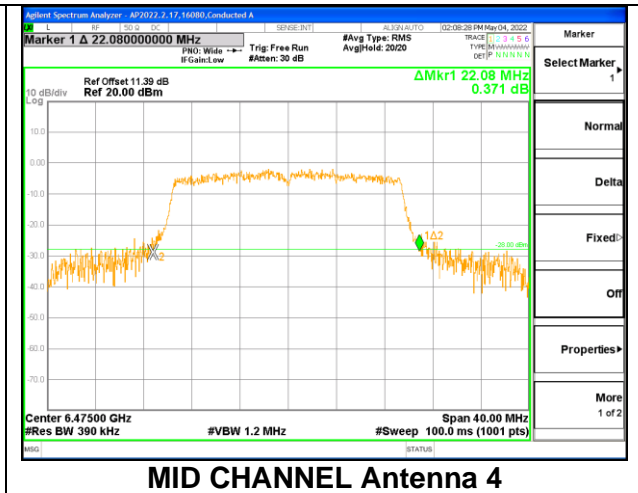
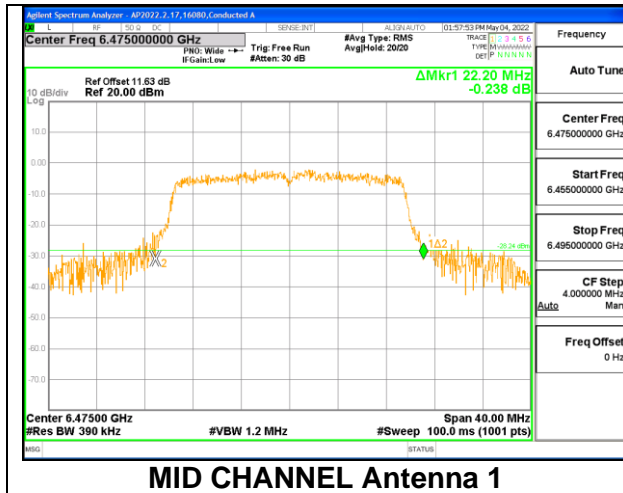
2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 242-Tones, RU Index 61

Channel	Frequency (MHz)	26 dB Bandwidth Antenna 1 (MHz)	26 dB Bandwidth Antenna 4 (MHz)
Low	6435	22.32	22.16
Mid	6475	22.20	22.08
High	6515	21.92	22.32

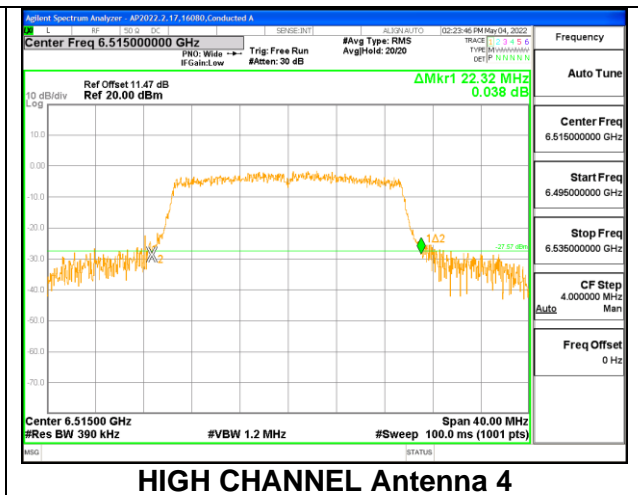
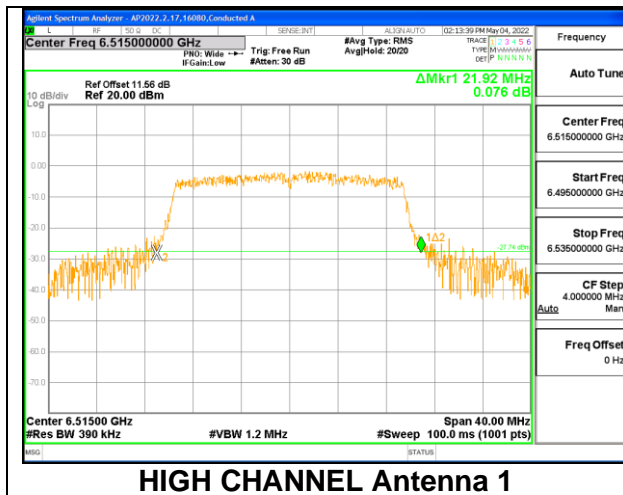
LOW CHANNEL



MID CHANNEL



HIGH CHANNEL

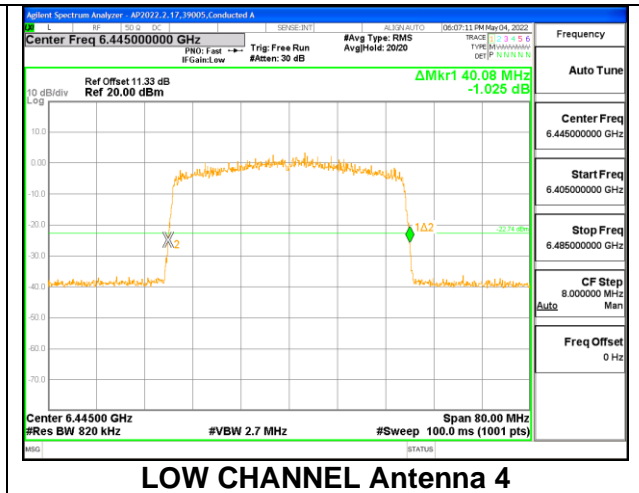
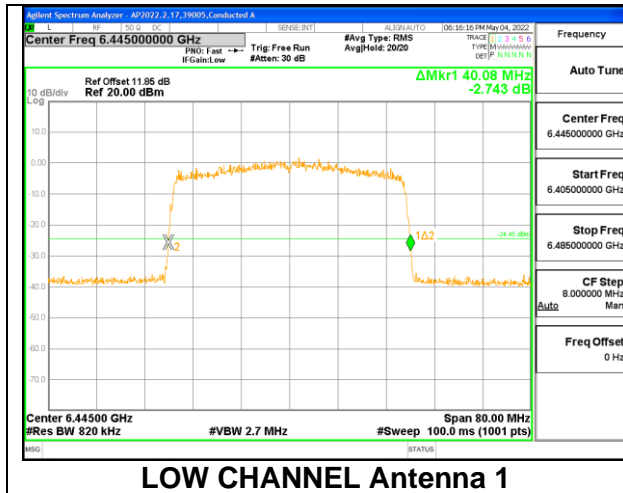


