

7.6.1 Antenna Gain Information at the Band Edge

The following antenna gain information is provided to demonstrate the antenna performance of the 27.5 – 28.35GHz band. These antenna gains were subtracted from the measured EIRP levels at the lower and upper band edge frequencies to determine an equivalent conductive power that was compared directly with the §30.203 limits.

Frequency (MHz)	Gain (dBi)
27.5	28.33
27.6	28.29
27.7	28.22
27.8	28.19
27.9	28.15
28	27.96
28.1	27.86
28.2	27.75
28.3	27.63
28.35	27.58

Table 7-24. Antenna Gains at the Band Edges

Sample Analyzer Offset Calculation (at 27.9GHz)

Measurement Antenna Factor = 47.07dB/m

Cable Loss = 6.88dB

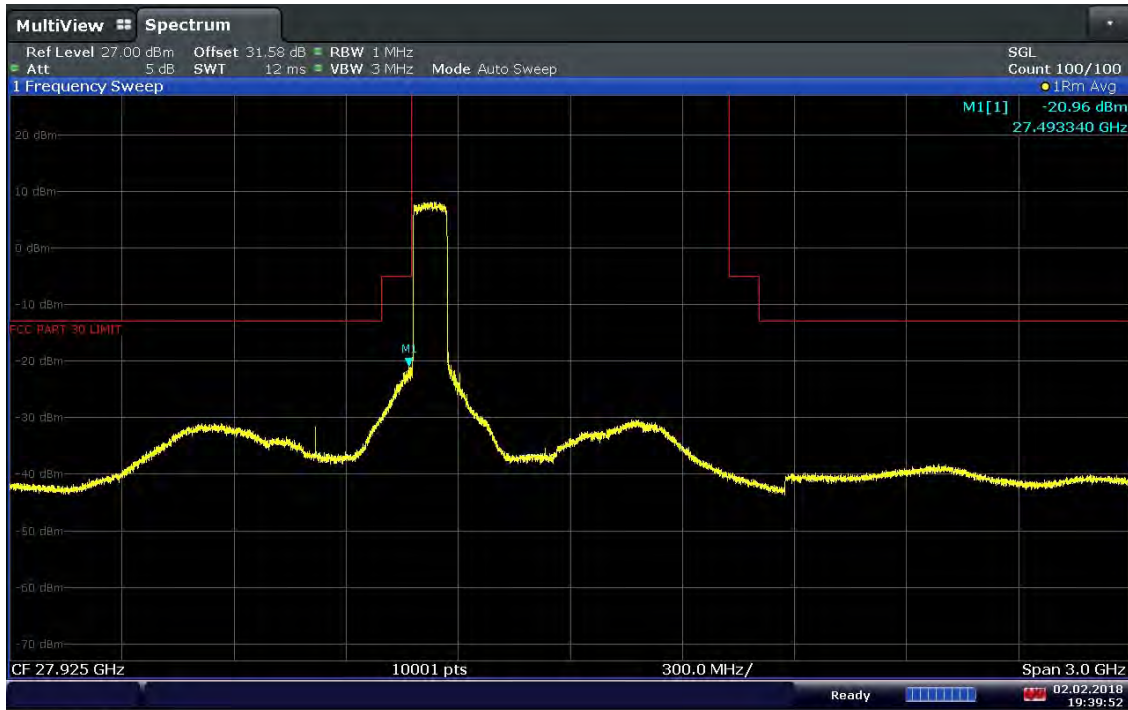
Far Field Distance = 1.51m

EUT Antenna Gain = 28.33dBi

$$\begin{aligned}
 \text{Analyzer Offset (dB)} &= \text{AF (dB/m)} + \text{CL (dB)} + 107 + 20\log_{10}(D) - 104.8\text{dB} - \text{Gain (dBi)} \\
 &= 47.07\text{dB/m} + 7.06\text{dB} + 107 + 20\log_{10}(1.5) - 104.8\text{dB} - 28.15\text{dBi} \\
 &= 31.58\text{dB}
 \end{aligned}$$

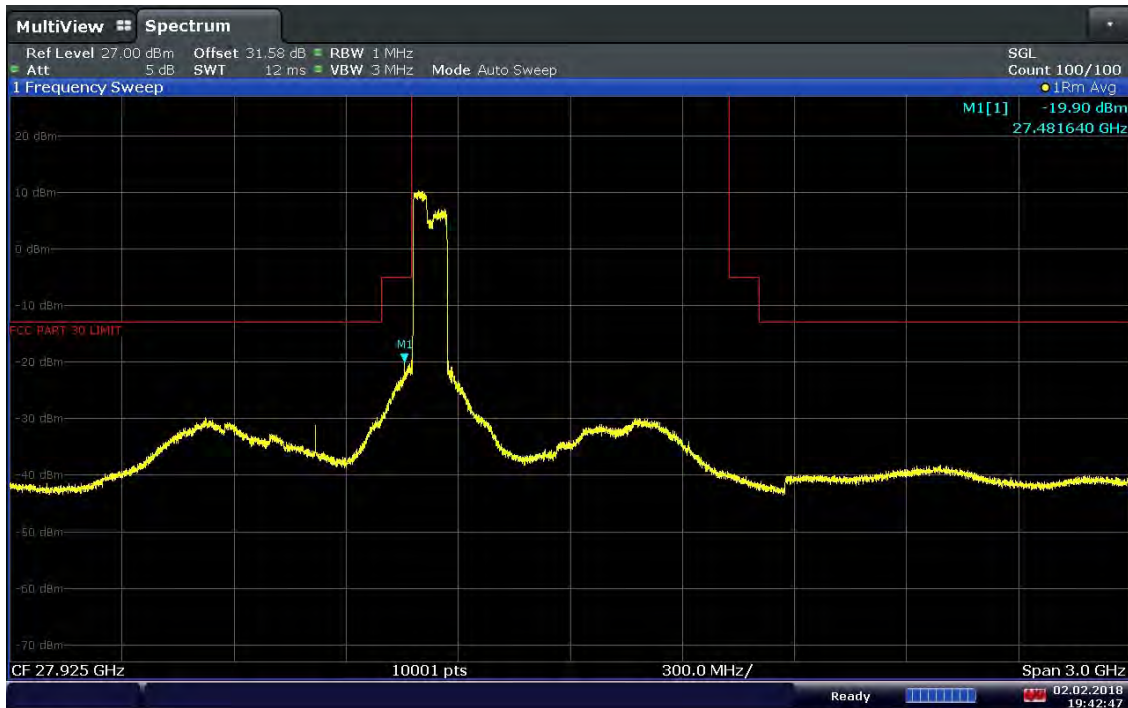
FCC ID: A3LSFG-AA100DC		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1712270338-01-R2.A3L	Test Dates: 1/2-2/3/2018	EUT Type: 5G Access Unit		Page 154 of 221

7.6.2 Antenna A Conducted Band Edge Maximized on Antenna A



19:39:52 02.02.2018

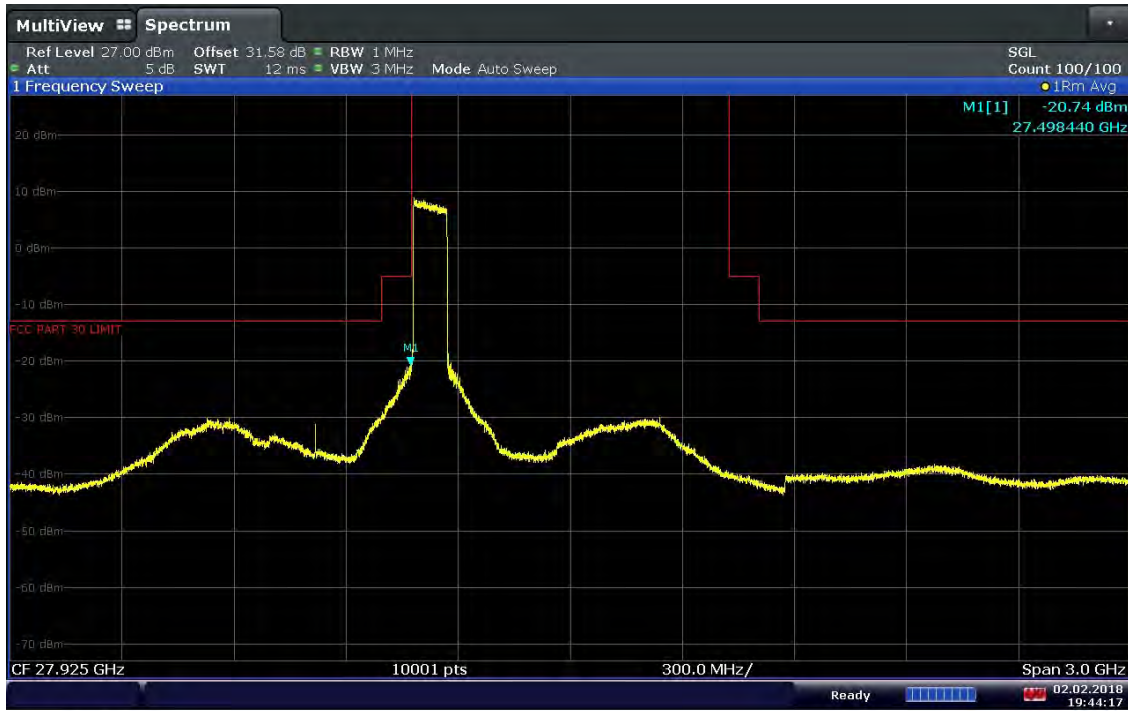
Plot 7-235. Band Edge Plot (1CC QPSK Low Channel)



19:42:48 02.02.2018

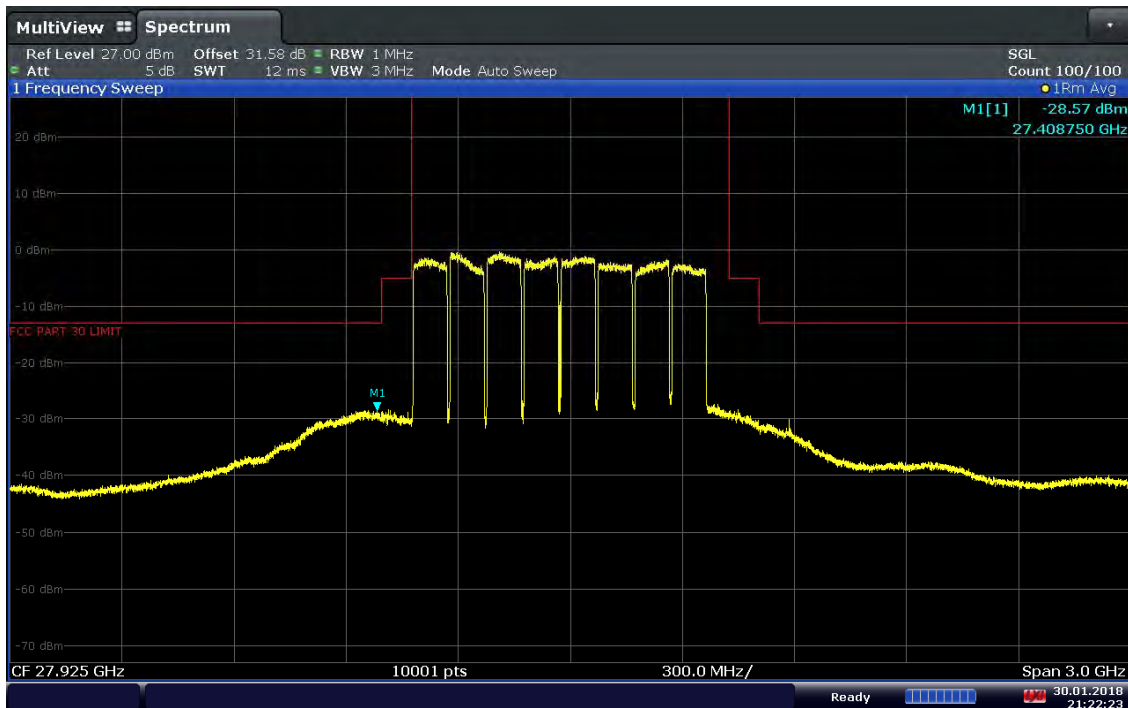
Plot 7-236. Band Edge Plot (1CC 16QAM Low Channel)

FCC ID: A3LSFG-AA100DC	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1712270338-01-R2.A3L	Test Dates: 1/2-2/3/2018	EUT Type: 5G Access Unit		Page 155 of 221



19:44:17 02.02.2018

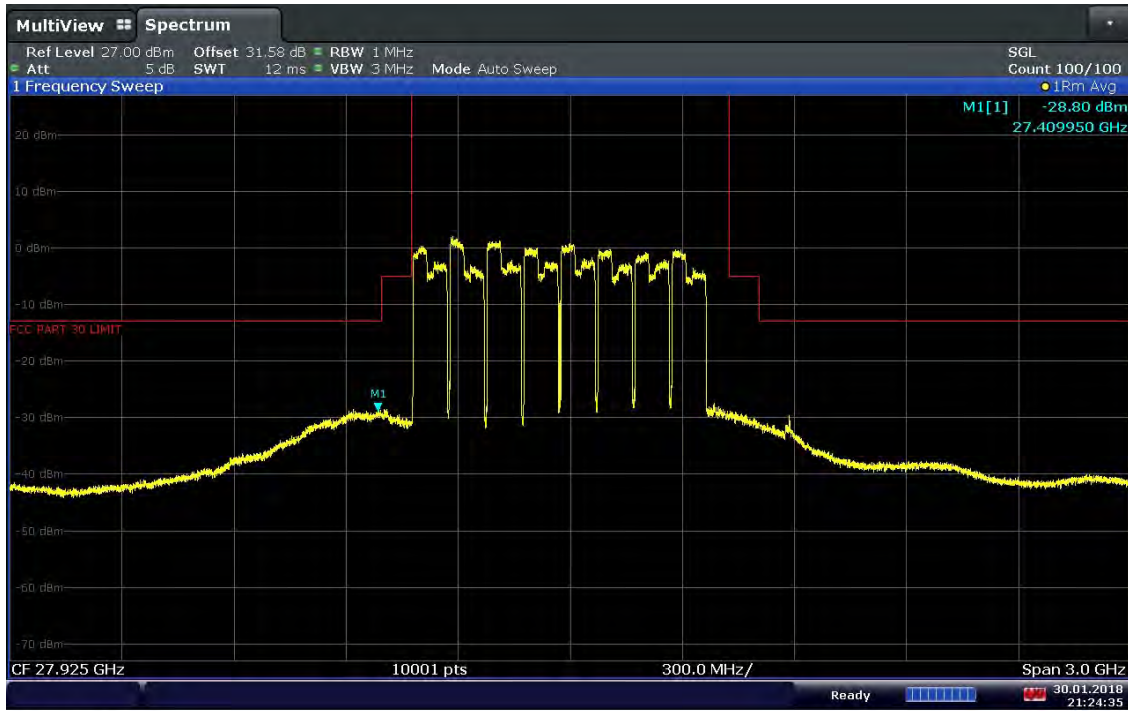
Plot 7-237. Band Edge Plot (1CC 64QAM Low Channel)



21:22:23 30.01.2018

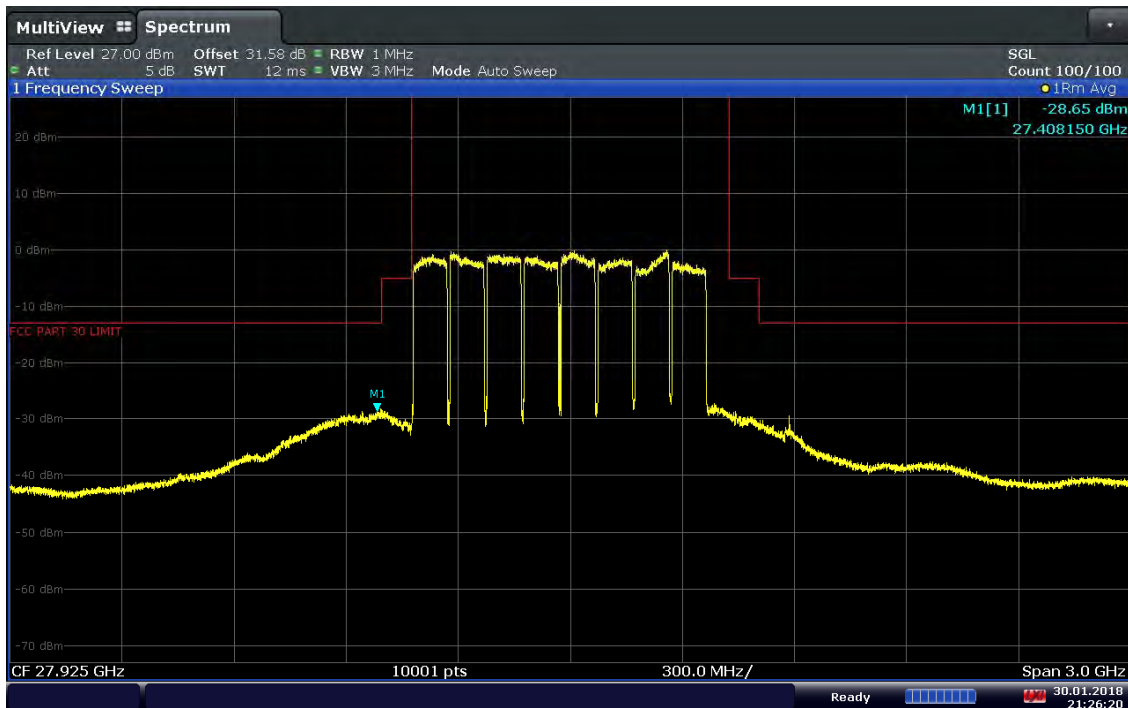
Plot 7-238. Band Edge Plot (8CC QPSK Low Channel)

FCC ID: A3LSFG-AA100DC	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1M1712270338-01-R2.A3L	Test Dates: 1/2-2/3/2018	EUT Type: 5G Access Unit	Page 156 of 221



21:24:35 30.01.2018

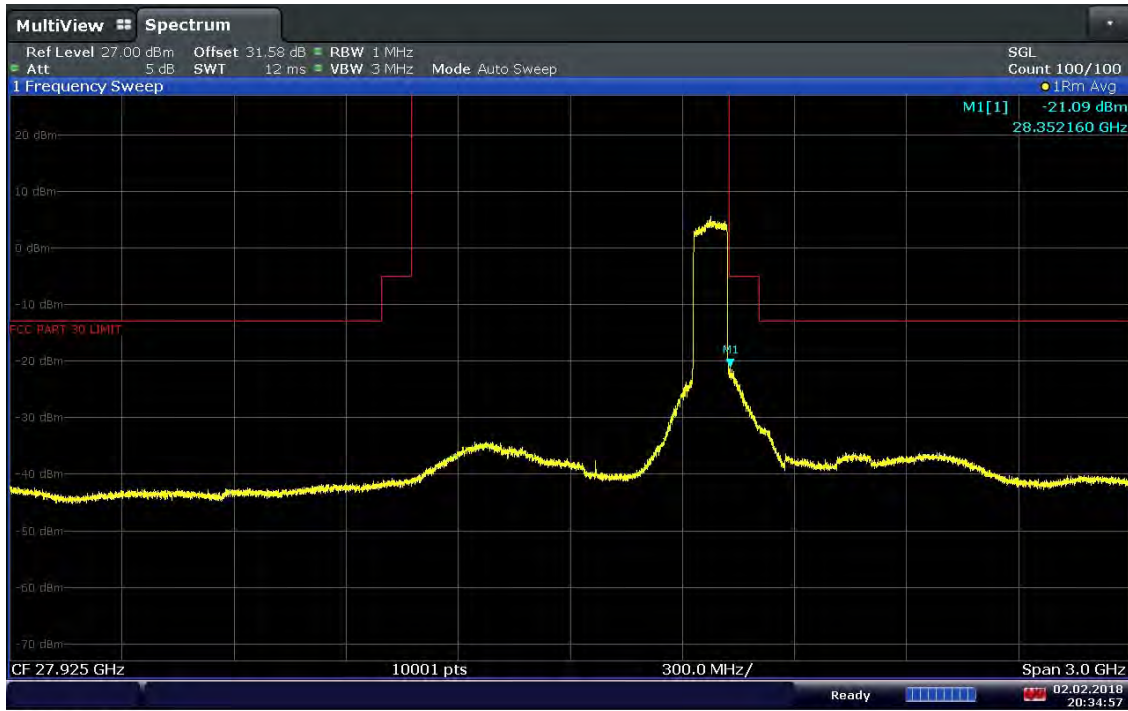
Plot 7-239. Band Edge Plot (8CC 16QAM Low Channel)



21:26:21 30.01.2018

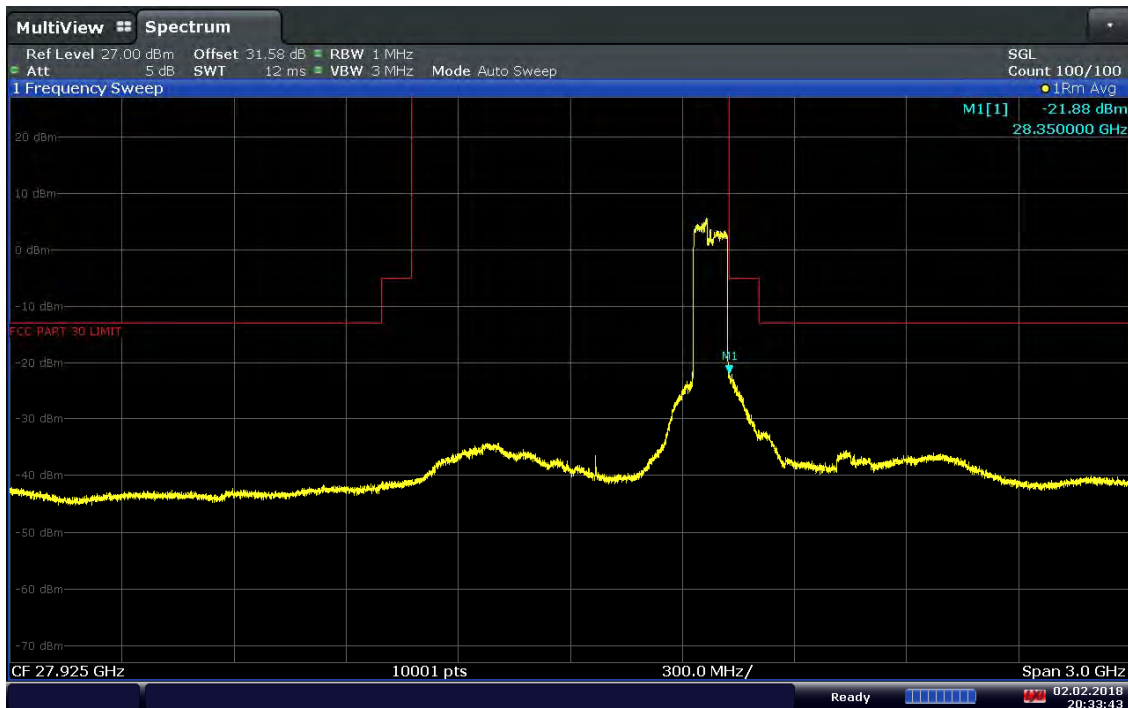
Plot 7-240. Band Edge Plot (8CC 64QAM Low Channel)

FCC ID: A3LSFG-AA100DC	MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1M1712270338-01-R2.A3L	Test Dates: 1/2-2/3/2018	EUT Type: 5G Access Unit		Page 157 of 221



20:34:57 02.02.2018

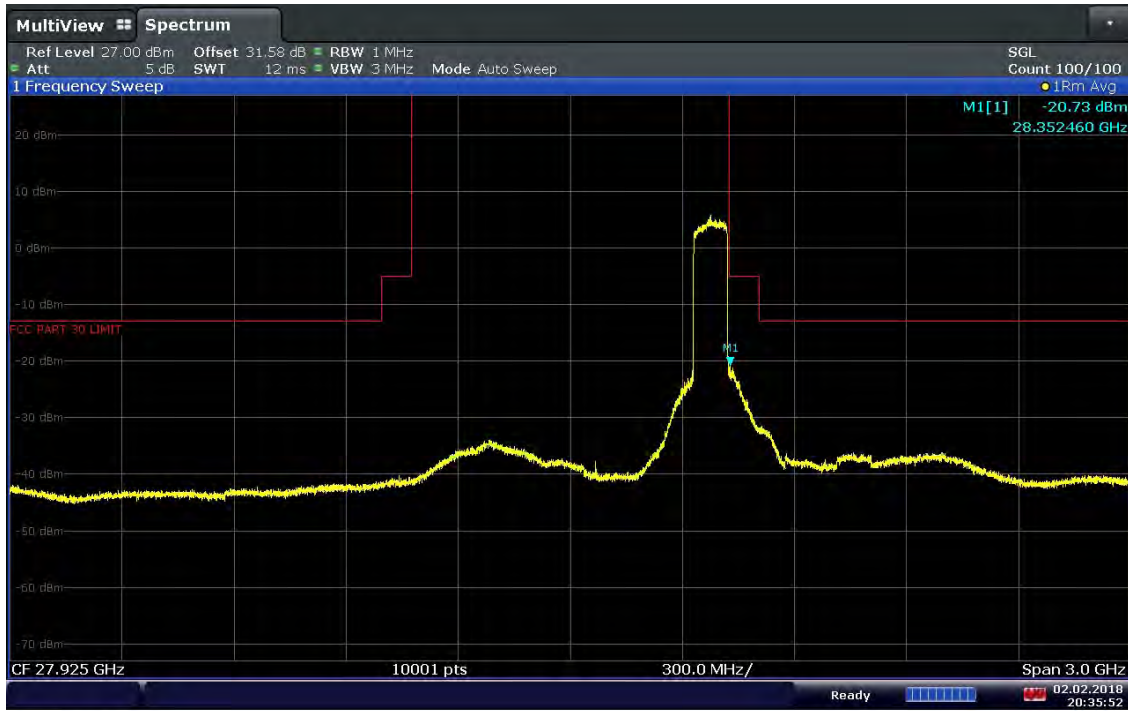
Plot 7-241. Band Edge Plot (1CC QPSK High Channel)



20:33:43 02.02.2018

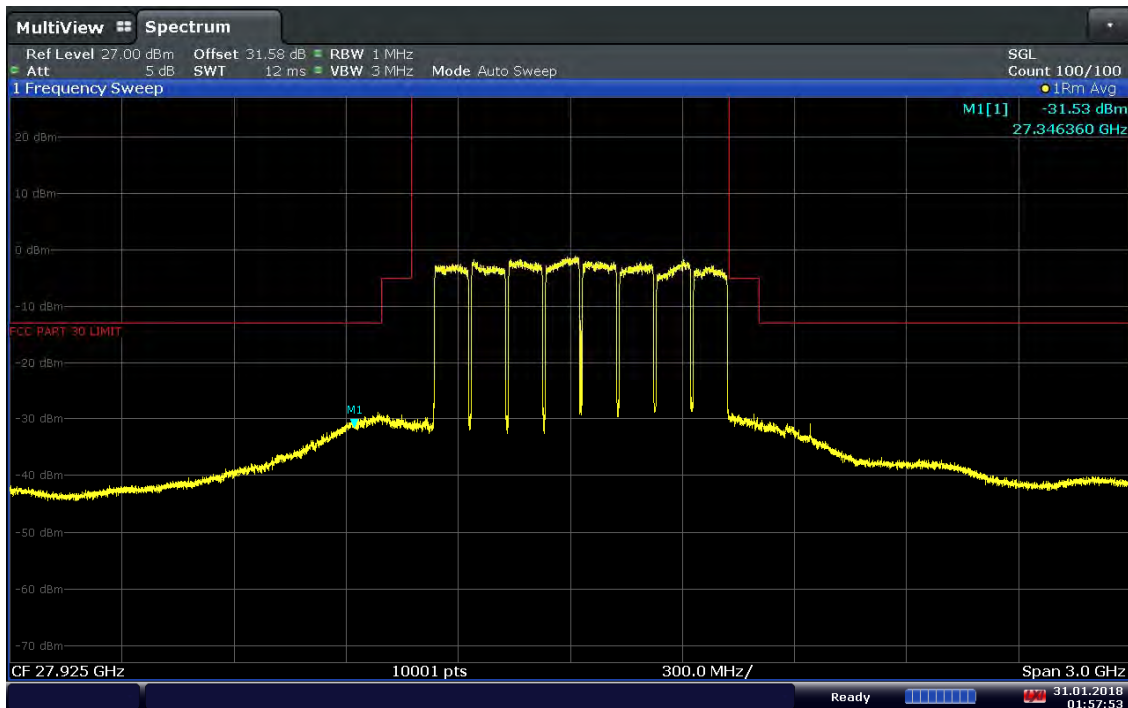
Plot 7-242. Band Edge Plot (1CC 16QAM High Channel)

FCC ID: A3LSFG-AA100DC	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
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20:35:53 02.02.2018

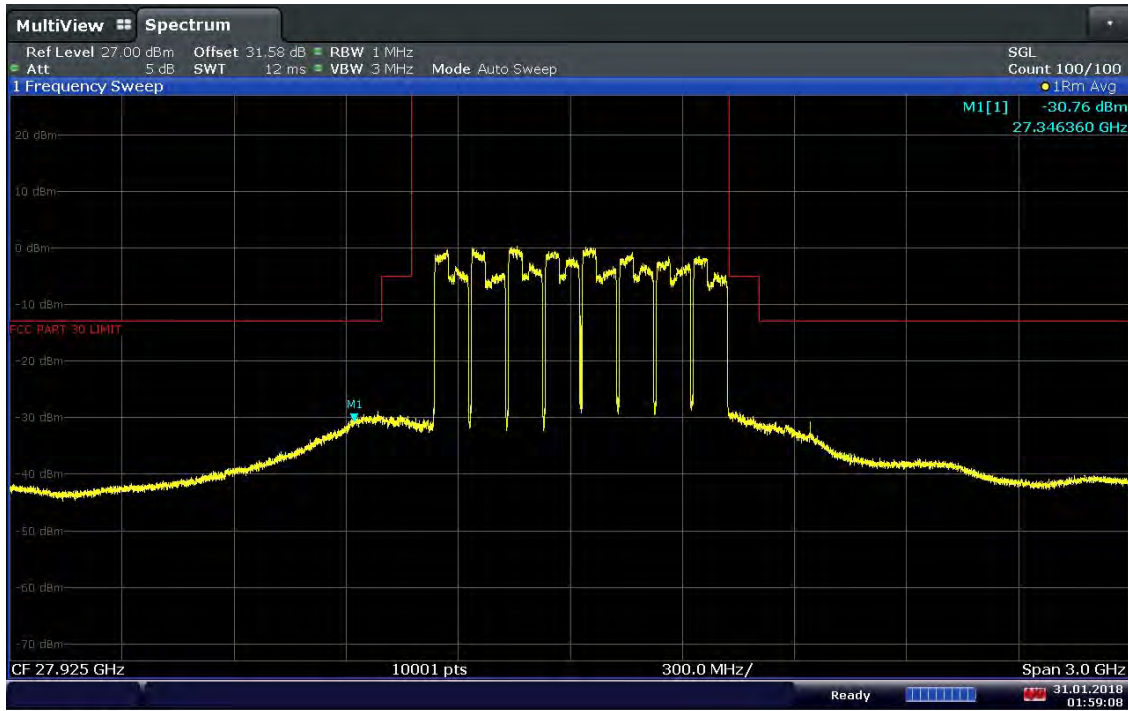
Plot 7-243. Band Edge Plot (1CC 64QAM High Channel)



01:57:54 31.01.2018

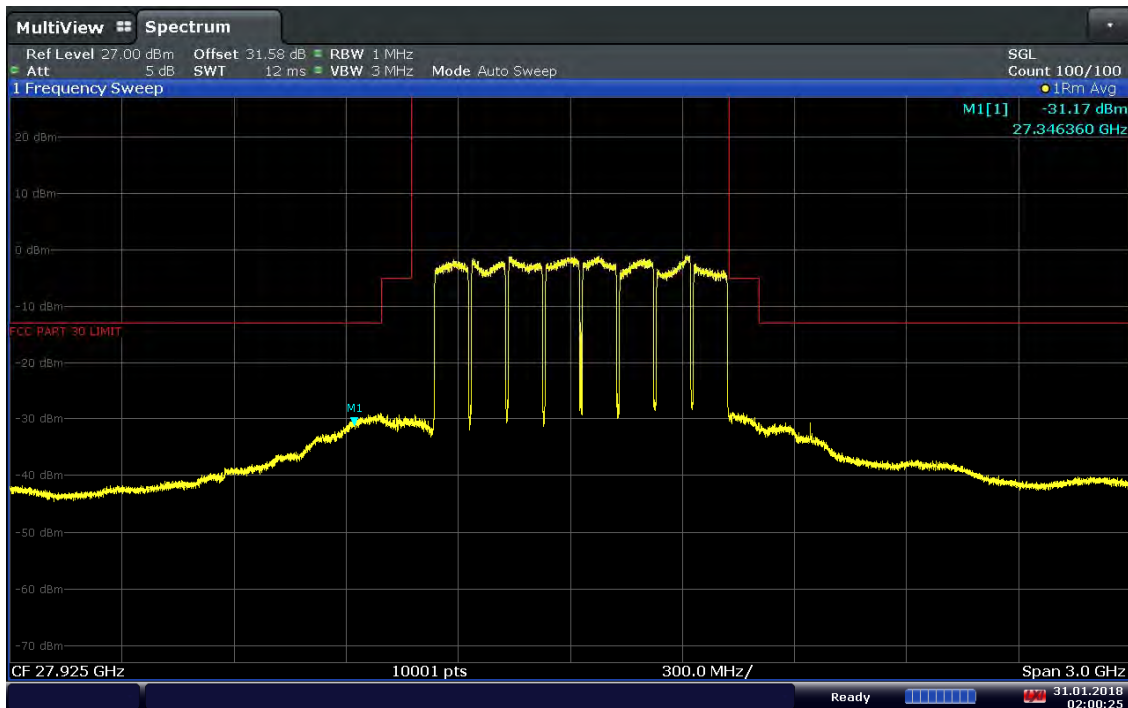
Plot 7-244. Band Edge Plot (8CC QPSK High Channel)

FCC ID: A3LSFG-AA100DC	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1712270338-01-R2.A3L	Test Dates: 1/2-2/3/2018	EUT Type: 5G Access Unit		Page 159 of 221



01:59:09 31.01.2018

Plot 7-245. Band Edge Plot (8CC 16QAM High Channel)

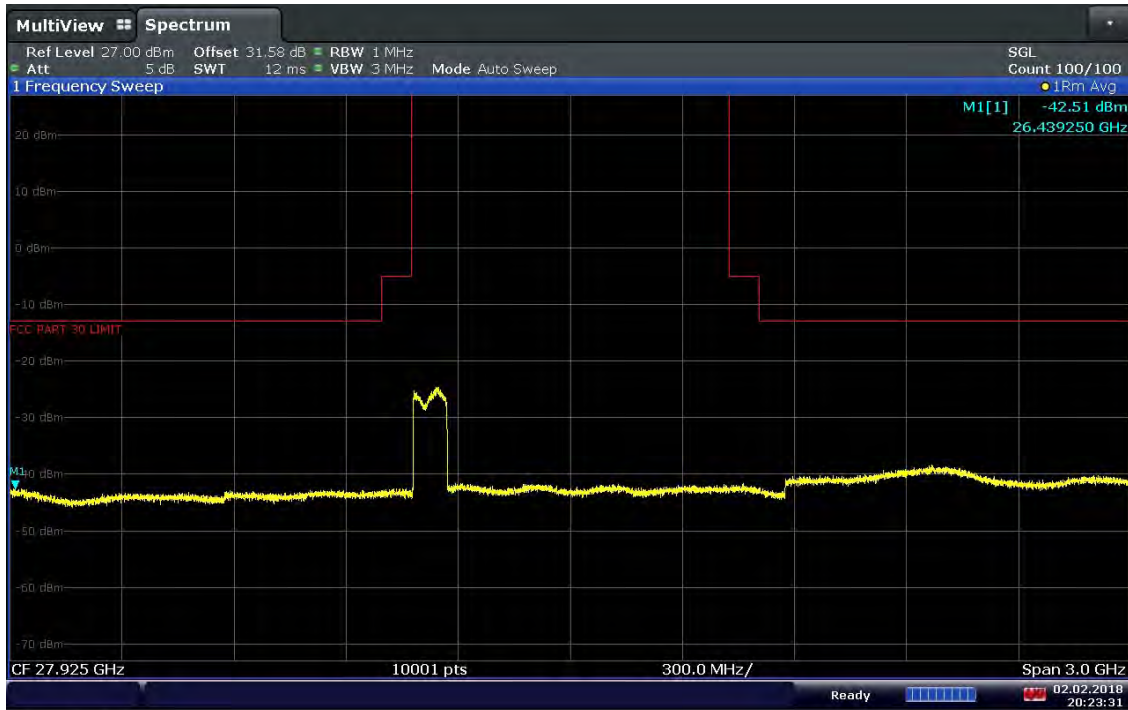


02:00:26 31.01.2018

Plot 7-246. Band Edge Plot (8CC 64QAM High Channel)

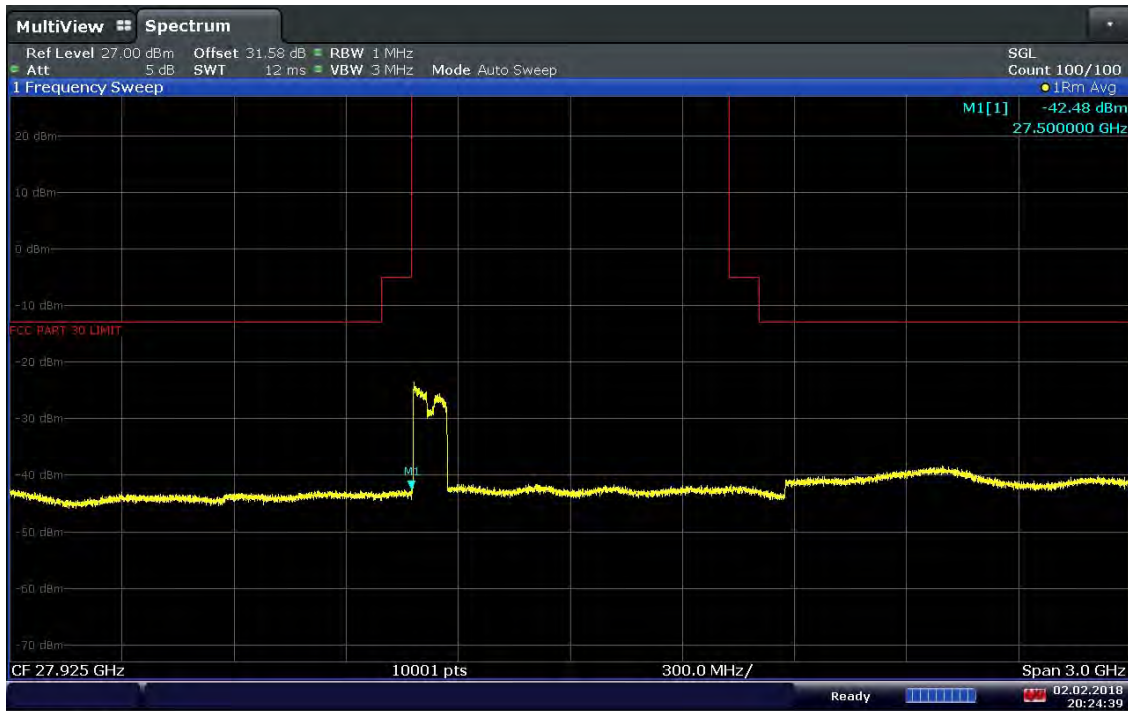
FCC ID: A3LSFG-AA100DC	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
Test Report S/N: 1M1712270338-01-R2.A3L	Test Dates: 1/2-2/3/2018	EUT Type: 5G Access Unit	Page 160 of 221

7.6.3 Antenna B Conducted Band Edge Maximized on Antenna A



20:23:32 02.02.2018

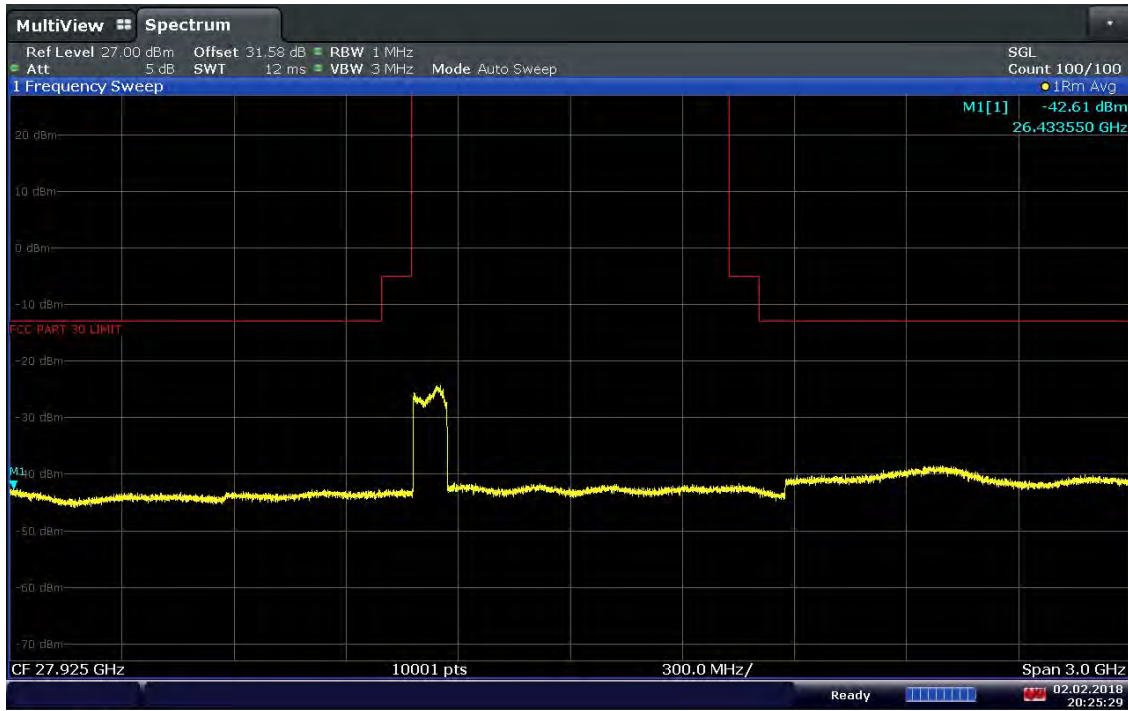
Plot 7-247. Band Edge Plot (1CC QPSK Low Channel)



