

6. Maximum Transmitted Peak Power Output

6.1 Test Specification

FCC Part 15, Subpart H, Section 15.709 (a)(1)

6.2 Test Procedure

The E.U.T operation mode and test set-up are as described in Section 2.

See Section 2.1 Justification of the System Test Configuration concerning the E.U.T. orientation for this test.

The E.U.T. antenna terminal was connected to the Spectrum Analyzer through an external attenuator (20 dB) and an appropriate coaxial cable (cable loss = 0.3 dB). The Spectrum Analyzer was set to 100 kHz resolution BW. Peak power level was measured by power channel with 6 MHz bandwidth.

Sweep time of 500ms for 1msec averaging time per trace point.

6.3 Test Results

JUDGEMENT: Passed

For additional information see *Figure 162* to *Figure 197*.

| Chain # | Modulation | Operation Frequency (MHz) | Reading (dBm) | Limit* (dBm) | Margin (dB) |
|---------|------------|---------------------------|---------------|--------------|-------------|
| Chain 1 | 16QAM | 473 | 23.9 | 28.0 | -4.1 |
| | | 587 | 25.0 | 28.0 | -3.0 |
| | | 695 | 23.2 | 28.0 | -4.8 |
| | 64QAM | 473 | 24.0 | 28.0 | -4.0 |
| | | 587 | 24.7 | 28.0 | -3.3 |
| | | 695 | 23.4 | 28.0 | -4.6 |
| | QPSK | 473 | 23.5 | 28.0 | -4.5 |
| | | 587 | 24.4 | 28.0 | -3.6 |
| | | 695 | 23.0 | 28.0 | -5.0 |
| Chain 2 | 16QAM | 473 | 23.3 | 28.0 | -4.7 |
| | | 587 | 24.4 | 28.0 | -3.6 |
| | | 695 | 23.3 | 28.0 | -4.7 |
| | 64QAM | 473 | 23.3 | 28.0 | -4.7 |
| | | 587 | 24.0 | 28.0 | -4.0 |
| | | 695 | 23.7 | 28.0 | -4.3 |
| | QPSK | 473 | 22.8 | 28.0 | -5.2 |
| | | 587 | 23.7 | 28.0 | -4.3 |
| | | 695 | 23.2 | 28.0 | -4.8 |

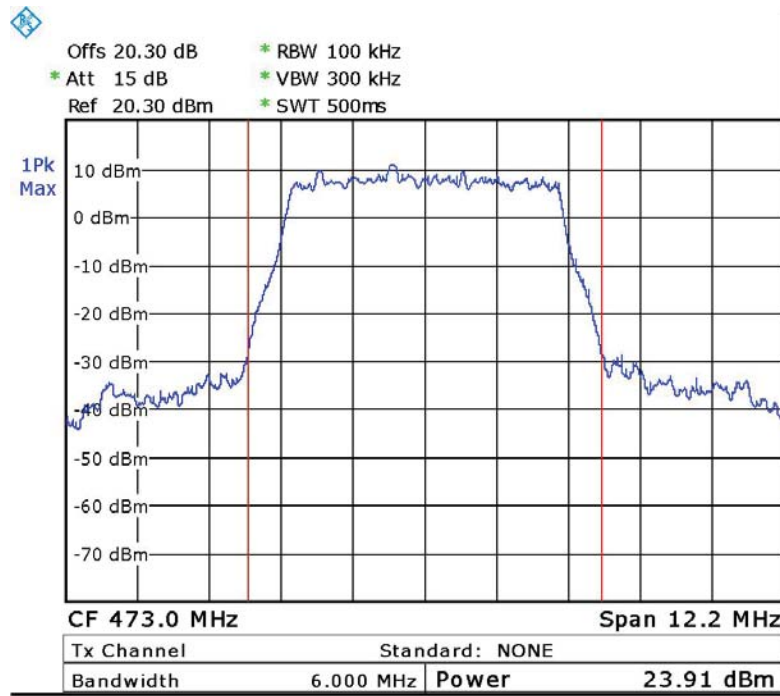
*Note – the limit is corrected by 2.0 dB since the product antenna has 8.0 dB gain.

Figure 160 Peak Power – Chain 1 & 2

| Chain # | Modulation | Operation Frequency (MHz) | Reading (dBm) | Limit* (dBm) | Margin (dB) |
|---------|------------|---------------------------|---------------|--------------|-------------|
| Chain 3 | 16QAM | 473 | 23.0 | 28.0 | -5.0 |
| | | 587 | 24.8 | 28.0 | -3.2 |
| | | 695 | 23.2 | 28.0 | -4.8 |
| | 64QAM | 473 | 23.0 | 28.0 | -5.0 |
| | | 587 | 24.3 | 28.0 | -3.7 |
| | | 695 | 23.5 | 28.0 | -4.5 |
| | QPSK | 473 | 23.1 | 28.0 | -4.9 |
| | | 587 | 24.1 | 28.0 | -3.9 |
| | | 695 | 23.1 | 28.0 | -4.9 |
| Chain 4 | 16QAM | 473 | 23.1 | 28.0 | -4.9 |
| | | 587 | 24.6 | 28.0 | -3.4 |
| | | 695 | 23.4 | 28.0 | -4.6 |
| | 64QAM | 473 | 23.2 | 28.0 | -4.8 |
| | | 587 | 24.2 | 28.0 | -3.8 |
| | | 695 | 24.0 | 28.0 | -4.0 |
| | QPSK | 473 | 23.2 | 28.0 | -4.8 |
| | | 587 | 24.2 | 28.0 | -3.8 |
| | | 695 | 23.6 | 28.0 | -4.4 |

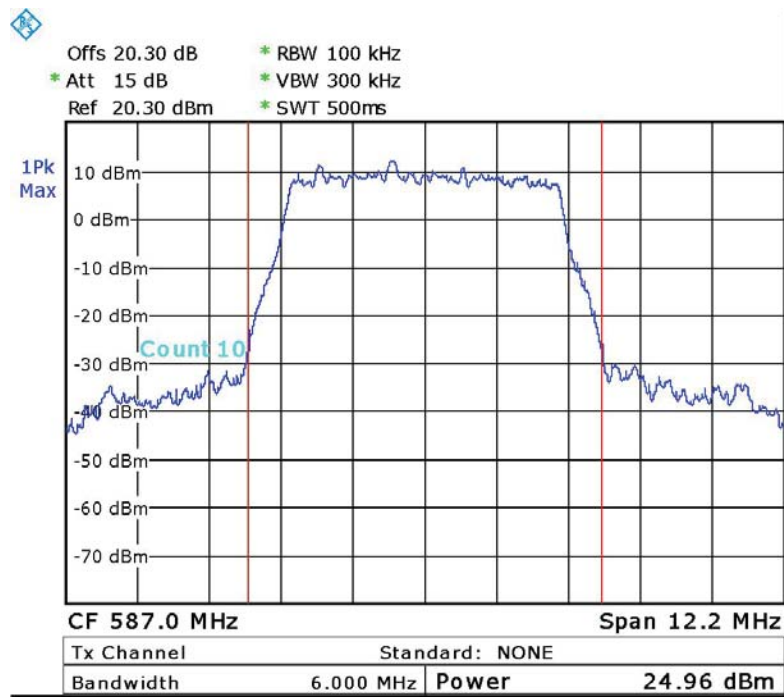
*Note – The limit is corrected by 2.0 dB since the product antenna has 8.0 dB gain.

Figure 161 Peak Power – Chain 3 & 4



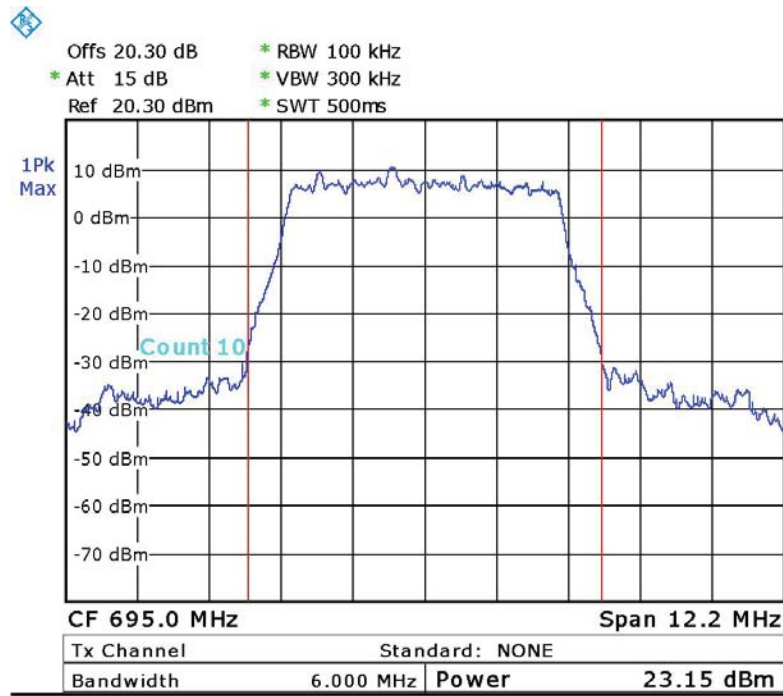
Date: 17.JUN.2015 13:47:38

Figure 162. Chain 1 – 16QAM – 473MHz



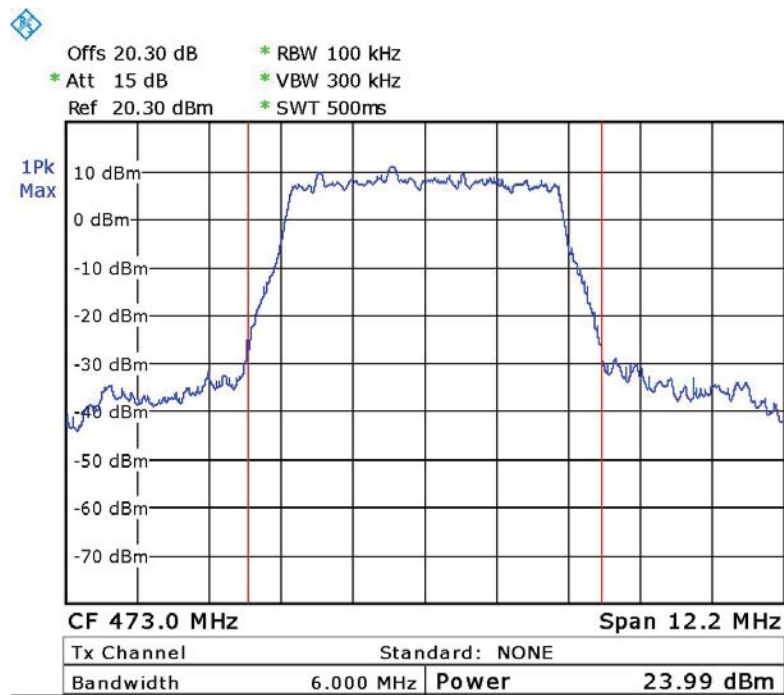
Date: 17.JUN.2015 15:16:07

Figure 163. . Chain 1 - 16QAM – 587MHz



Date: 17.JUN.2015 16:15:21

Figure 164. Chain 1 - 16QAM – 695MHz



Date: 17.JUN.2015 12:22:19

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Figure 165. Chain 1 - 64QAM – 473MHz

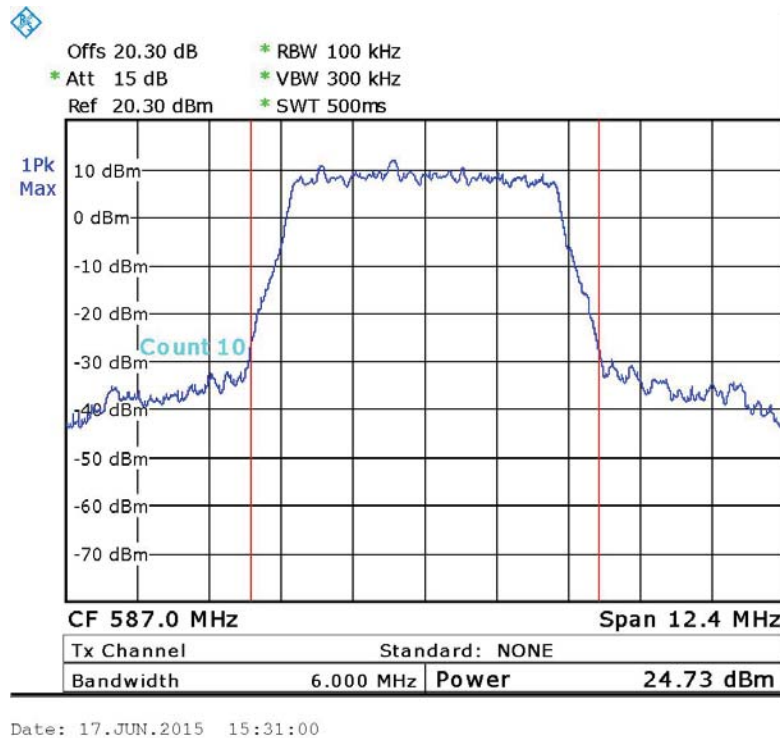


Figure 166. . Chain 1 -- 64QAM -- 587MHz

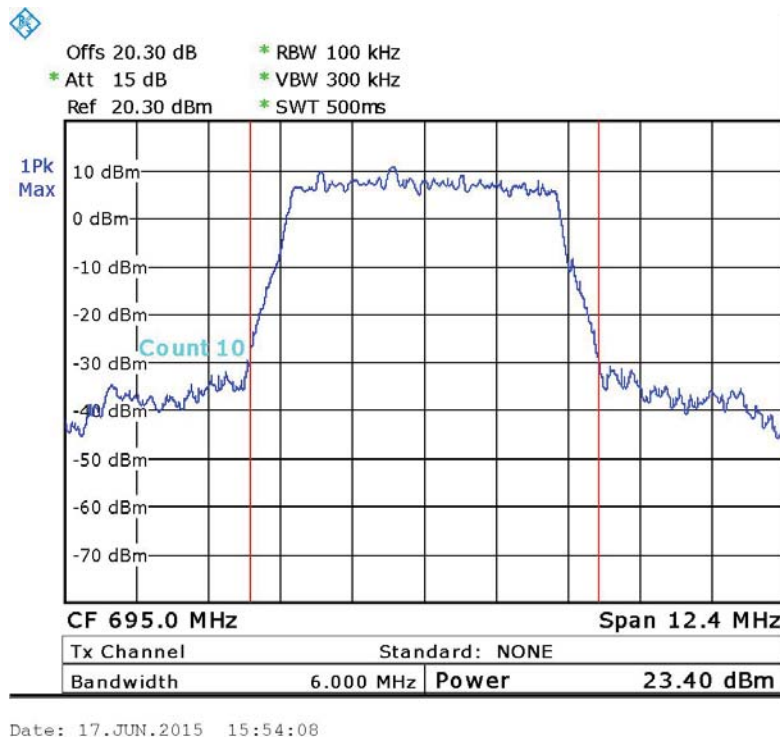


Figure 167. Chain 1 - 64QAM -- 695MHz

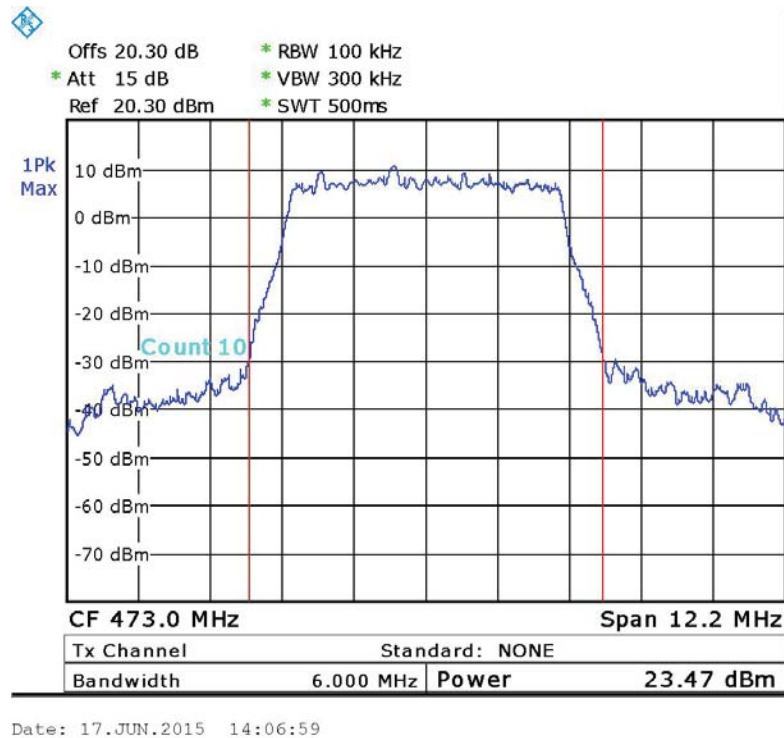


Figure 168. Chain 1 - QPSK – 473MHz

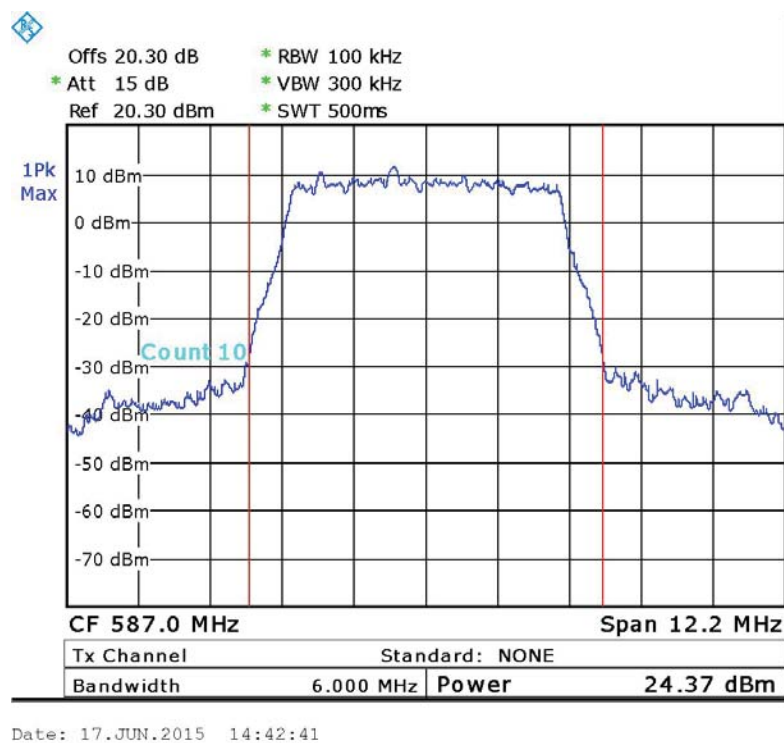
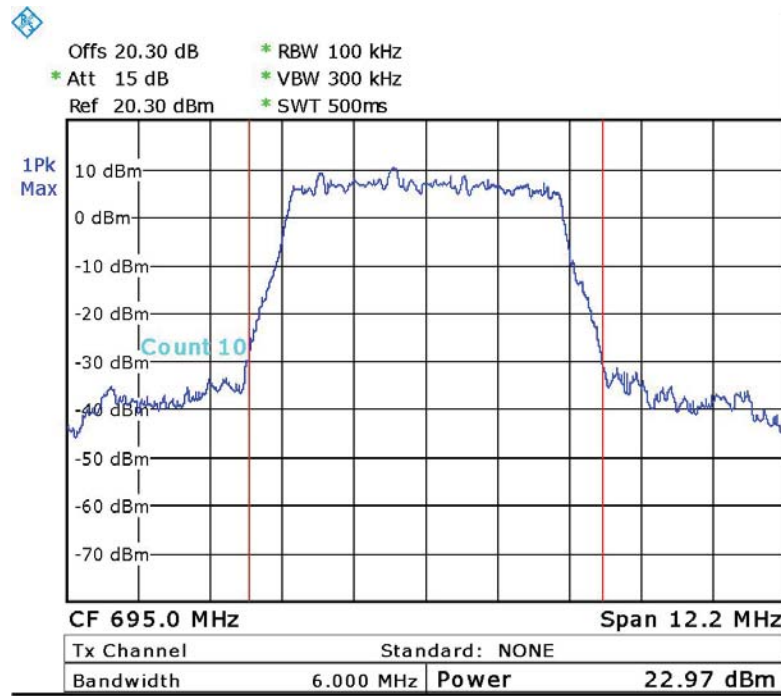