9.2.5. 802.11ax HE40 MODE 2TX IN THE UNII-6 BAND

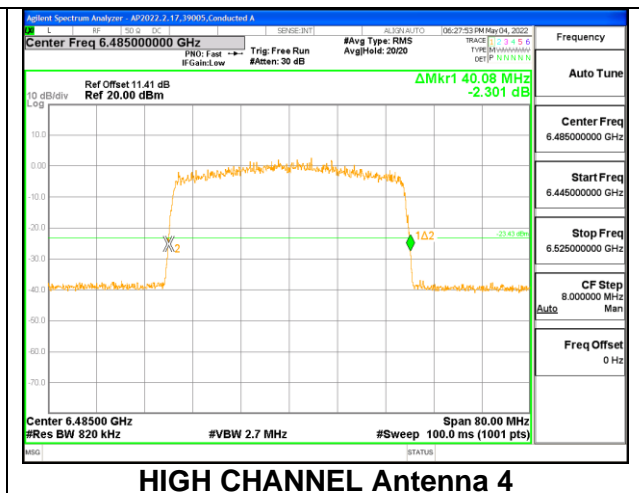
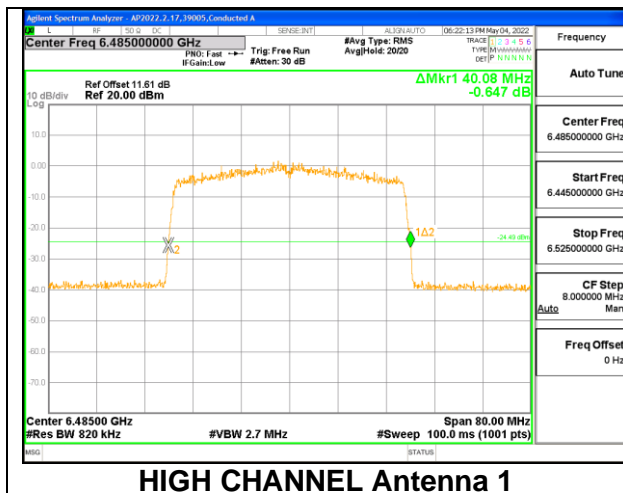
2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 484-Tones, RU Index 65

Channel	Frequency (MHz)	26 dB Bandwidth Antenna 1 (MHz)	26 dB Bandwidth Antenna 4 (MHz)
Low	6445	40.08	40.08
High	6485	40.08	40.08
Straddle	6525	40.08	40.08

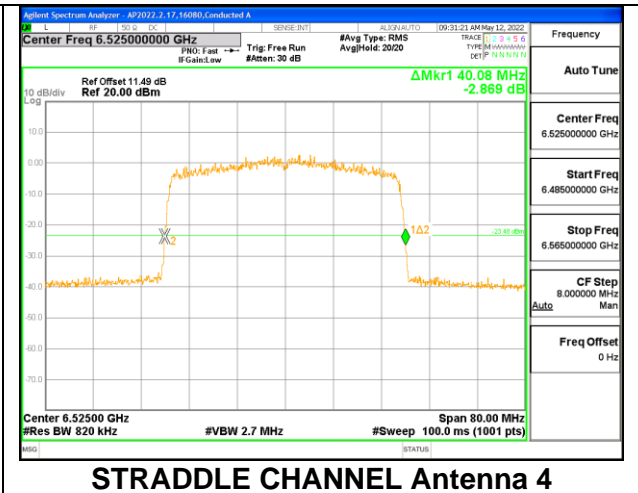
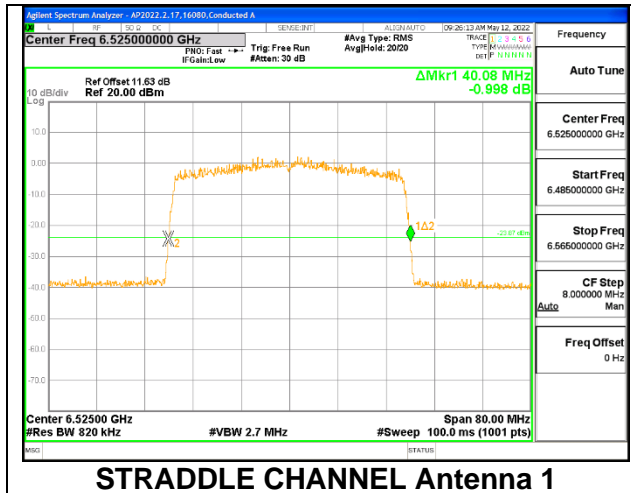
LOW CHANNEL



HIGH CHANNEL



STRADDLE CHANNEL

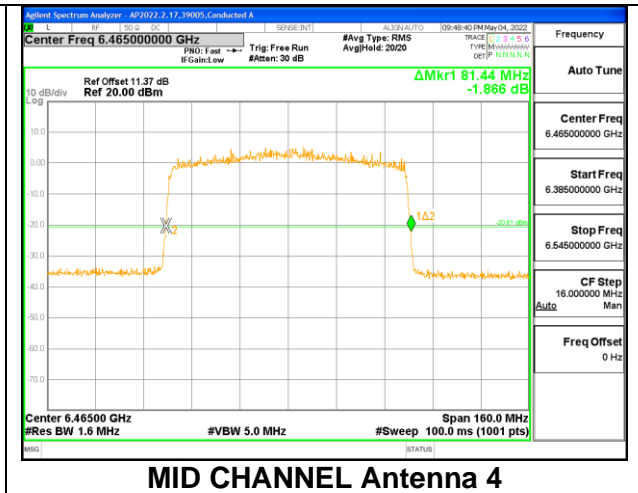
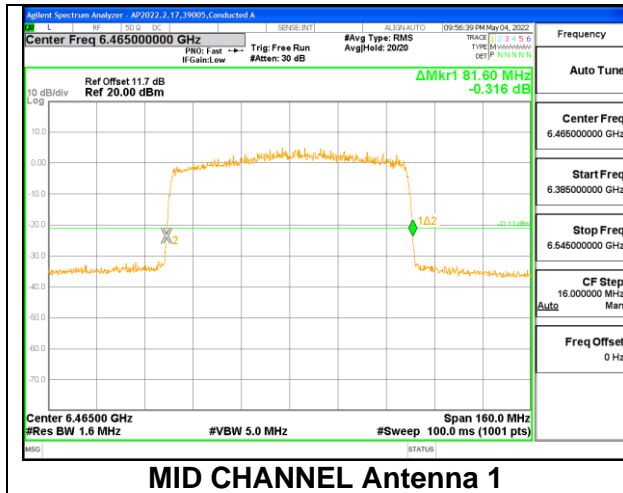