20:24:40 02.02.2018

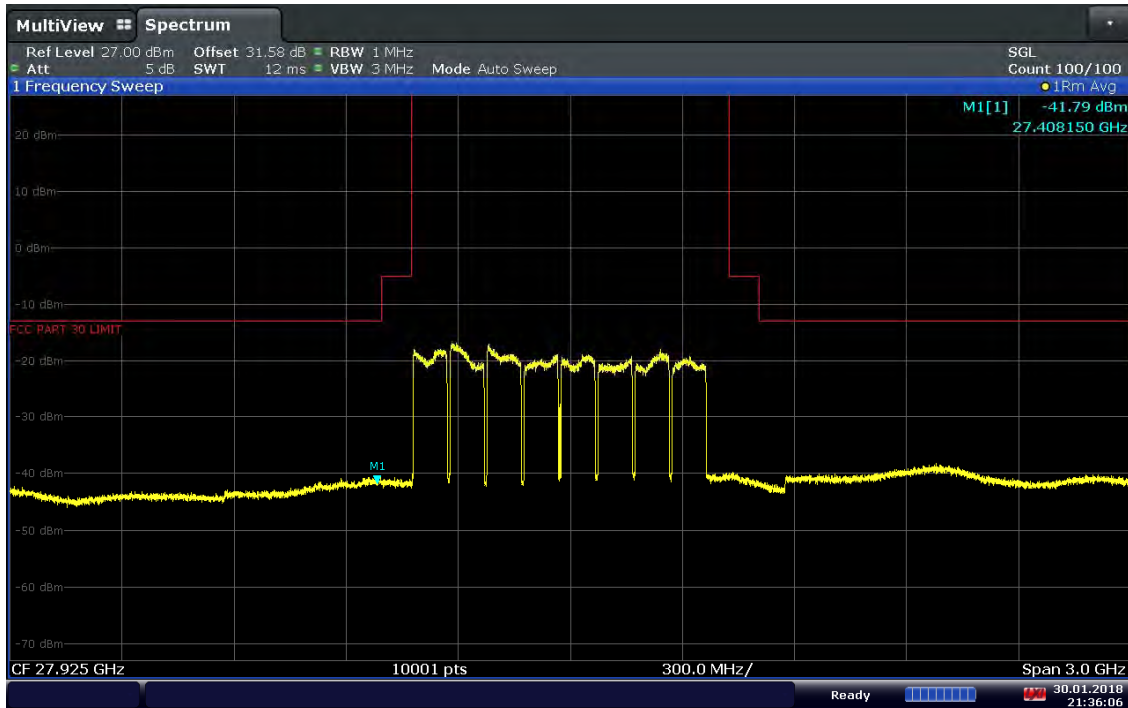
Plot 7-248. Band Edge Plot (1CC 16QAM Low Channel)

FCC ID: A3LSFG-AA100DC	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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20:25:30 02.02.2018

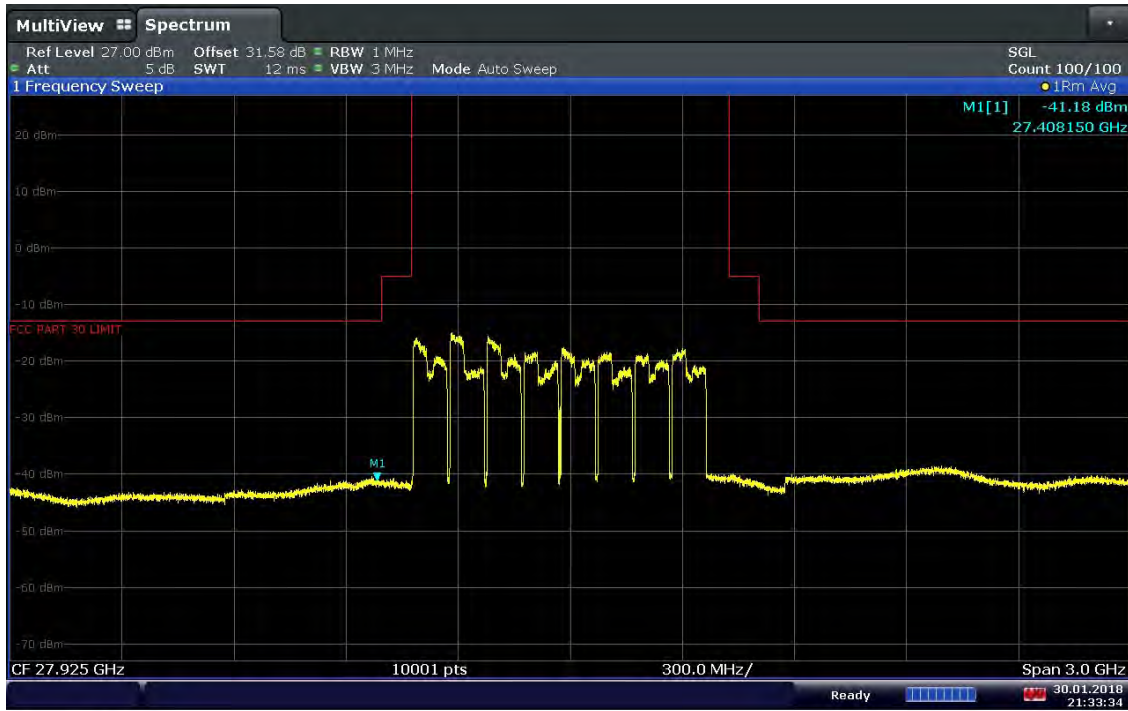
Plot 7-249. Band Edge Plot (1CC 64QAM Low Channel)



21:36:07 30.01.2018

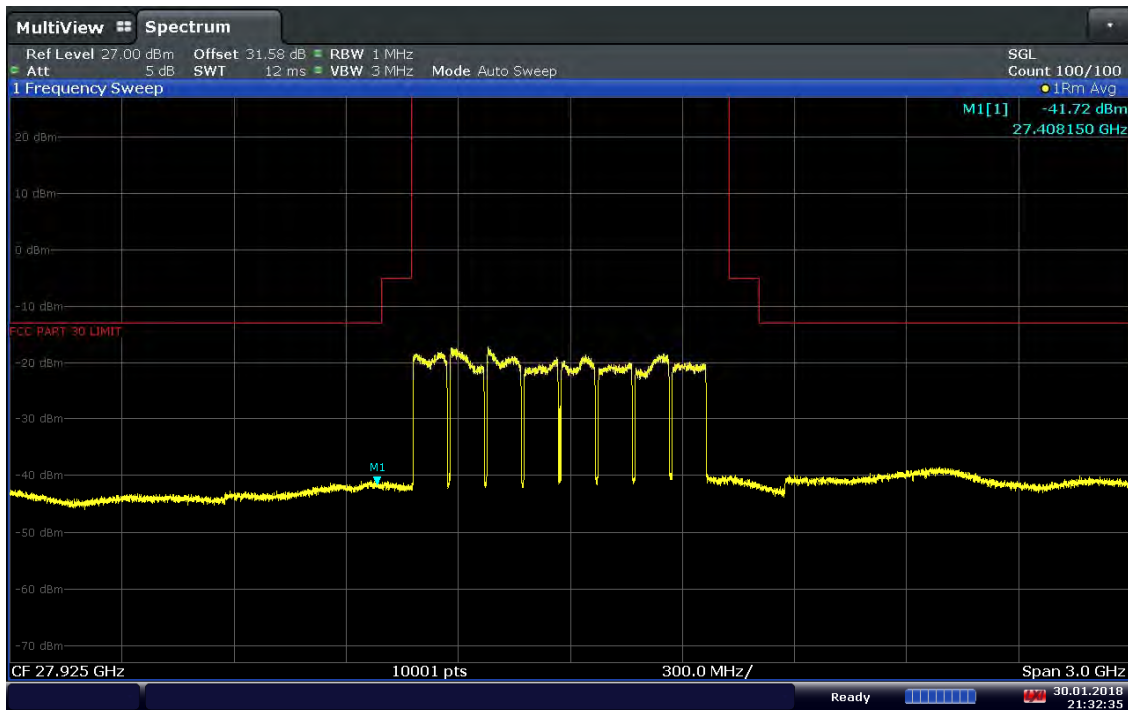
Plot 7-250. Band Edge Plot (8CC QPSK Low Channel)

FCC ID: A3LSFG-AA100DC	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1712270338-01-R2.A3L	Test Dates: 1/2-2/3/2018	EUT Type: 5G Access Unit		Page 162 of 221



21:33:34 30.01.2018

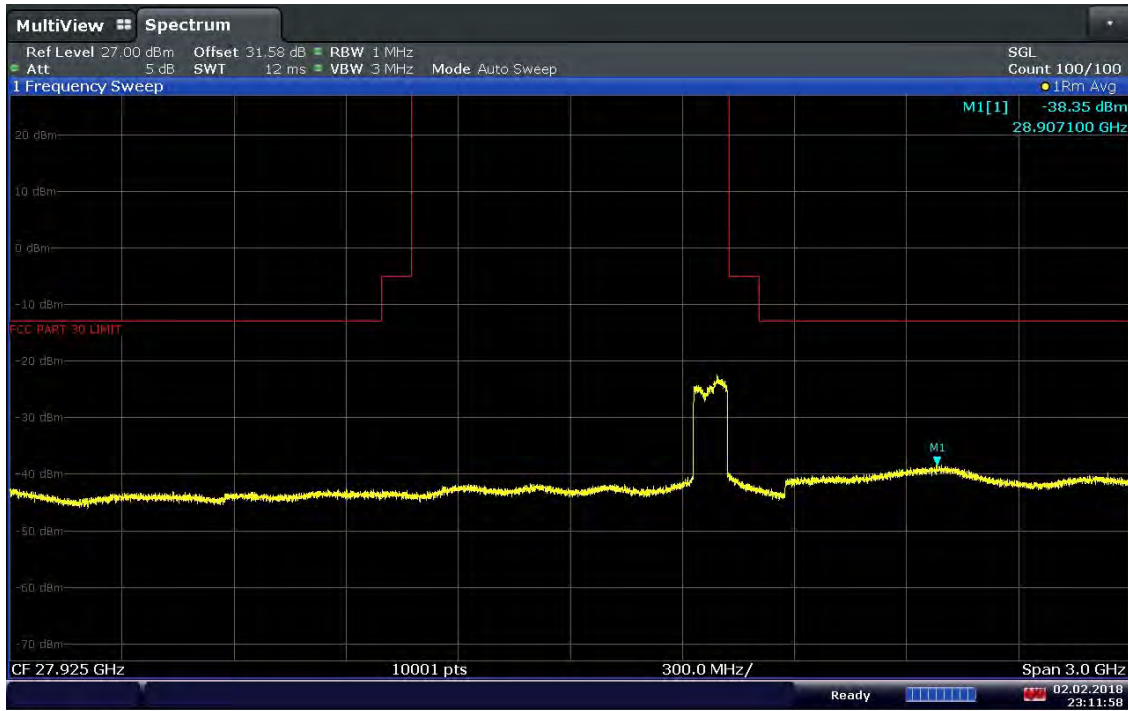
Plot 7-251. Band Edge Plot (8CC 16QAM Low Channel)



21:32:36 30.01.2018

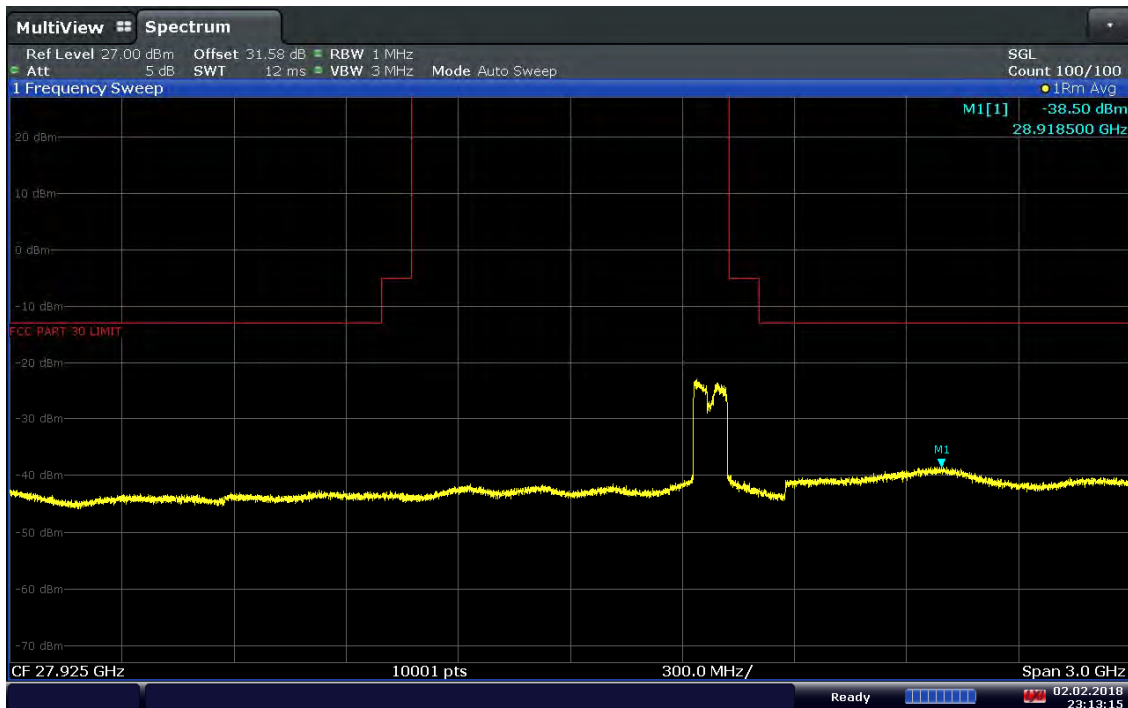
Plot 7-252. Band Edge Plot (8CC 64QAM Low Channel)

FCC ID: A3LSFG-AA100DC	MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1M1712270338-01-R2.A3L	Test Dates: 1/2-2/3/2018	EUT Type: 5G Access Unit		Page 163 of 221



23:11:58 02.02.2018

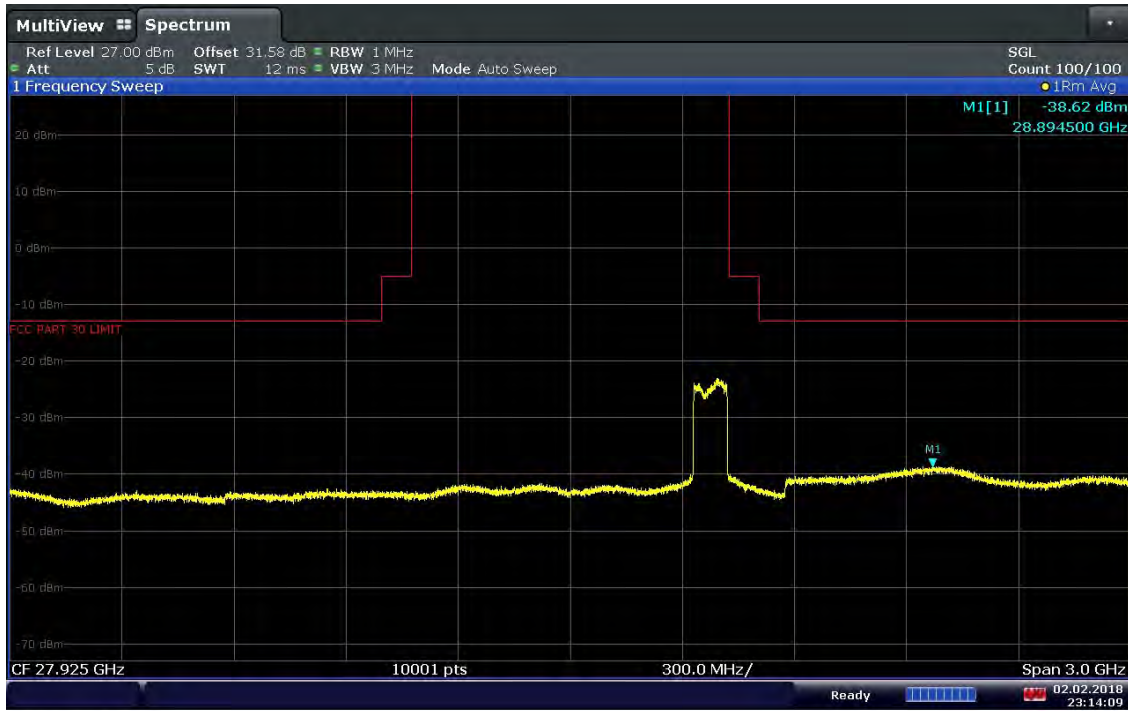
Plot 7-253. Band Edge Plot (1CC QPSK High Channel)



23:13:15 02.02.2018

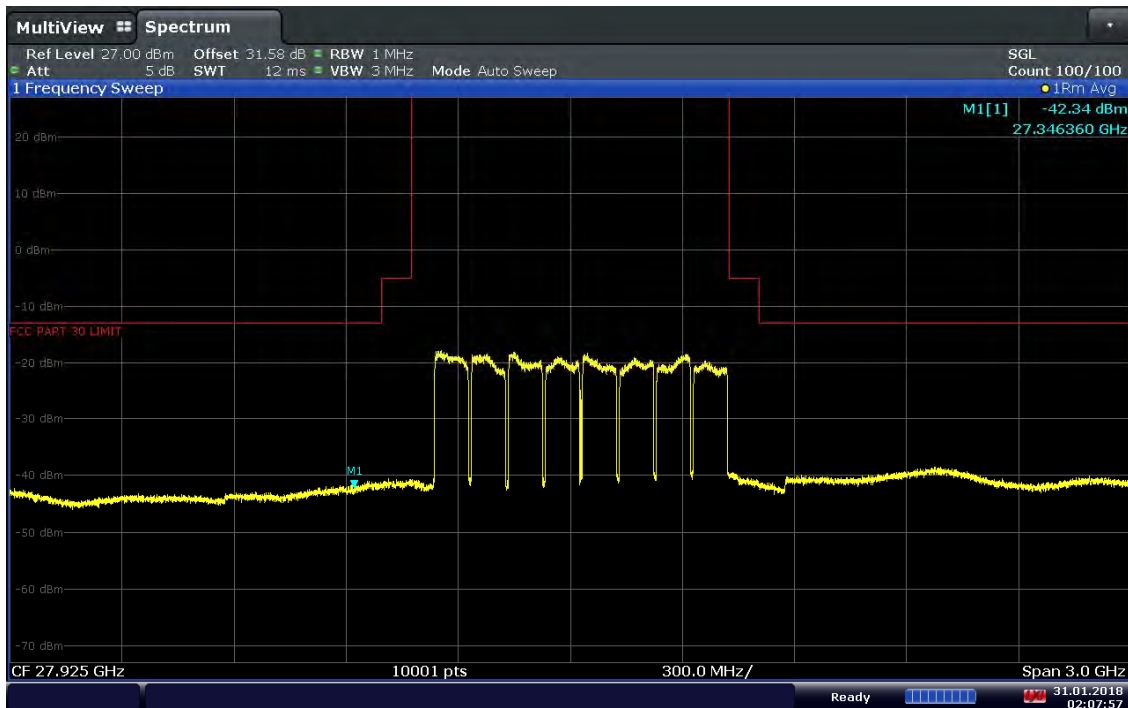
Plot 7-254. Band Edge Plot (1CC 16QAM High Channel)

FCC ID: A3LSFG-AA100DC	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
Test Report S/N: 1M1712270338-01-R2.A3L	Test Dates: 1/2-2/3/2018	EUT Type: 5G Access Unit	Page 164 of 221



23:14:09 02.02.2018

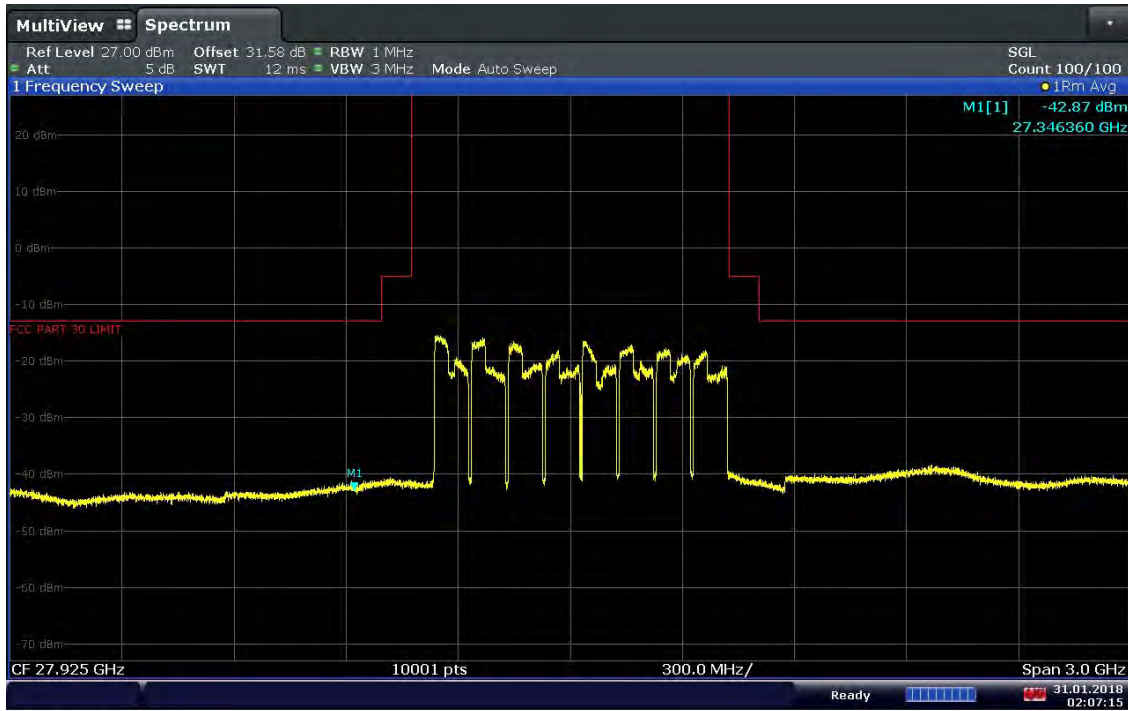
Plot 7-255. Band Edge Plot (1CC 64QAM High Channel)



02:07:58 31.01.2018

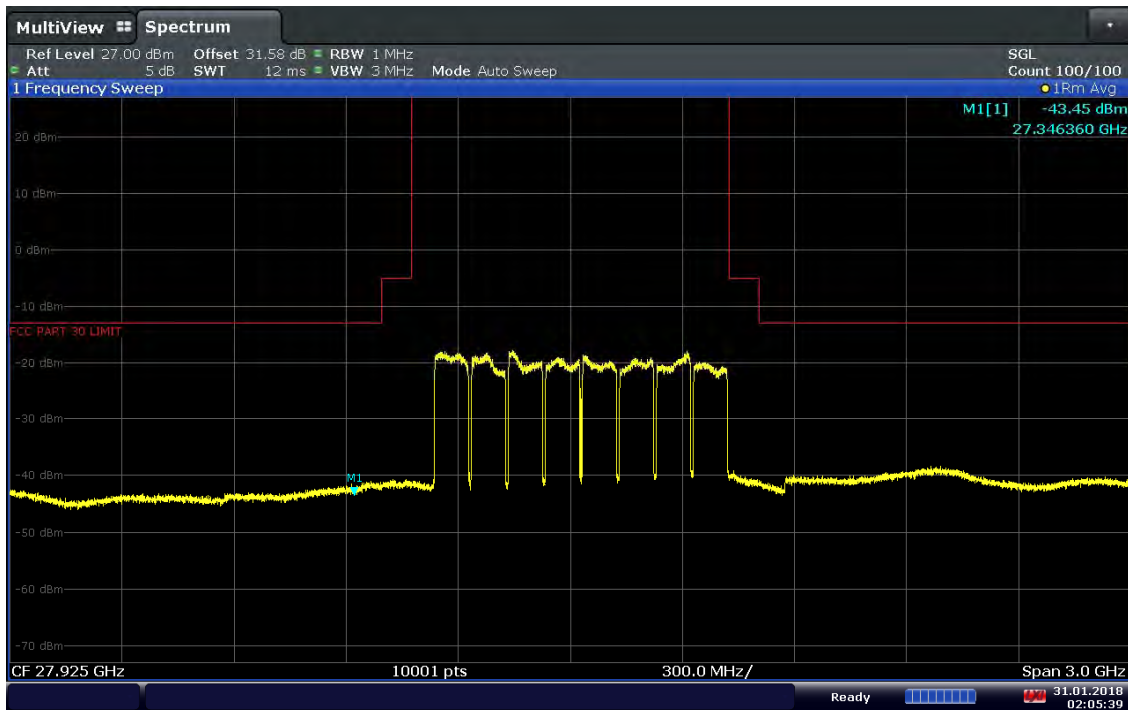
Plot 7-256. Band Edge Plot (8CC QPSK High Channel)

FCC ID: A3LSFG-AA100DC	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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02:07:15 31.01.2018

Plot 7-257. Band Edge Plot (8CC 16QAM High Channel)

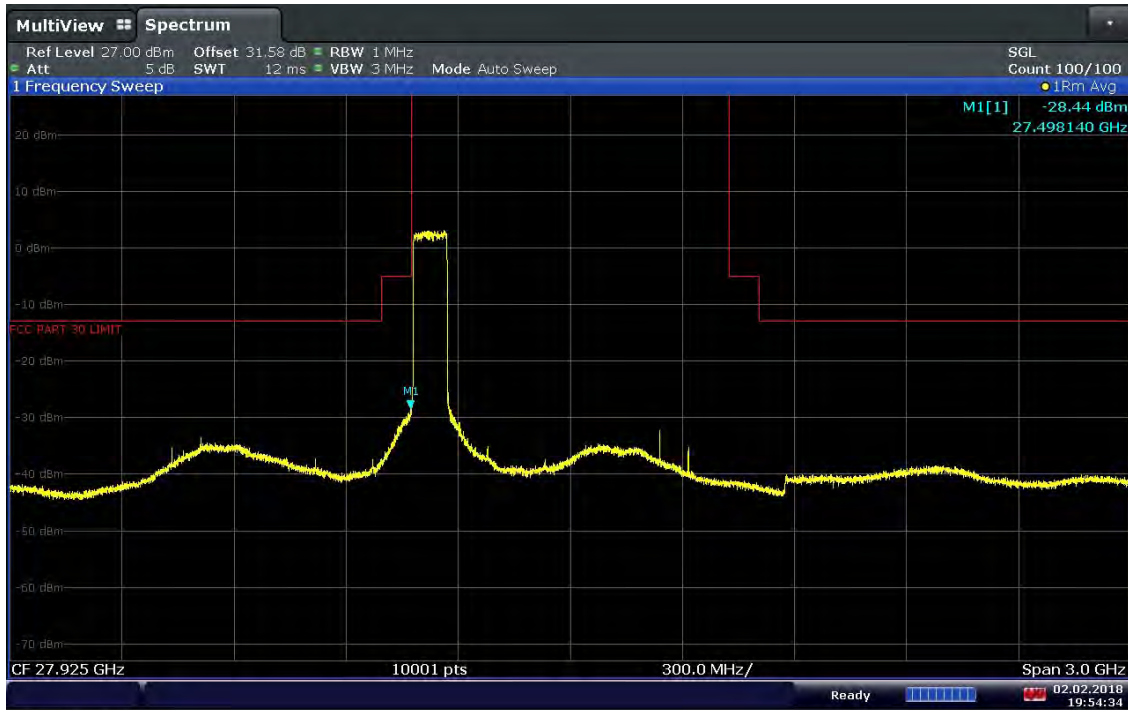


02:05:39 31.01.2018

Plot 7-258. Band Edge Plot (8CC 64QAM High Channel)

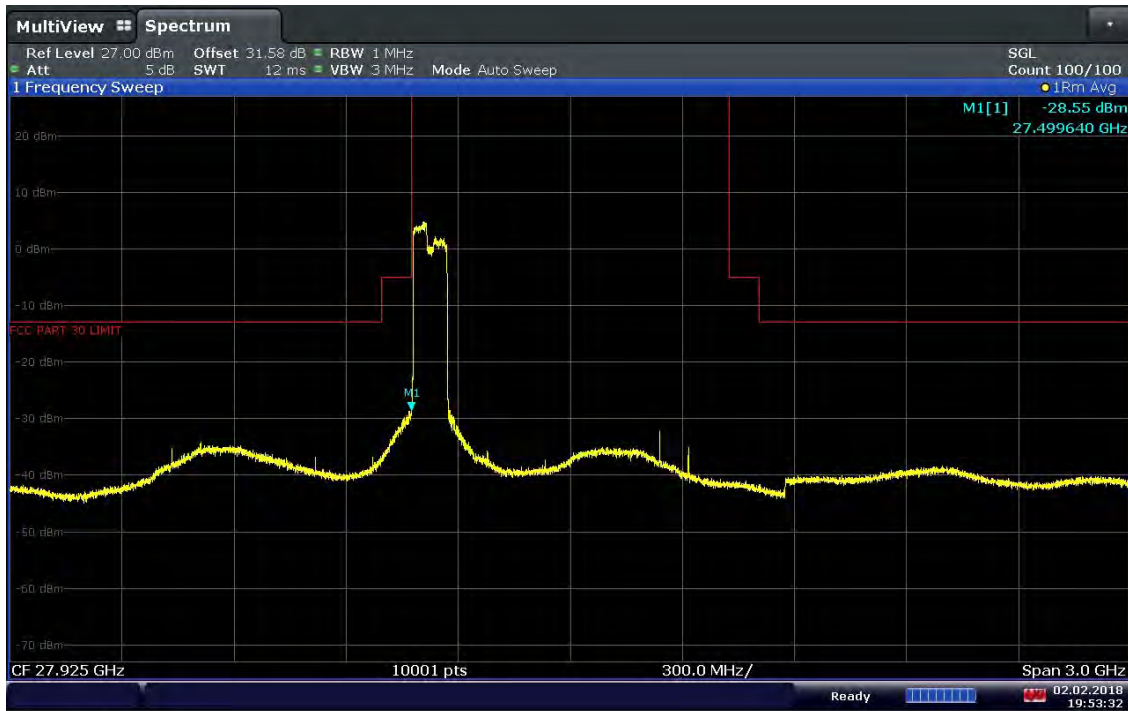
FCC ID: A3LSFG-AA100DC	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1712270338-01-R2.A3L	Test Dates: 1/2-2/3/2018	EUT Type: 5G Access Unit		Page 166 of 221

7.6.4 Antenna C Conducted Band Edge Maximized on Antenna A



19:54:35 02.02.2018

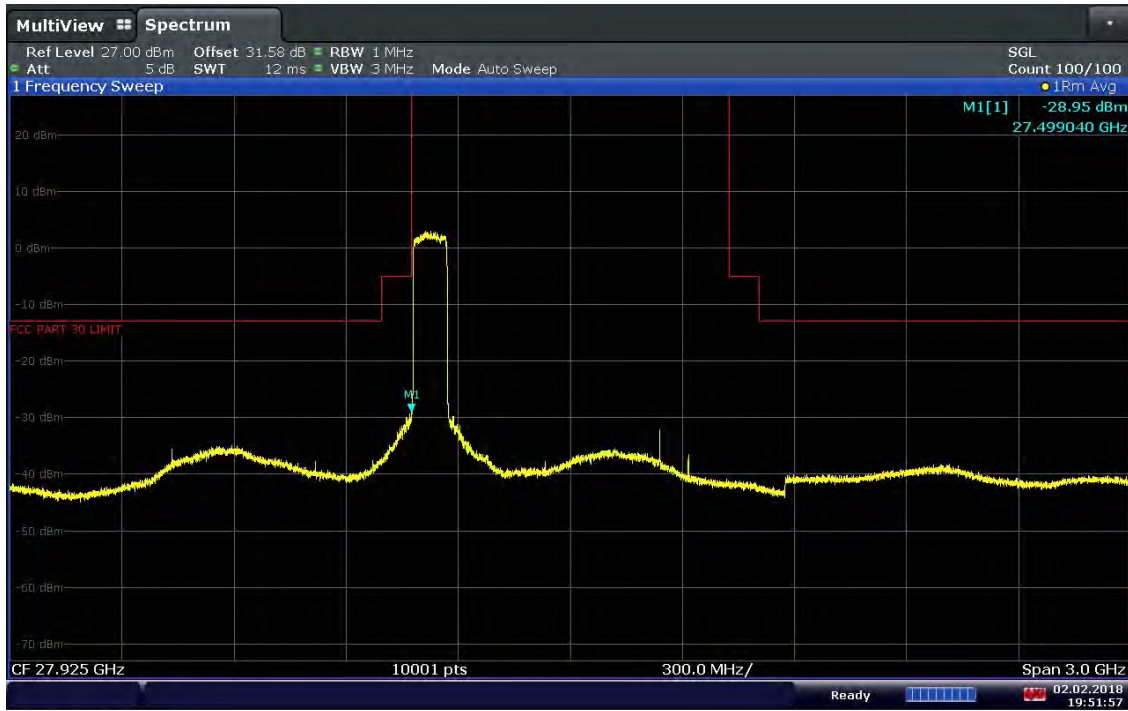
Plot 7-259. Band Edge Plot (1CC QPSK Low Channel)



19:53:32 02.02.2018

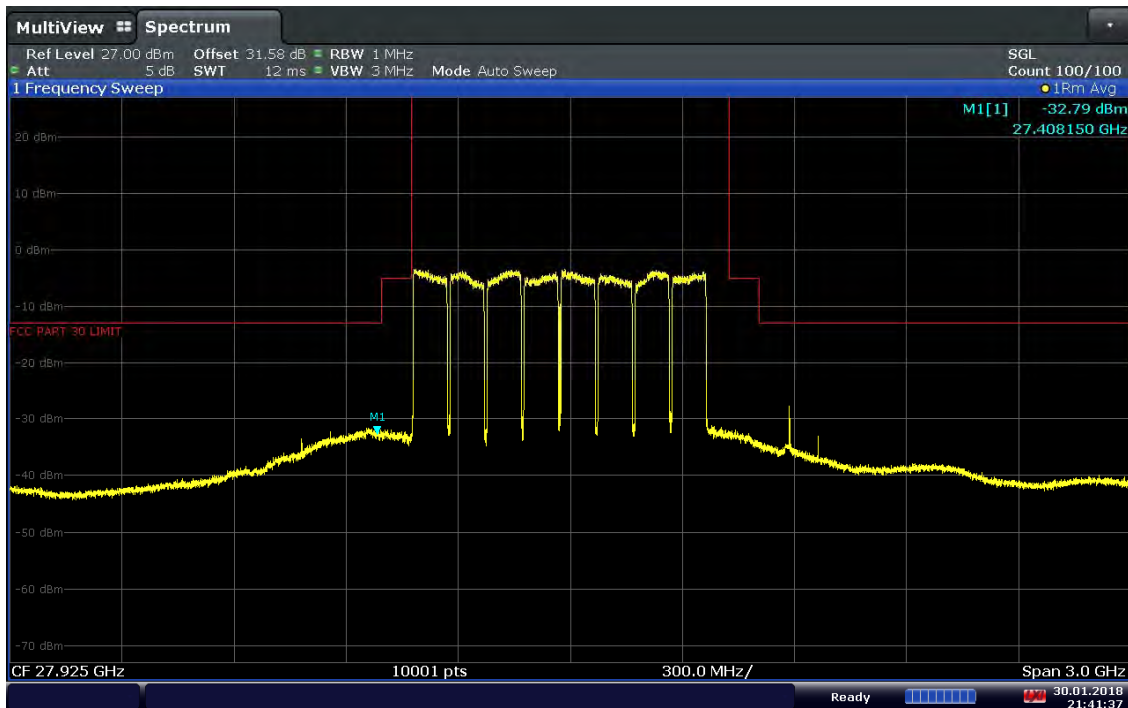
Plot 7-260. Band Edge Plot (1CC 16QAM Low Channel)

FCC ID: A3LSFG-AA100DC	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1712270338-01-R2.A3L	Test Dates: 1/2-2/3/2018	EUT Type: 5G Access Unit		Page 167 of 221



19:51:58 02.02.2018

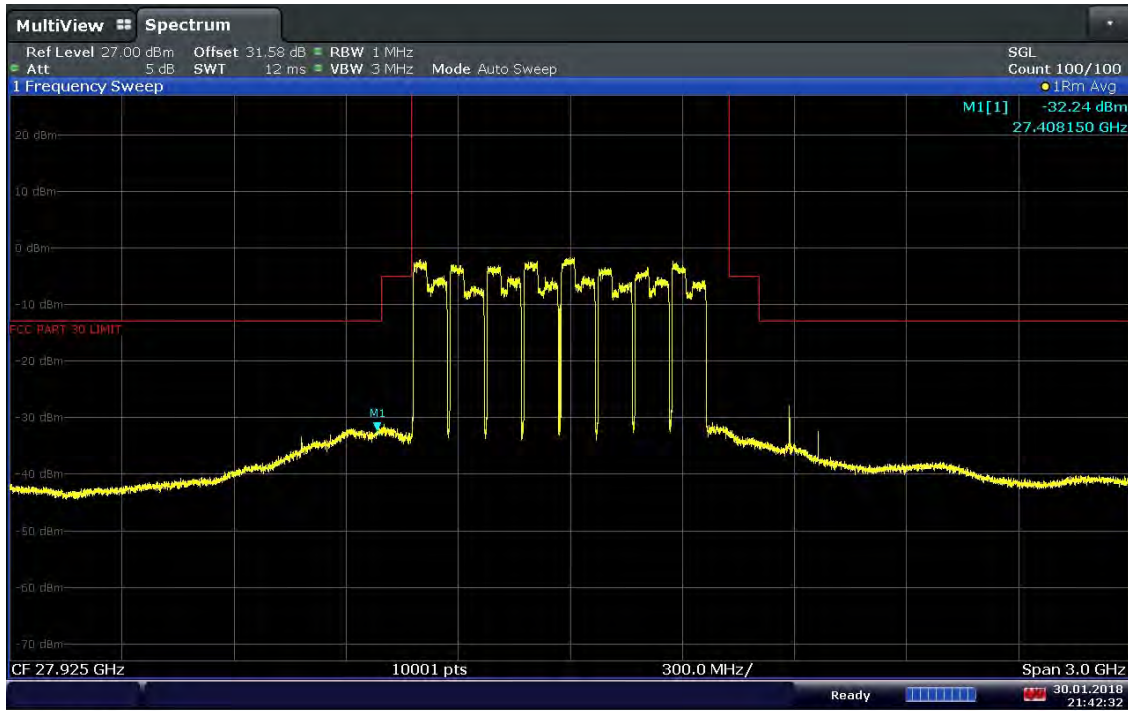
Plot 7-261. Band Edge Plot (1CC 64QAM Low Channel)



21:41:38 30.01.2018

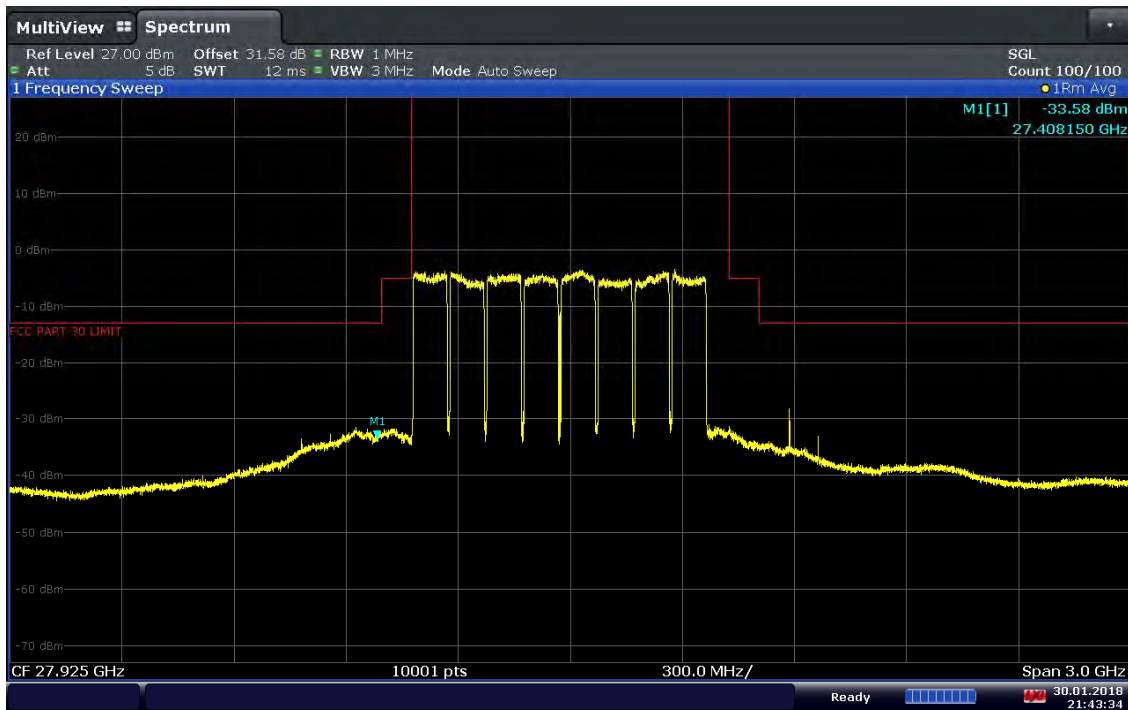
Plot 7-262. Band Edge Plot (8CC QPSK Low Channel)

FCC ID: A3LSFG-AA100DC	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1712270338-01-R2.A3L	Test Dates: 1/2-2/3/2018	EUT Type: 5G Access Unit		Page 168 of 221



21:42:32 30.01.2018

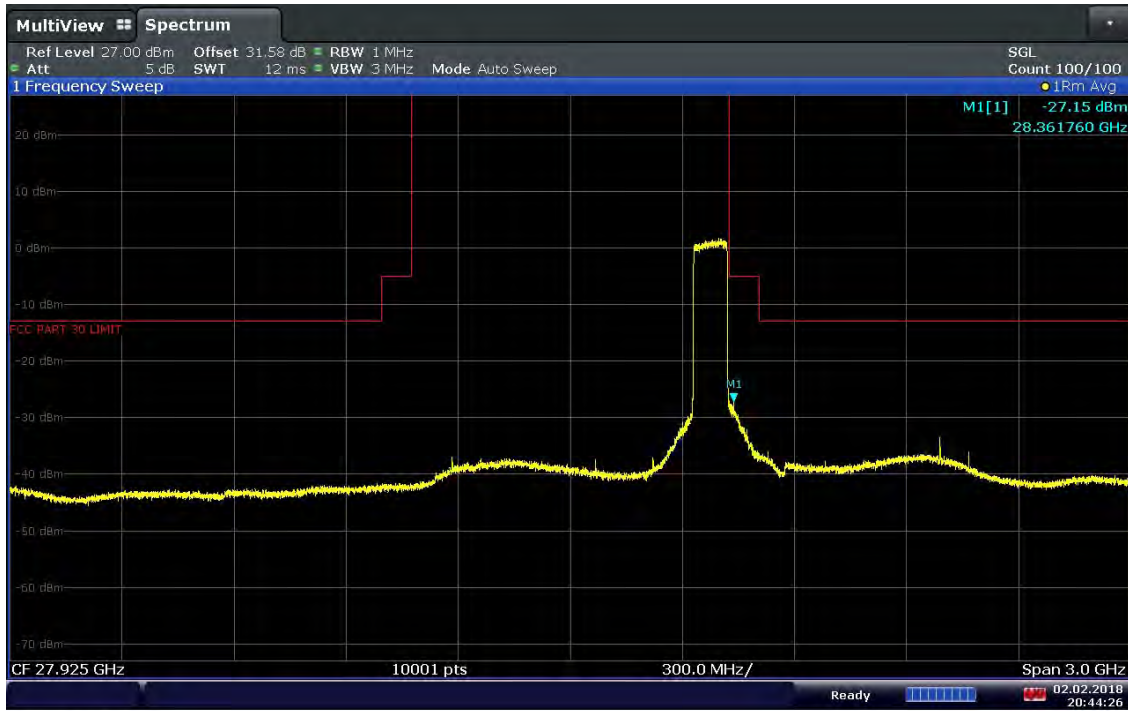
Plot 7-263. Band Edge Plot (8CC 16QAM Low Channel)



