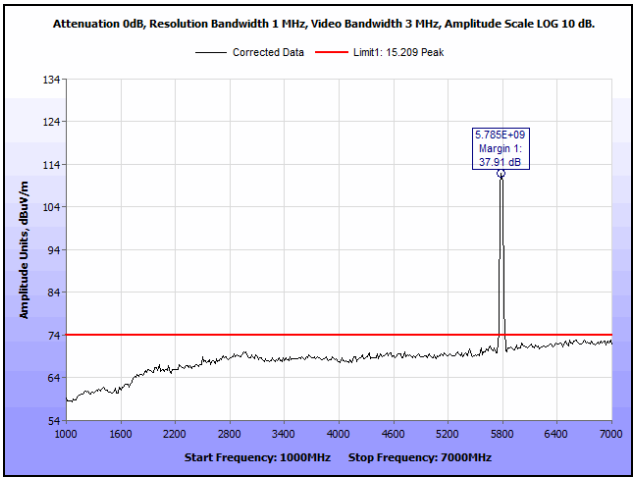
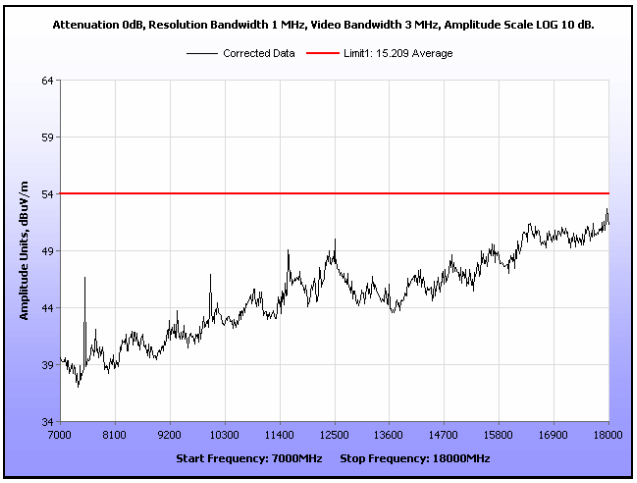
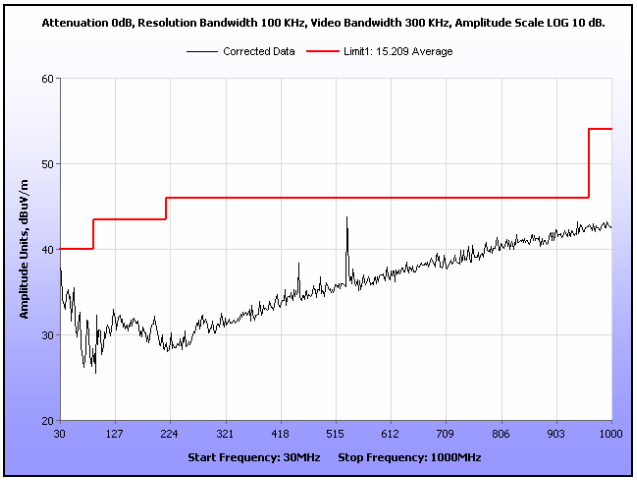


Plot 244. Radiated Spurious Emissions, Mid Channel, 802.11ac 20 MHz, Ant. 1, 1 GHz – 7 GHz, Peak

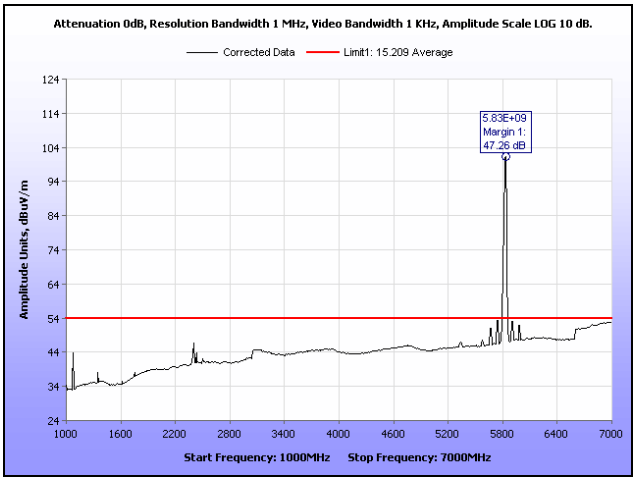


Plot 245. Radiated Spurious Emissions, Mid Channel, 802.11ac 20 MHz, Ant. 1, 7 GHz – 18 GHz

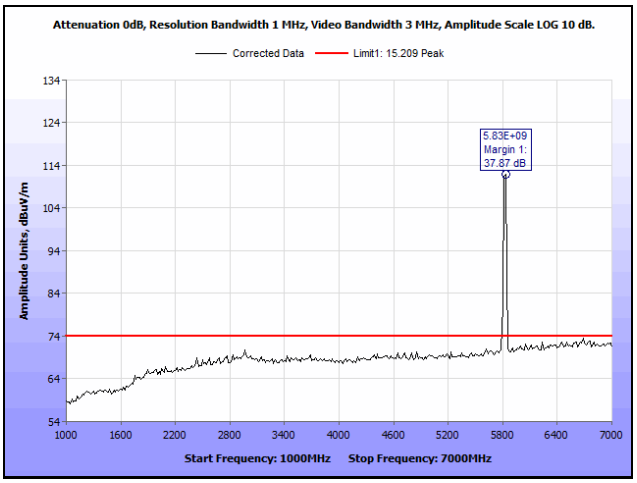


Plot 246. Radiated Spurious Emissions, High Channel, 802.11ac 20 MHz, Ant. 1, 30 MHz – 1 GHz

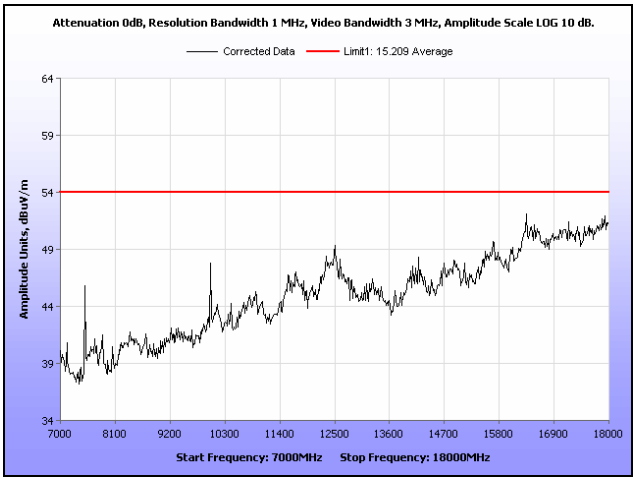
© 2014, MET Laboratories, Inc.



Plot 247. Radiated Spurious Emissions, High Channel, 802.11ac 20 MHz, Ant. 1, 1 GHz – 7 GHz, Average

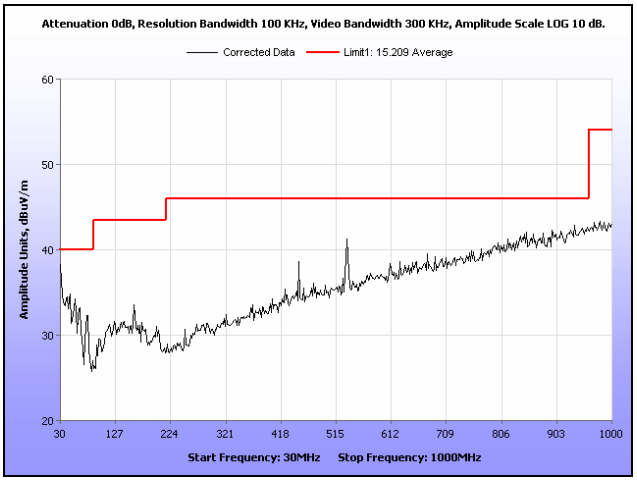


Plot 248. Radiated Spurious Emissions, High Channel, 802.11ac 20 MHz, Ant. 1, 1 GHz – 7 GHz, Peak

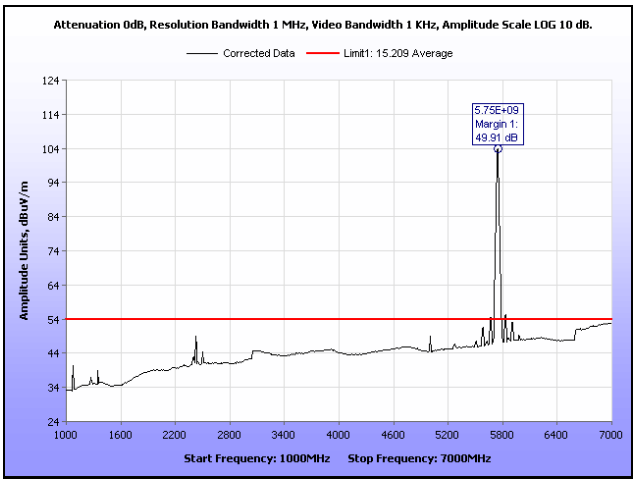


Plot 249. Radiated Spurious Emissions, High Channel, 802.11ac 20 MHz, Ant. 1, 7 GHz – 18 GHz

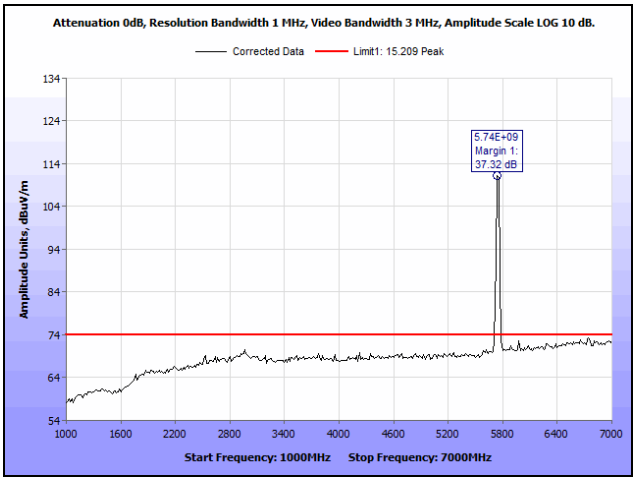
© 2014, MET Laboratories, Inc.



Plot 250. Radiated Spurious Emissions, Low Channel 802.11ac 20 MHz, Ant. 2, 30 MHz – 1 GHz

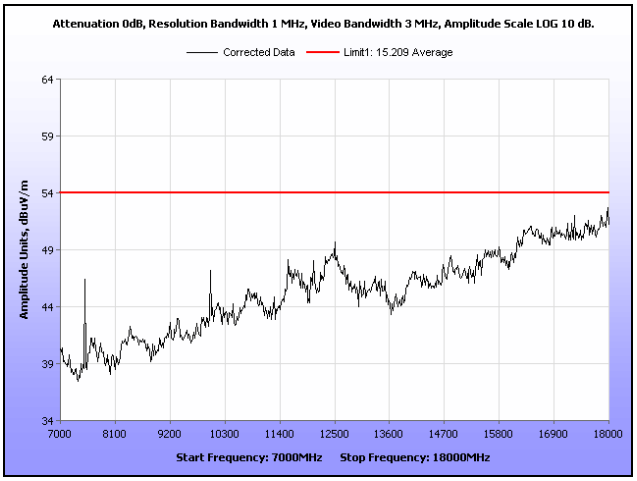


Plot 251. Radiated Spurious Emissions, Low Channel, 802.11ac 20 MHz, Ant. 2, 1 GHz – 7 GHz, Average

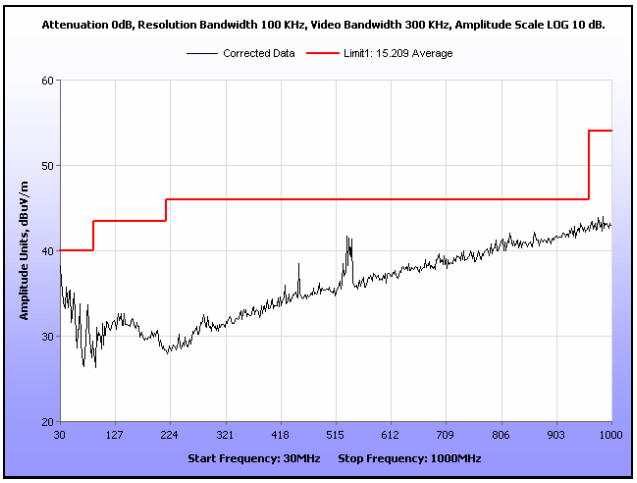


Plot 252. Radiated Spurious Emissions, Low Channel, 802.11ac 20 MHz, Ant. 2, 1 GHz – 7 GHz, Peak

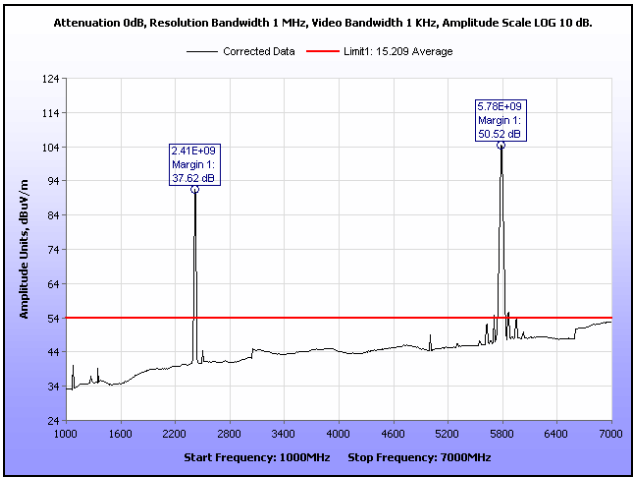
© 2014, MET Laboratories, Inc.



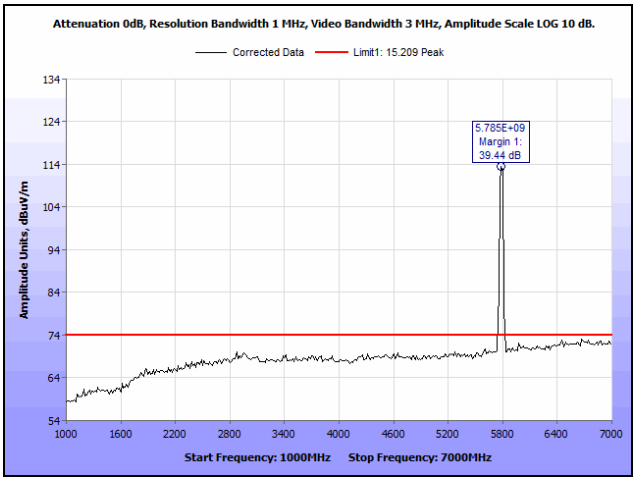
Plot 253. Radiated Spurious Emissions, Low Channel, 802.11ac 20 MHz, Ant. 2, 7 GHz – 18 GHz



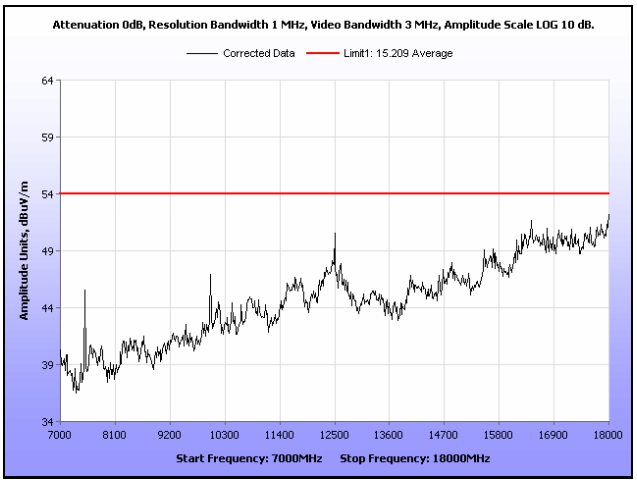
Plot 254. Radiated Spurious Emissions, Mid Channel, 802.11ac 20 MHz, Ant. 2, 30 MHz – 1 GHz



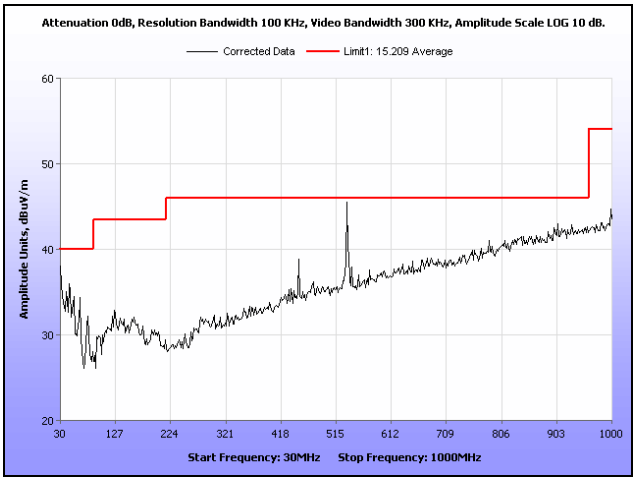
Plot 255. Radiated Spurious Emissions, Mid Channel, 802.11ac 20 MHz, Ant. 2, 1 GHz – 7 GHz, Average



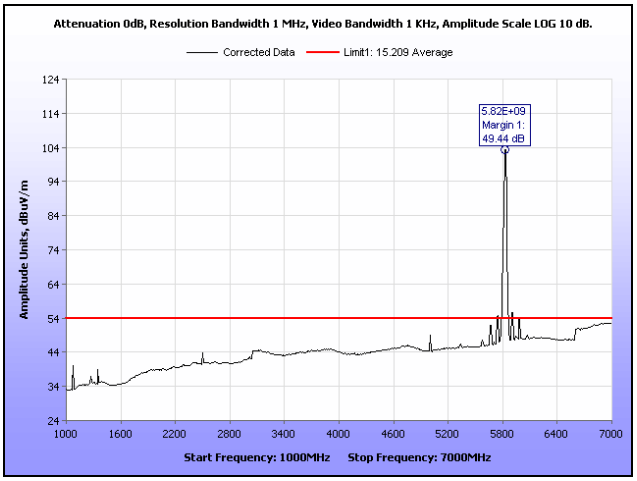
Plot 256. Radiated Spurious Emissions, Mid Channel, 802.11ac 20 MHz, Ant. 2, 1 GHz – 7 GHz, Peak



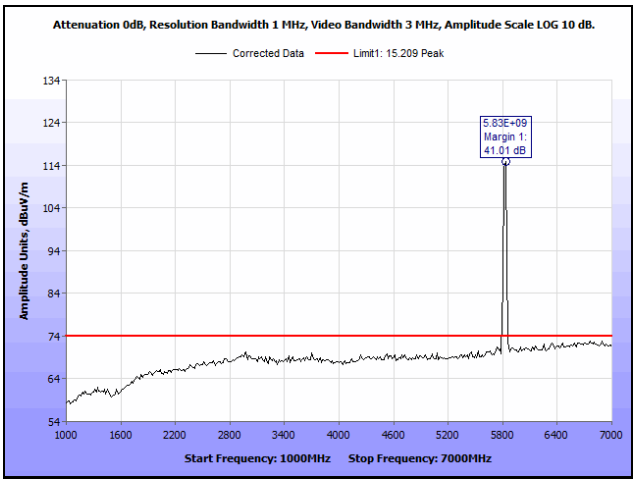
Plot 257. Radiated Spurious Emissions, Mid Channel, 802.11ac 20 MHz, Ant. 2, 7 GHz – 18 GHz



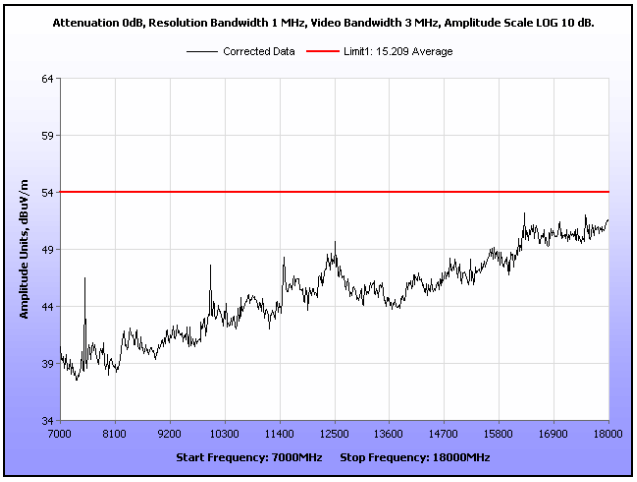
Plot 258. Radiated Spurious Emissions, High Channel, 802.11ac 20 MHz, Ant. 2, 30 MHz – 1 GHz



Plot 259. Radiated Spurious Emissions, High Channel, 802.11ac 20 MHz, Ant. 2, 1 GHz – 7 GHz, Average

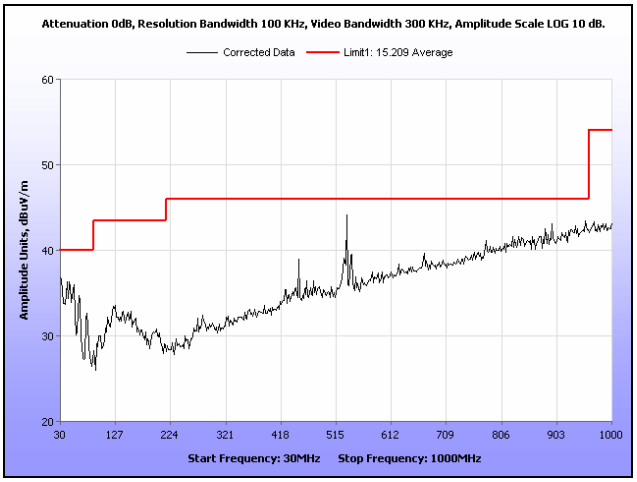


Plot 260. Radiated Spurious Emissions, High Channel, 802.11ac 20 MHz, Ant. 2, 1 GHz – 7 GHz, Peak

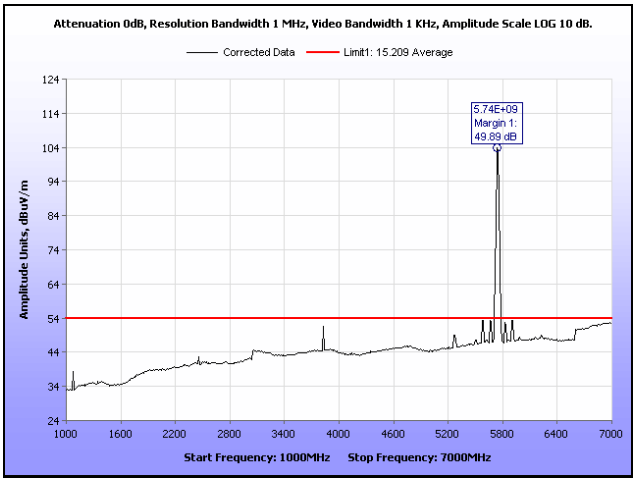


Plot 261. Radiated Spurious Emissions, High Channel, 802.11ac 20 MHz, Ant. 2, 7 GHz – 18 GHz

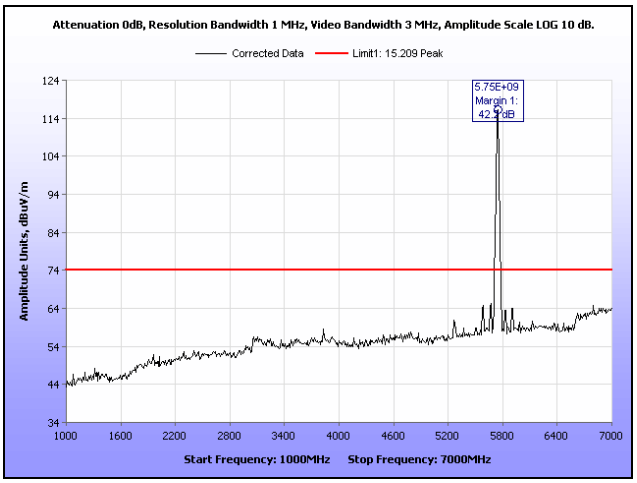
Radiated Spurious Emissions Test Results, 802.11ac 20 MHz, MIMO



Plot 262. Radiated Spurious Emissions, Low Channel, 802.11ac 20 MHz, 30 MHz – 1 GHz, MIMO

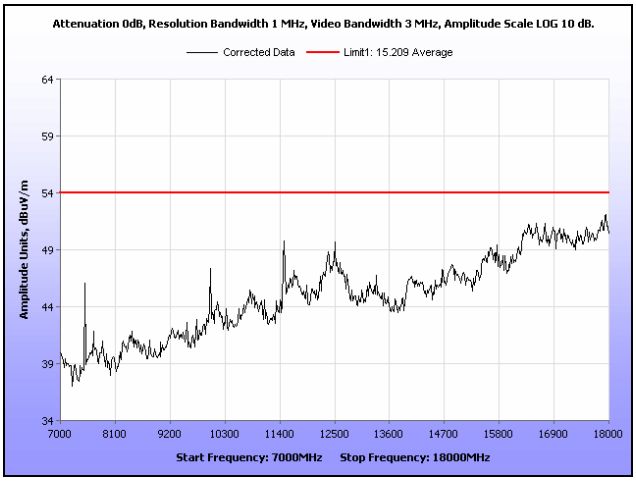


Plot 263. Radiated Spurious Emissions, Low Channel, 802.11ac 20 MHz, 1 GHz – 7 GHz, Average, MIMO

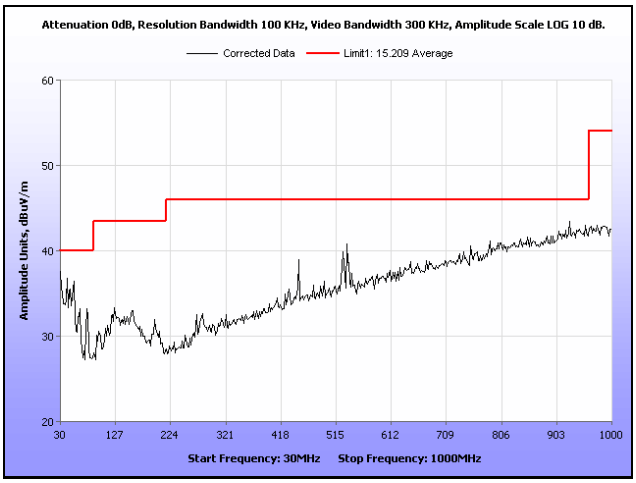


Plot 264. Radiated Spurious Emissions, Low Channel, 802.11ac 20 MHz, 1 GHz – 7 GHz, Peak, MIMO

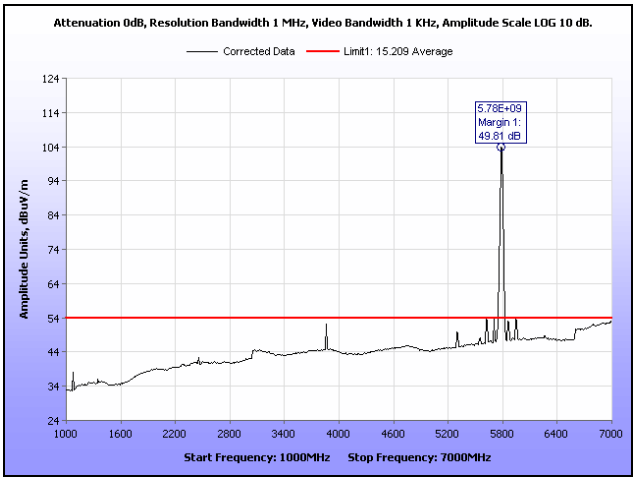
© 2014, MET Laboratories, Inc.



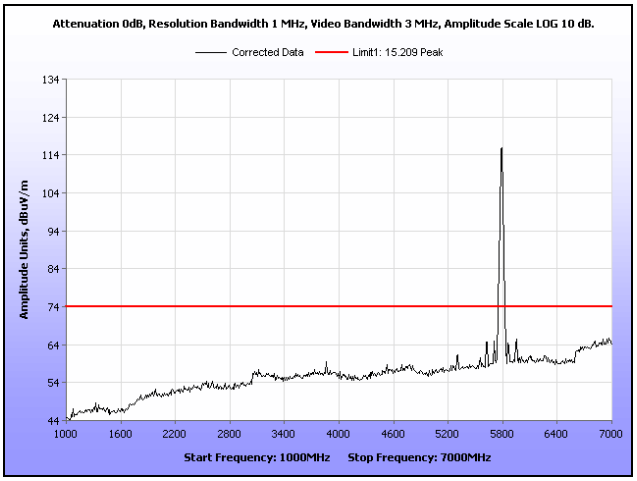
Plot 265. Radiated Spurious Emissions, Low Channel, 802.11ac 20 MHz, 7 GHz – 18 GHz, MIMO



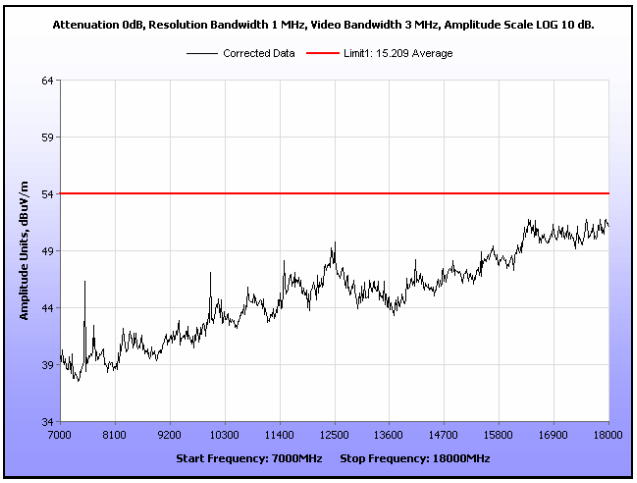
Plot 266. Radiated Spurious Emissions, Mid Channel, 802.11ac 20 MHz, 30 MHz – 1 GHz, MIMO



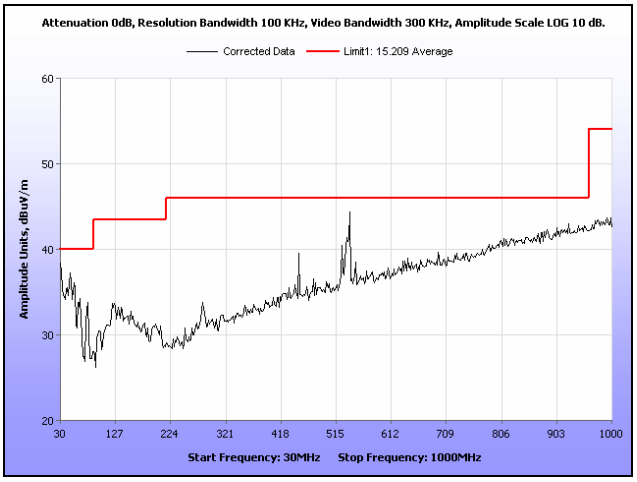
Plot 267. Radiated Spurious Emissions, Mid Channel, 802.11ac 20 MHz, 1 GHz – 7 GHz, Average, MIMO



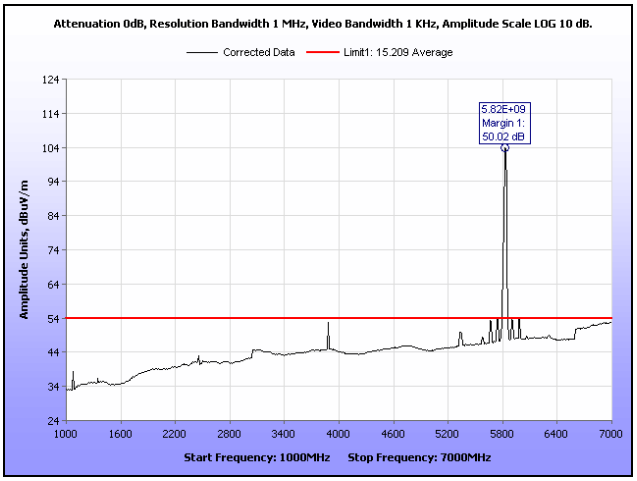
Plot 268. Radiated Spurious Emissions, Mid Channel, 802.11ac 20 MHz, 1 GHz – 7 GHz, Peak, MIMO



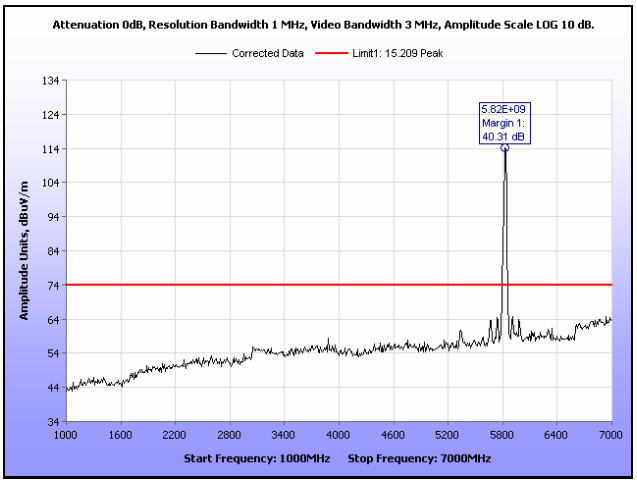
Plot 269. Radiated Spurious Emissions, Mid Channel, 802.11ac 20 MHz, 7 GHz – 18 GHz, MIMO



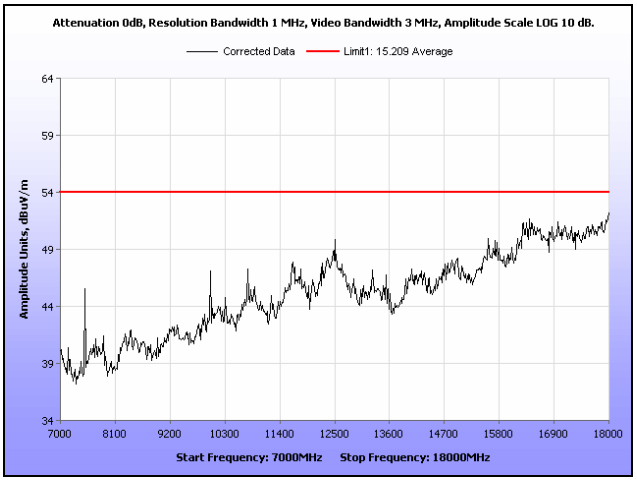
Plot 270. Radiated Spurious Emissions, High Channel, 802.11ac 20 MHz, 30 MHz – 1 GHz, MIMO



Plot 271. Radiated Spurious Emissions, High Channel, 802.11ac 20 MHz, 1 GHz – 7 GHz, Average, MIMO

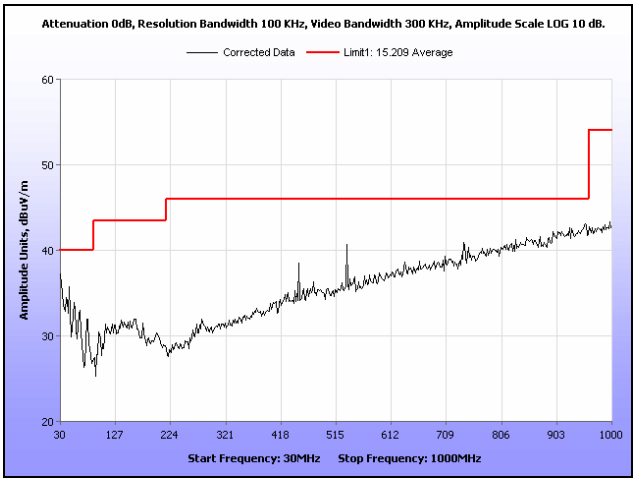


Plot 272. Radiated Spurious Emissions, High Channel, 802.11ac 20 MHz, 1 GHz – 7 GHz, Peak, MIMO

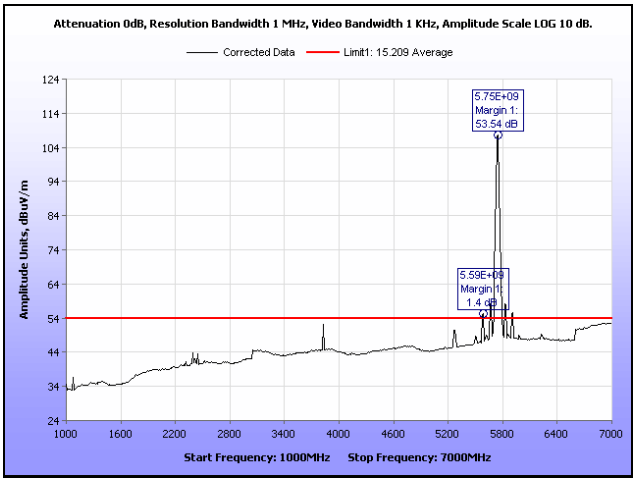


Plot 273. Radiated Spurious Emissions, High Channel, 802.11ac 20 MHz, 7 GHz – 18 GHz, MIMO

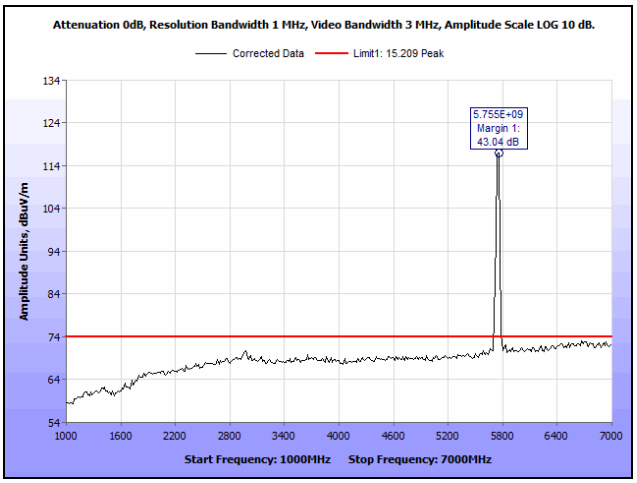
Radiated Spurious Emissions Test Results, 802.11n 20 MHz



Plot 274. Radiated Spurious Emissions, Low Channel, 802.11n 20 MHz, Ant. 0, 30 MHz – 1 GHz

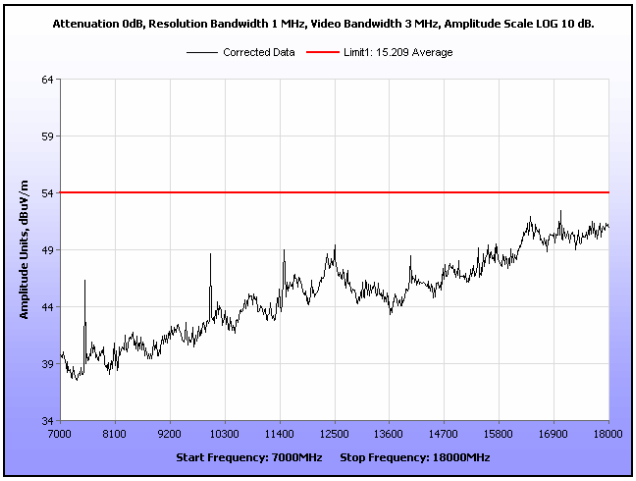


Plot 275. Radiated Spurious Emissions, Low Channel, 802.11n 20 MHz, Ant. 0, 1 GHz – 7 GHz, Average

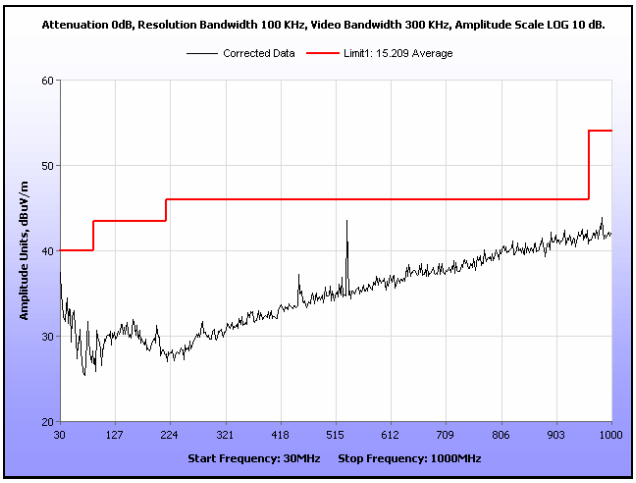


Plot 276. Radiated Spurious Emissions, Low Channel, 802.11n 20 MHz, Ant. 0, 1 GHz – 7 GHz, Peak

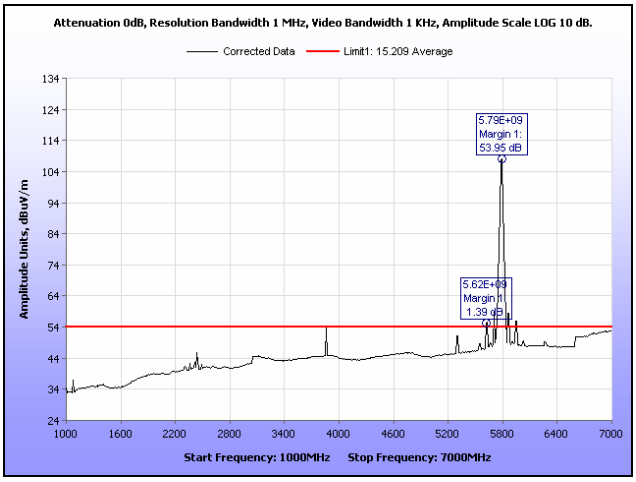
© 2014, MET Laboratories, Inc.



Plot 277. Radiated Spurious Emissions, Low Channel, 802.11n 20 MHz, Ant. 0, 7 GHz – 18 GHz

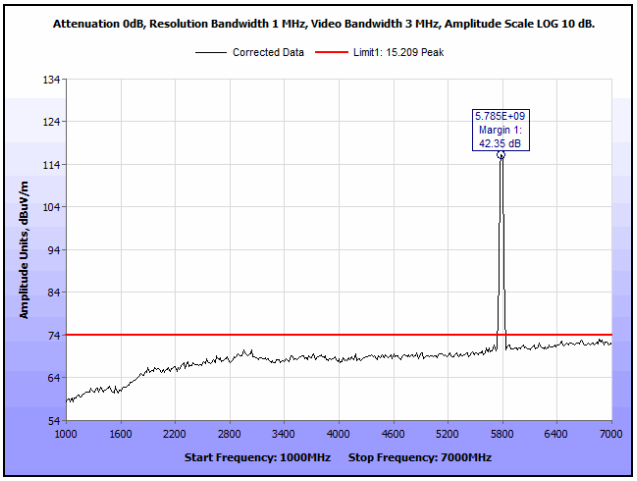


Plot 278. Radiated Spurious Emissions, Mid Channel, 802.11n 20 MHz, Ant. 0, 30 MHz – 1 GHz

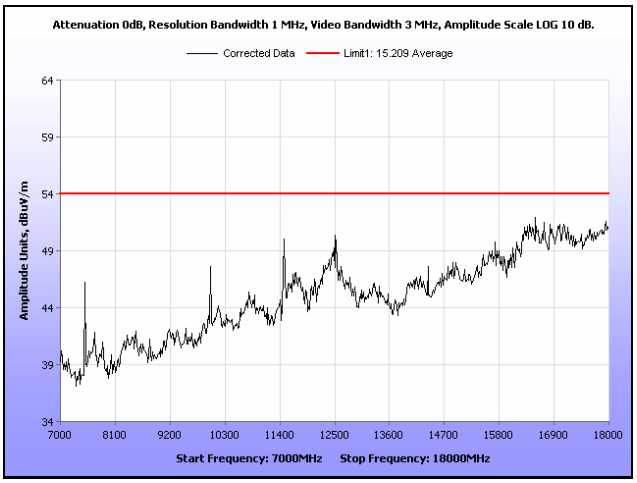


Plot 279. Radiated Spurious Emissions, Mid Channel, 802.11n 20 MHz, Ant. 0, 1 GHz – 7 GHz, Average

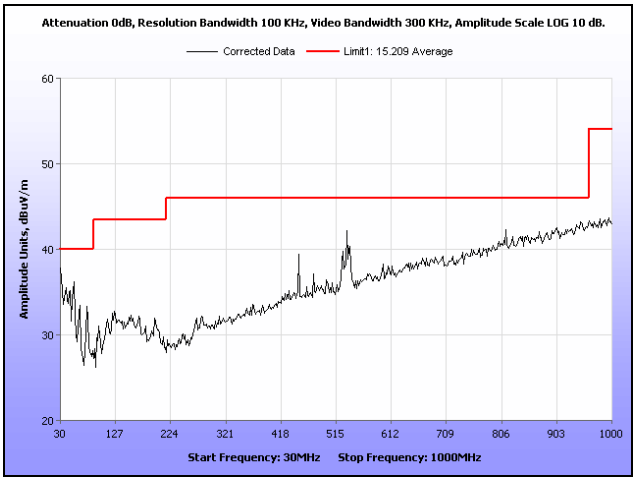
© 2014, MET Laboratories, Inc.