9.2.6. 802.11ax HE80 MODE 2TX IN THE UNII-6 BAND

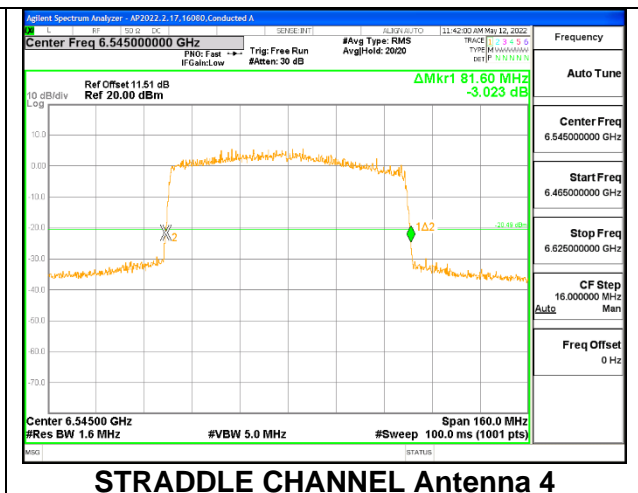
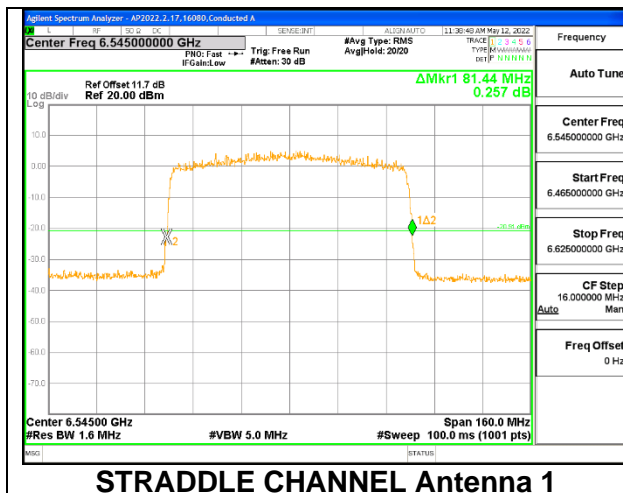
2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 996-Tones, RU Index 67

Channel	Frequency (MHz)	26 dB Bandwidth Antenna 1 (MHz)	26 dB Bandwidth Antenna 4 (MHz)
Mid	6465	81.60	81.44
Straddle	6545	81.44	81.60

MID CHANNEL



STRADDLE CHANNEL

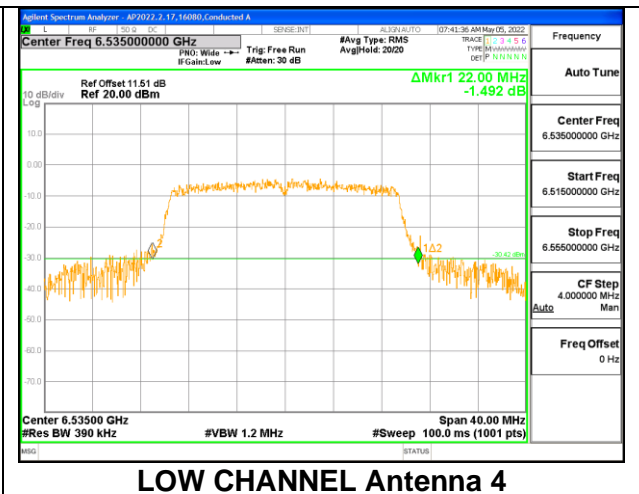
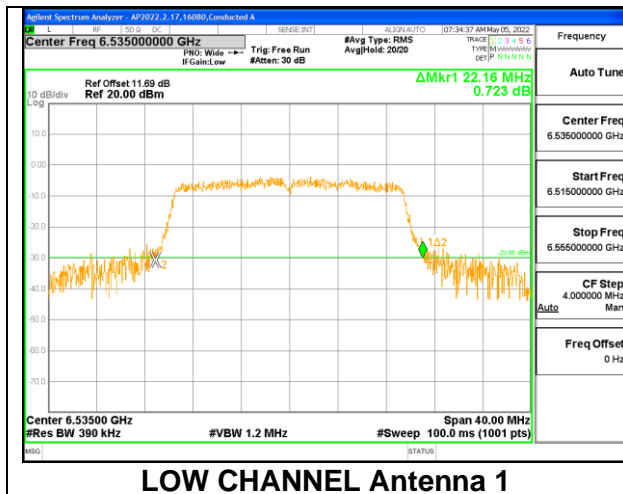