21:43:34 30.01.2018

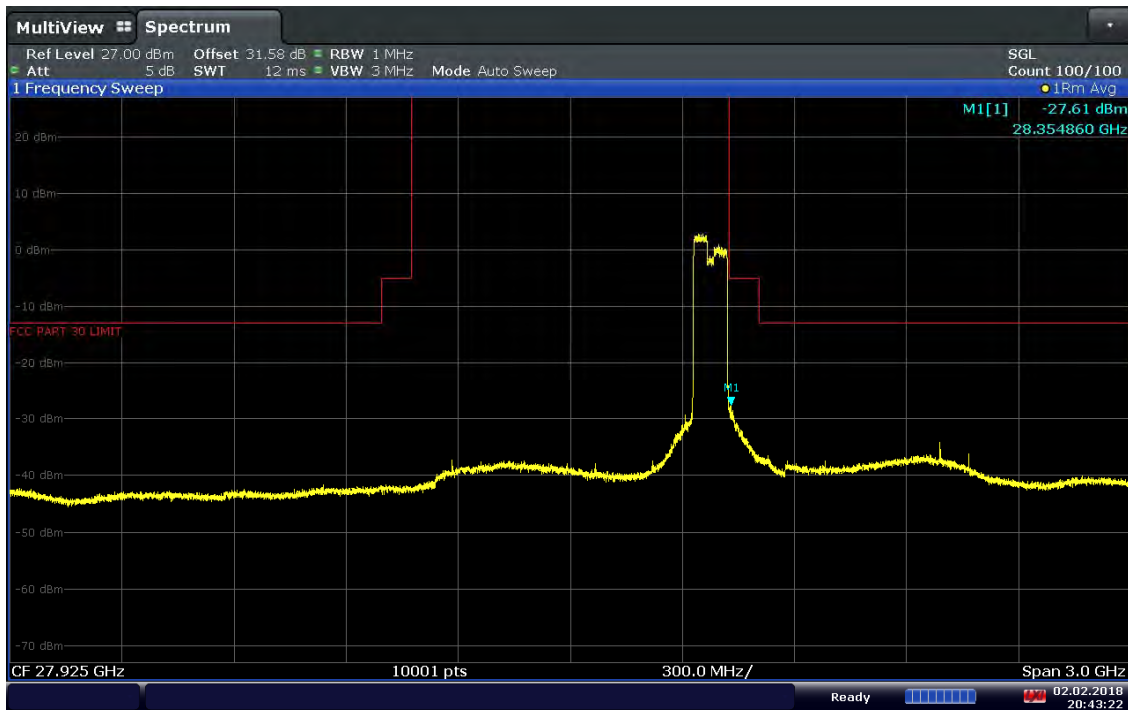
Plot 7-264. Band Edge Plot (8CC 64QAM Low Channel)

FCC ID: A3LSFG-AA100DC	MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1M1712270338-01-R2.A3L	Test Dates: 1/2-2/3/2018	EUT Type: 5G Access Unit		Page 169 of 221



20:44:27 02.02.2018

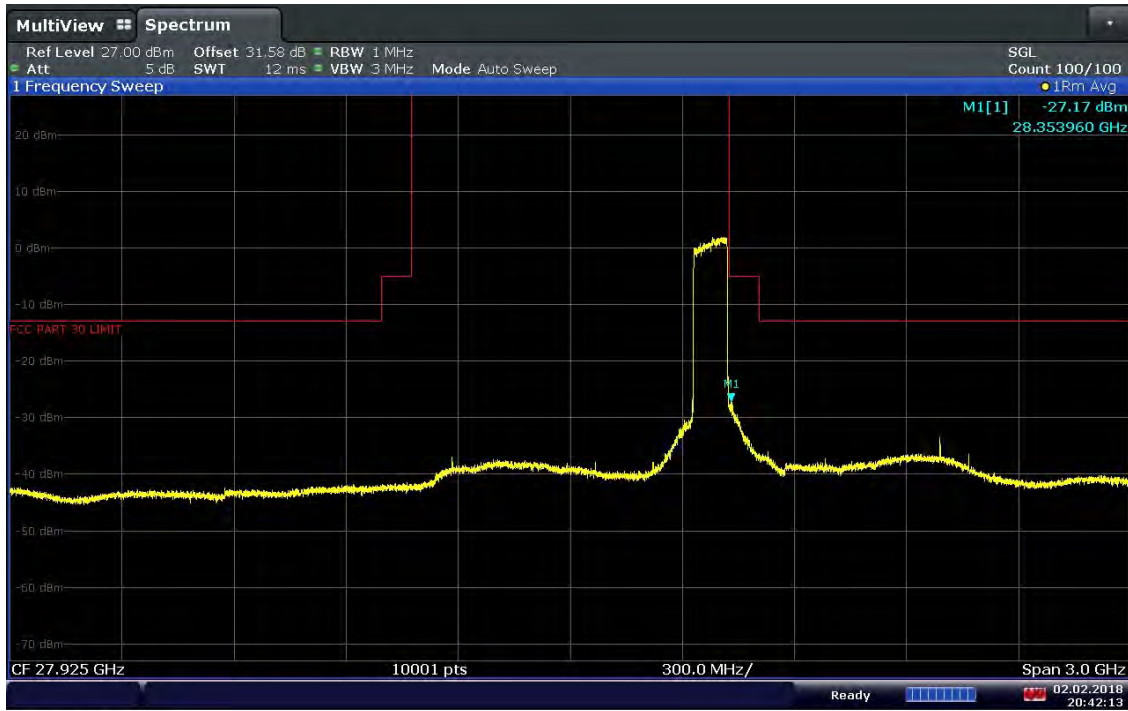
Plot 7-265. Band Edge Plot (1CC QPSK High Channel)



20:43:22 02.02.2018

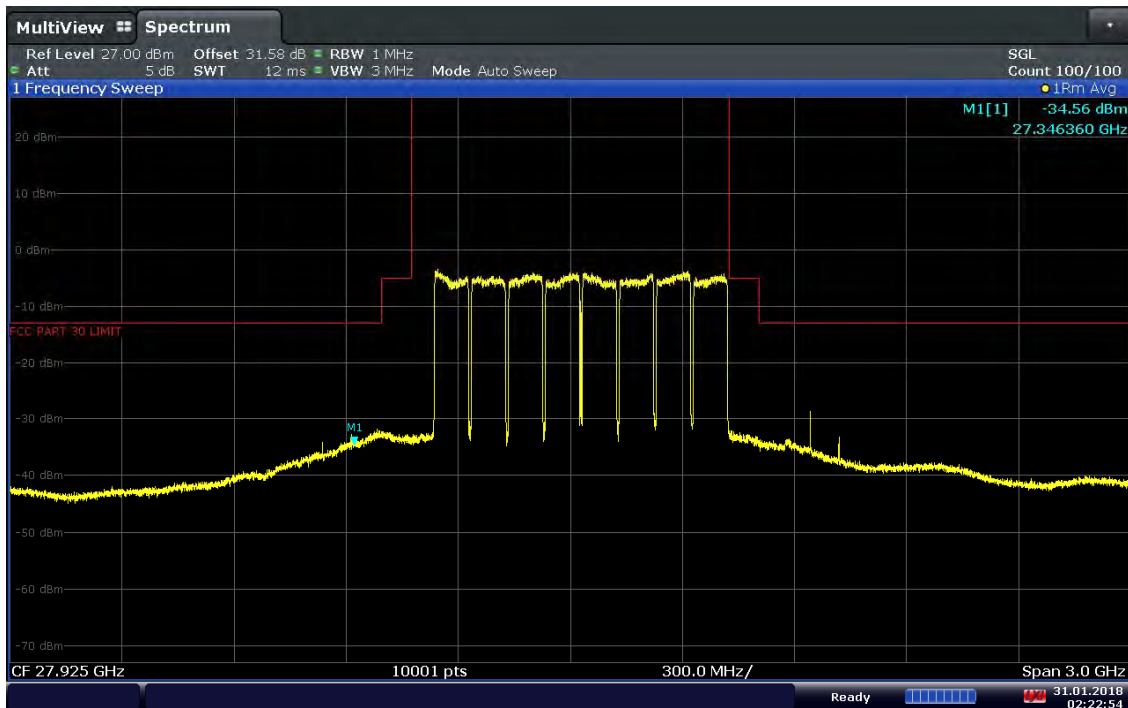
Plot 7-266. Band Edge Plot (1CC 16QAM High Channel)

FCC ID: A3LSFG-AA100DC	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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20:42:13 02.02.2018

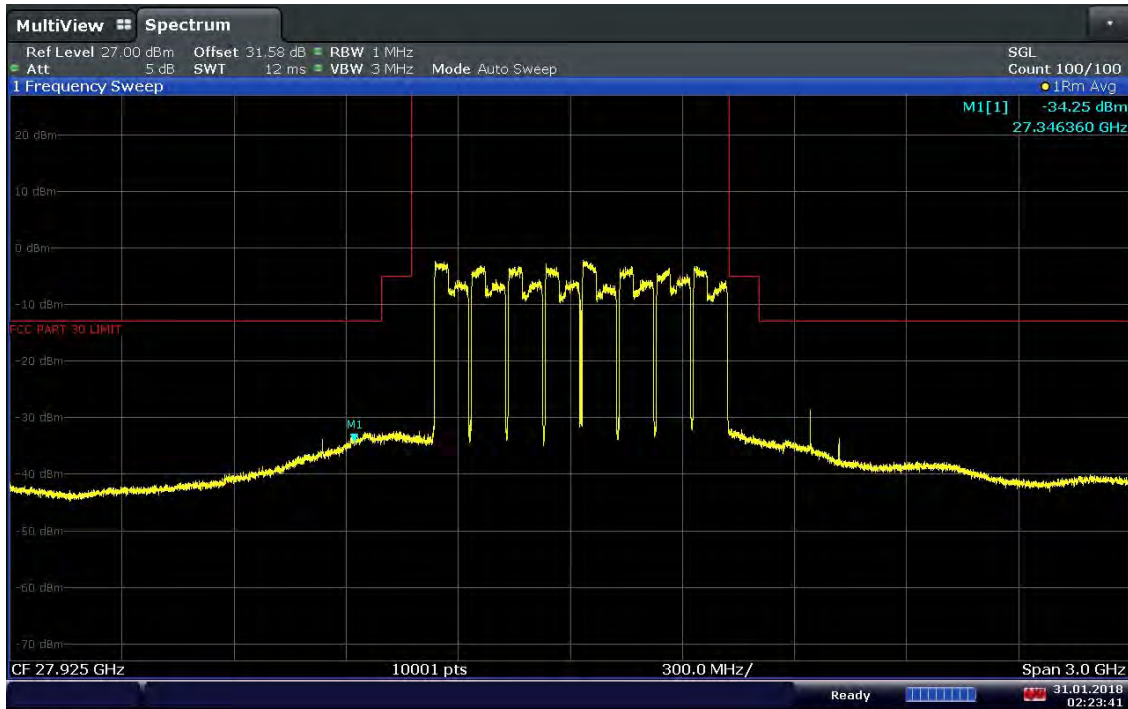
Plot 7-267. Band Edge Plot (1CC 64QAM High Channel)



02:22:54 31.01.2018

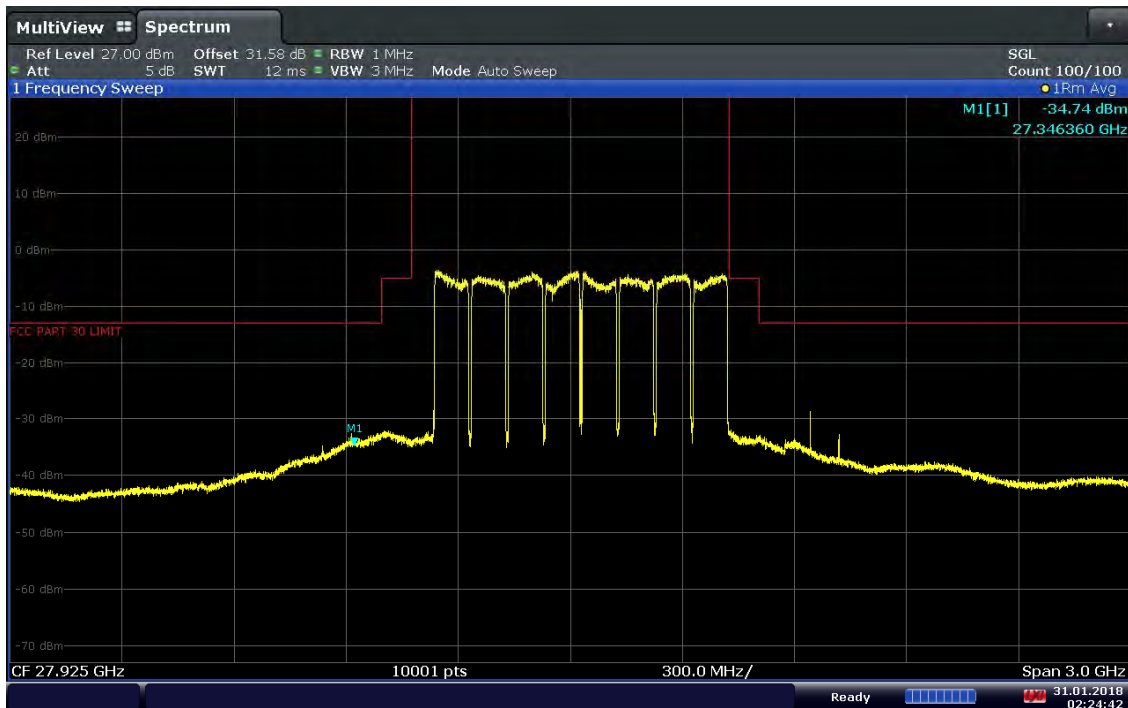
Plot 7-268. Band Edge Plot (8CC QPSK High Channel)

FCC ID: A3LSFG-AA100DC	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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02:23:41 31.01.2018

Plot 7-269. Band Edge Plot (8CC 16QAM High Channel)

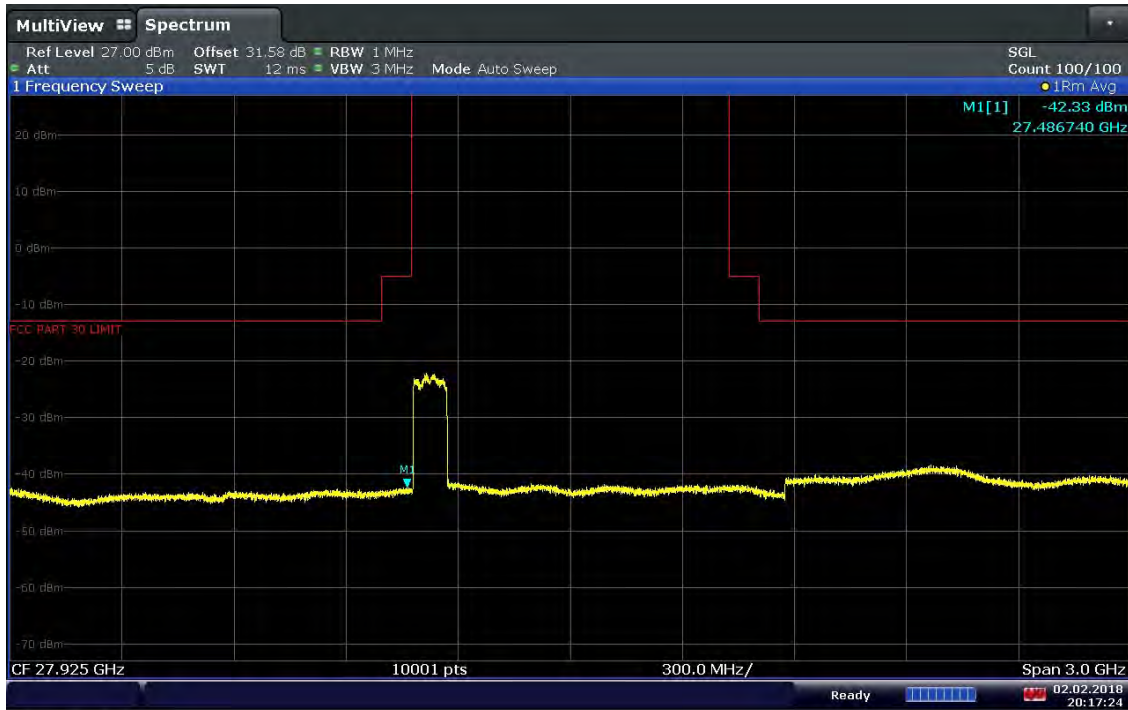


02:24:42 31.01.2018

Plot 7-270. Band Edge Plot (8CC 64QAM High Channel)

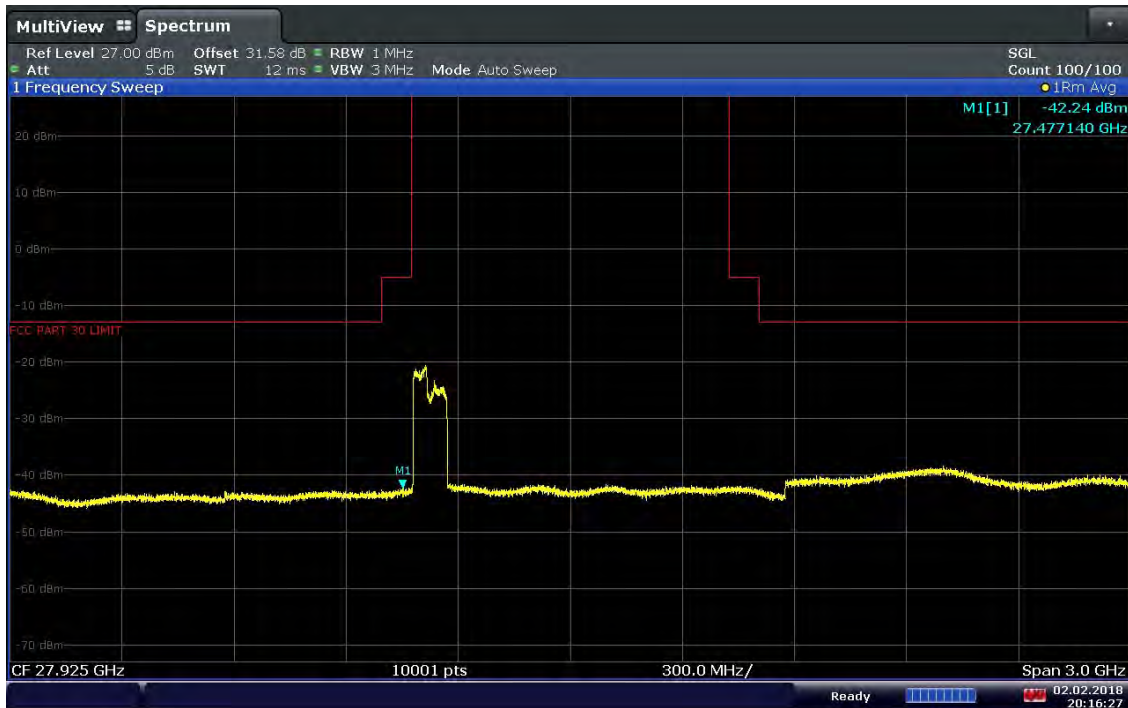
FCC ID: A3LSFG-AA100DC	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1M1712270338-01-R2.A3L	Test Dates: 1/2-2/3/2018	EUT Type: 5G Access Unit	Page 172 of 221

7.6.5 Antenna D Conducted Band Edge Maximized on Antenna A



20:17:24 02.02.2018

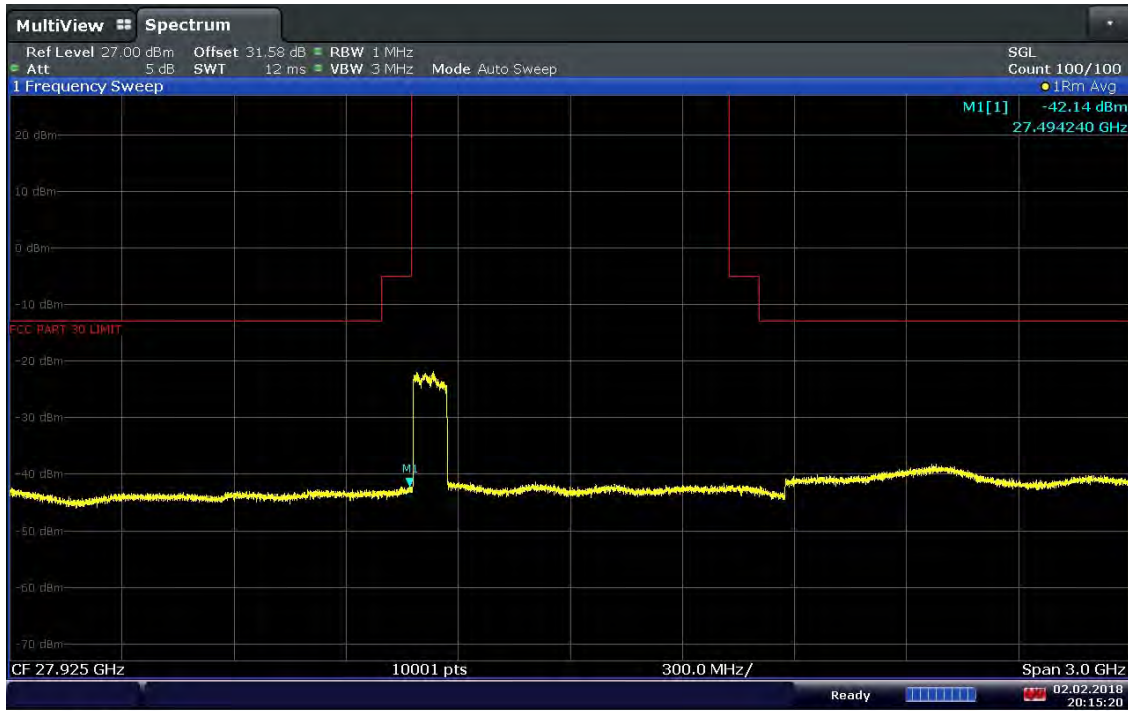
Plot 7-271. Band Edge Plot (1CC QPSK Low Channel)



20:16:28 02.02.2018

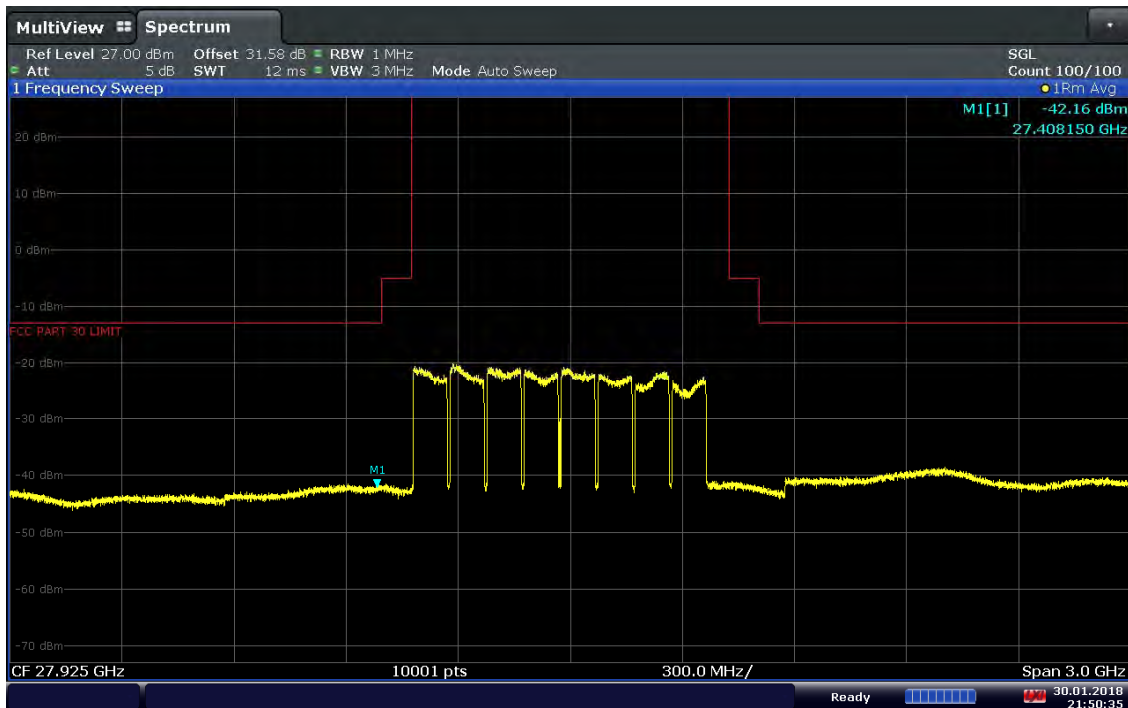
Plot 7-272. Band Edge Plot (1CC 16QAM Low Channel)

FCC ID: A3LSFG-AA100DC	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1712270338-01-R2.A3L	Test Dates: 1/2-2/3/2018	EUT Type: 5G Access Unit		Page 173 of 221



20:15:20 02.02.2018

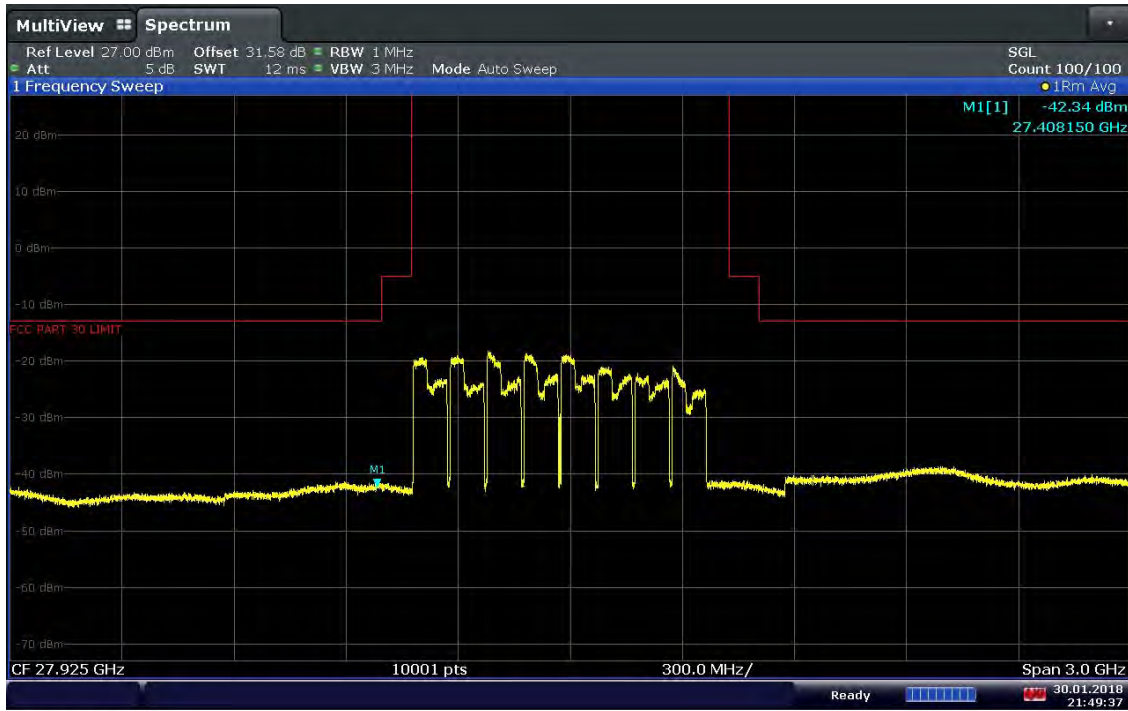
Plot 7-273. Band Edge Plot (1CC 64QAM Low Channel)



21:50:36 30.01.2018

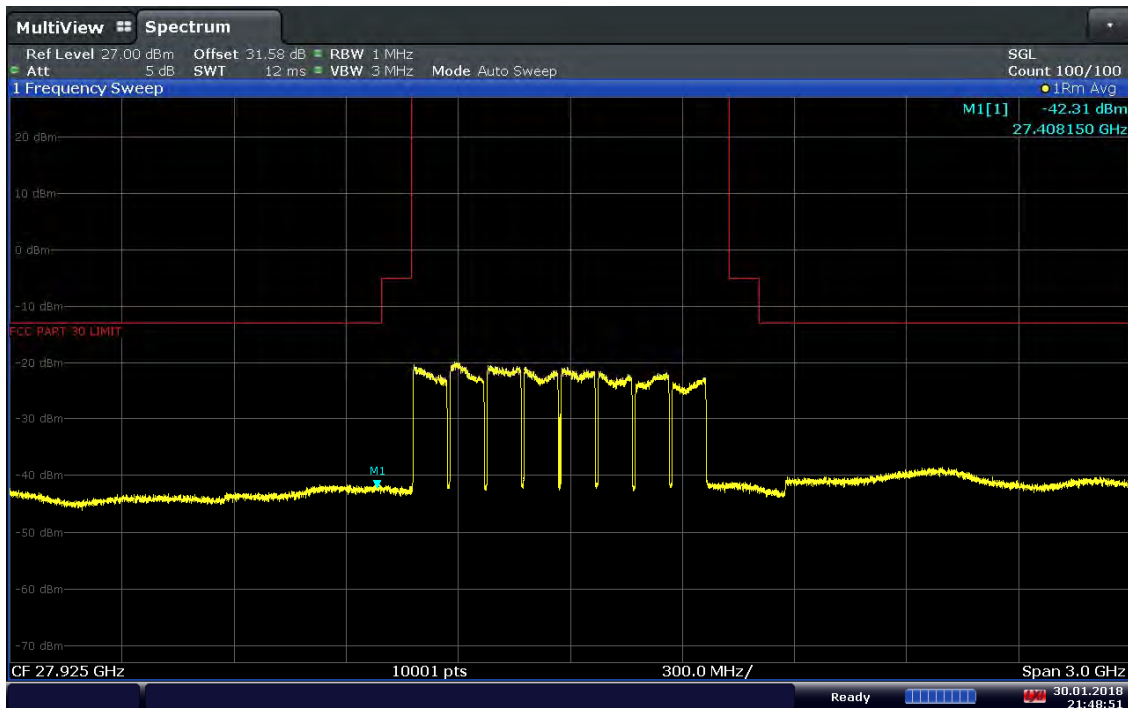
Plot 7-274. Band Edge Plot (8CC QPSK Low Channel)

FCC ID: A3LSFG-AA100DC	MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1M1712270338-01-R2.A3L	Test Dates: 1/2-2/3/2018	EUT Type: 5G Access Unit		Page 174 of 221



21:49:37 30.01.2018

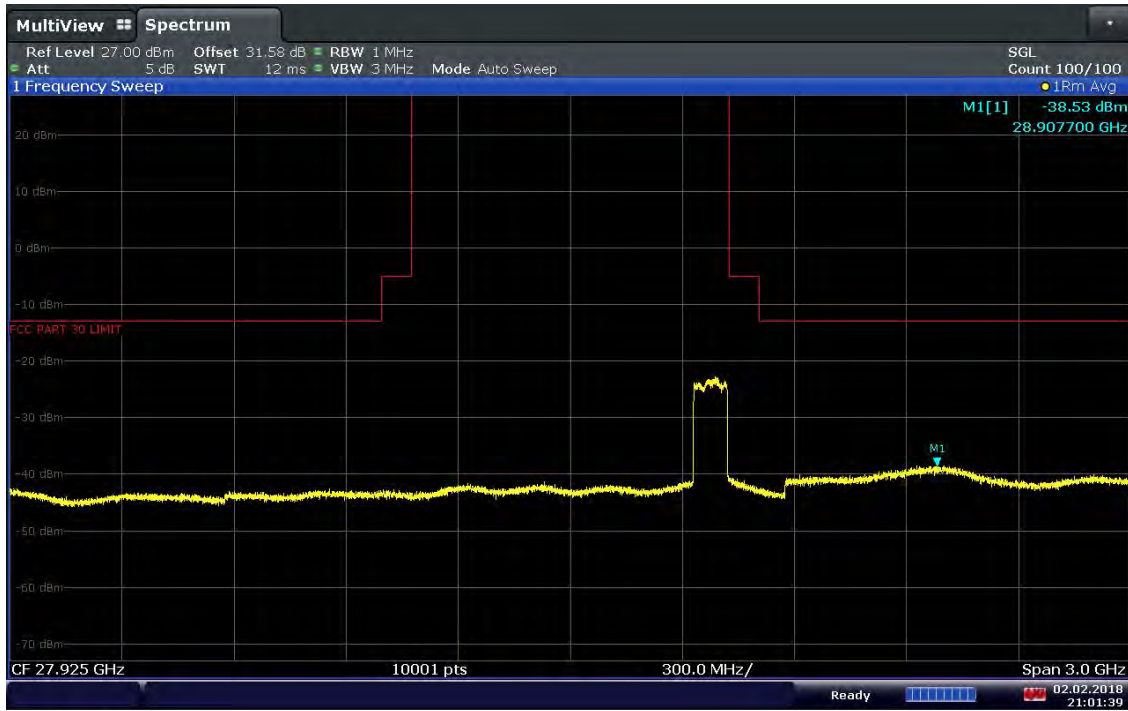
Plot 7-275. Band Edge Plot (8CC 16QAM Low Channel)



21:48:51 30.01.2018

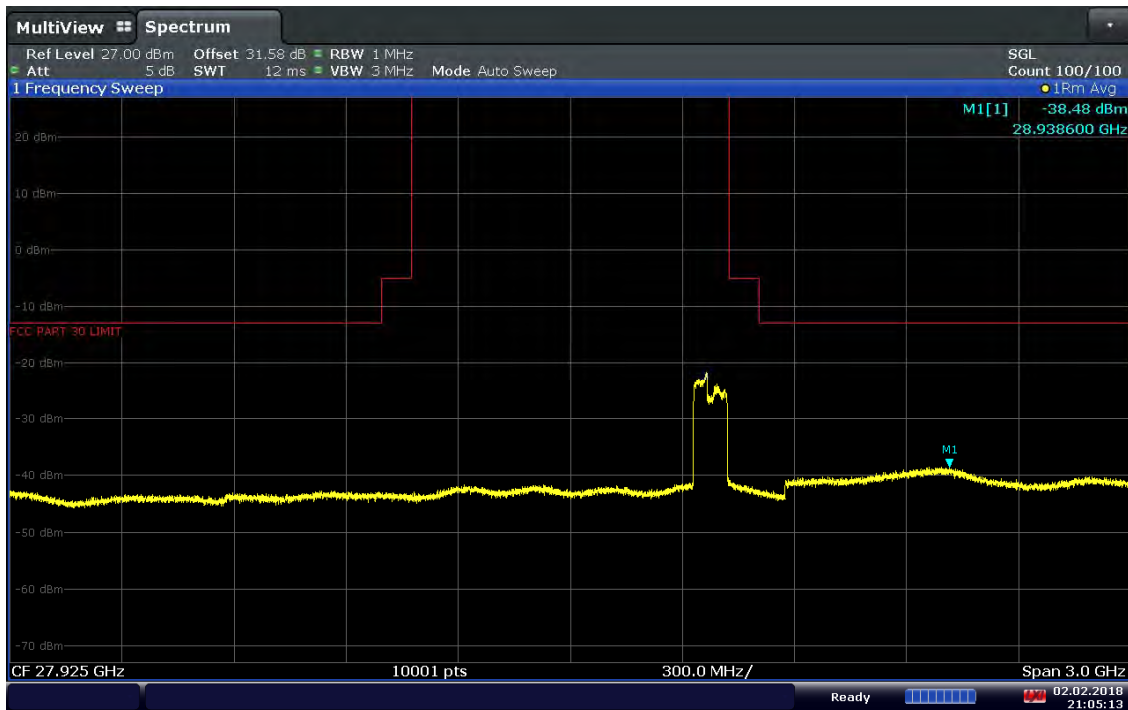
Plot 7-276. Band Edge Plot (8CC 64QAM Low Channel)

FCC ID: A3LSFG-AA100DC	MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1M1712270338-01-R2.A3L	Test Dates: 1/2-2/3/2018	EUT Type: 5G Access Unit		Page 175 of 221



21:01:39 02.02.2018

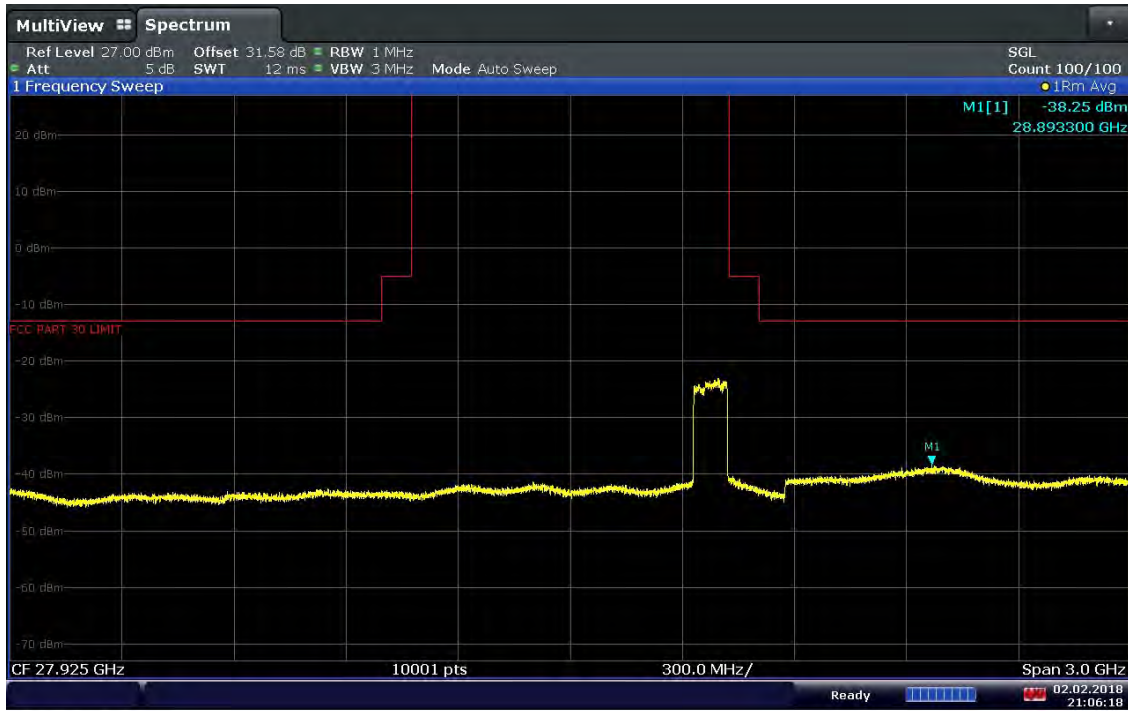
Plot 7-277. Band Edge Plot (1CC QPSK High Channel)



21:05:13 02.02.2018

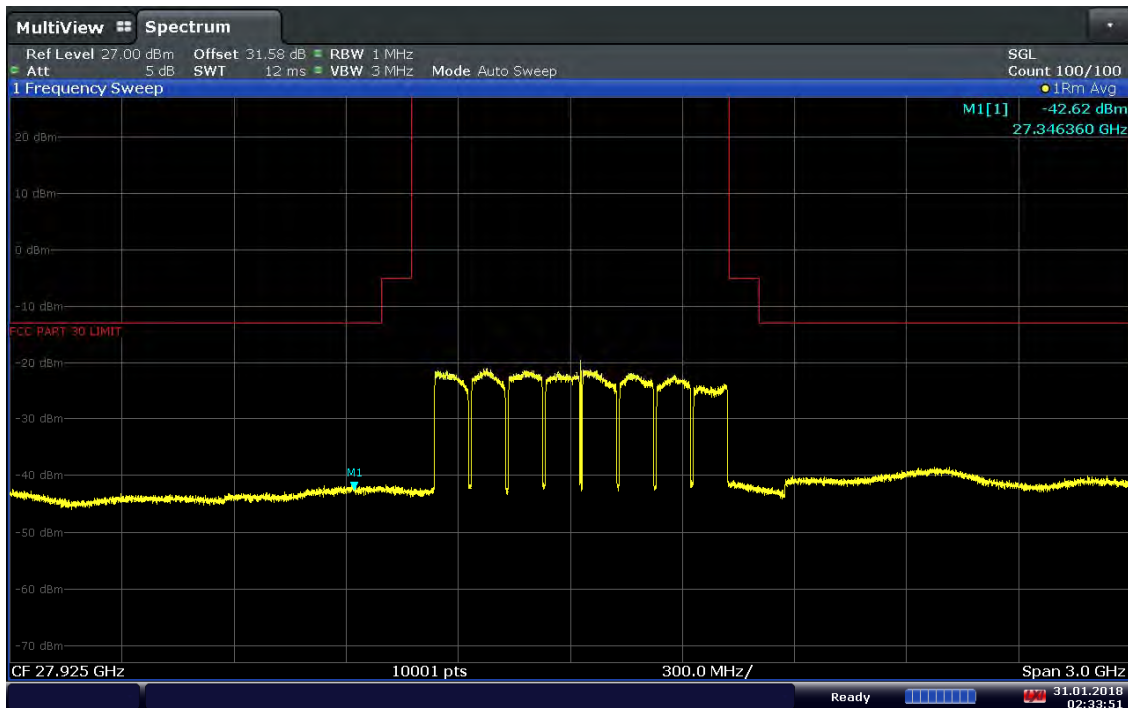
Plot 7-278. Band Edge Plot (1CC 16QAM High Channel)

FCC ID: A3LSFG-AA100DC	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1M1712270338-01-R2.A3L	Test Dates: 1/2-2/3/2018	EUT Type: 5G Access Unit	Page 176 of 221