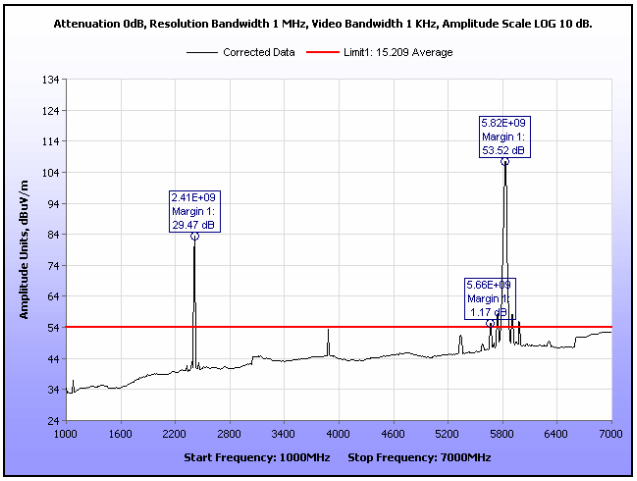
Plot 280. Radiated Spurious Emissions, Mid Channel, 802.11n 20 MHz, Ant. 0, 1 GHz – 7 GHz, Peak



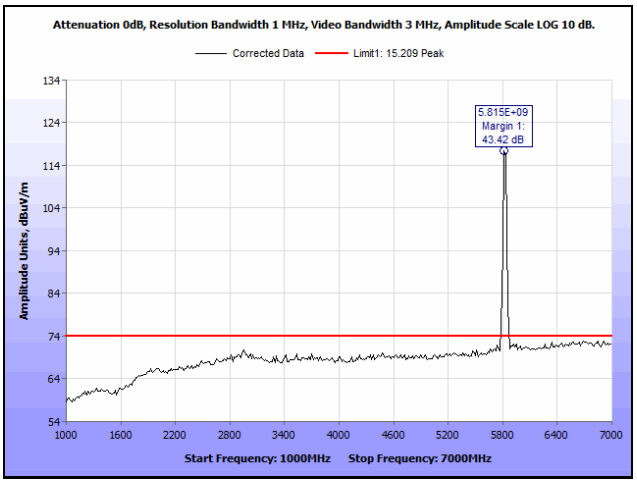
Plot 281. Radiated Spurious Emissions, Mid Channel, 802.11n 20 MHz, Ant. 0, 7 GHz – 18 GHz



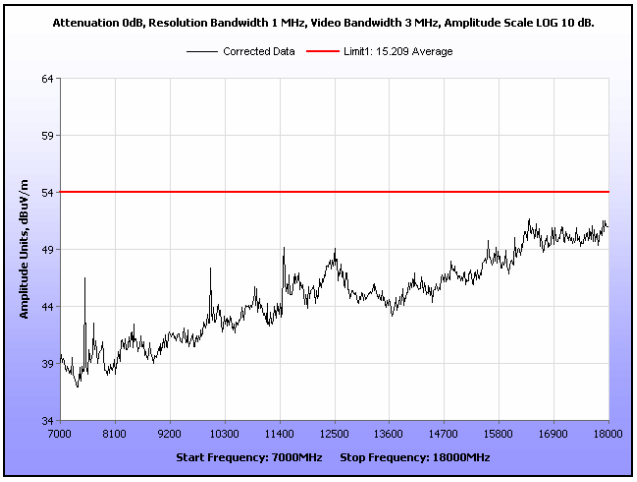
Plot 282. Radiated Spurious Emissions, High Channel, 802.11n 20 MHz, Ant. 0, 30 MHz – 1 GHz



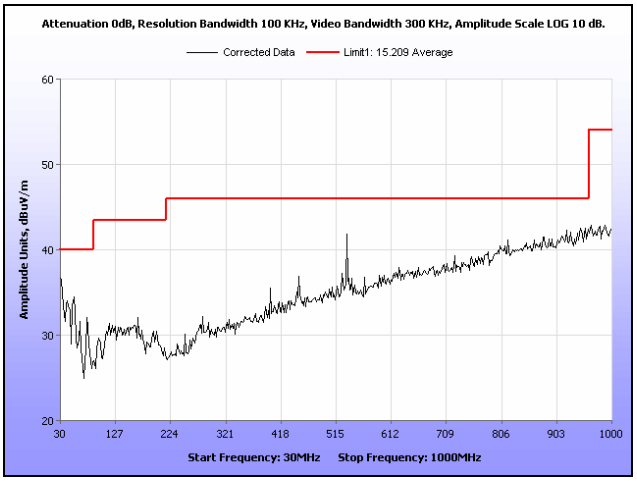
Plot 283. Radiated Spurious Emissions, High Channel, 802.11n 20 MHz, Ant. 0, 1 GHz – 7 GHz, Average



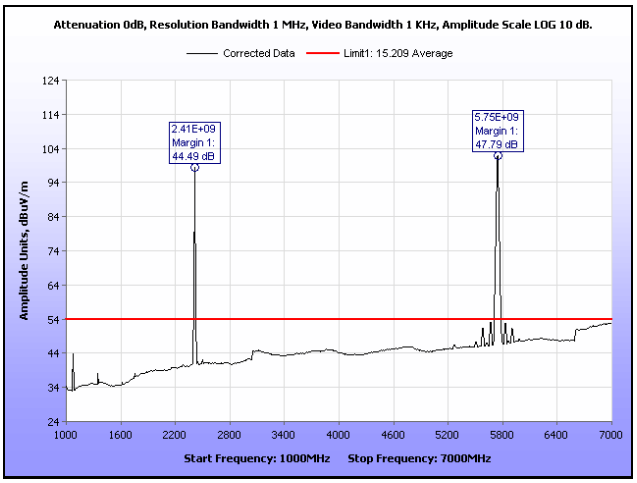
Plot 284. Radiated Spurious Emissions, High Channel, 802.11n 20 MHz, Ant. 0, 1 GHz – 7 GHz, Peak



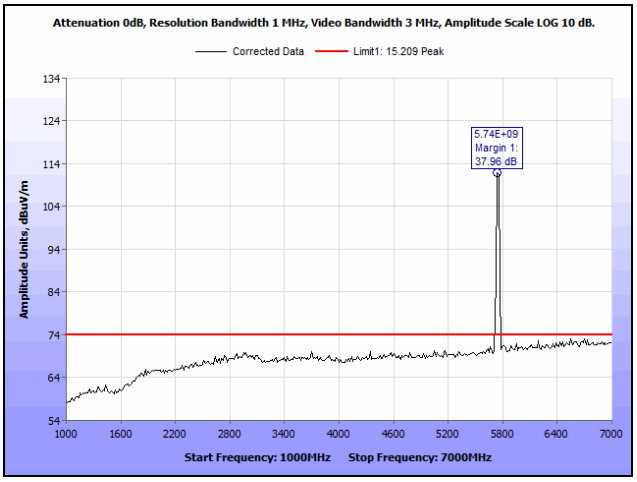
Plot 285. Radiated Spurious Emissions, High Channel, 802.11n 20 MHz, Ant. 0, 7 GHz – 18 GHz



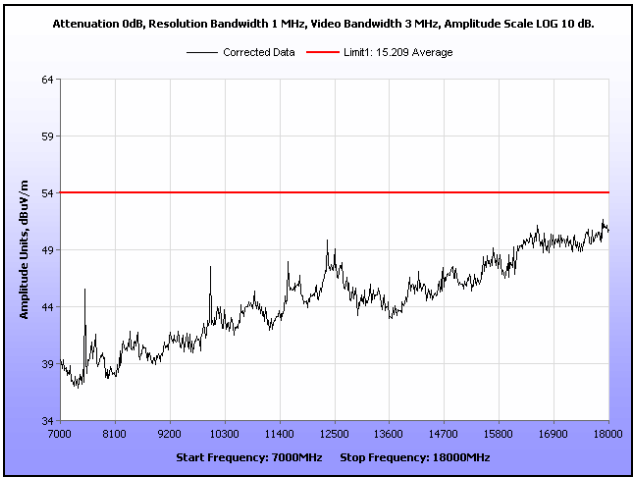
Plot 286. Radiated Spurious Emissions, Low Channel 802.11n 20 MHz, Ant. 1, 30 MHz – 1 GHz



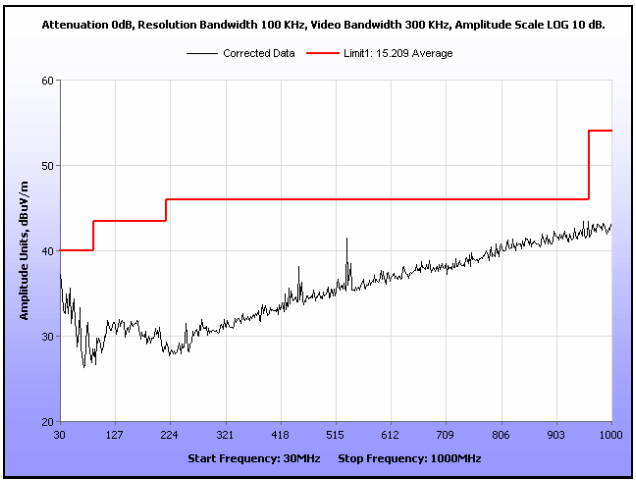
Plot 287. Radiated Spurious Emissions, Low Channel, 802.11n 20 MHz, Ant. 1, 1 GHz – 7 GHz, Average



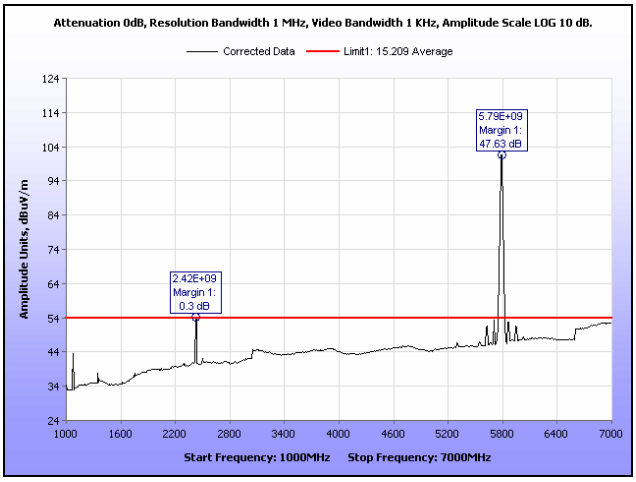
Plot 288. Radiated Spurious Emissions, Low Channel, 802.11n 20 MHz, Ant. 1, 1 GHz – 7 GHz, Peak



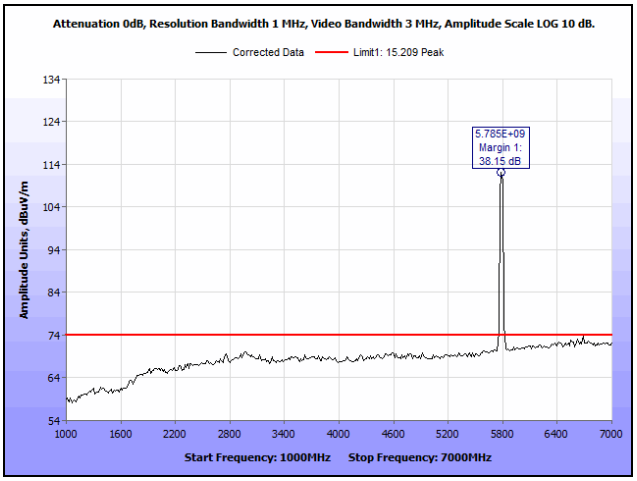
Plot 289. Radiated Spurious Emissions, Low Channel, 802.11n 20 MHz, Ant. 1, 7 GHz – 18 GHz



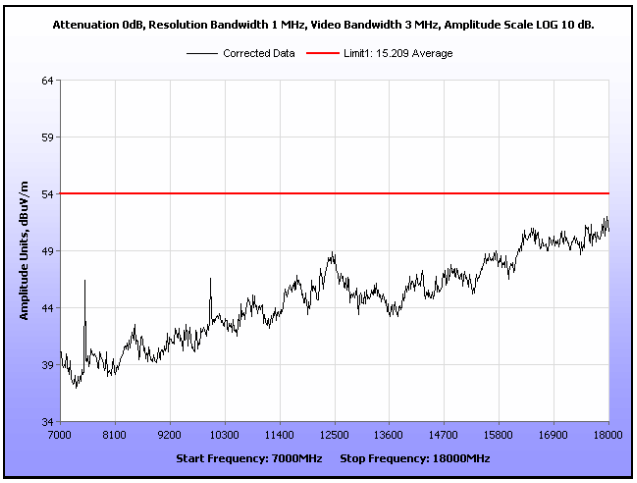
Plot 290. Radiated Spurious Emissions, Mid Channel, 802.11n 20 MHz, Ant. 1, 30 MHz – 1 GHz



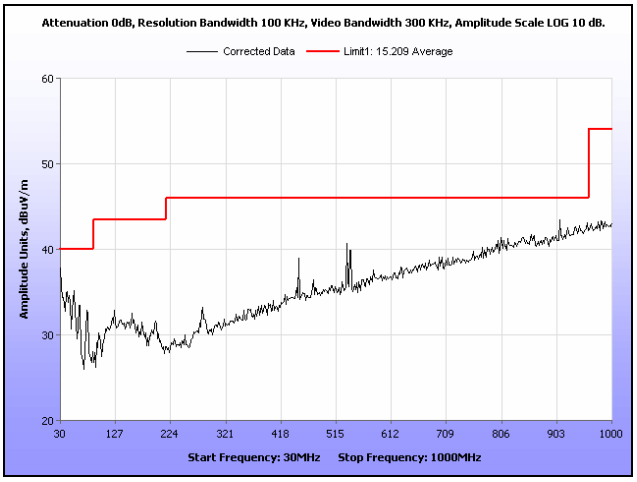
Plot 291. Radiated Spurious Emissions, Mid Channel, 802.11n 20 MHz, Ant. 1, 1 GHz – 7 GHz, Average



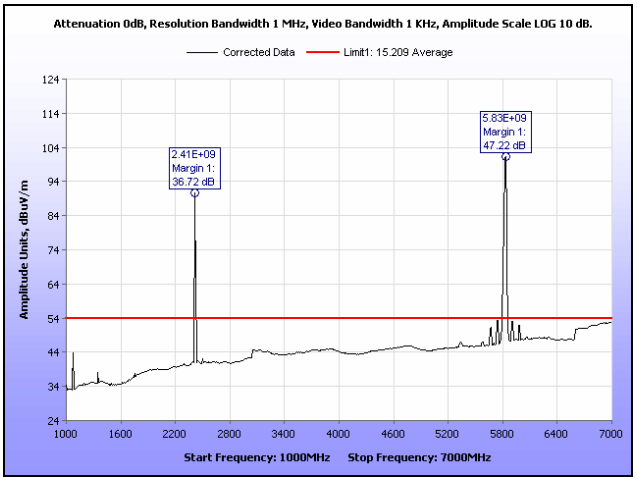
Plot 292. Radiated Spurious Emissions, Mid Channel, 802.11n 20 MHz, Ant. 1, 1 GHz – 7 GHz, Peak



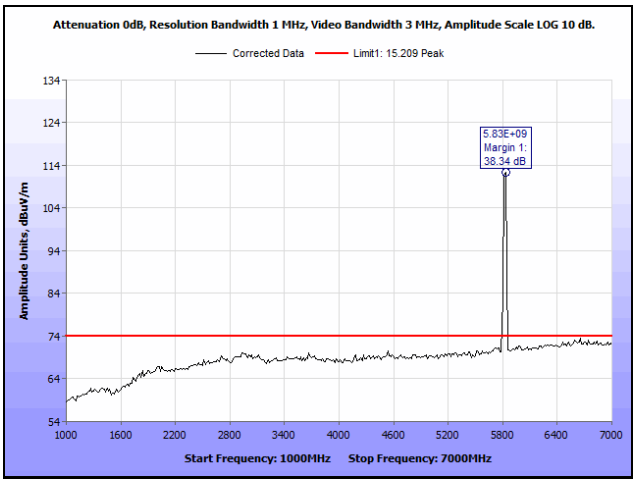
Plot 293. Radiated Spurious Emissions, Mid Channel, 802.11n 20 MHz, Ant. 1, 7 GHz – 18 GHz



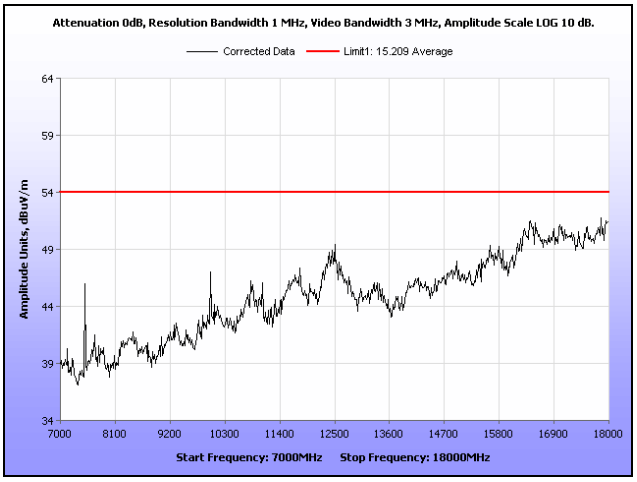
Plot 294. Radiated Spurious Emissions, High Channel, 802.11n 20 MHz, Ant. 1, 30 MHz – 1 GHz



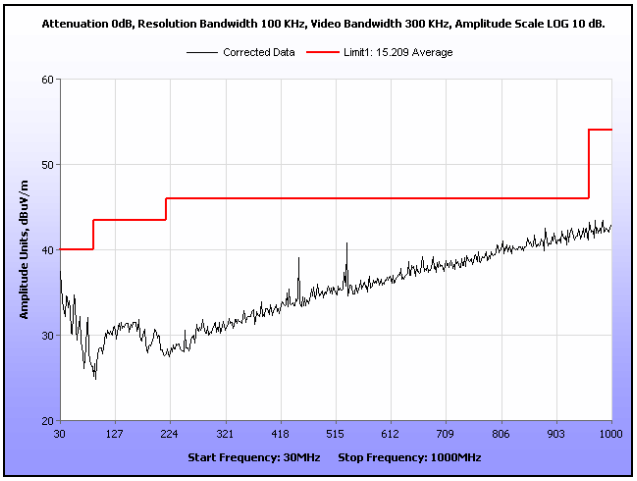
Plot 295. Radiated Spurious Emissions, High Channel, 802.11n 20 MHz, Ant. 1, 1 GHz – 7 GHz, Average



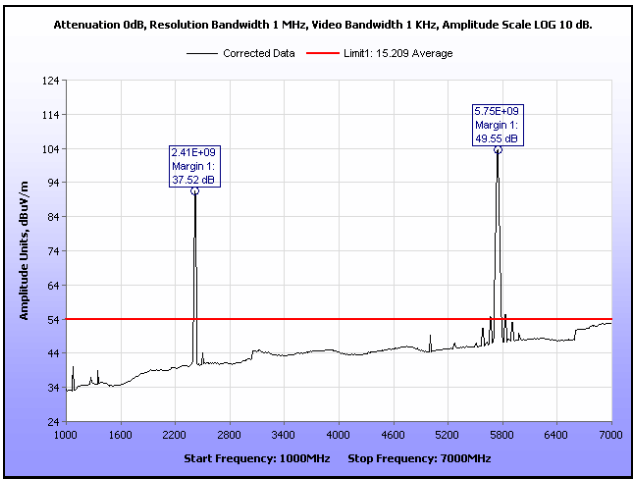
Plot 296. Radiated Spurious Emissions, High Channel, 802.11n 20 MHz, Ant. 1, 1 GHz – 7 GHz, Peak



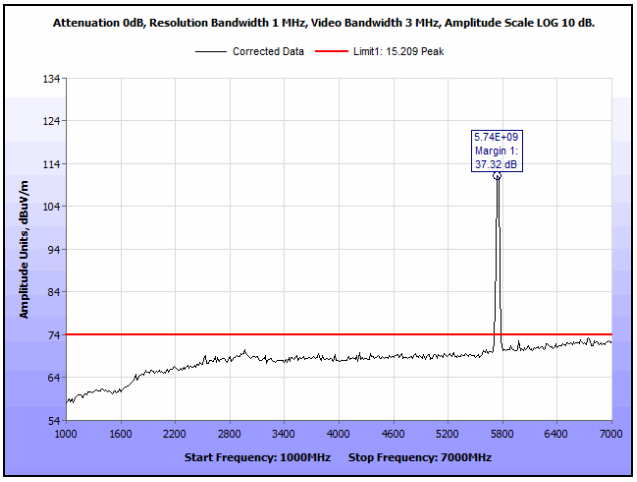
Plot 297. Radiated Spurious Emissions, High Channel, 802.11n 20 MHz, Ant. 1, 7 GHz – 18 GHz



Plot 298. Radiated Spurious Emissions, Low Channel 802.11n 20 MHz, Ant. 2, 30 MHz – 1 GHz

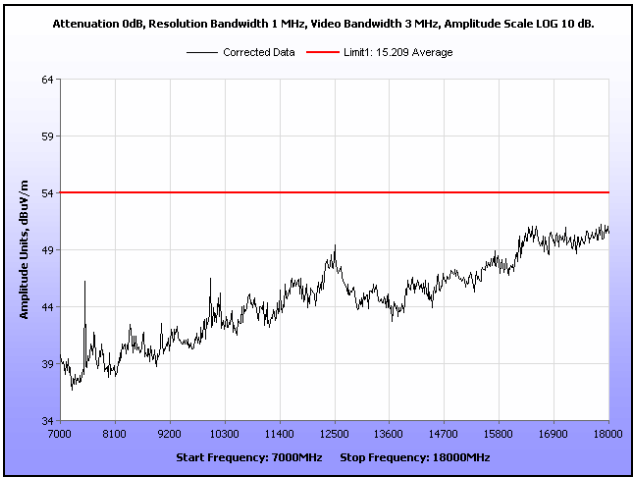


Plot 299. Radiated Spurious Emissions, Low Channel, 802.11n 20 MHz, Ant. 2, 1 GHz – 7 GHz, Average

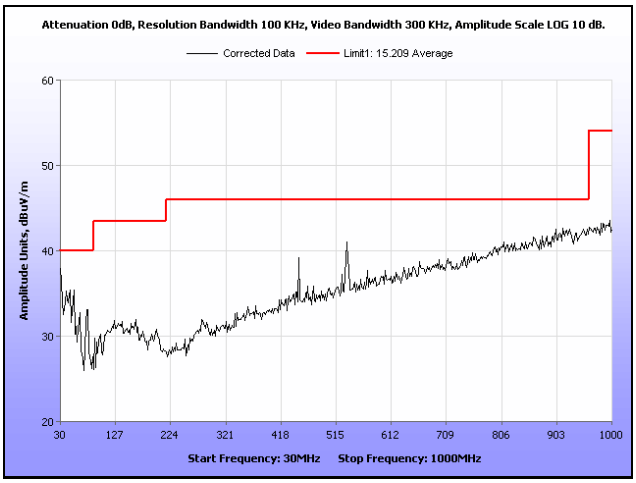


Plot 300. Radiated Spurious Emissions, Low Channel, 802.11n 20 MHz, Ant. 2, 1 GHz – 7 GHz, Peak

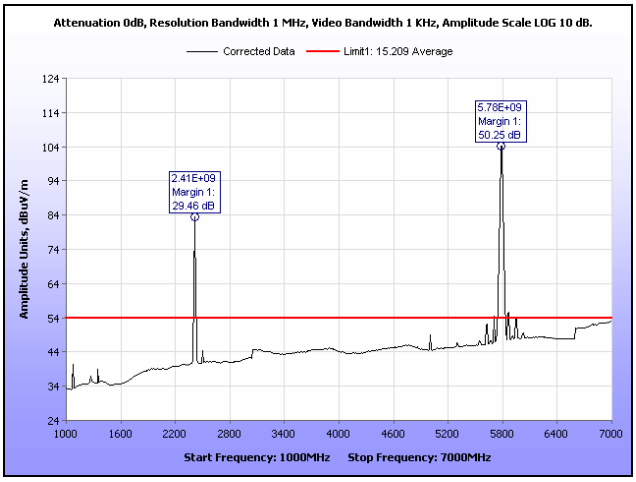
© 2014, MET Laboratories, Inc.



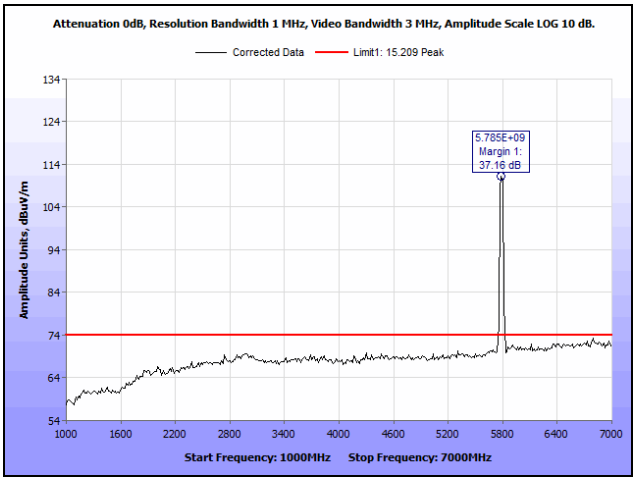
Plot 301. Radiated Spurious Emissions, Low Channel, 802.11n 20 MHz, Ant. 2, 7 GHz – 18 GHz



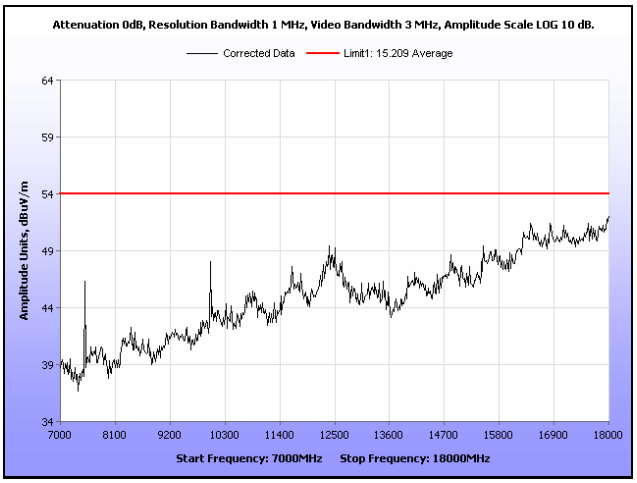
Plot 302. Radiated Spurious Emissions, Mid Channel, 802.11n 20 MHz, Ant. 2, 30 MHz – 1 GHz



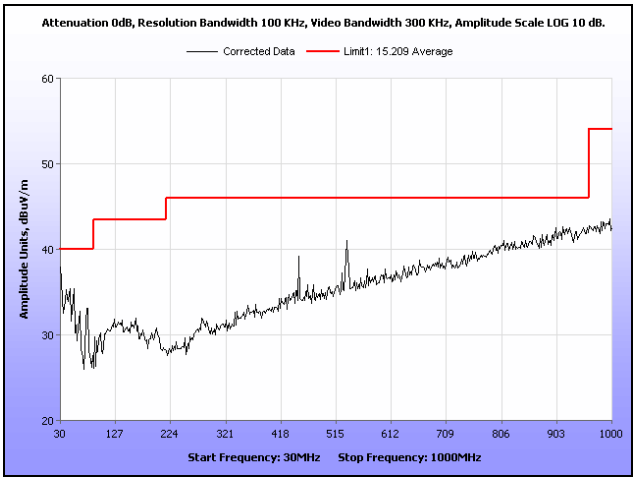
Plot 303. Radiated Spurious Emissions, Mid Channel, 802.11n 20 MHz, Ant. 2, 1 GHz – 7 GHz, Average



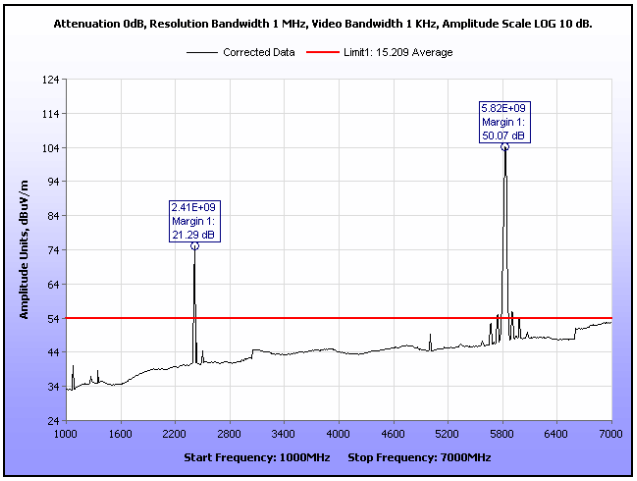
Plot 304. Radiated Spurious Emissions, Mid Channel, 802.11n 20 MHz, Ant. 2, 1 GHz – 7 GHz, Peak



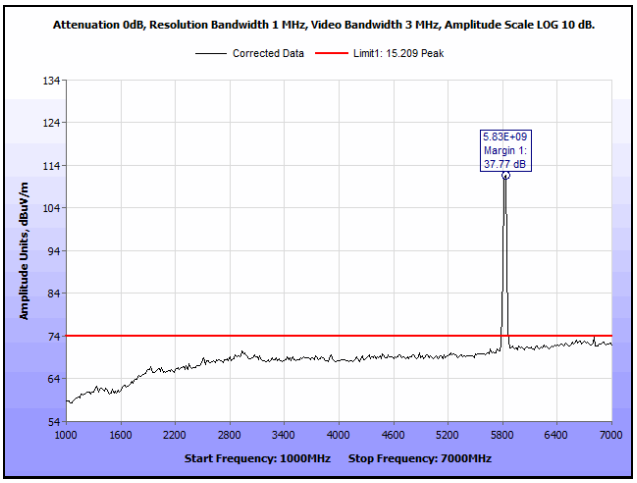
Plot 305. Radiated Spurious Emissions, Mid Channel, 802.11n 20 MHz, Ant. 2, 7 GHz – 18 GHz



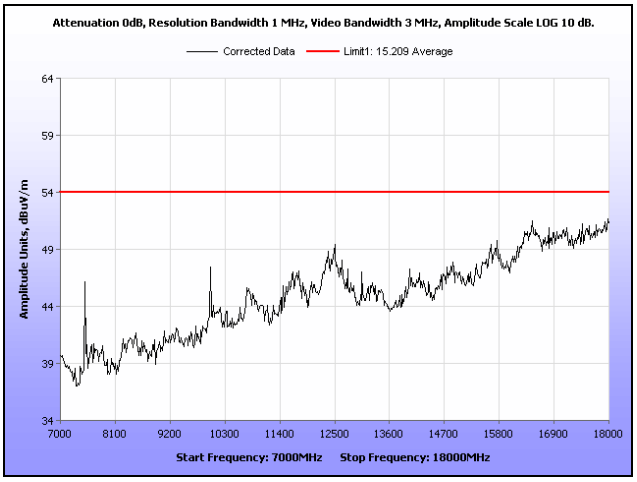
Plot 306. Radiated Spurious Emissions, High Channel, 802.11n 20 MHz, Ant. 2, 30 MHz – 1 GHz



Plot 307. Radiated Spurious Emissions, High Channel, 802.11n 20 MHz, Ant. 2, 1 GHz – 7 GHz, Average

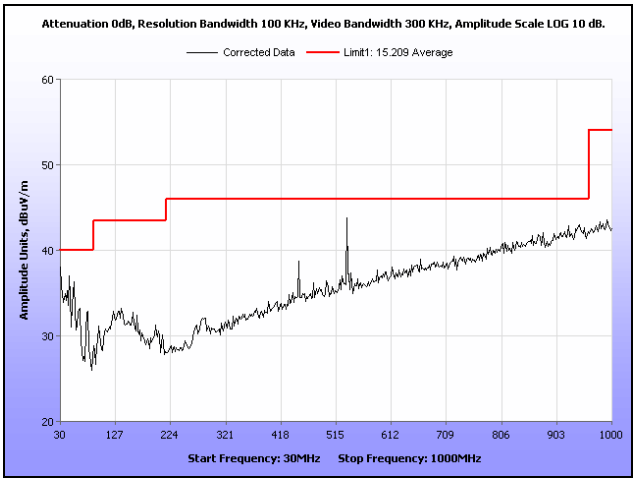


Plot 308. Radiated Spurious Emissions, High Channel, 802.11n 20 MHz, Ant. 2, 1 GHz – 7 GHz, Peak

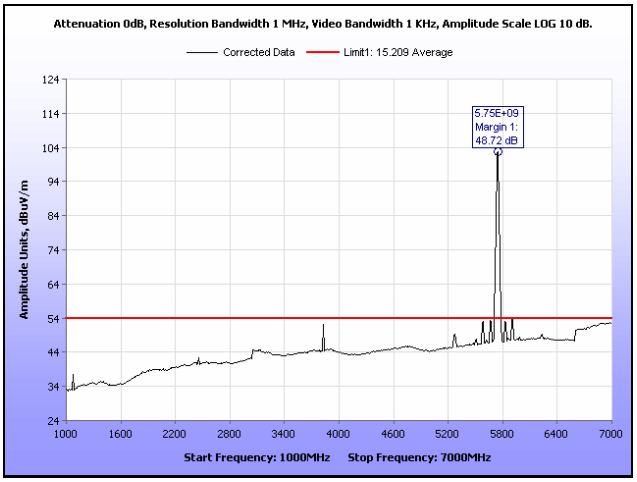


Plot 309. Radiated Spurious Emissions, High Channel, 802.11n 20 MHz, Ant. 2, 7 GHz – 18 GHz

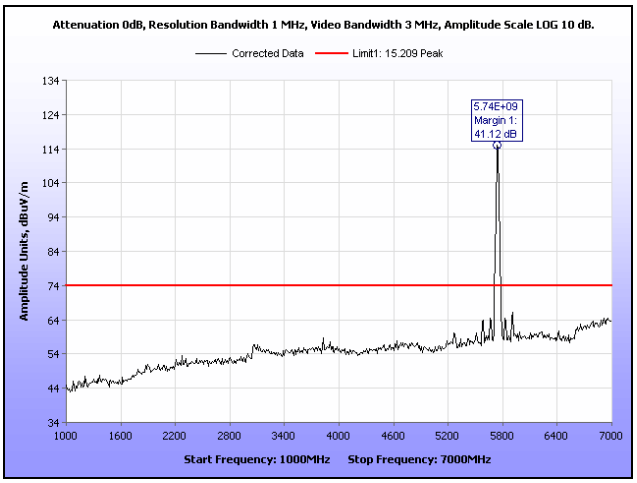
Radiated Spurious Emissions Test Results, 802.11n 20 MHz, MIMO



Plot 310. Radiated Spurious Emissions, Low Channel, 802.11n 20 MHz, 30 MHz – 1 GHz, MIMO

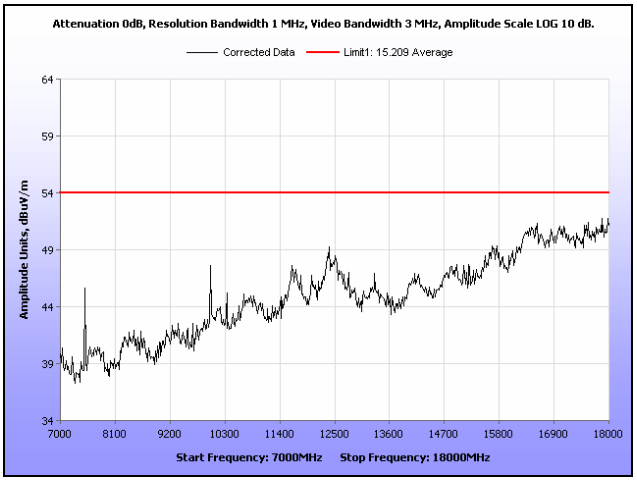


Plot 311. Radiated Spurious Emissions, Low Channel, 802.11n 20 MHz, 1 GHz – 7 GHz, Average, MIMO

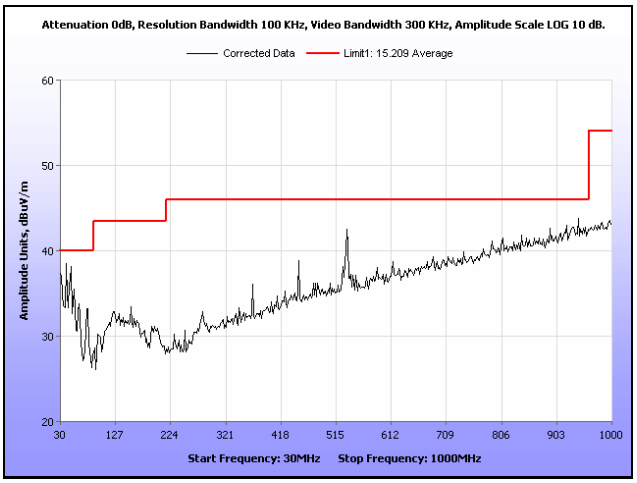


Plot 312. Radiated Spurious Emissions, Low Channel, 802.11n 20 MHz, 1 GHz – 7 GHz, Peak, MIMO

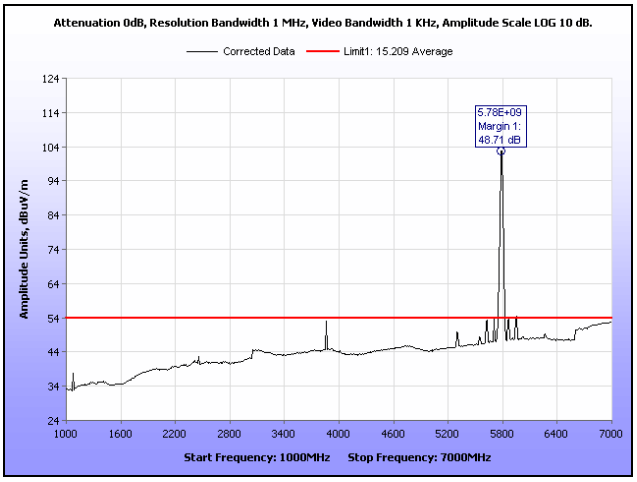
© 2014, MET Laboratories, Inc.



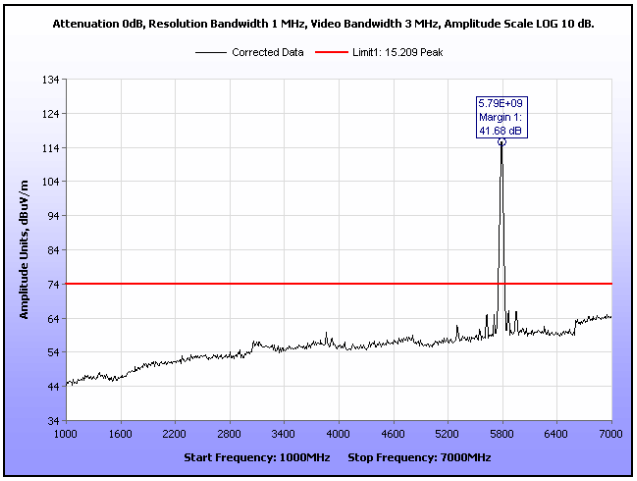
Plot 313. Radiated Spurious Emissions, Low Channel, 802.11n 20 MHz, 7 GHz – 18 GHz, MIMO



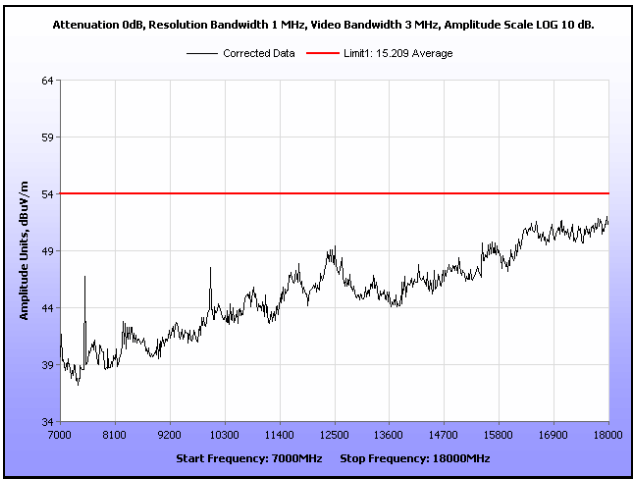
Plot 314. Radiated Spurious Emissions, Mid Channel, 802.11n 20 MHz, 30 MHz – 1 GHz, MIMO



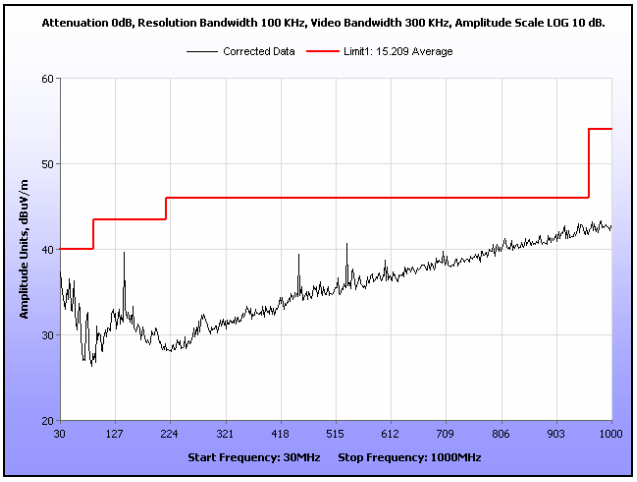
Plot 315. Radiated Spurious Emissions, Mid Channel, 802.11n 20 MHz, 1 GHz – 7 GHz, Average, MIMO



Plot 316. Radiated Spurious Emissions, Mid Channel, 802.11n 20 MHz, 1 GHz – 7 GHz, Peak, MIMO

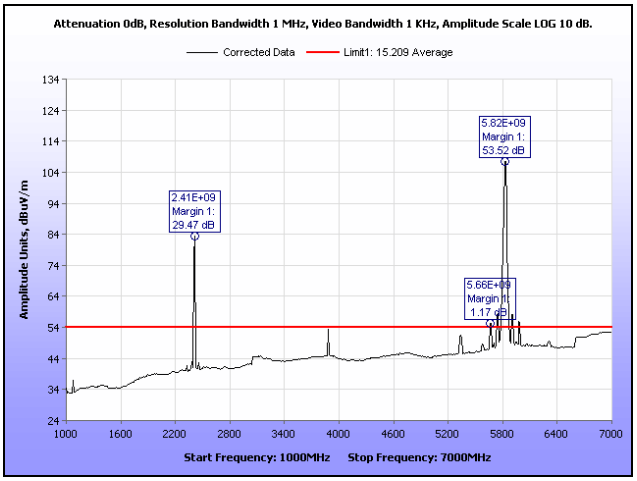


Plot 317. Radiated Spurious Emissions, Mid Channel, 802.11n 20 MHz, 7 GHz – 18 GHz, MIMO

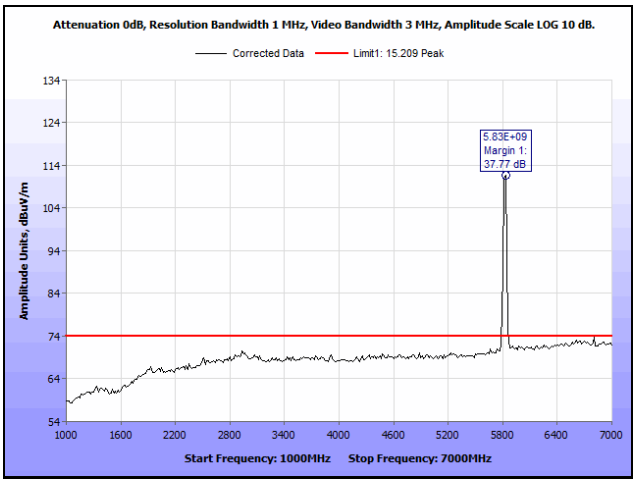


Plot 318. Radiated Spurious Emissions, High Channel, 802.11n 20 MHz, 30 MHz – 1 GHz, MIMO

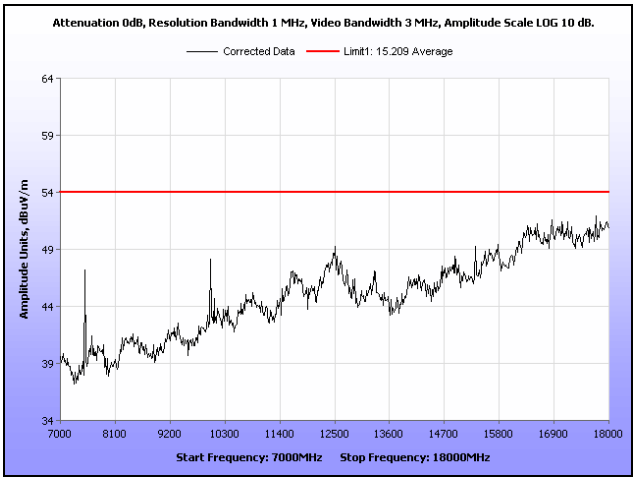
© 2014, MET Laboratories, Inc.