Figure 169. . Chain 1 — QPSK – 587MHz



Date: 17.JUN.2015 16:25:29

Figure 170. Chain 1 -- QPSK -- 695MHz

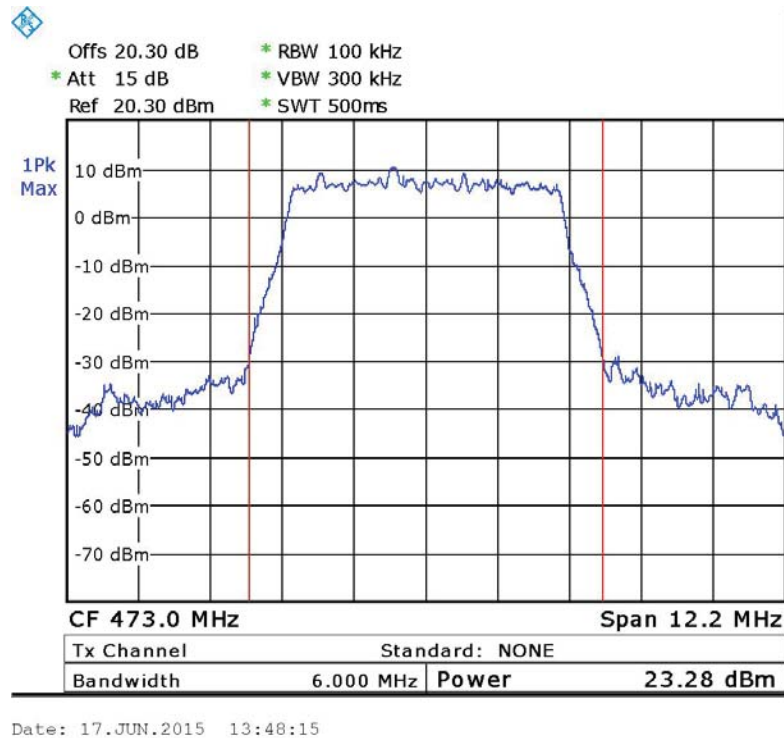


Figure 171. Chain 2 –16QAM – 473MHz

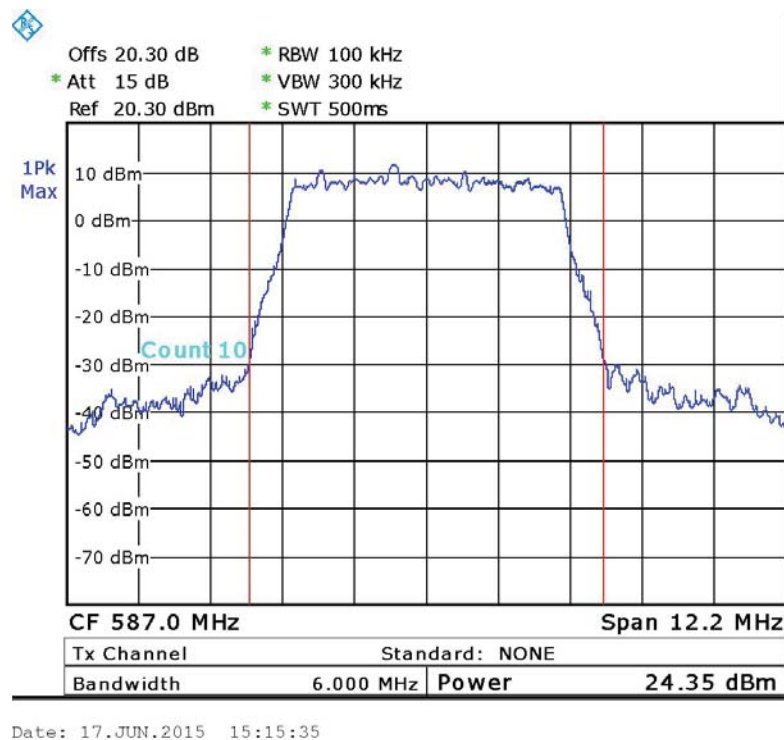
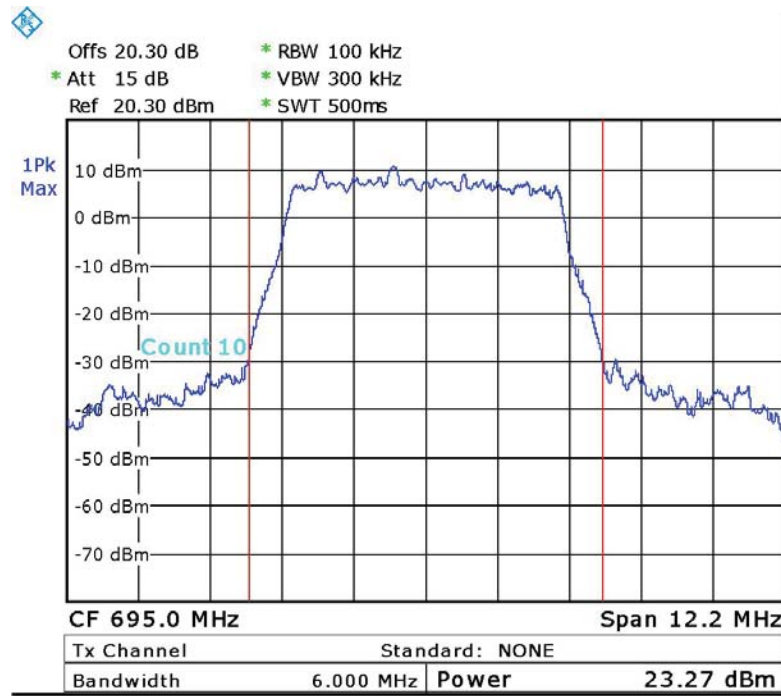
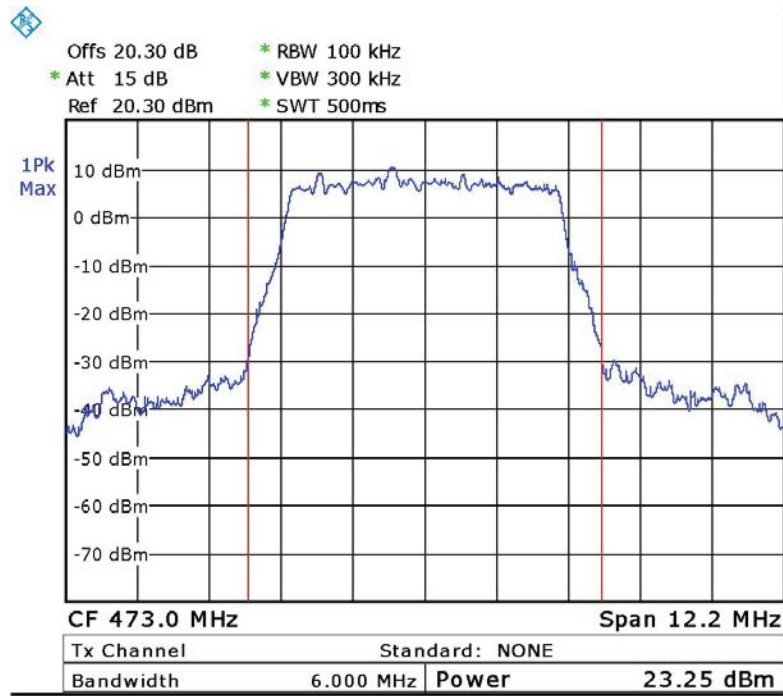