21:06:18 02.02.2018

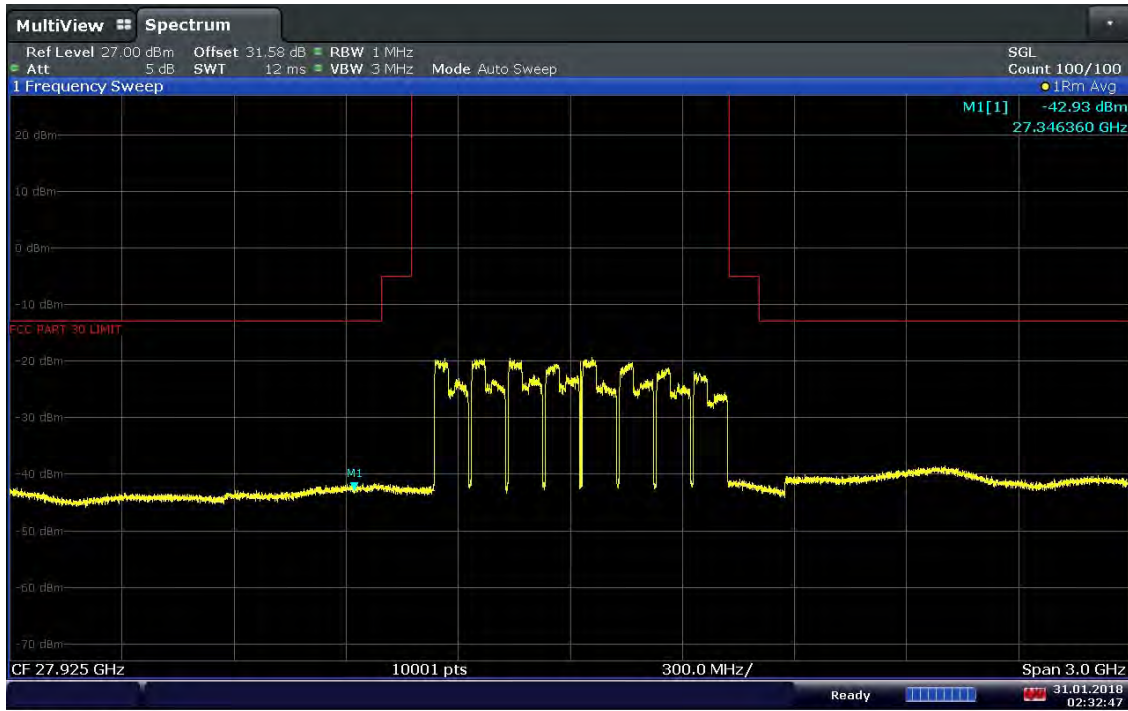
Plot 7-279. Band Edge Plot (1CC 64QAM High Channel)



02:33:52 31.01.2018

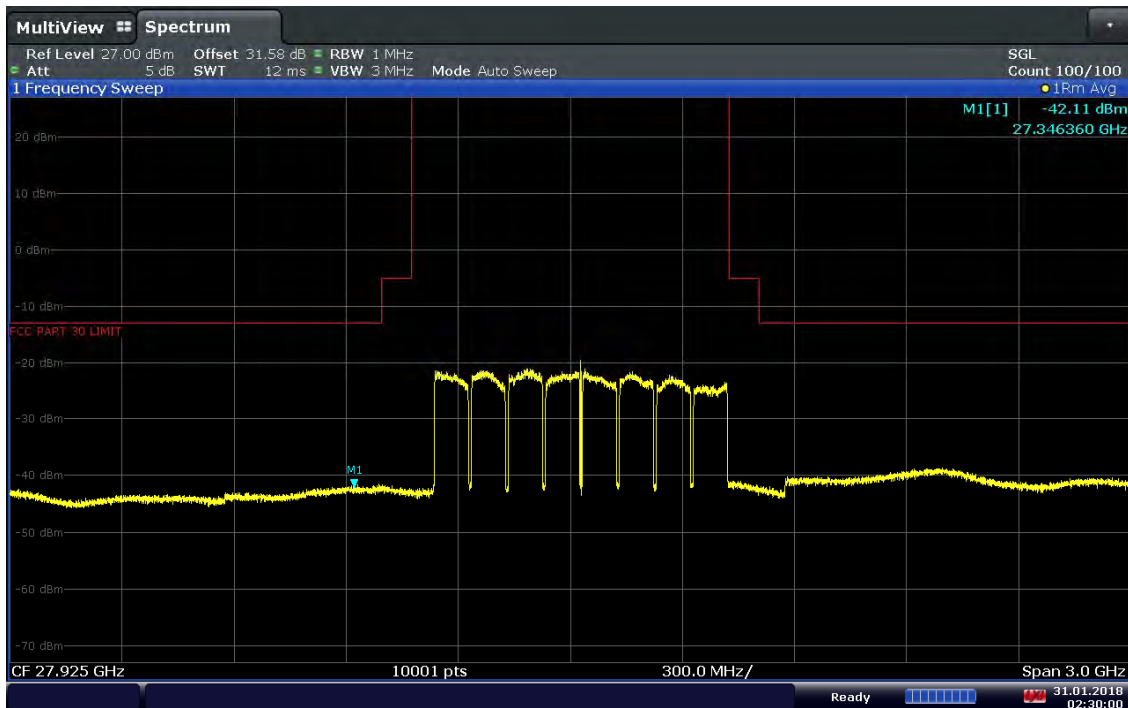
Plot 7-280. Band Edge Plot (8CC QPSK High Channel)

FCC ID: A3LSFG-AA100DC	MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1M1712270338-01-R2.A3L	Test Dates: 1/2-2/3/2018	EUT Type: 5G Access Unit		Page 177 of 221



02:32:48 31.01.2018

Plot 7-281. Band Edge Plot (8CC 16QAM High Channel)

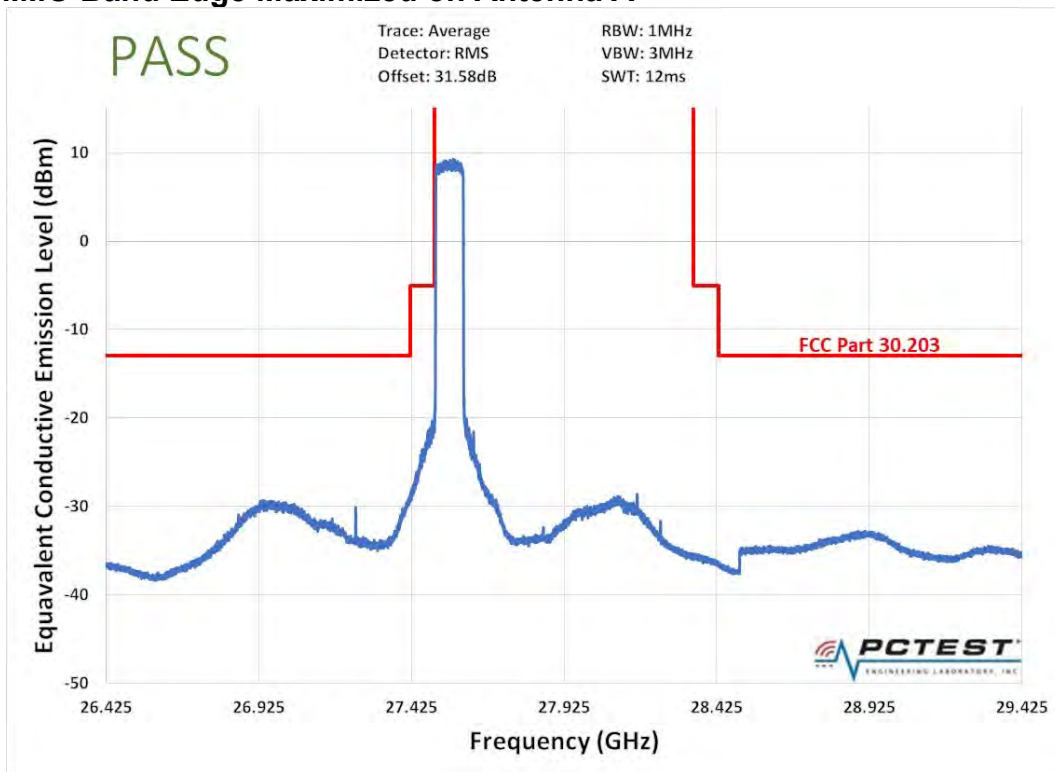


02:30:01 31.01.2018

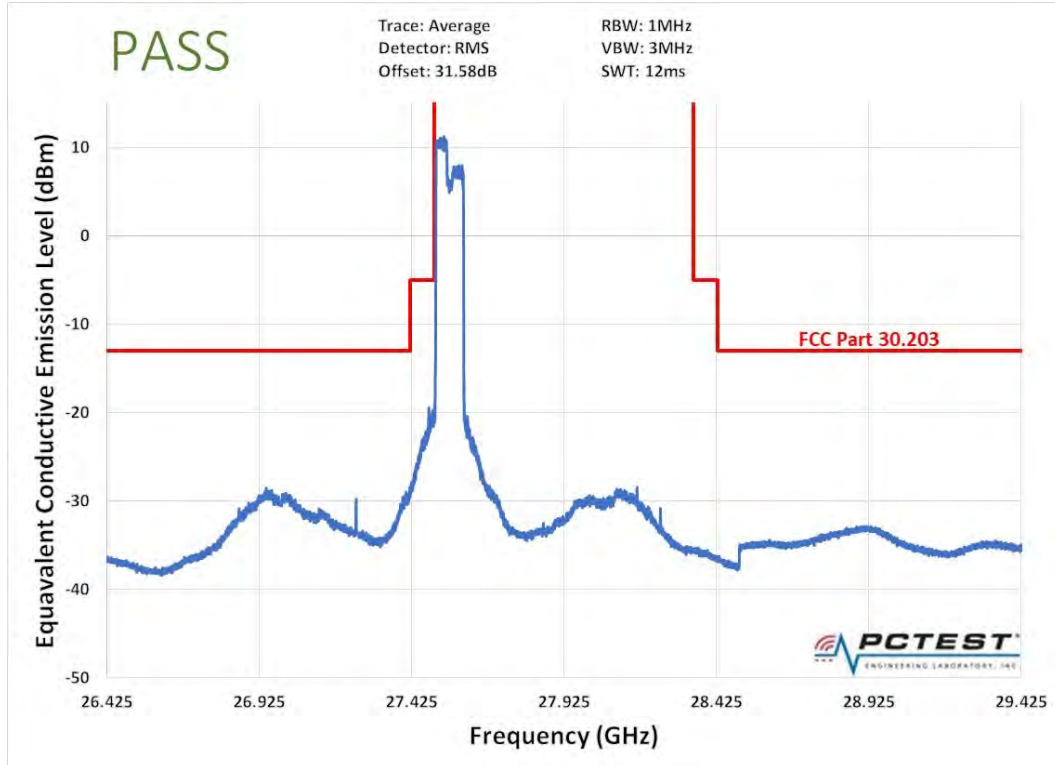
Plot 7-282. Band Edge Plot (8CC 64QAM High Channel)

FCC ID: A3LSFG-AA100DC	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
Test Report S/N: 1M1712270338-01-R2.A3L	Test Dates: 1/2-2/3/2018	EUT Type: 5G Access Unit	Page 178 of 221

7.6.6 MIMO Band Edge Maximized on Antenna A

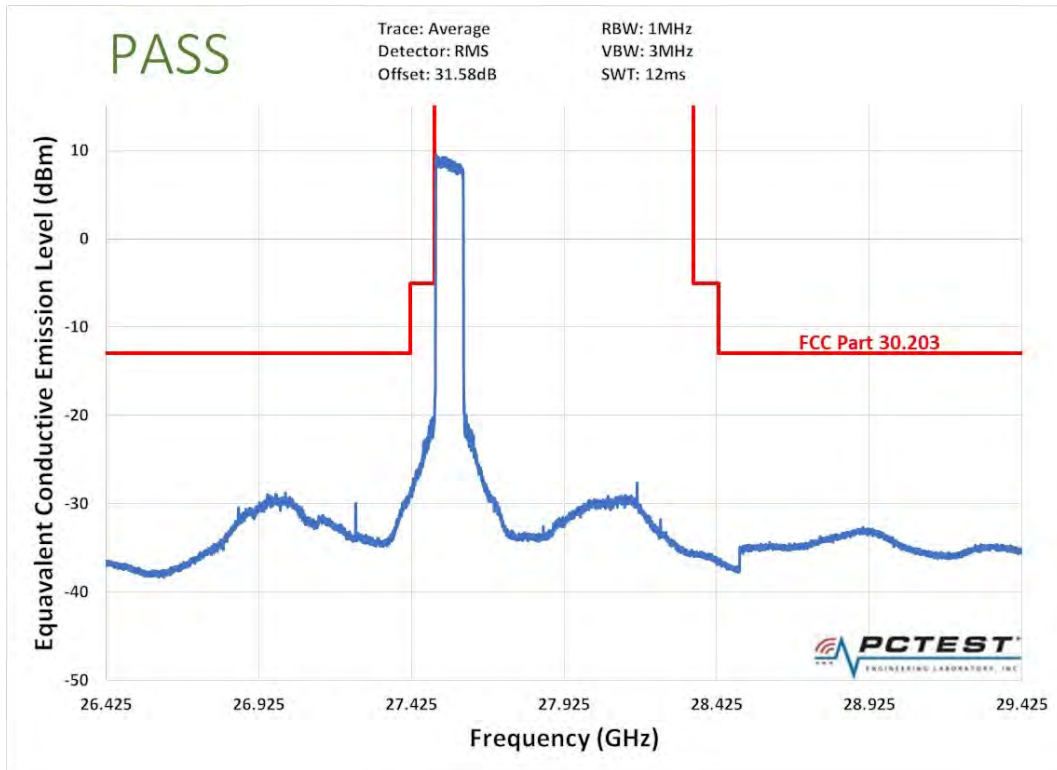


Plot 7-283. Band Edge Plot (1CC QPSK Low Channel)

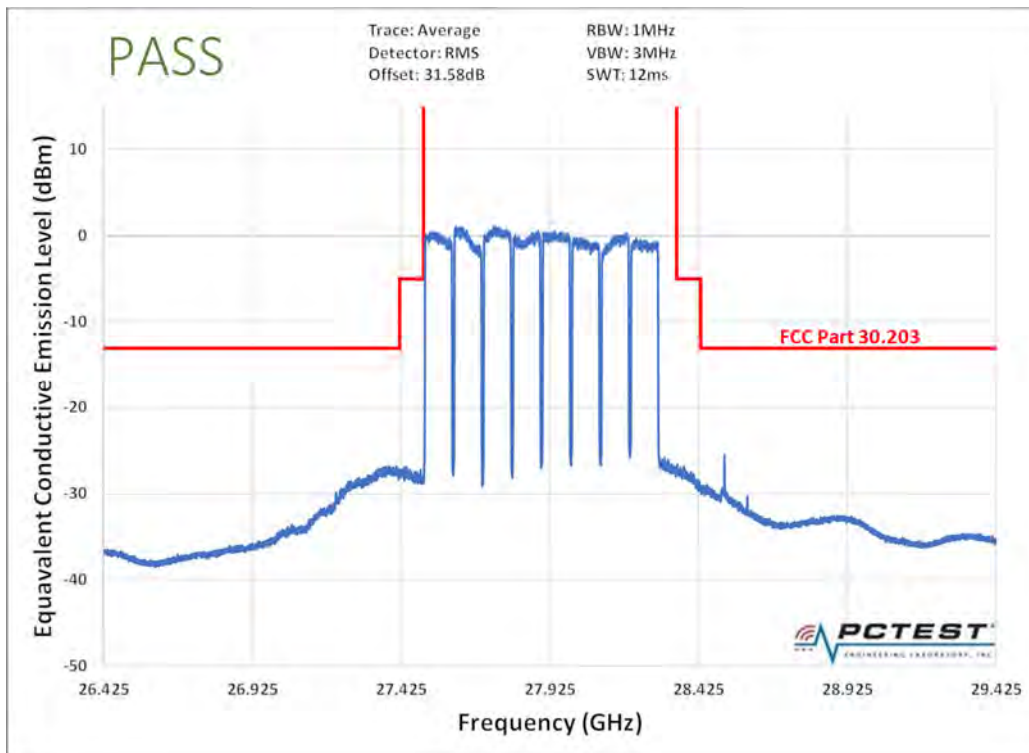


Plot 7-284. Band Edge Plot (1CC 16QAM Low Channel)

FCC ID: A3LSFG-AA100DC	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1712270338-01-R2.A3L	Test Dates: 1/2-2/3/2018	EUT Type: 5G Access Unit		Page 179 of 221

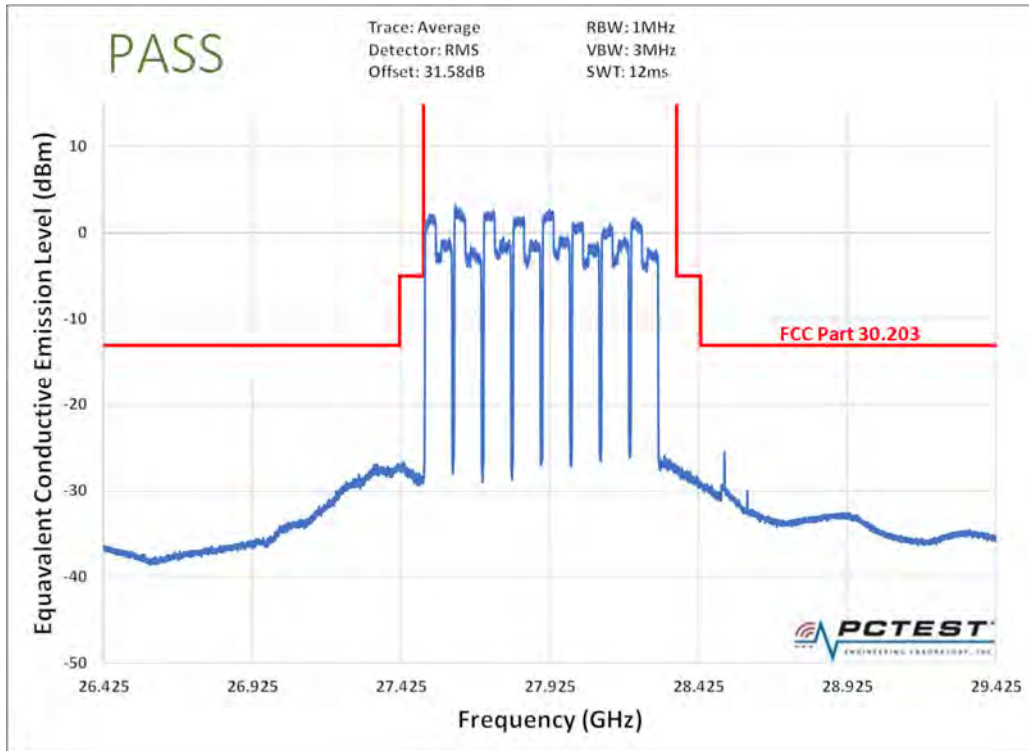


Plot 7-285. Band Edge Plot (1CC 64QAM Low Channel)

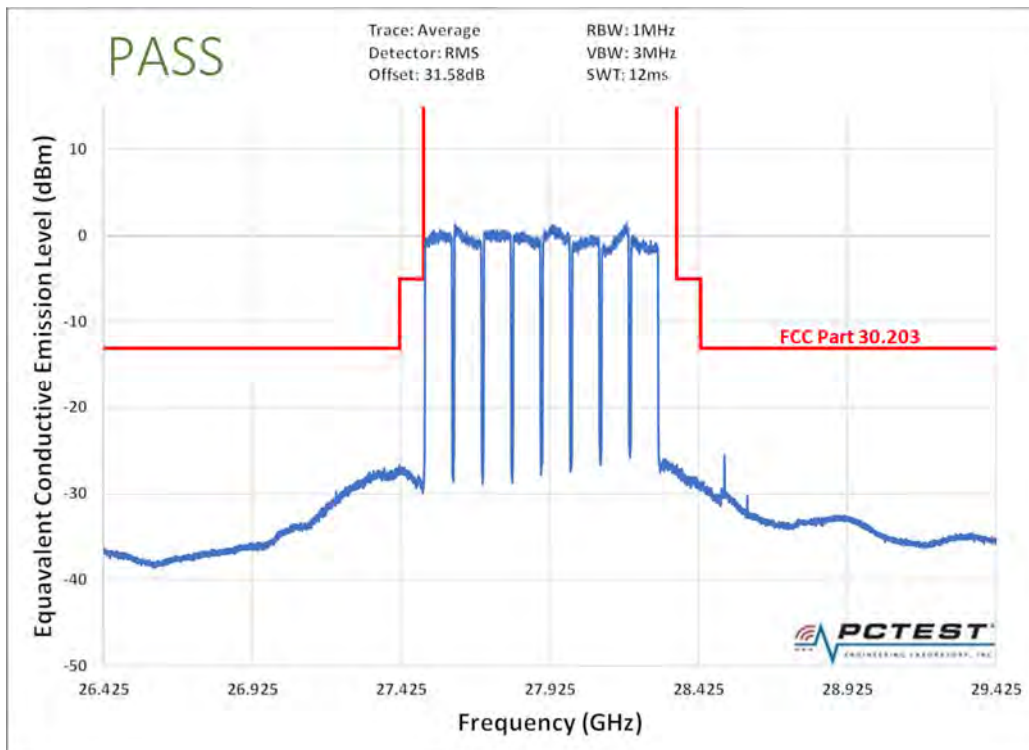


Plot 7-286. Band Edge Plot (8CC QPSK Low Channel)

FCC ID: A3LSFG-AA100DC	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1712270338-01-R2.A3L	Test Dates: 1/2-2/3/2018	EUT Type: 5G Access Unit		Page 180 of 221

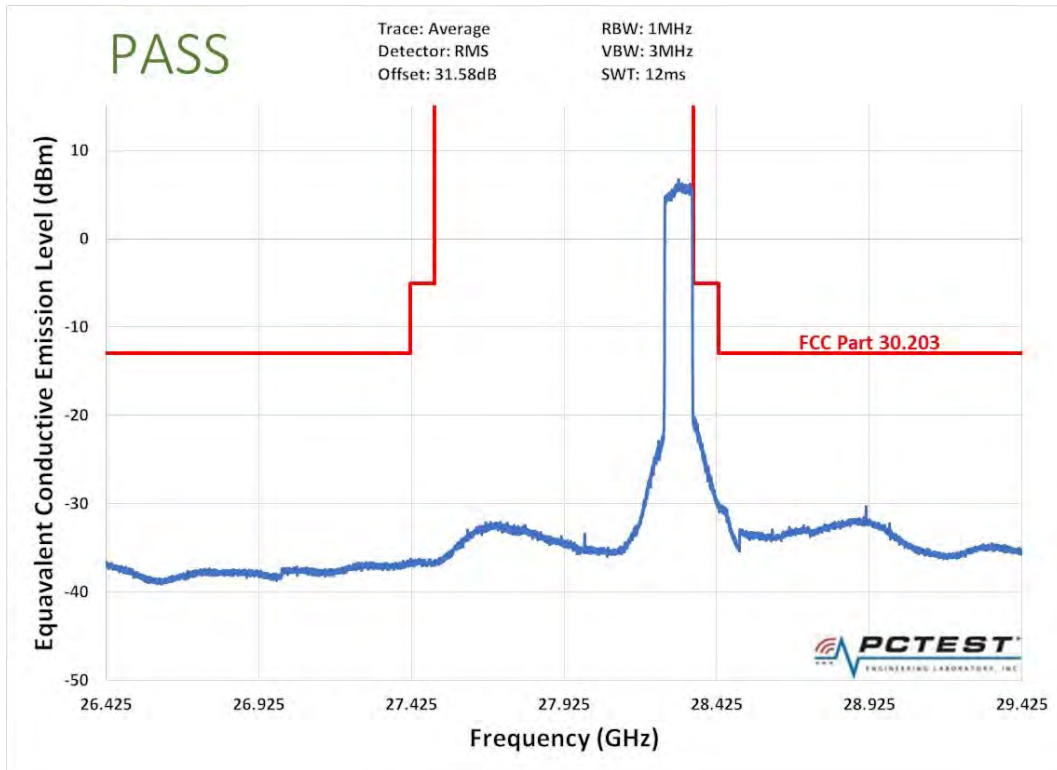


Plot 7-287. Band Edge Plot (8CC 16QAM Low Channel)

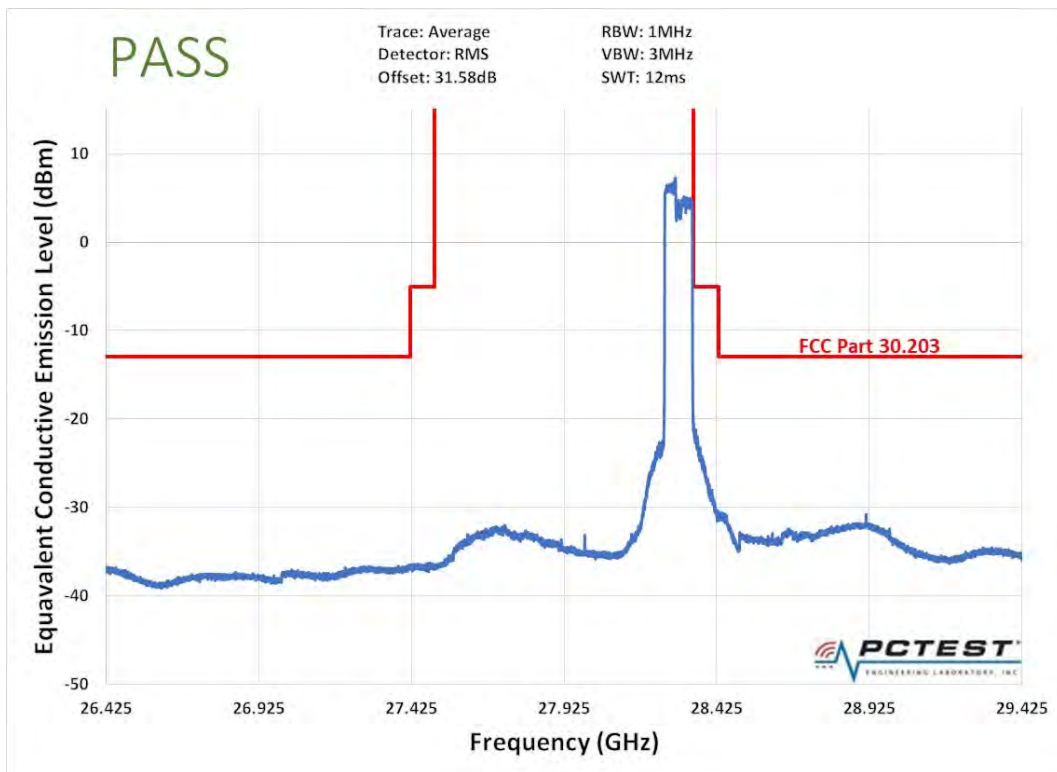


Plot 7-288. Band Edge Plot (8CC 64QAM Low Channel)

FCC ID: A3LSFG-AA100DC	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1712270338-01-R2.A3L	Test Dates: 1/2-2/3/2018	EUT Type: 5G Access Unit		Page 181 of 221

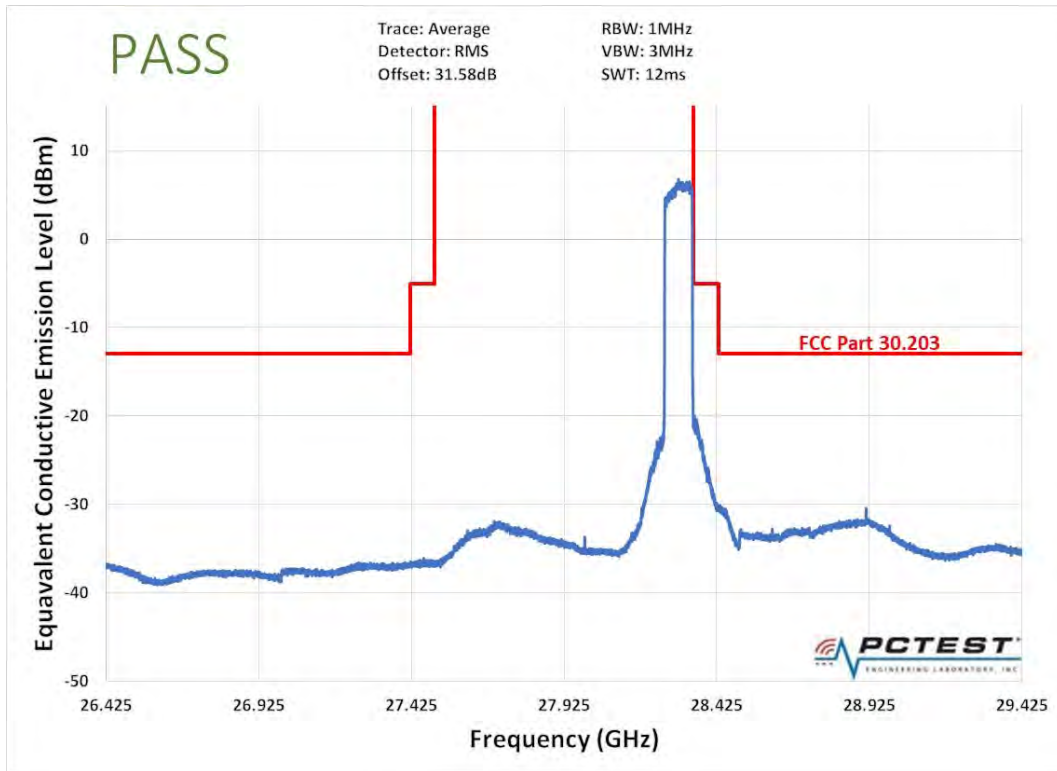


Plot 7-289. Band Edge Plot (1CC QPSK High Channel)

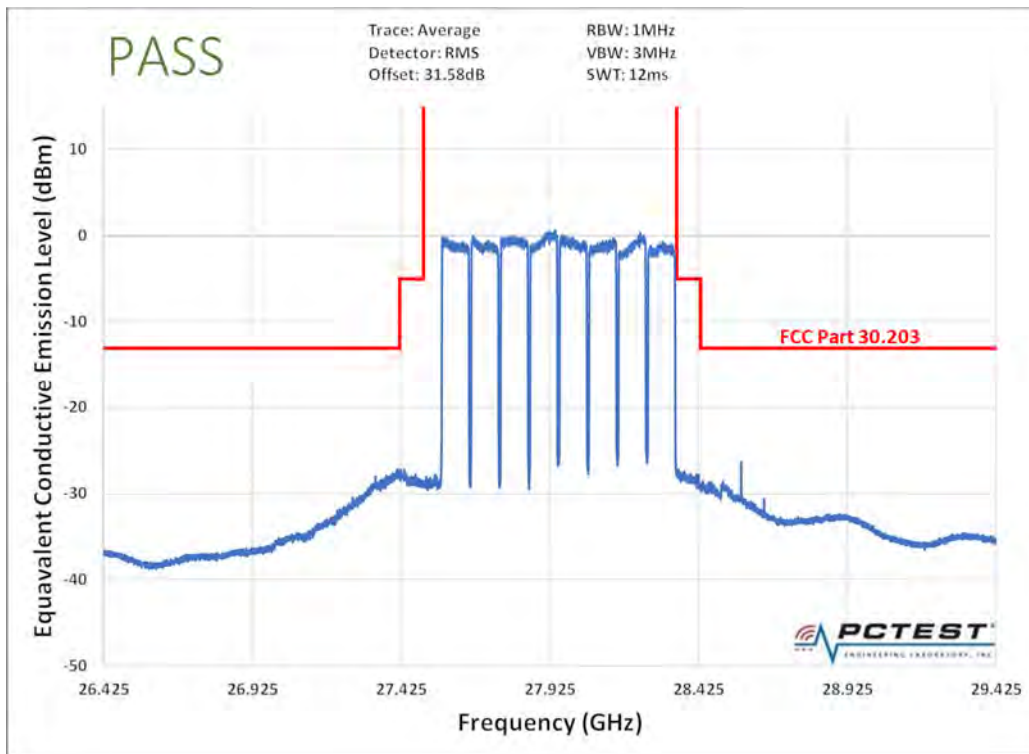


Plot 7-290. Band Edge Plot (1CC 16QAM High Channel)

FCC ID: A3LSFG-AA100DC	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1712270338-01-R2.A3L	Test Dates: 1/2-2/3/2018	EUT Type: 5G Access Unit		Page 182 of 221

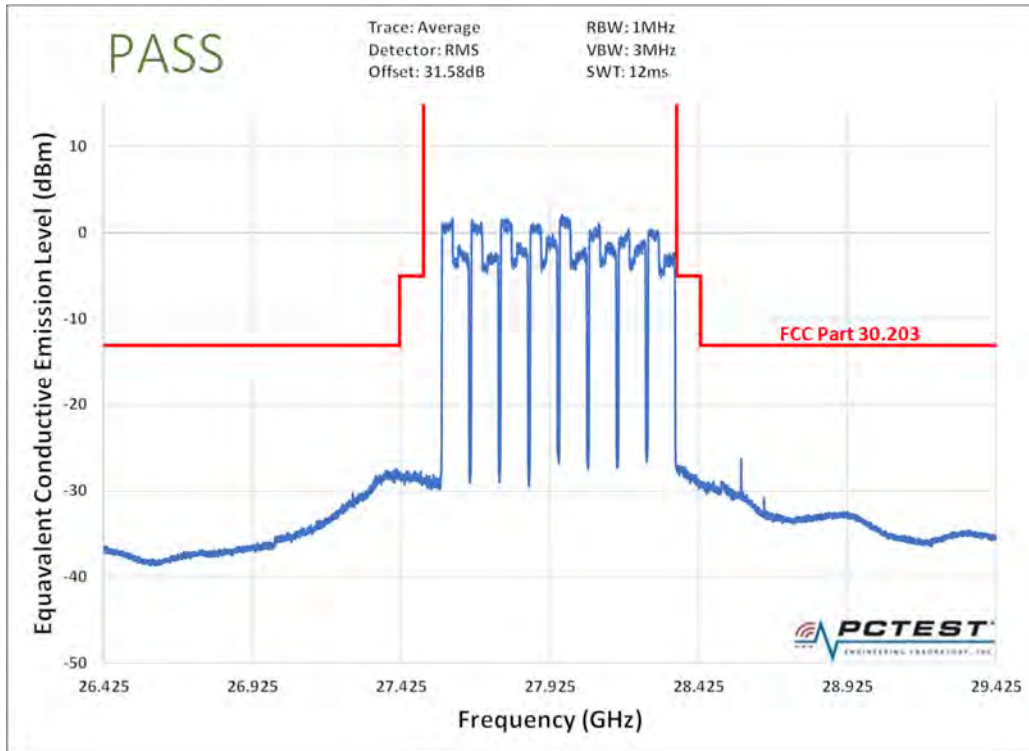


Plot 7-291. Band Edge Plot (1CC 64QAM High Channel)

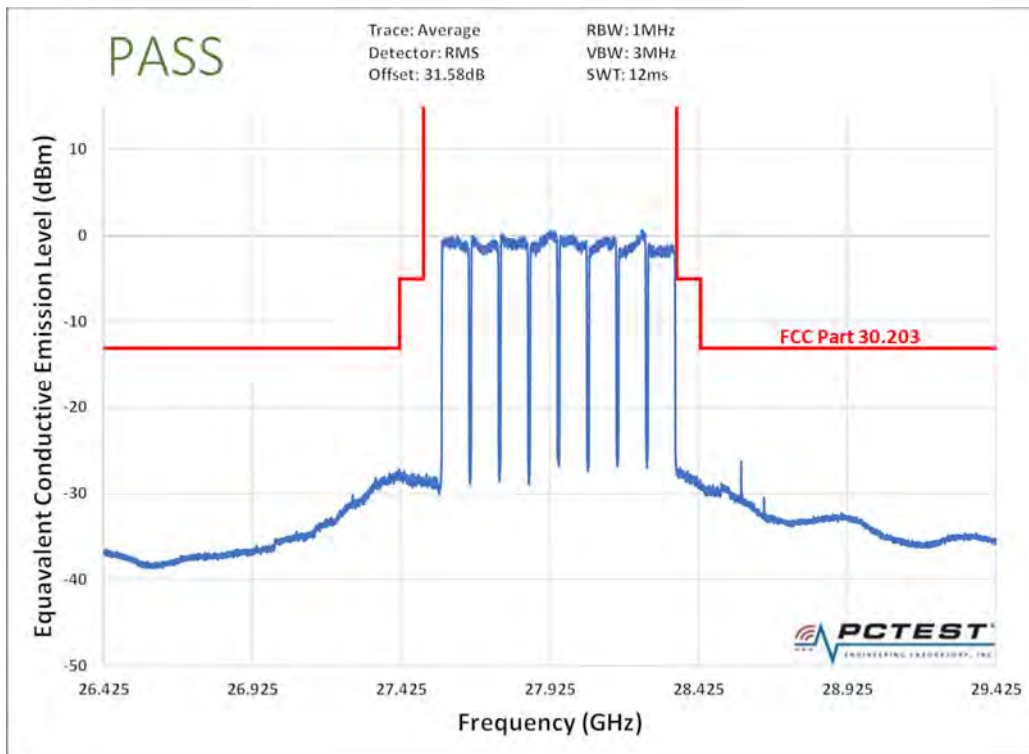


Plot 7-292. Band Edge Plot (8CC QPSK High Channel)

FCC ID: A3LSFG-AA100DC	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1712270338-01-R2.A3L	Test Dates: 1/2-2/3/2018	EUT Type: 5G Access Unit		Page 183 of 221



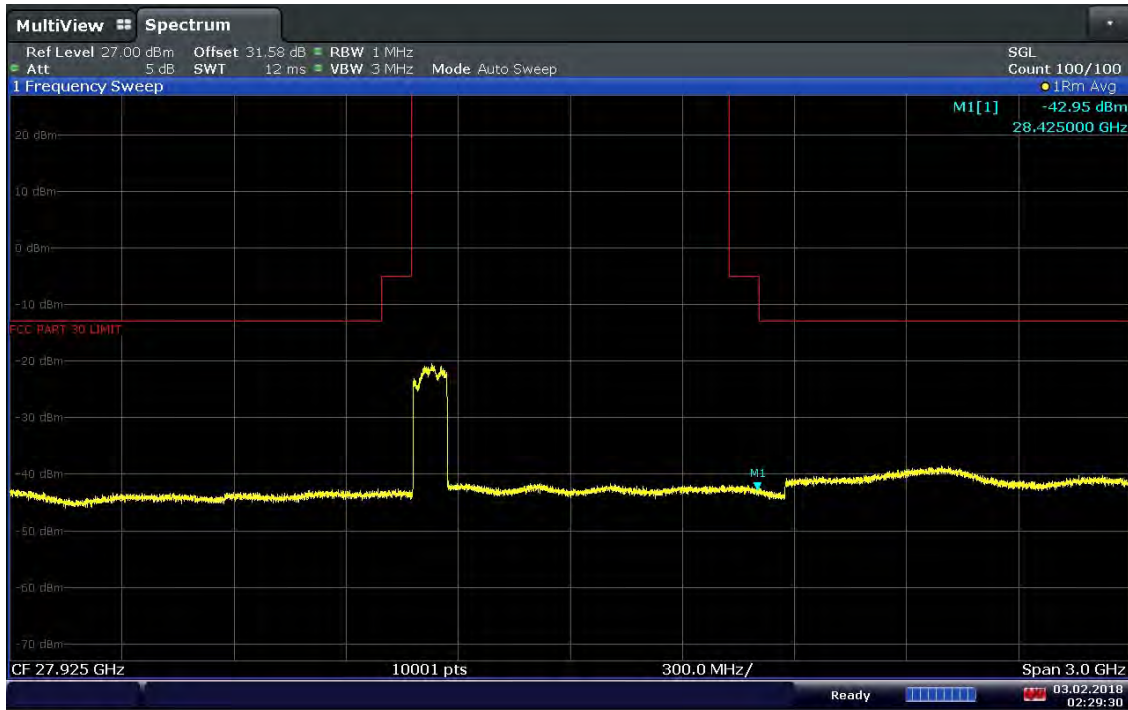
Plot 7-293. Band Edge Plot (8CC 16QAM High Channel)



Plot 7-294. Band Edge Plot (8CC 64QAM High Channel)

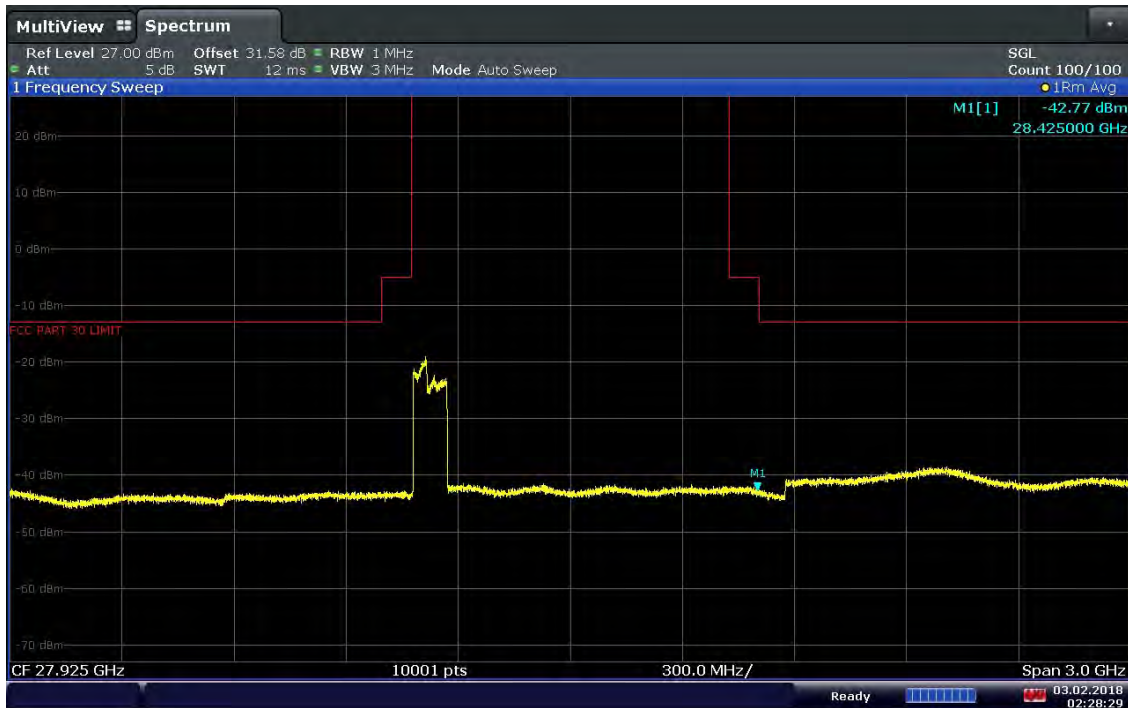
FCC ID: A3LSFG-AA100DC	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1712270338-01-R2.A3L	Test Dates: 1/2-2/3/2018	EUT Type: 5G Access Unit		Page 184 of 221