9.2.7. 802.11ax HE20 MODE 2TX IN THE UNII-7 BAND

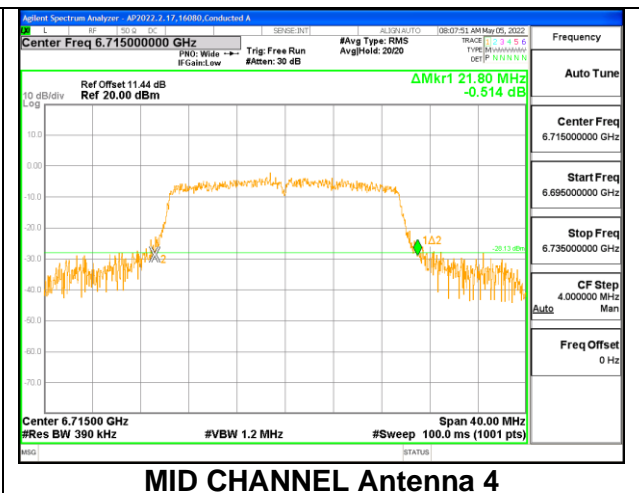
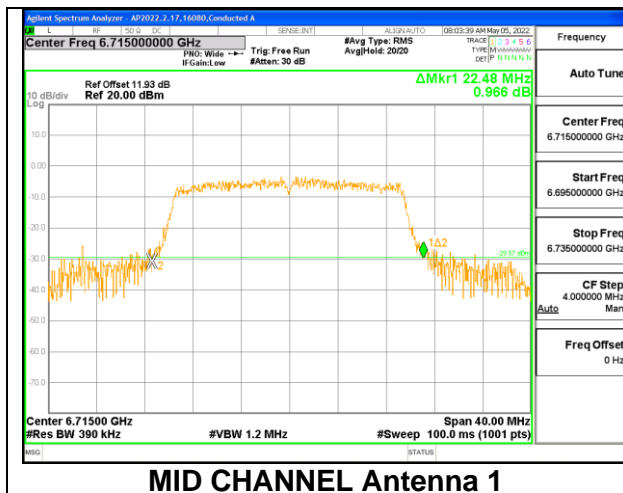
2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 242-Tones, RU Index 61

Channel	Frequency (MHz)	26 dB Bandwidth Antenna 1 (MHz)	26 dB Bandwidth Antenna 4 (MHz)
Low	6535	22.16	22.00
Mid	6715	22.48	21.80
High	6855	22.44	22.32
Straddle	6875	22.52	21.88

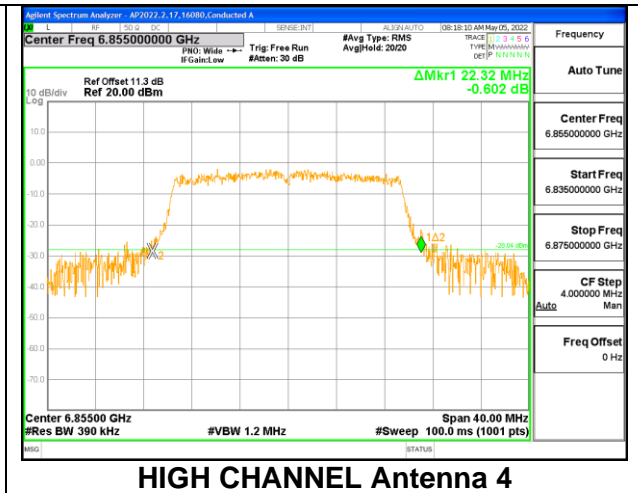
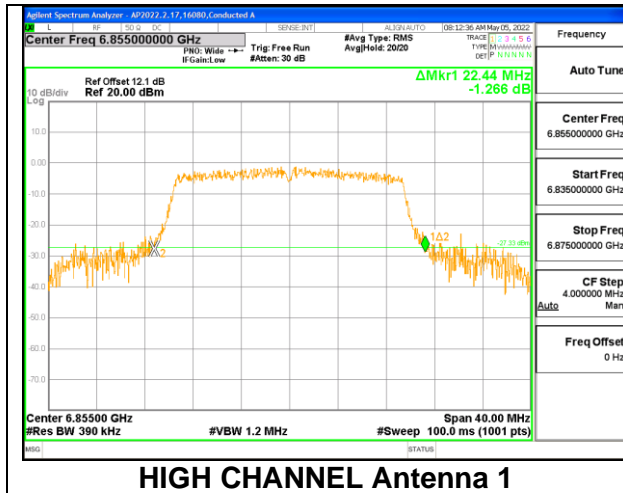
LOW CHANNEL



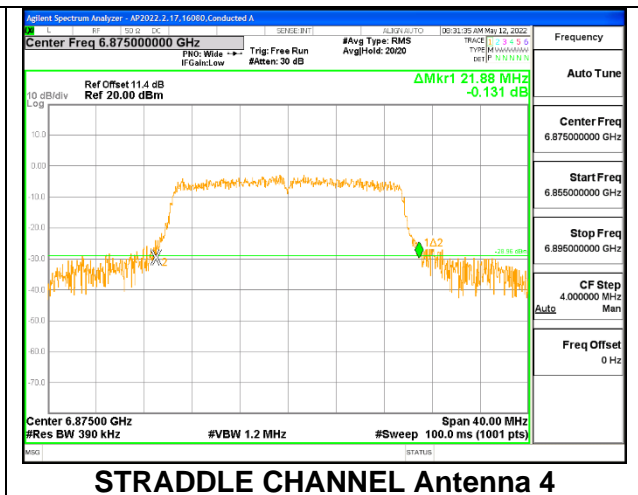
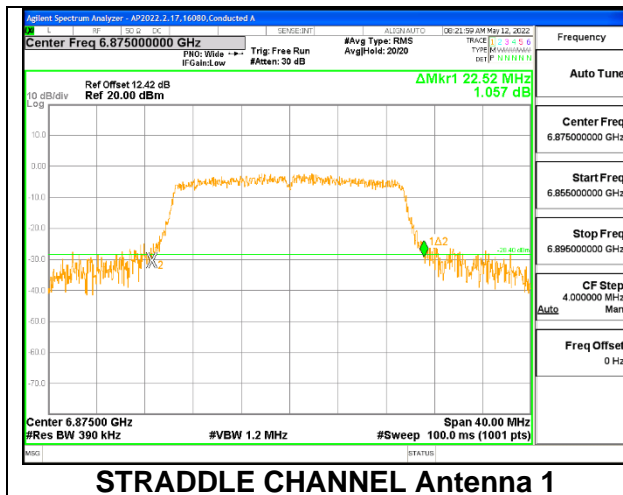
MID CHANNEL