Figure 172. Chain 2 – 16QAM – 587MHz



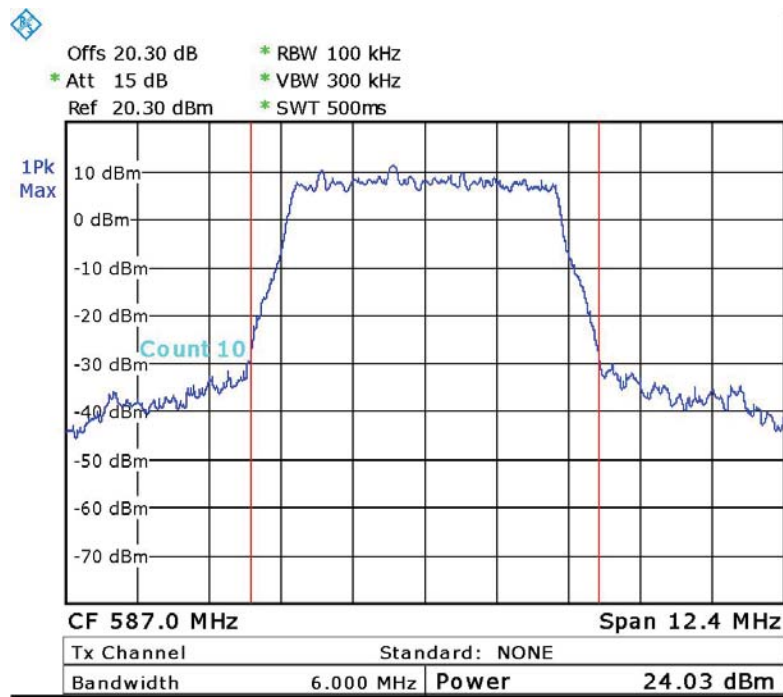
Date: 17.JUN.2015 16:15:50

Figure 173. Chain 2 — 16QAM – 695MHz



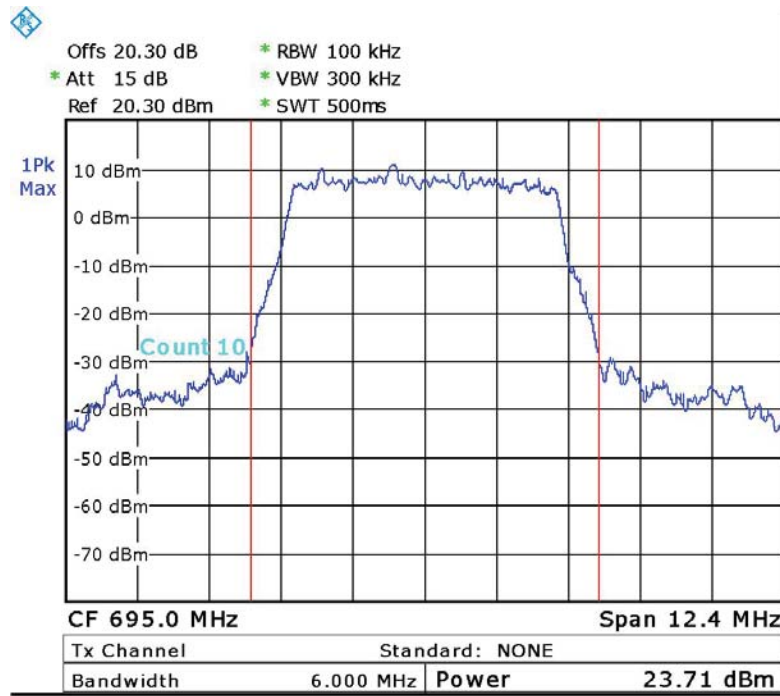
Date: 17.JUN.2015 12:22:58

Figure 174. Chain 2 – 64QAM – 473MHz



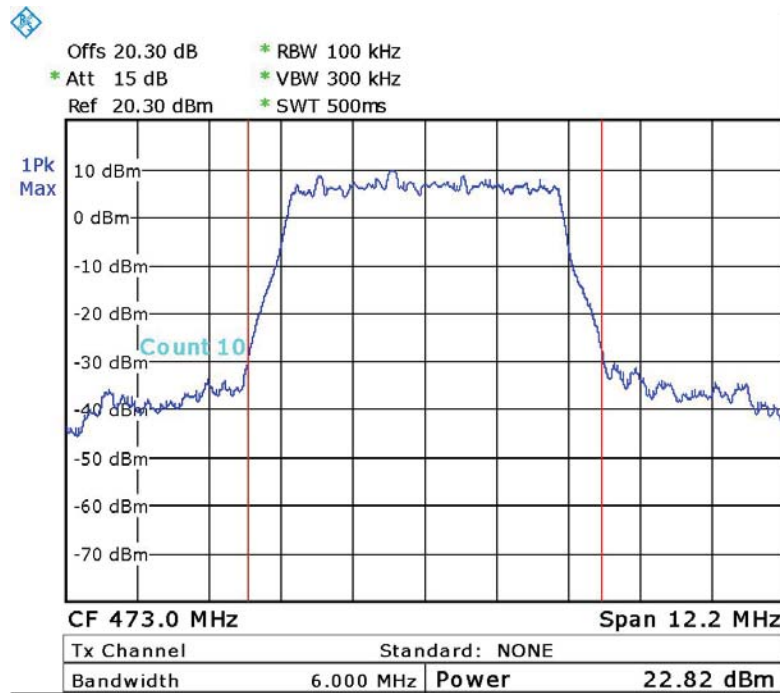
Date: 17.JUN.2015 15:31:56

Figure 175. . Chain 2 - 64QAM – 587MHz



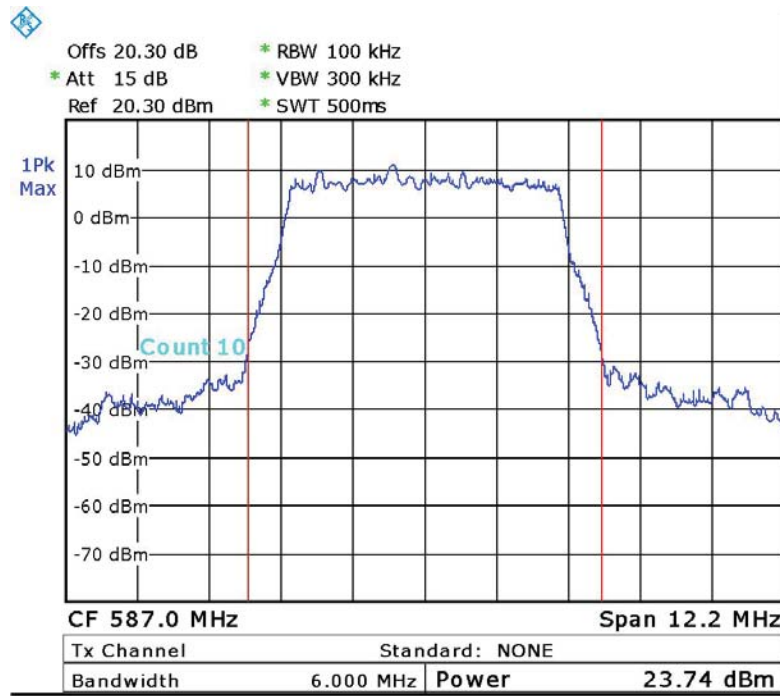
Date: 17.JUN.2015 15:53:42

Figure 176. Chain 2 – 64QAM – 695MHz



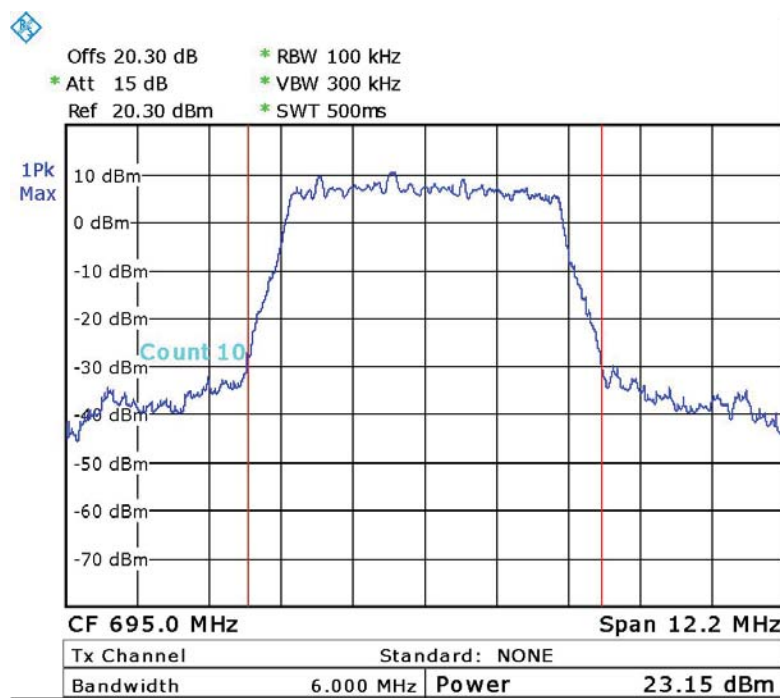
Date: 17.JUN.2015 14:04:46

Figure 177. Chain 2 - QPSK – 473MHz



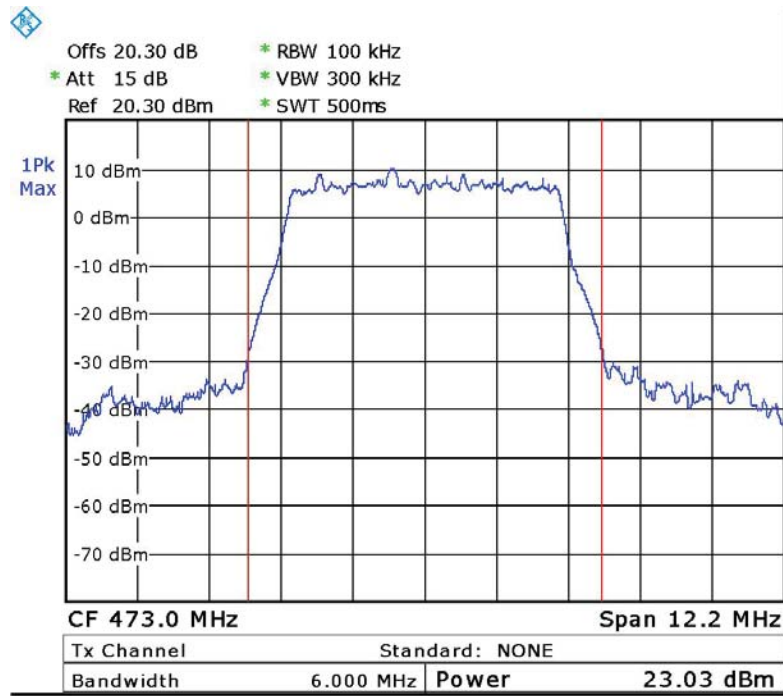
Date: 17.JUN.2015 14:43:30

Figure 178. . Chain 2 - QPSK – 587MHz



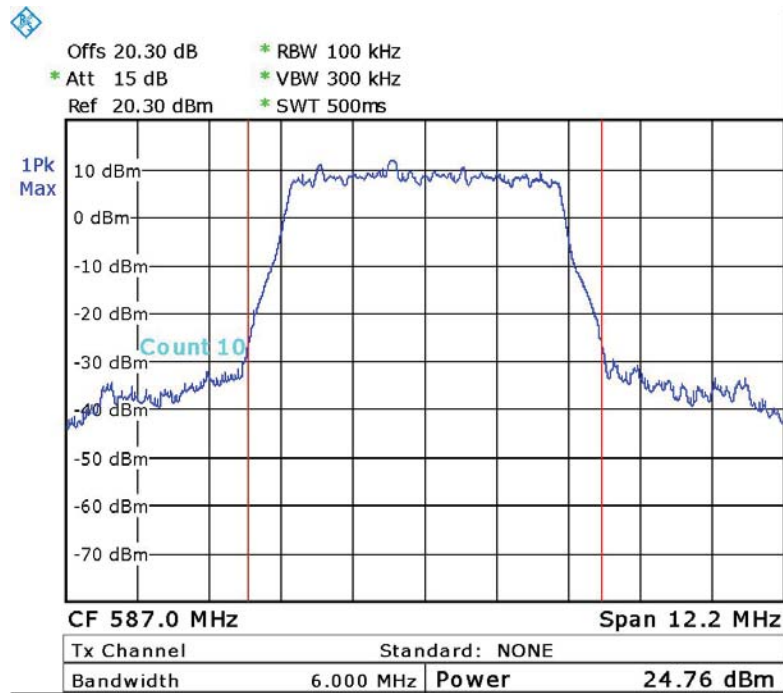
Date: 17.JUN.2015 16:25:06

Figure 179. Chain 2 - QPSK – 695MHz



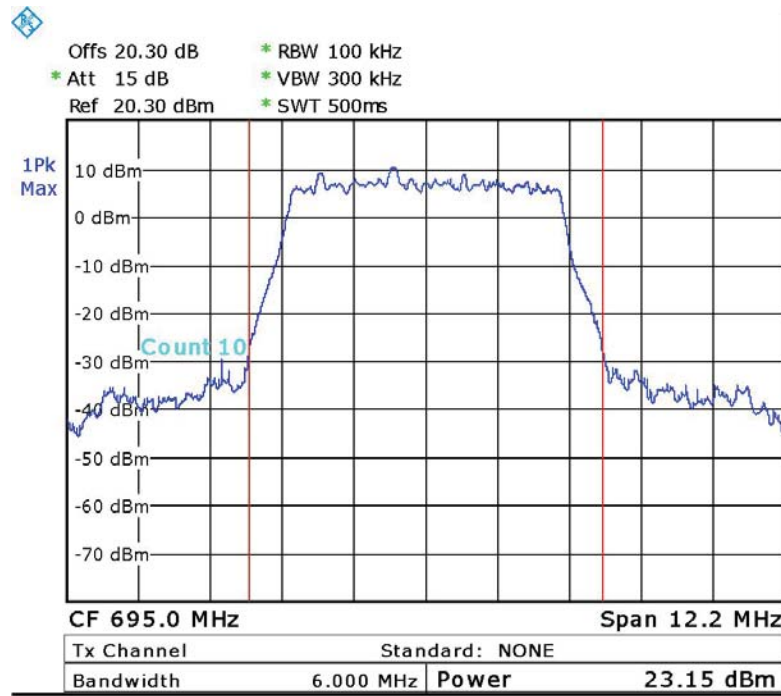
Date: 17.JUN.2015 13:48:56

Figure 180. Chain 3 – 16QAM – 473MHz



Date: 17.JUN.2015 15:15:10

Figure 181.. Chain 3- 16QAM – 587MHz



Date: 17.JUN.2015 16:16:18

Figure 182. Chain 3 — 16QAM – 695MHz

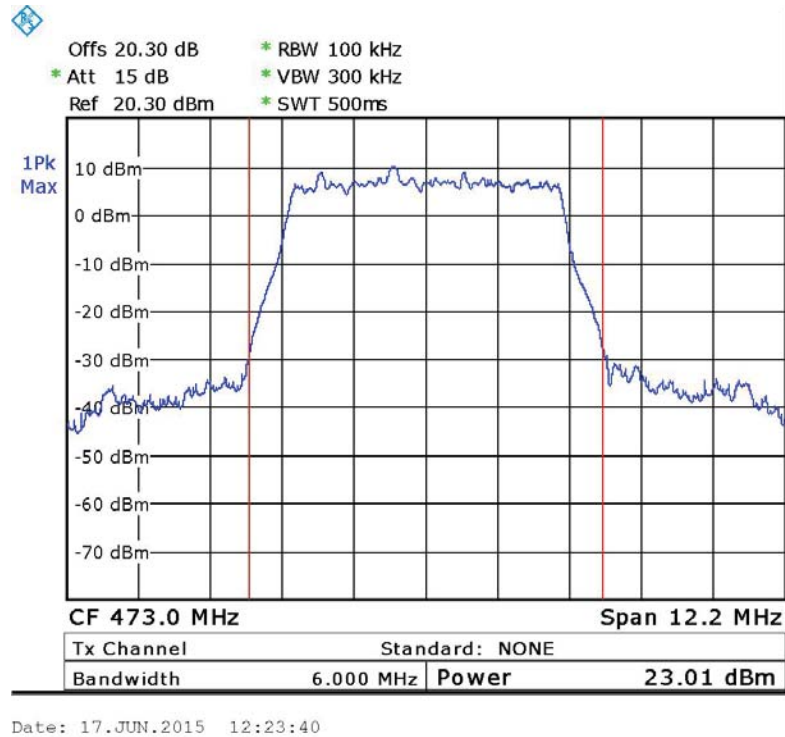


Figure 183. Chain 3 — 64QAM — 473MHz

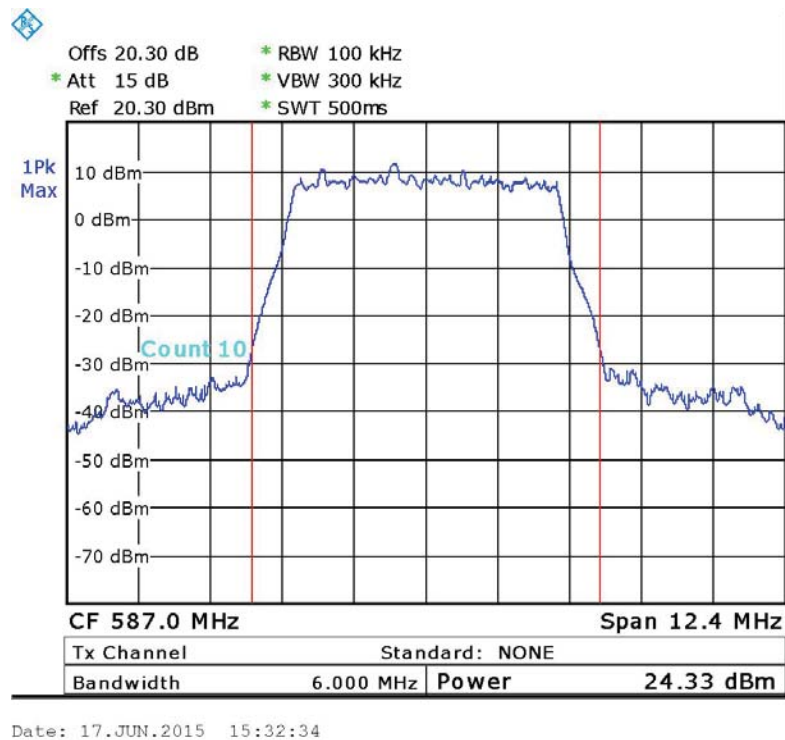


Figure 184. . Chain 3 – 64QAM – 587MHz

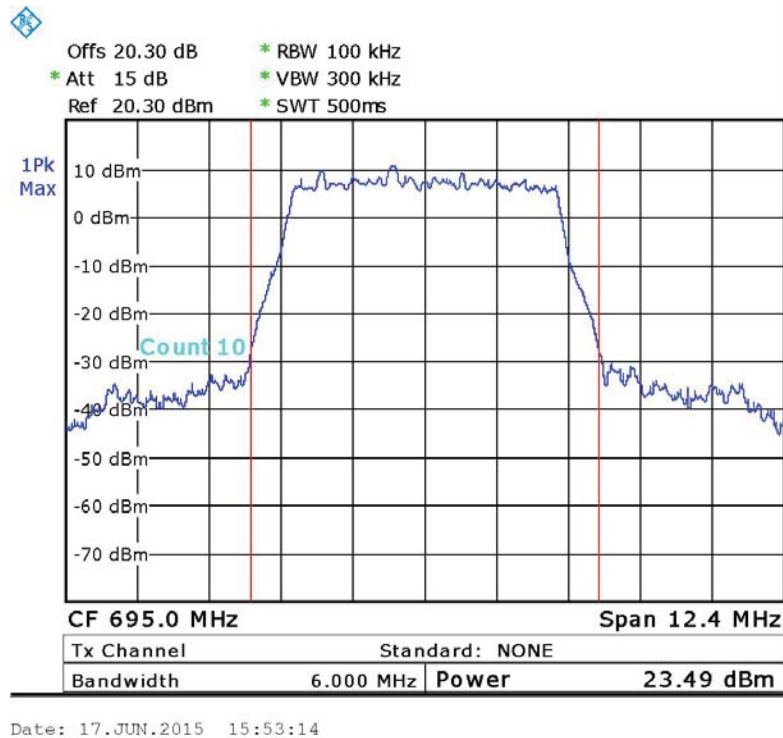


Figure 185. Chain 3 -- 64QAM -- 695MHz

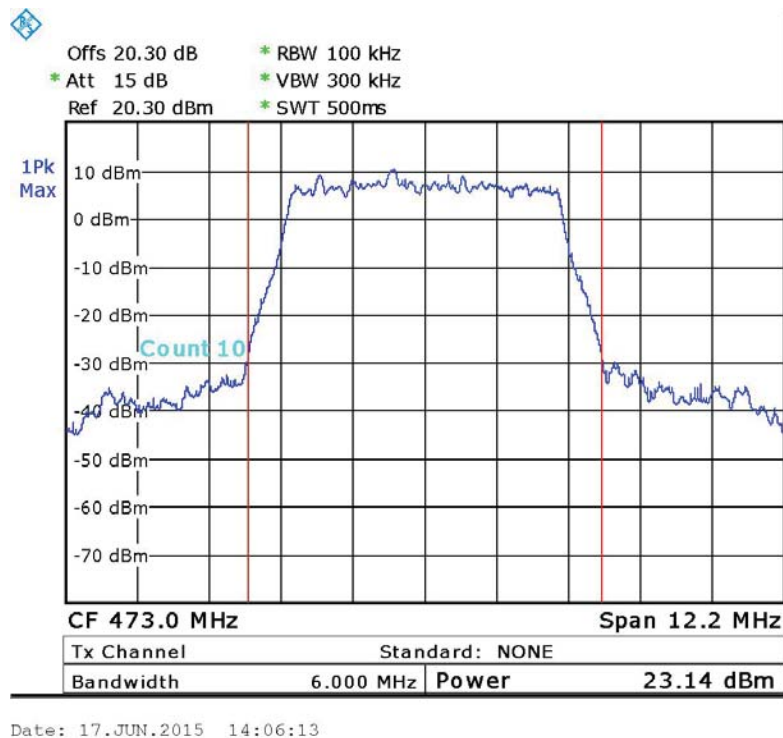
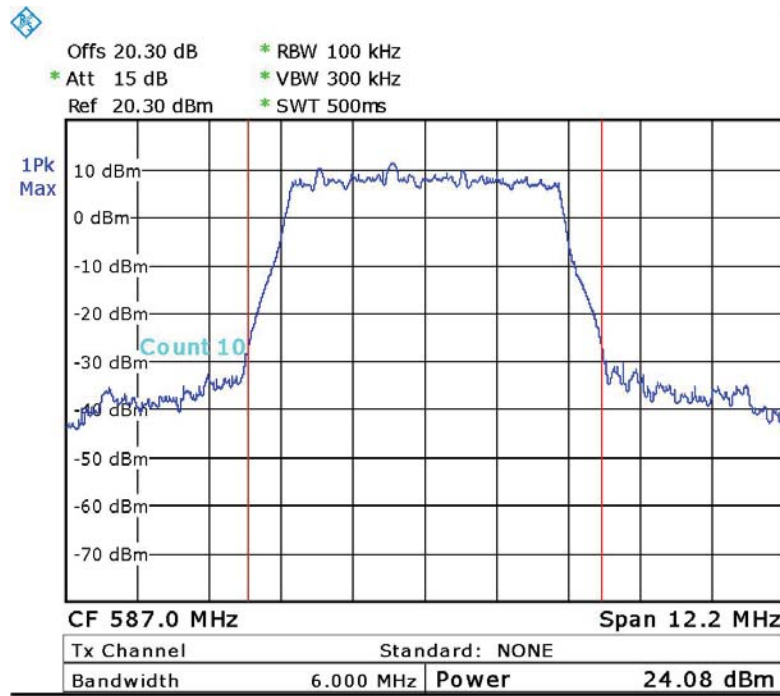
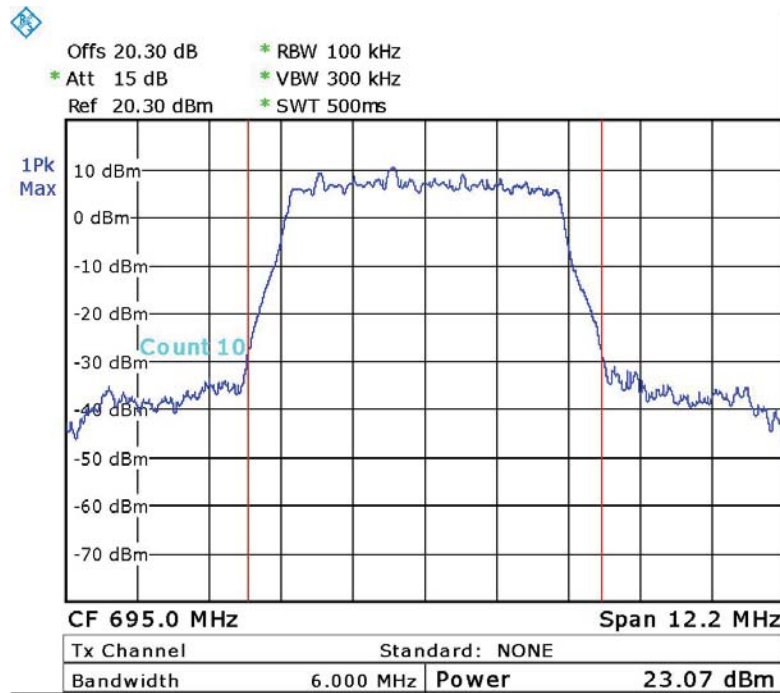