7.6.7 Antenna A Conducted Band Edge Maximized on Antenna B



02:29:31 03.02.2018

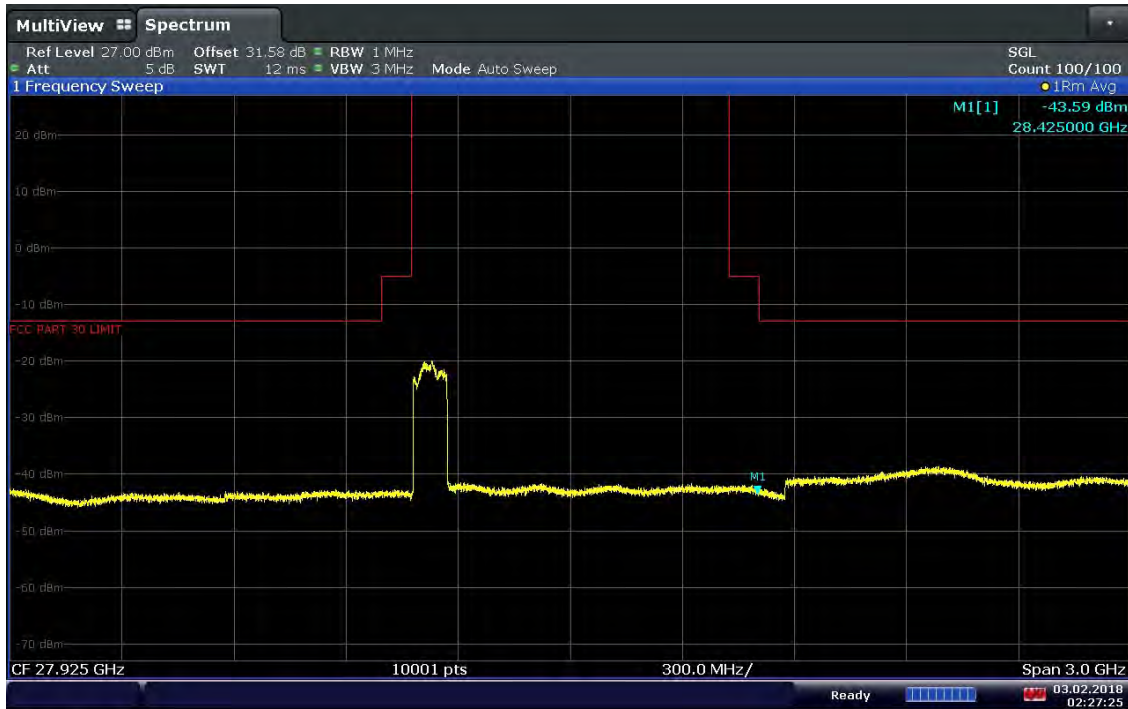
Plot 7-295. Band Edge Plot (1CC QPSK Low Channel)



02:28:29 03.02.2018

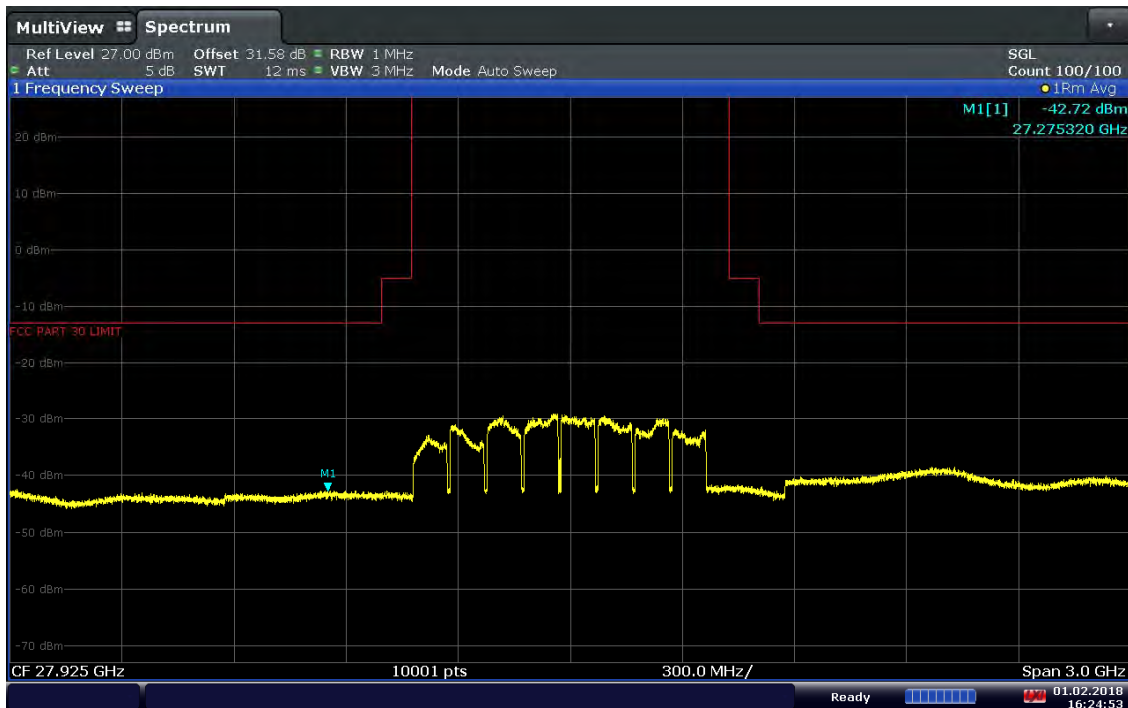
Plot 7-296. Band Edge Plot (1CC 16QAM Low Channel)

FCC ID: A3LSFG-AA100DC	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1712270338-01-R2.A3L	Test Dates: 1/2-2/3/2018	EUT Type: 5G Access Unit		Page 185 of 221



02:27:25 03.02.2018

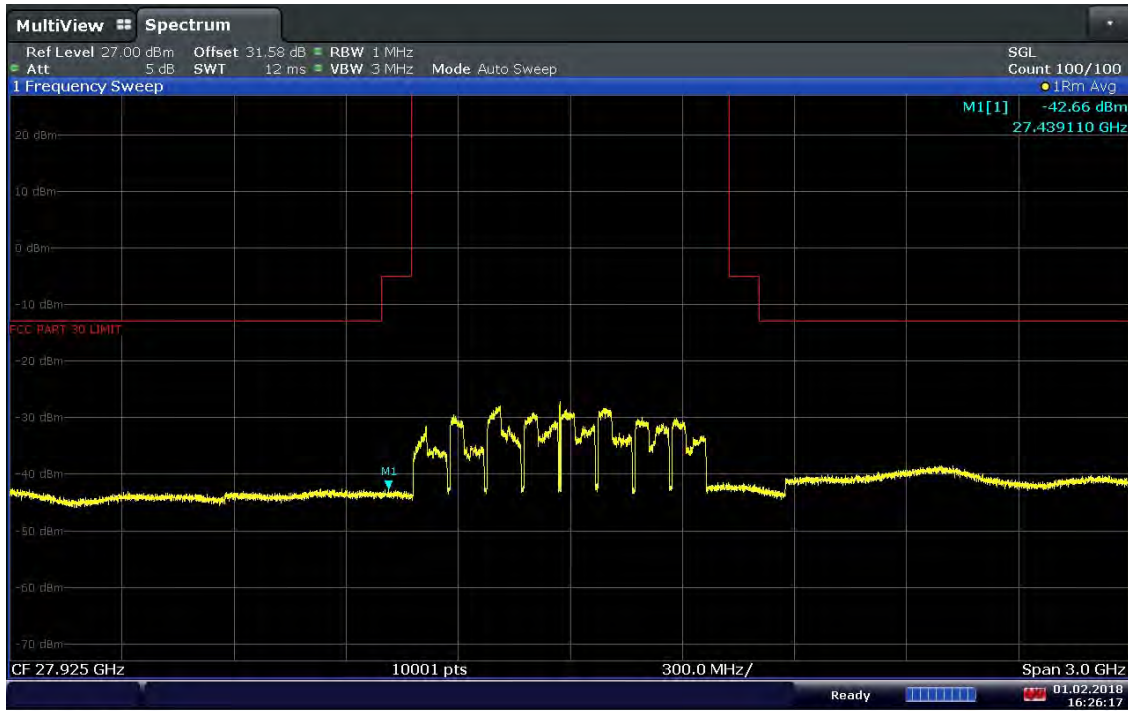
Plot 7-297. Band Edge Plot (1CC 64QAM Low Channel)



16:24:54 01.02.2018

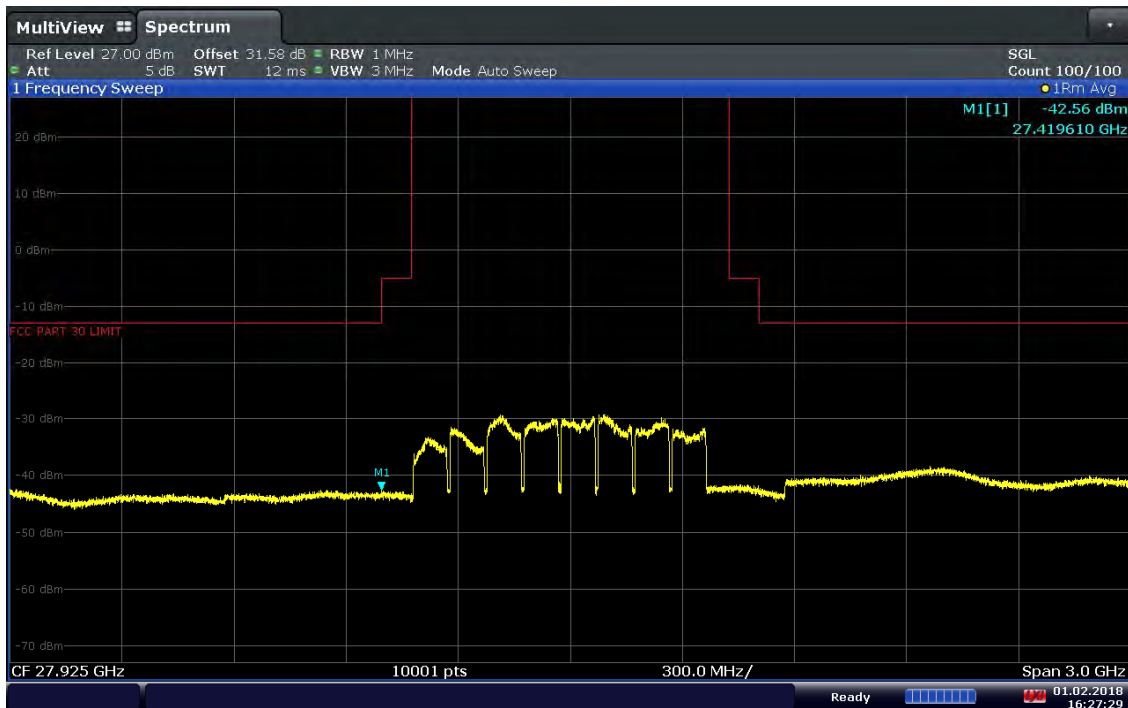
Plot 7-298. Band Edge Plot (8CC QPSK Low Channel)

FCC ID: A3LSFG-AA100DC	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1M1712270338-01-R2.A3L	Test Dates: 1/2-2/3/2018	EUT Type: 5G Access Unit	Page 186 of 221



16:26:17 01.02.2018

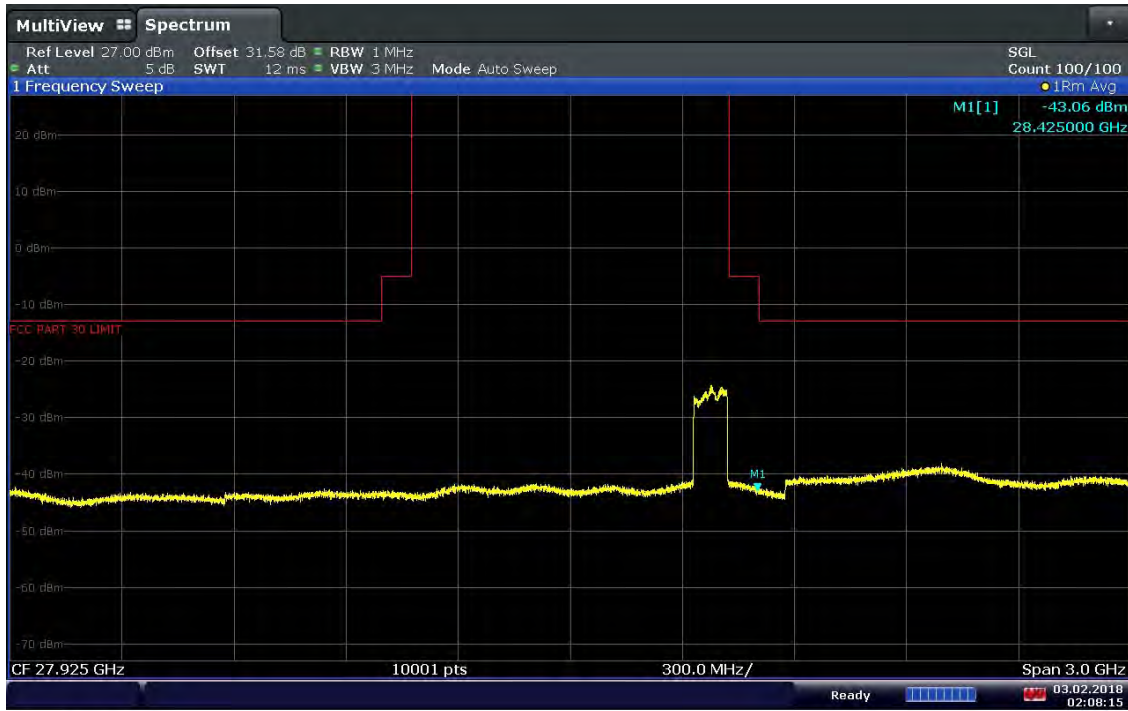
Plot 7-299. Band Edge Plot (8CC 16QAM Low Channel)



16:27:30 01.02.2018

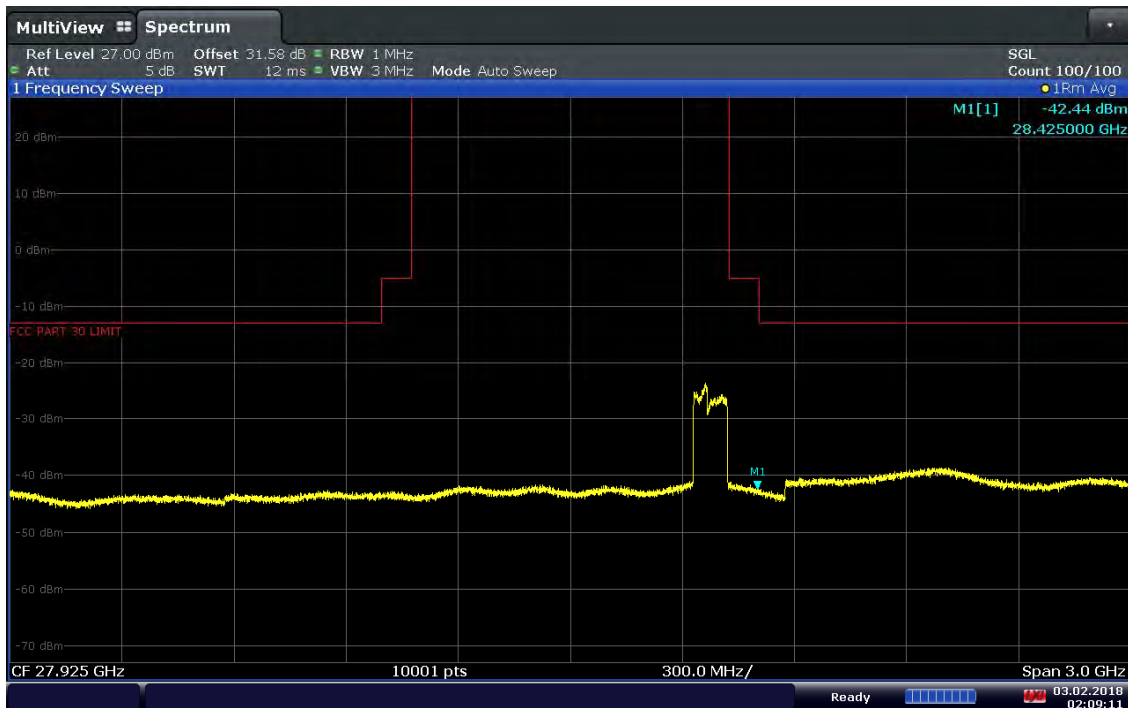
Plot 7-300. Band Edge Plot (8CC 64QAM Low Channel)

FCC ID: A3LSFG-AA100DC	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1712270338-01-R2.A3L	Test Dates: 1/2-2/3/2018	EUT Type: 5G Access Unit		Page 187 of 221



02:08:15 03.02.2018

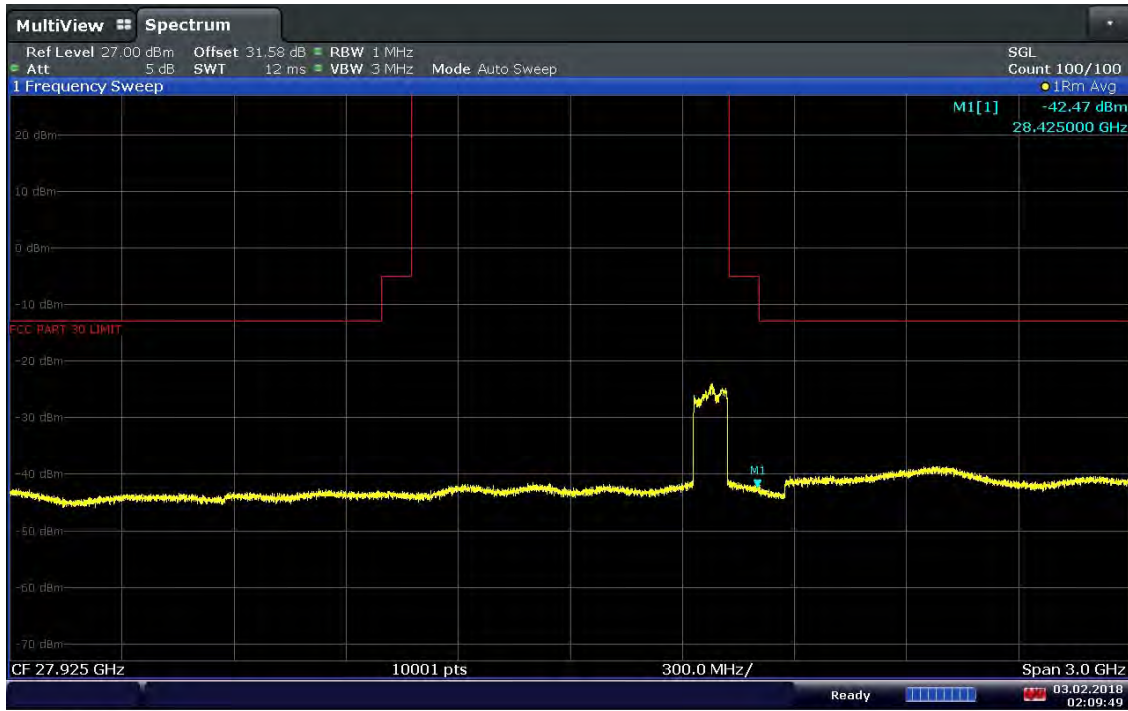
Plot 7-301. Band Edge Plot (1CC QPSK High Channel)



02:09:11 03.02.2018

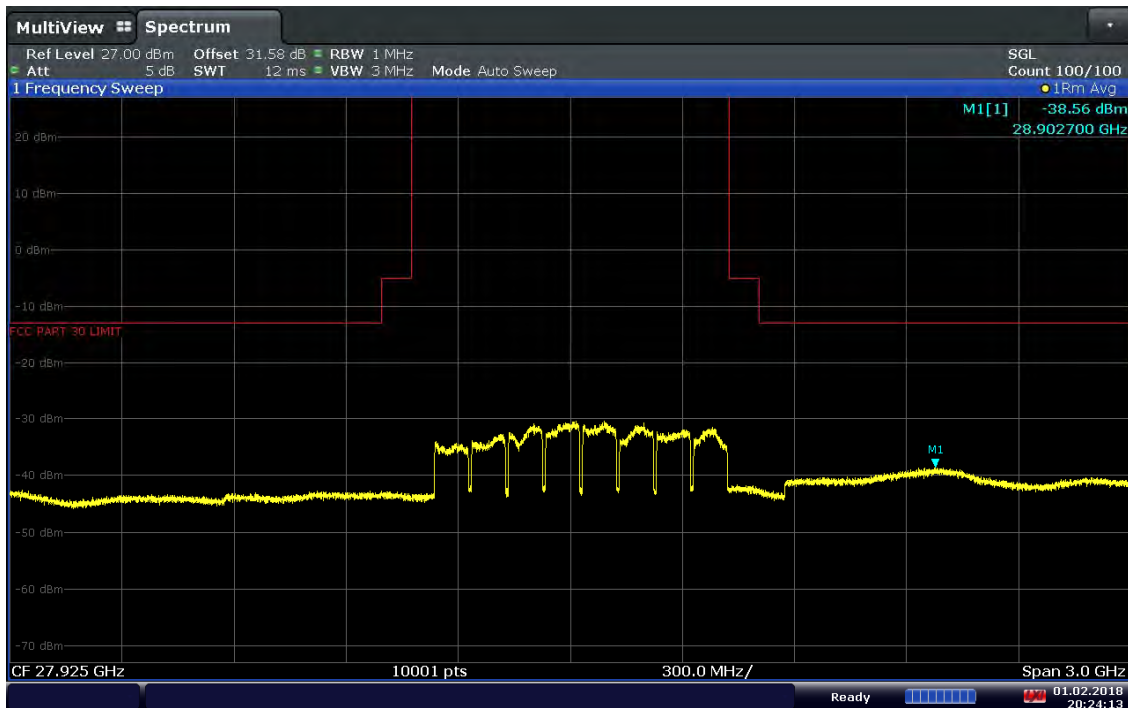
Plot 7-302. Band Edge Plot (1CC 16QAM High Channel)

FCC ID: A3LSFG-AA100DC	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1M1712270338-01-R2.A3L	Test Dates: 1/2-2/3/2018	EUT Type: 5G Access Unit	Page 188 of 221



02:09:50 03.02.2018

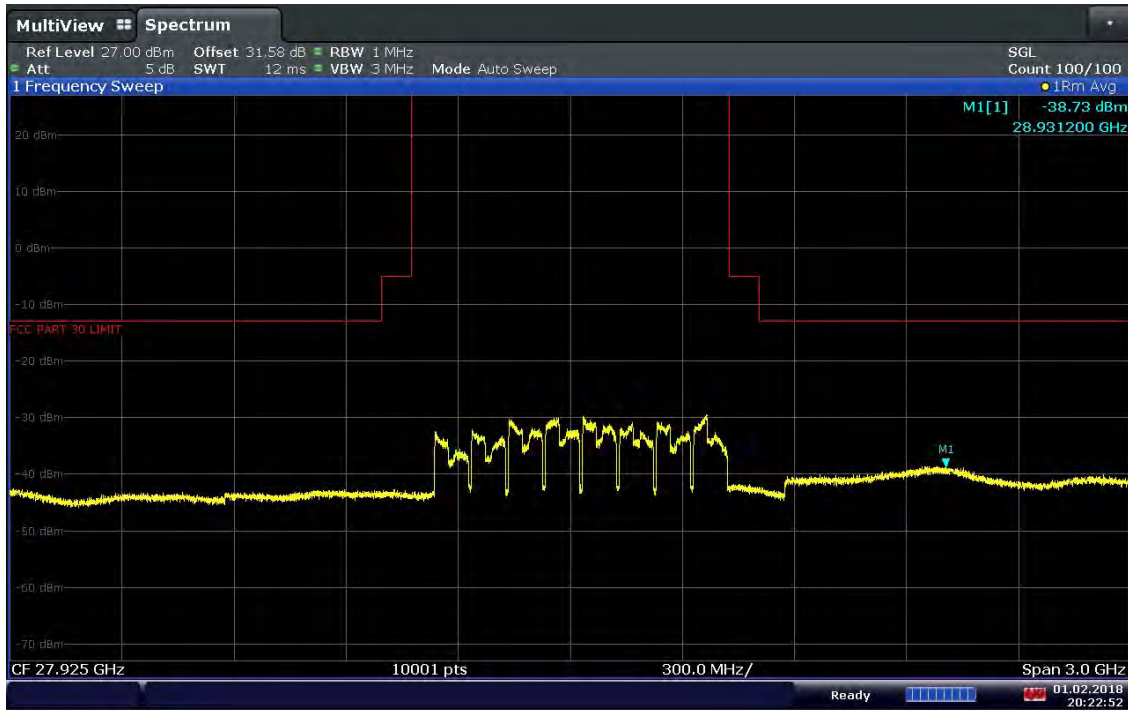
Plot 7-303. Band Edge Plot (1CC 64QAM High Channel)



20:24:14 01.02.2018

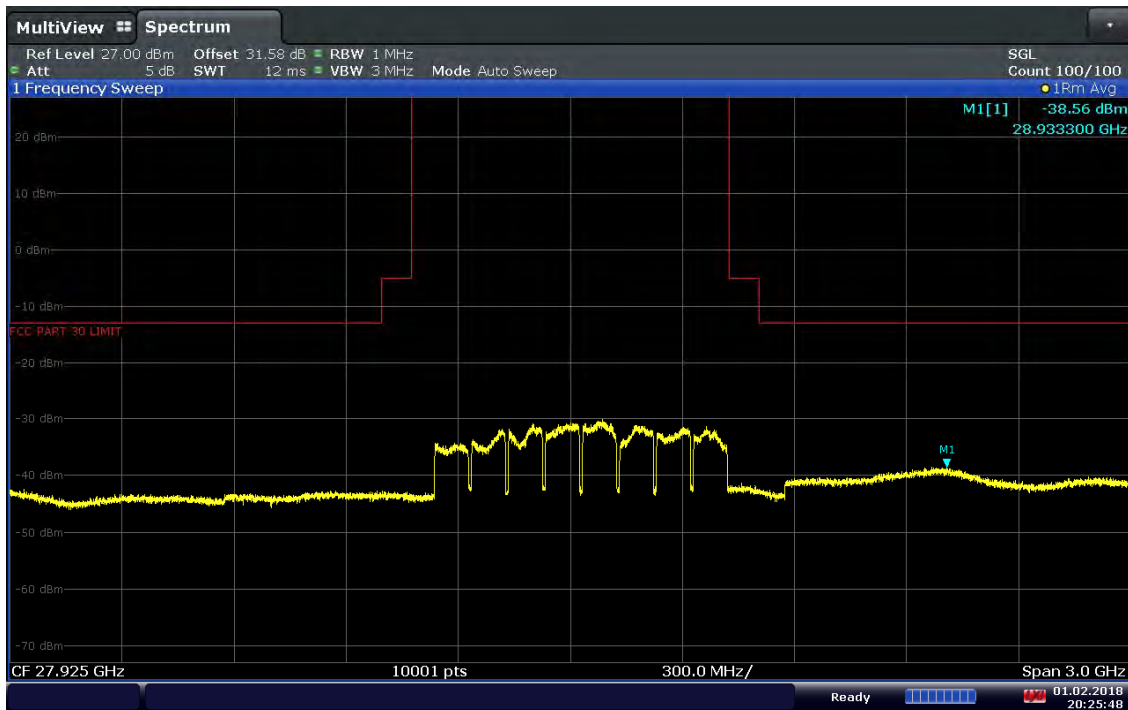
Plot 7-304. Band Edge Plot (8CC QPSK High Channel)

FCC ID: A3LSFG-AA100DC	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1M1712270338-01-R2.A3L	Test Dates: 1/2-2/3/2018	EUT Type: 5G Access Unit	Page 189 of 221



20:22:53 01.02.2018

Plot 7-305. Band Edge Plot (8CC 16QAM High Channel)

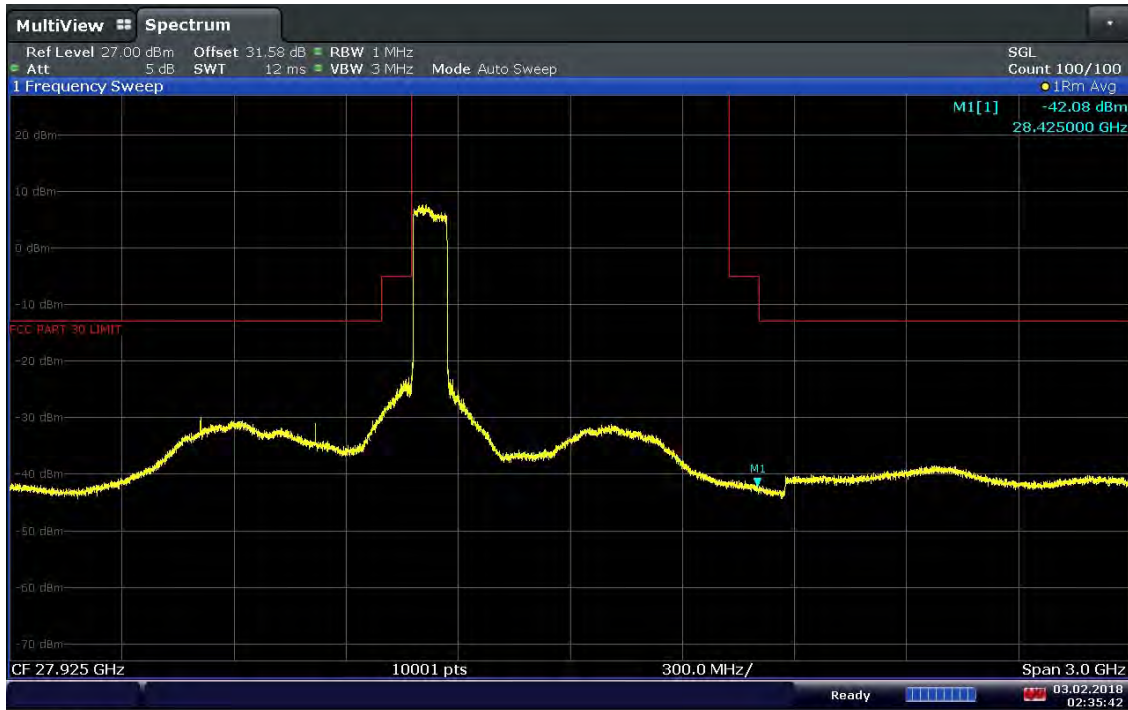


20:25:48 01.02.2018

Plot 7-306. Band Edge Plot (8CC 64QAM High Channel)

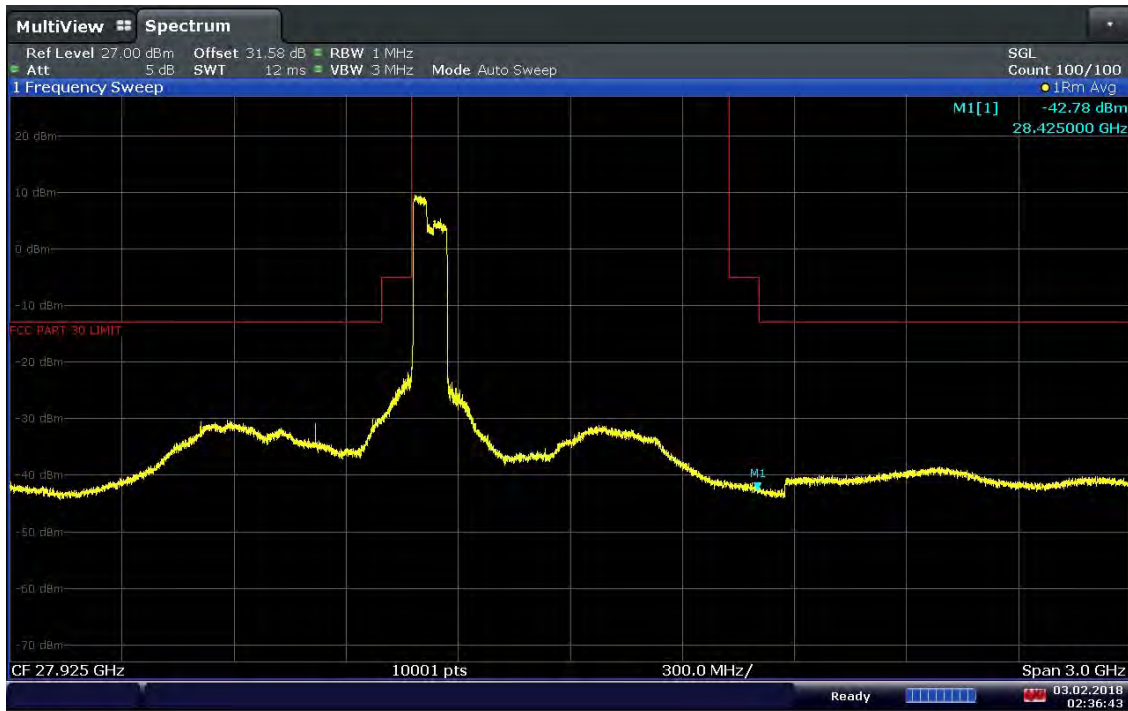
FCC ID: A3LSFG-AA100DC	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1M1712270338-01-R2.A3L	Test Dates: 1/2-2/3/2018	EUT Type: 5G Access Unit	Page 190 of 221

7.6.8 Antenna B Conducted Band Edge Maximized on Antenna B



02:35:42 03.02.2018

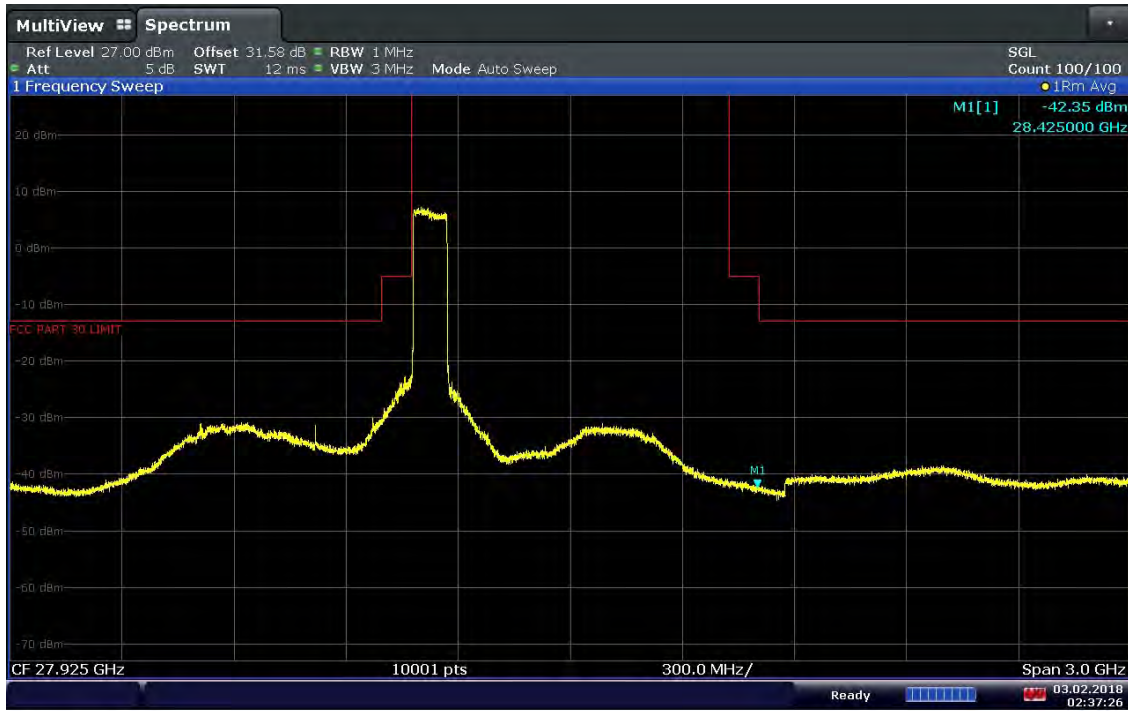
Plot 7-307. Band Edge Plot (1CC QPSK Low Channel)



02:36:44 03.02.2018

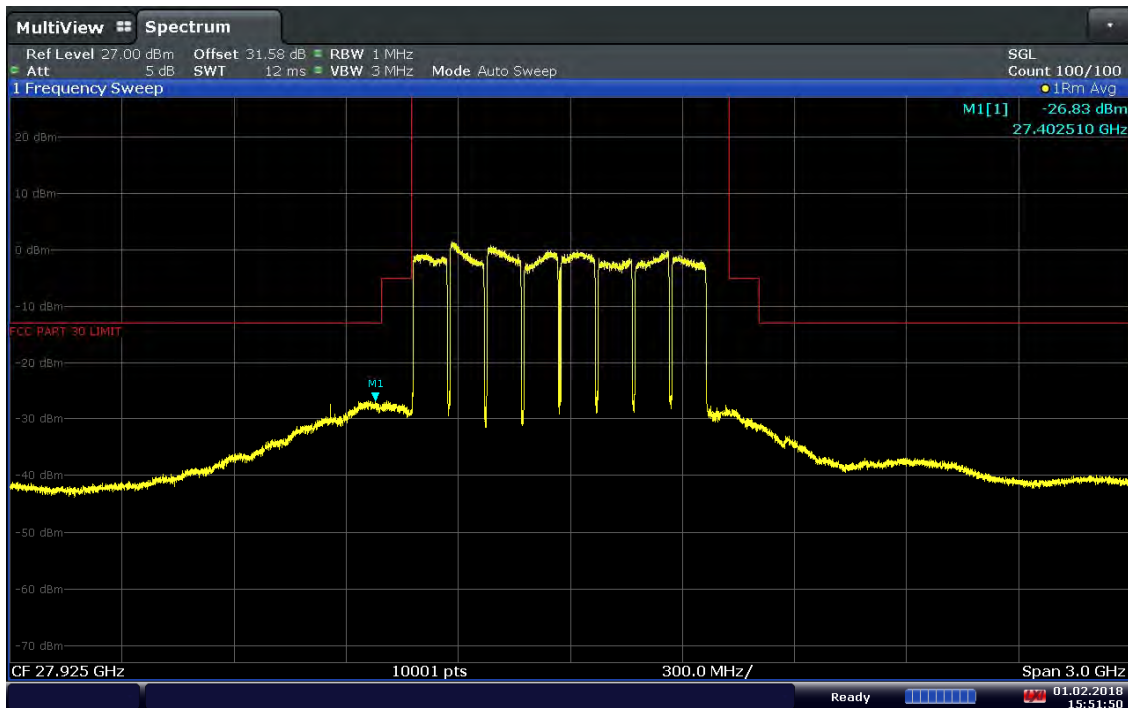
Plot 7-308. Band Edge Plot (1CC 16QAM Low Channel)

FCC ID: A3LSFG-AA100DC	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1712270338-01-R2.A3L	Test Dates: 1/2-2/3/2018	EUT Type: 5G Access Unit		Page 191 of 221



02:37:26 03.02.2018

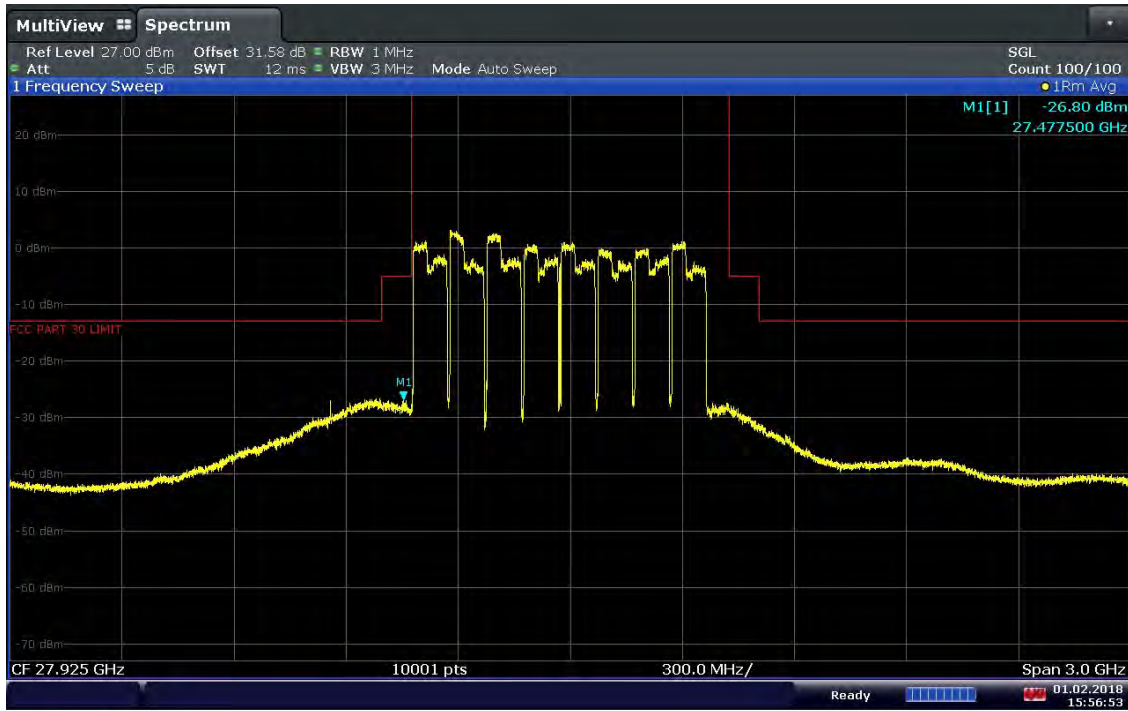
Plot 7-309. Band Edge Plot (1CC 64QAM Low Channel)



15:51:50 01.02.2018

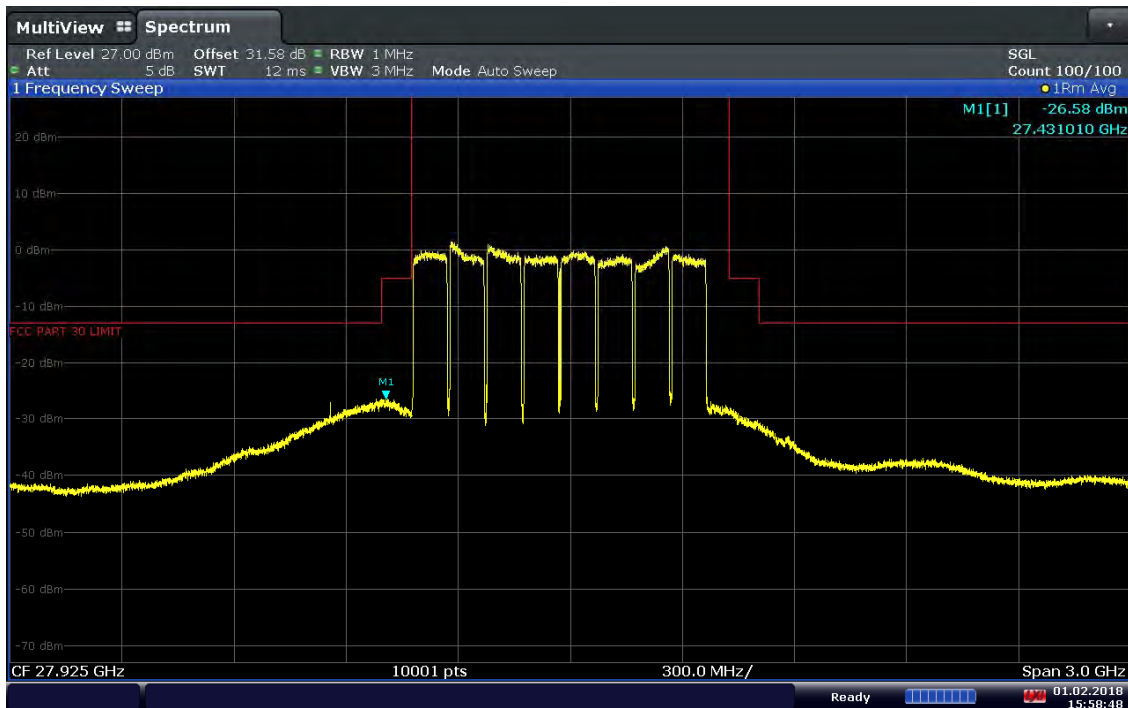
Plot 7-310. Band Edge Plot (8CC QPSK Low Channel)