HIGH CHANNEL



STRADDLE CHANNEL

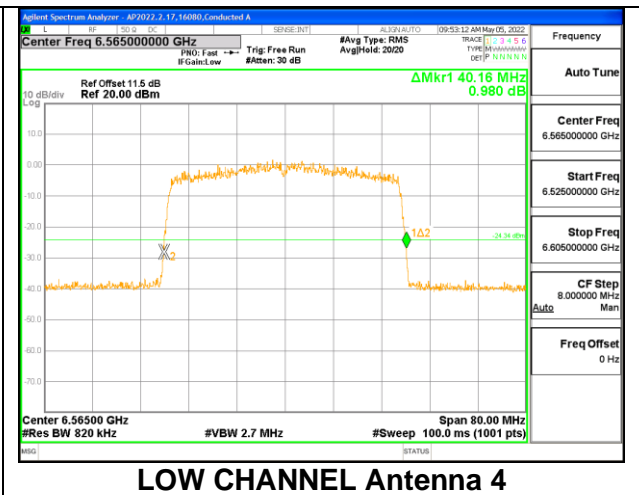
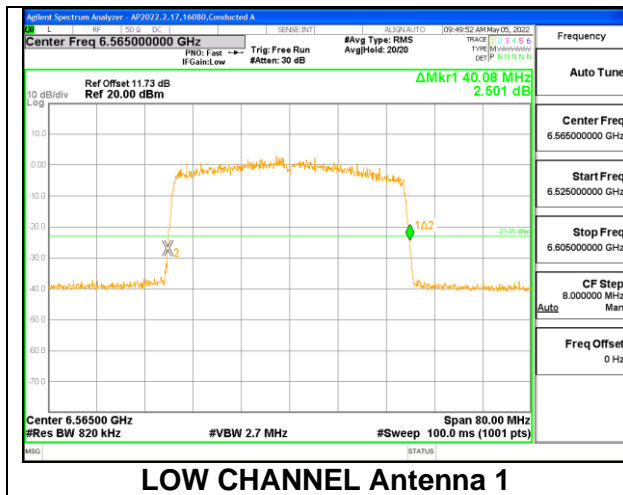


9.2.8. 802.11ax HE40 MODE 2TX IN THE UNII-7 BAND

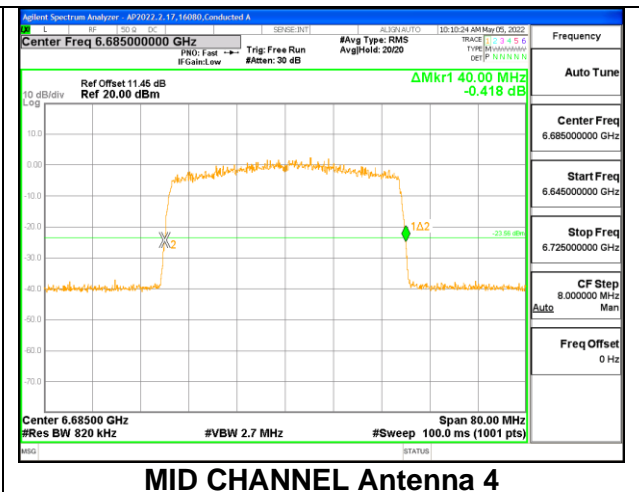
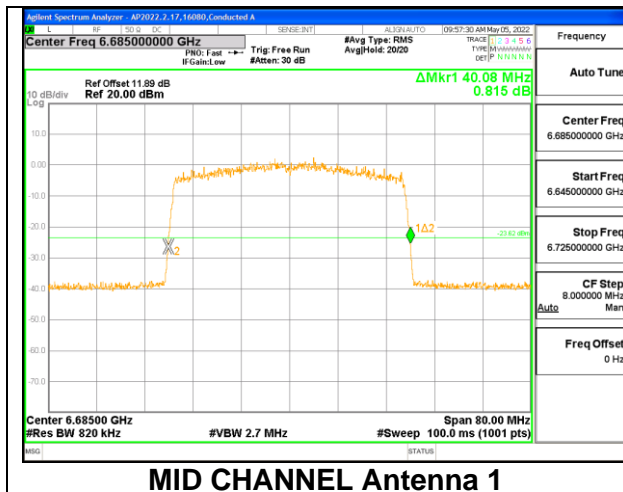
2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 484-Tones, RU Index 65

Channel	Frequency (MHz)	26 dB Bandwidth Antenna 1 (MHz)	26 dB Bandwidth Antenna 4 (MHz)
Low	6565	40.08	40.16
Mid	6685	40.08	40.00
High	6845	40.16	40.16
Straddle	6885	40.16	40.08

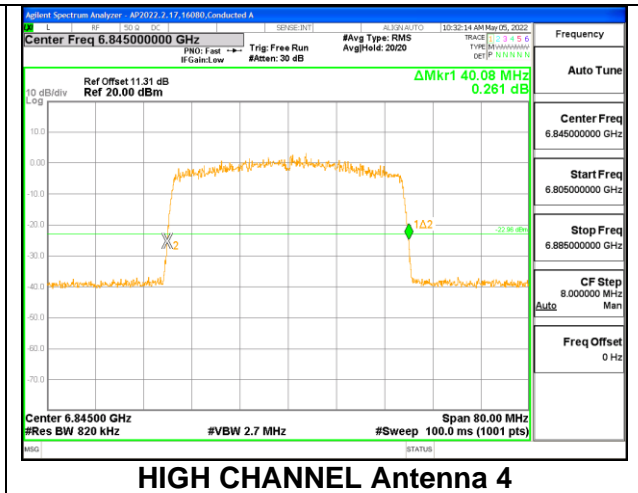
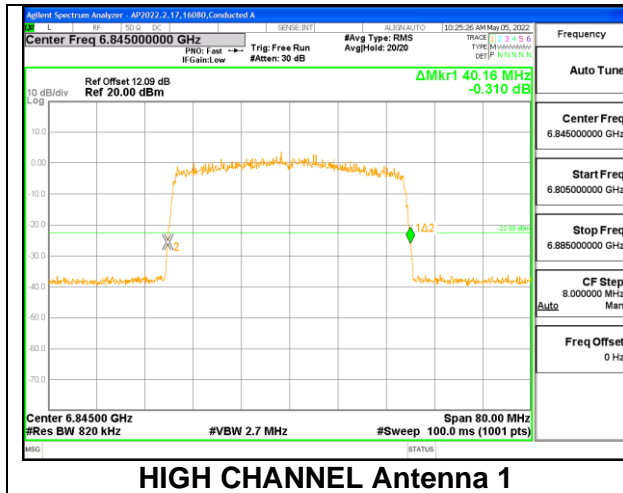
LOW CHANNEL