Figure 186. Chain 3-- QPSK -- 473MHz



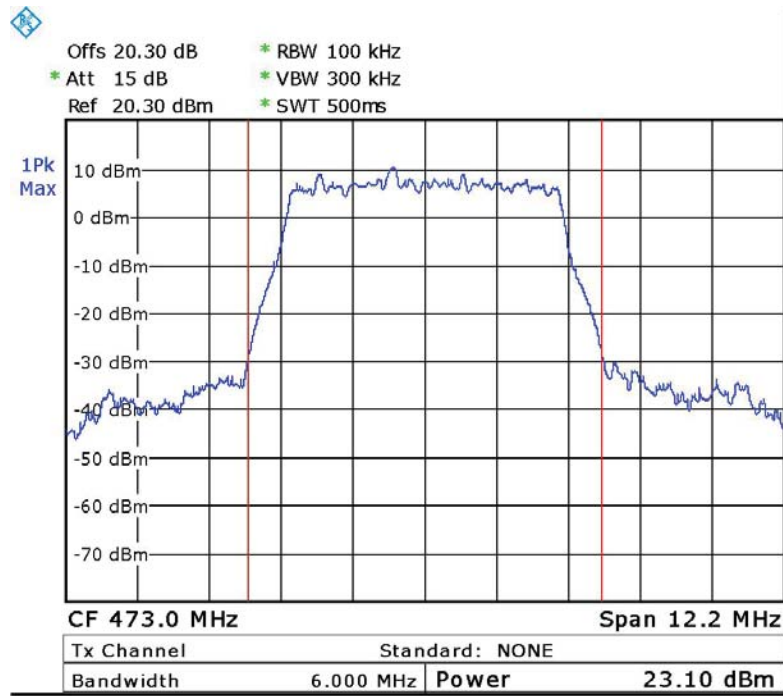
Date: 17.JUN.2015 14:44:23

Figure 187. . Chain 3 – QPSK – 587MHz



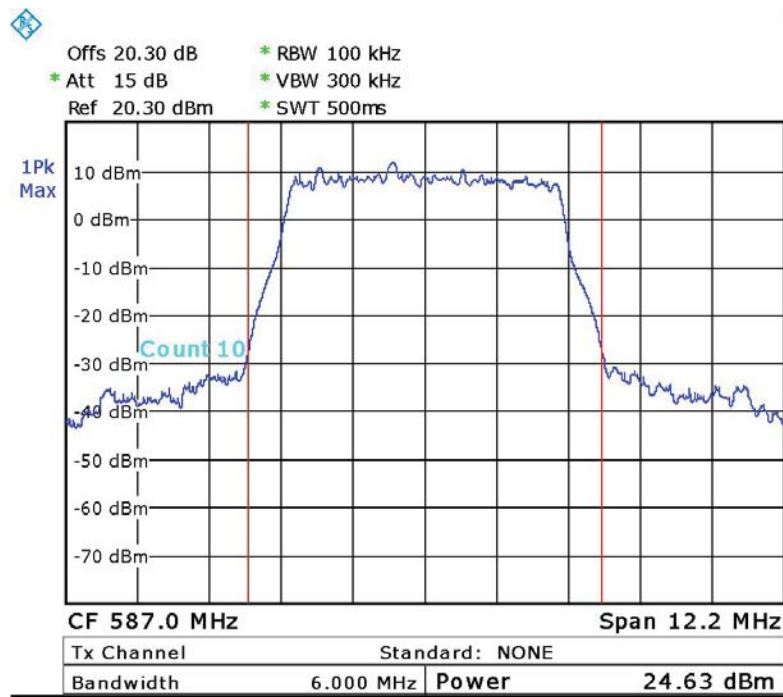
Date: 17.JUN.2015 16:24:39

Figure 188. Chain 3-- QPSK – 695MHz



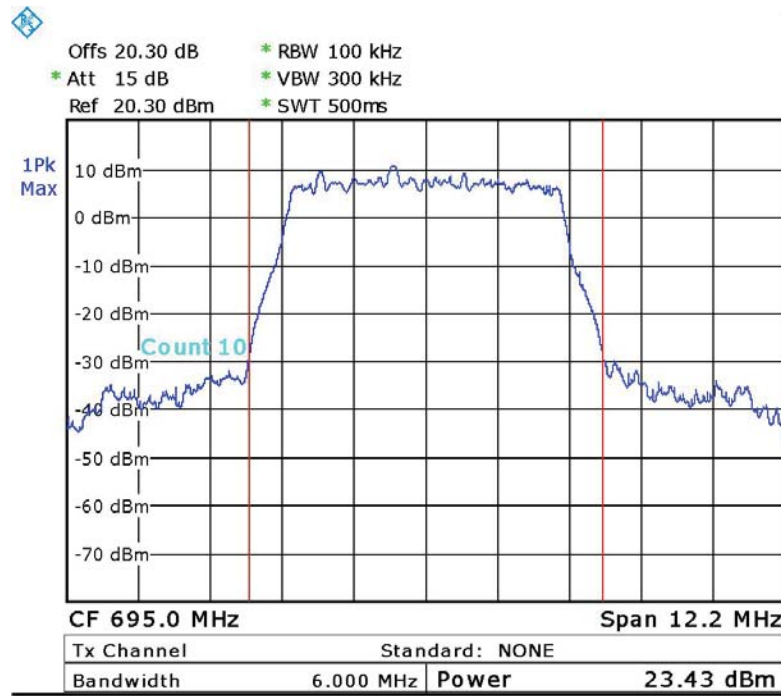
Date: 17.JUN.2015 13:49:32

Figure 189. Chain 4 -- 16QAM -- 473MHz



Date: 17.JUN.2015 15:14:40

Figure 190. . Chain 4 -- 16QAM -- 587MHz



Date: 17.JUN.2015 16:16:46

Figure 191. Chain 4 — 16QAM – 695MHz

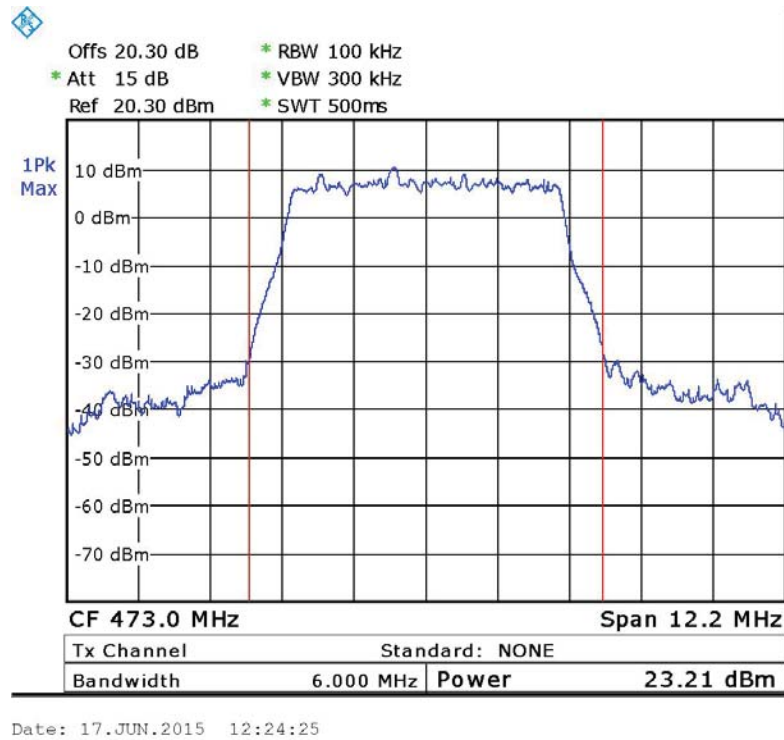


Figure 192. Chain 4 – 64QAM – 473MHz

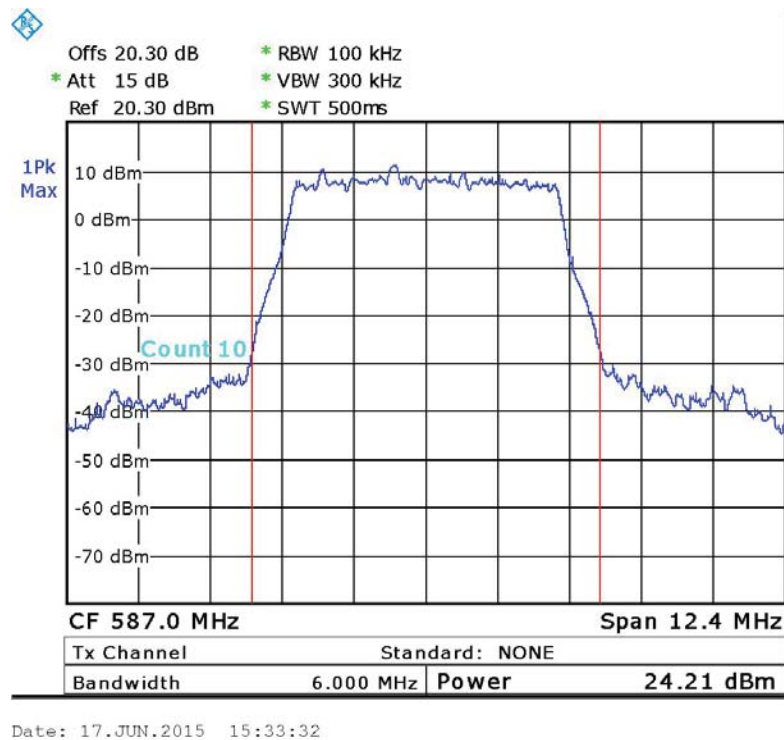


Figure 193. Chain 4 - 64QAM – 587MHz

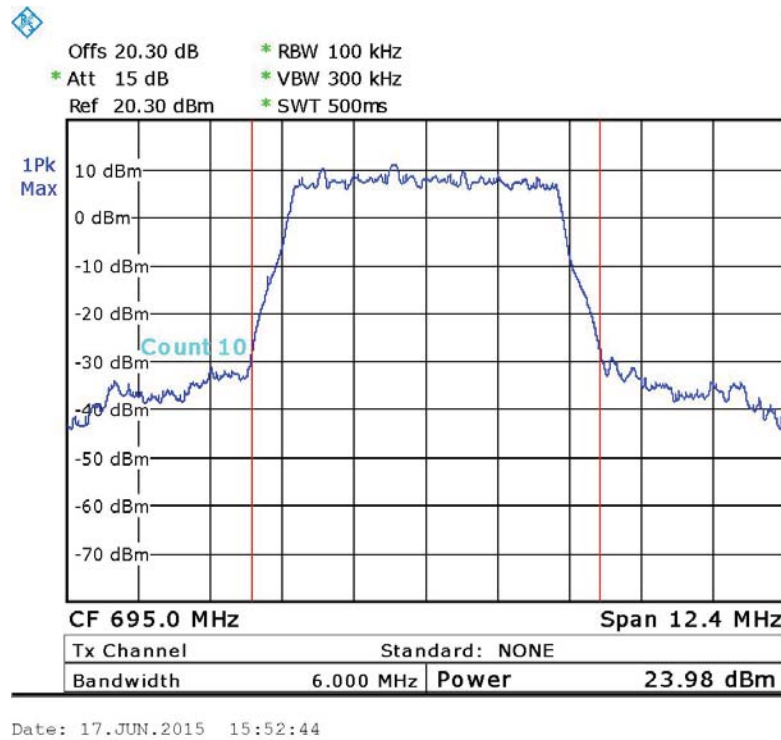


Figure 194. Chain 4 – 64QAM – 695MHz

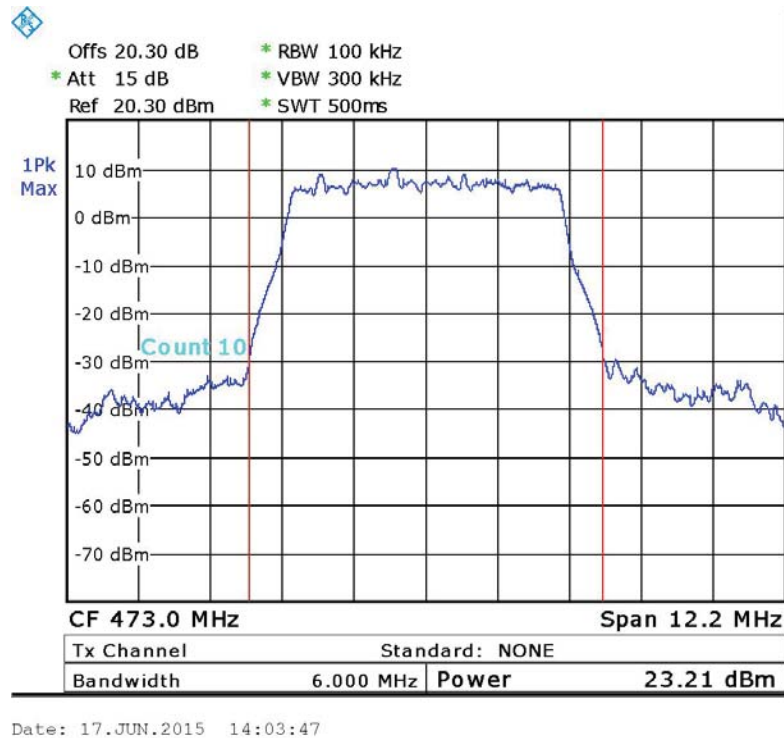


Figure 195. Chain 4 -- QPSK -- 473MHz

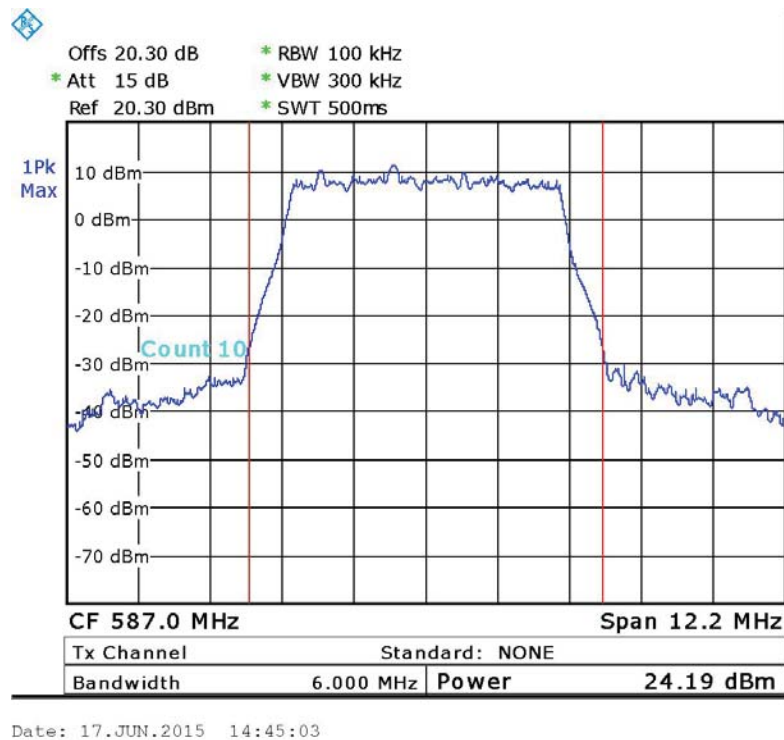


Figure 196. . Chain 4 -- QPSK -- 587MHz

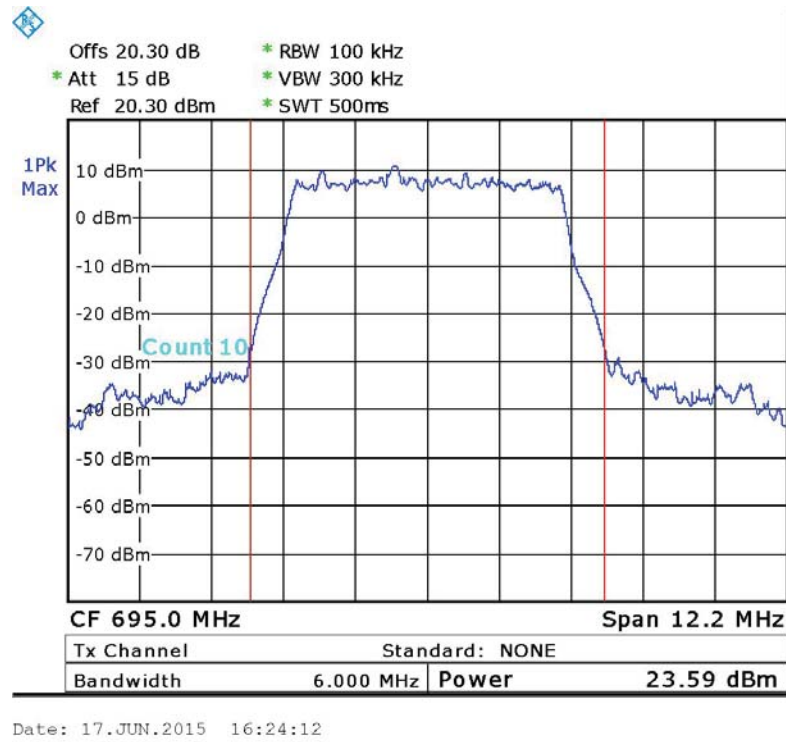


Figure 197. Chain 4 — QPSK – 695MHz



6.4 Test Equipment Used; Maximum Transmitted Peak Power Output

| Instrument | Manufacturer | Model | Serial No. | Last Calibration Date | Period |
|-------------------|---------------------|--------------|-------------------|------------------------------|---------------|
| Spectrum Analyzer | R&S | FSL6 | 100194 | January 1, 2015 | 1 year |
| 20 dB attenuator | MCL | VAT-20W2+ | 848 | June 15, 2015 | 1 year |

Figure 198 Test Equipment Used

7. Power Spectral Density

7.1 **Specification**

FCC Part 15, Subpart H, Section 15.709(a)(5)(i)

7.2 **Test Procedure**

The E.U.T operation mode and test set-up are as described in Section 2.

See Section 2.1 Justification of the System Test Configuration concerning the E.U.T. orientation for this test.

The E.U.T. antenna terminal was connected to the Spectrum Analyzer through an external attenuator (20 dB) and an appropriate coaxial cable (cable loss = 0.3 dB). The Spectrum Analyzer was set to 100 kHz resolution BW. Peak power level was measured in any 100 kHz resolution bandwidth with an RMS detector.

A sweep time of 500ms was used for 1ms per trace point.