Plot 319. Radiated Spurious Emissions, High Channel, 802.11n 20 MHz, 1 GHz – 7 GHz, Average, MIMO

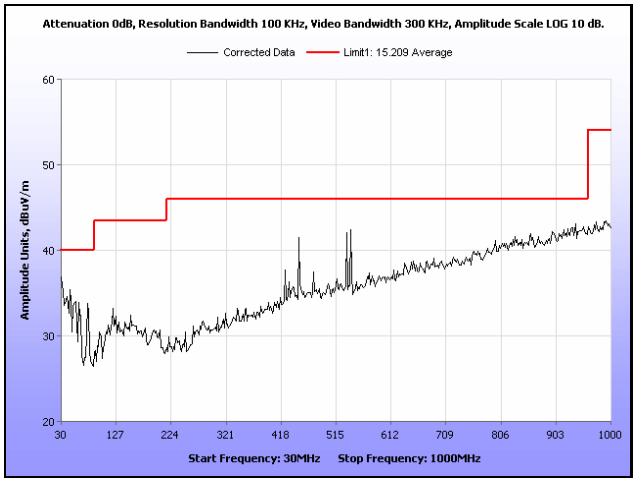


Plot 320. Radiated Spurious Emissions, High Channel, 802.11n 20 MHz, 1 GHz – 7 GHz, Peak, MIMO

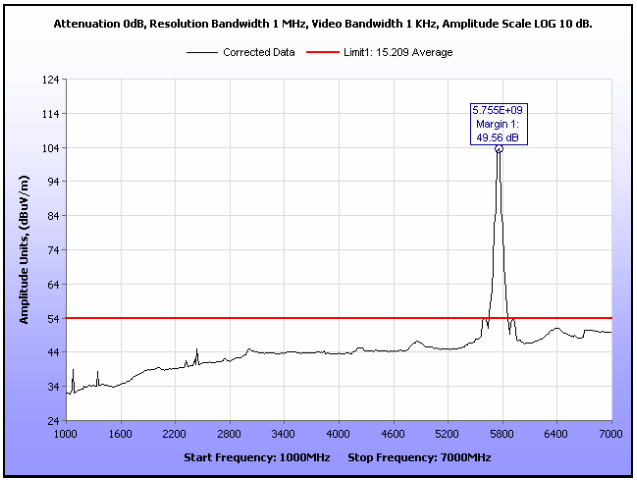


Plot 321. Radiated Spurious Emissions, High Channel, 802.11n 20 MHz, 7 GHz – 18 GHz, MIMO

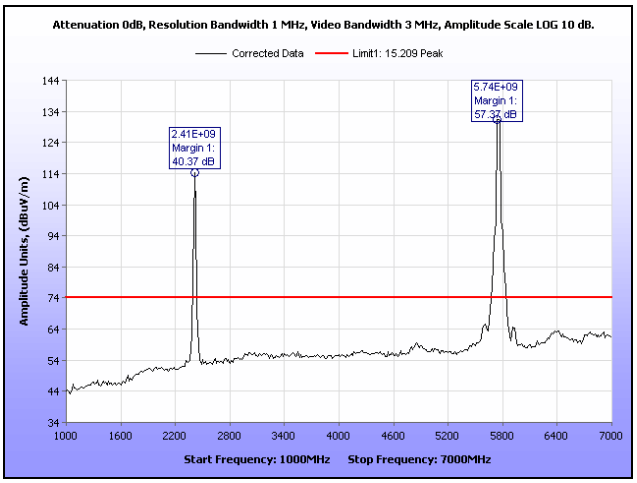
Radiated Spurious Emissions Test Results, 802.11a 40 MHz



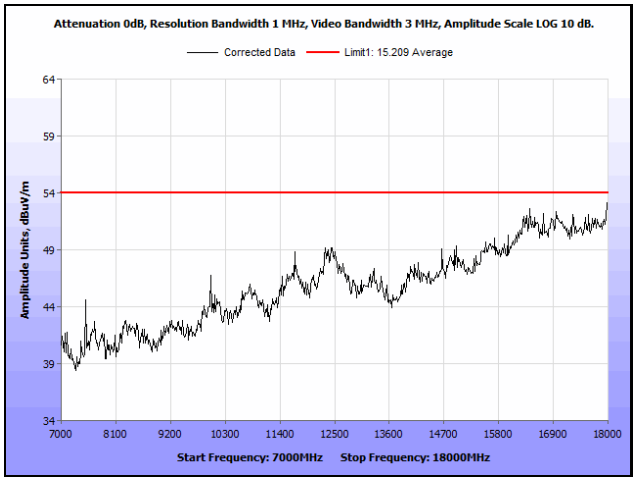
Plot 322. Radiated Spurious Emissions, Low Channel, 802.11a 40 MHz, Ant. 0, 30 MHz – 1 GHz



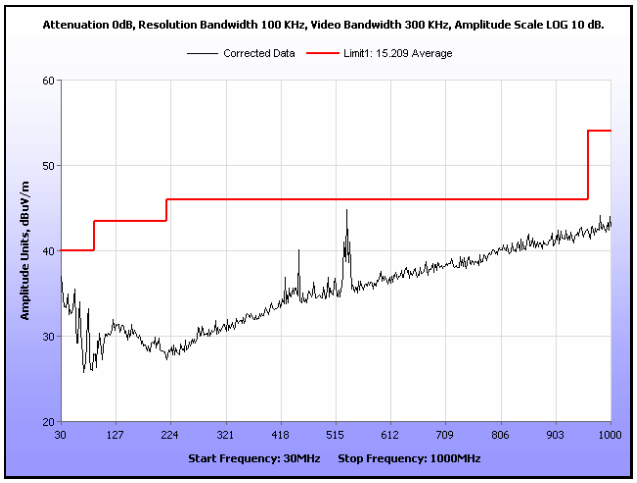
Plot 323. Radiated Spurious Emissions, Low Channel, 802.11a 40 MHz, Ant. 0, 1 GHz – 7 GHz, Average



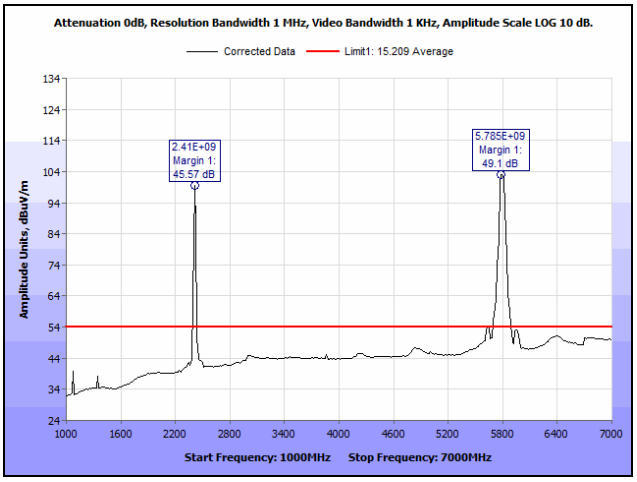
Plot 324. Radiated Spurious Emissions, Low Channel, 802.11a 40 MHz, Ant. 0, 1 GHz – 7 GHz, Peak



Plot 325. Radiated Spurious Emissions, Low Channel, 802.11a 40 MHz, Ant. 0, 7 GHz – 18 GHz

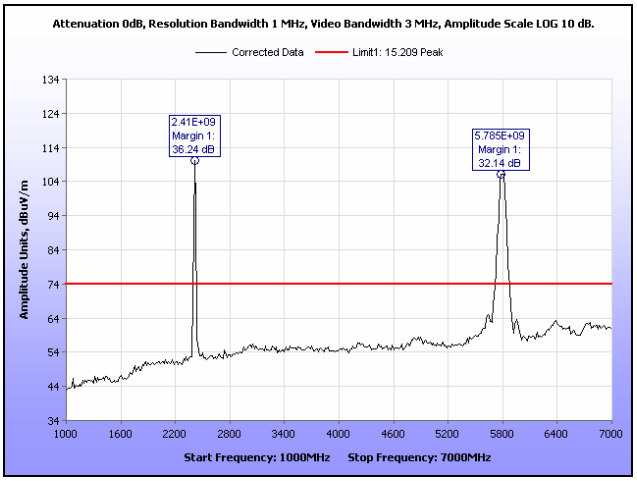


Plot 326. Radiated Spurious Emissions, High Channel, 802.11a 40 MHz, Ant. 0, 30 MHz – 1 GHz

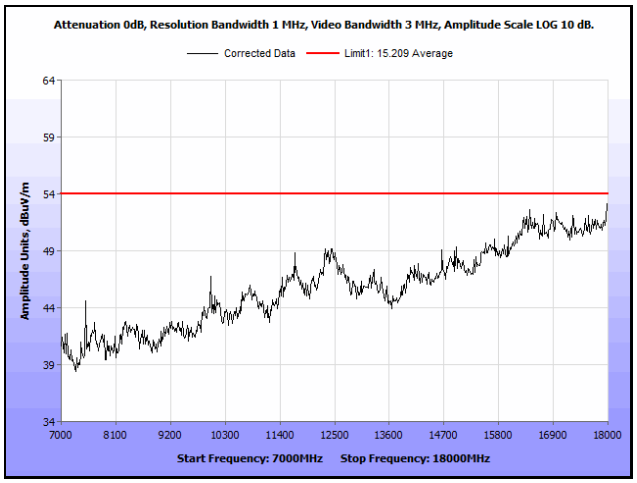


Plot 327. Radiated Spurious Emissions, High Channel, 802.11a 40 MHz, Ant. 0, 1 GHz – 7 GHz, Average

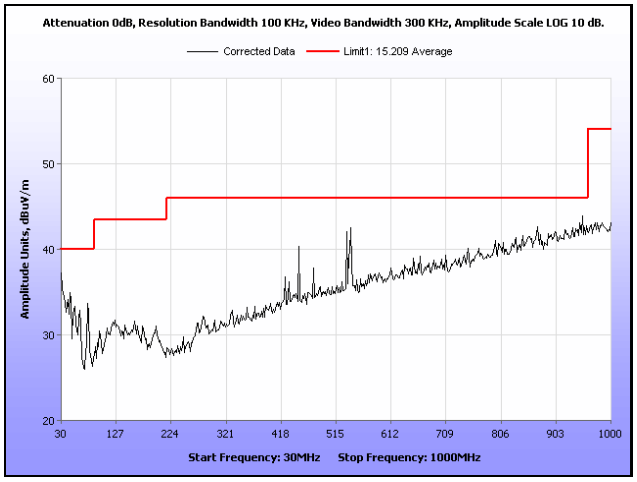
© 2014, MET Laboratories, Inc.



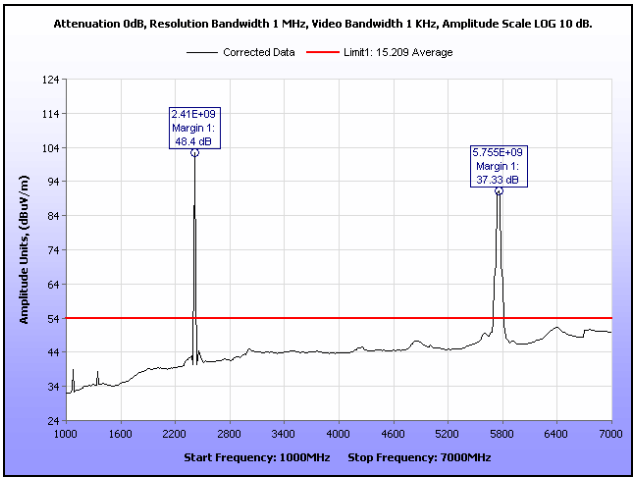
Plot 328. Radiated Spurious Emissions, High Channel, 802.11a 40 MHz, Ant. 0, 1 GHz – 7 GHz, Peak



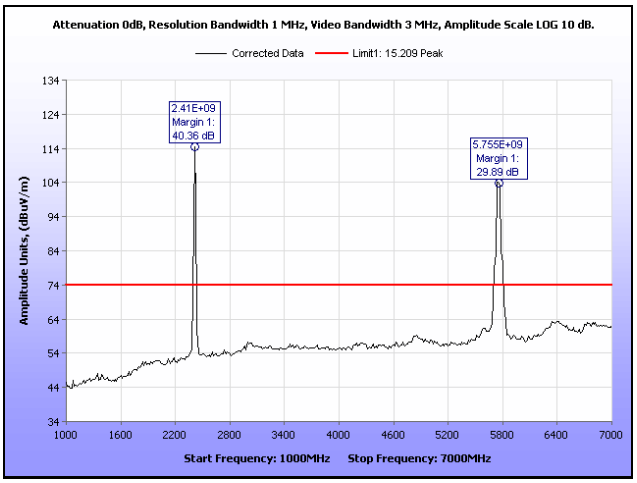
Plot 329. Radiated Spurious Emissions, High Channel, 802.11a 40 MHz, Ant. 0, 7 GHz – 18 GHz



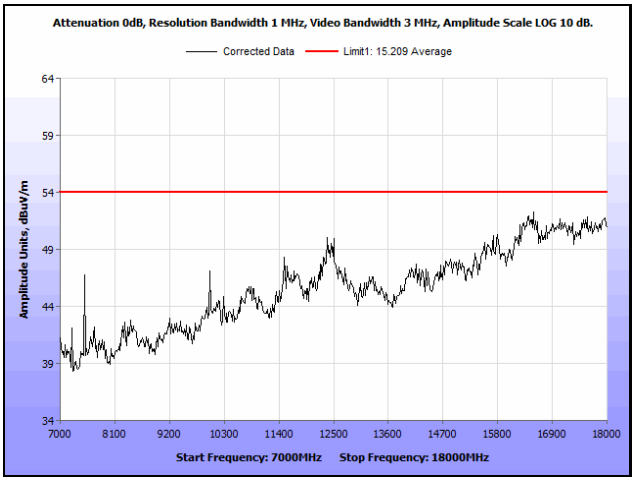
Plot 330. Radiated Spurious Emissions, Low Channel, 802.11a 40 MHz, Ant. 1, 30 MHz – 1 GHz



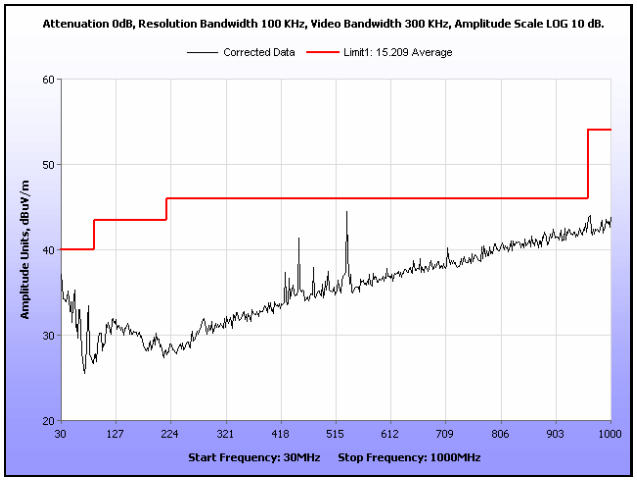
Plot 331. Radiated Spurious Emissions, Low Channel, 802.11a 40 MHz, Ant. 1, 1 GHz – 7 GHz, Average



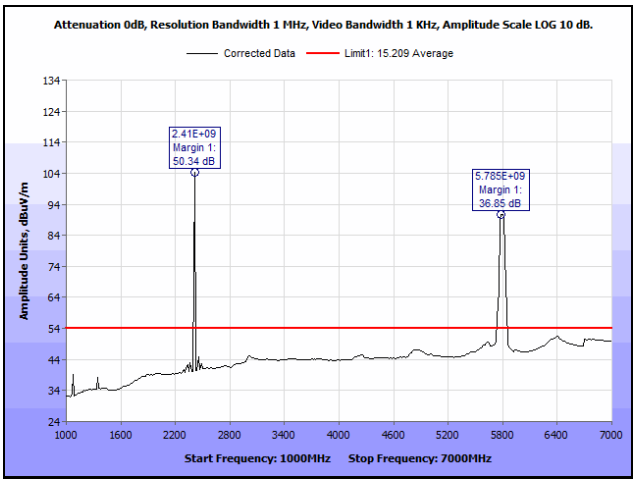
Plot 332. Radiated Spurious Emissions, Low Channel, 802.11a 40 MHz, Ant. 1, 1 GHz – 7 GHz, Peak



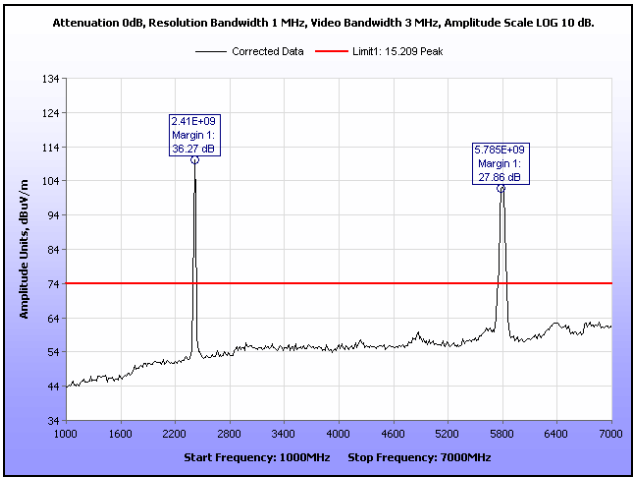
Plot 333. Radiated Spurious Emissions, Low Channel, 802.11a 40 MHz, Ant. 1, 7 GHz – 18 GHz



Plot 334. Radiated Spurious Emissions, High Channel, 802.11a 40 MHz, Ant. 1, 30 MHz – 1 GHz

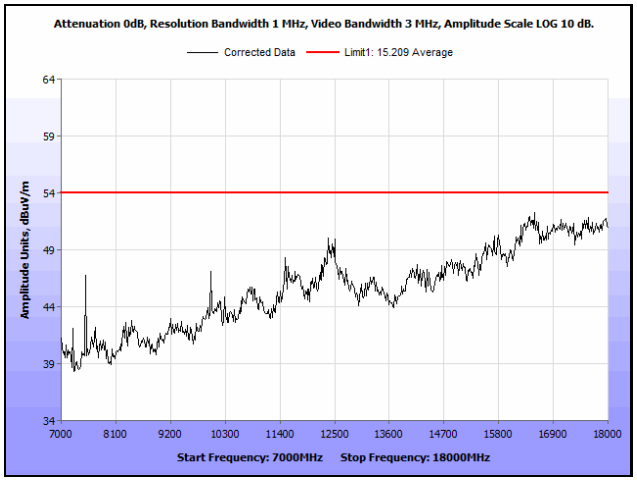


Plot 335. Radiated Spurious Emissions, High Channel, 802.11a 40 MHz, Ant. 1, 1 GHz – 7 GHz, Average

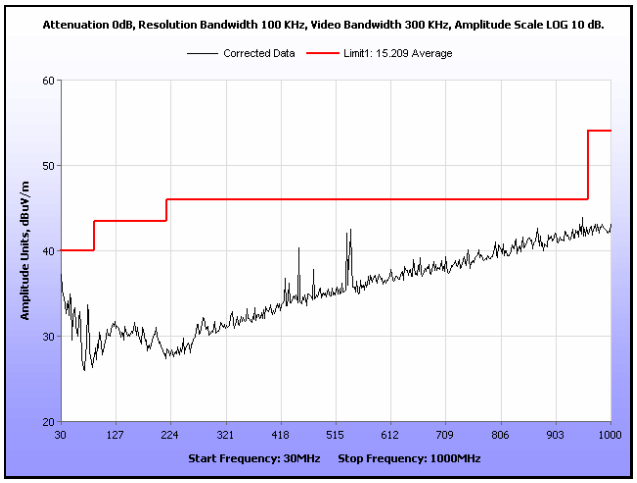


Plot 336. Radiated Spurious Emissions, High Channel, 802.11a 40 MHz, Ant. 1, 1 GHz – 7 GHz, Peak

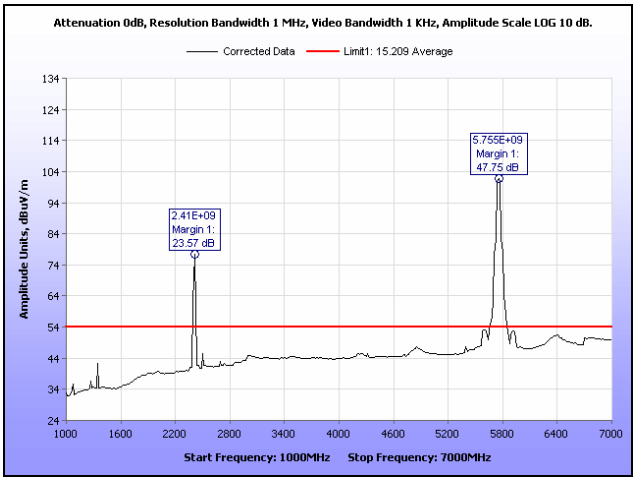
© 2014, MET Laboratories, Inc.



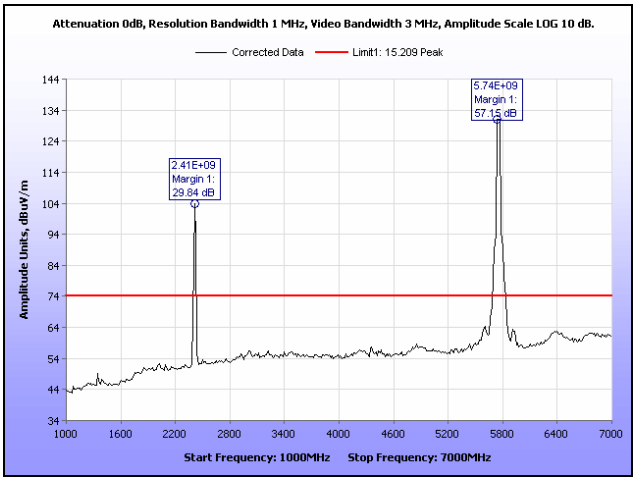
Plot 337. Radiated Spurious Emissions, High Channel, 802.11a 40 MHz, Ant. 1, 7 GHz – 18 GHz



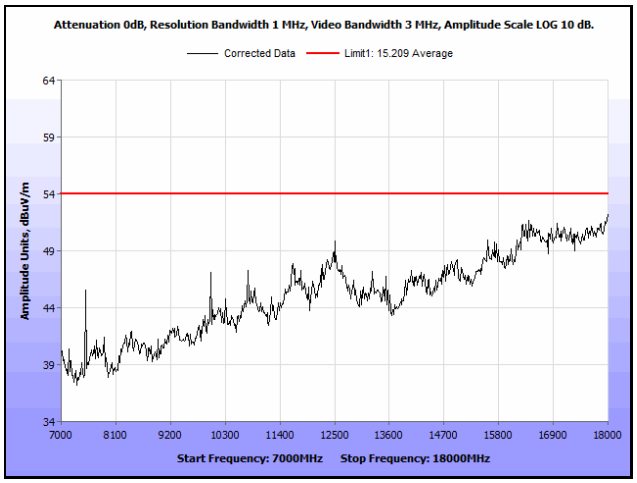
Plot 338. Radiated Spurious Emissions, Low Channel, 802.11a 40 MHz, Ant. 2, 30 MHz – 1 GHz



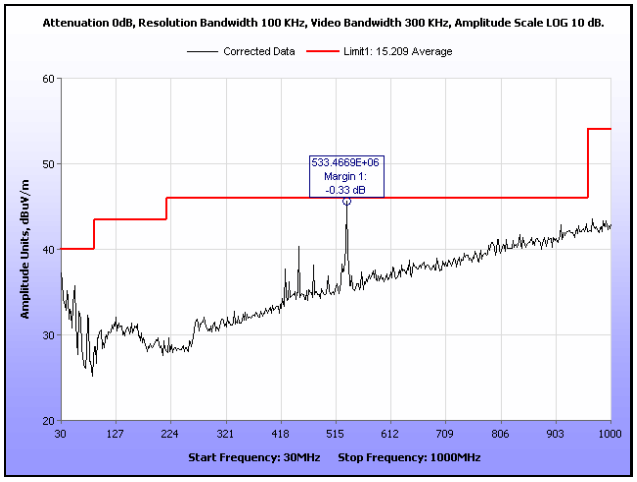
Plot 339. Radiated Spurious Emissions, Low Channel, 802.11a 40 MHz, Ant. 2, 1 GHz – 7 GHz, Average



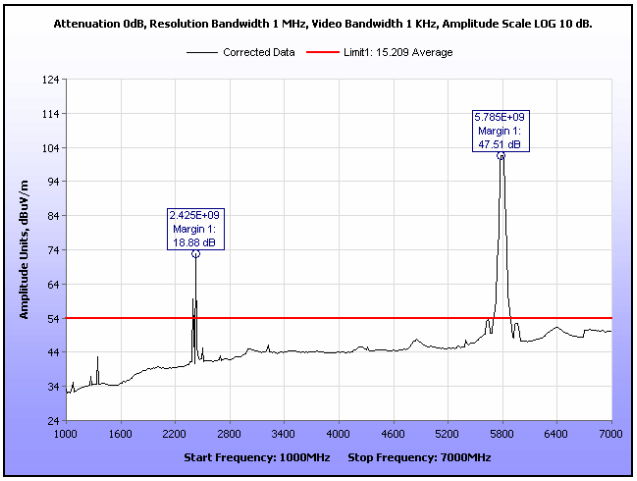
Plot 340. Radiated Spurious Emissions, Low Channel, 802.11a 40 MHz, Ant. 2, 1 GHz – 7 GHz, Peak



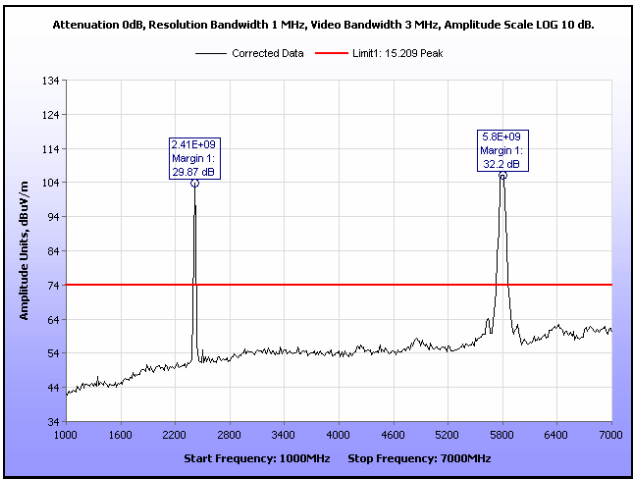
Plot 341. Radiated Spurious Emissions, Low Channel, 802.11a 40 MHz, Ant. 2, 7 GHz – 18 GHz



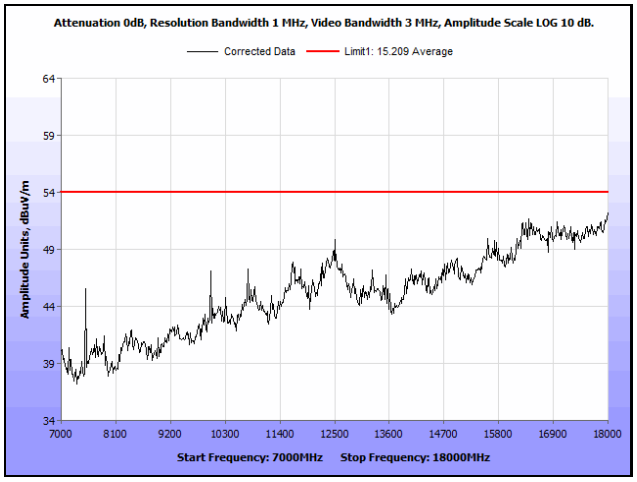
Plot 342. Radiated Spurious Emissions, High Channel, 802.11a 40 MHz, Ant. 2, 30 MHz – 1 GHz



Plot 343. Radiated Spurious Emissions, High Channel, 802.11a 40 MHz, Ant. 2, 1 GHz – 7 GHz, Average

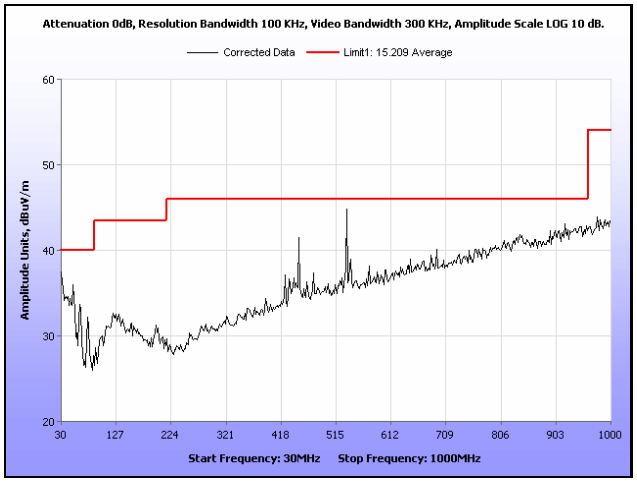


Plot 344. Radiated Spurious Emissions, High Channel, 802.11a 40 MHz, Ant. 2, 1 GHz – 7 GHz, Peak

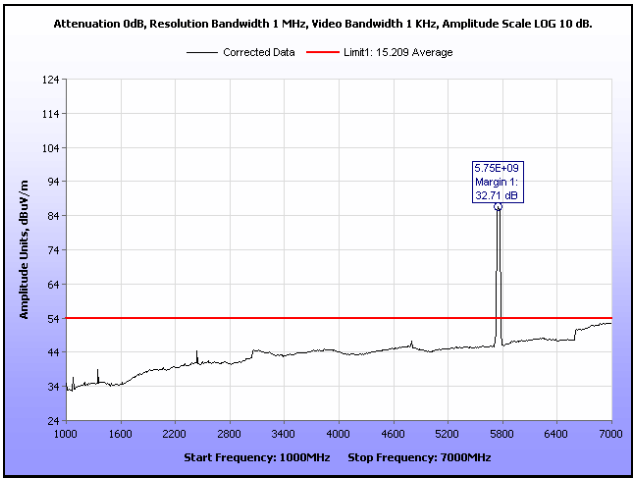


Plot 345. Radiated Spurious Emissions, High Channel, 802.11a 40 MHz, Ant. 2, 7 GHz – 18 GHz

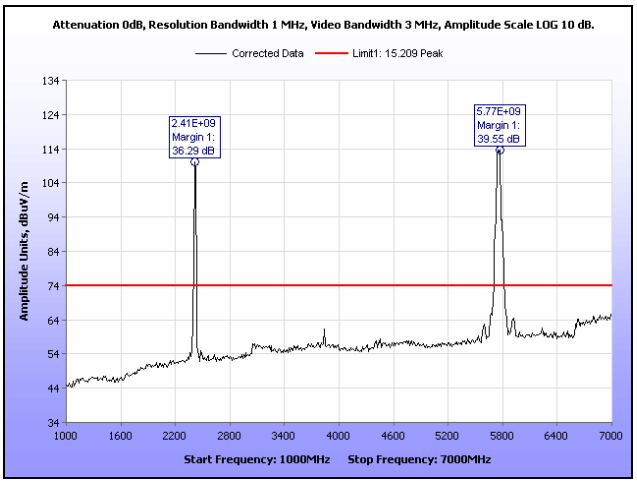
Radiated Spurious Emissions Test Results, 802.11ac 40 MHz, MIMO



Plot 346. Radiated Spurious Emissions, Low Channel, 802.11ac 40 MHz, 30 MHz – 1 GHz, MIMO

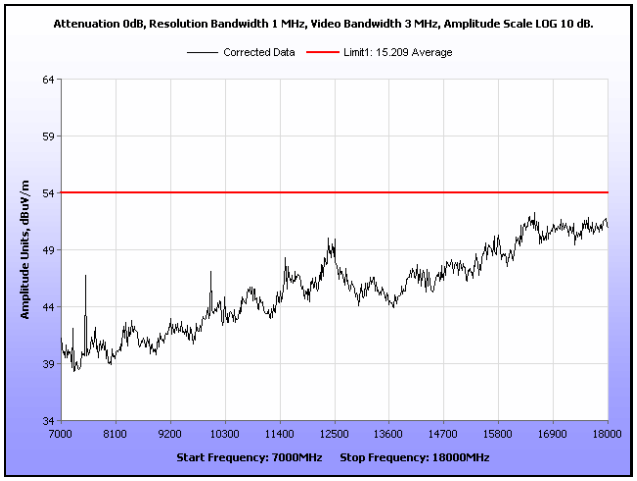


Plot 347. Radiated Spurious Emissions, Low Channel, 802.11ac 40 MHz, 1 GHz – 7 GHz, Average, MIMO

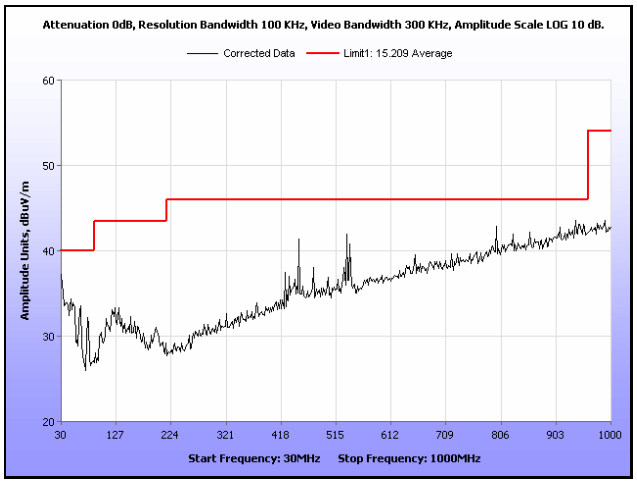


Plot 348. Radiated Spurious Emissions, Low Channel, 802.11ac 40 MHz, 1 GHz – 7 GHz, Peak, MIMO

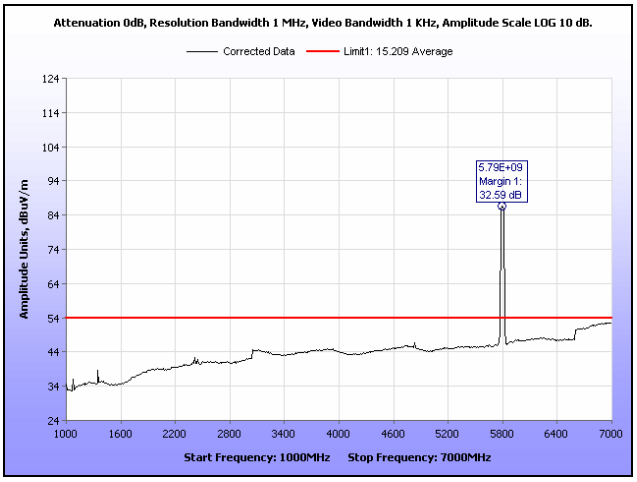
© 2014, MET Laboratories, Inc.



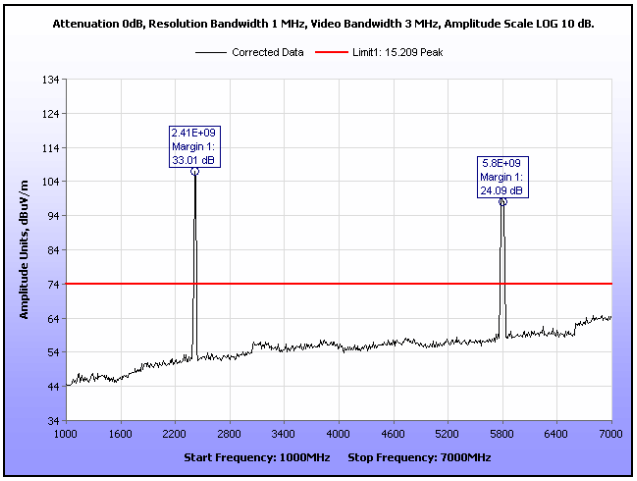
Plot 349. Radiated Spurious Emissions, Low Channel, 802.11ac 40 MHz, 7 GHz – 18 GHz, MIMO



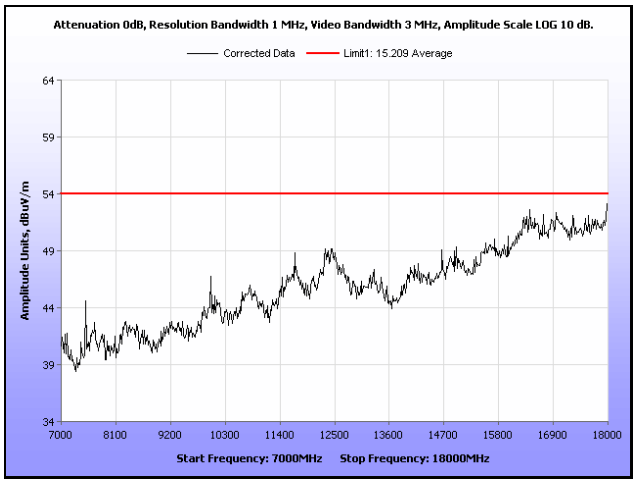
Plot 350. Radiated Spurious Emissions, High Channel, 802.11ac 40 MHz, 30 MHz – 1 GHz, MIMO



Plot 351. Radiated Spurious Emissions, High Channel, 802.11ac 40 MHz, 1 GHz – 7 GHz, Average, MIMO

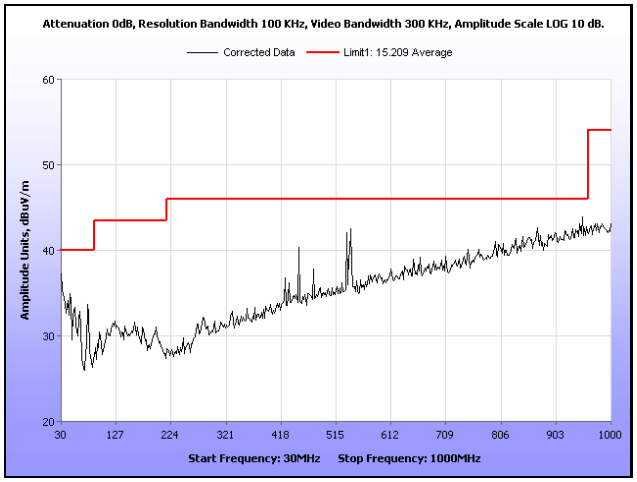


Plot 352. Radiated Spurious Emissions, High Channel, 802.11ac 40 MHz, 1 GHz – 7 GHz, Peak, MIMO

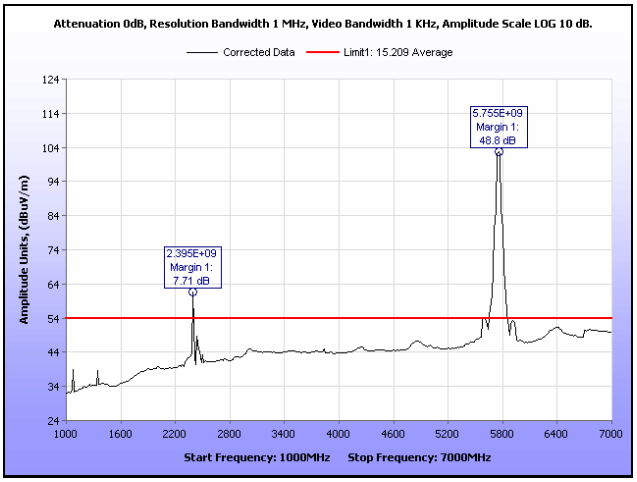


Plot 353. Radiated Spurious Emissions, High Channel, 802.11ac 40 MHz, 7 GHz – 18 GHz, MIMO

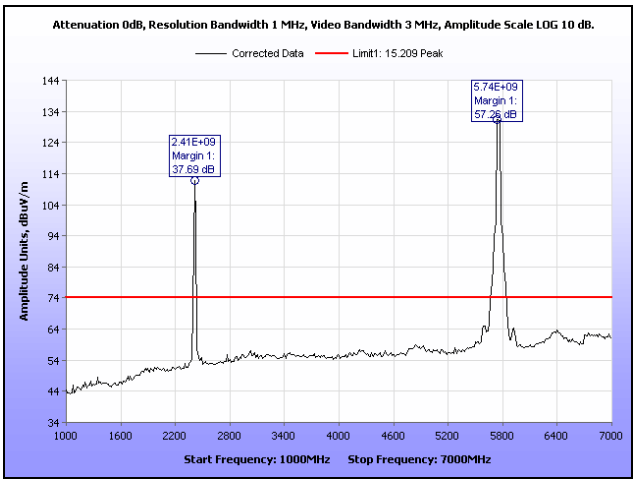
Radiated Spurious Emissions Test Results, 802.11n 40 MHz



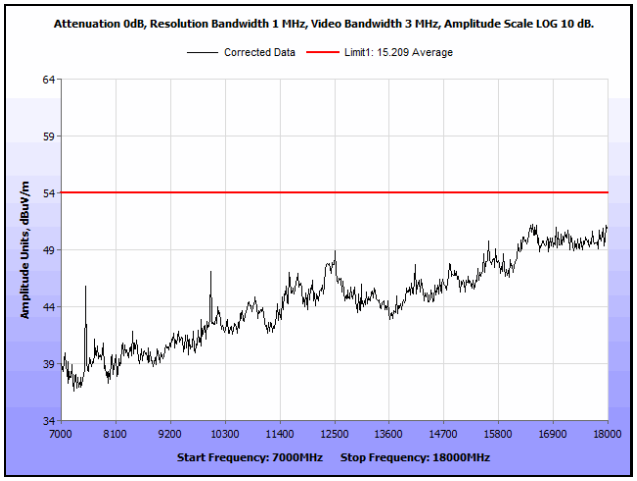
Plot 354. Radiated Spurious Emissions, Low Channel, 802.11n 40 MHz, Ant. 0, 30 MHz – 1 GHz



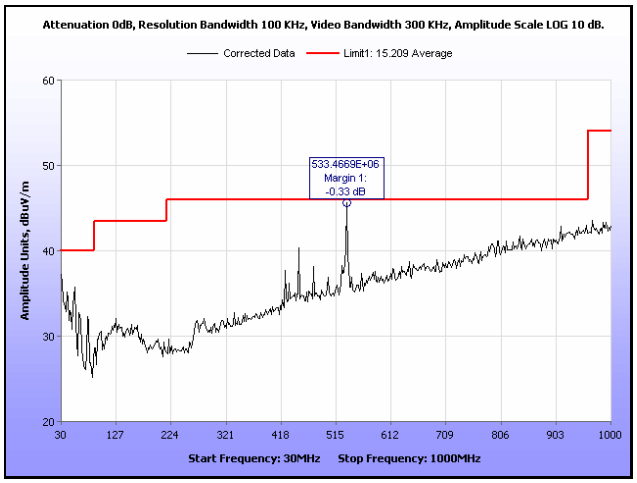
Plot 355. Radiated Spurious Emissions, Low Channel, 802.11n 40 MHz, Ant. 0, 1 GHz – 7 GHz, Average



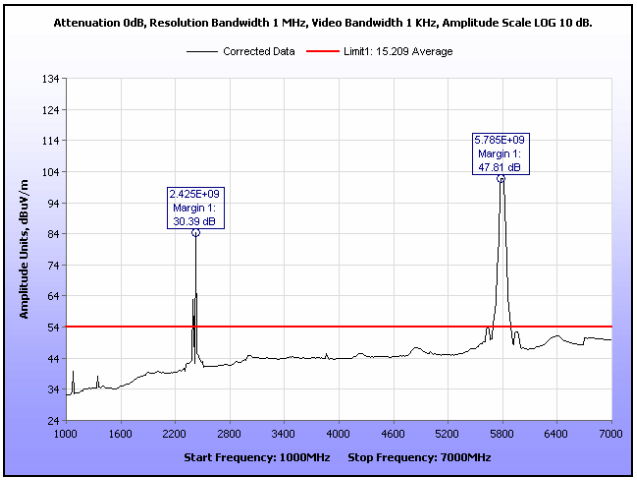
Plot 356. Radiated Spurious Emissions, Low Channel, 802.11n 40 MHz, Ant. 0, 1 GHz – 7 GHz, Peak



Plot 357. Radiated Spurious Emissions, Low Channel, 802.11n 40 MHz, Ant. 0, 7 GHz – 18 GHz

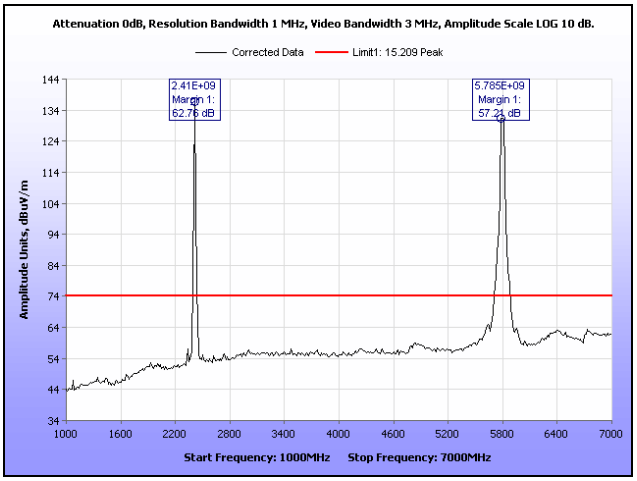


Plot 358. Radiated Spurious Emissions, High Channel, 802.11n 40 MHz, Ant. 0, 30 MHz – 1 GHz

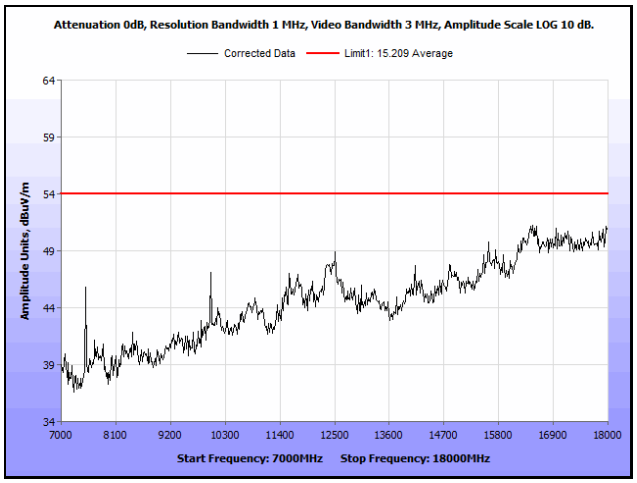


Plot 359. Radiated Spurious Emissions, High Channel, 802.11n 40 MHz, Ant. 0, 1 GHz – 7 GHz, Average

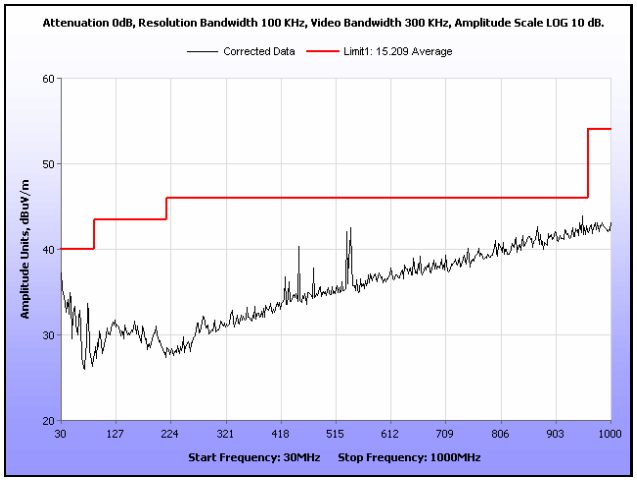
© 2014, MET Laboratories, Inc.