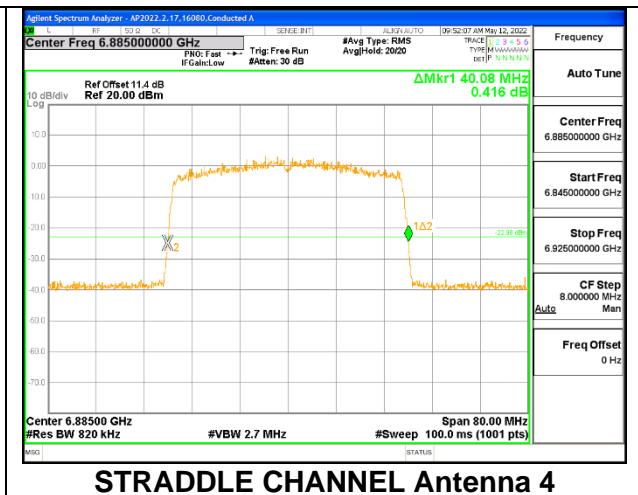
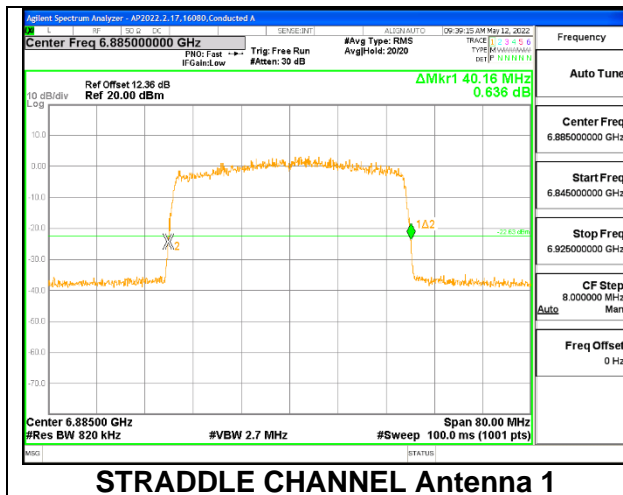
MID CHANNEL



HIGH CHANNEL



STRADDLE CHANNEL

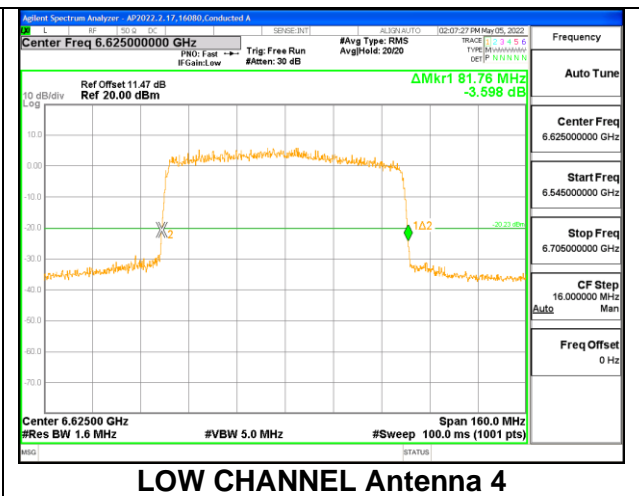
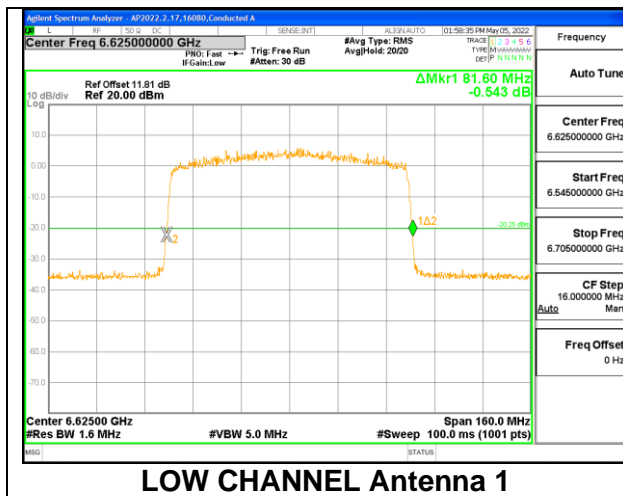


9.2.9. 802.11ax HE80 MODE 2TX IN THE UNII-7 BAND

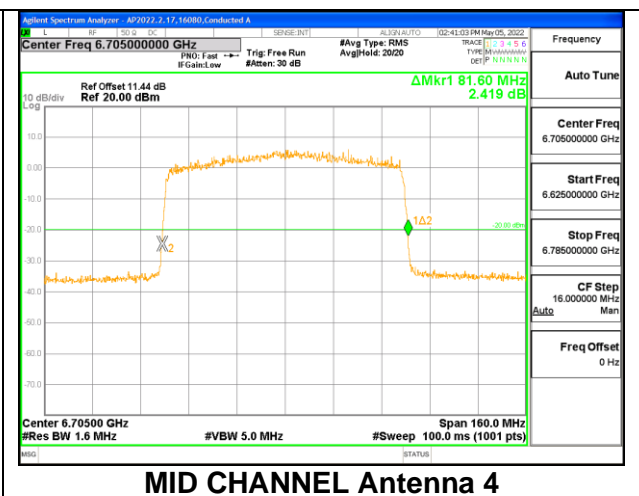
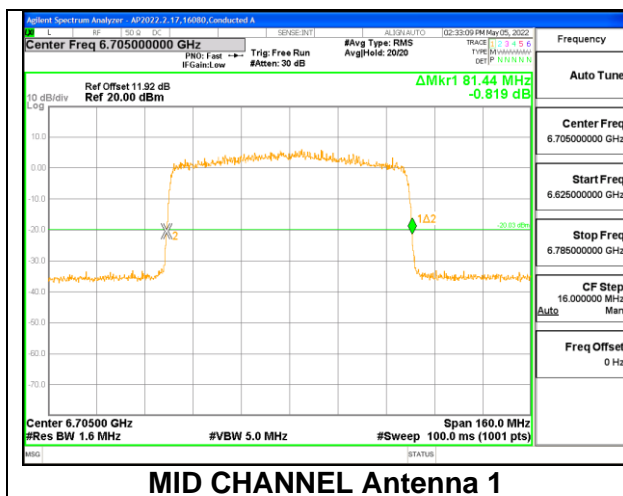
2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 996-Tones, RU Index 67