FCC ID: A3LSFG-AA100DC	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1M1712270338-01-R2.A3L	Test Dates: 1/2-2/3/2018	EUT Type: 5G Access Unit	Page 192 of 221



15:56:53 01.02.2018

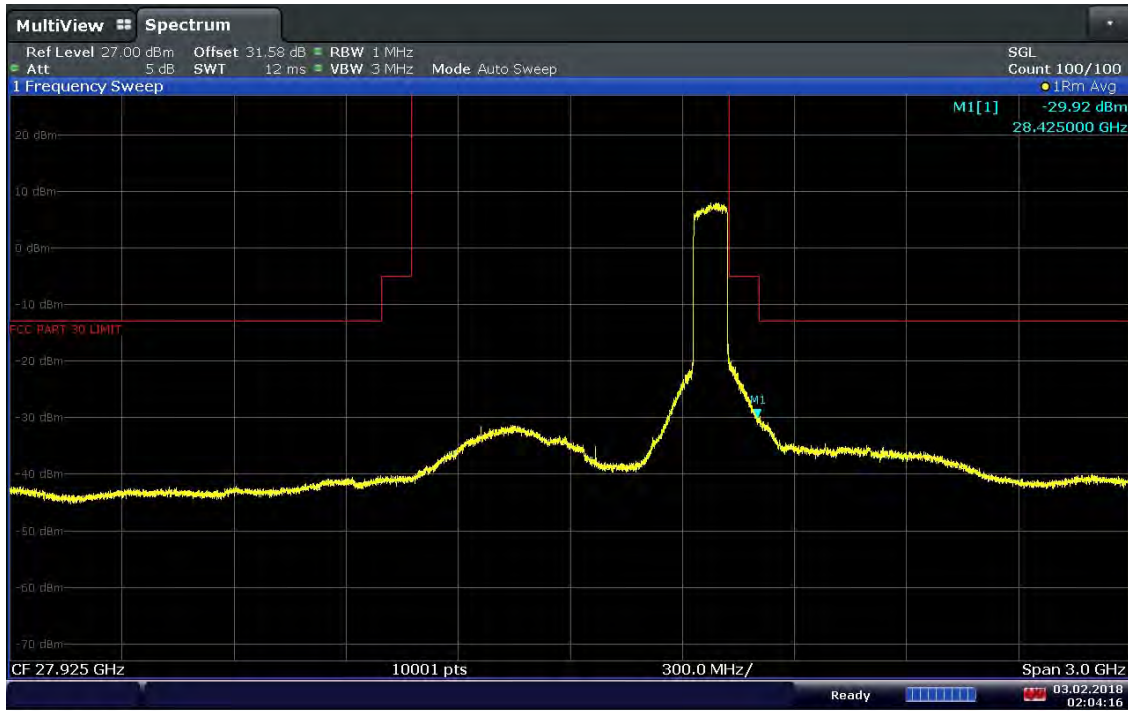
Plot 7-311. Band Edge Plot (8CC 16QAM Low Channel)



15:58:48 01.02.2018

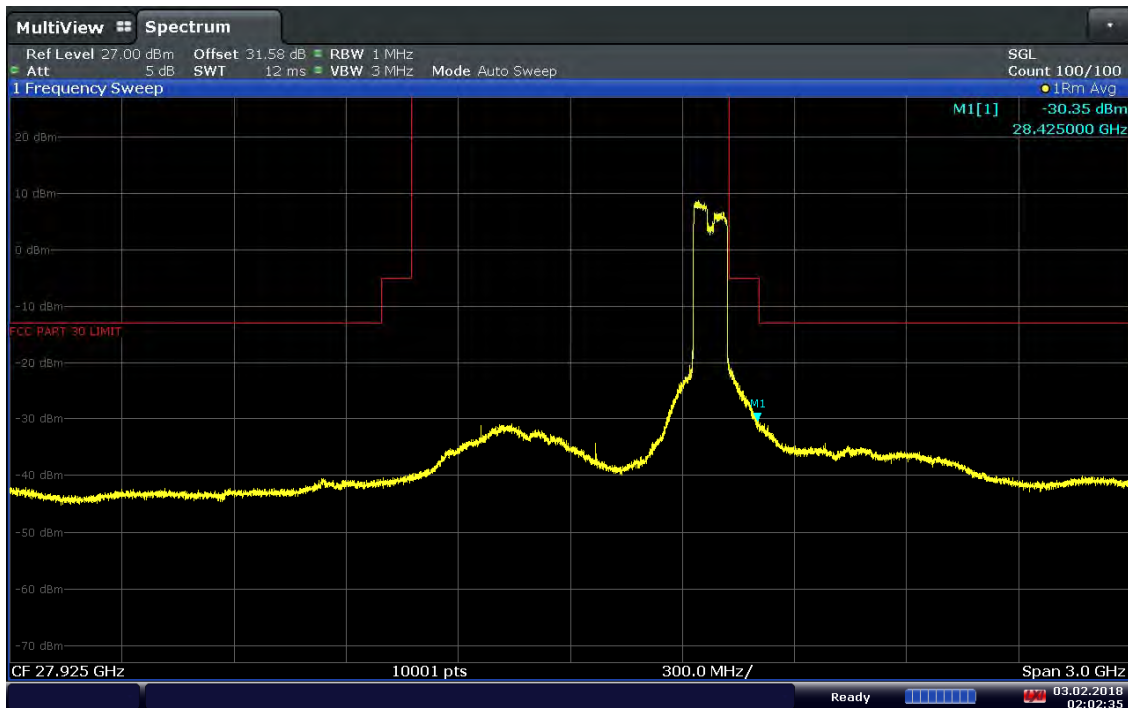
Plot 7-312. Band Edge Plot (8CC 64QAM Low Channel)

FCC ID: A3LSFG-AA100DC	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1712270338-01-R2.A3L	Test Dates: 1/2-2/3/2018	EUT Type: 5G Access Unit		Page 193 of 221



02:04:17 03.02.2018

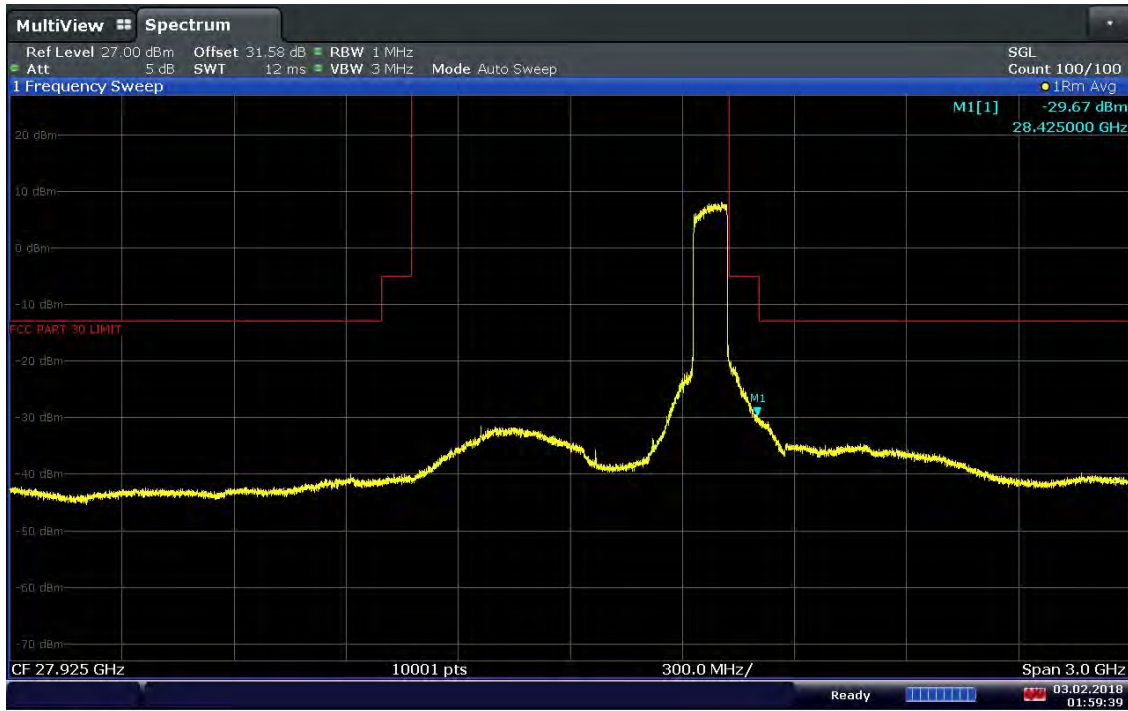
Plot 7-313. Band Edge Plot (1CC QPSK High Channel)



02:02:36 03.02.2018

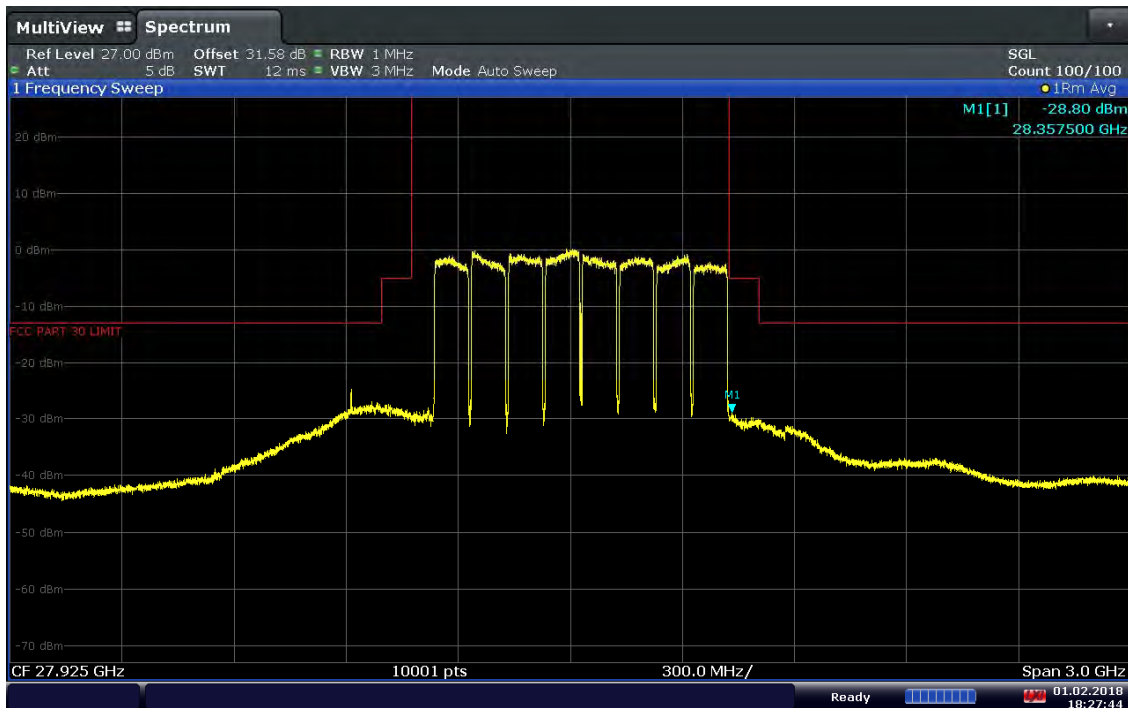
Plot 7-314. Band Edge Plot (1CC 16QAM High Channel)

FCC ID: A3LSFG-AA100DC	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1712270338-01-R2.A3L	Test Dates: 1/2-2/3/2018	EUT Type: 5G Access Unit		Page 194 of 221



01:59:39 03.02.2018

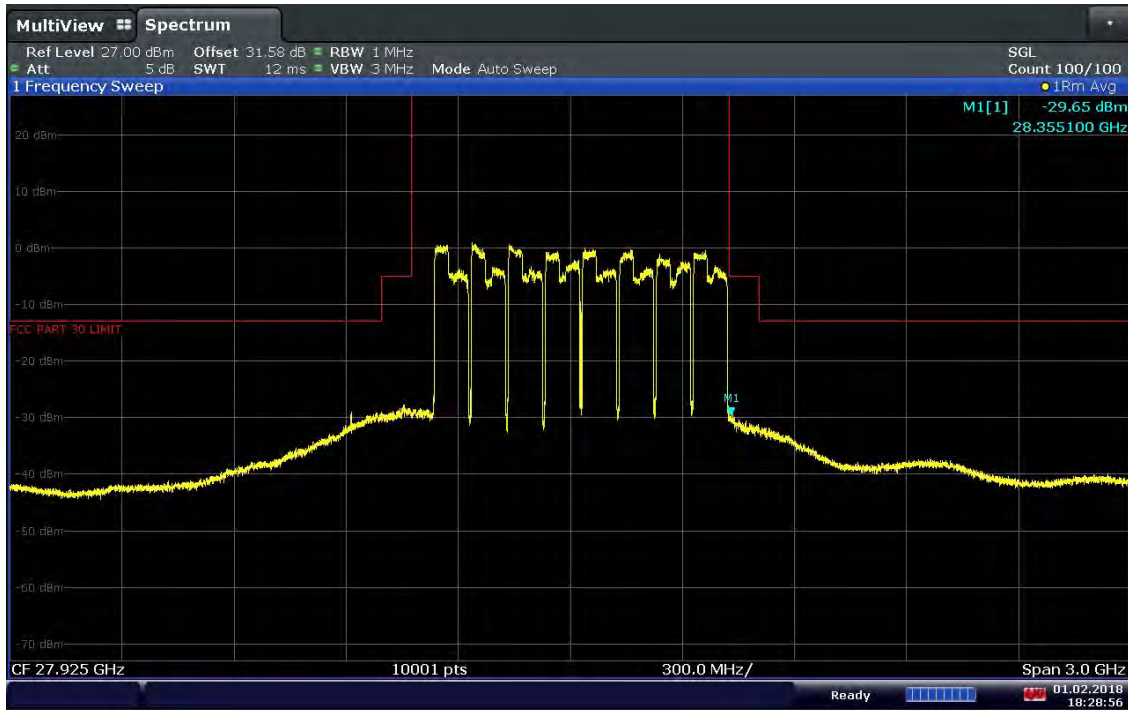
Plot 7-315. Band Edge Plot (1CC 64QAM High Channel)



18:27:45 01.02.2018

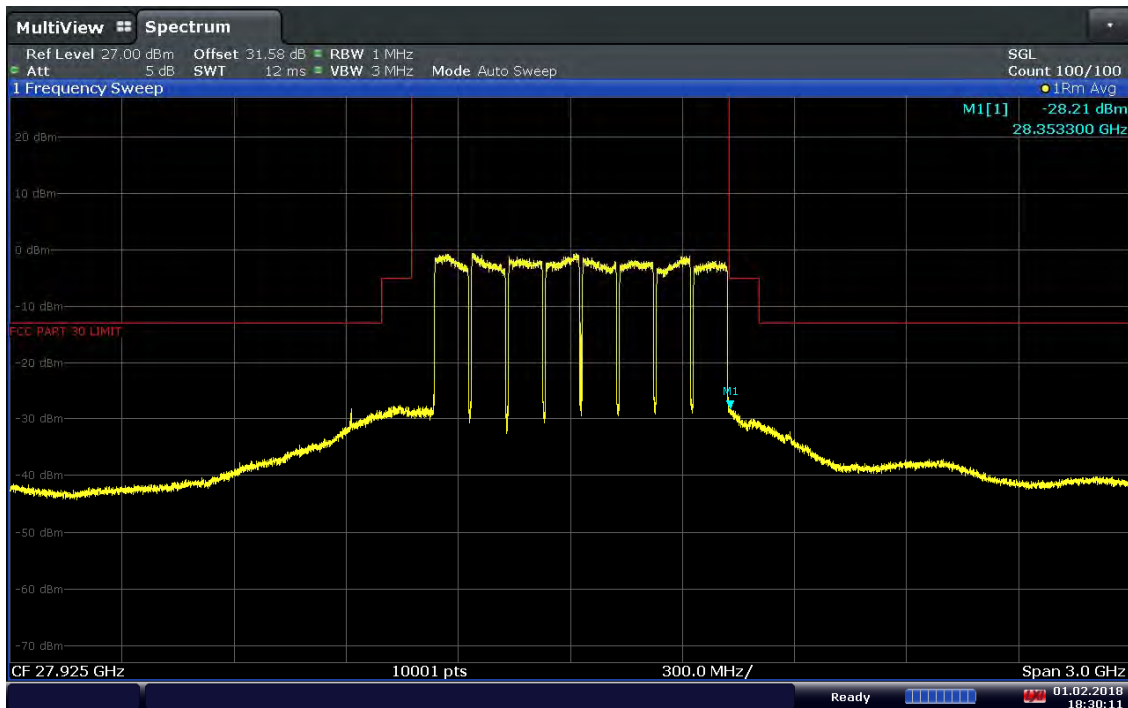
Plot 7-316. Band Edge Plot (8CC QPSK High Channel)

FCC ID: A3LSFG-AA100DC	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1712270338-01-R2.A3L	Test Dates: 1/2-2/3/2018	EUT Type: 5G Access Unit		Page 195 of 221



18:28:56 01.02.2018

Plot 7-317. Band Edge Plot (8CC 16QAM High Channel)

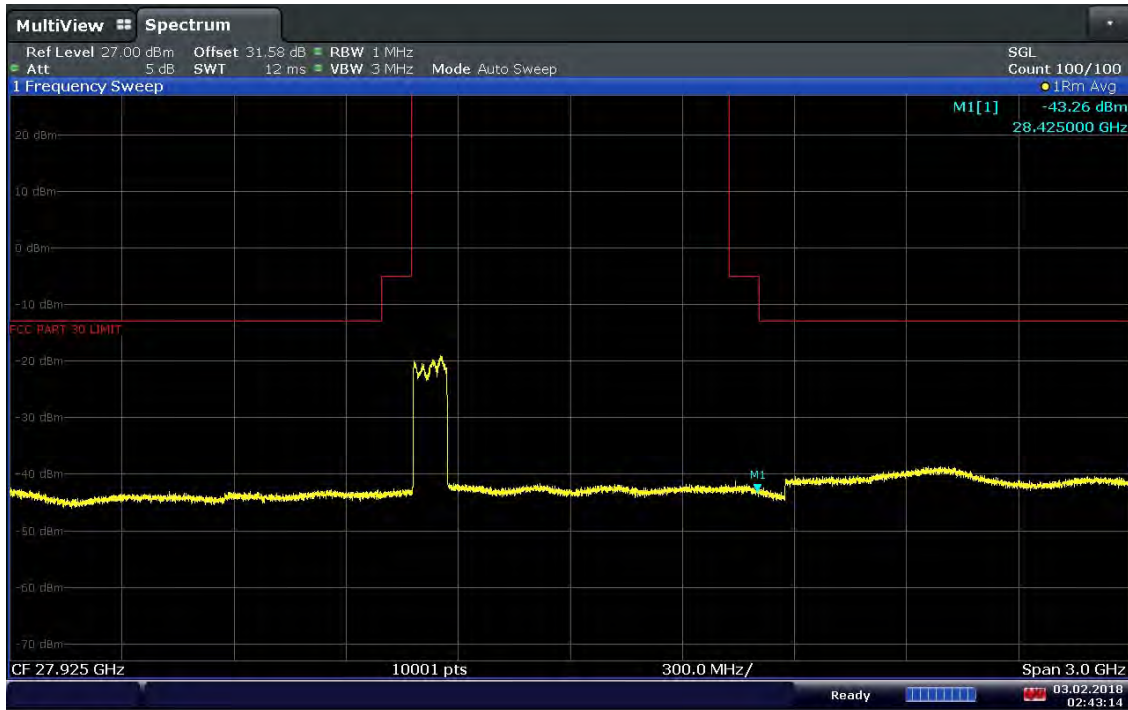


18:30:11 01.02.2018

Plot 7-318. Band Edge Plot (8CC 64QAM High Channel)

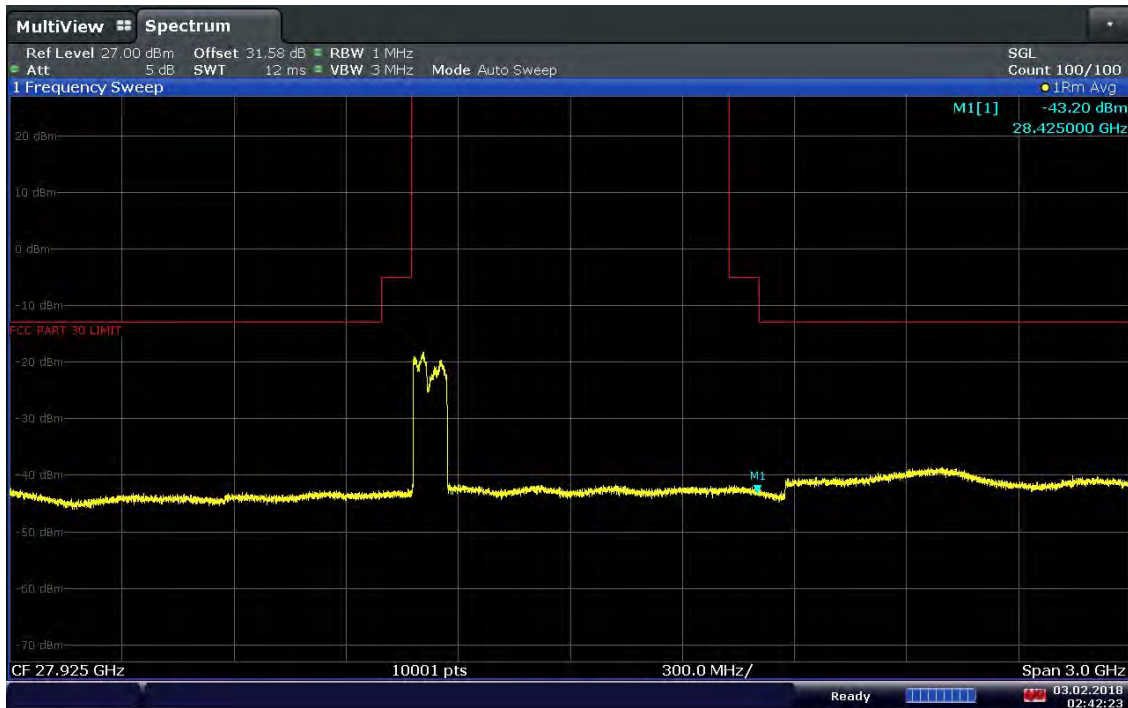
FCC ID: A3LSFG-AA100DC	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
Test Report S/N: 1M1712270338-01-R2.A3L	Test Dates: 1/2-2/3/2018	EUT Type: 5G Access Unit	Page 196 of 221

7.6.9 Antenna C Conducted Band Edge Maximized on Antenna B



02:43:14 03.02.2018

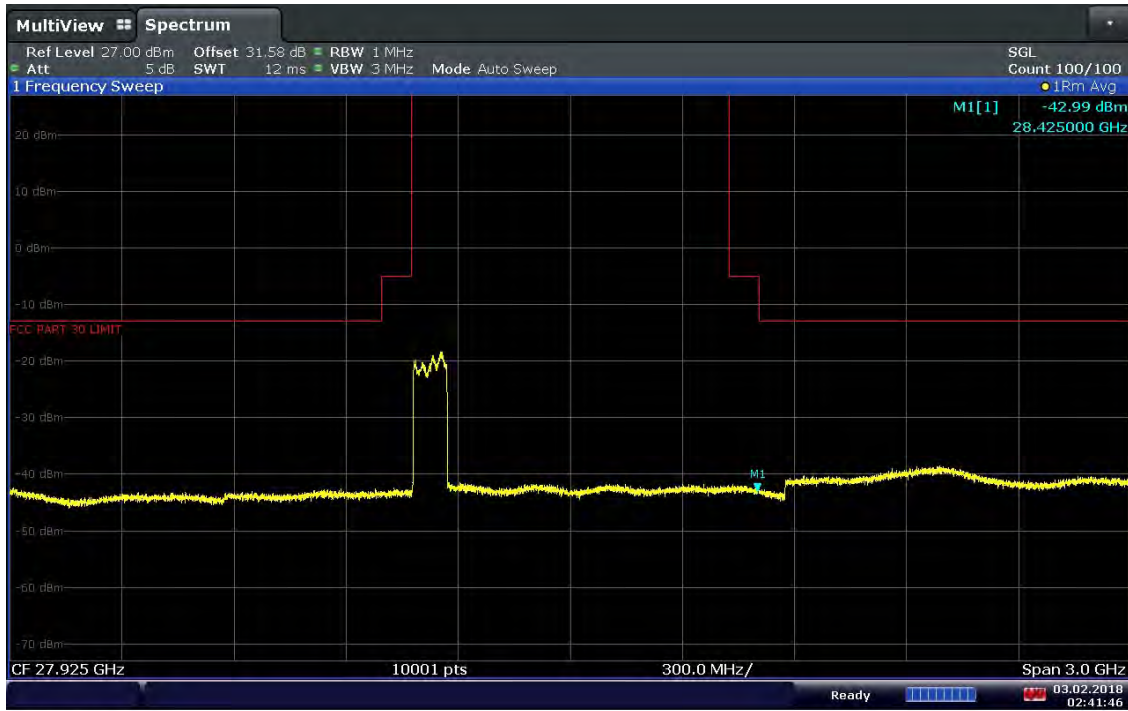
Plot 7-319. Band Edge Plot (1CC QPSK Low Channel)



02:42:24 03.02.2018

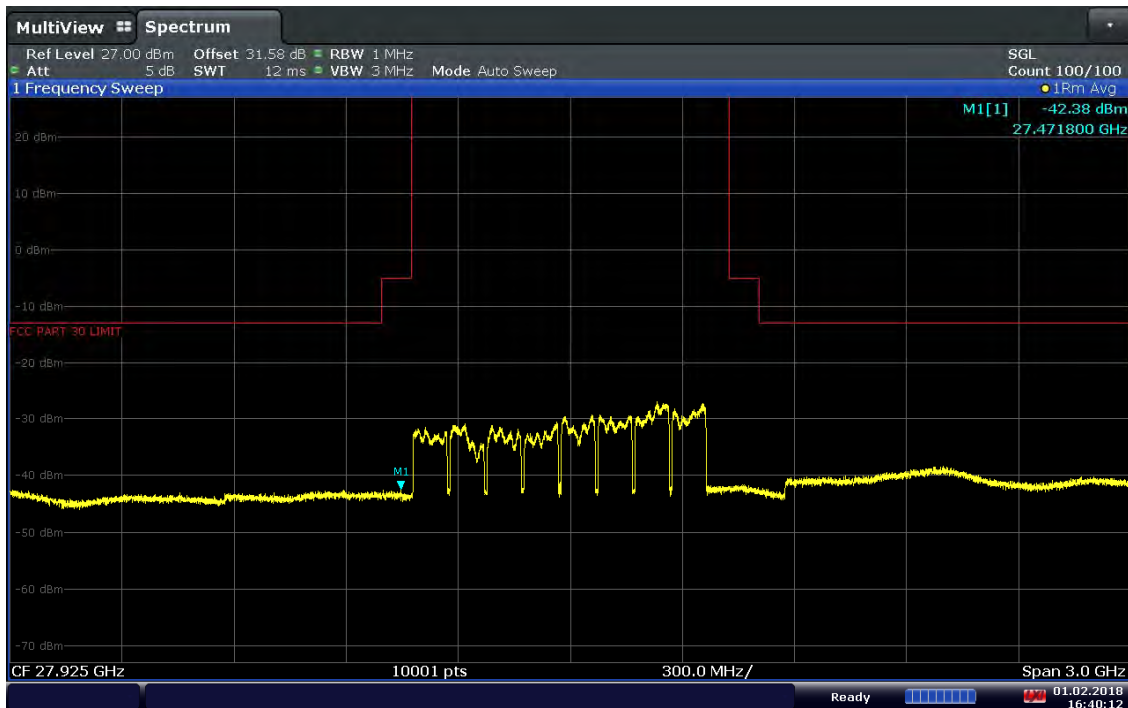
Plot 7-320. Band Edge Plot (1CC 16QAM Low Channel)

FCC ID: A3LSFG-AA100DC	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1712270338-01-R2.A3L	Test Dates: 1/2-2/3/2018	EUT Type: 5G Access Unit		Page 197 of 221



02:41:46 03.02.2018

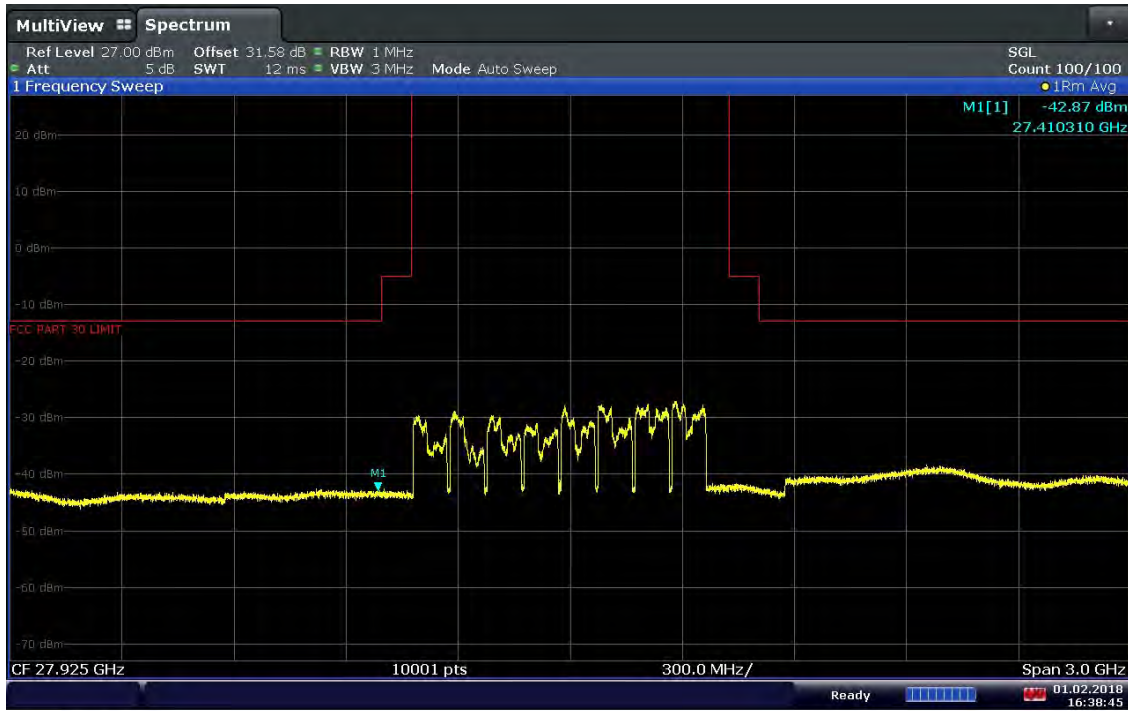
Plot 7-321. Band Edge Plot (1CC 64QAM Low Channel)



16:40:13 01.02.2018

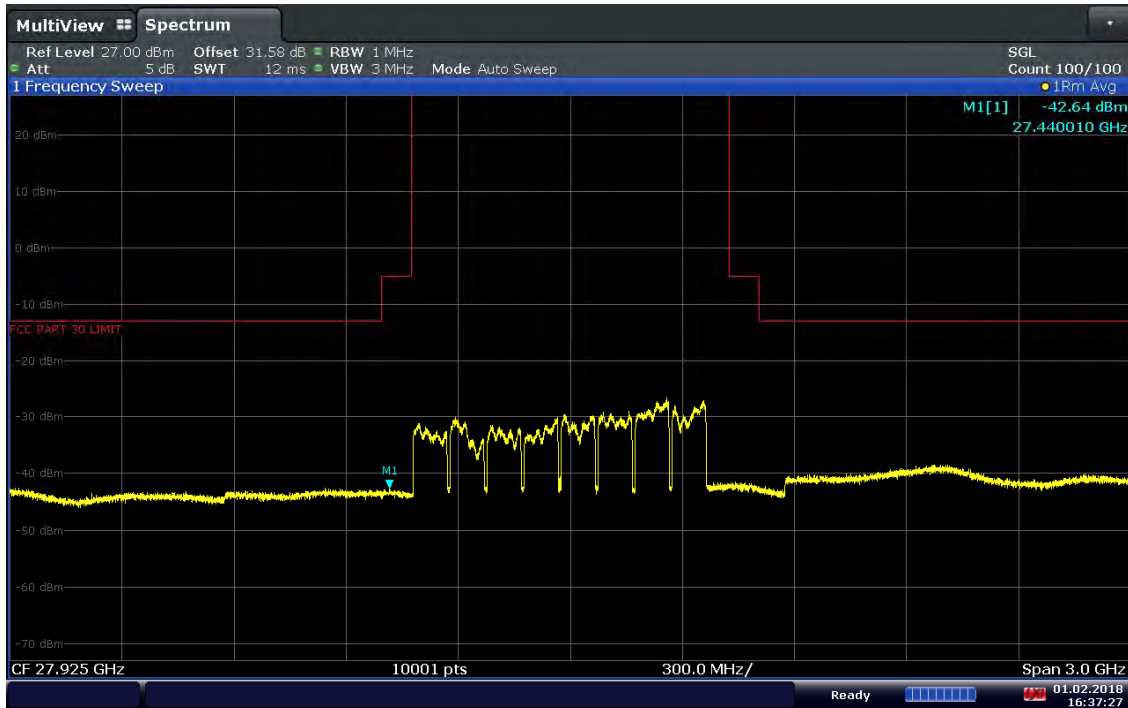
Plot 7-322. Band Edge Plot (8CC QPSK Low Channel)

FCC ID: A3LSFG-AA100DC	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1M1712270338-01-R2.A3L	Test Dates: 1/2-2/3/2018	EUT Type: 5G Access Unit	Page 198 of 221



16:38:45 01.02.2018

Plot 7-323. Band Edge Plot (8CC 16QAM Low Channel)



16:37:27 01.02.2018

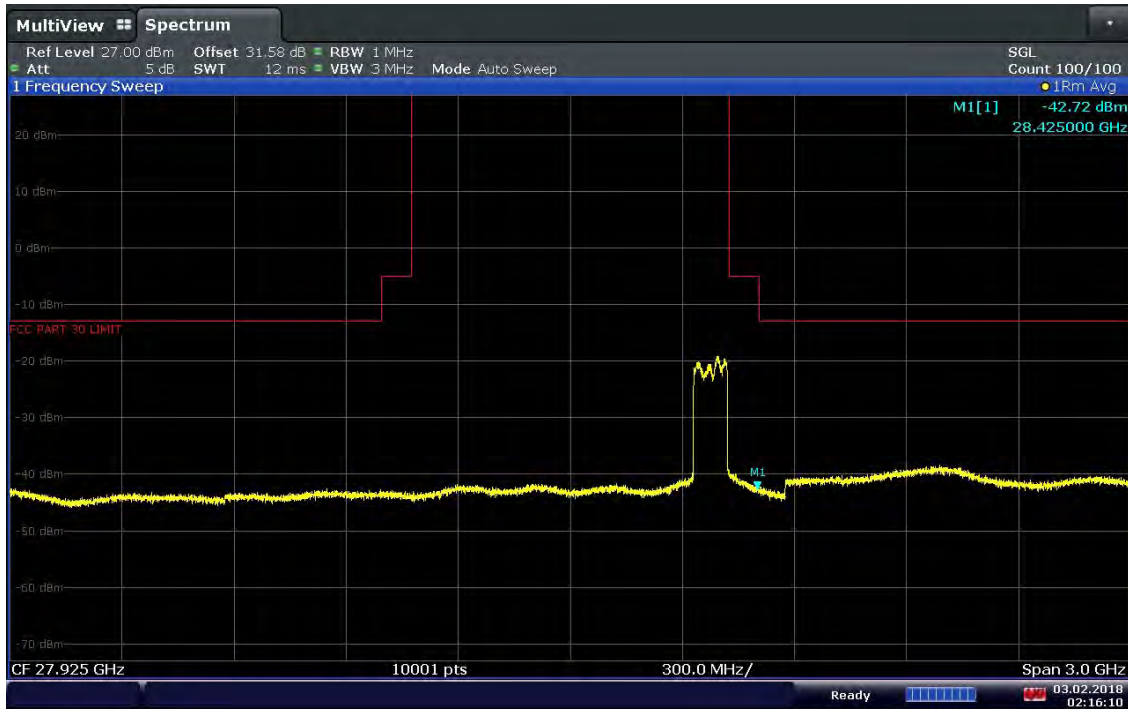
Plot 7-324. Band Edge Plot (8CC 64QAM Low Channel)

FCC ID: A3LSFG-AA100DC	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1M1712270338-01-R2.A3L	Test Dates: 1/2-2/3/2018	EUT Type: 5G Access Unit	Page 199 of 221

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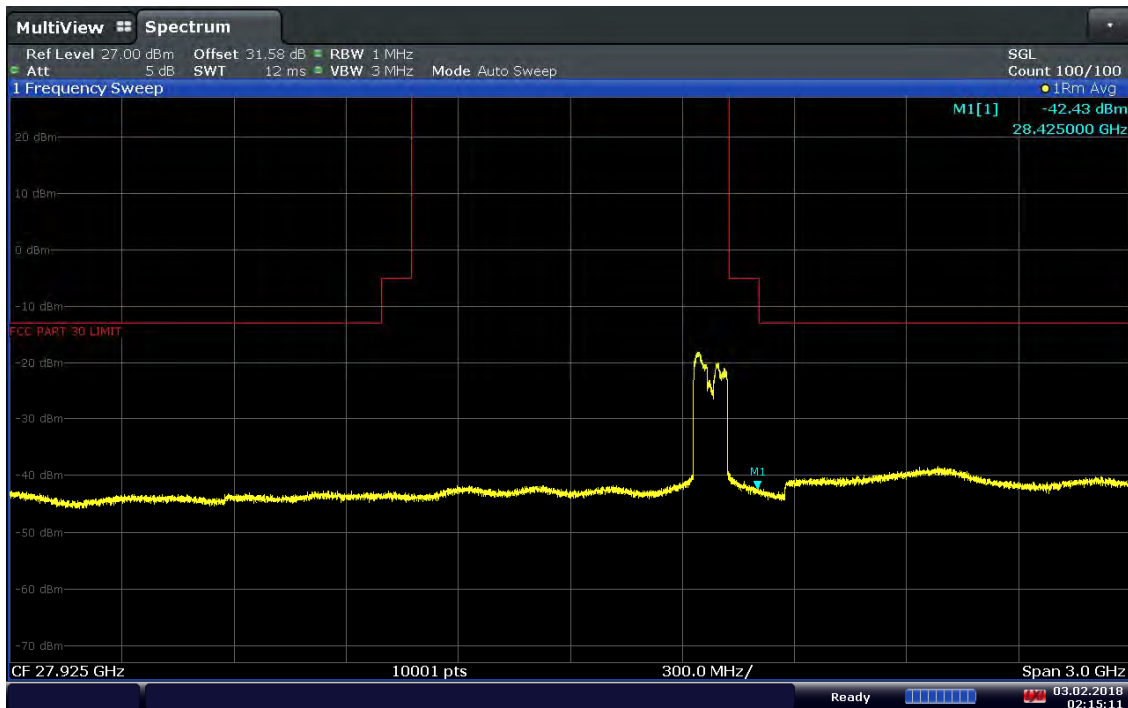
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V1.0



02:16:11 03.02.2018

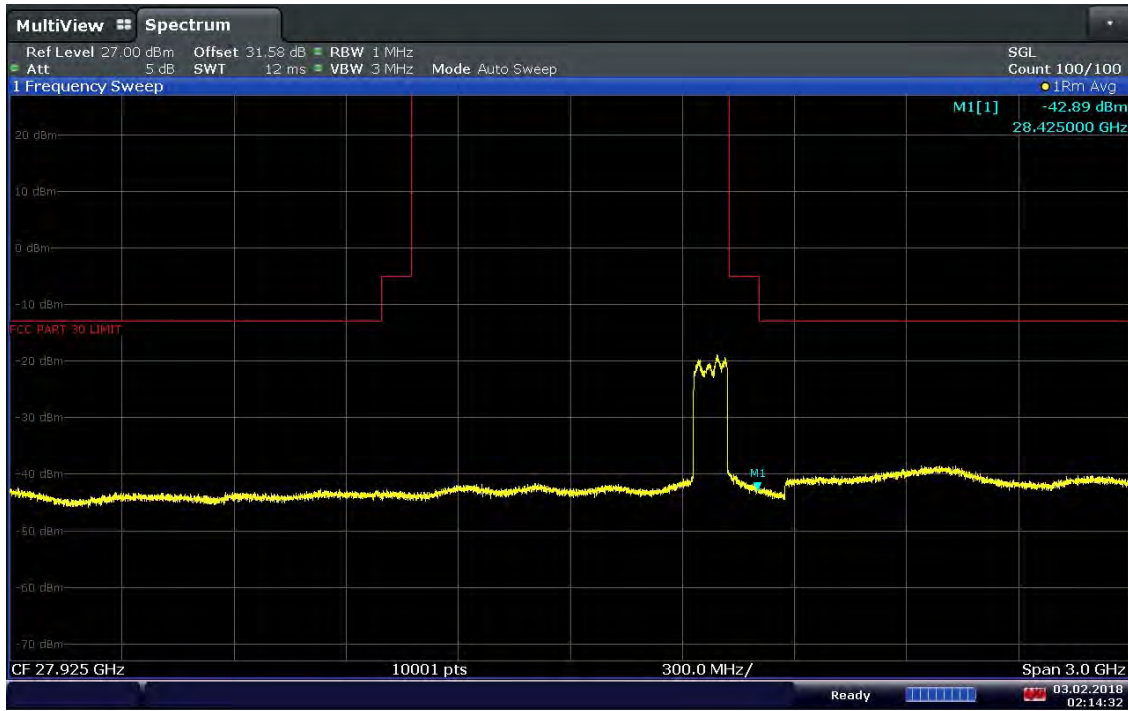
Plot 7-325. Band Edge Plot (1CC QPSK High Channel)