Plot 360. Radiated Spurious Emissions, High Channel, 802.11n 40 MHz, Ant. 0, 1 GHz – 7 GHz, Peak

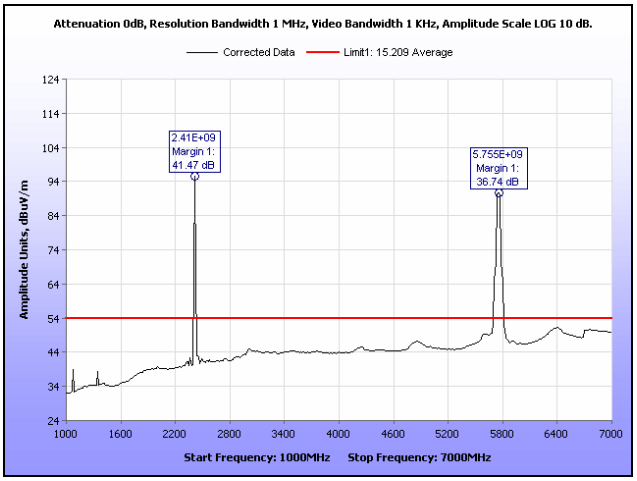


Plot 361. Radiated Spurious Emissions, High Channel, 802.11n 40 MHz, Ant. 0, 7 GHz – 18 GHz

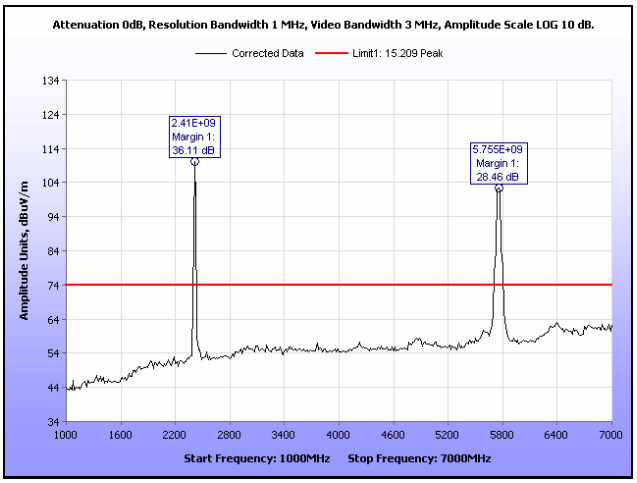


Plot 362. Radiated Spurious Emissions, Low Channel 802.11n 40 MHz, Ant. 1, 30 MHz – 1 GHz

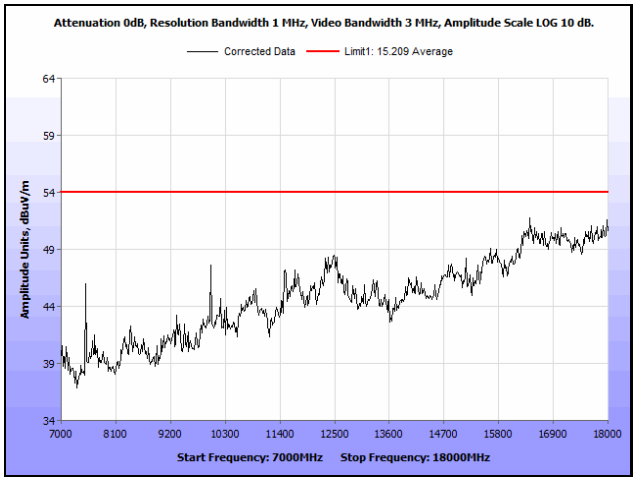
© 2014, MET Laboratories, Inc.



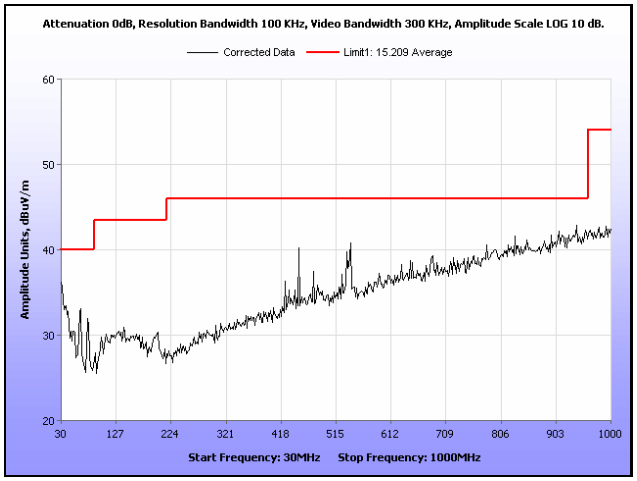
Plot 363. Radiated Spurious Emissions, Low Channel, 802.11n 40 MHz, Ant. 1, 1 GHz – 7 GHz, Average



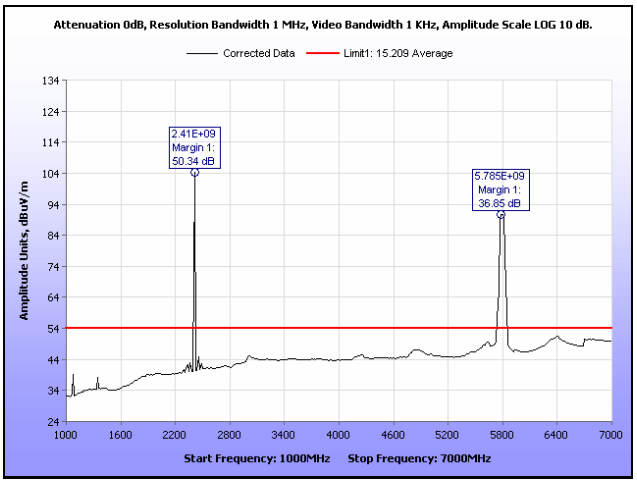
Plot 364. Radiated Spurious Emissions, Low Channel, 802.11n 40 MHz, Ant. 1, 1 GHz – 7 GHz, Peak



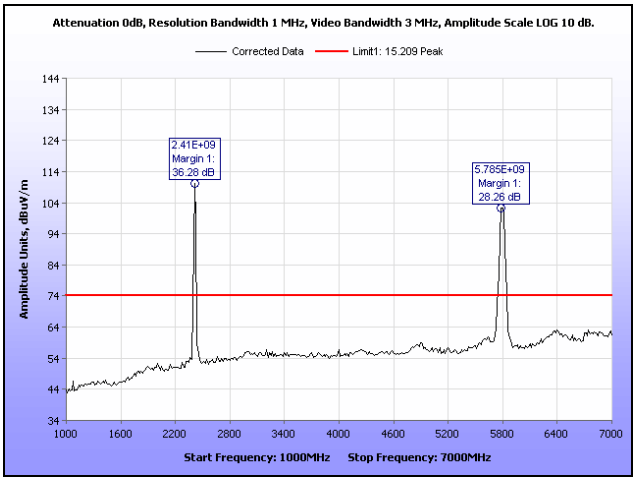
Plot 365. Radiated Spurious Emissions, Low Channel, 802.11n 40 MHz, Ant. 1, 7 GHz – 18 GHz



Plot 366. Radiated Spurious Emissions, High Channel, 802.11n 40 MHz, Ant. 1, 30 MHz – 1 GHz

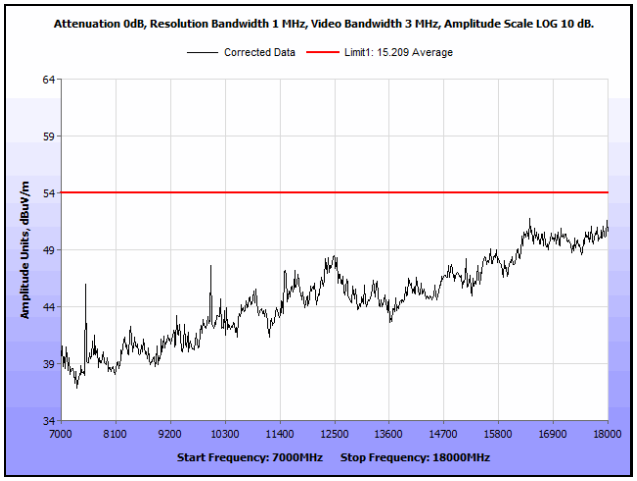


Plot 367. Radiated Spurious Emissions, High Channel, 802.11n 40 MHz, Ant. 1, 1 GHz – 7 GHz, Average

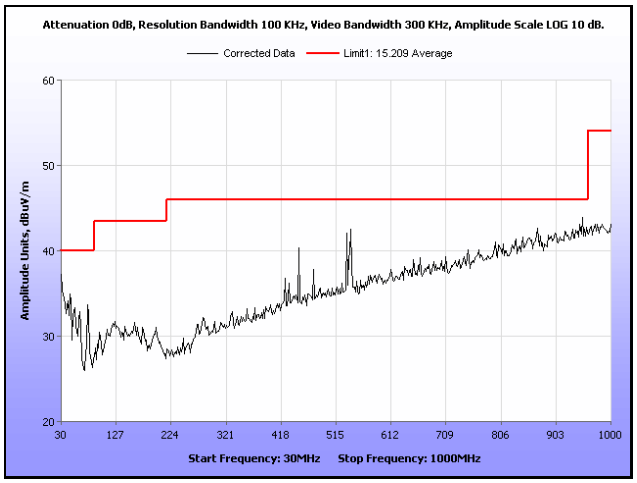


Plot 368. Radiated Spurious Emissions, High Channel, 802.11n 40 MHz, Ant. 1, 1 GHz – 7 GHz, Peak

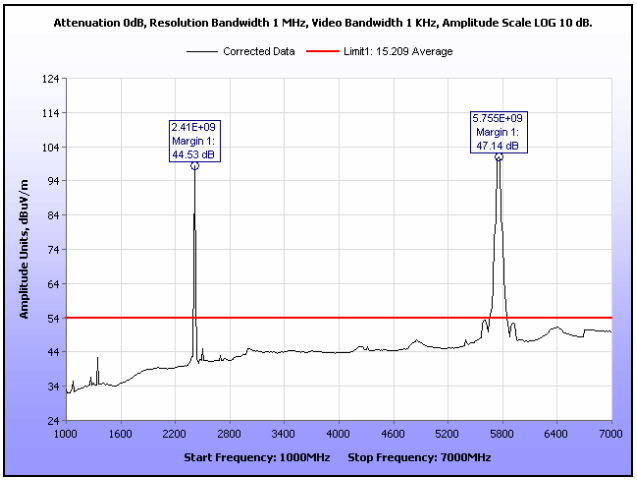
© 2014, MET Laboratories, Inc.



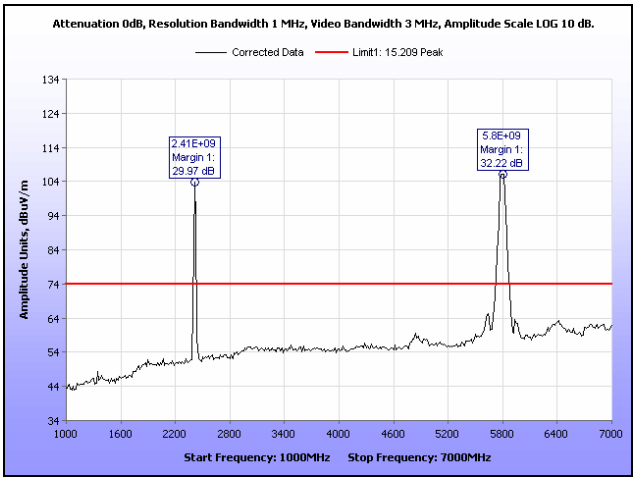
Plot 369. Radiated Spurious Emissions, High Channel, 802.11n 40 MHz, Ant. 1, 7 GHz – 18 GHz



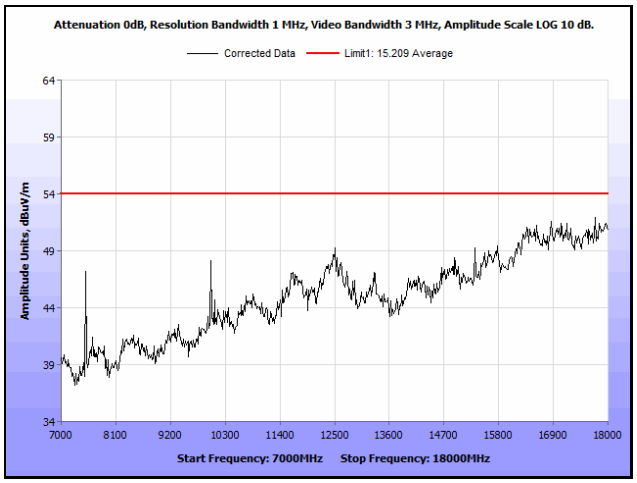
Plot 370. Radiated Spurious Emissions, Low Channel 802.11n 40 MHz, Ant. 2, 30 MHz – 1 GHz



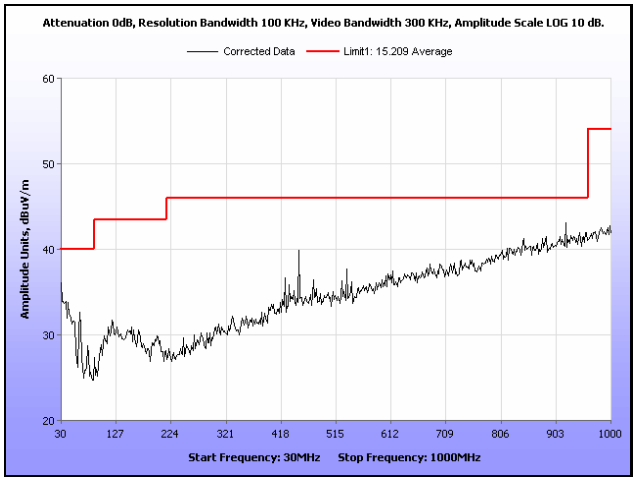
Plot 371. Radiated Spurious Emissions, Low Channel, 802.11n 40 MHz, Ant. 2, 1 GHz – 7 GHz, Average



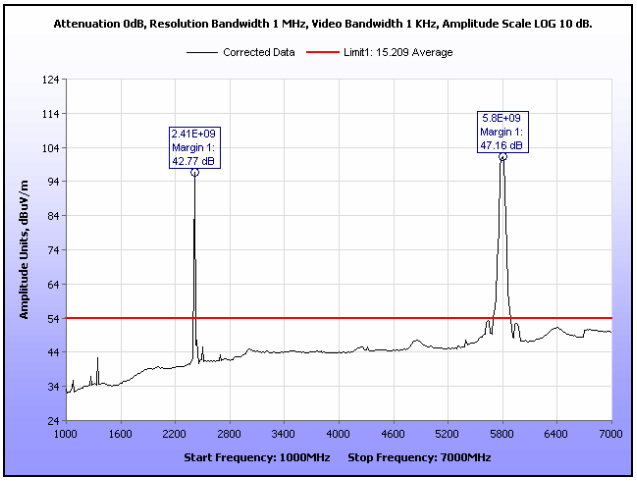
Plot 372. Radiated Spurious Emissions, Low Channel, 802.11n 40 MHz, Ant. 2, 1 GHz – 7 GHz, Peak



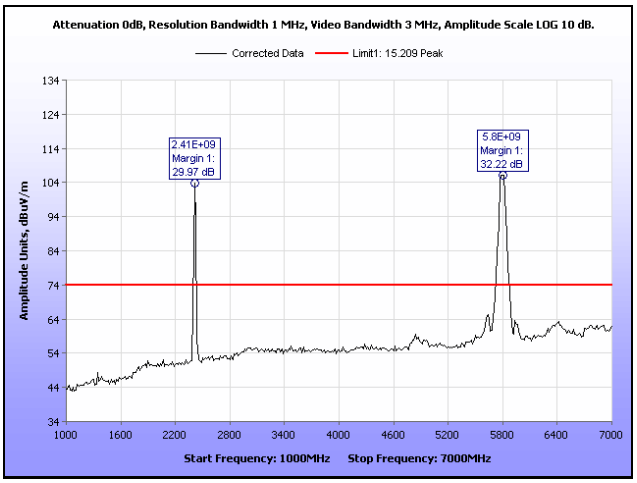
Plot 373. Radiated Spurious Emissions, Low Channel, 802.11n 40 MHz, Ant. 2, 7 GHz – 18 GHz



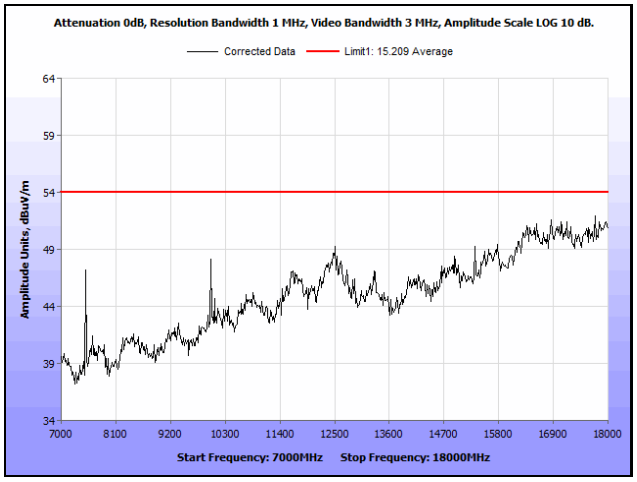
Plot 374. Radiated Spurious Emissions, High Channel, 802.11n 40 MHz, Ant. 2, 30 MHz – 1 GHz



Plot 375. Radiated Spurious Emissions, High Channel, 802.11n 40 MHz, Ant. 2, 1 GHz – 7 GHz, Average

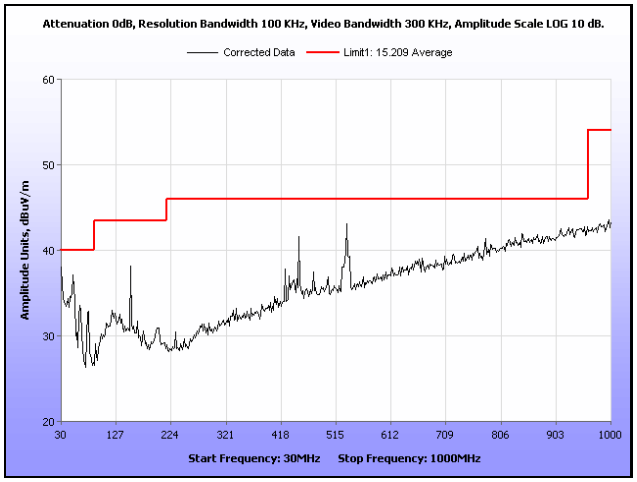


Plot 376. Radiated Spurious Emissions, High Channel, 802.11n 40 MHz, Ant. 2, 1 GHz – 7 GHz, Peak

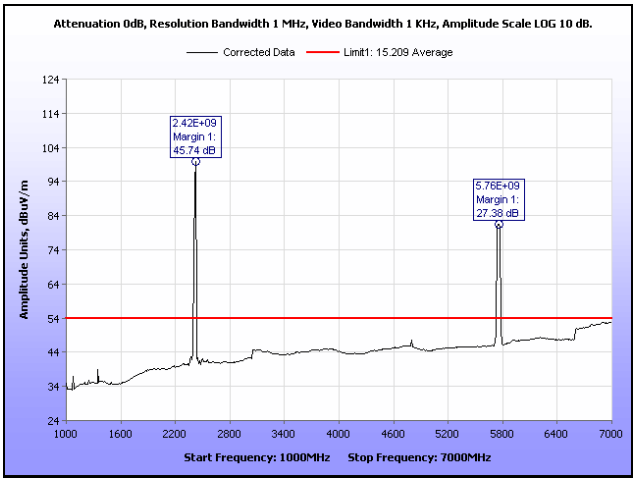


Plot 377. Radiated Spurious Emissions, High Channel, 802.11n 40 MHz, Ant. 2, 7 GHz – 18 GHz

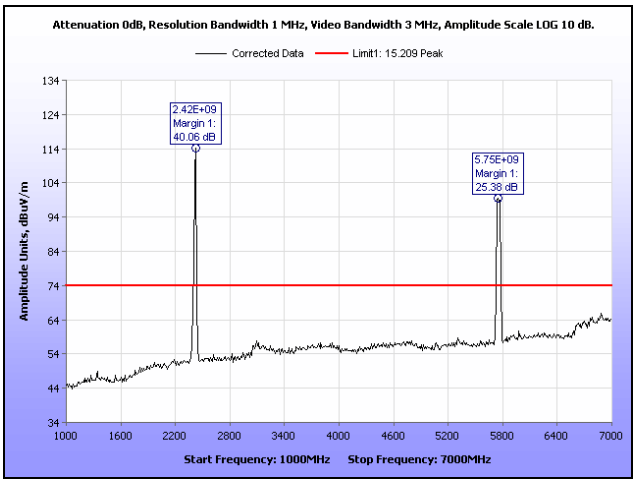
Radiated Spurious Emissions Test Results, 802.11n 40 MHz, MIMO



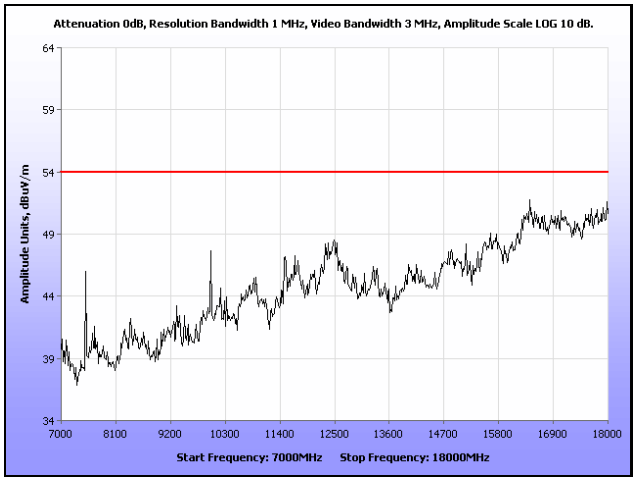
Plot 378. Radiated Spurious Emissions, Low Channel, 802.11n 40 MHz, 30 MHz – 1 GHz, MIMO



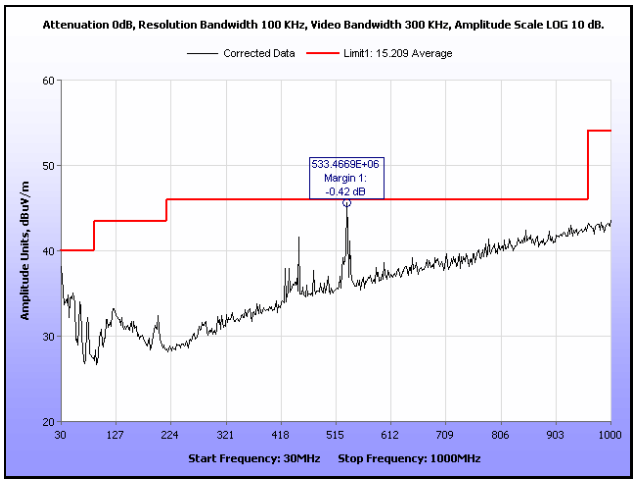
Plot 379. Radiated Spurious Emissions, Low Channel, 802.11n 40 MHz, 1 GHz – 7 GHz, Average, MIMO



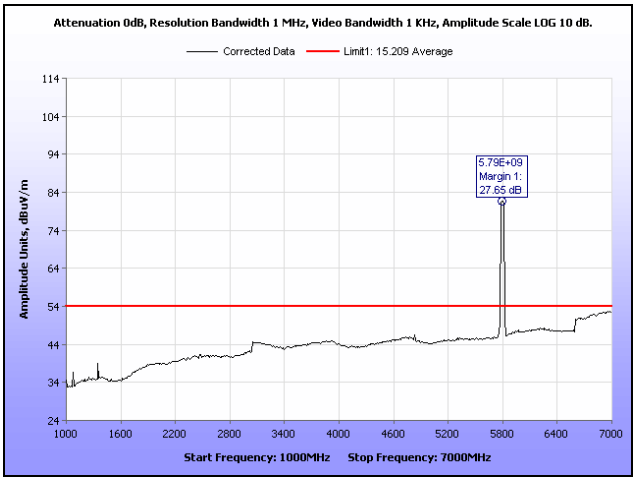
Plot 380. Radiated Spurious Emissions, Low Channel, 802.11n 40 MHz, 1 GHz – 7 GHz, Peak, MIMO



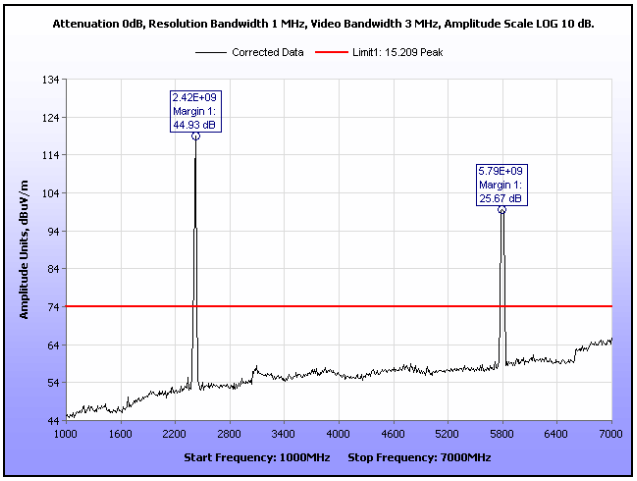
Plot 381. Radiated Spurious Emissions, Low Channel, 802.11n 40 MHz, 7 GHz – 18 GHz, MIMO



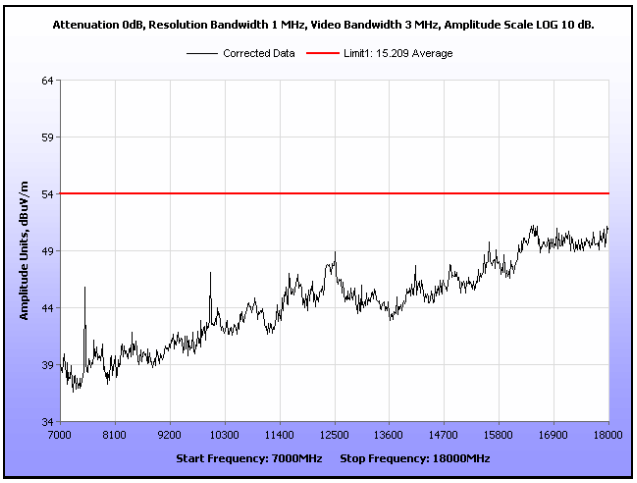
Plot 382. Radiated Spurious Emissions, High Channel, 802.11n 40 MHz, 30 MHz – 1 GHz, MIMO



Plot 383. Radiated Spurious Emissions, High Channel, 802.11n 40 MHz, 1 GHz – 7 GHz, Average, MIMO

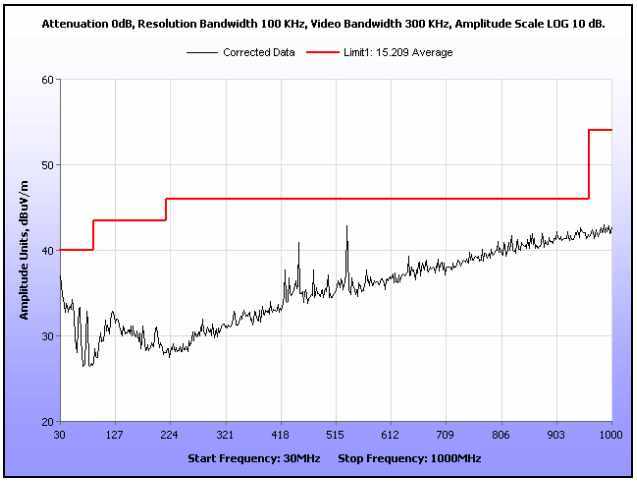


Plot 384. Radiated Spurious Emissions, High Channel, 802.11n 40 MHz, 1 GHz – 7 GHz, Peak, MIMO

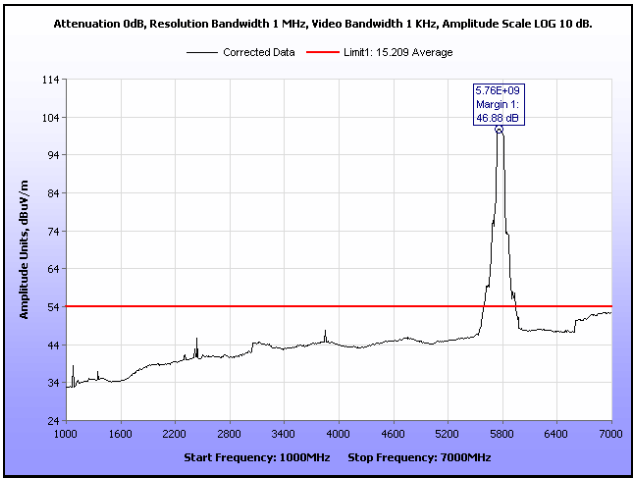


Plot 385. Radiated Spurious Emissions, High Channel, 802.11n 40 MHz, 7 GHz – 18 GHz, MIMO

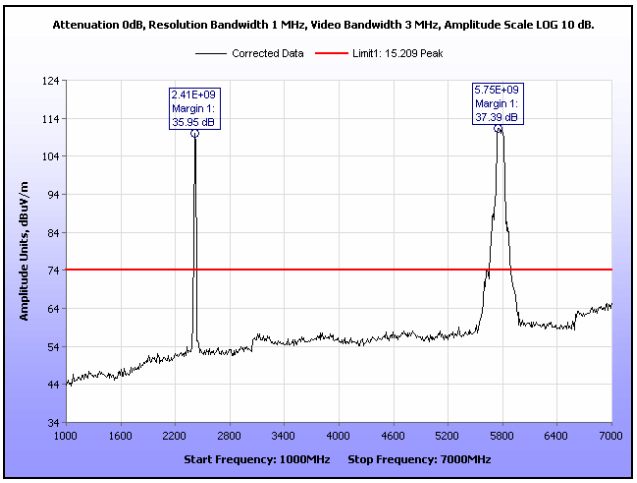
Radiated Spurious Emissions Test Results, 802.11a 80 MHz



Plot 386. Radiated Spurious Emissions, 802.11a 80 MHz, Ant. 0, 30 MHz – 1 GHz

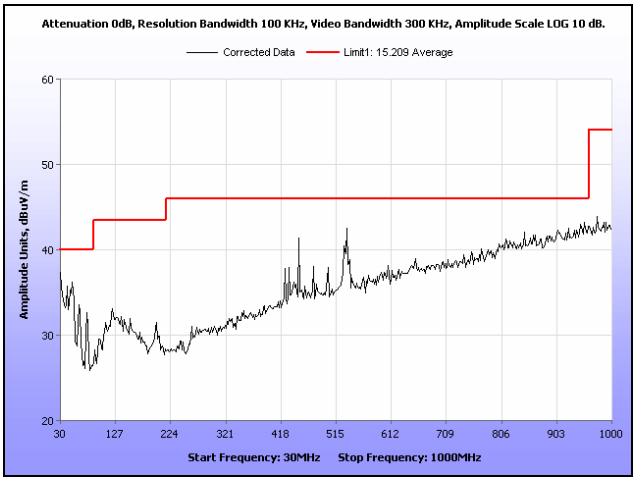


Plot 387. Radiated Spurious Emissions, 802.11a 80 MHz, Ant. 0, 1 GHz – 7 GHz, Average

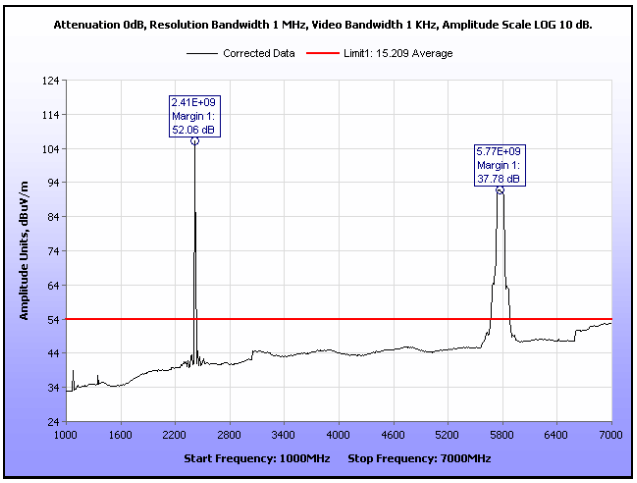


Plot 388. Radiated Spurious Emissions, 802.11a 80 MHz, Ant. 0, 1 GHz – 7 GHz, Peak

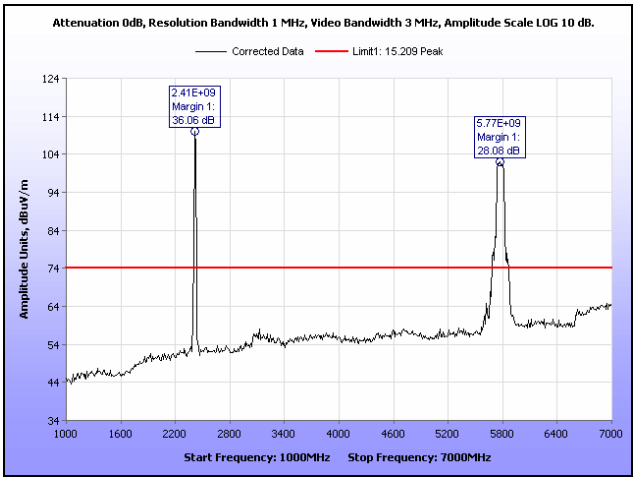
© 2014, MET Laboratories, Inc.