Channel	Frequency (MHz)	26 dB Bandwidth Antenna 1 (MHz)	26 dB Bandwidth Antenna 4 (MHz)
Low	6625	81.60	81.76
Mid	6705	81.44	81.60
High	6785	81.44	81.44
Straddle	6865	81.92	81.44

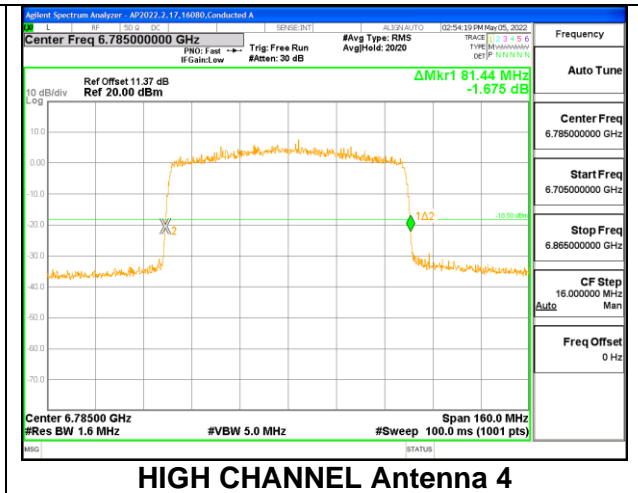
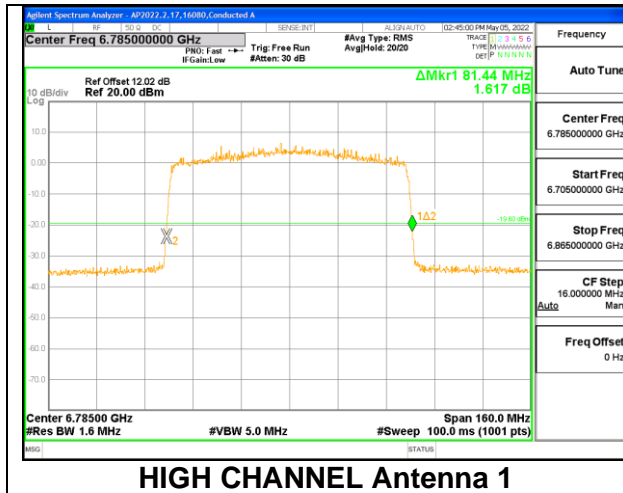
LOW CHANNEL



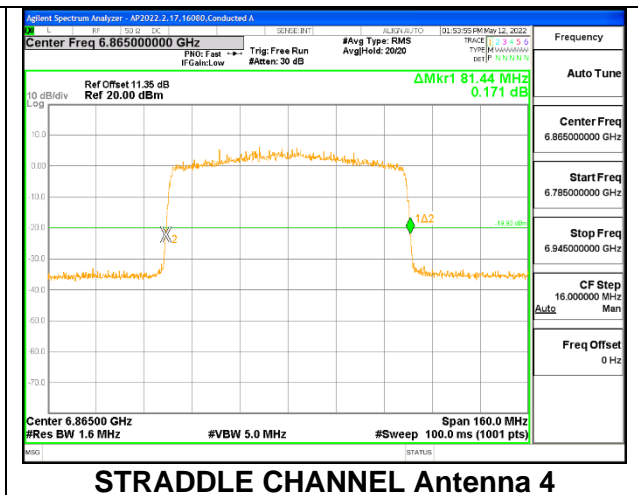
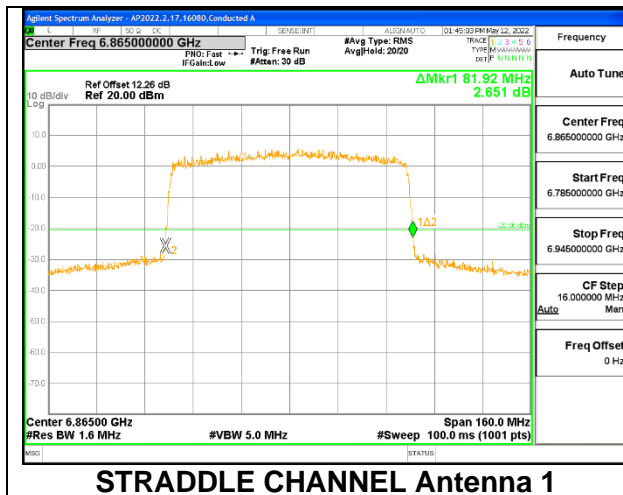
MID CHANNEL