7.3 **Test Results**

JUDGEMENT: Passed

For additional information see *Figure 201* to *Figure 236*.

| Chain # | Modulation | Operation Frequency (MHz) | Reading (dBm) | Specification* (dBm) | Margin |
|---------|------------|---------------------------|---------------|----------------------|--------|
| Chain 1 | 16QAM | 473 | -2.3 | 10.6 | -12.9 |
| | | 587 | -0.2 | 10.6 | -10.8 |
| | | 695 | -2.6 | 10.6 | -13.2 |
| | 64QAM | 473 | -2.1 | 10.6 | -12.7 |
| | | 587 | -0.9 | 10.6 | -11.5 |
| | | 695 | -1.3 | 10.6 | -11.9 |
| | QPSK | 473 | -1.9 | 10.6 | -12.5 |
| | | 587 | 1.3 | 10.6 | -9.3 |
| | | 695 | -2.6 | 10.6 | -13.2 |
| Chain 2 | 16QAM | 473 | -2.0 | 10.6 | -12.6 |
| | | 587 | -0.9 | 10.6 | -11.5 |
| | | 695 | -2.6 | 10.6 | -13.2 |
| | 64QAM | 473 | -2.7 | 10.6 | -13.3 |
| | | 587 | -1.7 | 10.6 | -12.3 |
| | | 695 | -2.0 | 10.6 | -12.6 |
| | QPSK | 473 | -2.8 | 10.6 | -13.4 |
| | | 587 | 0.8 | 10.6 | -11.4 |
| | | 695 | -2.1 | 10.6 | -12.7 |

*Note – the specification is corrected by 2.0 dB since the product antenna has 8 dB gain

Figure 199 Peak Power – Chain 1 & 2

| Chain # | Modulation | Operation Frequency (MHz) | Reading (MHz) | Specification* (MHz) | Margin |
|---------|------------|---------------------------|---------------|----------------------|--------|
| Chain 3 | 16QAM | 473 | -2.9 | 10.6 | -13.5 |
| | | 587 | -0.3 | 10.6 | -10.9 |
| | | 695 | -2.7 | 10.6 | -13.3 |
| | 64QAM | 473 | -2.8 | 10.6 | -13.4 |
| | | 587 | -1.5 | 10.6 | -12.1 |
| | | 695 | -2.3 | 10.6 | -12.9 |
| | QPSK | 473 | -2.8 | 10.6 | -13.4 |
| | | 587 | 1.2 | 10.6 | -9.4 |
| | | 695 | -2.6 | 10.6 | -13.2 |
| Chain 4 | 16QAM | 473 | -2.7 | 10.6 | -13.3 |
| | | 587 | -1.2 | 10.6 | -11.8 |
| | | 695 | -2.2 | 10.6 | -12.8 |
| | 64QAM | 473 | -2.1 | 10.6 | -12.7 |
| | | 587 | -1.3 | 10.6 | -11.9 |
| | | 695 | -2.3 | 10.6 | -12.9 |
| | QPSK | 473 | -2.7 | 10.6 | -13.3 |
| | | 587 | 0.7 | 10.6 | -11.3 |
| | | 695 | -2.2 | 10.6 | -12.8 |

*Note – the specification is corrected by 2.0 dB since the product antenna has 8 dB gain

Figure 200 Peak Power – Chain 3 & 4

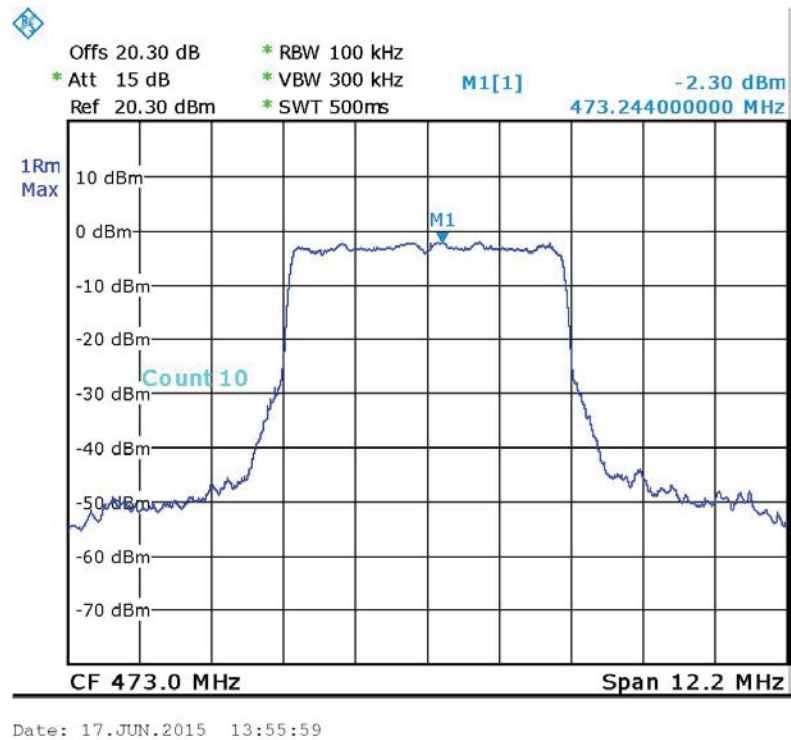


Figure 201. Chain 1 – 16QAM – 473MHz

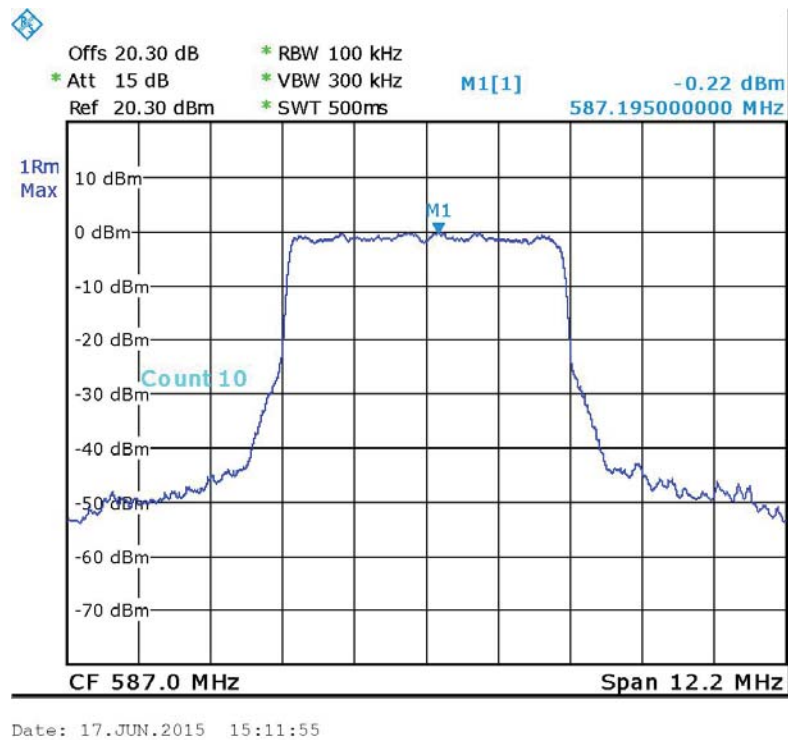
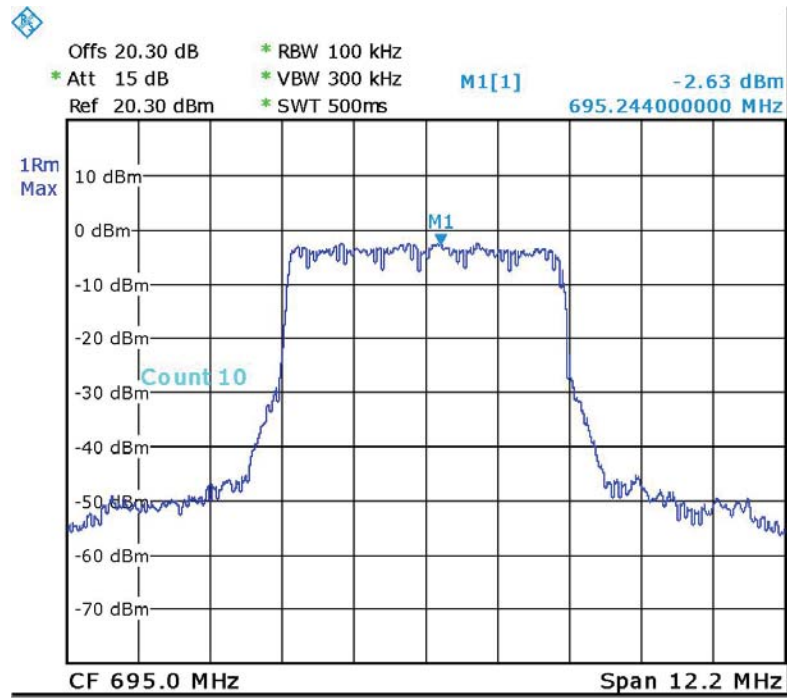
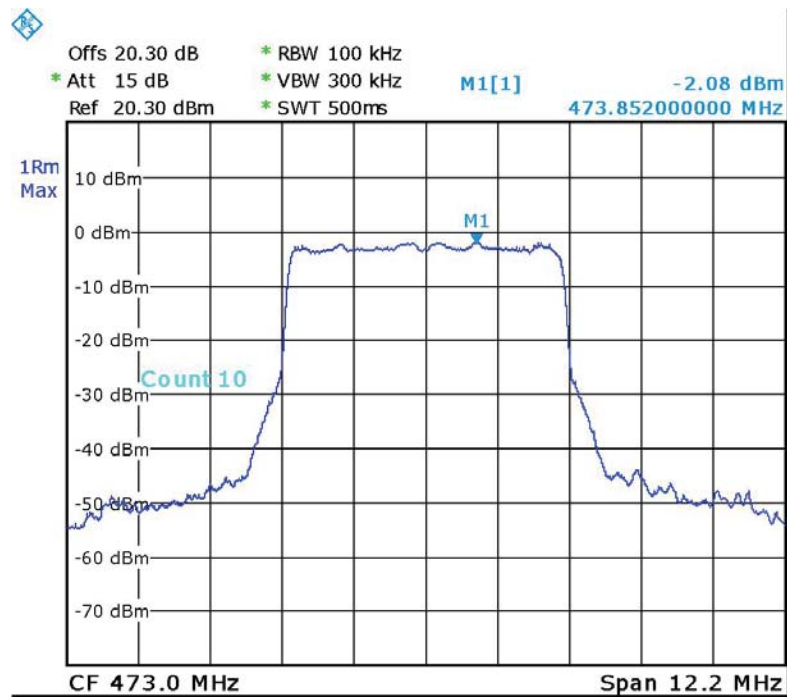