02:15:11 03.02.2018

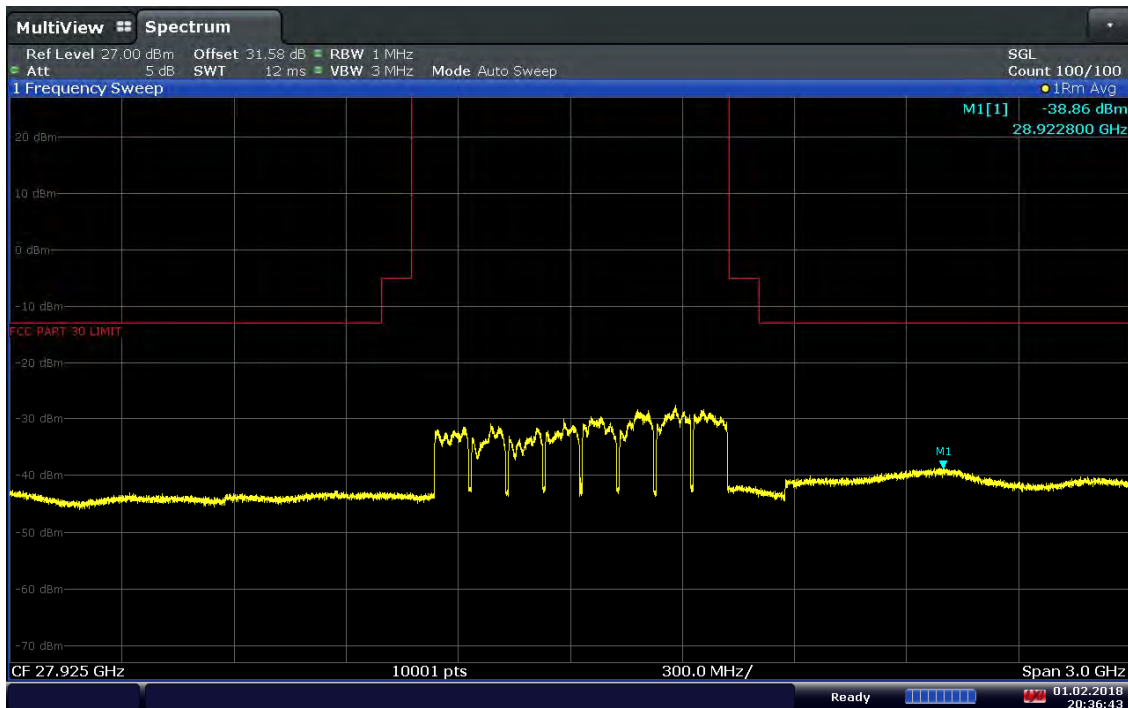
Plot 7-326. Band Edge Plot (1CC 16QAM High Channel)

FCC ID: A3LSFG-AA100DC	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1M1712270338-01-R2.A3L	Test Dates: 1/2-2/3/2018	EUT Type: 5G Access Unit	Page 200 of 221



02:14:32 03.02.2018

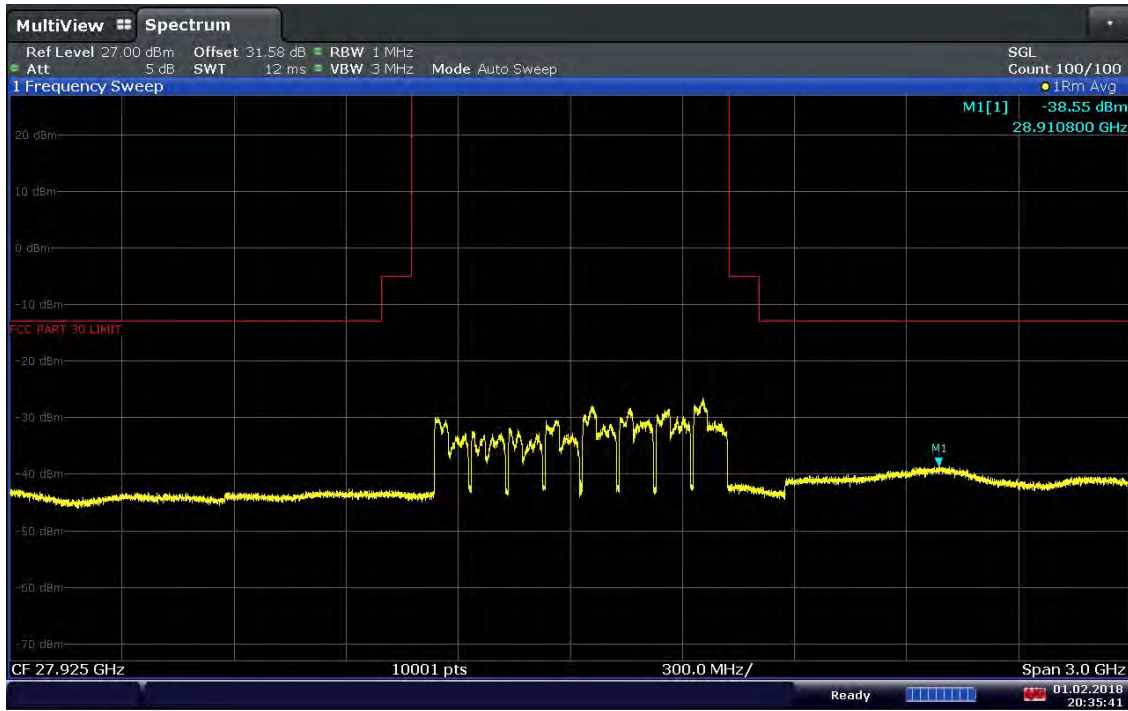
Plot 7-327. Band Edge Plot (1CC 64QAM High Channel)



20:36:43 01.02.2018

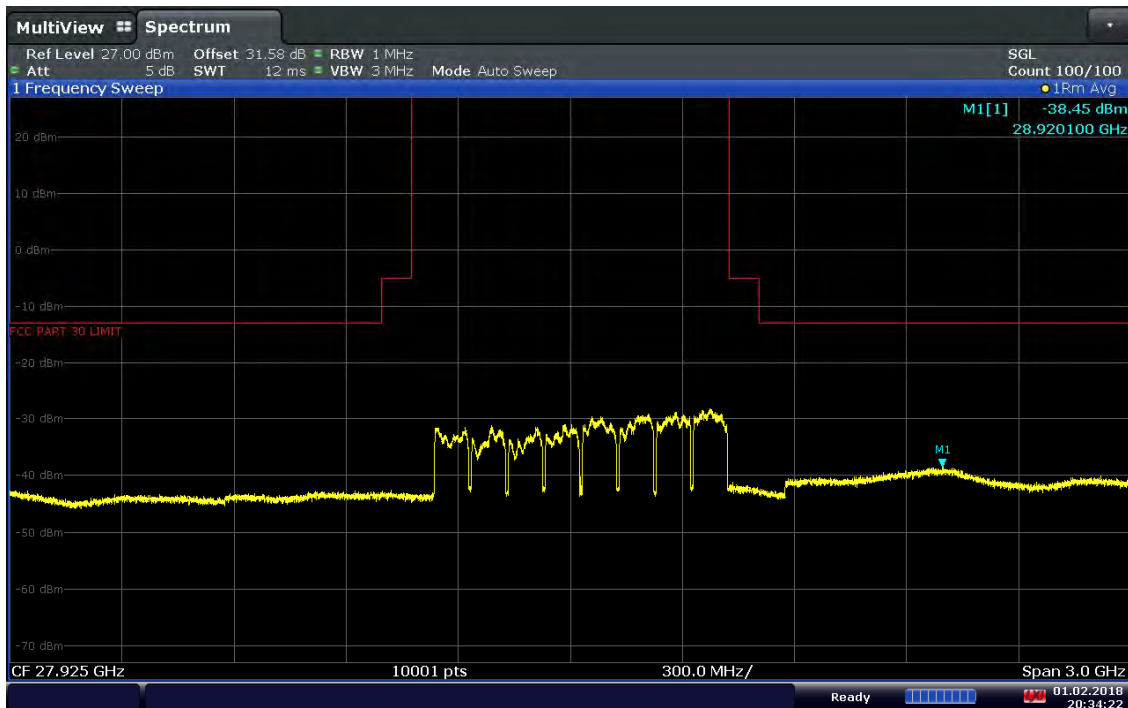
Plot 7-328. Band Edge Plot (8CC QPSK High Channel)

FCC ID: A3LSFG-AA100DC	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1712270338-01-R2.A3L	Test Dates: 1/2-2/3/2018	EUT Type: 5G Access Unit		Page 201 of 221



20:35:41 01.02.2018

Plot 7-329. Band Edge Plot (8CC 16QAM High Channel)

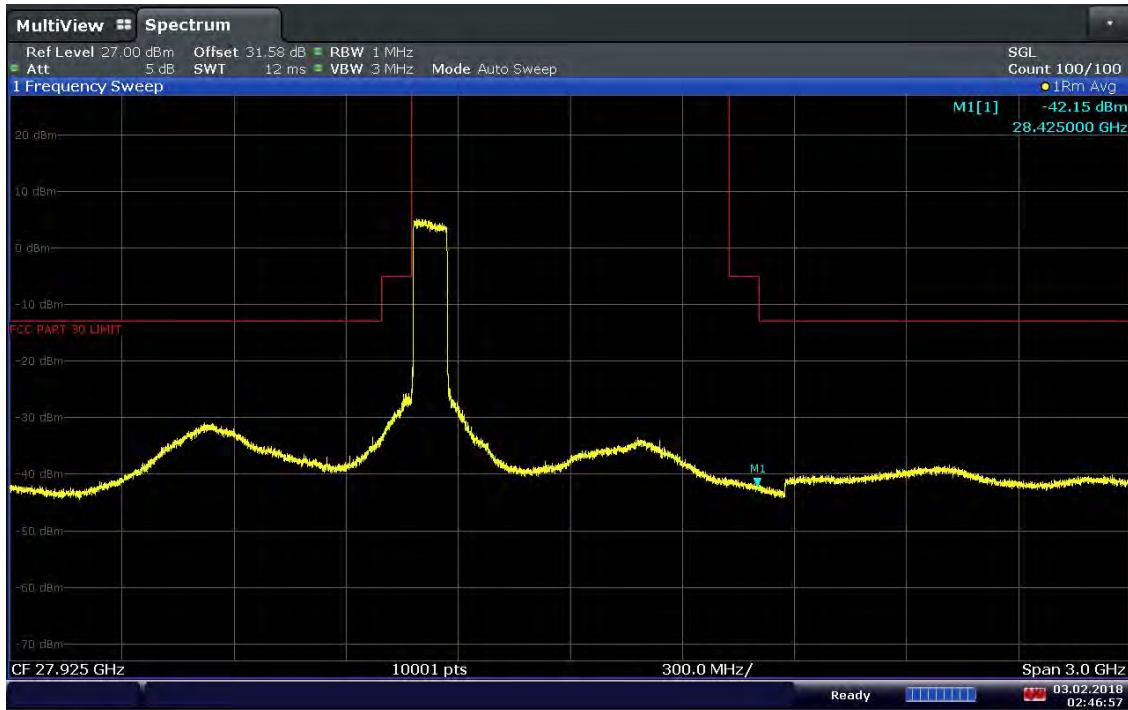


20:34:22 01.02.2018

Plot 7-330. Band Edge Plot (8CC 64QAM High Channel)

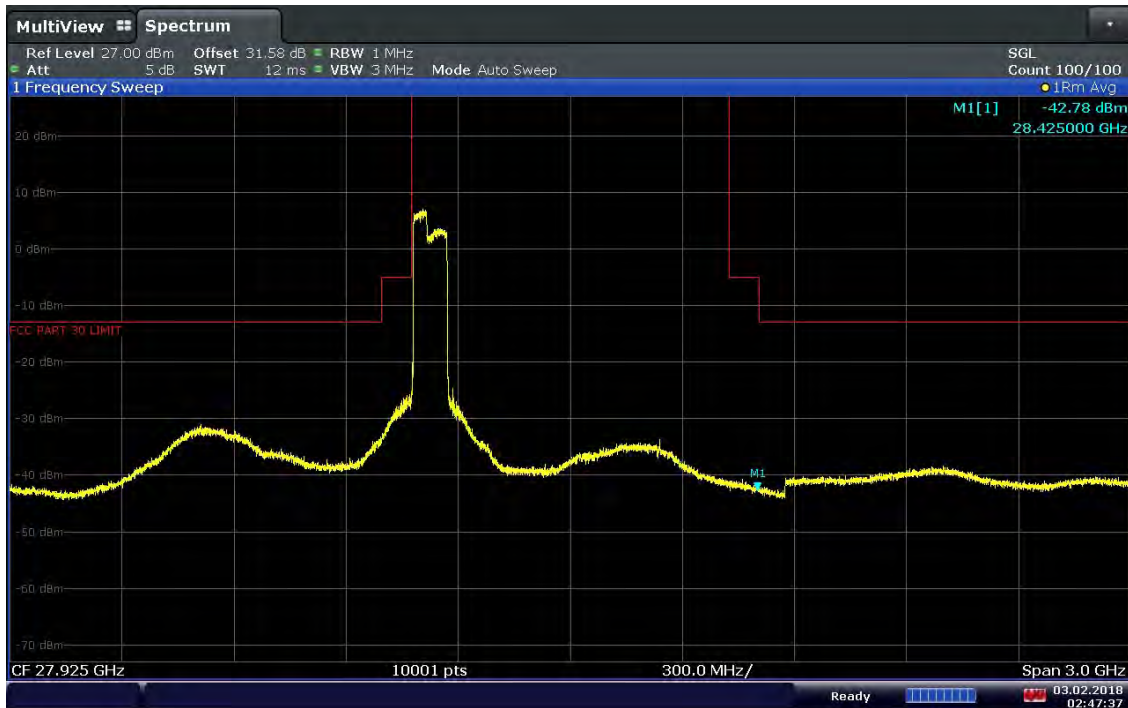
FCC ID: A3LSFG-AA100DC	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1M1712270338-01-R2.A3L	Test Dates: 1/2-2/3/2018	EUT Type: 5G Access Unit	Page 202 of 221

7.6.10 Antenna D Conducted Band Edge Maximized on Antenna B



02:46:58 03.02.2018

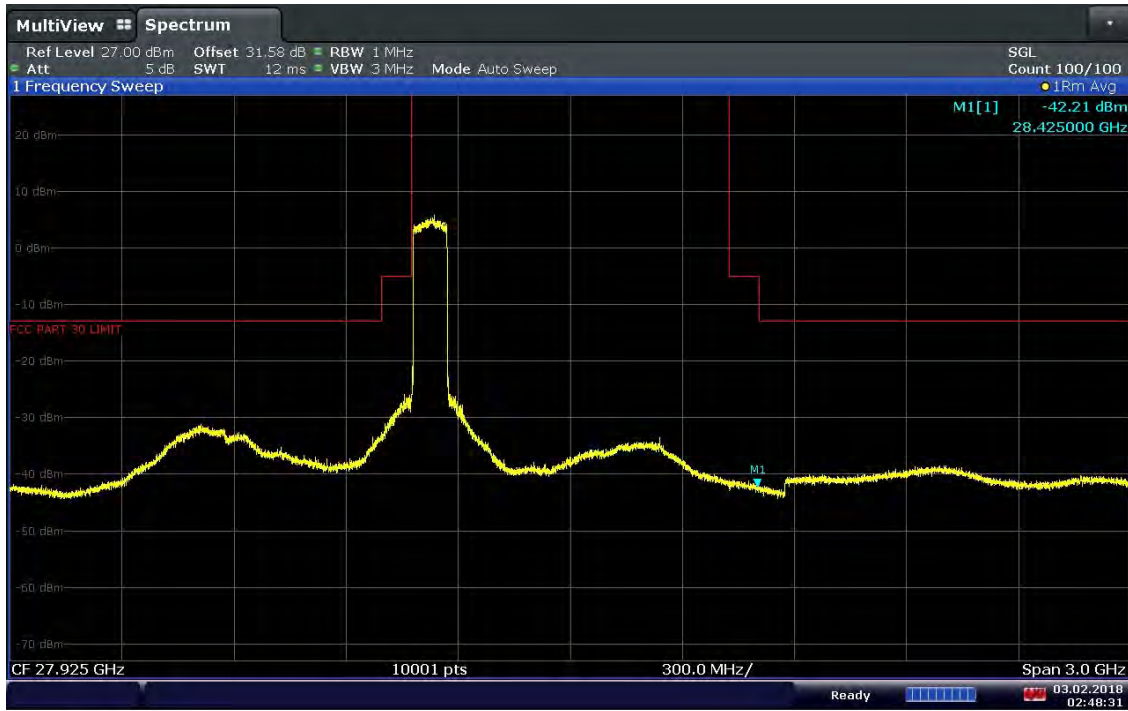
Plot 7-331. Band Edge Plot (1CC QPSK Low Channel)



02:47:38 03.02.2018

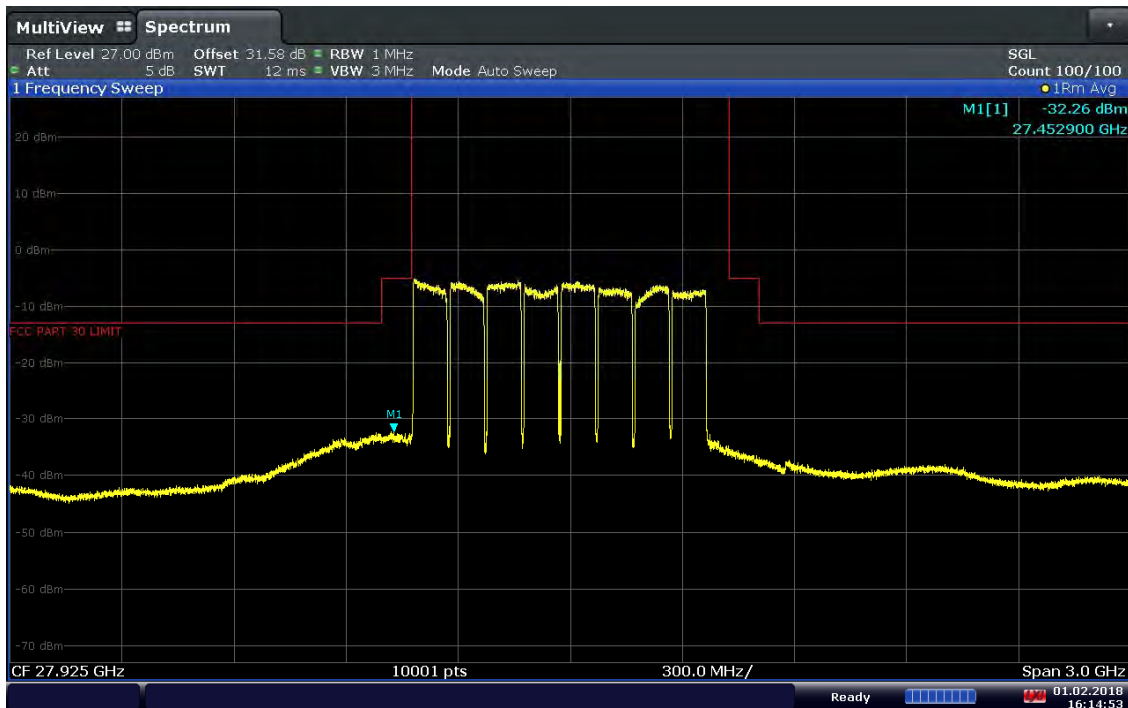
Plot 7-332. Band Edge Plot (1CC 16QAM Low Channel)

FCC ID: A3LSFG-AA100DC	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1712270338-01-R2.A3L	Test Dates: 1/2-2/3/2018	EUT Type: 5G Access Unit		Page 203 of 221



02:48:32 03.02.2018

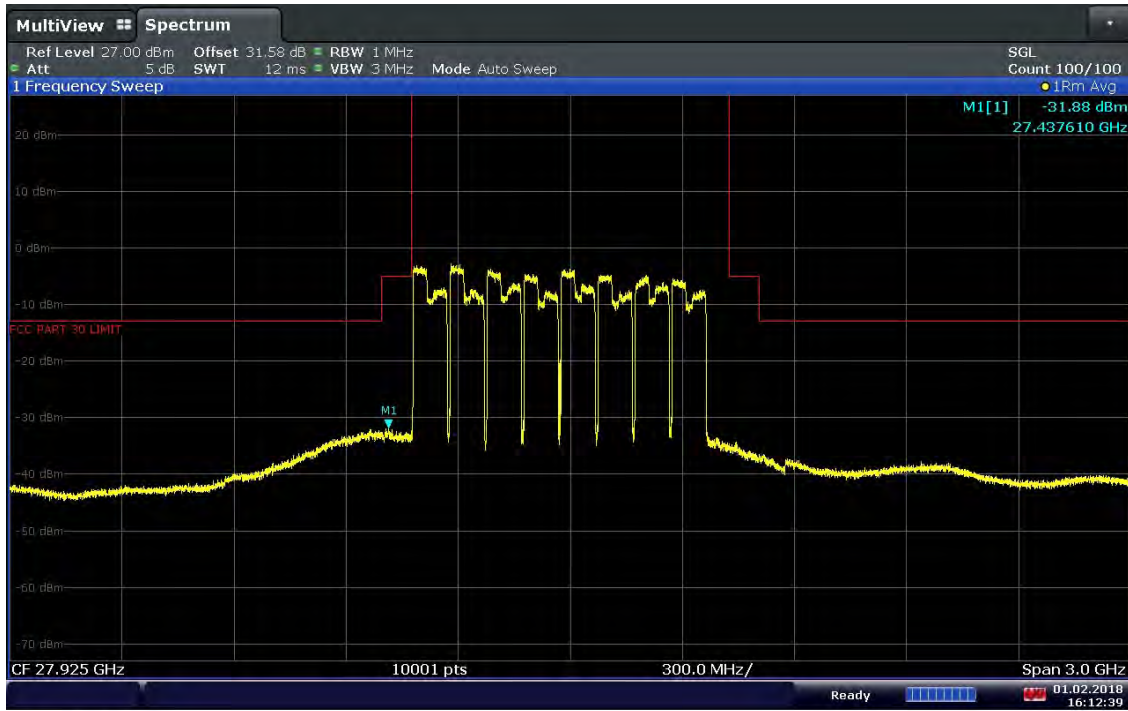
Plot 7-333. Band Edge Plot (1CC 64QAM Low Channel)



16:14:54 01.02.2018

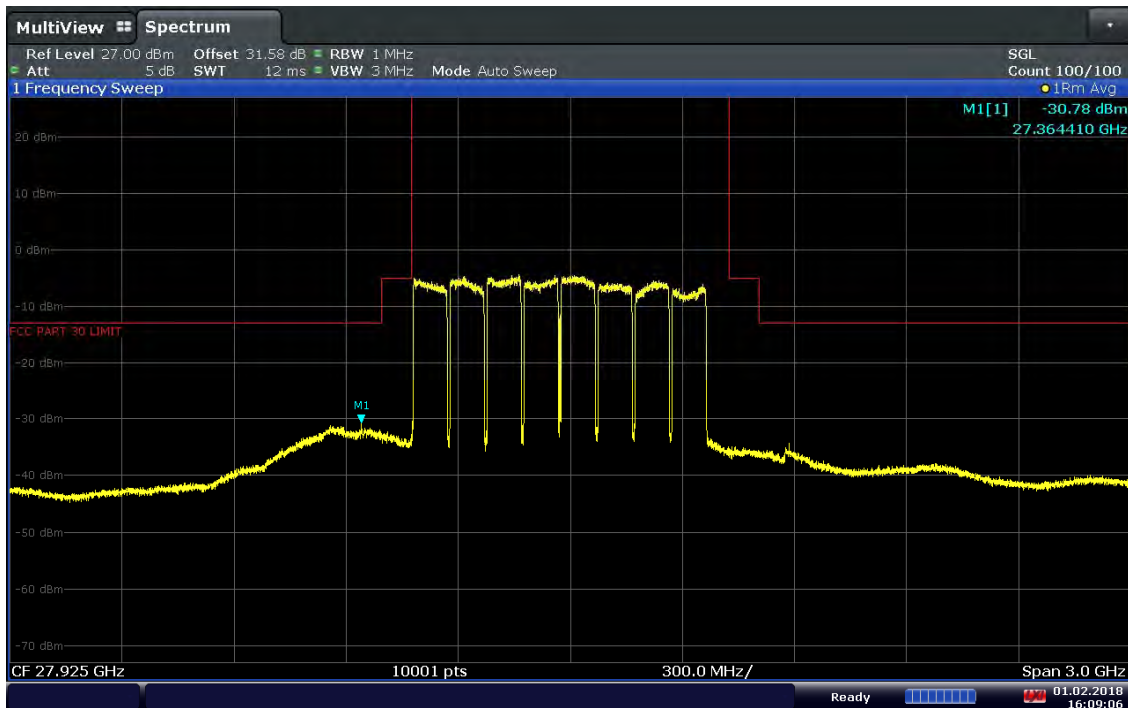
Plot 7-334. Band Edge Plot (8CC QPSK Low Channel)

FCC ID: A3LSFG-AA100DC	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1712270338-01-R2.A3L	Test Dates: 1/2-2/3/2018	EUT Type: 5G Access Unit		Page 204 of 221



16:12:40 01.02.2018

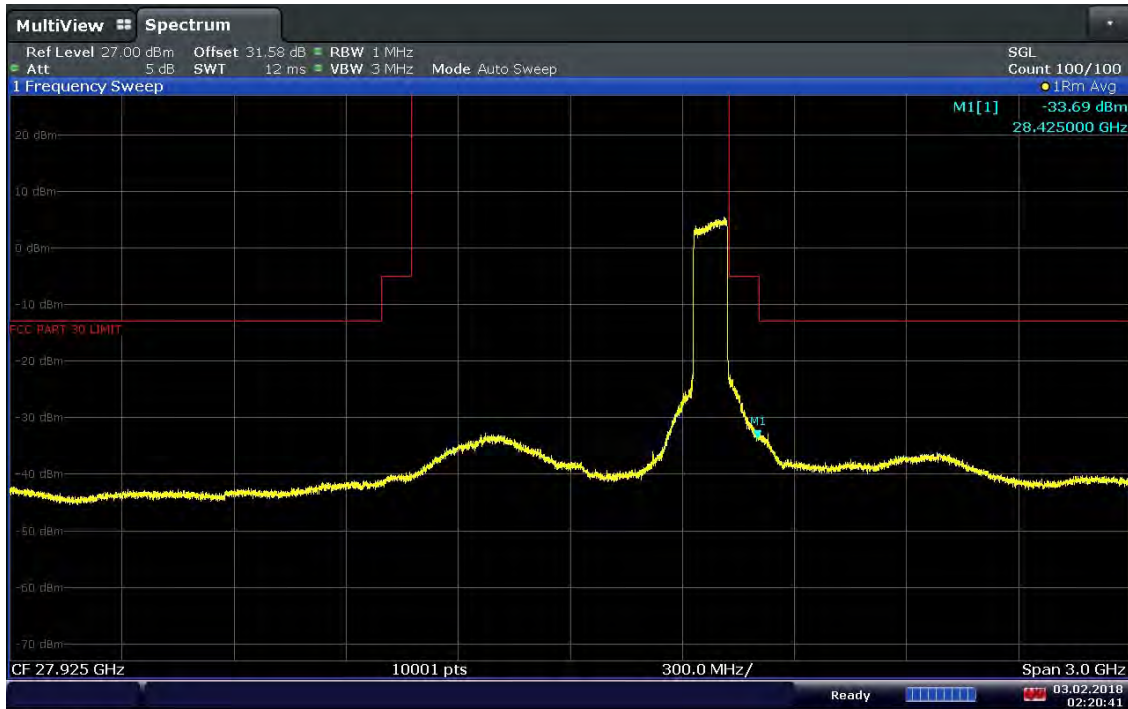
Plot 7-335. Band Edge Plot (8CC 16QAM Low Channel)



16:09:07 01.02.2018

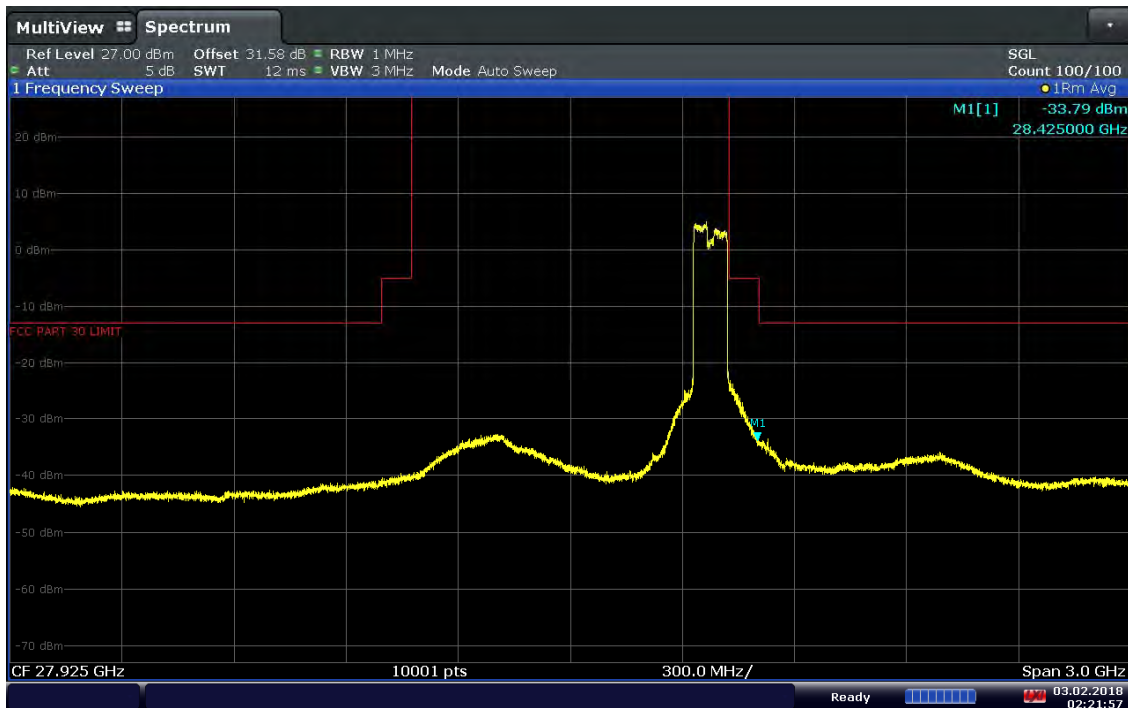
Plot 7-336. Band Edge Plot (8CC 64QAM Low Channel)

FCC ID: A3LSFG-AA100DC	MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1M1712270338-01-R2.A3L	Test Dates: 1/2-2/3/2018	EUT Type: 5G Access Unit		Page 205 of 221



02:20:42 03.02.2018

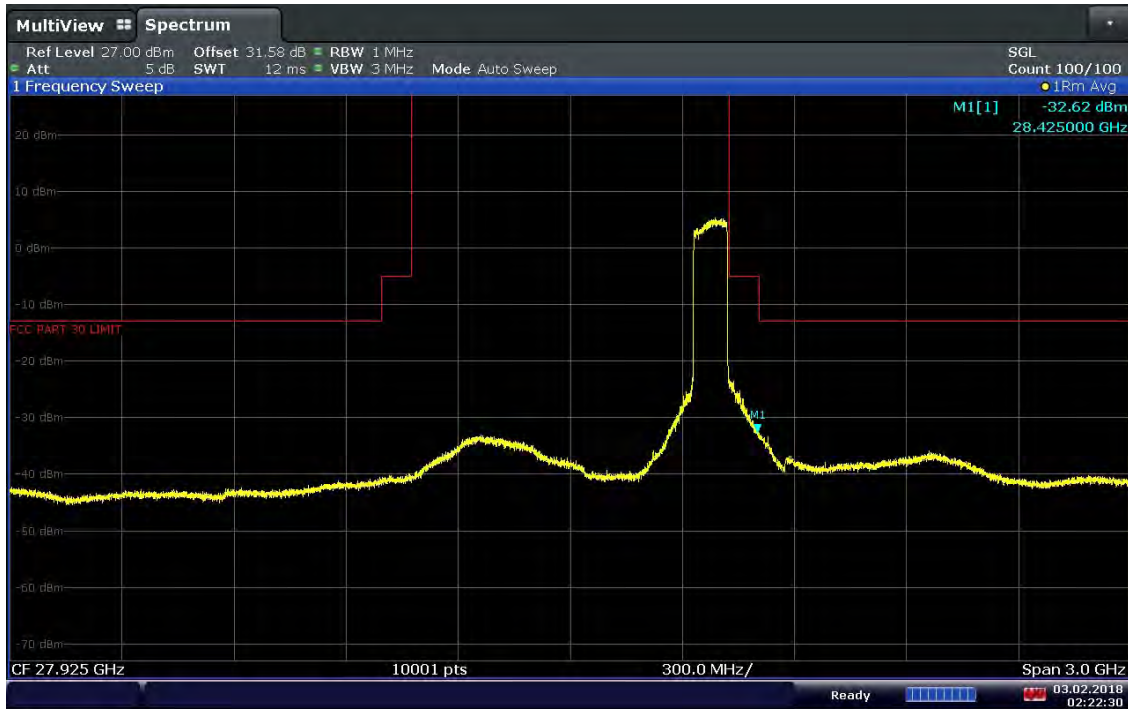
Plot 7-337. Band Edge Plot (1CC QPSK High Channel)



02:21:57 03.02.2018

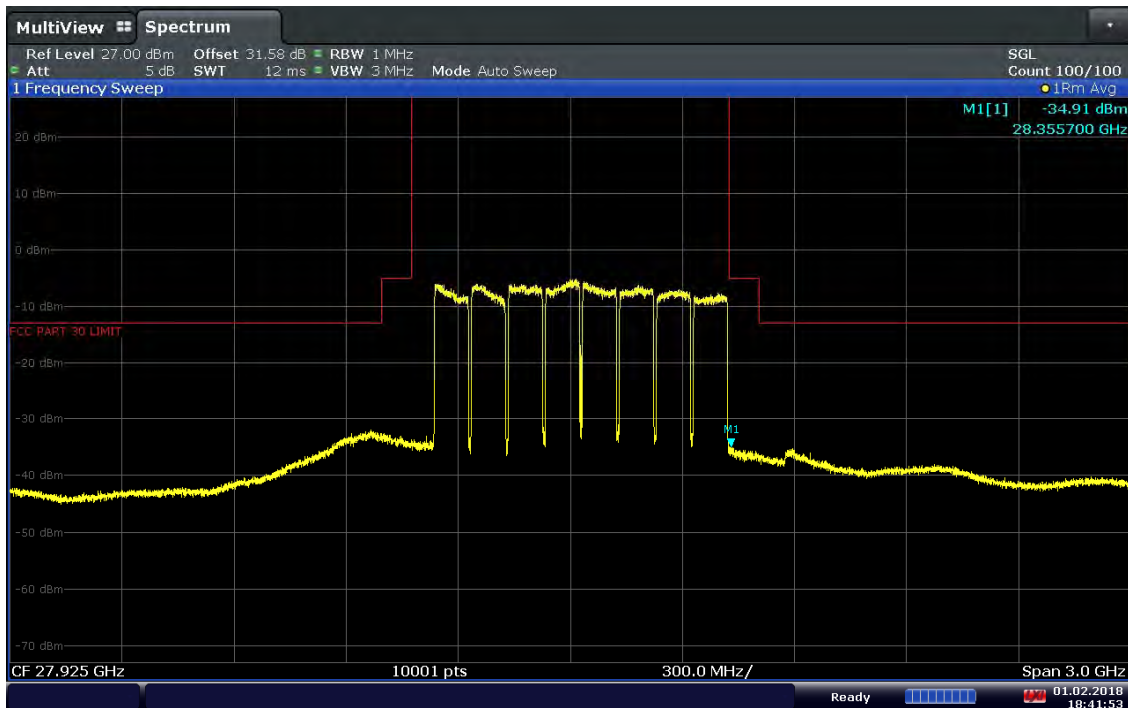
Plot 7-338. Band Edge Plot (1CC 16QAM High Channel)

FCC ID: A3LSFG-AA100DC	MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1M1712270338-01-R2.A3L	Test Dates: 1/2-2/3/2018	EUT Type: 5G Access Unit		Page 206 of 221



02:22:31 03.02.2018

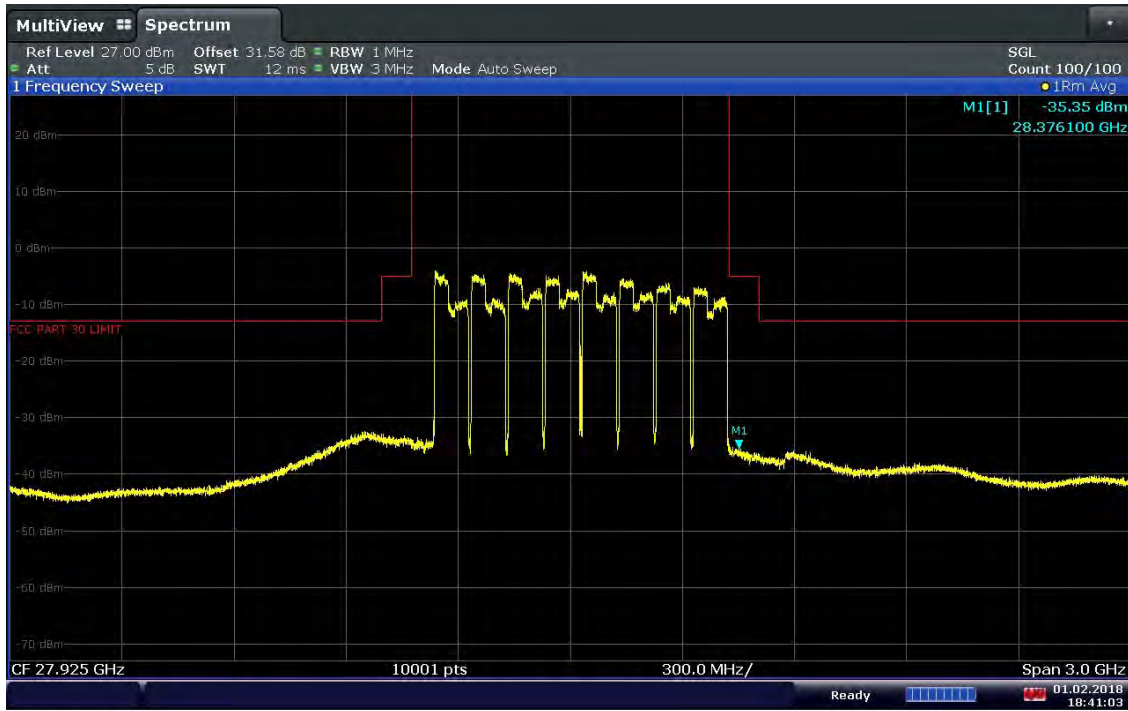
Plot 7-339. Band Edge Plot (1CC 64QAM High Channel)



18:41:54 01.02.2018

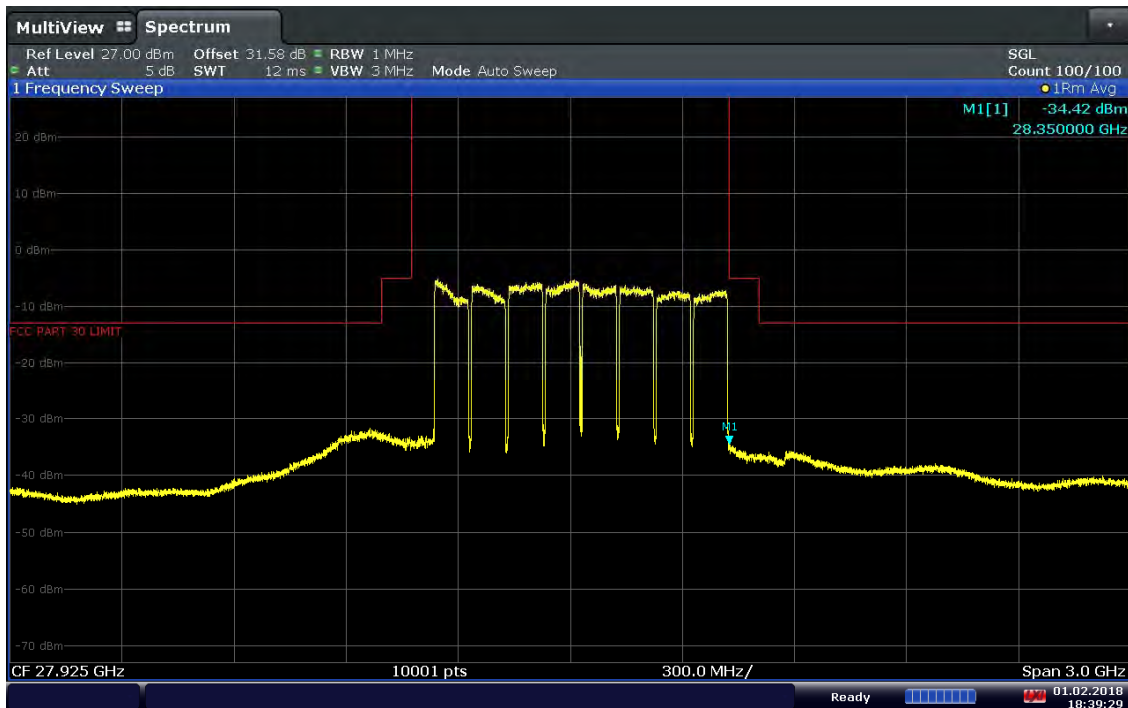
Plot 7-340. Band Edge Plot (8CC QPSK High Channel)

FCC ID: A3LSFG-AA100DC	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1712270338-01-R2.A3L	Test Dates: 1/2-2/3/2018	EUT Type: 5G Access Unit		Page 207 of 221



18:41:03 01.02.2018

Plot 7-341. Band Edge Plot (8CC 16QAM High Channel)