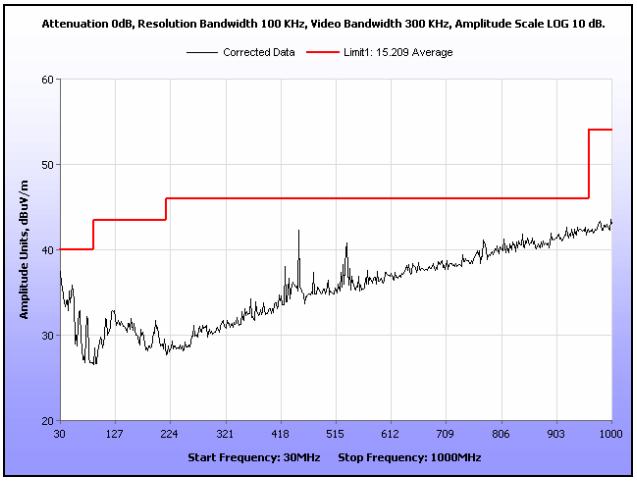
Plot 389. Radiated Spurious Emissions, 802.11a 80 MHz, Ant. 1, 30 MHz – 1 GHz



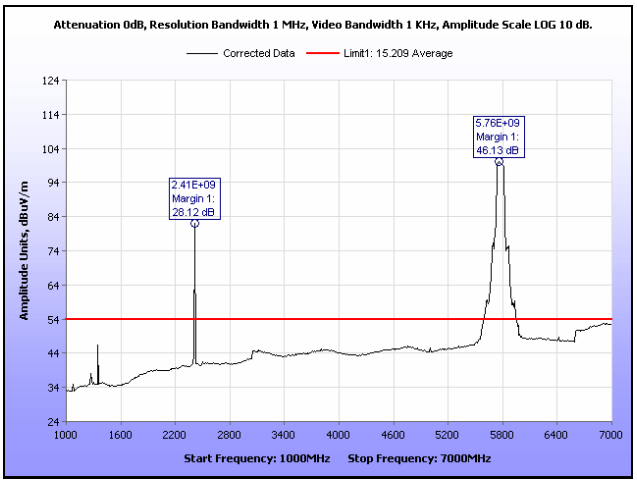
Plot 390. Radiated Spurious Emissions, 802.11a 80 MHz, Ant. 1, 1 GHz – 7 GHz, Average



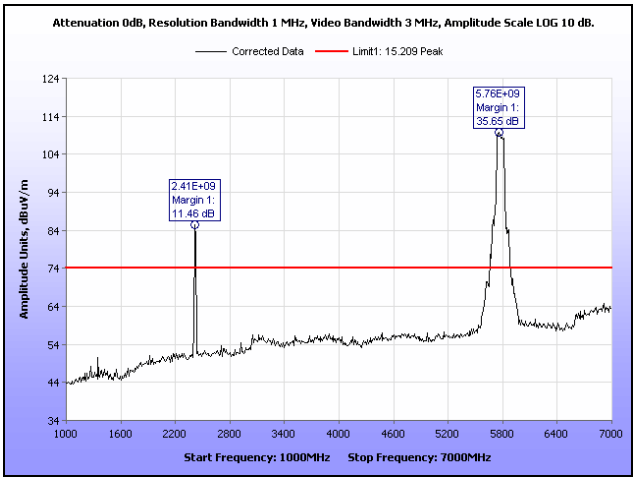
Plot 391. Radiated Spurious Emissions, 802.11a 80 MHz, Ant. 1, 1 GHz – 7 GHz, Peak



Plot 392. Radiated Spurious Emissions, 802.11a 80 MHz, Ant. 2, 30 MHz – 1 GHz

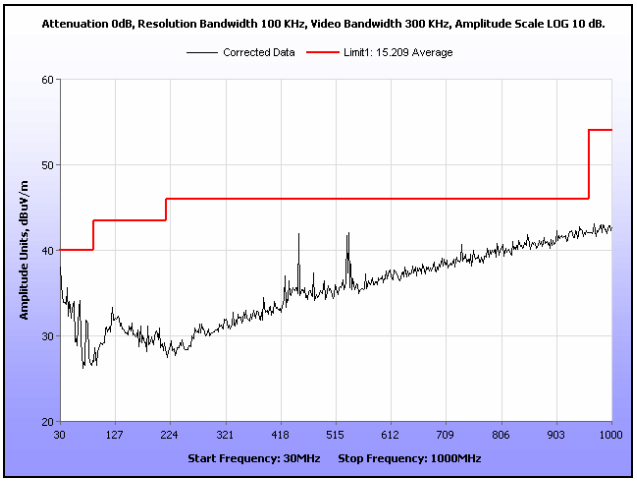


Plot 393. Radiated Spurious Emissions, 802.11a 80 MHz, Ant. 2, 1 GHz – 7 GHz, Average

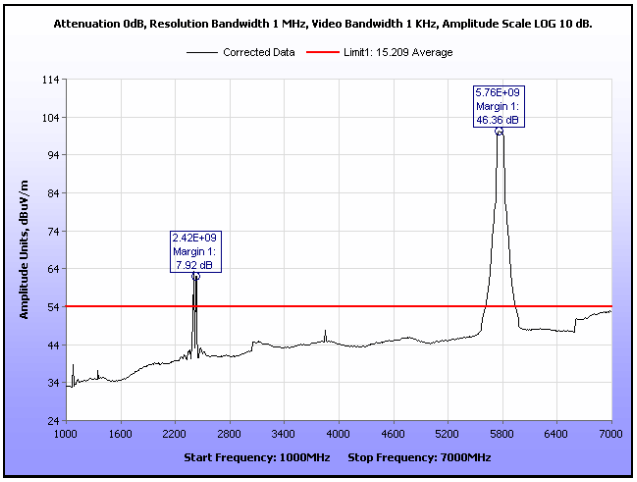


Plot 394. Radiated Spurious Emissions, 802.11a 80 MHz, Ant. 2, 1 GHz – 7 GHz, Peak

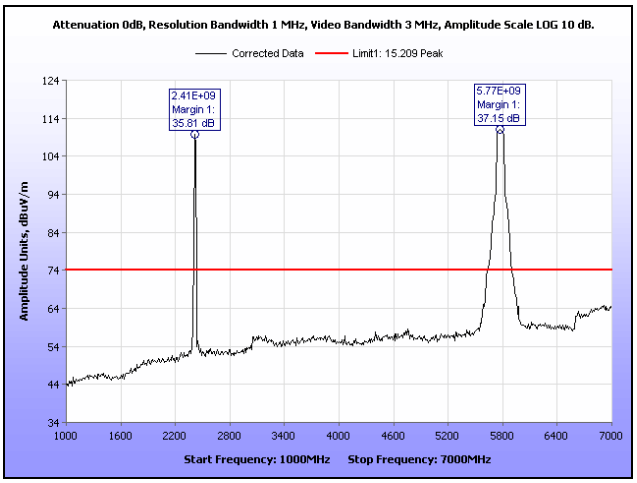
Radiated Spurious Emissions Test Results, 802.11ac 80 MHz



Plot 395. Radiated Spurious Emissions, 802.11ac 80 MHz, Ant. 0, 30 MHz – 1 GHz

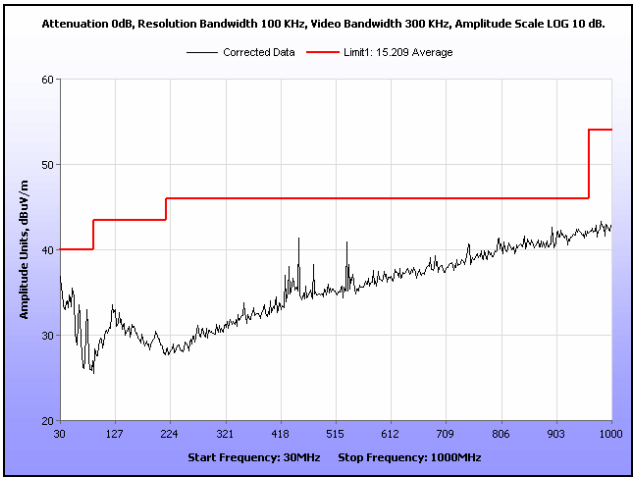


Plot 396. Radiated Spurious Emissions, 802.11ac 80 MHz, Ant. 0, 1 GHz – 7 GHz, Average

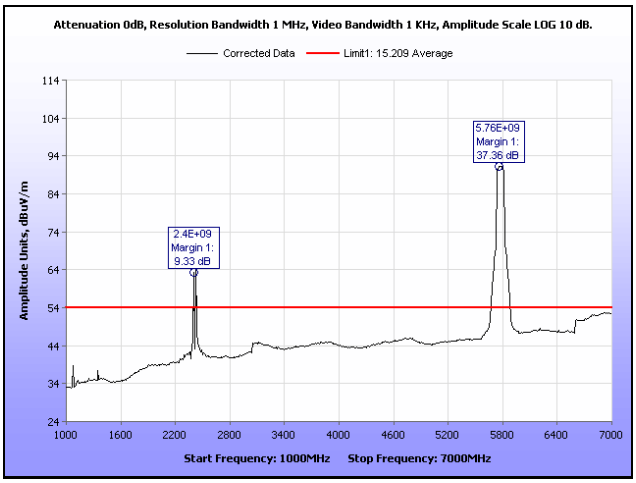


Plot 397. Radiated Spurious Emissions, 802.11ac 80 MHz, Ant. 0, 1 GHz – 7 GHz, Peak

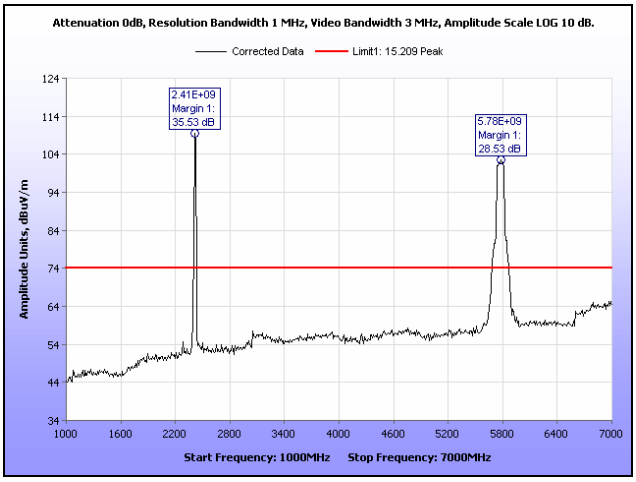
© 2014, MET Laboratories, Inc.



Plot 398. Radiated Spurious Emissions, 802.11ac 80 MHz, Ant. 1, 30 MHz – 1 GHz

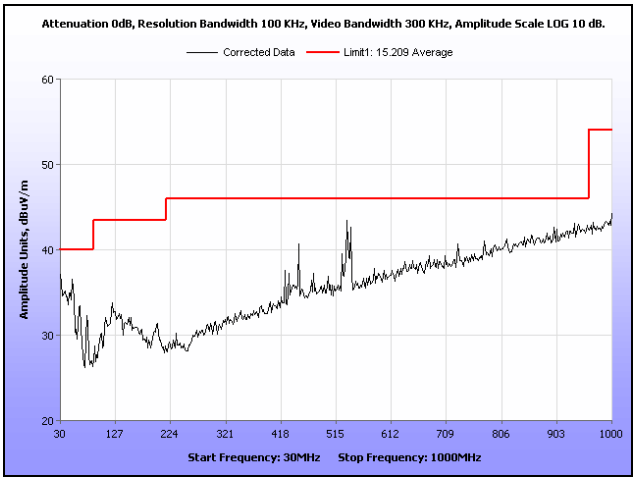


Plot 399. Radiated Spurious Emissions, 802.11ac 80 MHz, Ant. 1, 1 GHz – 7 GHz, Average

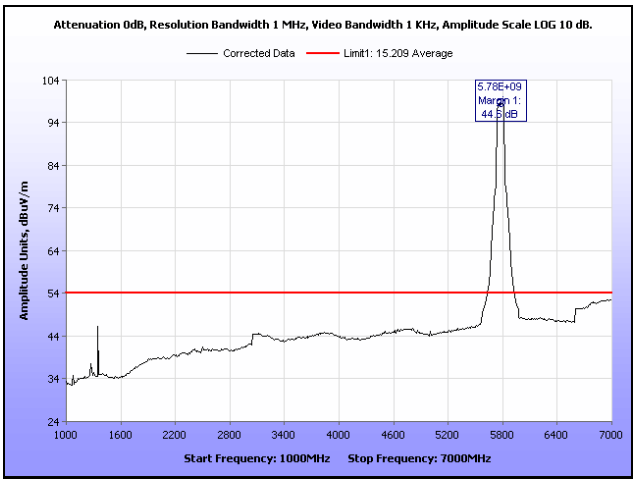


Plot 400. Radiated Spurious Emissions, 802.11ac 80 MHz, Ant. 1, 1 GHz – 7 GHz, Peak

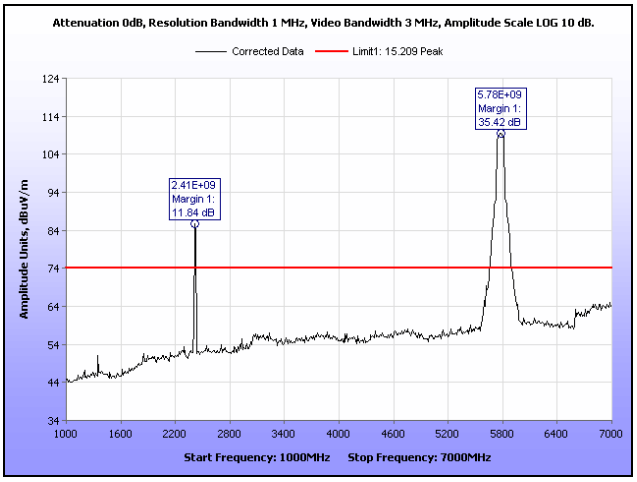
© 2014, MET Laboratories, Inc.



Plot 401. Radiated Spurious Emissions, 802.11ac 80 MHz, Ant. 2, 30 MHz – 1 GHz



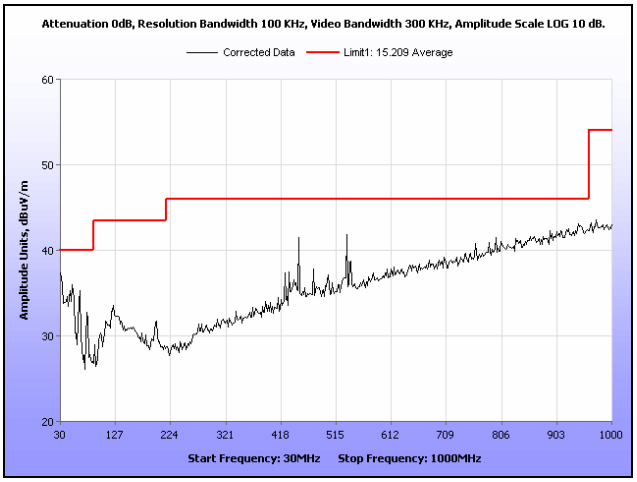
Plot 402. Radiated Spurious Emissions, 802.11ac 80 MHz, Ant. 2, 1 GHz – 7 GHz, Average



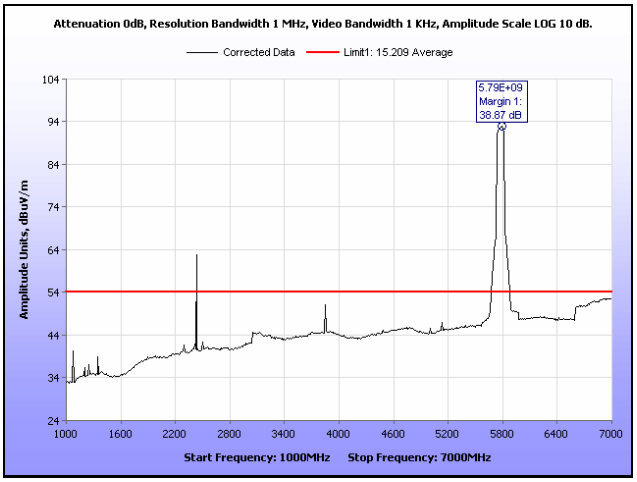
Plot 403. Radiated Spurious Emissions, 802.11ac 80 MHz, Ant. 2, 1 GHz – 7 GHz, Peak

© 2014, MET Laboratories, Inc.

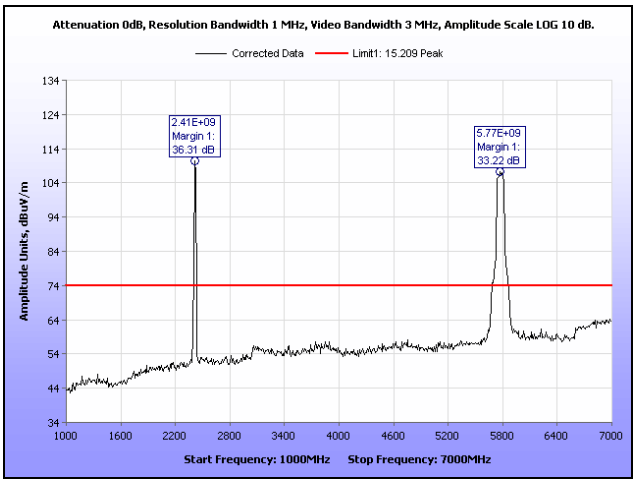
Radiated Spurious Emissions Test Results, 802.11ac 80 MHz, MIMO



Plot 404. Radiated Spurious Emissions, 802.11ac 80 MHz, 30 MHz – 1 GHz, MIMO



Plot 405. Radiated Spurious Emissions, 802.11ac 80 MHz, 1 GHz – 7 GHz, Average, MIMO



Plot 406. Radiated Spurious Emissions, 802.11ac 80 MHz, 1 GHz – 7 GHz, Peak, MIMO

Electromagnetic Compatibility Criteria for Intentional Radiators

§ 15.247(d) RF Conducted Spurious Emissions Requirements and Band Edge

Test Requirement: **15.247(d)** In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.

Test Procedure: For intentional radiators with a digital device portion which operates below 10 GHz, the spectrum was investigated as per §15.33(a)(1) and §15.33(a)(4); i.e., the lowest RF signal generated or used in the device up to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.

Since the EUT had an integral antenna, conducted measurements could not be performed. Measurements needed to be taken radiated. An antenna was located 3 m away from the EUT and plots were taken. The EUT was rotated through all three orthogonal axes. The plots were corrected for both antenna correction factor and cable lost.

See following pages for detailed test results with RF Conducted Spurious Emissions.

Test Results: The EUT was compliant with the Conducted Spurious Emission limits of **§15.247(d)**.

Test Engineer(s): Surinder Singh

Test Date(s): 02/21/14

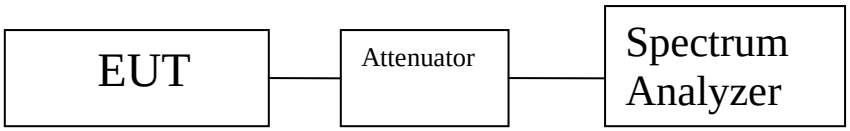
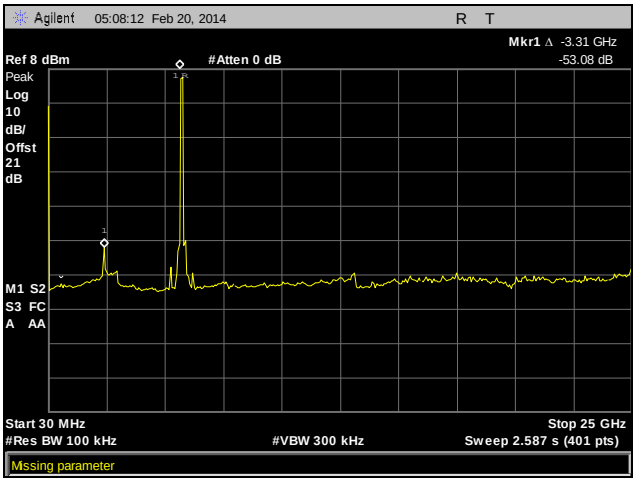


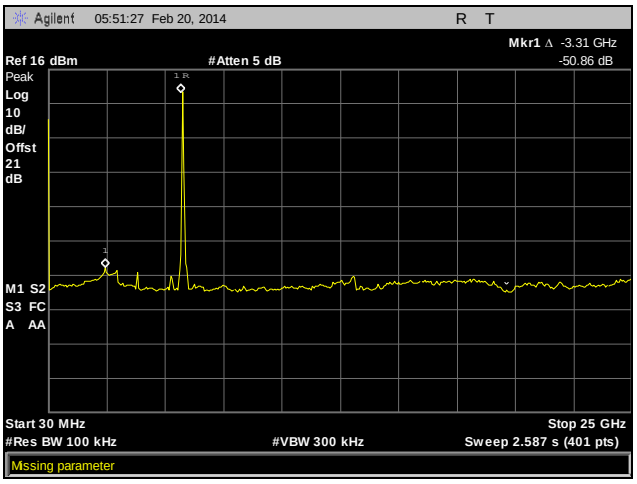
Figure 3. Block Diagram, Conducted Spurious Emissions Test Setup

 © 2014, MET Laboratories, Inc.

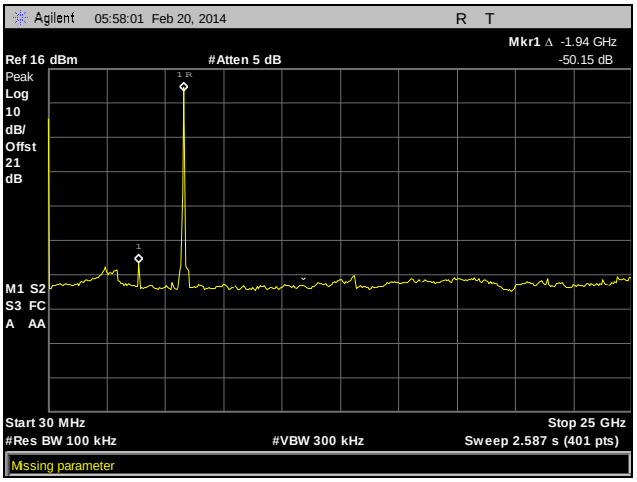
Conducted Spurious Emissions Test Results, 802.11a 20 MHz



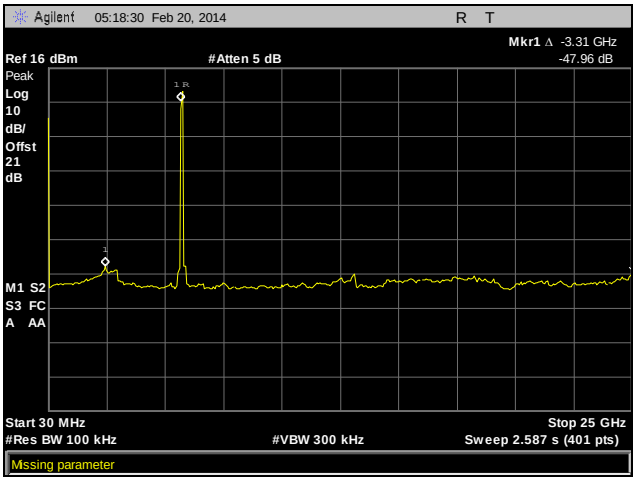
Plot 407. Conducted Spurious Emissions, Low Channel, 802.11a 20 MHz, Ant. 0



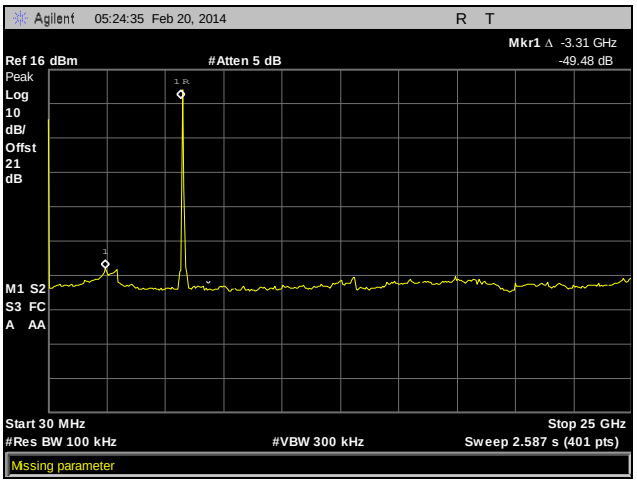
Plot 408. Conducted Spurious Emissions, Mid Channel, 802.11a 20 MHz, Ant. 0



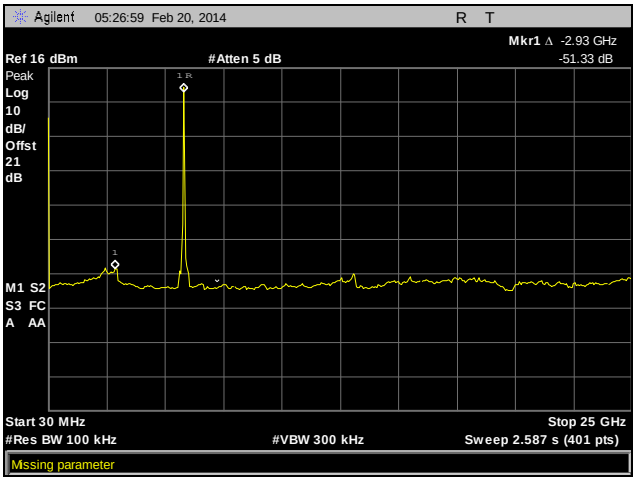
Plot 409. Conducted Spurious Emissions, High Channel, 802.11a 20 MHz, Ant. 0



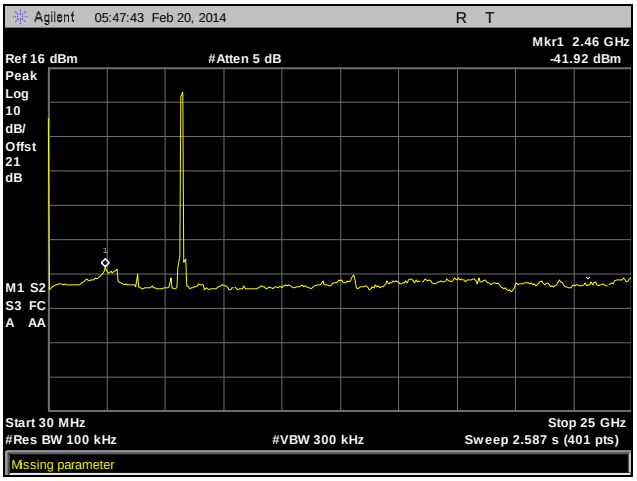
Plot 410. Conducted Spurious Emissions, Low Channel, 802.11a 20 MHz, Ant. 1



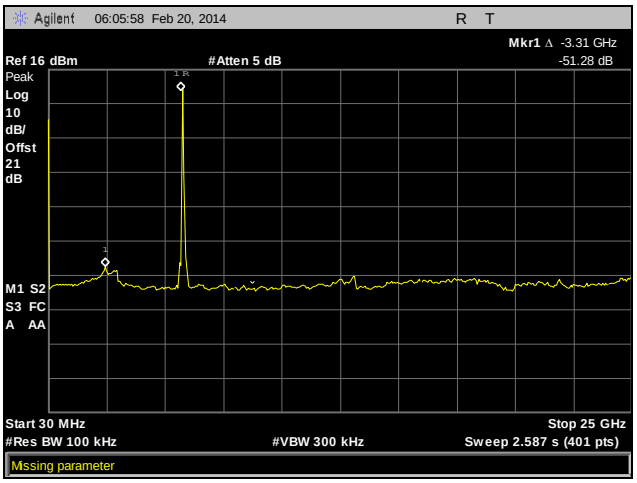
Plot 411. Conducted Spurious Emissions, Mid Channel, 802.11a 20 MHz, Ant. 1



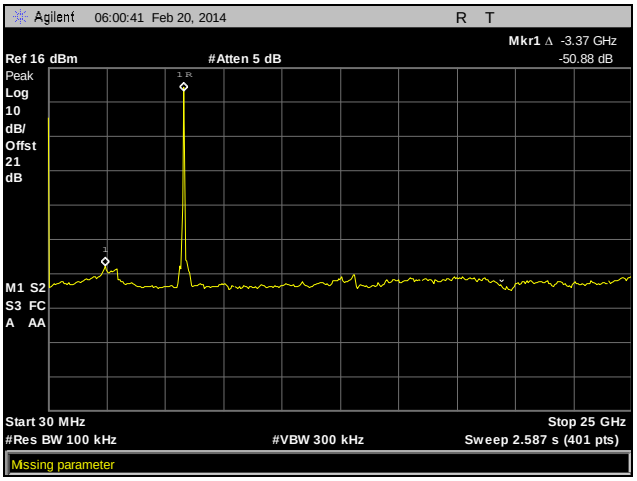
Plot 412. Conducted Spurious Emissions, High Channel, 802.11a 20 MHz, Ant. 1



Plot 413. Conducted Spurious Emissions, Low Channel, 802.11a 20 MHz, Ant. 2

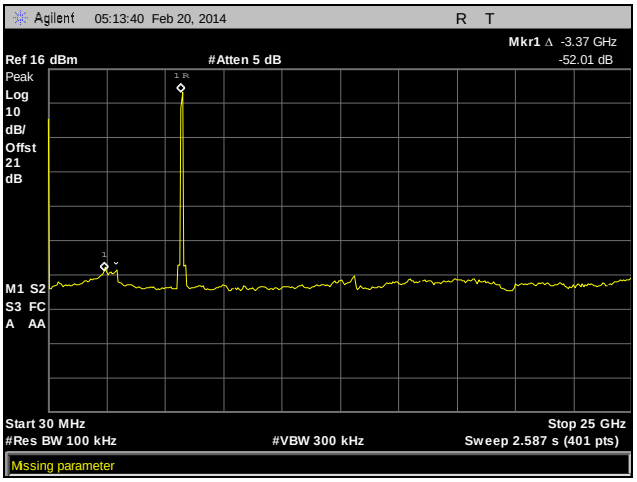


Plot 414. Conducted Spurious Emissions, Mid Channel, 802.11a 20 MHz, Ant. 2

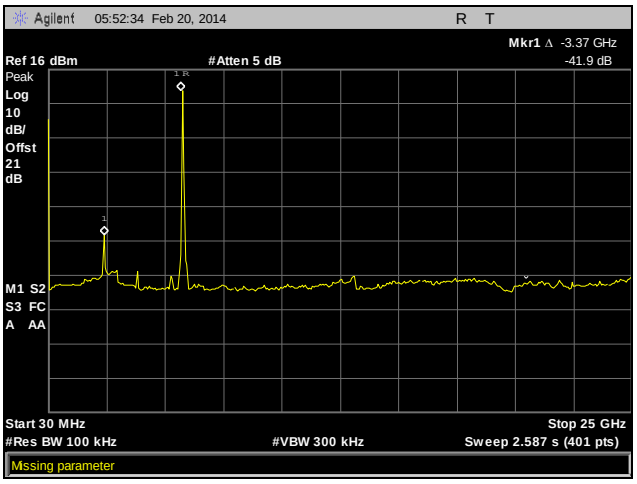


Plot 415. Conducted Spurious Emissions, High Channel, 802.11a 20 MHz, Ant. 2

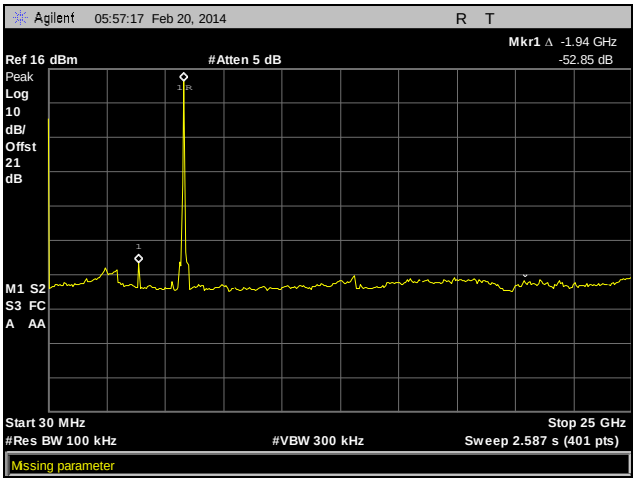
Conducted Spurious Emissions Test Results, 802.11ac 20 MHz



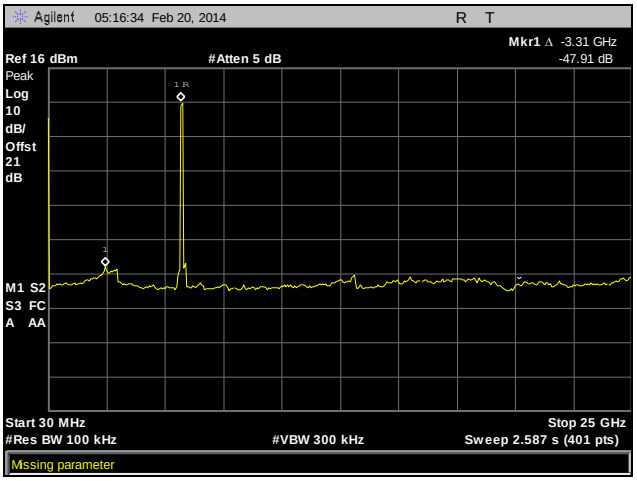
Plot 416. Conducted Spurious Emissions, Low Channel, 802.11ac 20 MHz, Ant. 0



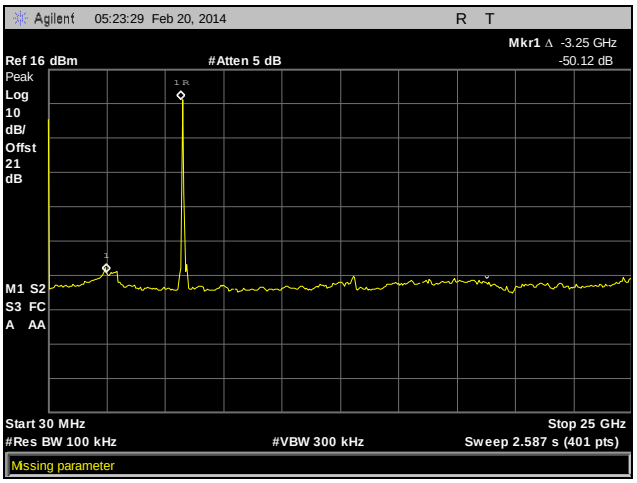
Plot 417. Conducted Spurious Emissions, Mid Channel, 802.11ac 20 MHz, Ant. 0



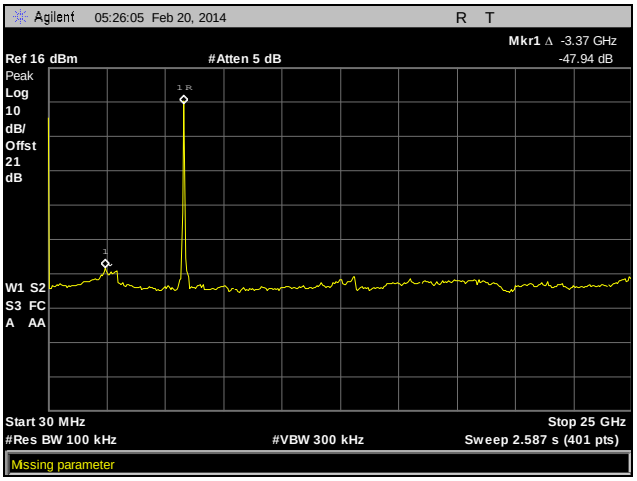
Plot 418. Conducted Spurious Emissions, High Channel, 802.11ac 20 MHz, Ant. 0



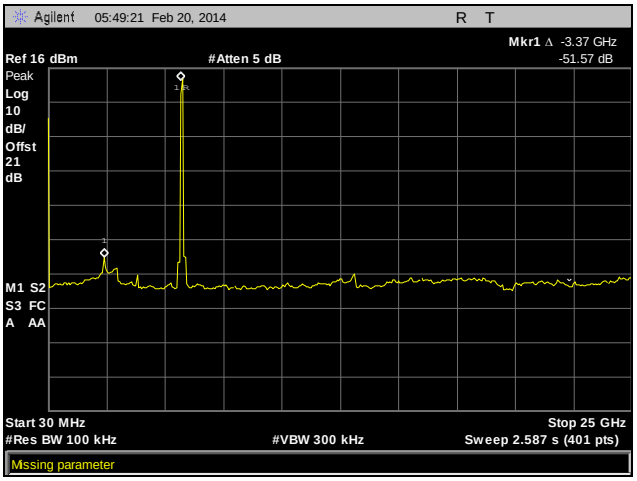
Plot 419. Conducted Spurious Emissions, Low Channel, 802.11ac 20 MHz, Ant. 1



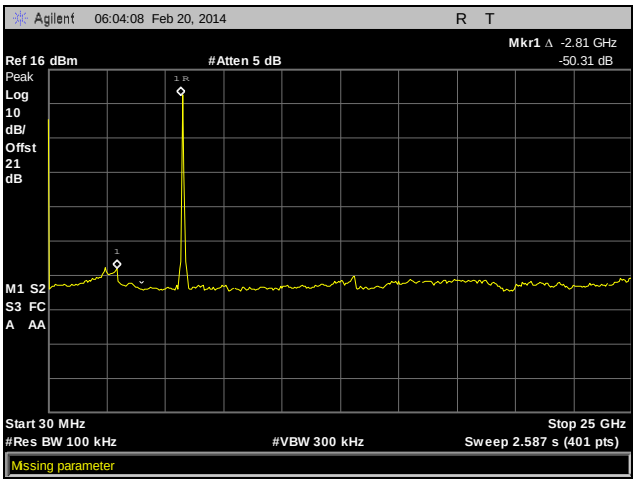
Plot 420. Conducted Spurious Emissions, Mid Channel, 802.11ac 20 MHz, Ant. 1



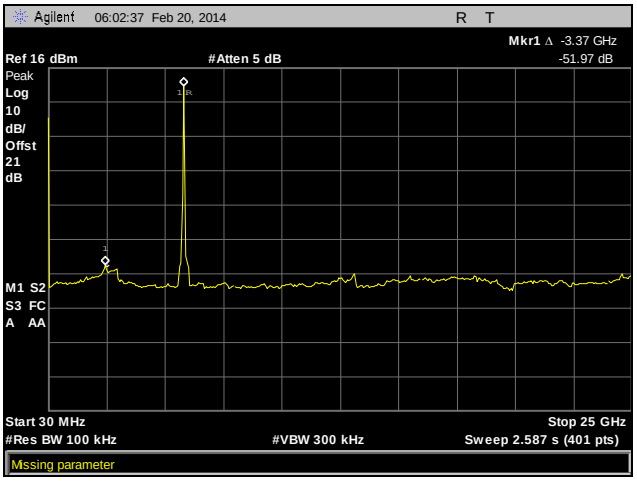
Plot 421. Conducted Spurious Emissions, High Channel, 802.11ac 20 MHz, Ant. 1



Plot 422. Conducted Spurious Emissions, Low Channel, 802.11ac 20 MHz, Ant. 2

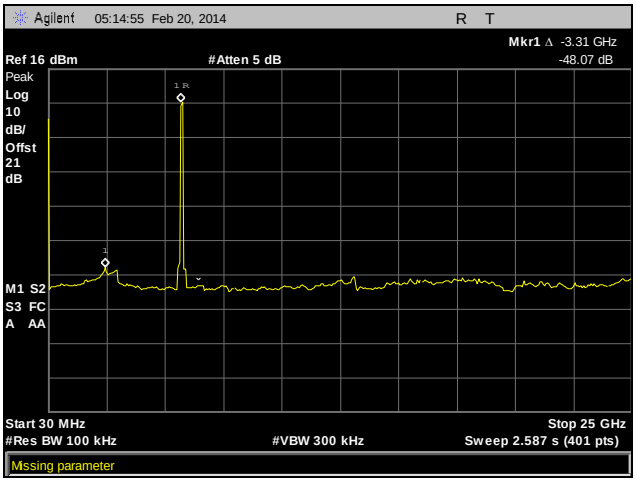


Plot 423. Conducted Spurious Emissions, Mid Channel, 802.11ac 20 MHz, Ant. 2

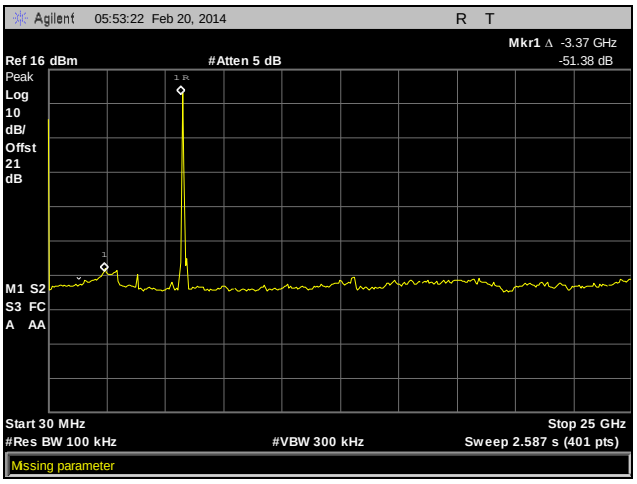


Plot 424. Conducted Spurious Emissions, High Channel, 802.11ac 20 MHz, Ant. 2

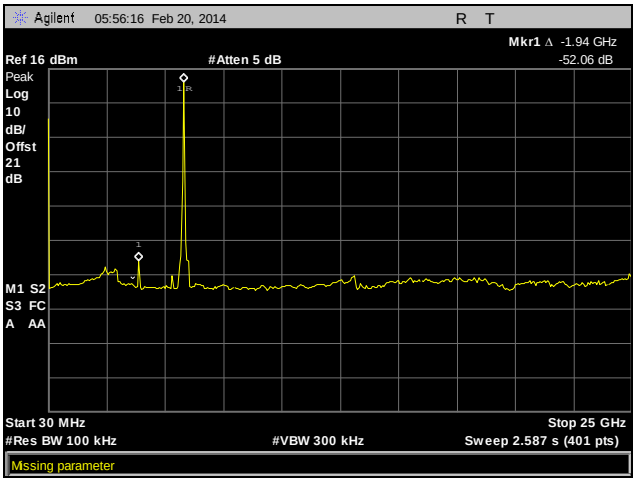
Conducted Spurious Emissions Test Results, 802.11n 20 MHz



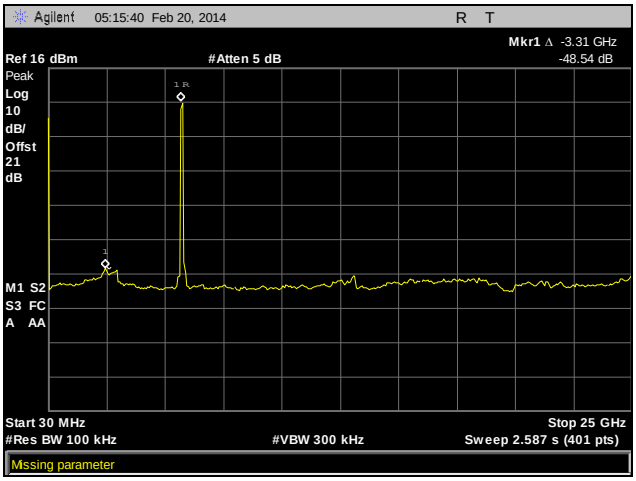
Plot 425. Conducted Spurious Emissions, Low Channel, 802.11n 20 MHz, Ant. 0



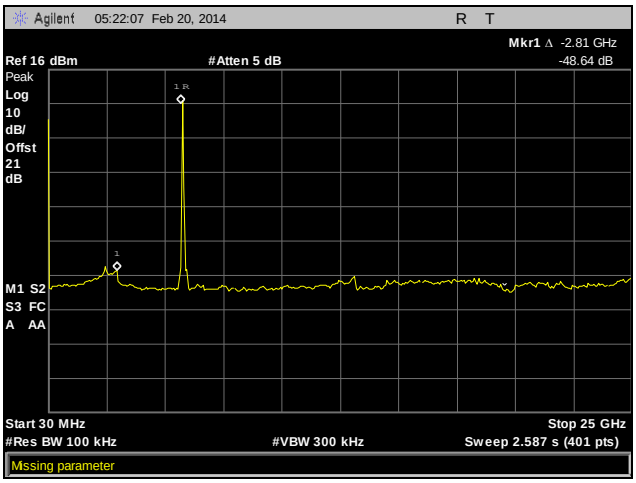
Plot 426. Conducted Spurious Emissions, Mid Channel, 802.11n 20 MHz, Ant. 0



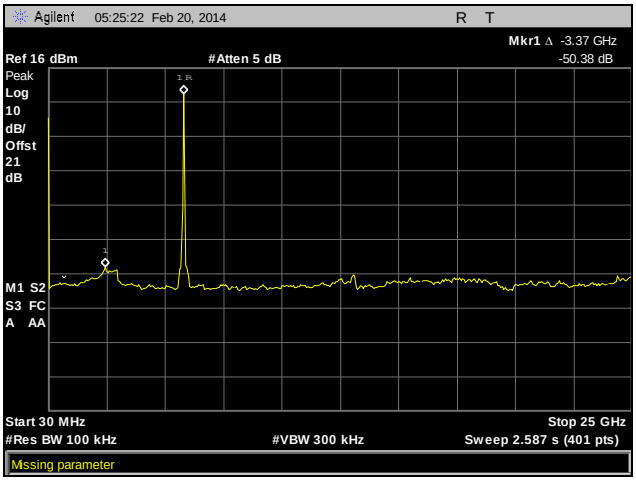
Plot 427. Conducted Spurious Emissions, High Channel, 802.11n 20 MHz, Ant. 0



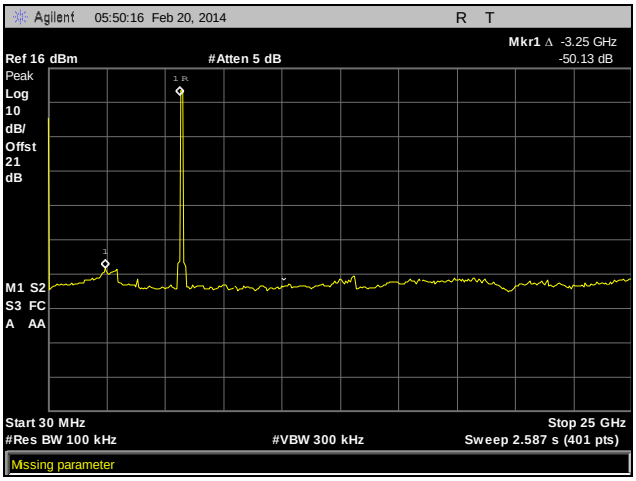
Plot 428. Conducted Spurious Emissions, Low Channel, 802.11n 20 MHz, Ant. 1



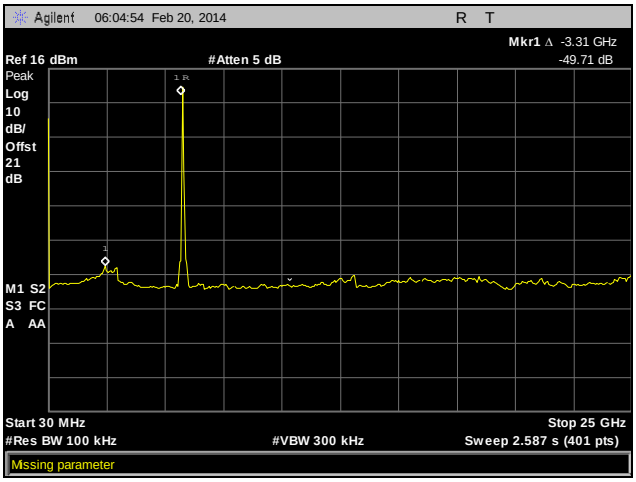
Plot 429. Conducted Spurious Emissions, Mid Channel, 802.11n 20 MHz, Ant. 1