Figure 202. . Chain 1 - 16QAM – 587MHz



Date: 17.JUN.2015 16:19:14

Figure 203. Chain 1 - 16QAM – 695MHz



Date: 17.JUN.2015 12:31:24

Figure 204. Chain 1 - 64QAM – 473MHz

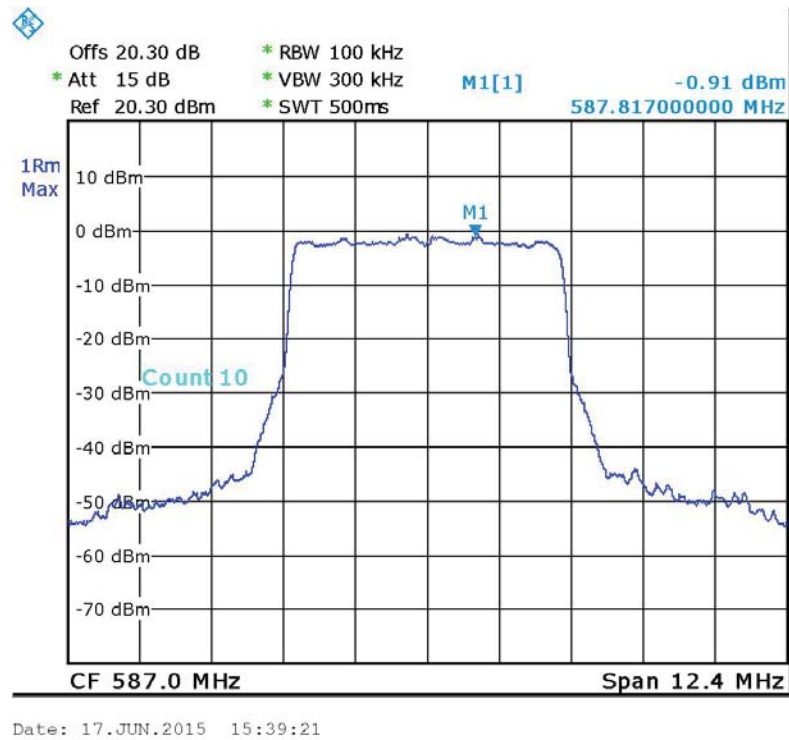


Figure 205. . Chain 1 — 64QAM – 587MHz

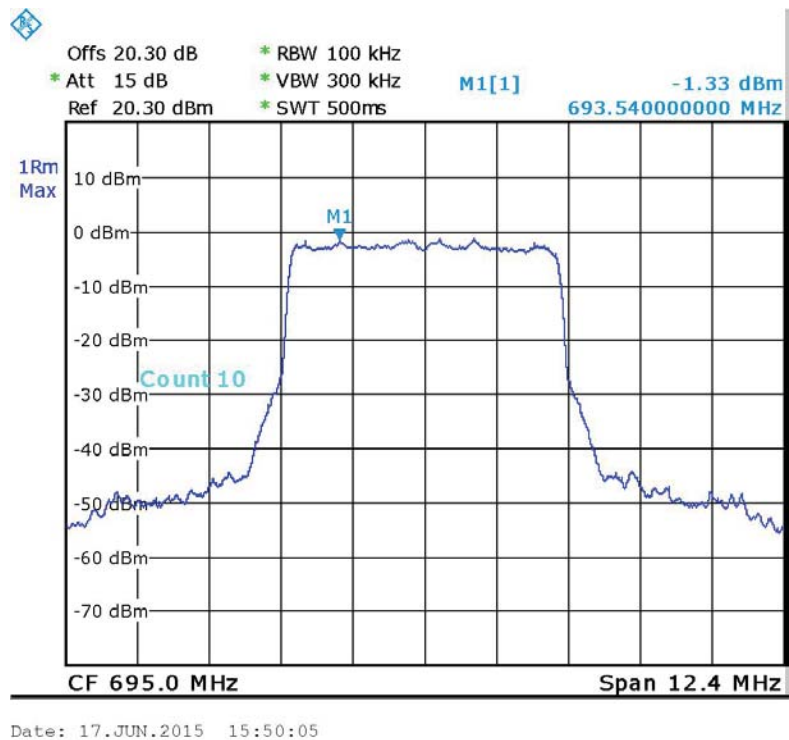


Figure 206. Chain 1 - 64QAM – 695MHz

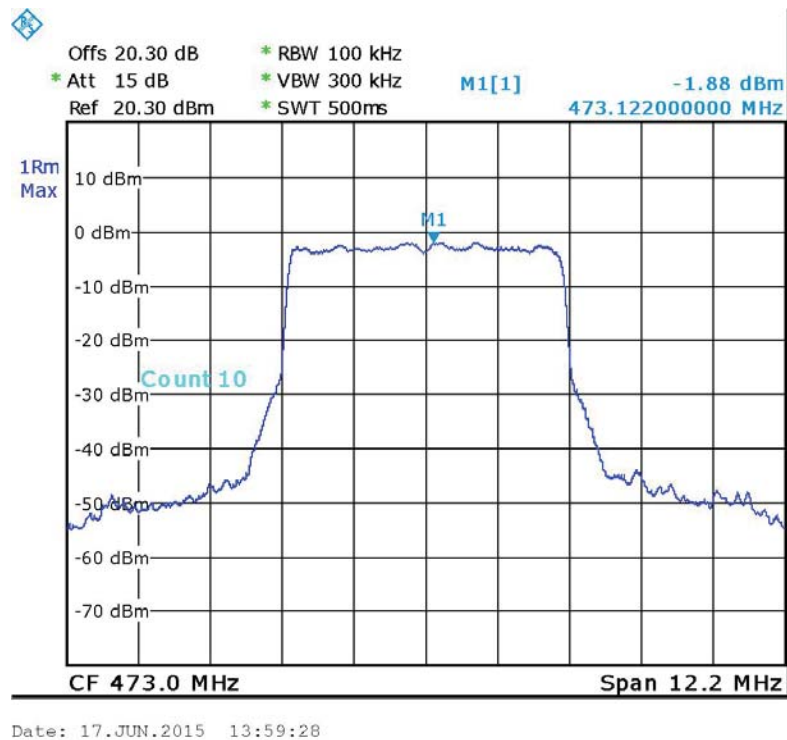


Figure 207. Chain 1 - QPSK – 473MHz

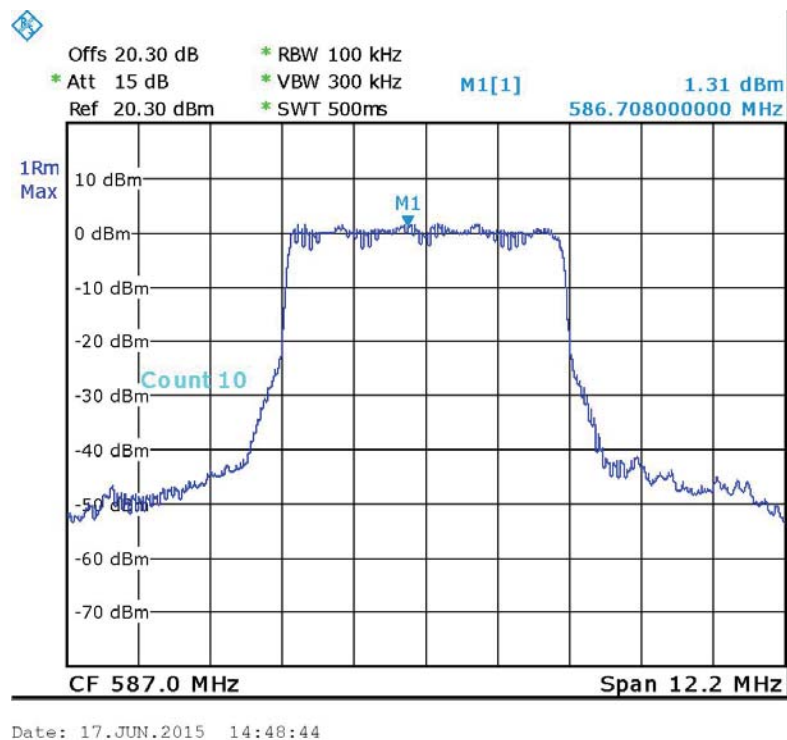


Figure 208. . Chain 1 — QPSK – 587MHz

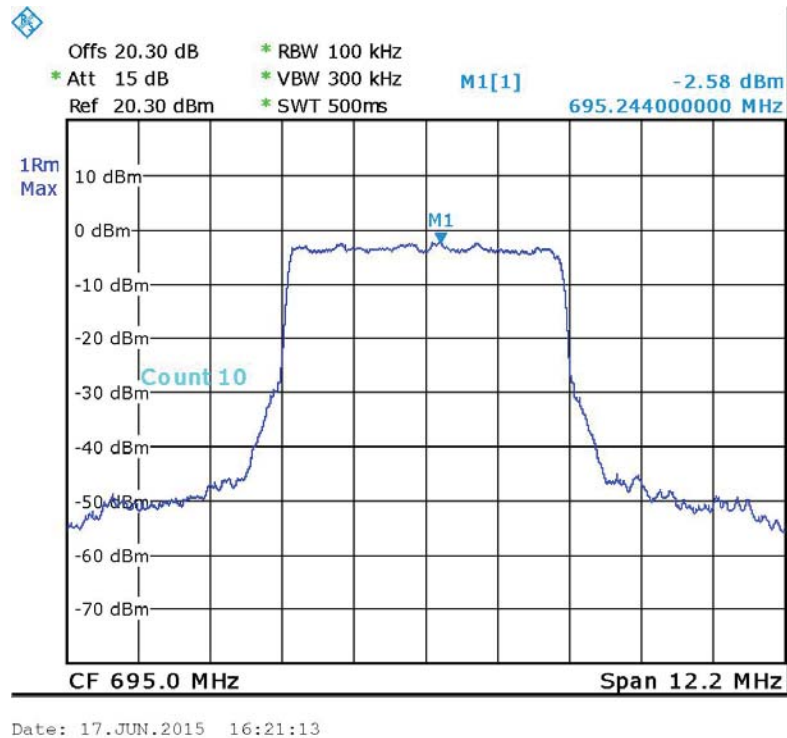


Figure 209. Chain 1 -- QPSK – 695MHz

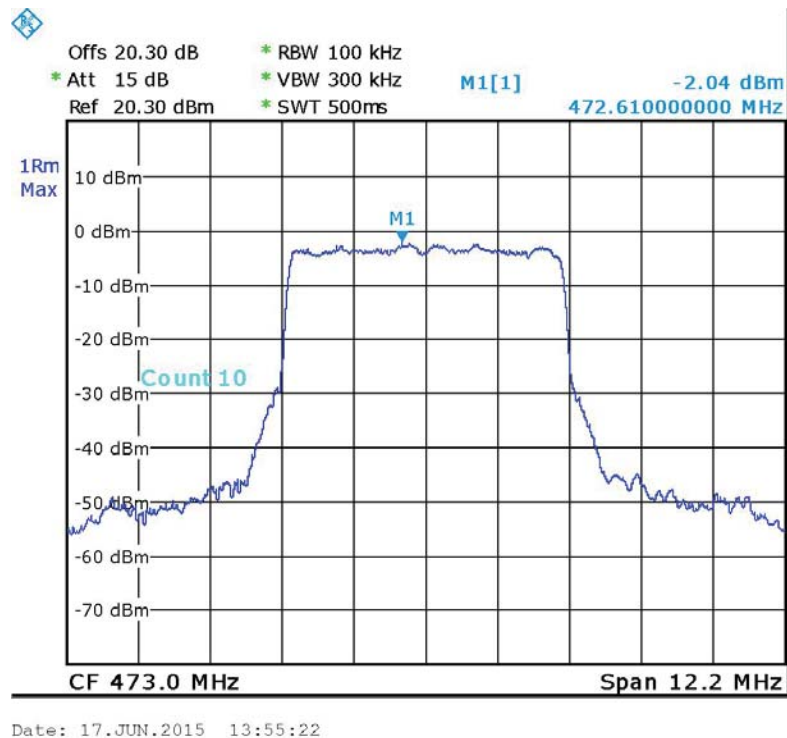
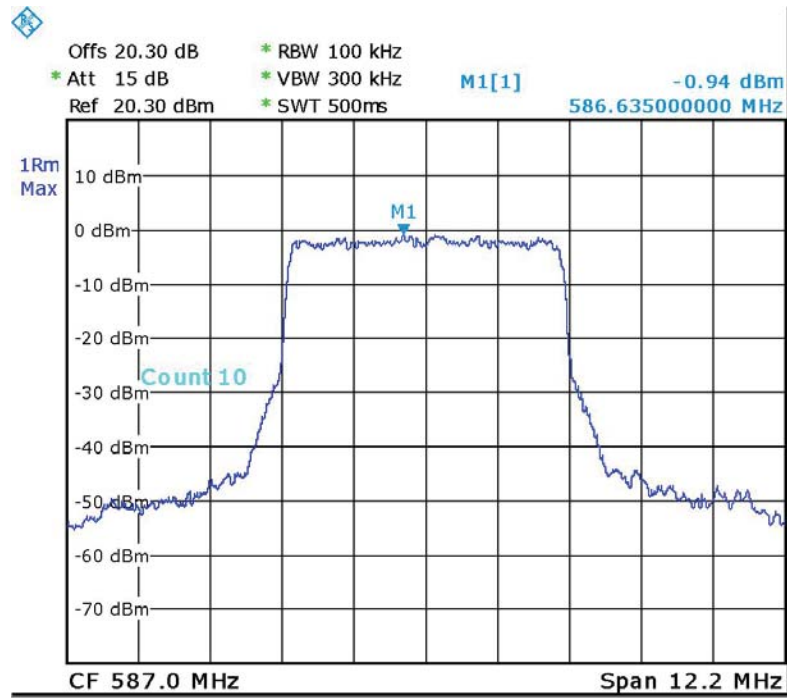
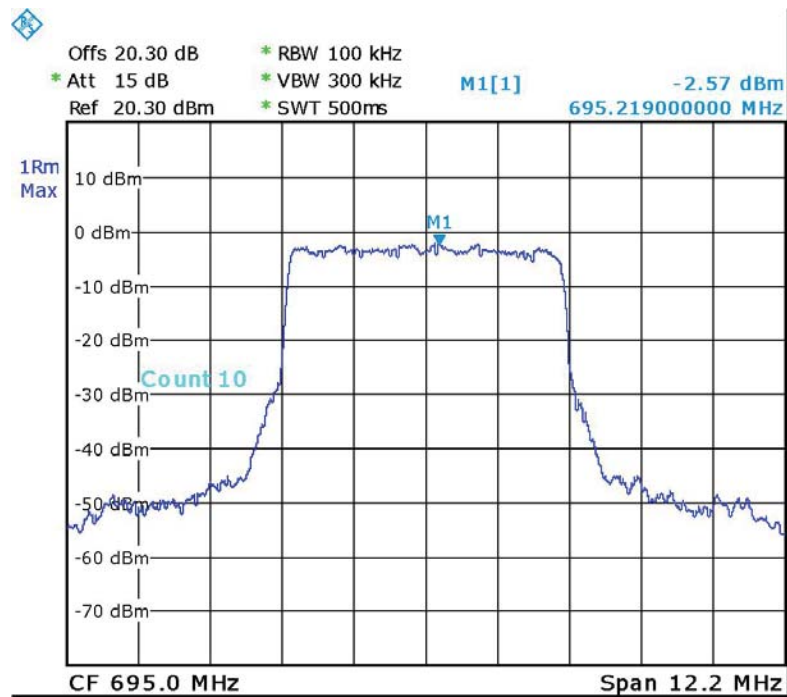


Figure 210. Chain 2 -- 16QAM – 473MHz



Date: 17.JUN.2015 15:12:27

Figure 211. . Chain 2 – 16QAM – 587MHz



Date: 17.JUN.2015 16:18:42

Figure 212. Chain 2 — 16QAM – 695MHz

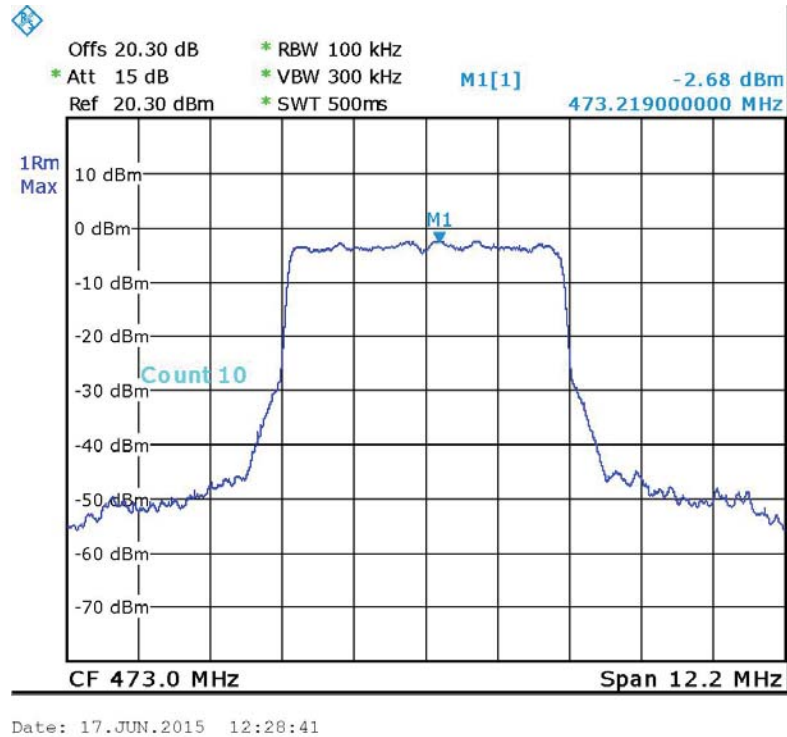


Figure 213. Chain 2 – 64QAM – 473MHz

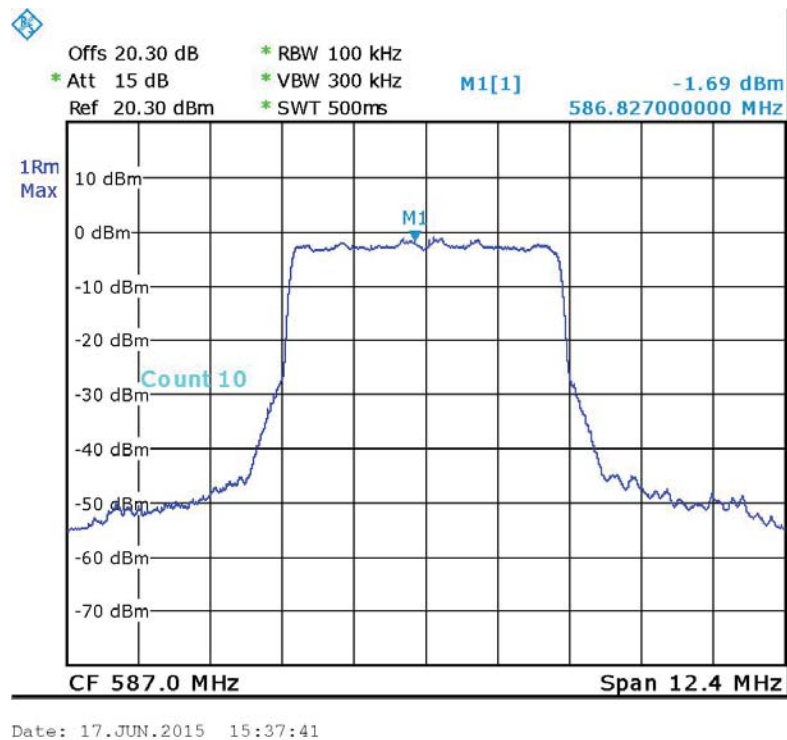
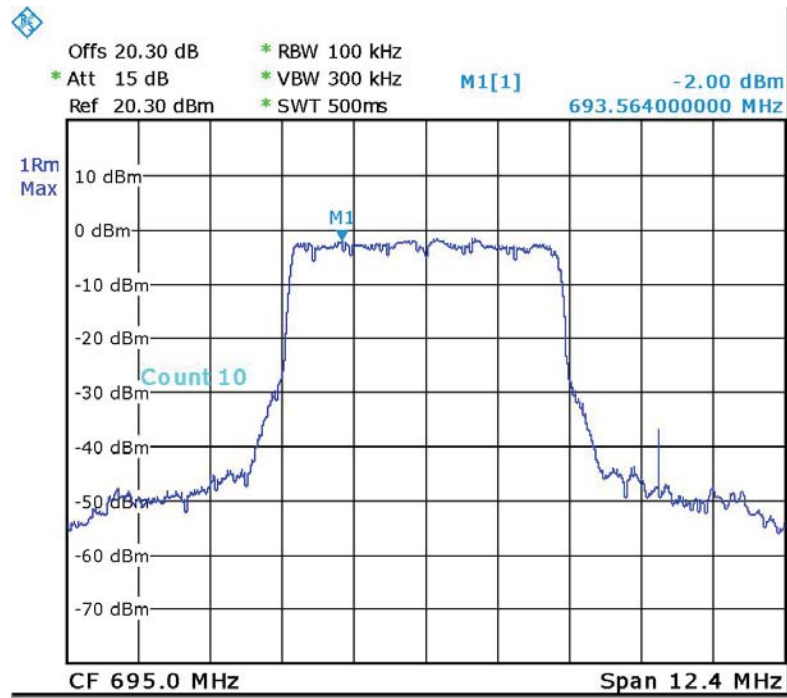
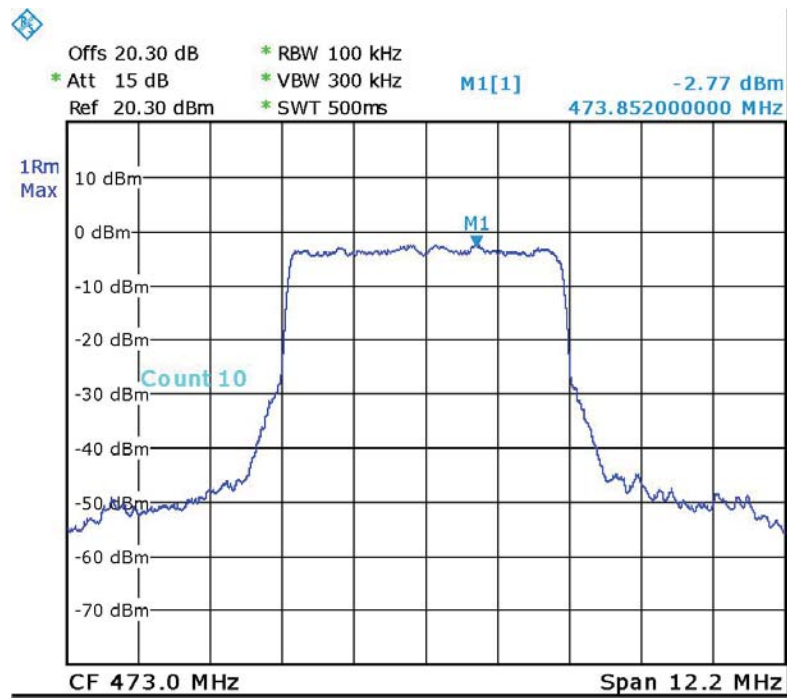