HIGH CHANNEL



STRADDLE CHANNEL

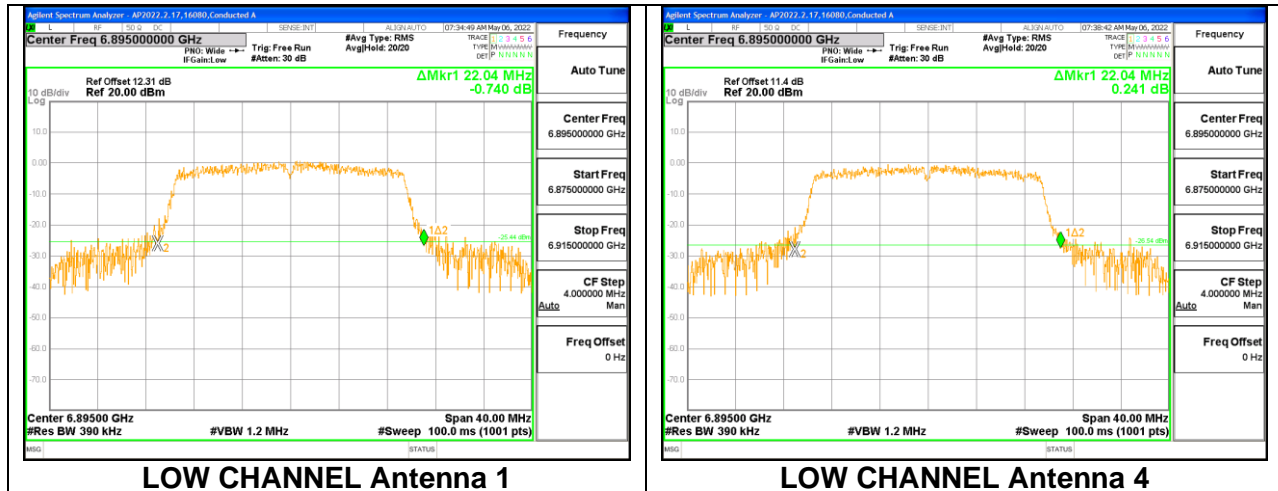


9.2.10. 802.11ax HE20 MODE 2TX IN THE UNII-8 BAND

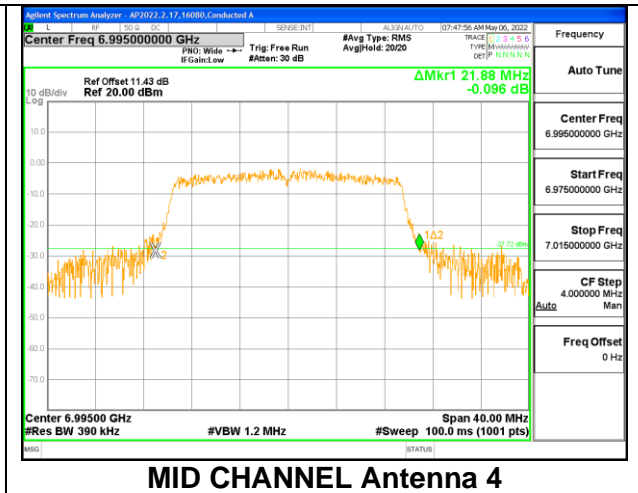
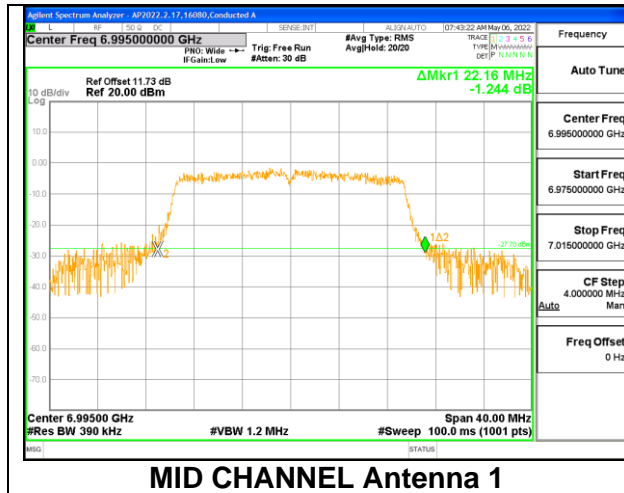
2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 242-Tones, RU Index 61

Channel	Frequency (MHz)	26 dB Bandwidth Antenna 1 (MHz)	26 dB Bandwidth Antenna 4 (MHz)
Low	6895	22.04	22.04
Mid	6995	22.16	21.88
High	7115	22.20	22.32

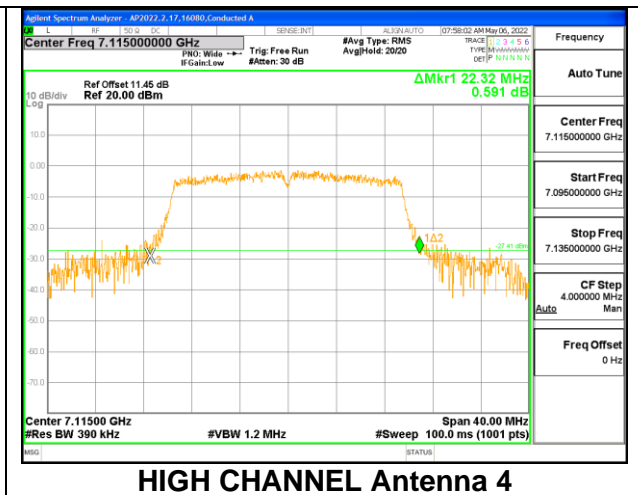
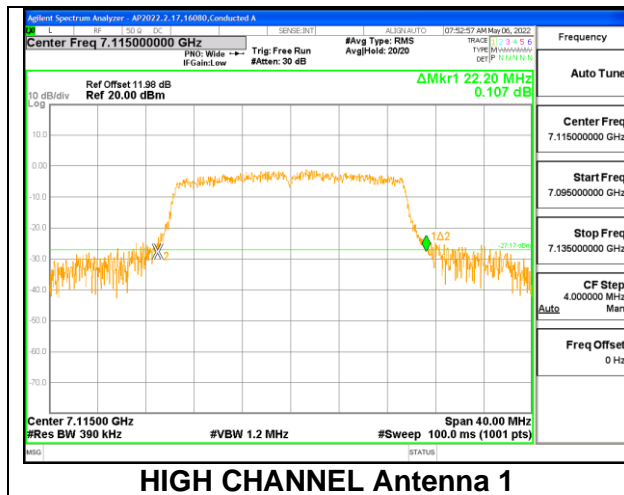
LOW CHANNEL



MID CHANNEL



HIGH CHANNEL



9.2.11. 802.11ax HE40 MODE 2TX IN THE UNII-8 BAND

2TX Antenna 1 + Antenna 4 CDD OFDMA MODE: 484-Tones, RU Index 65

Channel	Frequency (MHz)	26 dB Bandwidth Antenna 1 (MHz)	26 dB Bandwidth Antenna 4 (MHz)
Low	6925	40.16	40.08
Mid	6965	40.16	40.16
High	7085	40.00	40.00

LOW CHANNEL