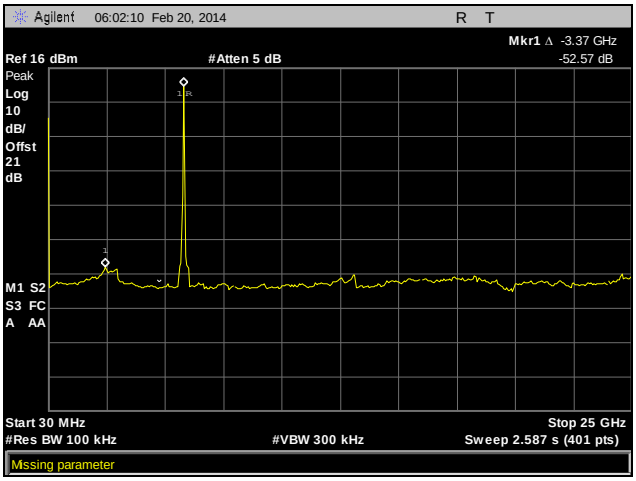
Plot 430. Conducted Spurious Emissions, High Channel, 802.11n 20 MHz, Ant. 1



Plot 431. Conducted Spurious Emissions, Low Channel, 802.11n 20 MHz, Ant. 2

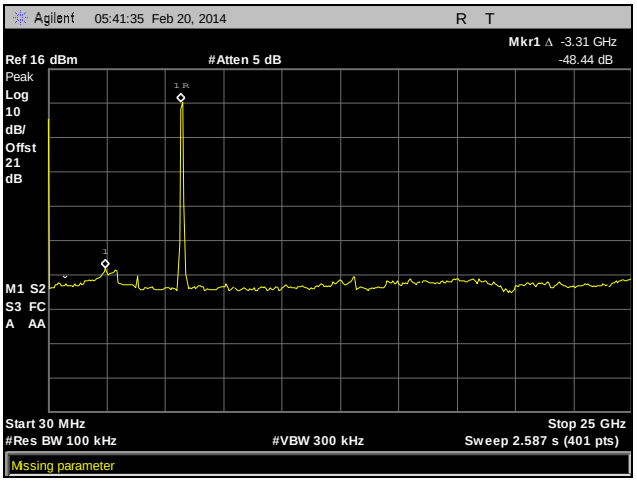


Plot 432. Conducted Spurious Emissions, Mid Channel, 802.11n 20 MHz, Ant. 2

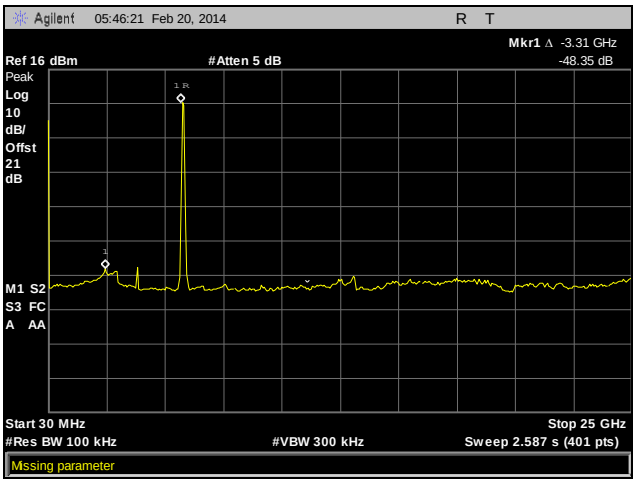


Plot 433. Conducted Spurious Emissions, High Channel, 802.11n 20 MHz, Ant. 2

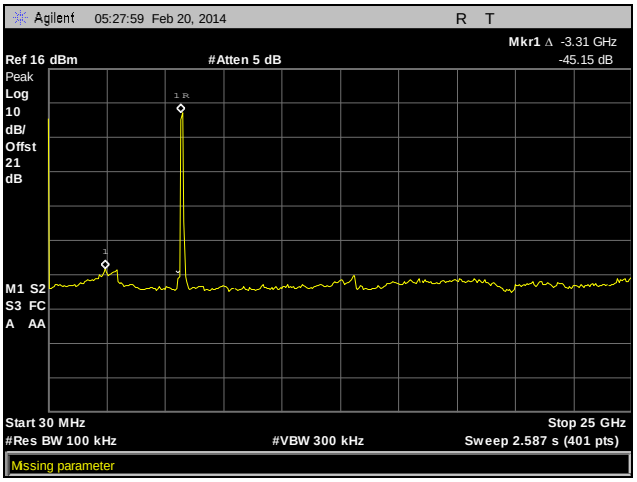
Conducted Spurious Emissions Test Results, 802.11a 40 MHz



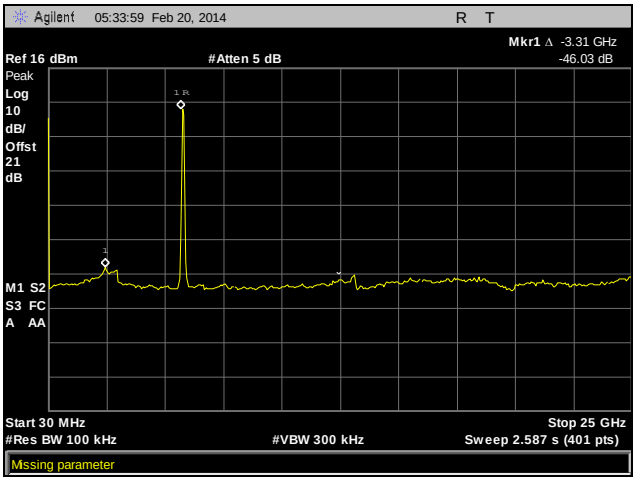
Plot 434. Conducted Spurious Emissions, Low Channel, 802.11a 40 MHz, Ant. 0



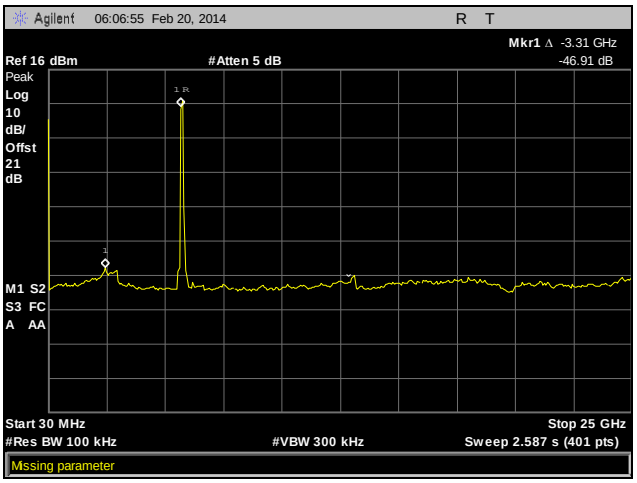
Plot 435. Conducted Spurious Emissions, High Channel, 802.11a 40 MHz, Ant. 0



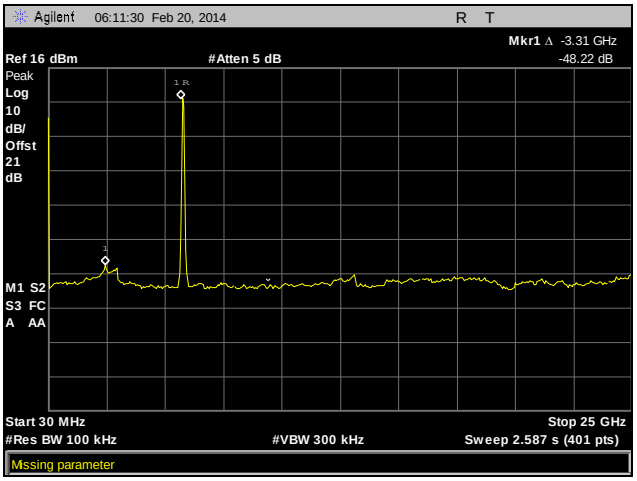
Plot 436. Conducted Spurious Emissions, Low Channel, 802.11a 40 MHz, Ant. 1



Plot 437. Conducted Spurious Emissions, High Channel, 802.11a 40 MHz, Ant. 1

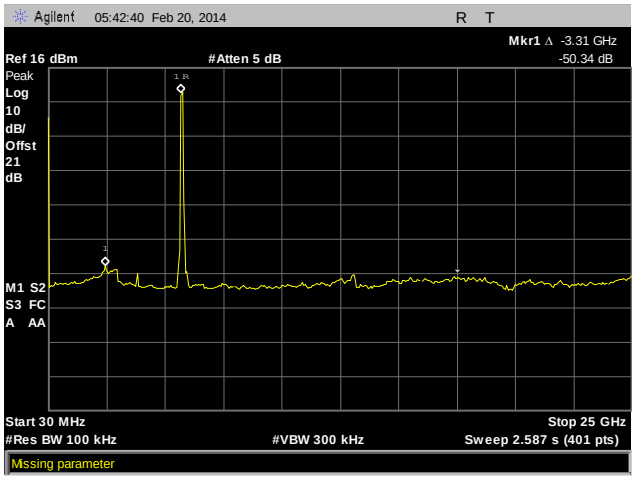


Plot 438. Conducted Spurious Emissions, Low Channel, 802.11a 40 MHz, Ant. 2

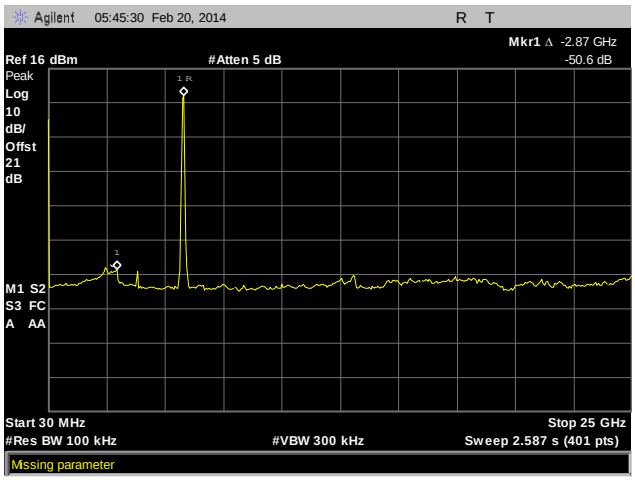


Plot 439. Conducted Spurious Emissions, High Channel, 802.11a 40 MHz, Ant. 2

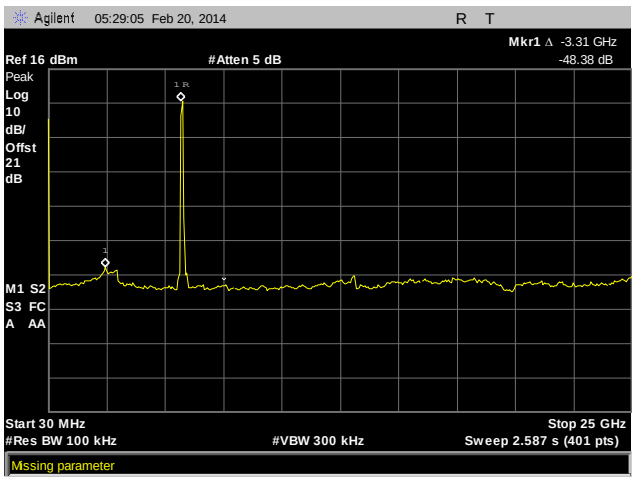
Conducted Spurious Emissions Test Results, 802.11ac 40 MHz



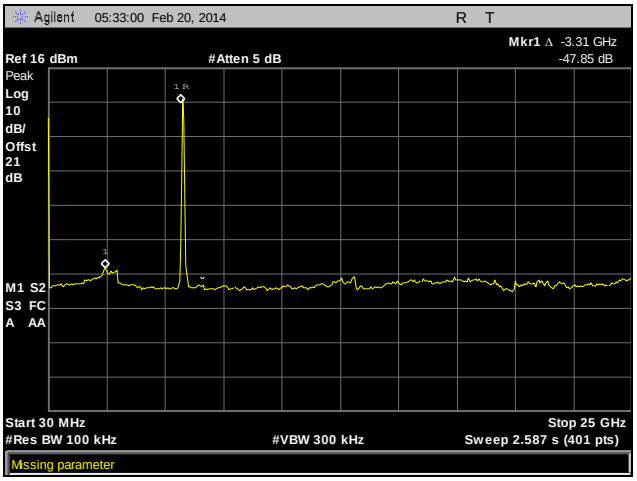
Plot 440. Conducted Spurious Emissions, Low Channel, 802.11ac 40 MHz, Ant. 0



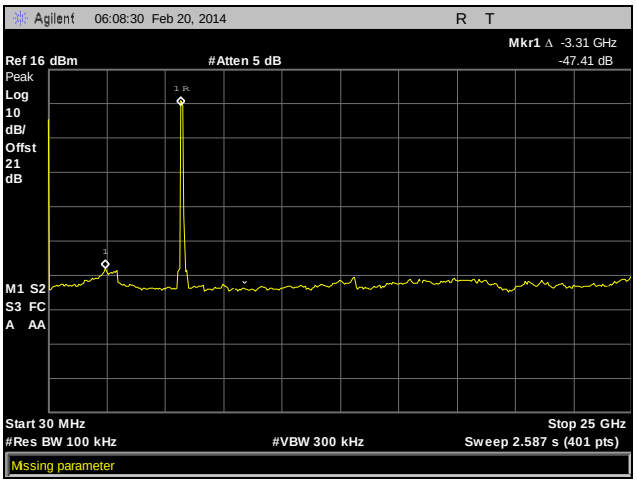
Plot 441. Conducted Spurious Emissions, High Channel, 802.11ac 40 MHz, Ant. 0



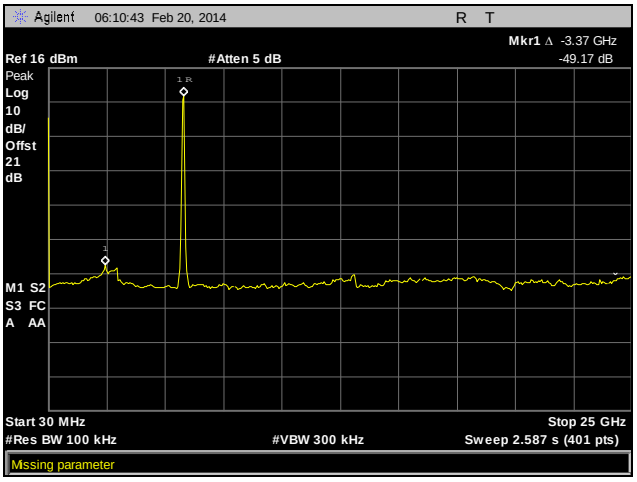
Plot 442. Conducted Spurious Emissions, Low Channel, 802.11ac 40 MHz, Ant. 1



Plot 443. Conducted Spurious Emissions, High Channel, 802.11ac 40 MHz, Ant. 1

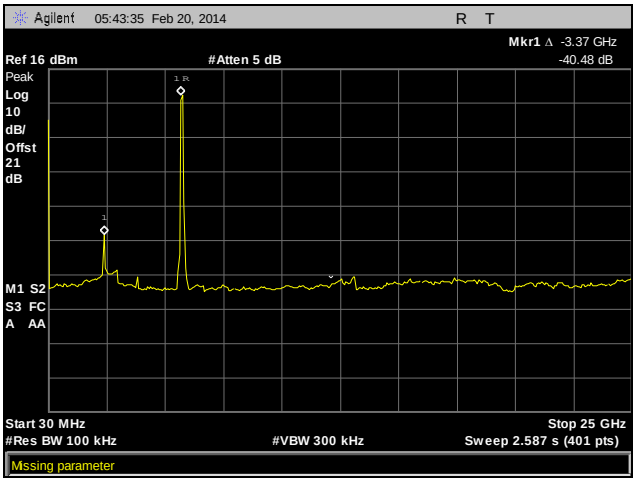


Plot 444. Conducted Spurious Emissions, Low Channel, 802.11ac 40 MHz, Ant. 2

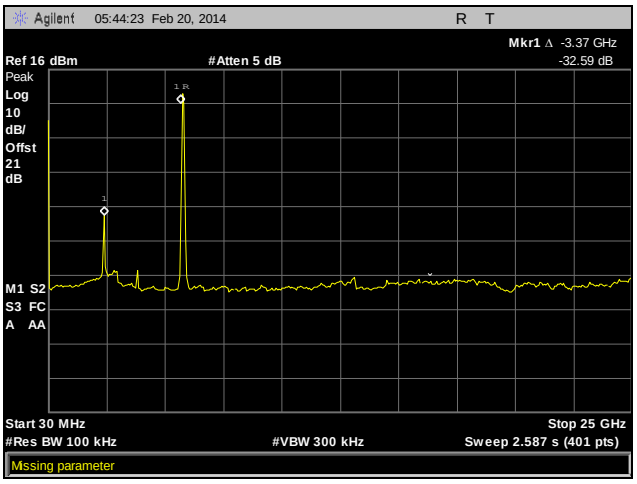


Plot 445. Conducted Spurious Emissions, High Channel, 802.11ac 40 MHz, Ant. 2

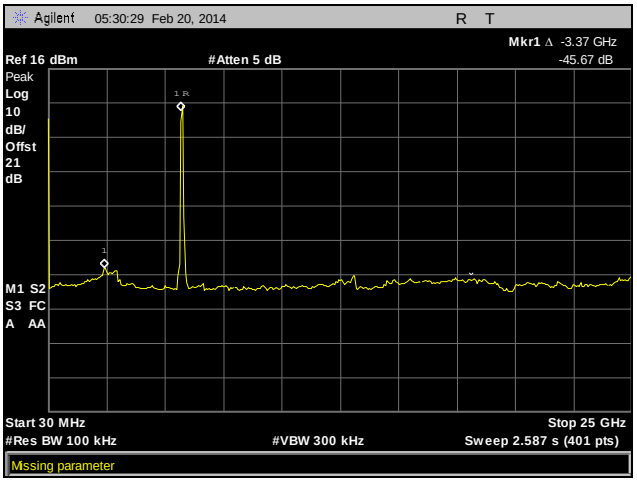
Conducted Spurious Emissions Test Results, 802.11n 40 MHz



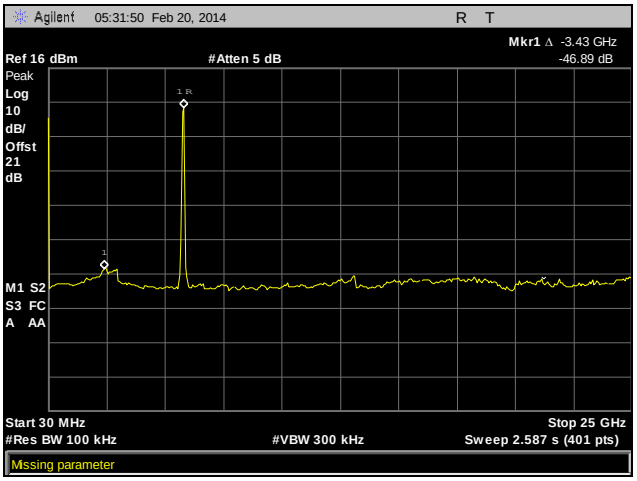
Plot 446. Conducted Spurious Emissions, Low Channel, 802.11n 40 MHz, Ant. 0



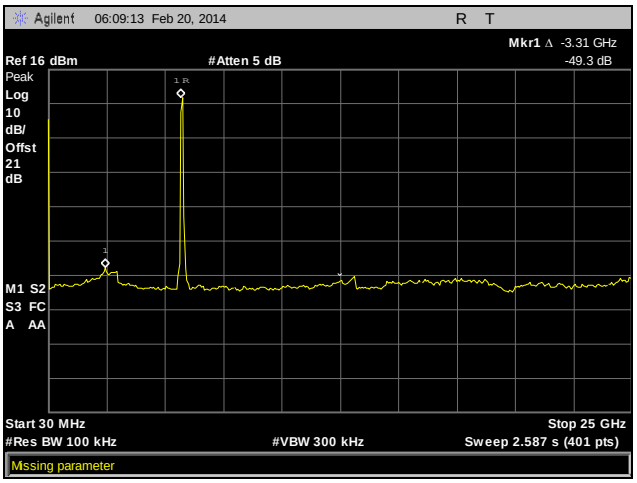
Plot 447. Conducted Spurious Emissions, High Channel, 802.11n 40 MHz, Ant. 0



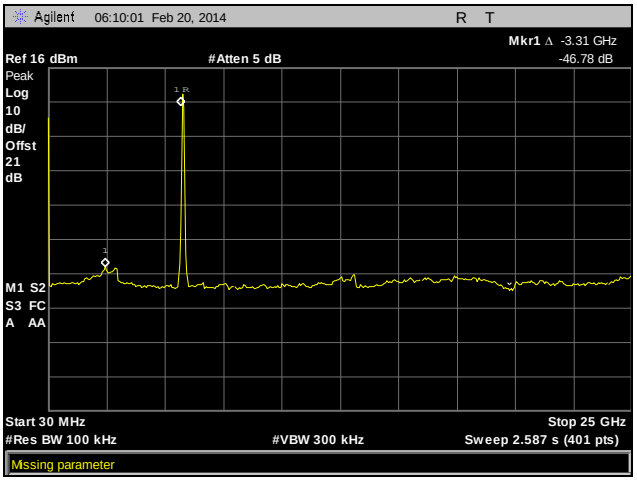
Plot 448. Conducted Spurious Emissions, Low Channel, 802.11n 40 MHz, Ant. 1



Plot 449. Conducted Spurious Emissions, High Channel, 802.11n 40 MHz, Ant. 1

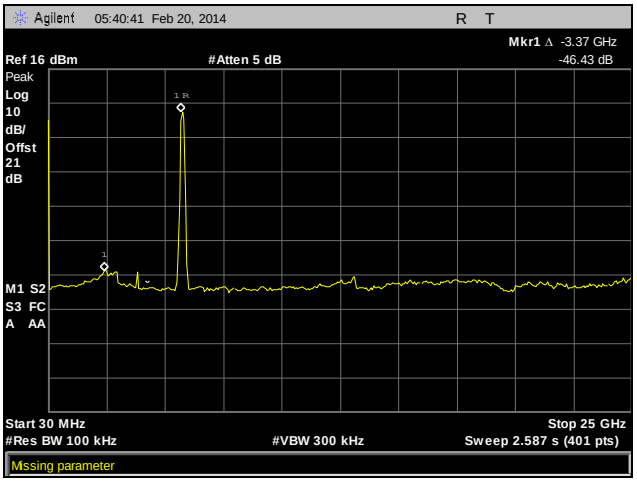


Plot 450. Conducted Spurious Emissions, Low Channel, 802.11n 40 MHz, Ant. 2

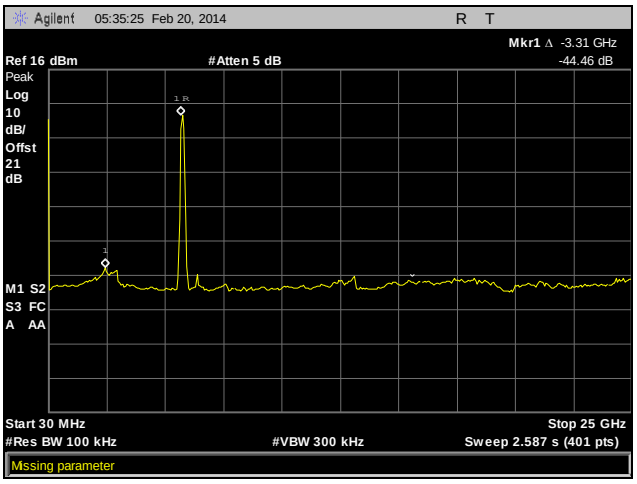


Plot 451. Conducted Spurious Emissions, High Channel, 802.11n 40 MHz, Ant. 2

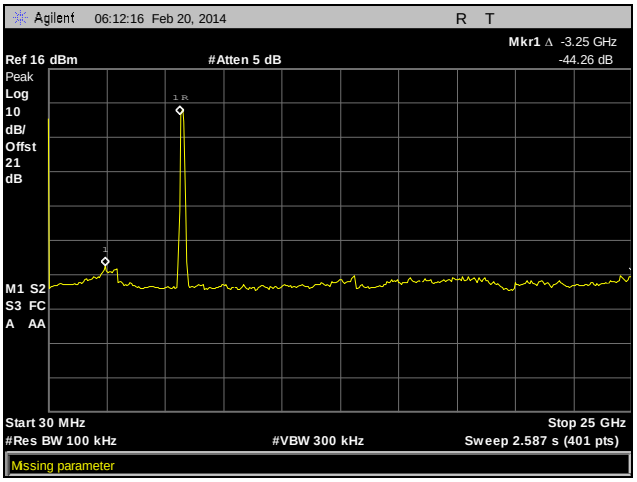
Conducted Spurious Emissions Test Results, 802.11a 80 MHz



Plot 452. Conducted Spurious Emissions, 802.11a 80 MHz, Ant. 0

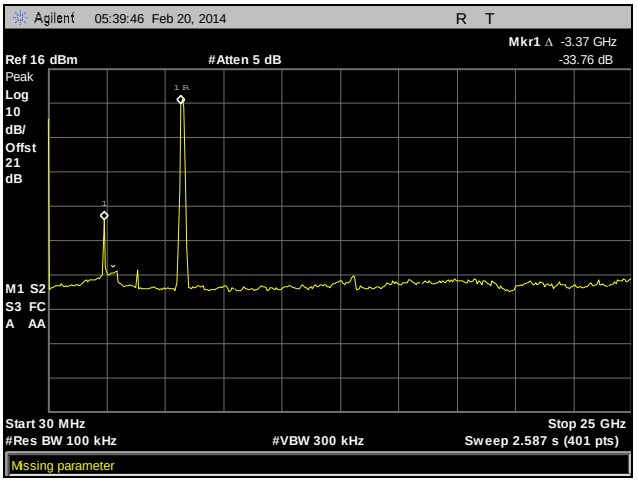


Plot 453. Conducted Spurious Emissions, 802.11a 80 MHz, Ant. 1

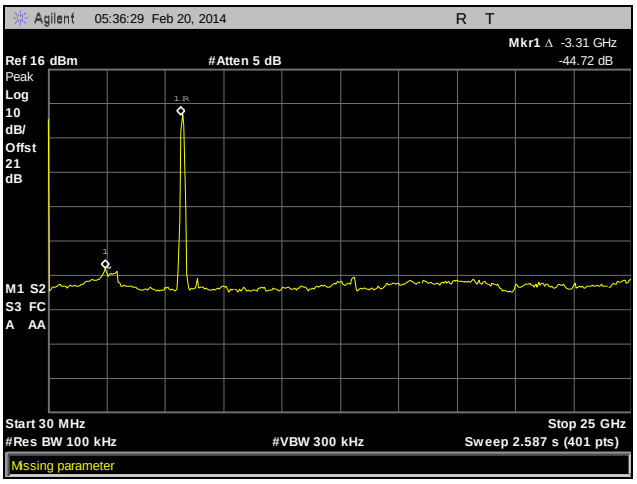


Plot 454. Conducted Spurious Emissions, 802.11a 80 MHz, Ant. 2

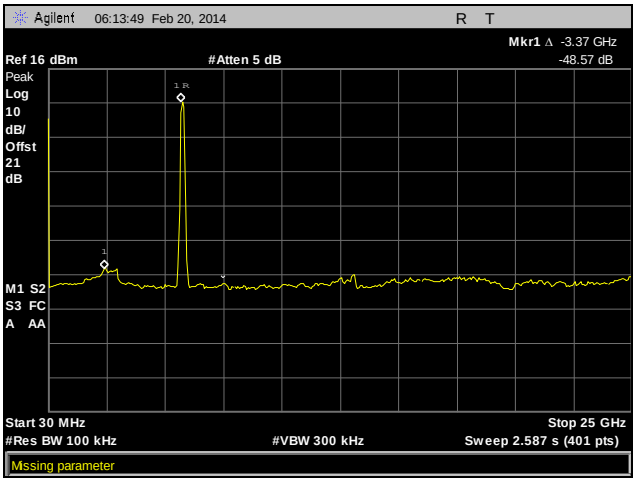
Conducted Spurious Emissions Test Results, 802.11ac 80 MHz



Plot 455. Conducted Spurious Emissions, 802.11ac 80 MHz, Ant. 0

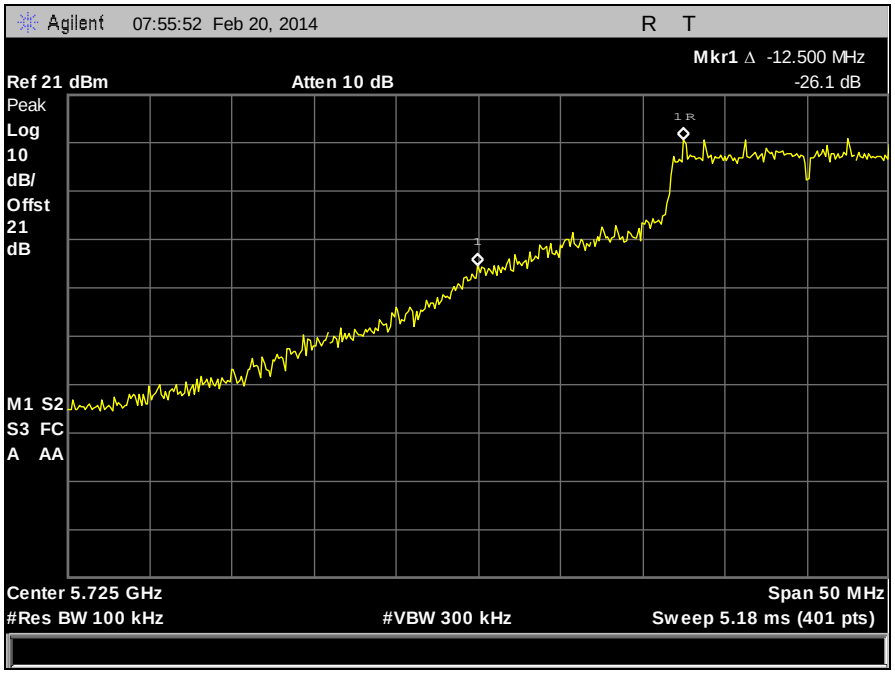


Plot 456. Conducted Spurious Emissions, 802.11ac 80 MHz, Ant. 1

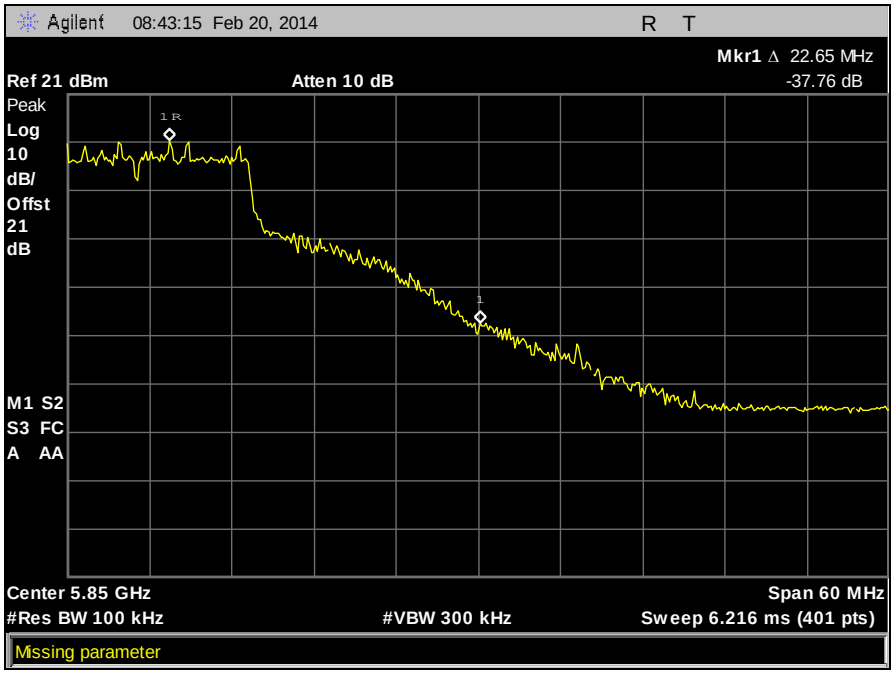


Plot 457. Conducted Spurious Emissions, 802.11ac 80 MHz, Ant. 2

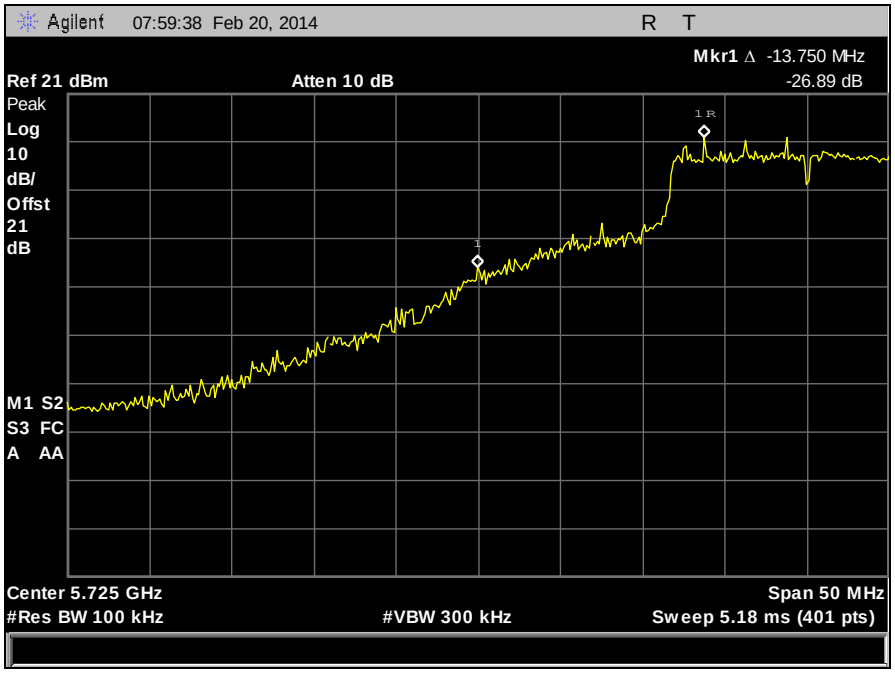
Conducted Band Edge Test Results, 802.11a



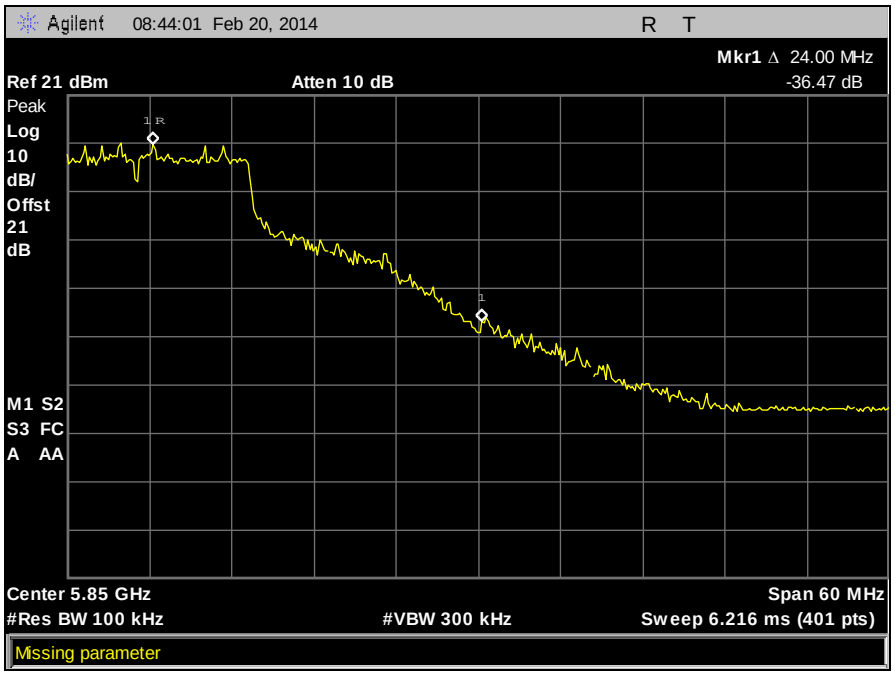
Plot 458. Conducted Band Edge, Low Channel, 802.11a, Ant. 0



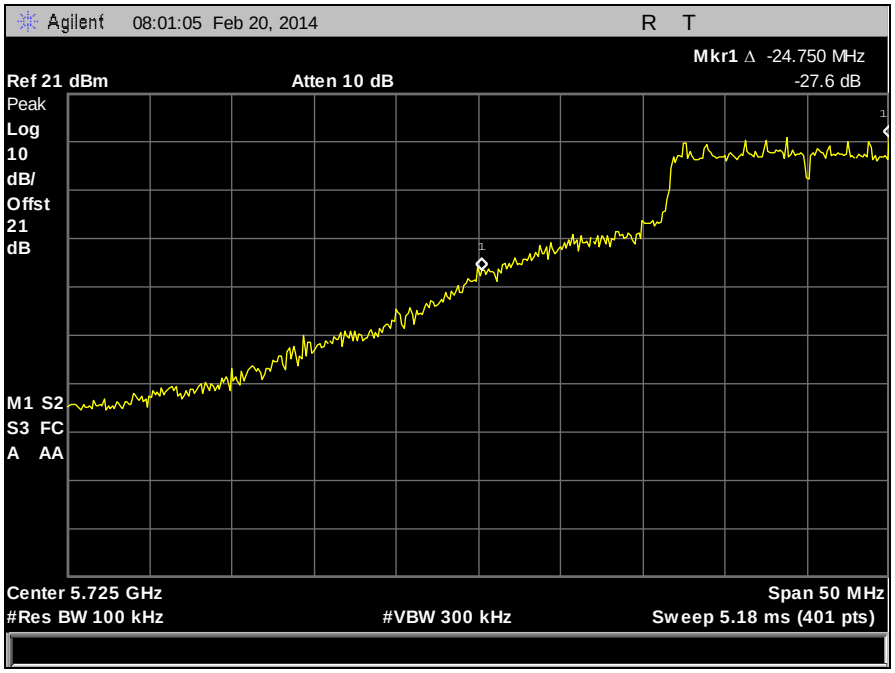
Plot 459. Conducted Band Edge, High Channel, 802.11a, Ant. 0



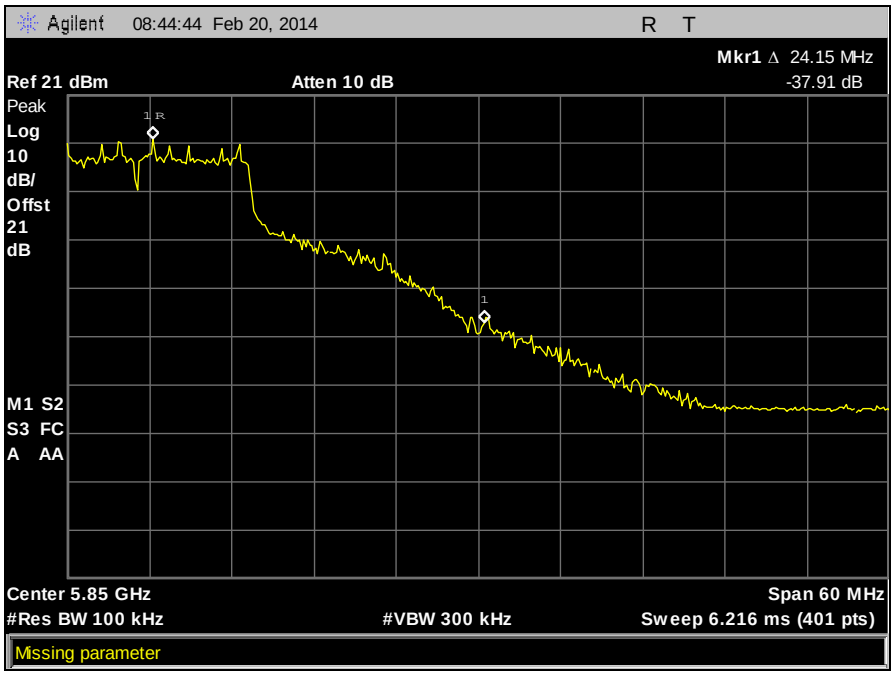
Plot 460. Conducted Band Edge, Low Channel, 802.11a, Ant. 1



Plot 461. Conducted Band Edge, High Channel, 802.11a, Ant. 1

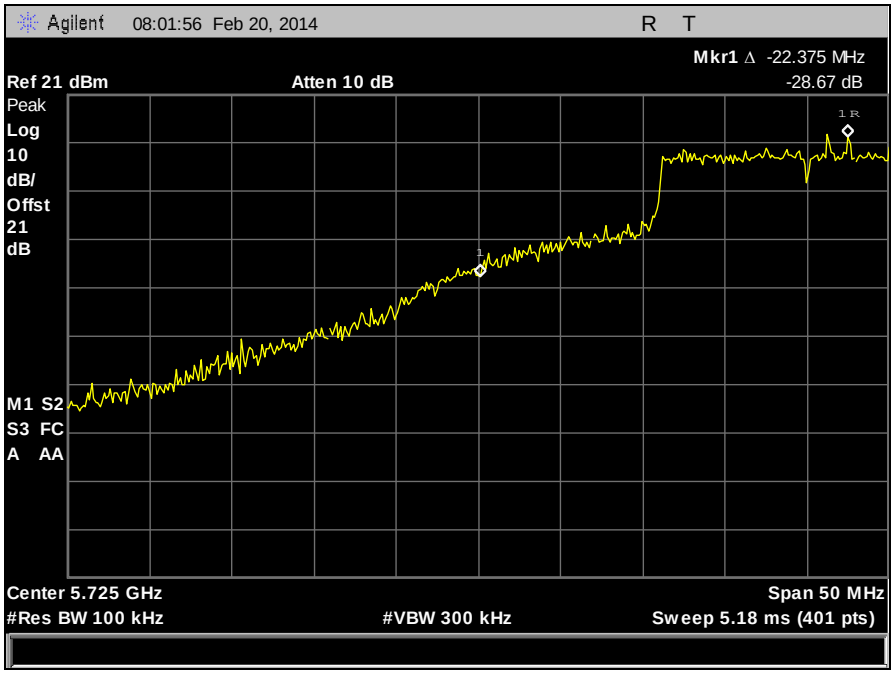


Plot 462. Conducted Band Edge, Low Channel, 802.11a, Ant. 2

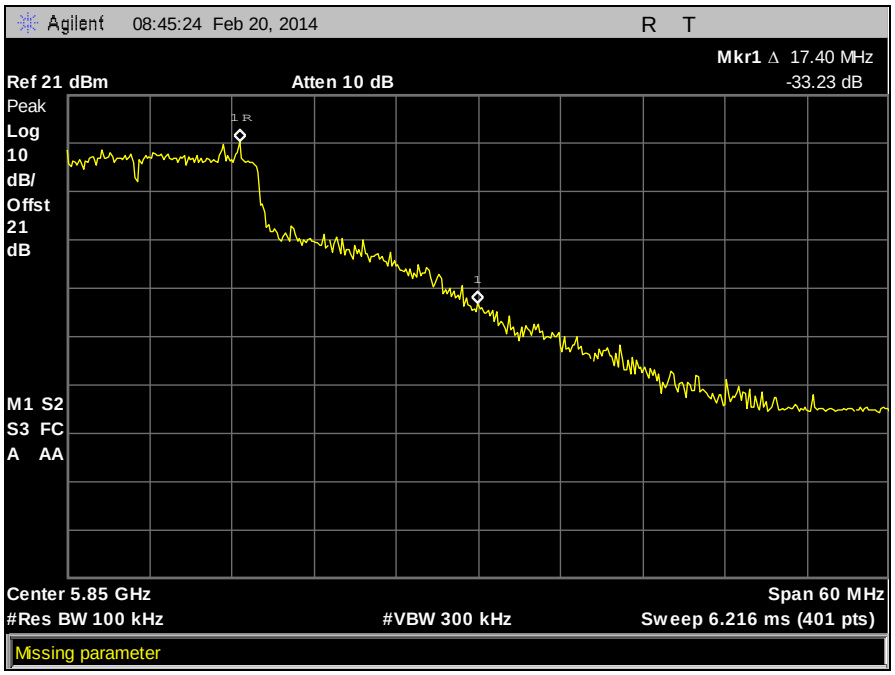


Plot 463. Conducted Band Edge, High Channel, 802.11a, Ant. 2

Conducted Band Edge Test Results, 802.11ac 20 MHz

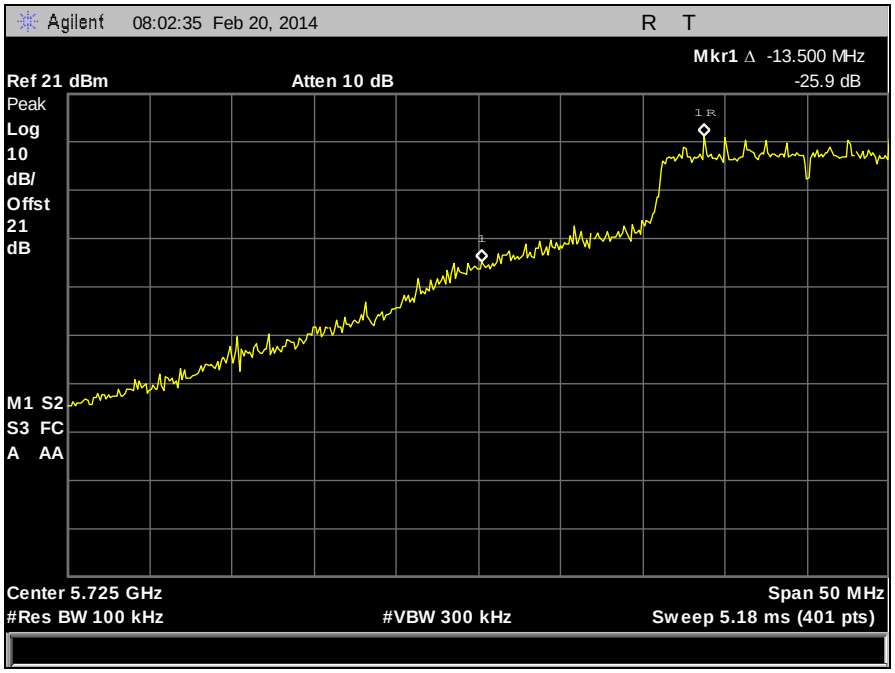


Plot 464. Conducted Band Edge, Low Channel, 802.11ac 20 MHz, Ant. 0

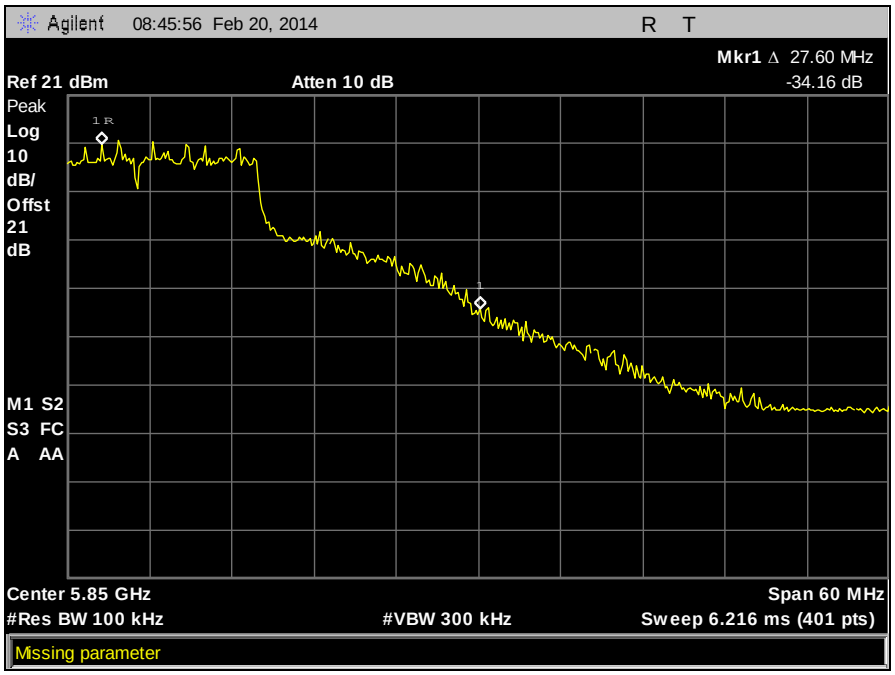


Plot 465. Conducted Band Edge, High Channel, 802.11ac 20 MHz, Ant. 0

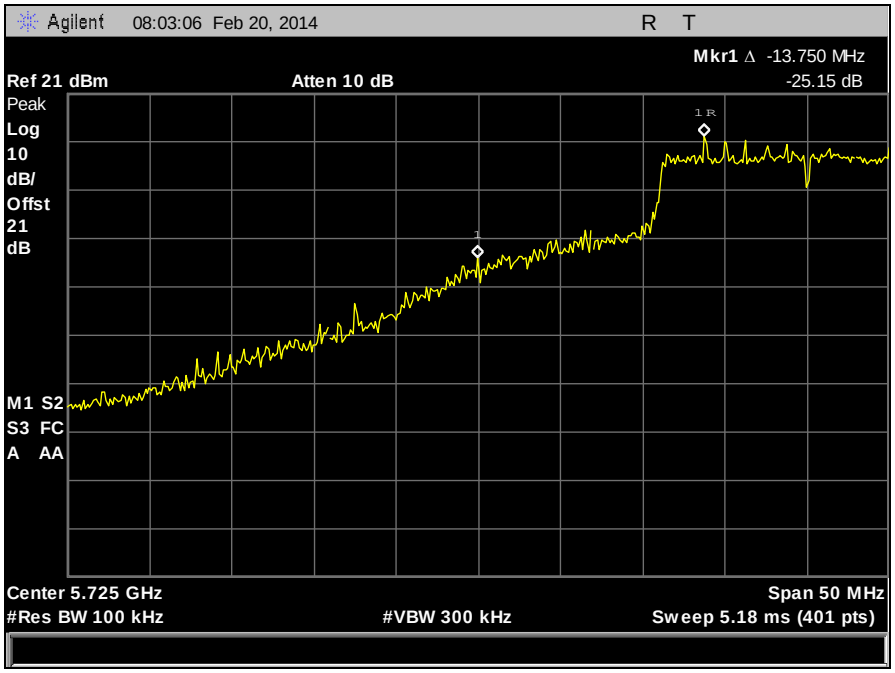
© 2014, MET Laboratories, Inc.