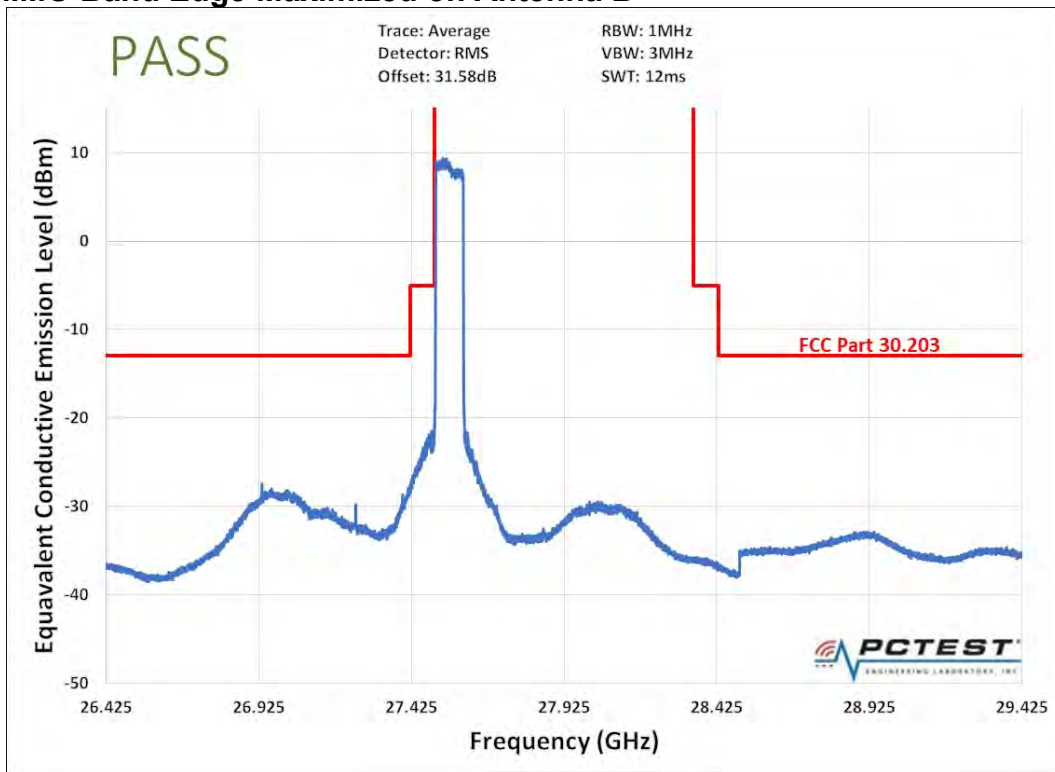


18:39:29 01.02.2018

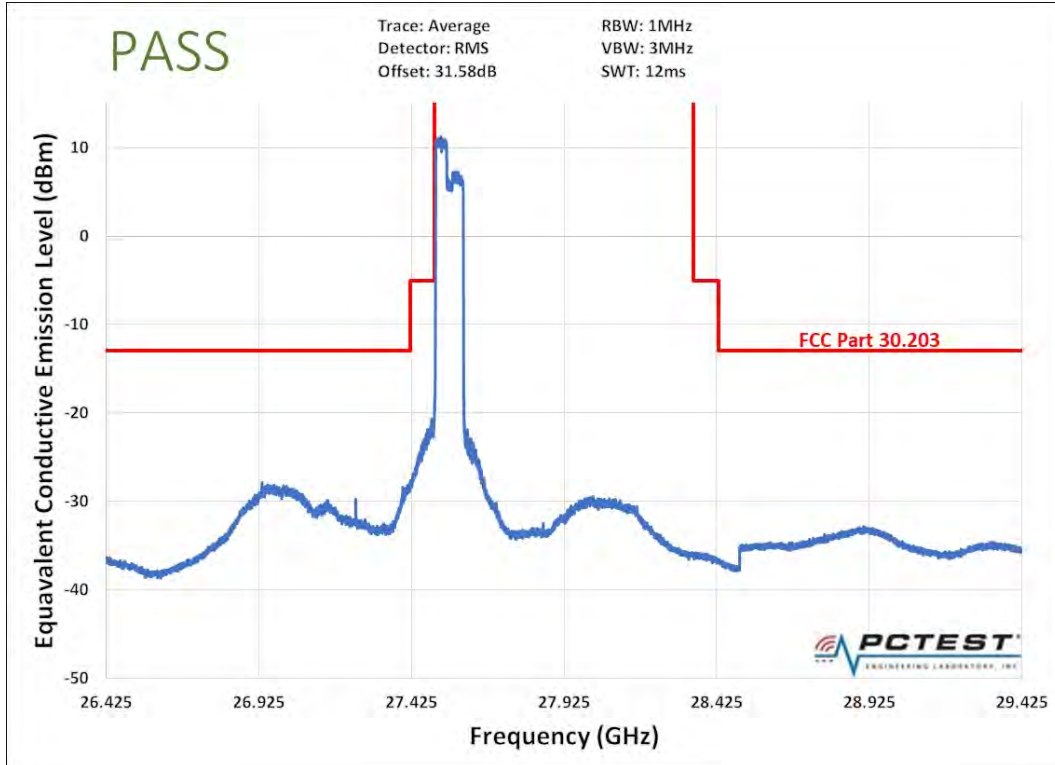
Plot 7-342. Band Edge Plot (8CC 64QAM High Channel)

FCC ID: A3LSFG-AA100DC	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
Test Report S/N: 1M1712270338-01-R2.A3L	Test Dates: 1/2-2/3/2018	EUT Type: 5G Access Unit	Page 208 of 221

7.6.11 MIMO Band Edge Maximized on Antenna B

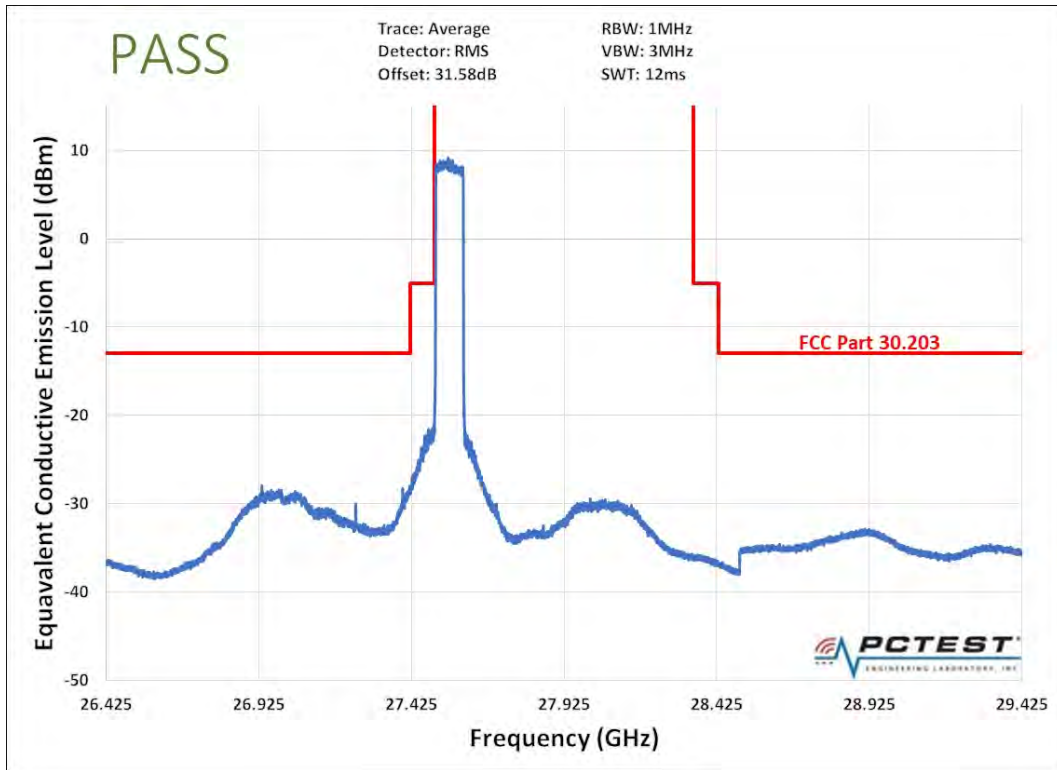


Plot 7-343. Band Edge Plot (1CC QPSK Low Channel)

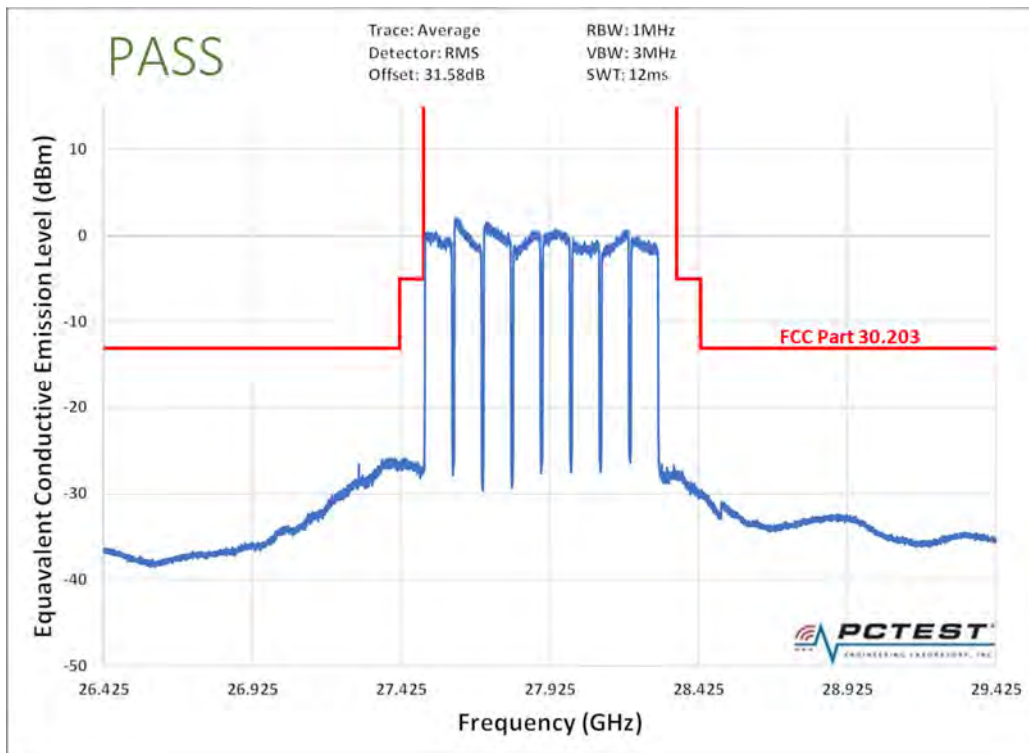


Plot 7-344. Band Edge Plot (1CC 16QAM Low Channel)

FCC ID: A3LSFG-AA100DC	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1712270338-01-R2.A3L	Test Dates: 1/2-2/3/2018	EUT Type: 5G Access Unit		Page 209 of 221

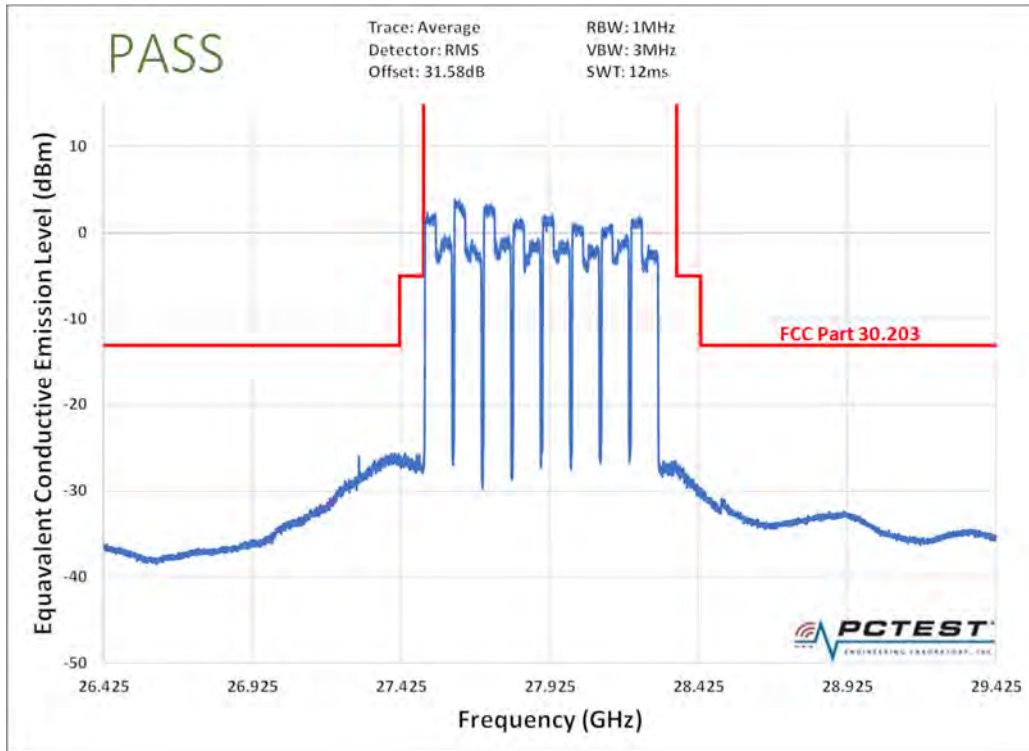


Plot 7-345. Band Edge Plot (1CC 64QAM Low Channel)

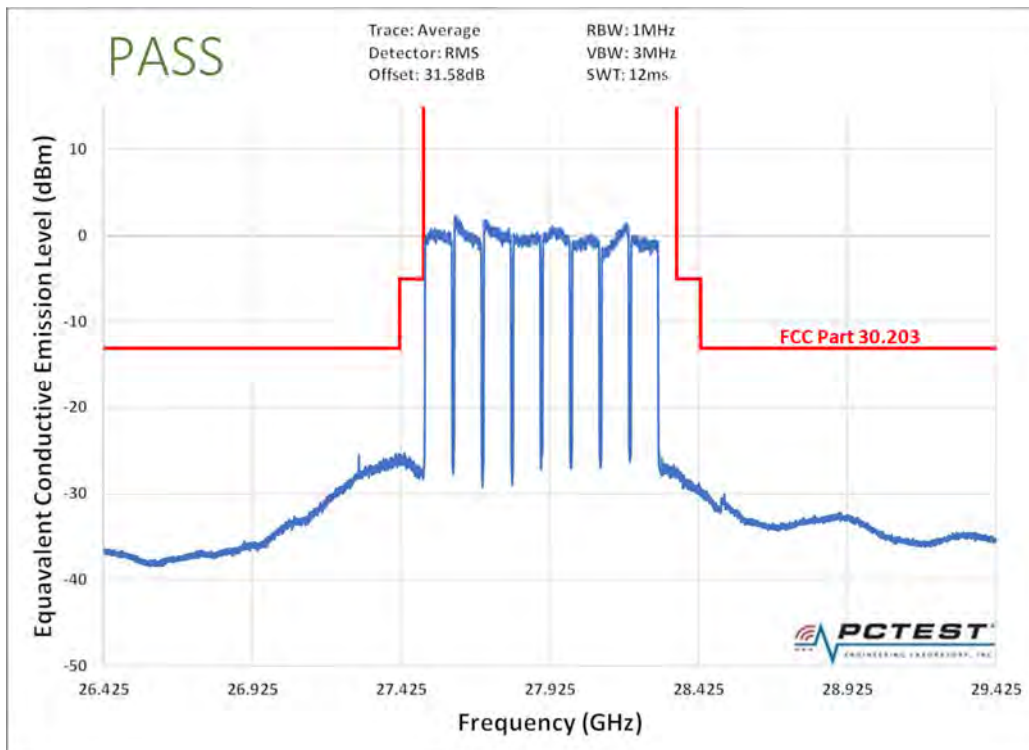


Plot 7-346. Band Edge Plot (8CC QPSK Low Channel)

FCC ID: A3LSFG-AA100DC	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1712270338-01-R2.A3L	Test Dates: 1/2-2/3/2018	EUT Type: 5G Access Unit		Page 210 of 221

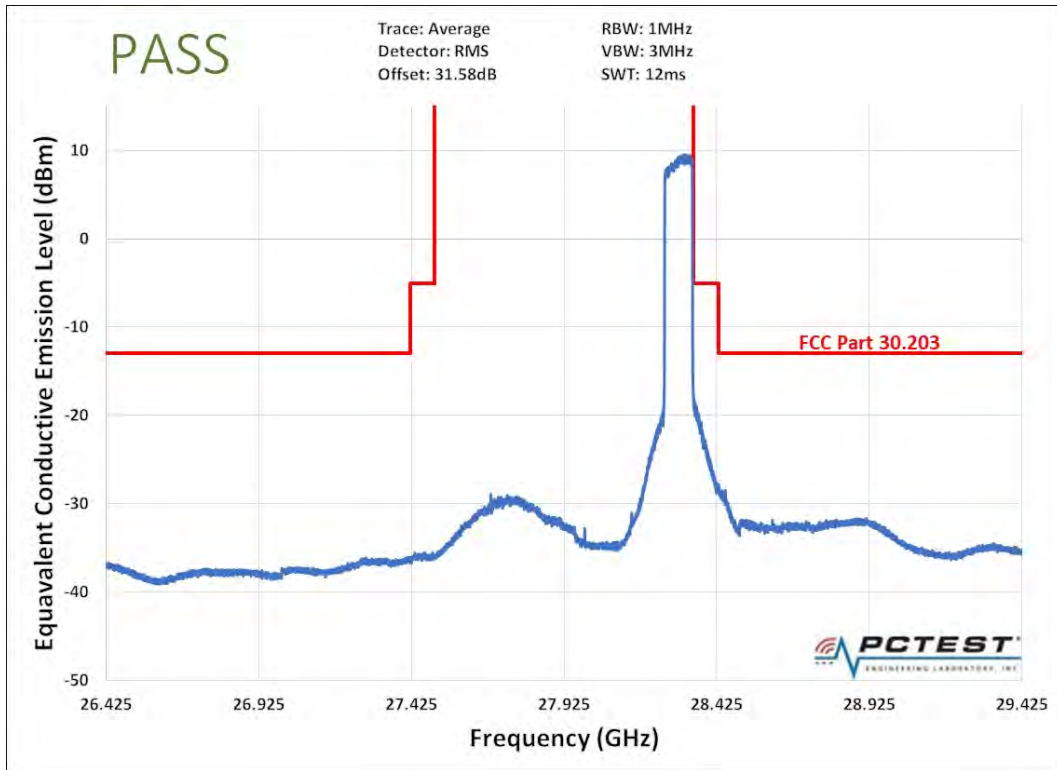


Plot 7-347. Band Edge Plot (8CC 16QAM Low Channel)

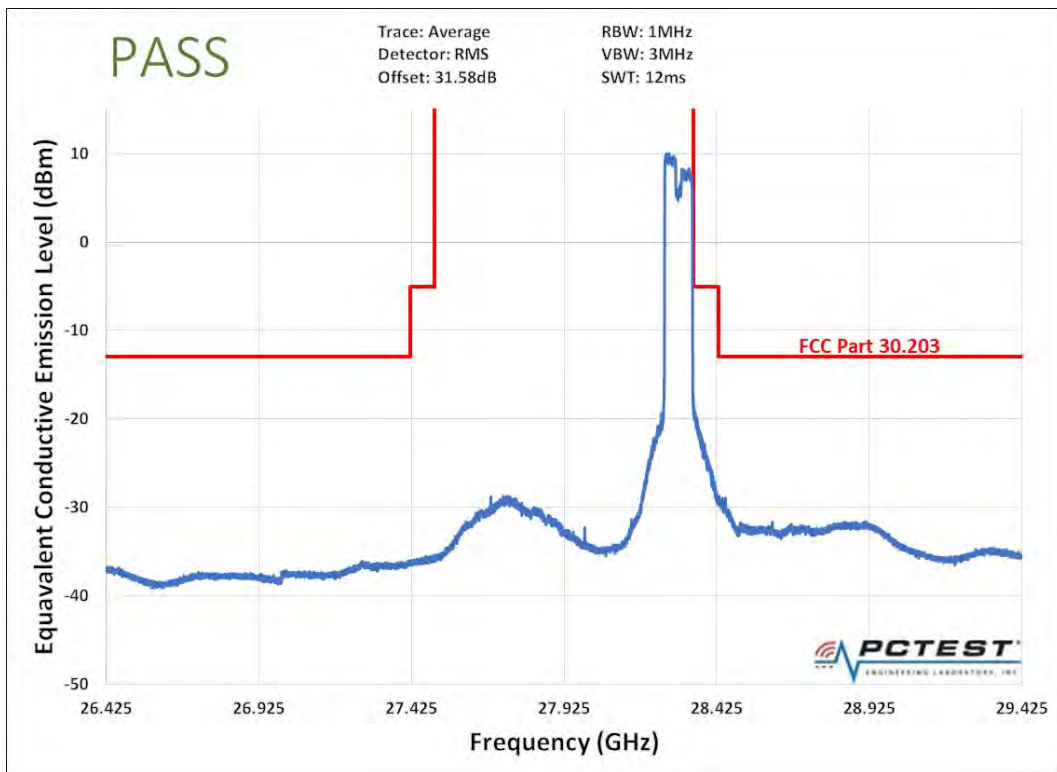


Plot 7-348. Band Edge Plot (8CC 64QAM Low Channel)

FCC ID: A3LSFG-AA100DC	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1712270338-01-R2.A3L	Test Dates: 1/2-2/3/2018	EUT Type: 5G Access Unit		Page 211 of 221

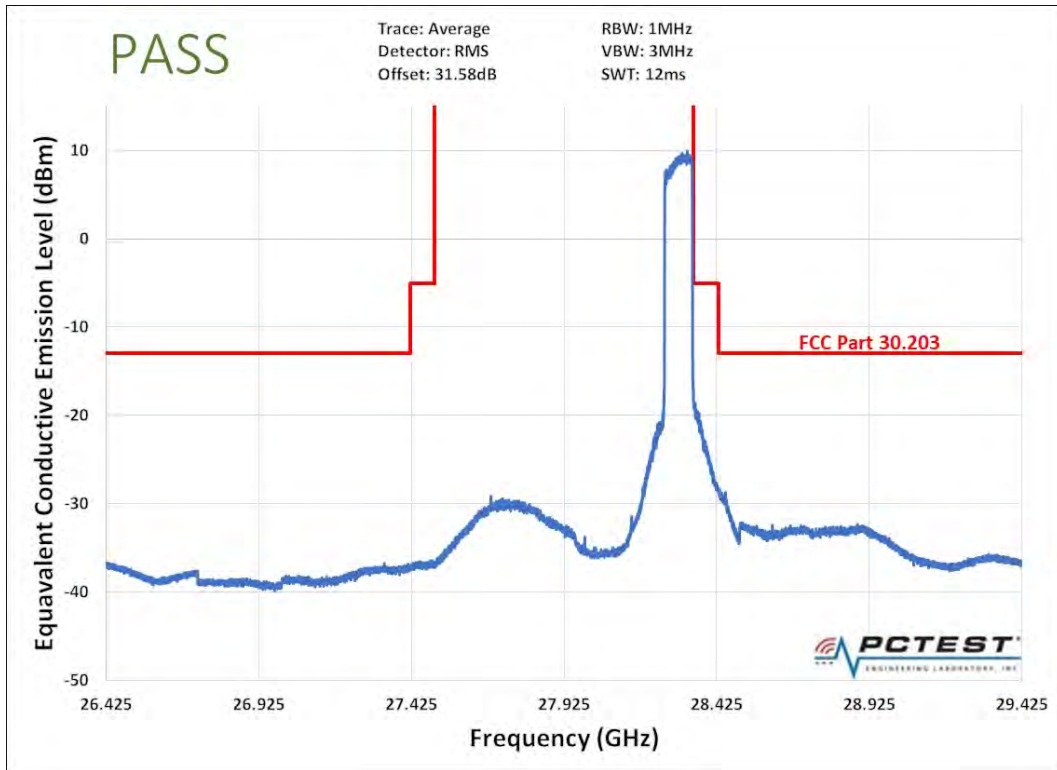


Plot 7-349. Band Edge Plot (1CC QPSK High Channel)

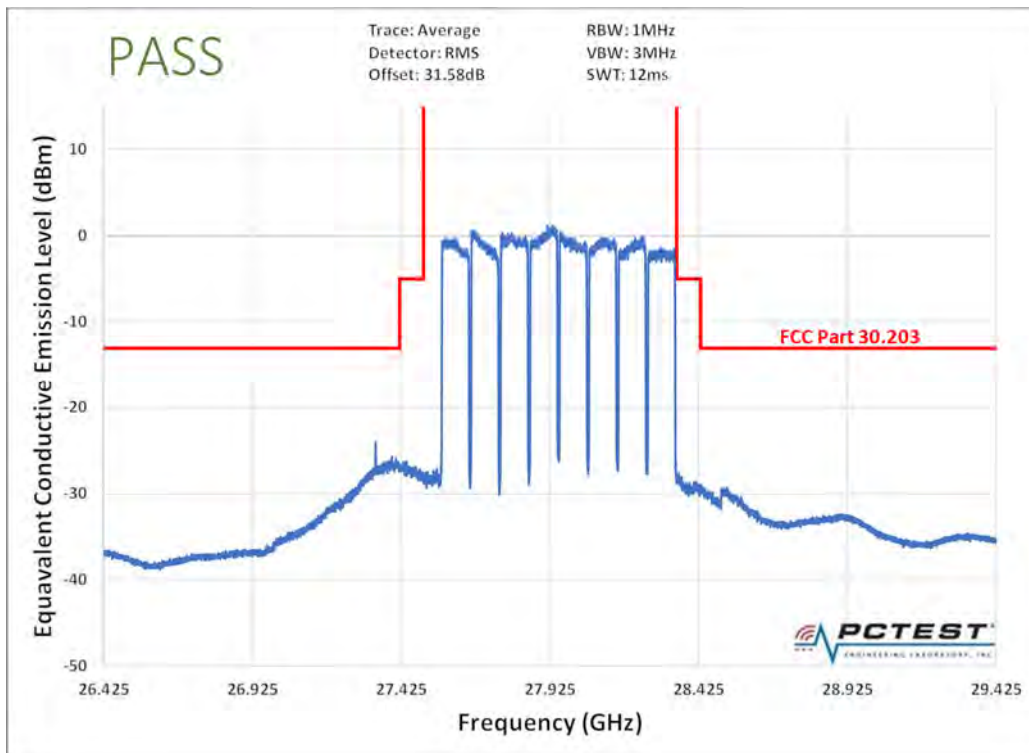


Plot 7-350. Band Edge Plot (1CC 16QAM High Channel)

FCC ID: A3LSFG-AA100DC	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1712270338-01-R2.A3L	Test Dates: 1/2-2/3/2018	EUT Type: 5G Access Unit		Page 212 of 221

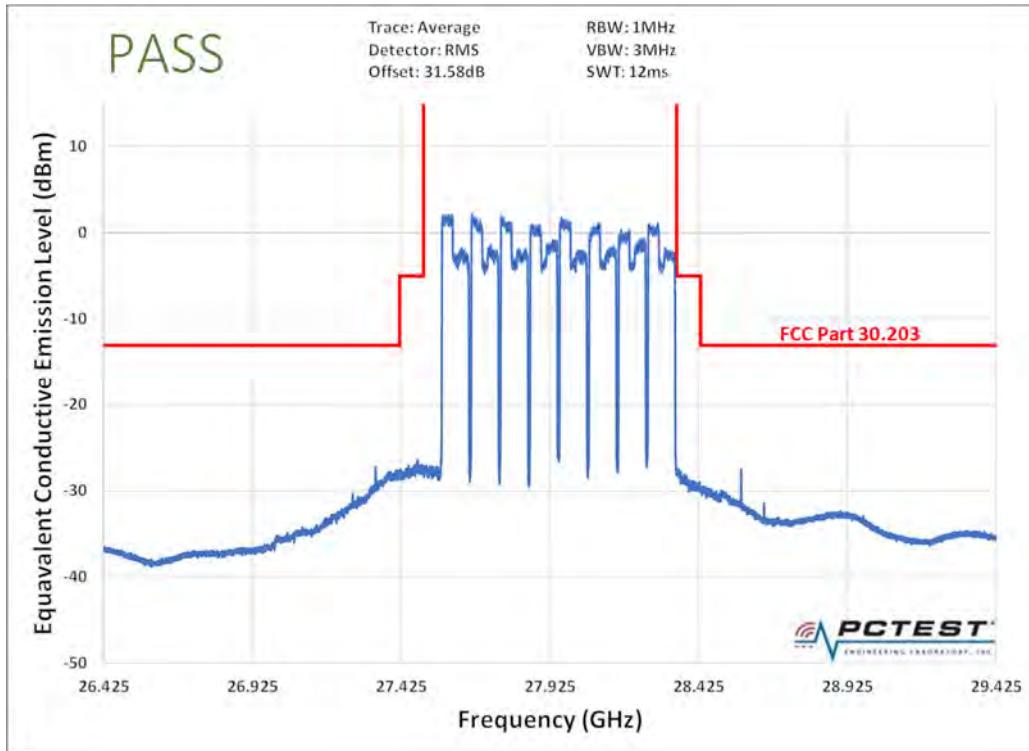


Plot 7-351. Band Edge Plot (1CC 64QAM High Channel)

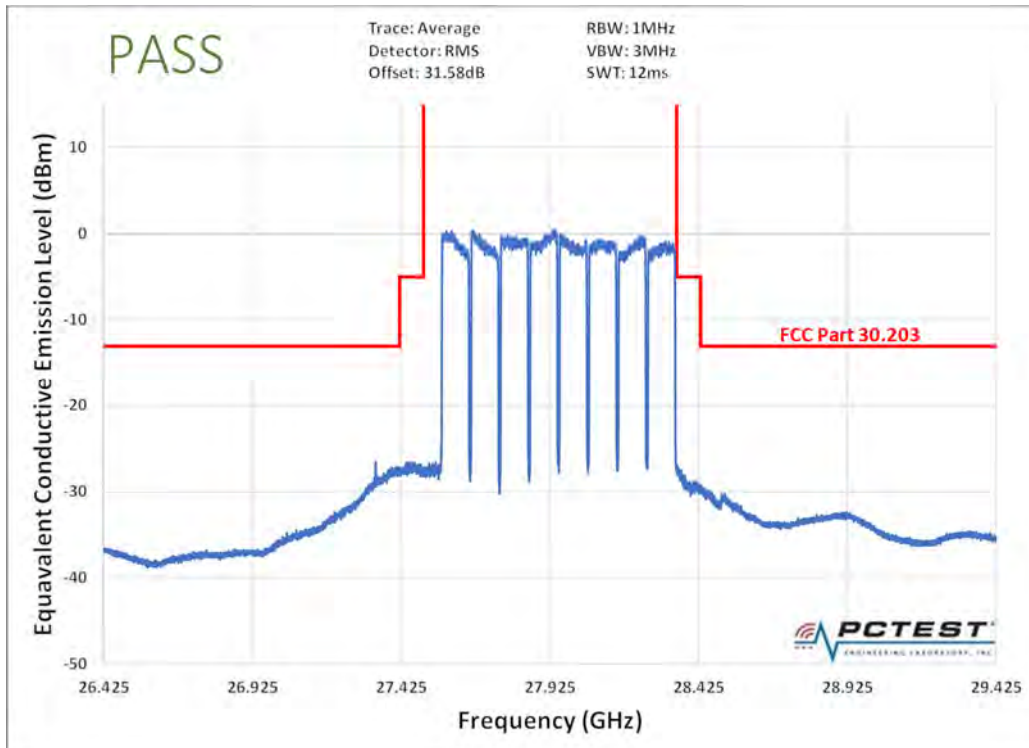


Plot 7-352. Band Edge Plot (8CC QPSK High Channel)

FCC ID: A3LSFG-AA100DC	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1712270338-01-R2.A3L	Test Dates: 1/2-2/3/2018	EUT Type: 5G Access Unit		Page 213 of 221



Plot 7-353. Band Edge Plot (8CC 16QAM High Channel)



Plot 7-354. Band Edge Plot (8CC 64QAM High Channel)

FCC ID: A3LSFG-AA100DC	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1712270338-01-R2.A3L	Test Dates: 1/2-2/3/2018	EUT Type: 5G Access Unit		Page 214 of 221

7.7 Frequency Stability / Temperature Variation

§2.1055

Test Overview and Limit

Frequency stability testing is performed in accordance with the guidelines of ANSI C63.26-2015. The frequency stability of the transmitter is measured by:

- Temperature:** The temperature is varied from -30°C to +50°C in 10°C increments using an environmental chamber.
- Primary Supply Voltage:** The primary supply voltage is varied from 85% to 115% of the nominal value for non hand-carried battery and AC powered equipment. For hand-carried, battery-powered equipment, primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacturer.

Test Procedure Used

ANSI C63.26-2015 Section 5.6

Test Settings

- The carrier frequency of the transmitter is measured at room temperature (20°C to provide a reference).
- The equipment is turned on in a “standby” condition for fifteen minutes before applying power to the transmitter. Measurement of the carrier frequency of the transmitter is made within one minute after applying power to the transmitter.
- Frequency measurements are made at 10°C intervals ranging from -30°C to +50°C. A period of at least one half-hour is provided to allow stabilization of the equipment at each temperature level.

Test Setup

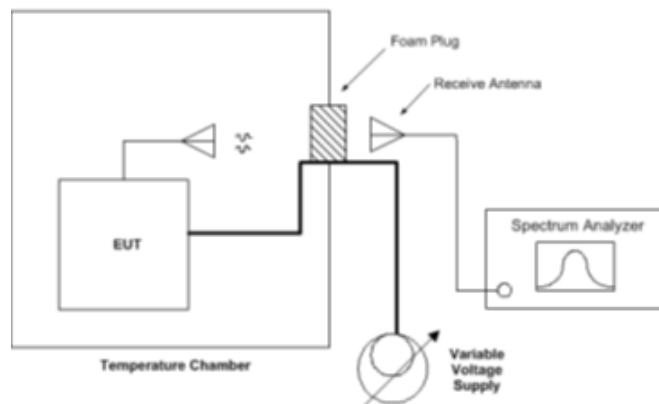


Figure 7-1. Test Instrument & Measurement Setup

The EUT was measured using horn antenna connected to a spectrum analyzer. The EUT was placed inside an environmental chamber.

Test Notes

None

FCC ID: A3LSFG-AA100DC	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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Frequency Stability Measurements

\$2.1055

OPERATING FREQUENCY: 27,925,000,000 Hz
 REFERENCE VOLTAGE: -48.00 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	-48.00	+ 20 (Ref)	27,925,001,386	1,386	0.0000050
100 %		- 30	27,925,002,298	2,298	0.0000082
100 %		- 20	27,924,998,589	-1,411	-0.0000051
100 %		- 10	27,924,997,689	-2,311	-0.0000083
100 %		0	27,925,000,759	759	0.0000027
100 %		+ 10	27,924,999,357	-643	-0.0000023
100 %		+ 20	27,924,999,150	-850	-0.0000030
100 %		+ 30	27,925,001,721	1,721	0.0000062
100 %		+ 40	27,925,001,344	1,344	0.0000048
100 %		+ 50	27,924,997,692	-2,308	-0.0000083
85 %	-40.80	+ 20	27,925,001,691	1,691	0.0000061
115 %	-55.20	+ 20	27,925,000,731	731	0.0000026

Table 7-25. Frequency Stability Data

Note:

Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

FCC ID: A3LSFG-AA100DC	 MEASUREMENT REPORT (CERTIFICATION)		 Approved by: Quality Manager
Test Report S/N: 1M1712270338-01-R2.A3L	Test Dates: 1/2-2/3/2018	EUT Type: 5G Access Unit	Page 216 of 221

Frequency Stability Measurements

§2.1055

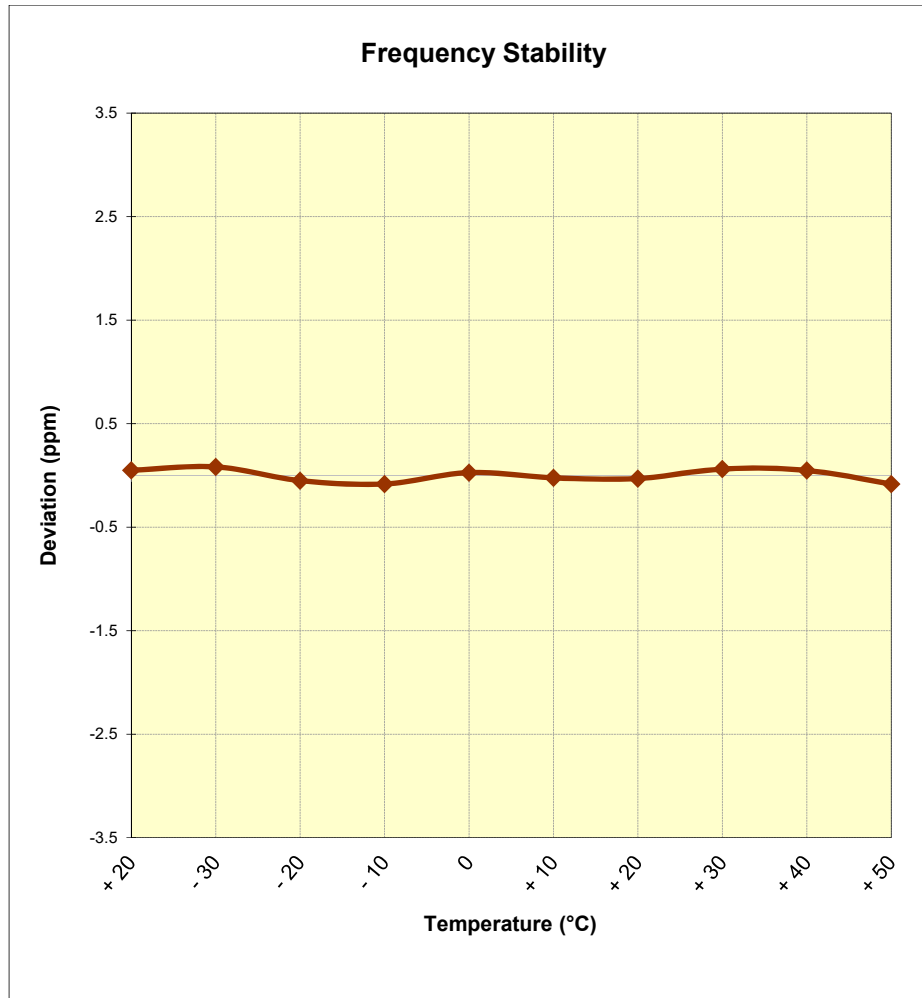


Figure 7-2. Frequency Stability Graph

FCC ID: A3LSFG-AA100DC		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1712270338-01-R2.A3L	Test Dates: 1/2-2/3/2018	EUT Type: 5G Access Unit		Page 217 of 221

8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **Samsung 5G Access Unit FCC ID: A3LSFG-AA100DC** complies with all the requirements of Part 30.

FCC ID: A3LSFG-AA100DC		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1712270338-01-R2.A3L	Test Dates: 1/2-2/3/2018	EUT Type: 5G Access Unit		Page 218 of 221

9.0 APPENDIX A

9.1 OML Mixer Verification Certificate

Certificate of Compliance

Certificate No: 6201218D-F00228-1

Manufacturer: OML, Inc.

Model/Part No: HWDX08-VS (M08HWA Funct Verif) **Serial/ID No:** F00228-1

Description: WR-08 Mixer Functional Verification Service, Test Data, & USB Stick

Date of Test: January 16, 2018

Temperature: (23 +/- 5) deg C

Humidity: 20 to 65% RH

Procedure:

This certifies that the above product was tested in compliance with OML specifications using applicable OML's procedures.

As Received : Physical Condition: Good
Within Tolerance: Yes

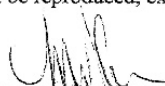
As Shipped: At the completion of the test, the product COMPLIED with the performance capability.

Remarks:

Traceability Information: Traceability is to national standards administered by U.S. NIST, NRC Canada, Euromet members (NPL, PTB, BNM, etc.) or other recognized standards laboratories. Some measurements are traceable to natural physical constants, consensus standards or ratio type measurements. Supporting documentation relative to traceability is available for review by appointment.

In the absence of power standards above 110 GHz, power measurements and conversion loss measurements above 110 GHz are to confirm operation functionality and traceable only to OML.

This certificate shall not be reproduced, except in full, without the written approval of OML.


Mitzi Chow, Material Manager

01/16/2018
Date

OML Inc.

300 Digital Drive, Morgan Hill, CA 95037 USA Tel. (408) 779 2698 Fax (408) 778 0491

FCC ID: A3LSFG-AA100DC		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1712270338-01-R2.A3L	Test Dates: 1/2-2/3/2018	EUT Type: 5G Access Unit		Page 219 of 221

Certificate of Compliance

Certificate No: 6201218C-E00228-1

Manufacturer: OML, Inc.

Model/Part No: HWDX12-VS (M12HWA Funct Verif) **Serial/ID No:** E00228-1

Description: WR-12 Mixer Functional Verification Service, Test Data, & USB Stick

Date of Test: January 16, 2018

Temperature: (23 +/- 5) deg C

Humidity: 20 to 65% RH

Procedure:

This certifies that the above product was tested in compliance with OML specifications using applicable OML's procedures.

As Received : Physical Condition: Good
Within Tolerance: Yes

As Shipped: At the completion of the test, the product COMPLIED with the performance capability.

Remarks:

Traceability Information: Traceability is to national standards administered by U.S. NIST, NRC Canada, Euromet members (NPL, PTB, BNM, etc.) or other recognized standards laboratories. Some measurements are traceable to natural physical constants, consensus standards or ratio type measurements. Supporting documentation relative to traceability is available for review by appointment.

In the absence of power standards above 110 GHz, power measurements and conversion loss measurements above 110 GHz are to confirm operation functionality and traceable only to OML.

This certificate shall not be reproduced, except in full, without the written approval of OML.


Mitzi Chow, Material Manager

01/16/2018

Date

OML Inc.

300 Digital Drive, Morgan Hill, CA 95037 USA Tel. (408) 779 2698 Fax (408) 778 0491

FCC ID: A3LSFG-AA100DC		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1712270338-01-R2.A3L	Test Dates: 1/2-2/3/2018	EUT Type: 5G Access Unit		Page 220 of 221

Certificate of Compliance

Certificate No: 6201218B-U00228-1

Manufacturer: OML, Inc.

Model/Part No: HWDX19-VS (M19HWA Funct Verif) **Serial/ID No:** U00228-1

Description: WR-19 Mixer Functional Verification Service, Test Data, & USB Stick

Date of Test: January 16, 2018

Temperature: (23 +/- 5) deg C

Humidity: 20 to 65% RH

Procedure:

This certifies that the above product was tested in compliance with OML specifications using applicable OML's procedures.

As Received : Physical Condition: Good
Within Tolerance: Yes

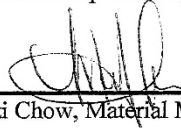
As Shipped: At the completion of the test, the product COMPLIED with the performance capability.

Remarks:

Traceability Information: Traceability is to national standards administered by U.S. NIST, NRC Canada, Euromet members (NPL, PTB, BNM, etc.) or other recognized standards laboratories. Some measurements are traceable to natural physical constants, consensus standards or ratio type measurements. Supporting documentation relative to traceability is available for review by appointment.

In the absence of power standards above 110 GHz, power measurements and conversion loss measurements above 110 GHz are to confirm operation functionality and traceable only to OML.

This certificate shall not be reproduced, except in full, without the written approval of OML.


Mitzi Chow, Material Manager

01/16/2018

Date

OML Inc.

300 Digital Drive, Morgan Hill, CA 95037 USA Tel. (408) 779 2698 Fax (408) 778 0491

FCC ID: A3LSFG-AA100DC		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1712270338-01-R2.A3L	Test Dates: 1/2-2/3/2018	EUT Type: 5G Access Unit		Page 221 of 221