Figure 214. . Chain 2 - 64QAM – 587MHz



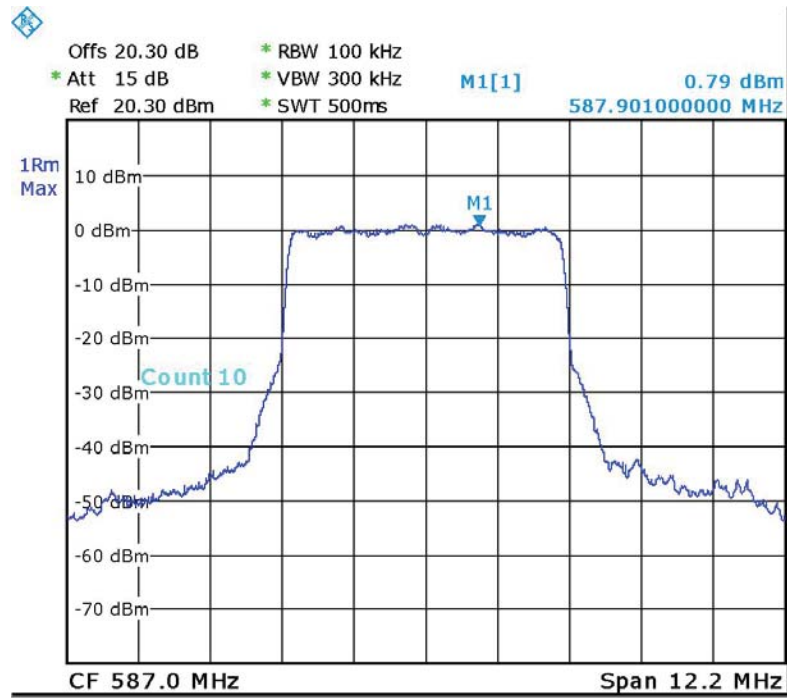
Date: 17.JUN.2015 15:50:48

Figure 215. Chain 2 – 64QAM – 695MHz



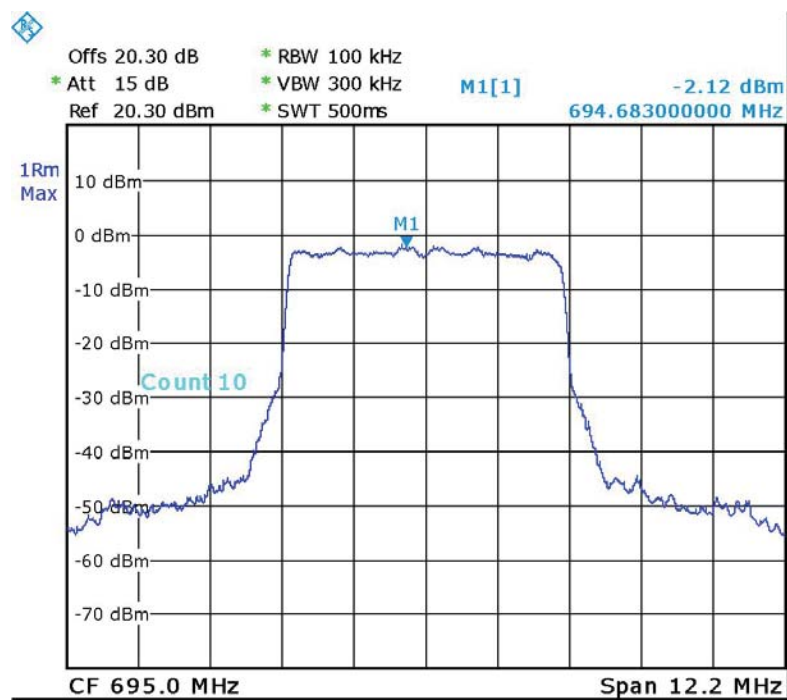
Date: 17.JUN.2015 14:00:09

Figure 216. Chain 2 - QPSK – 473MHz



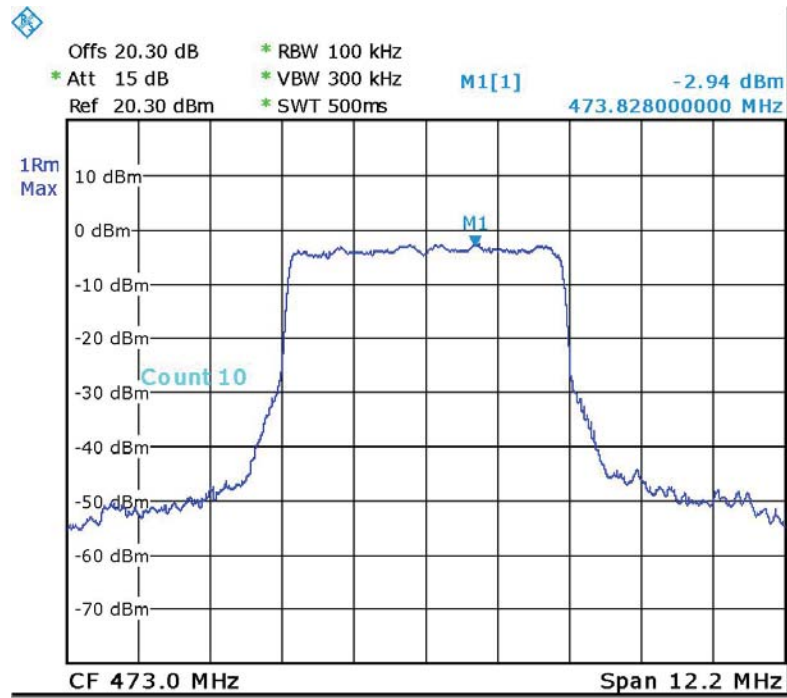
Date: 17.JUN.2015 14:48:04

Figure 217. . Chain 2 - QPSK – 587MHz



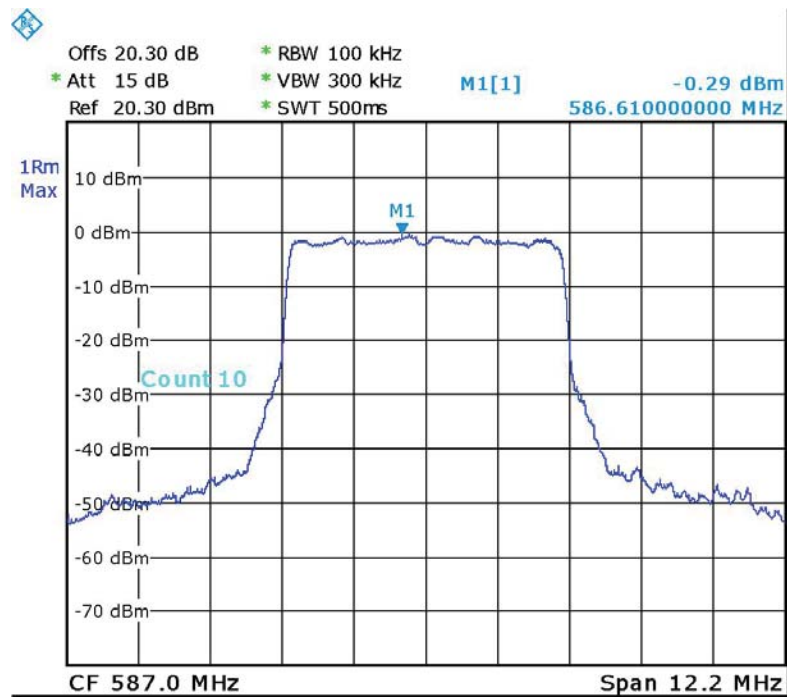
Date: 17.JUN.2015 16:21:55

Figure 218. Chain 2 - QPSK – 695MHz



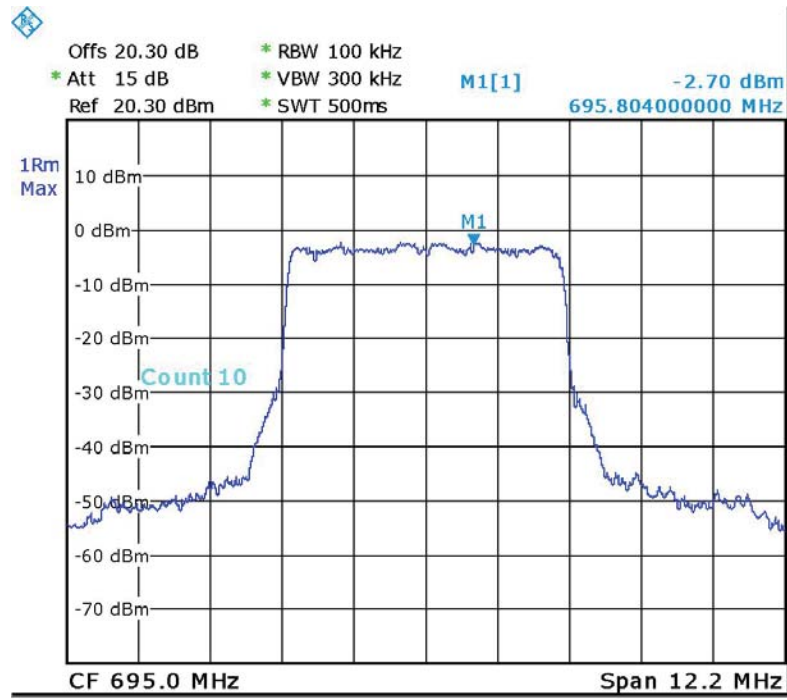
Date: 17.JUN.2015 13:54:50

Figure 219. Chain 3 – 16QAM – 473MHz



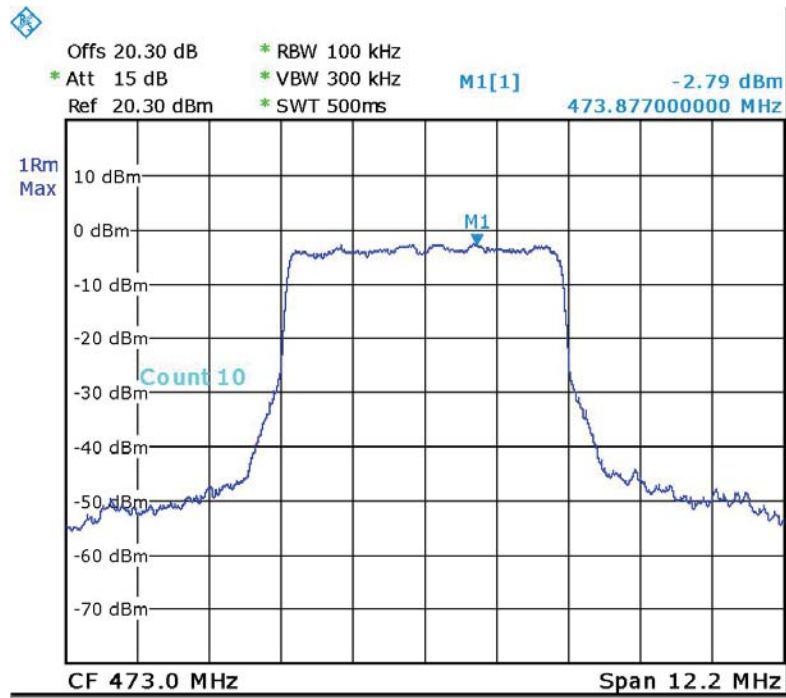
Date: 17.JUN.2015 15:13:07

Figure 220. . Chain 3 - 16QAM – 587MHz



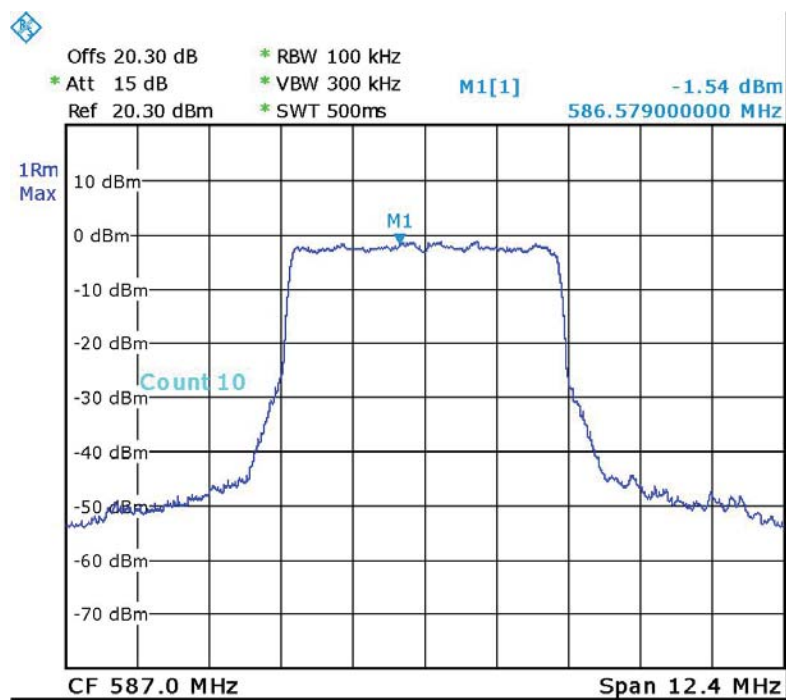
Date: 17.JUN.2015 16:18:12

Figure 221. Chain 3 — 16QAM — 695MHz



Date: 17.JUN.2015 12:27:14

Figure 222. Chain 3 -- 64QAM -- 473MHz



Date: 17.JUN.2015 15:36:03

Figure 223. . Chain 3 – 64QAM – 587MHz

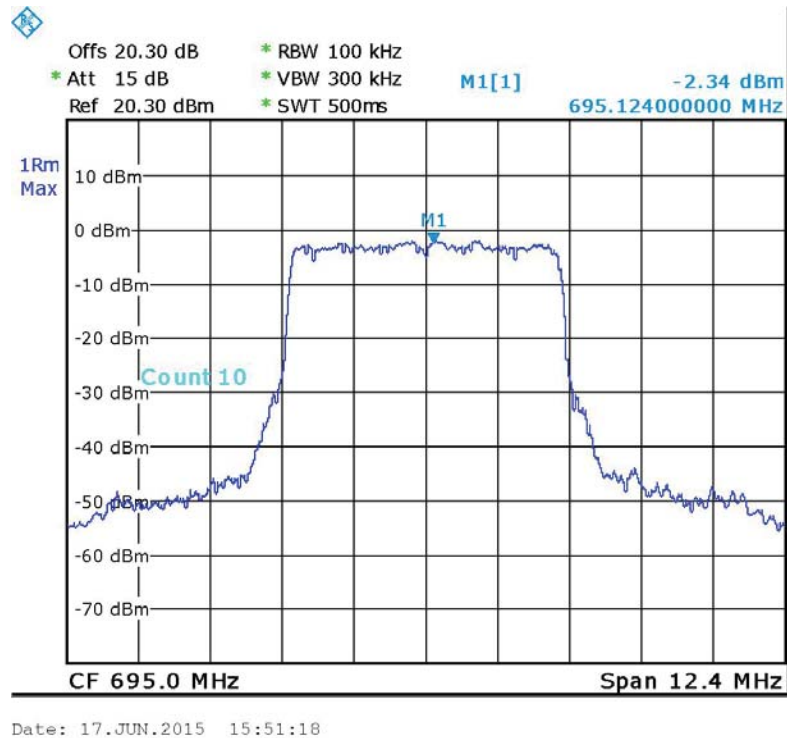


Figure 224. Chain 3 -- 64QAM -- 695MHz

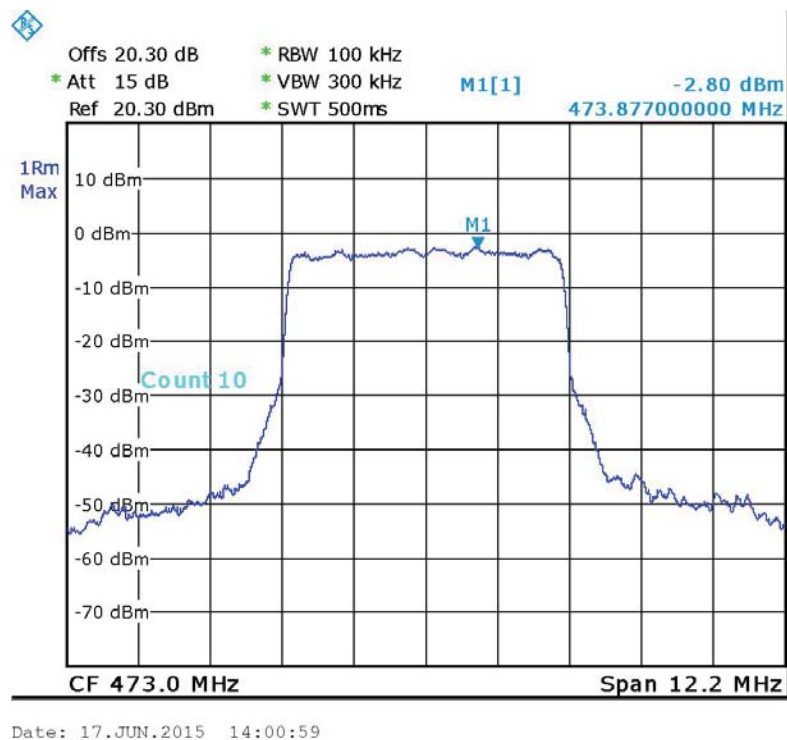
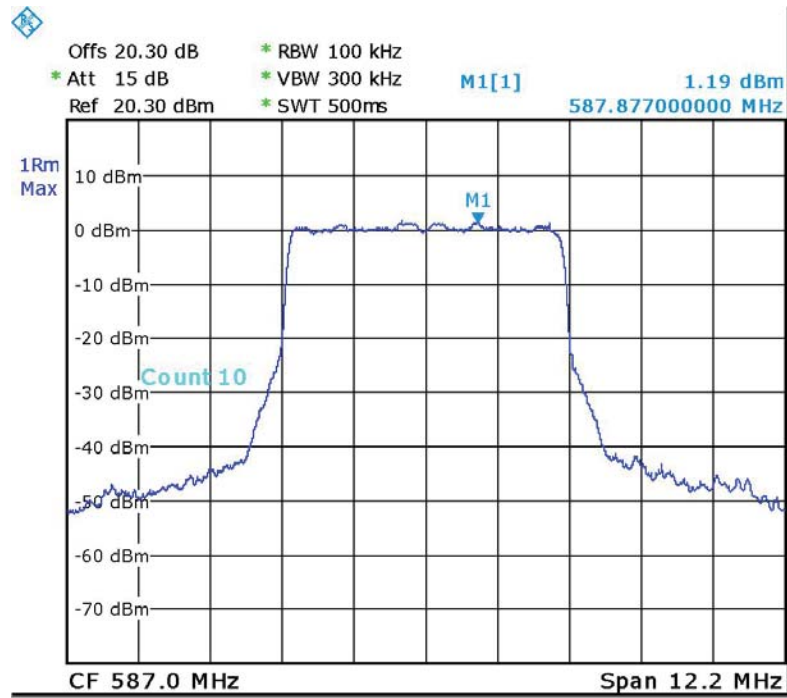
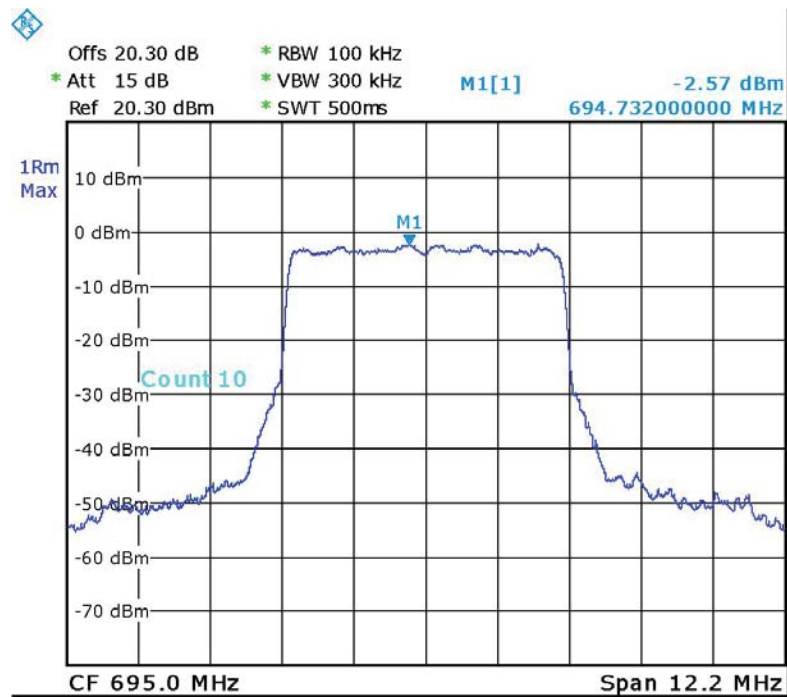