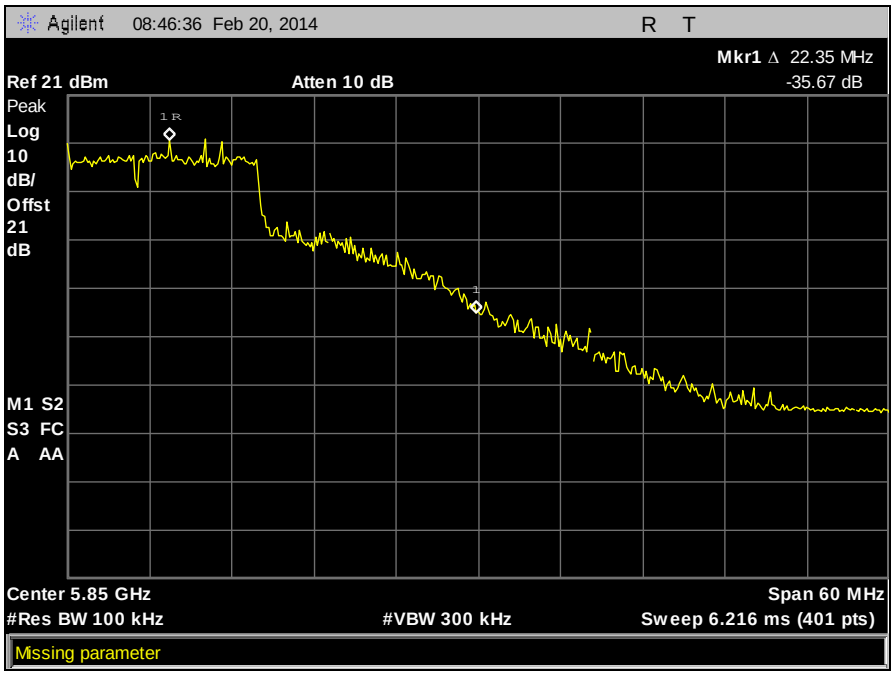
Plot 466. Conducted Band Edge, Low Channel, 802.11ac 20 MHz, Ant. 1



Plot 467. Conducted Band Edge, High Channel, 802.11ac 20 MHz, Ant. 1

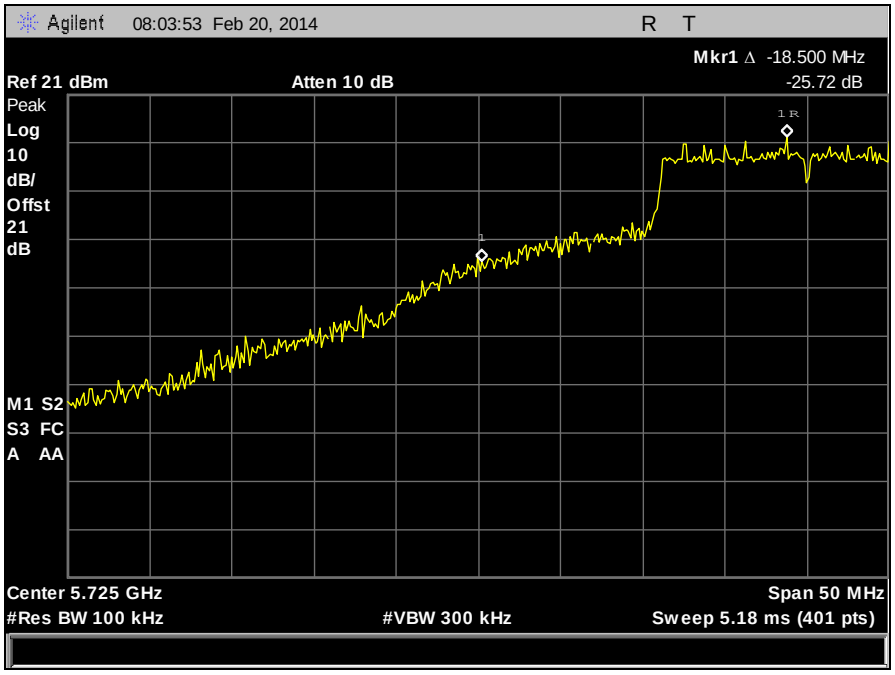


Plot 468. Conducted Band Edge, Low Channel, 802.11ac 20 MHz, Ant. 2

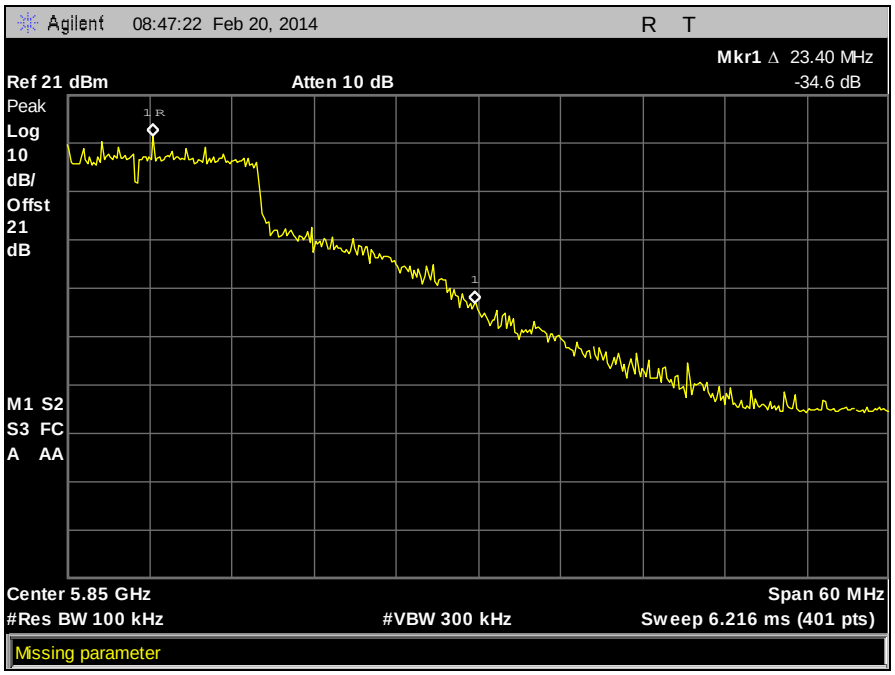


Plot 469. Conducted Band Edge, High Channel, 802.11ac 20 MHz, Ant. 2

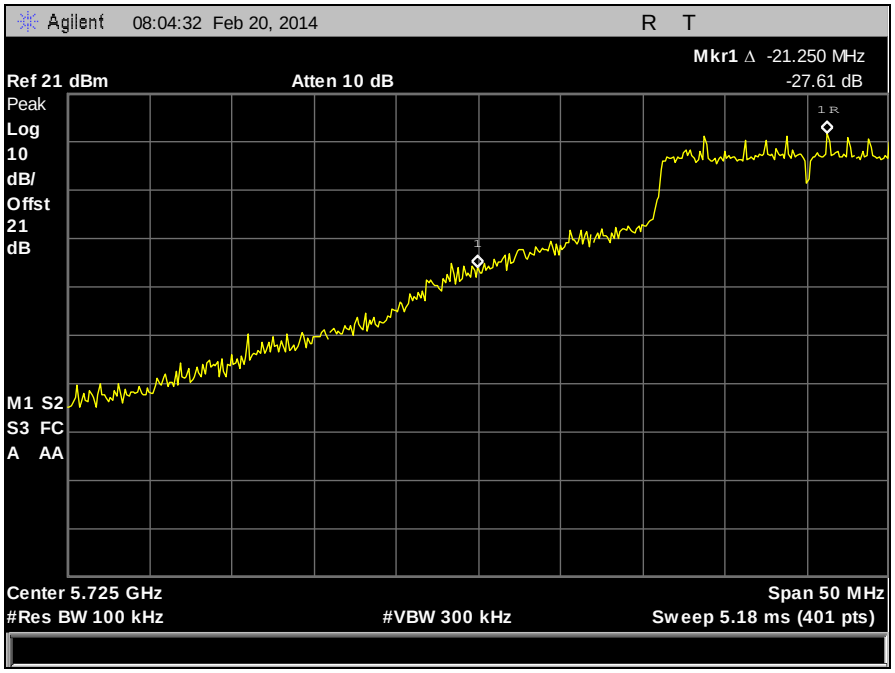
Conducted Band Edge Test Results, 802.11n 20 MHz



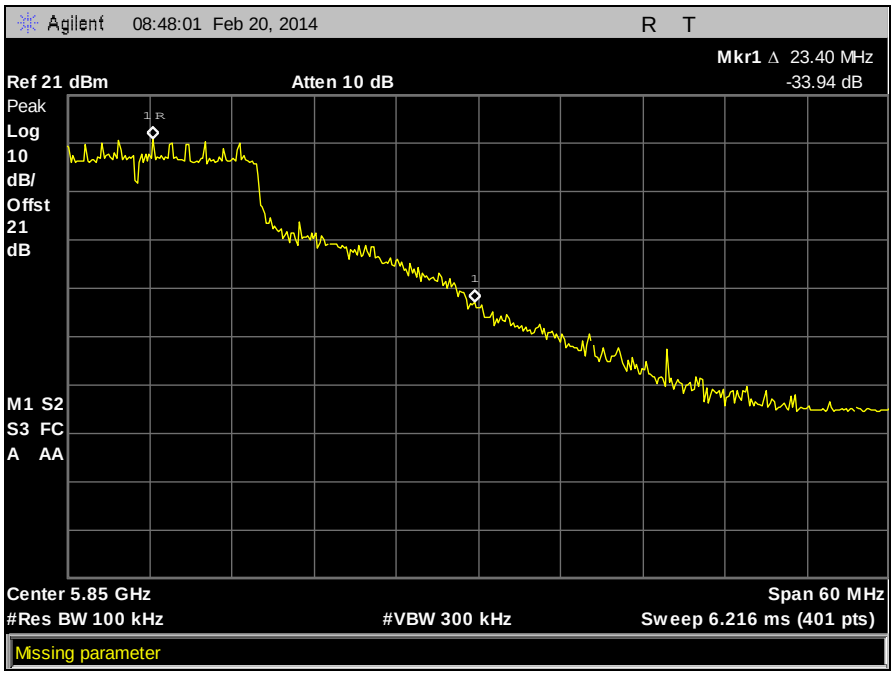
Plot 470. Conducted Band Edge, Low Channel, 802.11n 20 MHz, Ant. 0



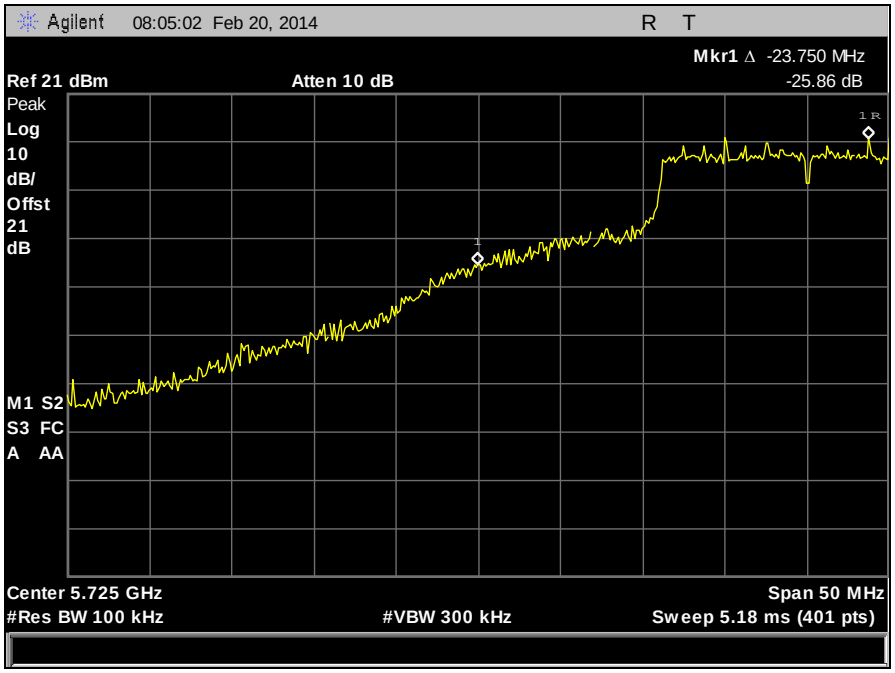
Plot 471. Conducted Band Edge, High Channel, 802.11n 20 MHz, Ant. 0



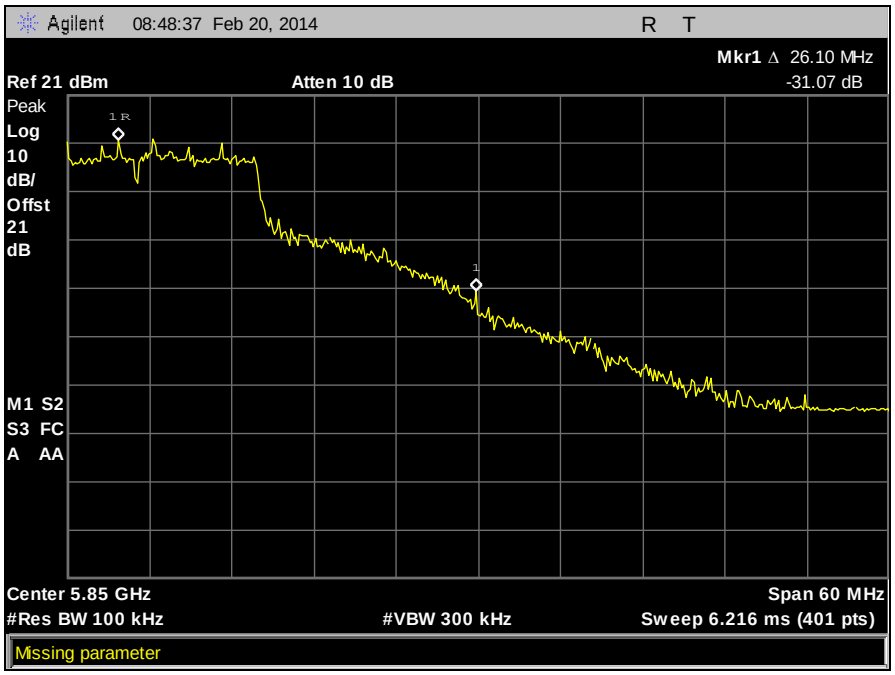
Plot 472. Conducted Band Edge, Low Channel, 802.11n 20 MHz, Ant. 1



Plot 473. Conducted Band Edge, High Channel, 802.11n 20 MHz, Ant. 1

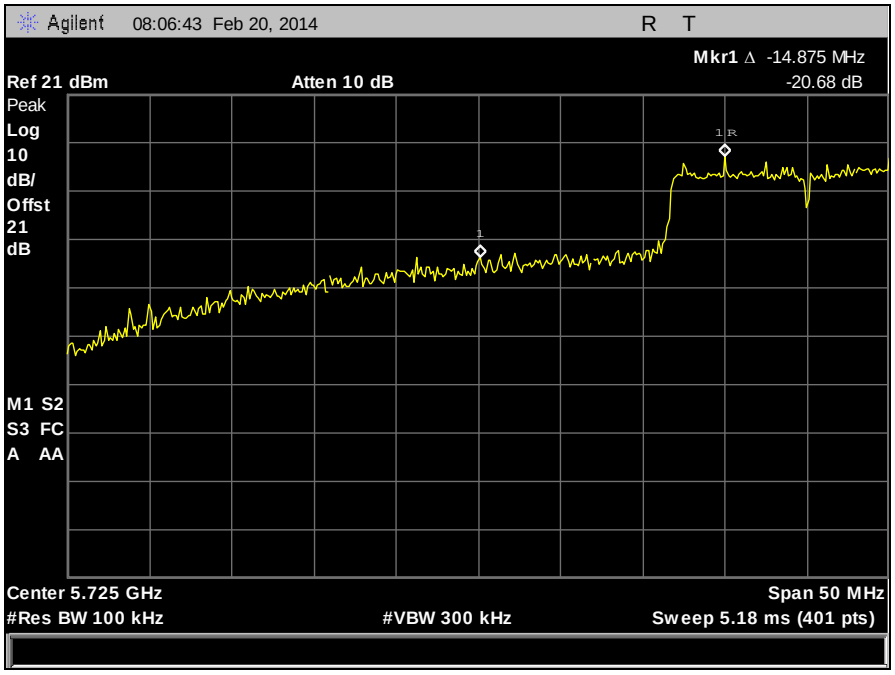


Plot 474. Conducted Band Edge, Low Channel, 802.11n 20 MHz, Ant. 2

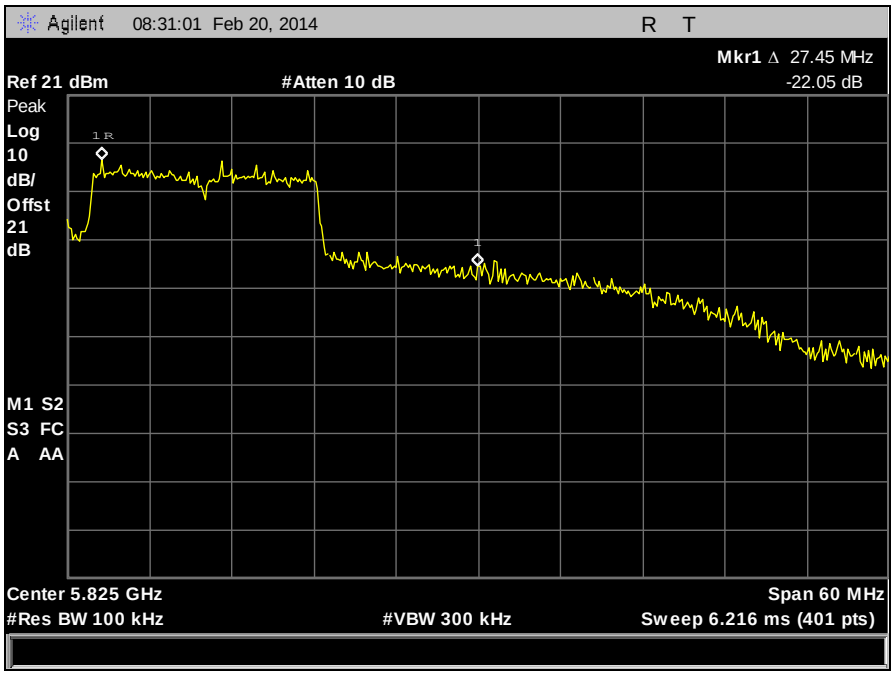


Plot 475. Conducted Band Edge, High Channel, 802.11n 20 MHz, Ant. 2

Conducted Band Edge Test Results, 802.11a 40 MHz

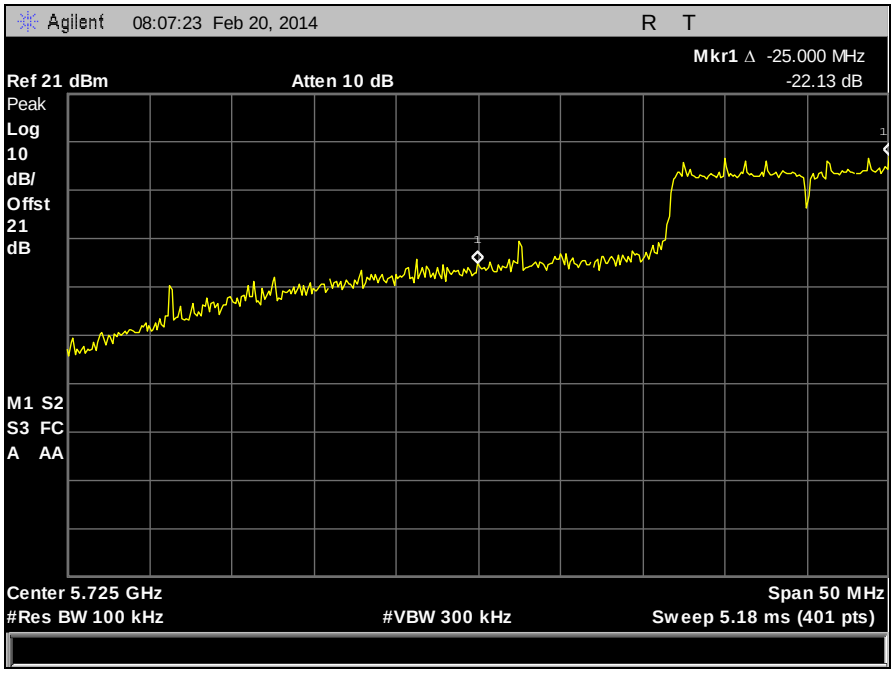


Plot 476. Conducted Band Edge, Low Channel, 802.11a 40 MHz, Ant. 0

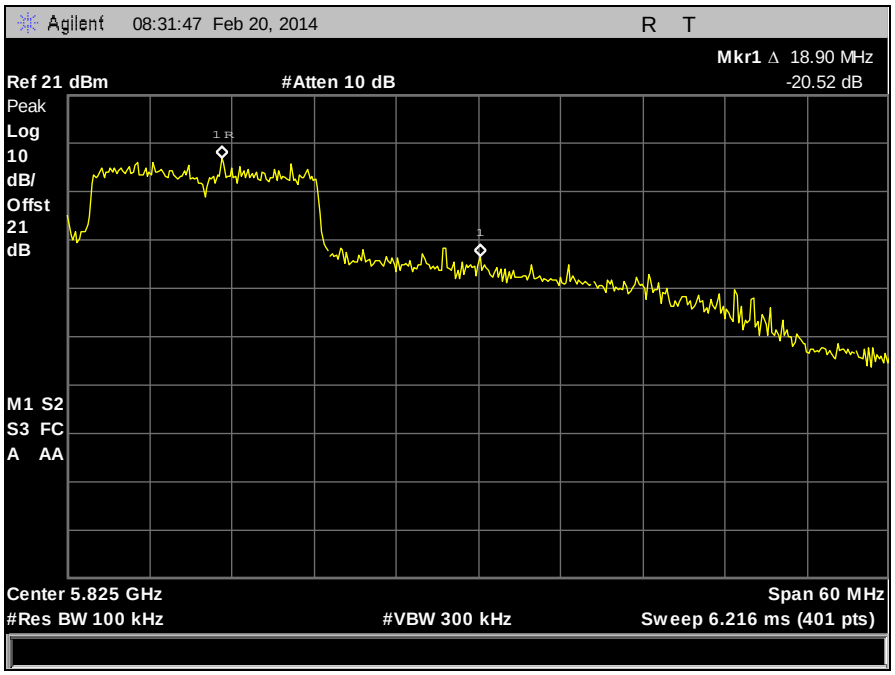


Plot 477. Conducted Band Edge, High Channel, 802.11a 40 MHz, Ant. 0

© 2014, MET Laboratories, Inc.

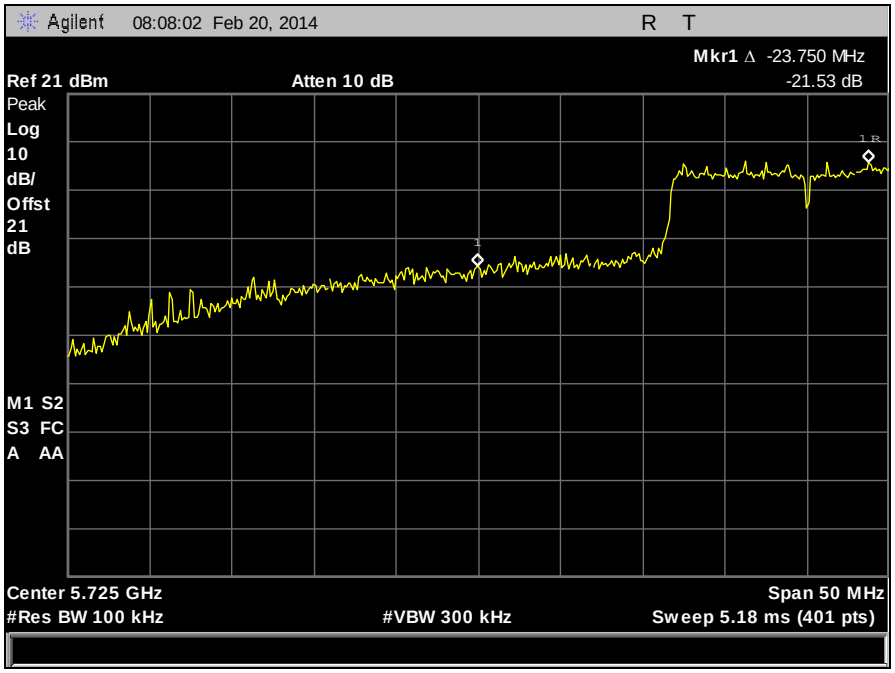


Plot 478. Conducted Band Edge, Low Channel, 802.11a 40 MHz, Ant. 1

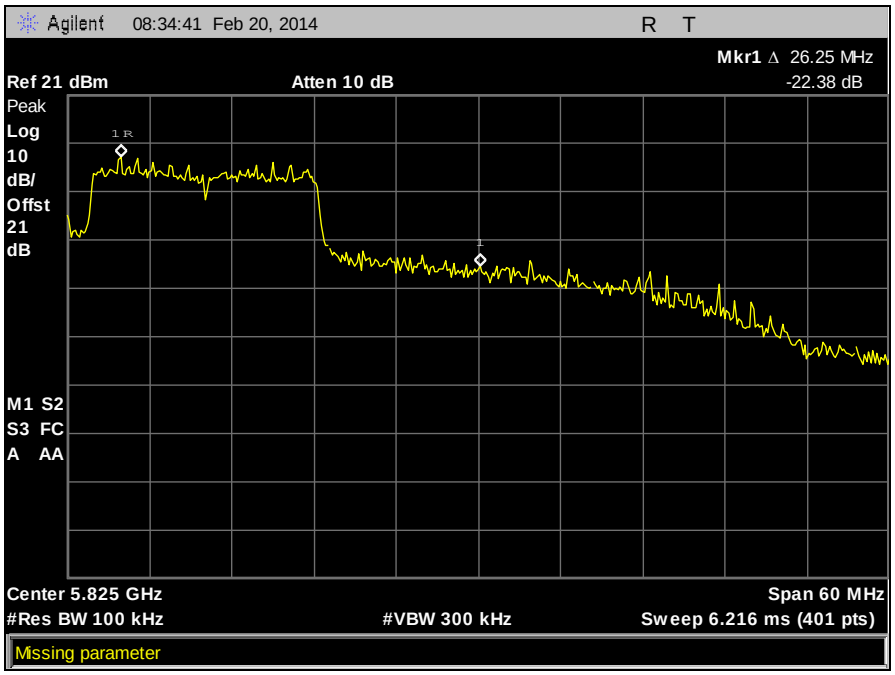


Plot 479. Conducted Band Edge, High Channel, 802.11a 40 MHz, Ant. 1

© 2014, MET Laboratories, Inc.

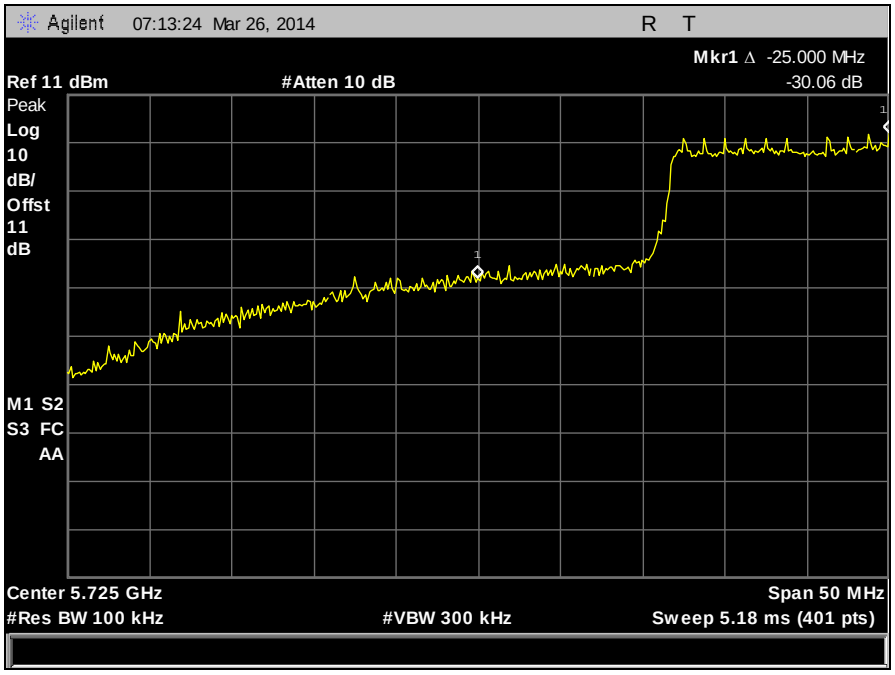


Plot 480. Conducted Band Edge, Low Channel, 802.11a 40 MHz, Ant. 2

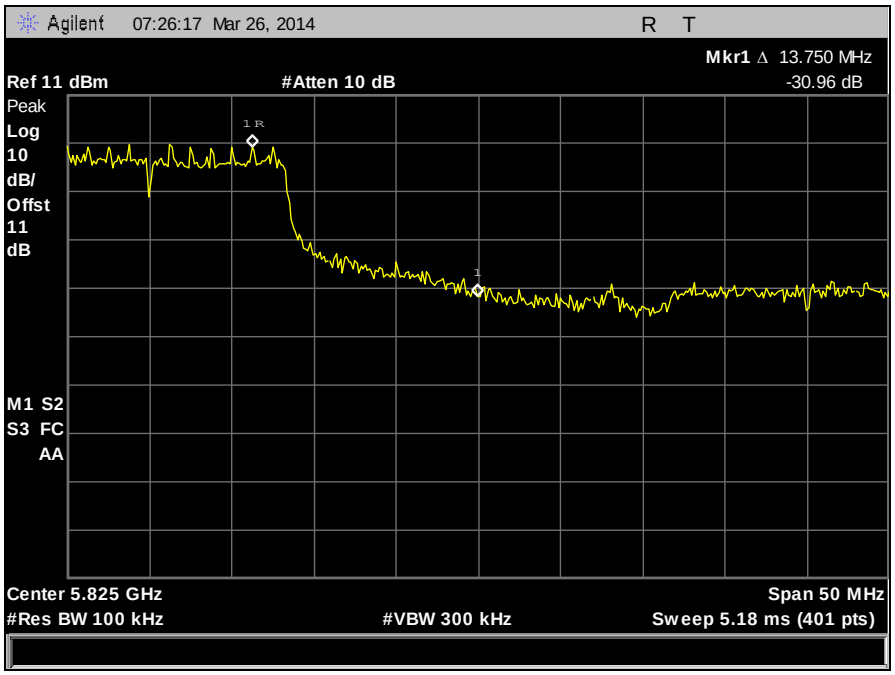


Plot 481. Conducted Band Edge, High Channel, 802.11a 40 MHz, Ant. 2

Conducted Band Edge Test Results, 802.11ac 40 MHz

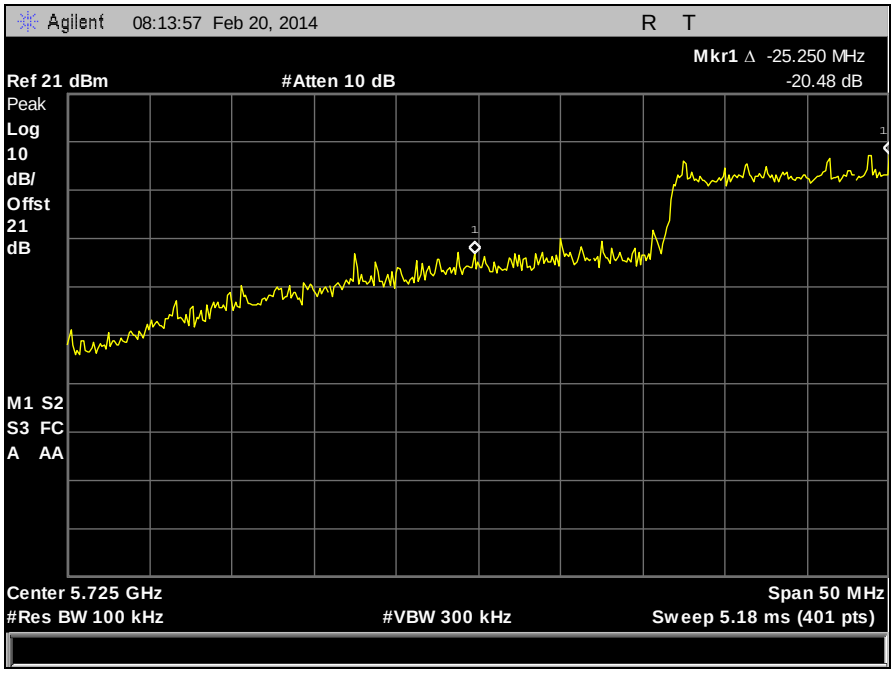


Plot 482. Conducted Band Edge, Low Channel, 802.11ac 40 MHz, Ant. 0

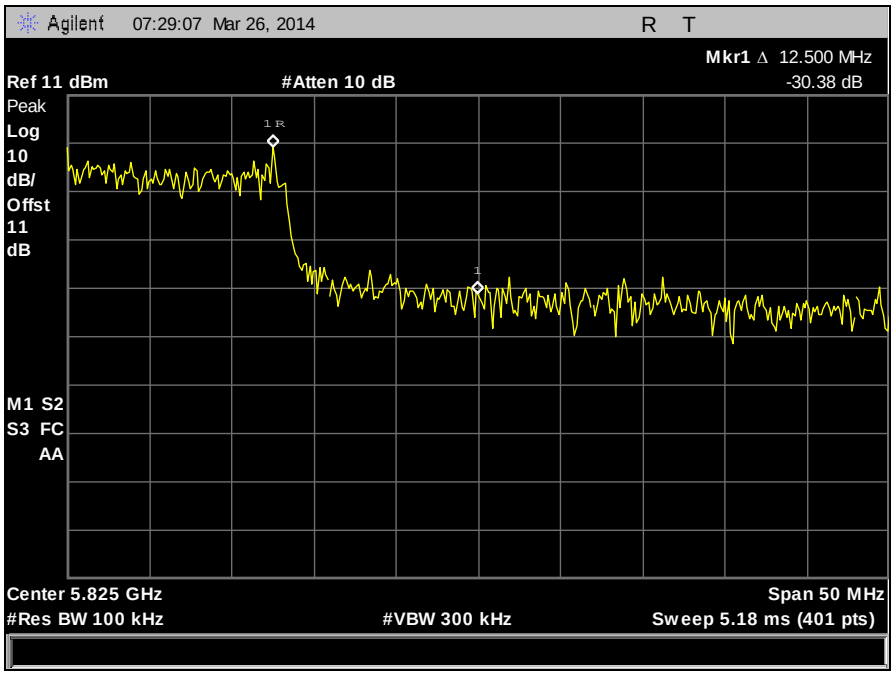


Plot 483. Conducted Band Edge, High Channel, 802.11ac 40 MHz, Ant. 0

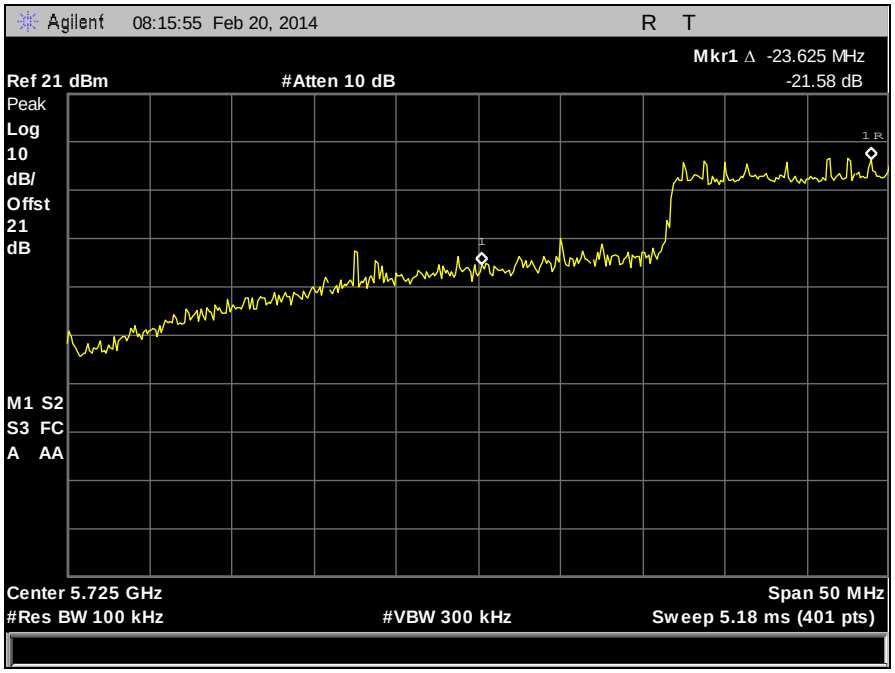
© 2014, MET Laboratories, Inc.