Figure 225. Chain 3-- QPSK -- 473MHz



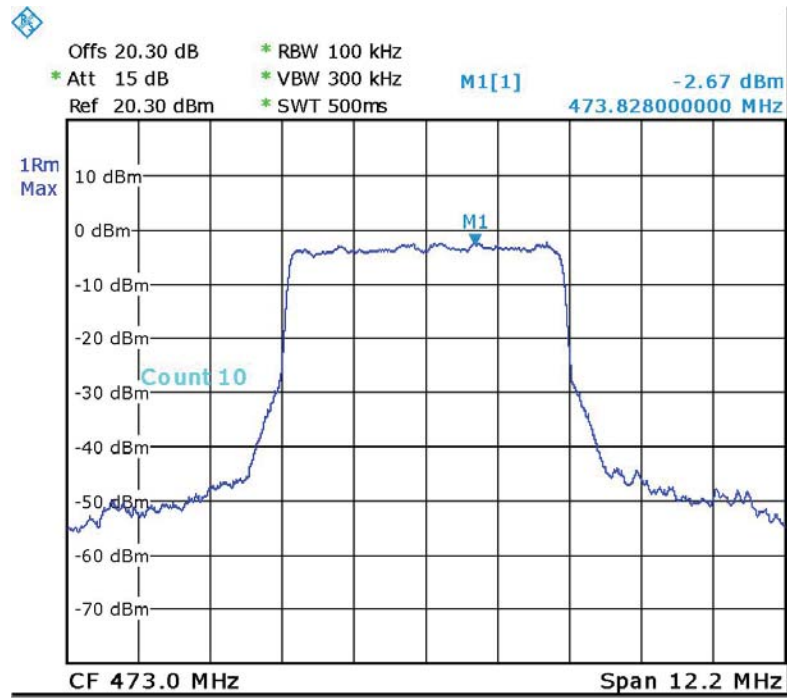
Date: 17.JUN.2015 14:47:28

Figure 226. . Chain 3 – QPSK – 587MHz



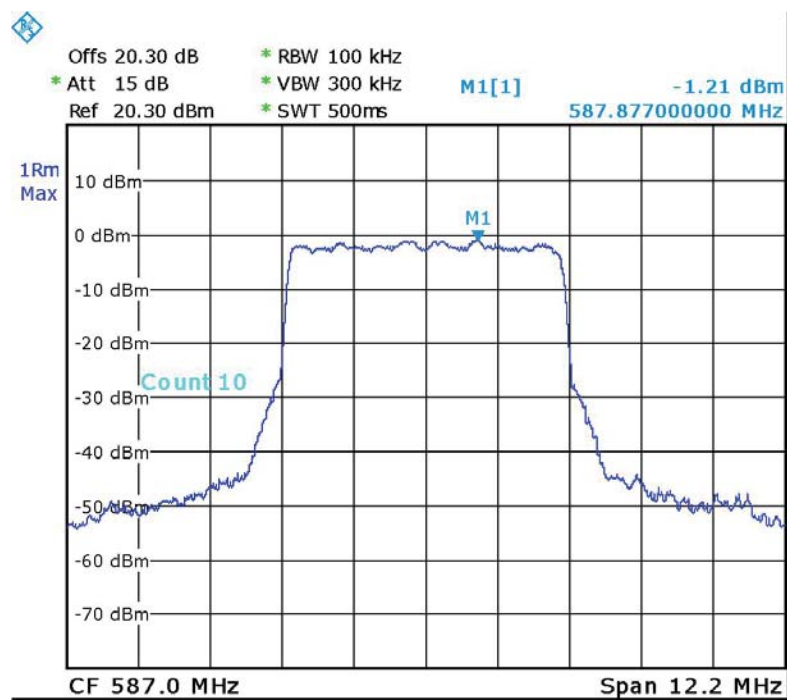
Date: 17.JUN.2015 16:22:42

Figure 227. Chain 3-- QPSK – 695MHz



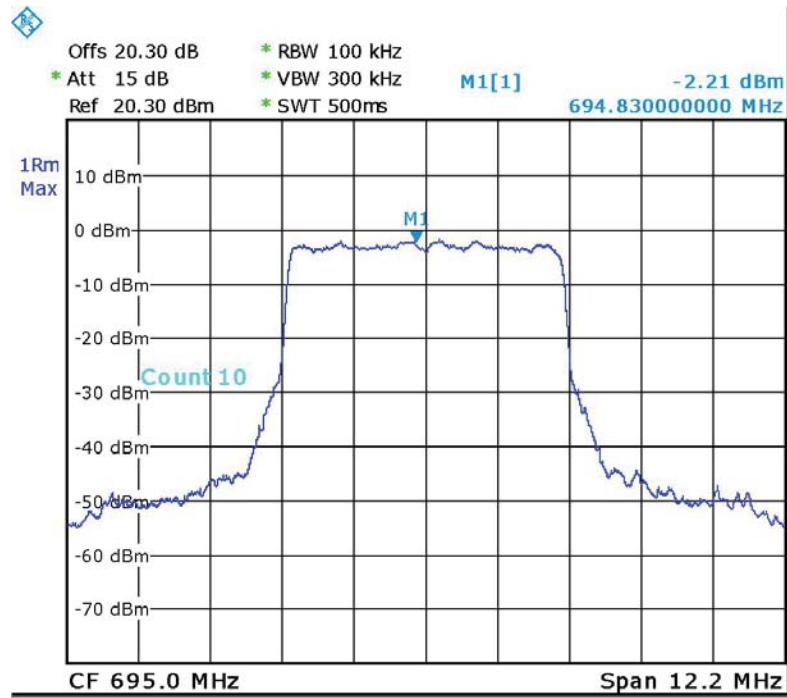
Date: 17.JUN.2015 13:54:07

Figure 228. Chain 4 -- 16QAM -- 473MHz



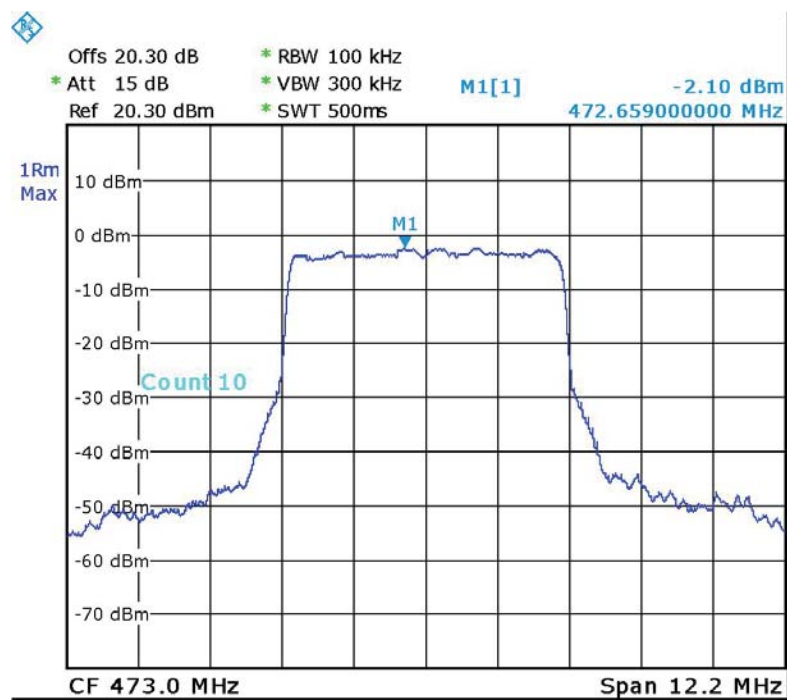
Date: 17.JUN.2015 15:13:44

Figure 229. . Chain 4 -- 16QAM -- 587MHz



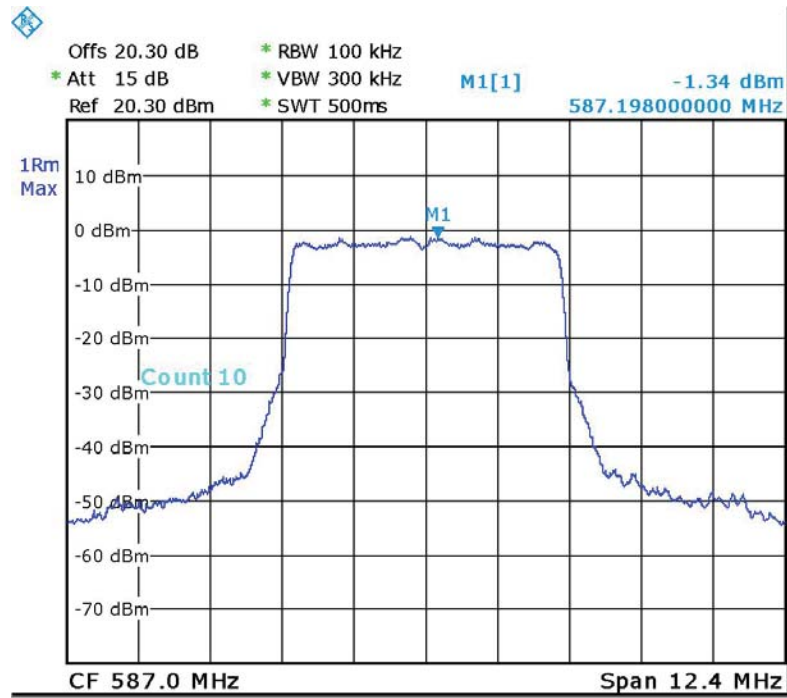
Date: 17.JUN.2015 16:17:43

Figure 230. Chain 4 — 16QAM – 695MHz



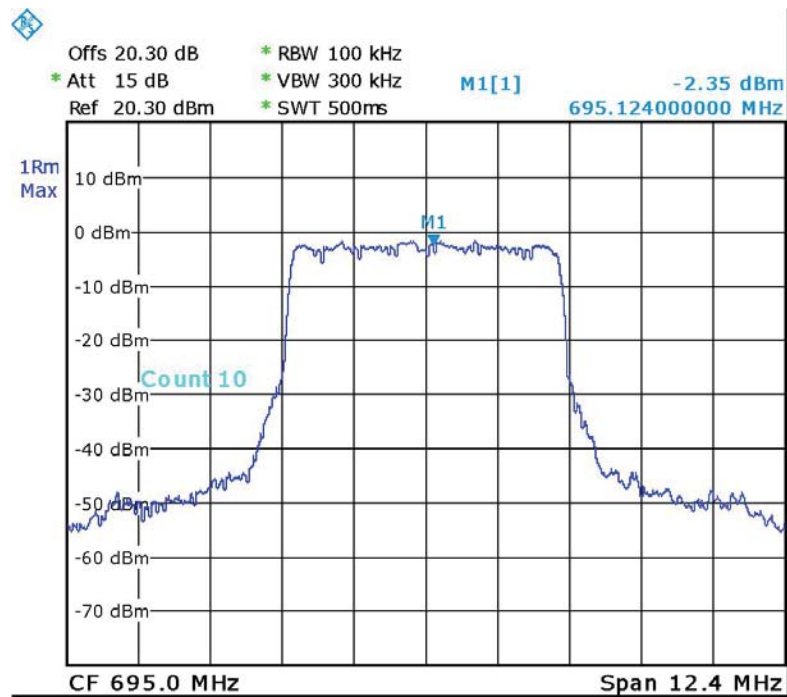
Date: 17.JUN.2015 12:26:22

Figure 231. Chain 4 — 64QAM – 473MHz



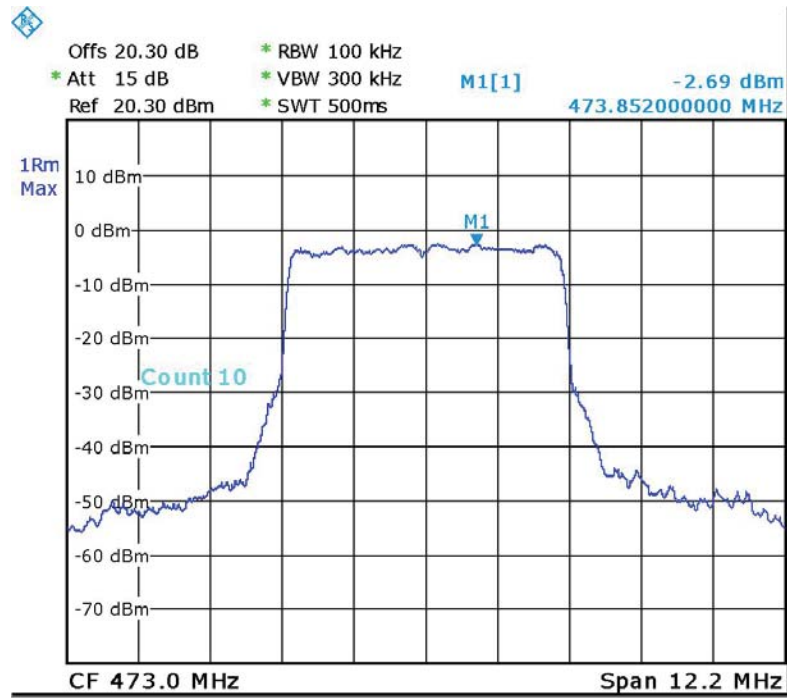
Date: 17.JUN.2015 15:34:57

Figure 232. . Chain 4 - 64QAM – 587MHz



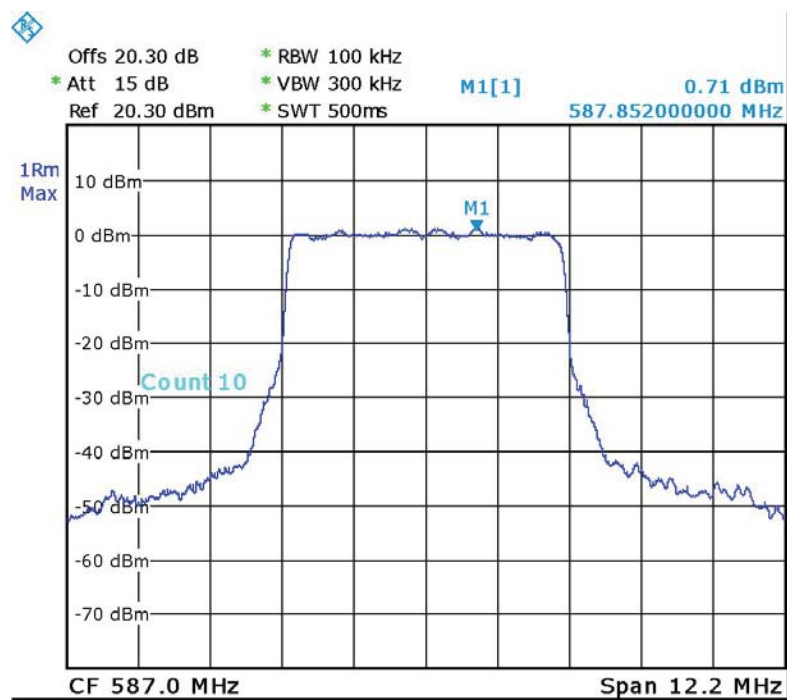
Date: 17.JUN.2015 15:51:50

Figure 233. Chain 4 — 64QAM – 695MHz



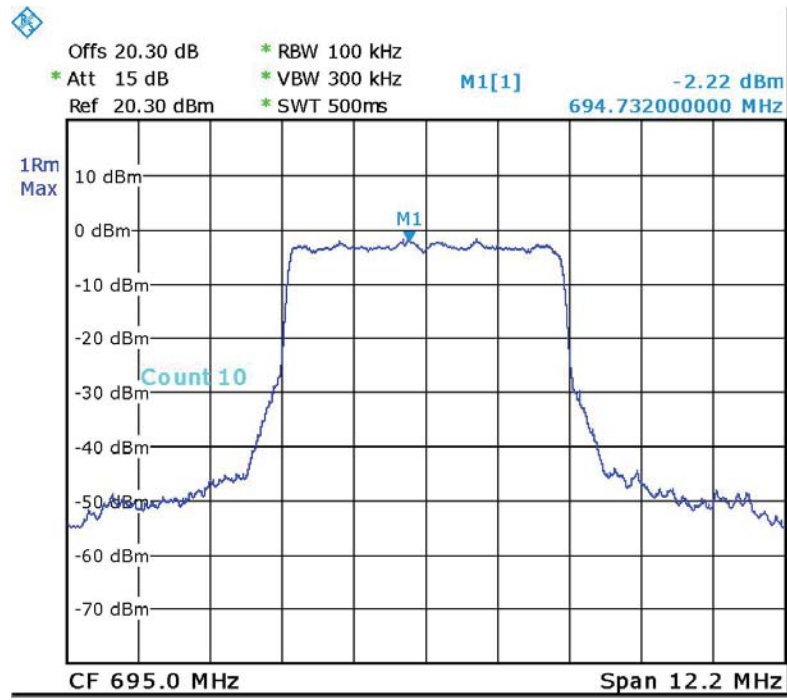
Date: 17.JUN.2015 14:01:50

Figure 234. Chain 4 -- QPSK -- 473MHz



Date: 17.JUN.2015 14:46:34

Figure 235. . Chain 4 -- QPSK -- 587MHz



Date: 17.JUN.2015 16:23:20

Figure 236. Chain 4 -- QPSK -- 695MHz



7.4 *Test Equipment Used; Power Spectral Density*

| Instrument | Manufacturer | Model | Serial No. | Last Calibration Date | Period |
|-------------------|--------------|-----------|------------|-----------------------|--------|
| Spectrum Analyzer | R&S | FSL6 | 100194 | January 1, 2015 | 1 year |
| 20 dB attenuator | MCL | VAT-20W2+ | 848 | June 15, 2015 | 1 year |

Figure 237 Test Equipment Used