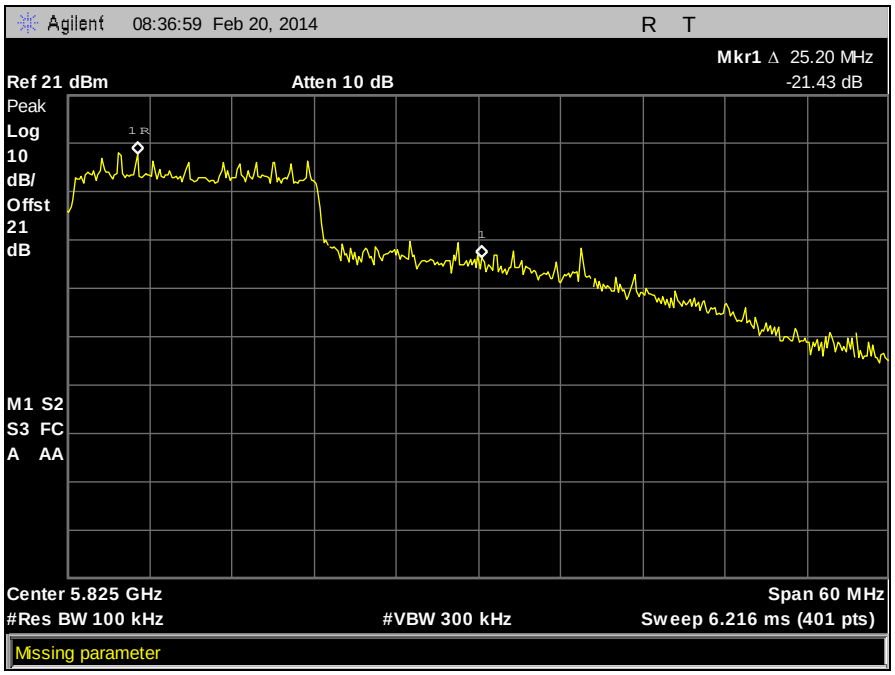
Plot 484. Conducted Band Edge, Low Channel, 802.11ac 40 MHz, Ant. 1



Plot 485. Conducted Band Edge, High Channel, 802.11ac 40 MHz, Ant. 1

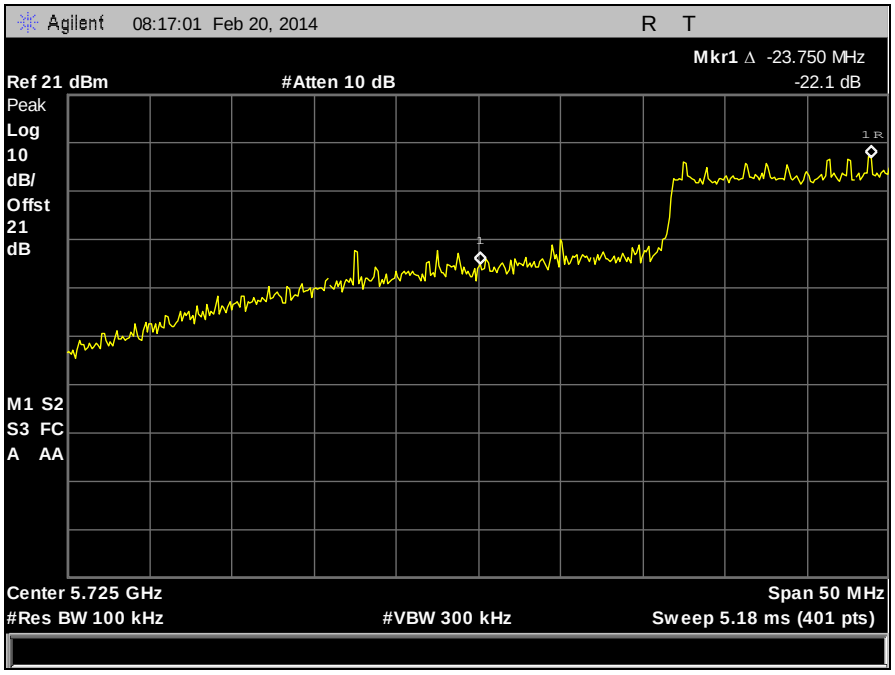


Plot 486. Conducted Band Edge, Low Channel, 802.11ac 40 MHz, Ant. 2

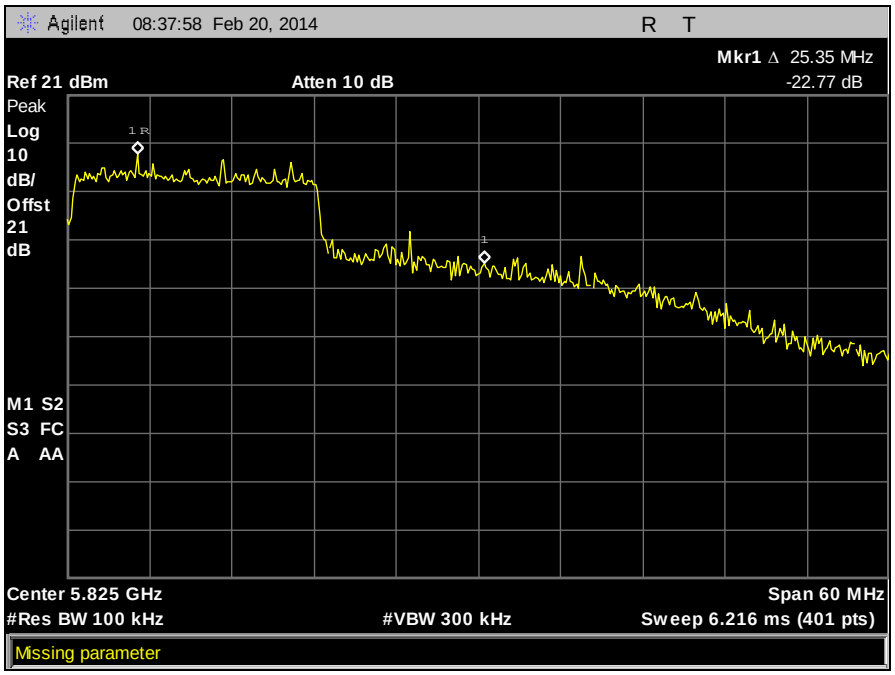


Plot 487. Conducted Band Edge, High Channel, 802.11ac 40 MHz, Ant. 2

Conducted Band Edge Test Results, 802.11n 40 MHz

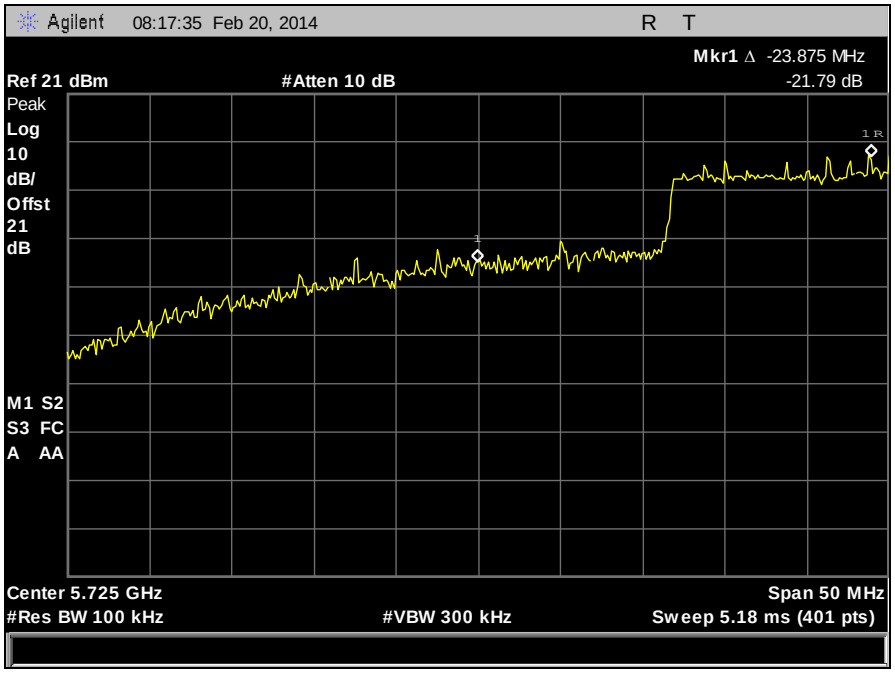


Plot 488. Conducted Band Edge, Low Channel, 802.11n 40 MHz, Ant. 0

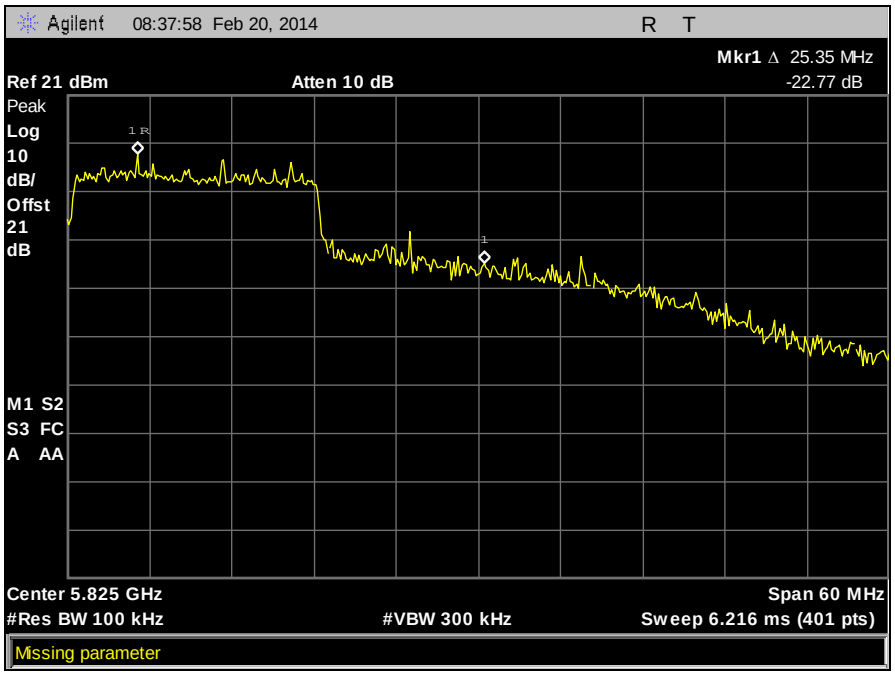


Plot 489. Conducted Band Edge, High Channel, 802.11n 40 MHz, Ant. 0

© 2014, MET Laboratories, Inc.

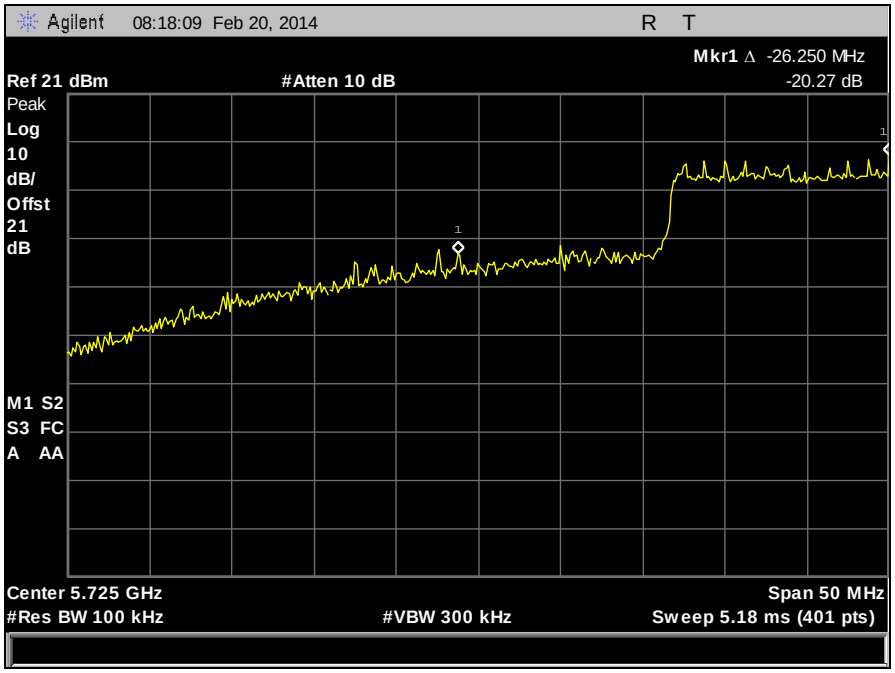


Plot 490. Conducted Band Edge, Low Channel, 802.11n 40 MHz, Ant. 1

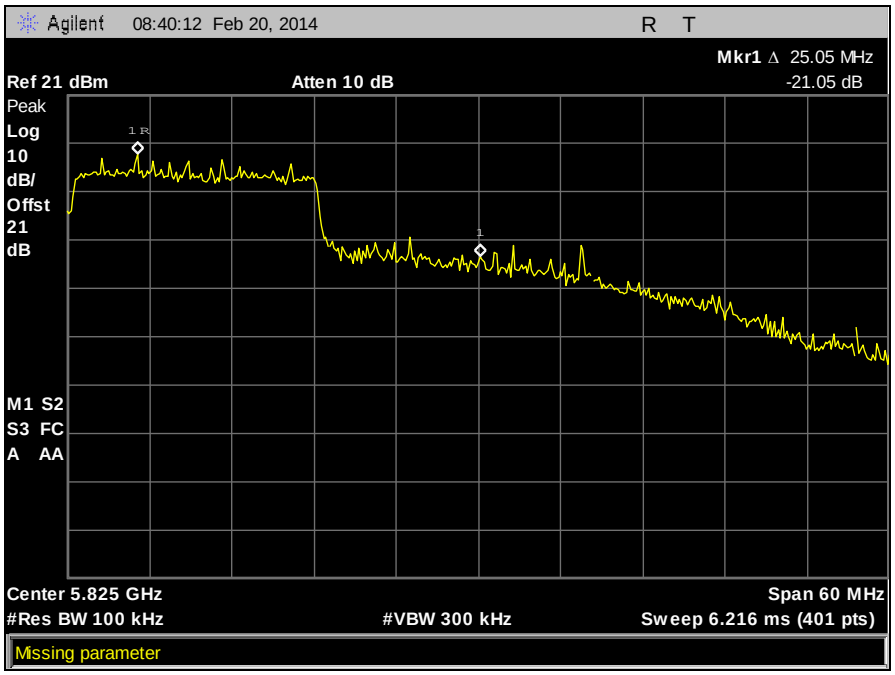


Plot 491. Conducted Band Edge, High Channel, 802.11n 40 MHz, Ant. 1

© 2014, MET Laboratories, Inc.

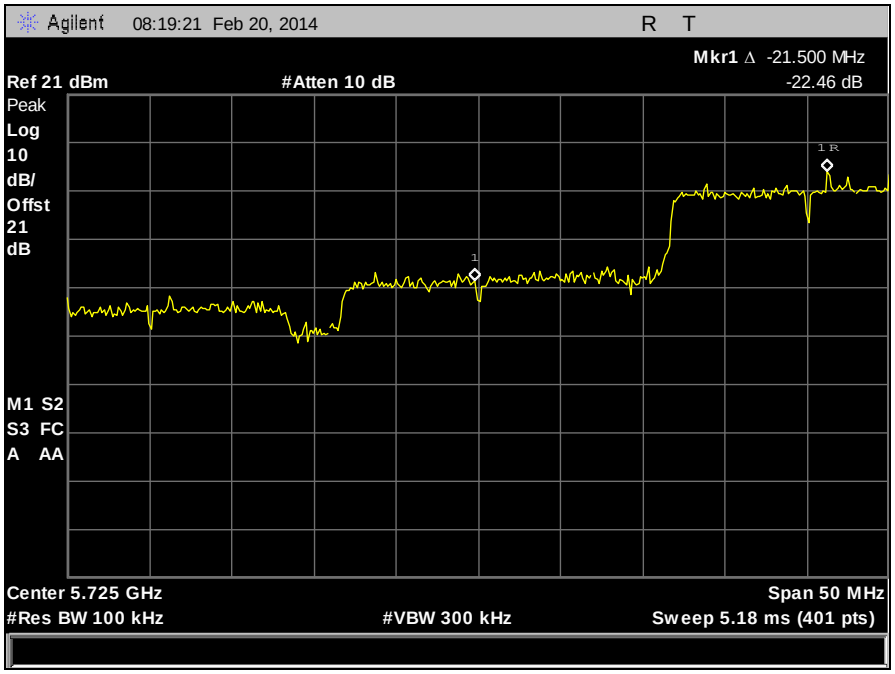


Plot 492. Conducted Band Edge, Low Channel, 802.11n 40 MHz, Ant. 2

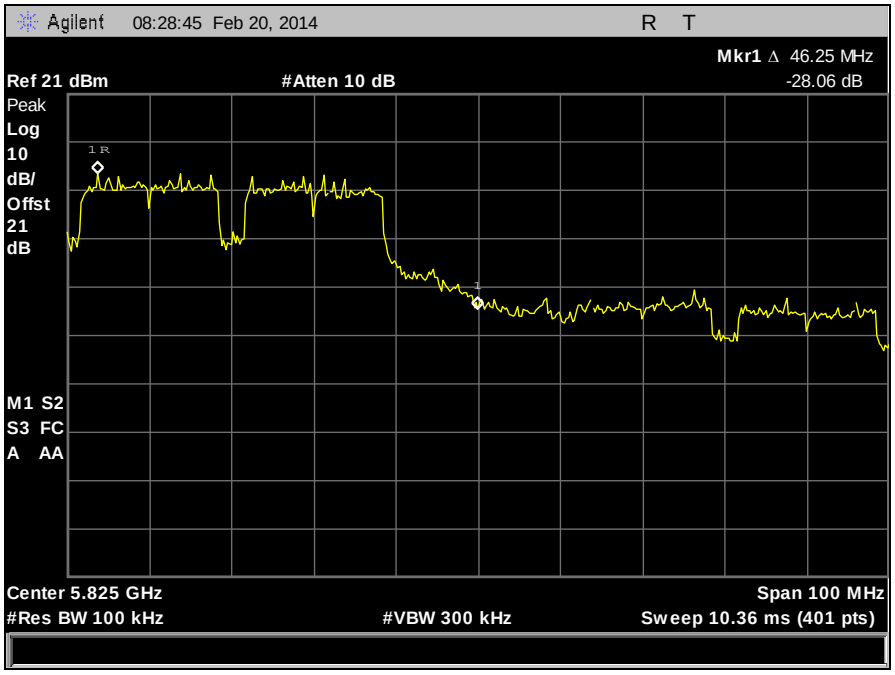


Plot 493. Conducted Band Edge, High Channel, 802.11n 40 MHz, Ant. 2

Conducted Band Edge Test Results, 802.11a 80 MHz

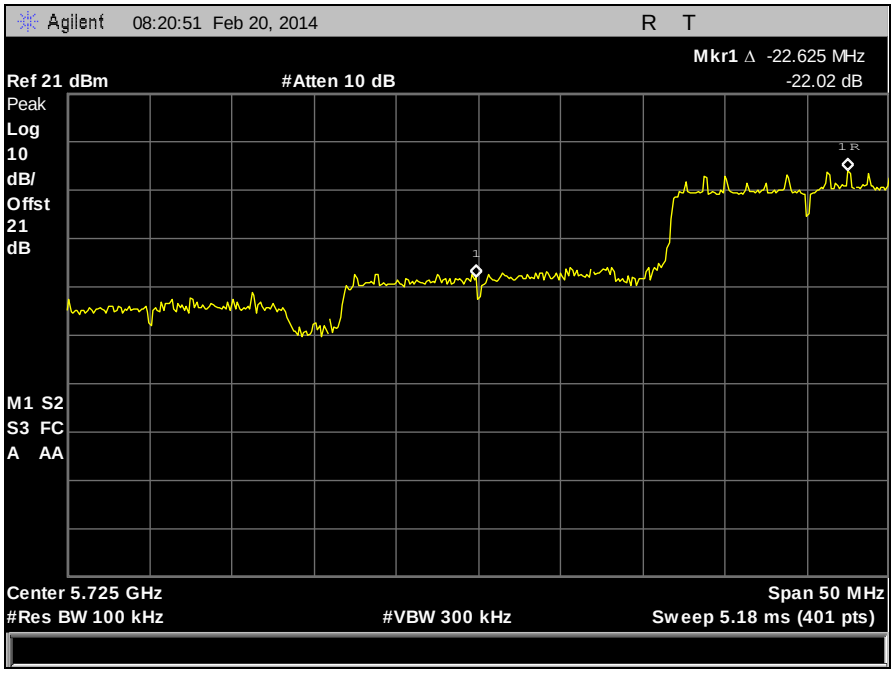


Plot 494. Conducted Band Edge, Low Channel, 802.11a 80 MHz, Ant. 0

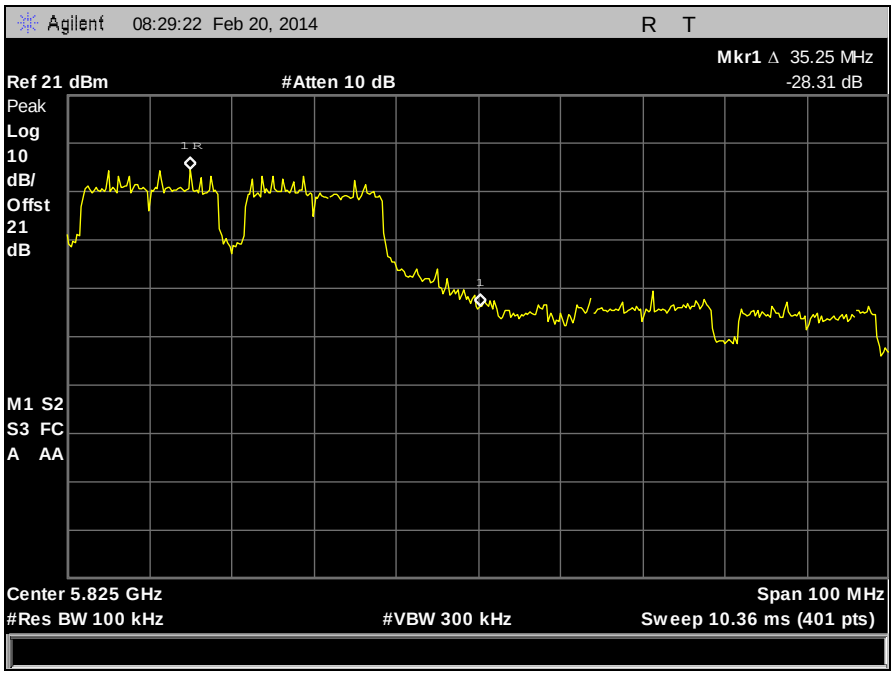


Plot 495. Conducted Band Edge, High Channel, 802.11a 80 MHz, Ant. 0

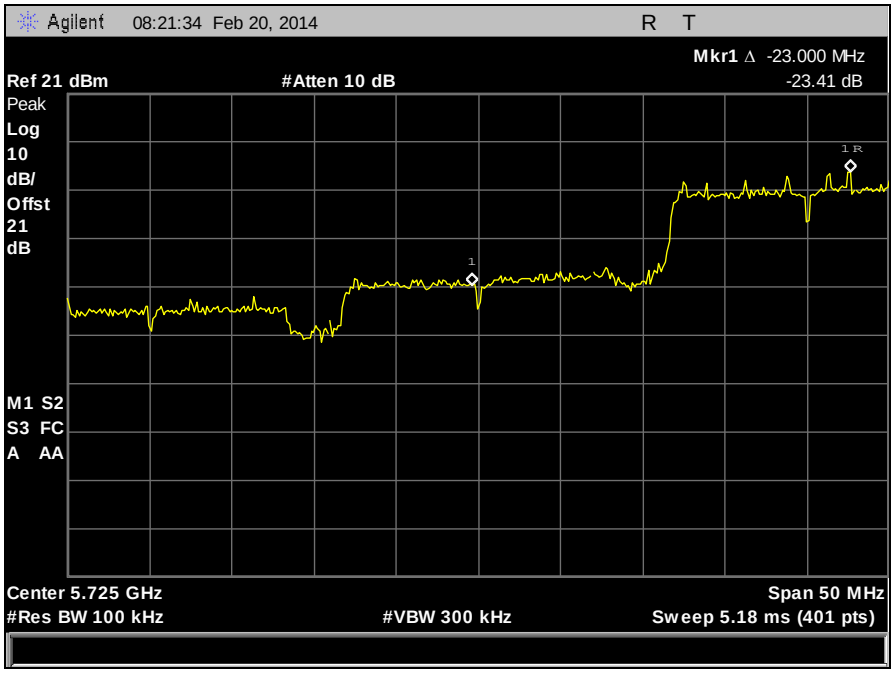
© 2014, MET Laboratories, Inc.



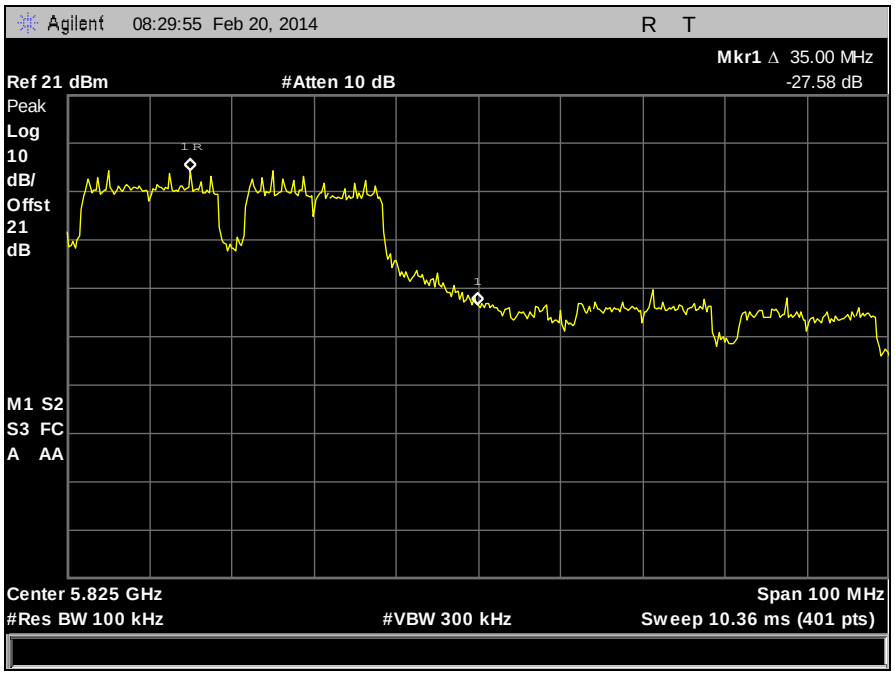
Plot 496. Conducted Band Edge, High Channel, 802.11a 80 MHz, Ant. 1



Plot 497. Conducted Band Edge, High Channel, 802.11a 80 MHz, Ant. 1



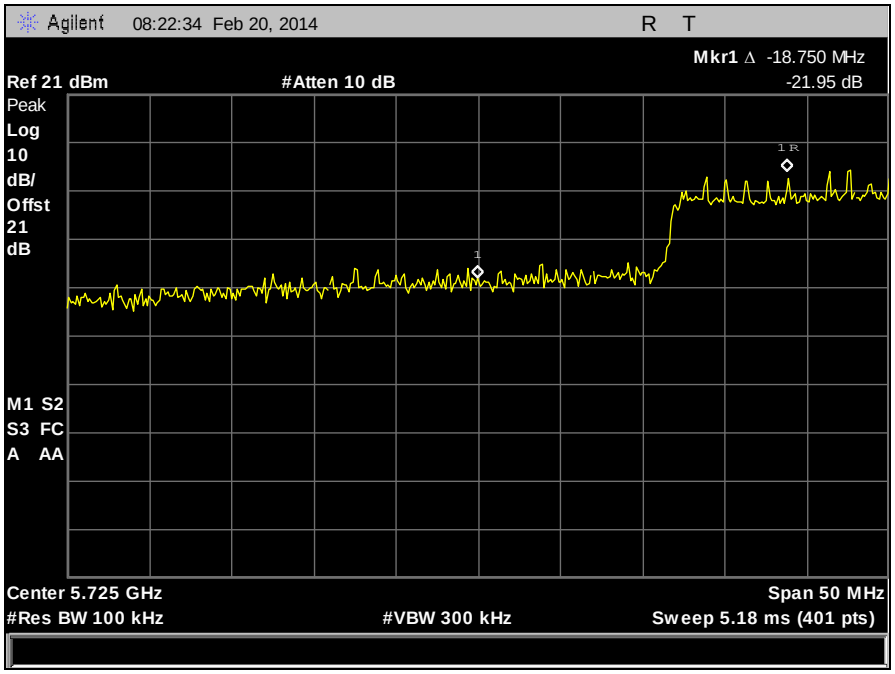
Plot 498. Conducted Band Edge, Low Channel, 802.11a 80 MHz, Ant. 2



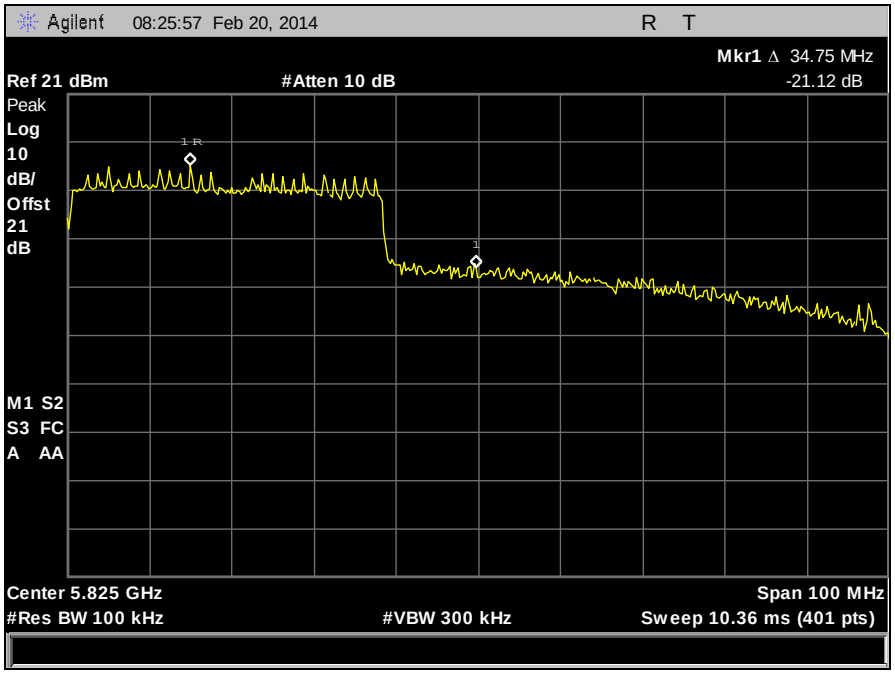
Plot 499. Conducted Band Edge, High Channel, 802.11a 80 MHz, Ant. 2

© 2014, MET Laboratories, Inc.

Conducted Band Edge Test Results, 802.11ac 80 MHz

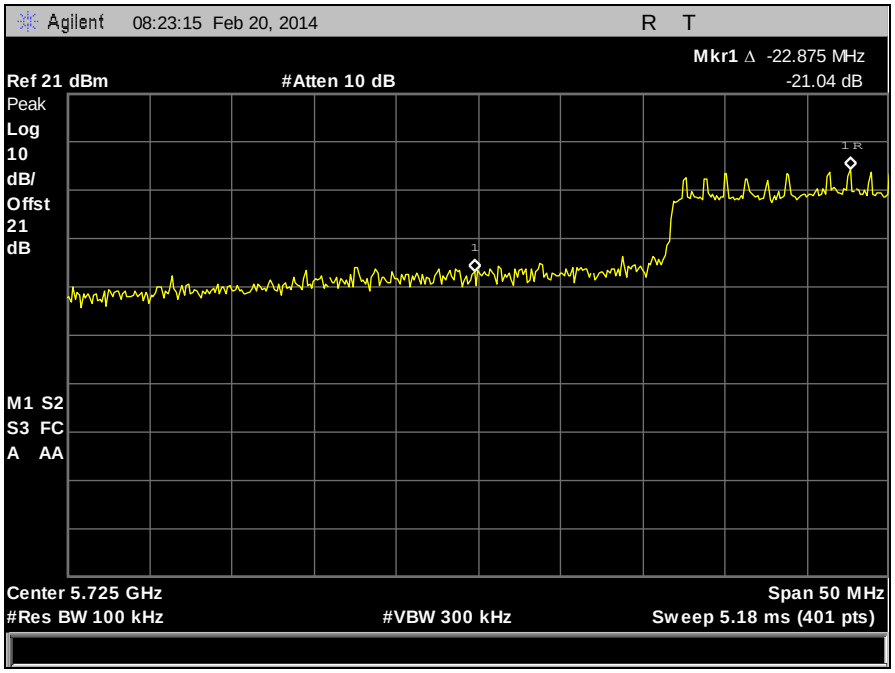


Plot 500. Conducted Band Edge, Low Channel, 802.11ac 80 MHz, Ant. 0

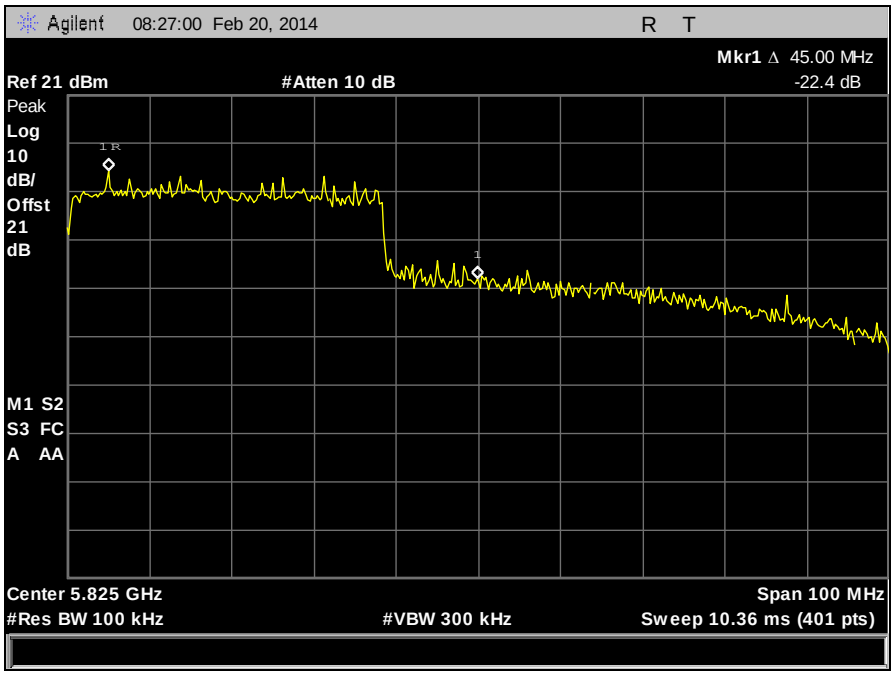


Plot 501. Conducted Band Edge, High Channel, 802.11ac 80 MHz, Ant. 0

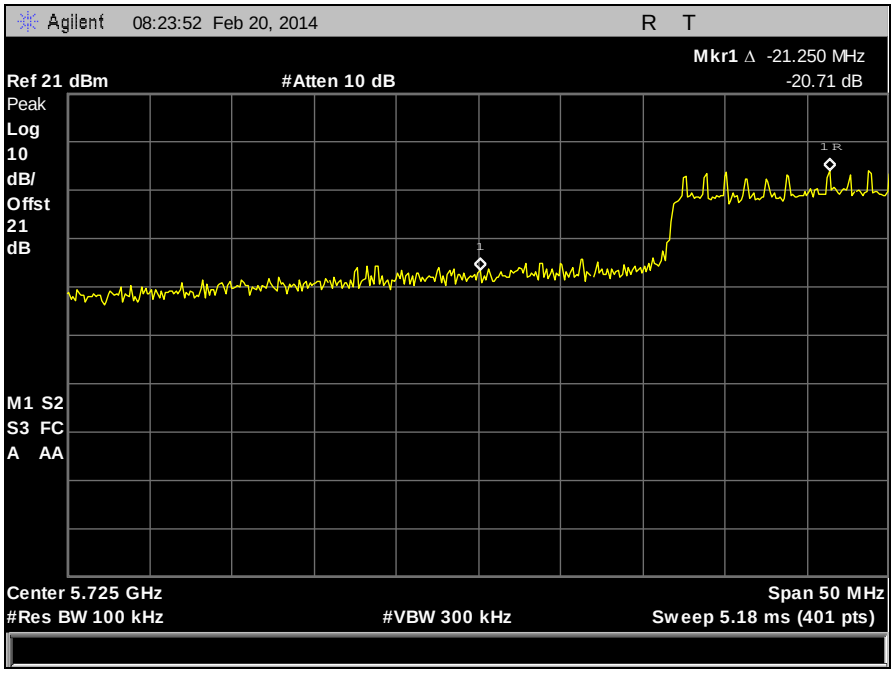
© 2014, MET Laboratories, Inc.



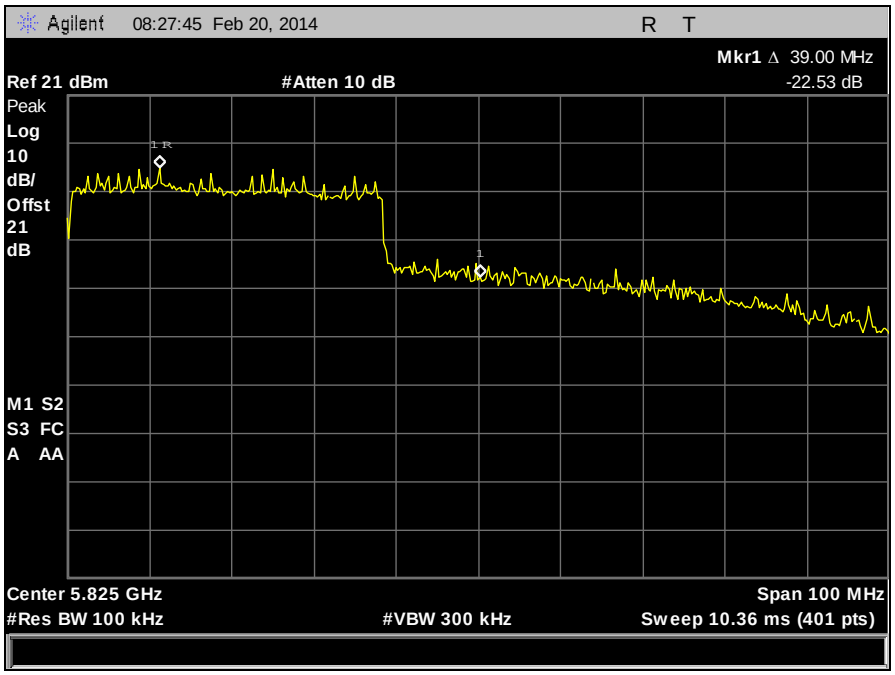
Plot 502. Conducted Band Edge, Low Channel, 802.11ac 80 MHz, Ant. 1



Plot 503. Conducted Band Edge, High Channel, 802.11ac 80 MHz, Ant. 1



Plot 504. Conducted Band Edge, Low Channel, 802.11ac 80 MHz, Ant. 2



Plot 505. Conducted Band Edge, High Channel, 802.11ac 80 MHz, Ant. 2

Electromagnetic Compatibility Criteria for Intentional Radiators

§ 15.247(e) Peak Power Spectral Density

Test Requirements: **§15.247(e):** For digitally modulated systems, the peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3 kHz band during any time interval of continuous transmission.

Test Procedure: The transmitter was connected directly to a Spectrum Analyzer through an attenuator. The power level was set to the maximum level. The RBW was set to 3 kHz and a VBW set to 9 kHz or greater. The spectrum analyzer was set to an auto sweep time and a peak detector was used. Measurements were carried out at the low, mid and high channels.

Test Results: The EUT was compliant with the peak power spectral density limits of **§ 15.247 (e)**.

The peak power spectral density was determined from plots on the following page(s).

Test Engineer: Surinder Singh

Test Date: 02/20/14

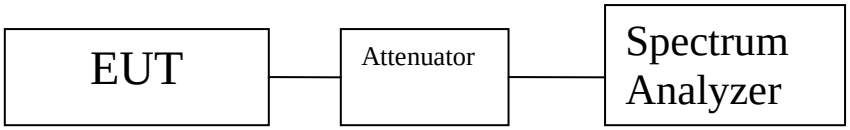


Figure 4. Block Diagram, Peak Power Spectral Density Test Setup

 © 2014, MET Laboratories, Inc.

Peak Power Spectral Density Test Results

Peak Power Spectral Density				
Carrier Channel	**Frequency (MHz)**	**Measured PPSD (dBm)**	**Limit (dBm)**	**Margin (dB)**
Low	5745	-1.471	8	-9.471
Mid	5785	-0.9	8	-8.9
High	5825	-1.206	8	-9.206

Table 92. Peak Power Spectral Density, Test Results, 802.11a 20 MHz, Ant. 0

Peak Power Spectral Density				
Carrier Channel	**Frequency (MHz)**	**Measured PPSD (dBm)**	**Limit (dBm)**	**Margin (dB)**
Low	5745	-5.98	8	-13.98
Mid	5785	-7.5	8	-15.5
High	5825	-5	8	-13

Table 93. Peak Power Spectral Density, Test Results, 802.11a 20 MHz, Ant. 1

Peak Power Spectral Density				
Carrier Channel	**Frequency (MHz)**	**Measured PPSD (dBm)**	**Limit (dBm)**	**Margin (dB)**
Low	5745	-2.09	8	-10.09
Mid	5785	-3.44	8	-11.44
High	5825	-3.27	8	-11.27

Table 94. Peak Power Spectral Density, Test Results, 802.11a 20 MHz, Ant. 2

Peak Power Spectral Density				
Carrier Channel	**Frequency (MHz)**	**Measured PPSD (dBm)**	**Limit (dBm)**	**Margin (dB)**
Low	5745	-1.765	8	-9.765
Mid	5785	-0.141	8	-8.141
High	5825	-0.287	8	-8.287

Table 95. Peak Power Spectral Density, Test Results, 802.11ac 20 MHz, Ant. 0

Peak Power Spectral Density				
Carrier Channel	**Frequency (MHz)**	**Measured PPSD (dBm)**	**Limit (dBm)**	**Margin (dB)**
Low	5745	-5	8	-13
Mid	5785	-7.5	8	-15.5
High	5825	-6.08	8	-14.08

Table 96. Peak Power Spectral Density, Test Results, 802.11ac 20 MHz, Ant. 1

Peak Power Spectral Density				
Carrier Channel	**Frequency (MHz)**	**Measured PPSD (dBm)**	**Limit (dBm)**	**Margin (dB)**
Low	5745	-2.24	8	-10.24
Mid	5785	-2.41	8	-10.41
High	5825	-2.3	8	-10.3

Table 97. Peak Power Spectral Density, Test Results, 802.11ac 20 MHz, Ant. 2

 © 2014, MET Laboratories, Inc.

Carrier Channel	Frequency (MHz)	Measured PPSD (dBm) Ant0	Measured PPSD (dBm) Ant1	Measured PPSD (dBm) Ant2	Total PPSD (dBm)	Limit (dBm)	Margin (dB)
Low	5745	-6.45	-6.26	-6.45	-1.61	5.29	-6.9
Mid	5785	-4.36	-7.95	-4.36	-0.49	5.29	-5.7
High	5825	-6.08	-7.4	-6.08	-1.70	5.29	-6.99

Table 98. Peak Power Spectral Density, Test Results, 802.11ac 20 MHz, MIMO

Peak Power Spectral Density				
Carrier Channel	**Frequency (MHz)**	**Measured PPSD (dBm)**	**Limit (dBm)**	**Margin (dB)**
Low	5745	-1.954	8	-9.954
Mid	5785	-1.05	8	-9.05
High	5825	-1.852	8	-9.852

Table 99. Peak Power Spectral Density, Test Results, 802.11n 20 MHz, Ant. 0

Peak Power Spectral Density				
Carrier Channel	**Frequency (MHz)**	**Measured PPSD (dBm)**	**Limit (dBm)**	**Margin (dB)**
Low	5745	-5.55	8	-13.55
Mid	5785	-6.48	8	-14.48
High	5825	-5	8	-13

Table 100. Peak Power Spectral Density, Test Results, 802.11n 20 MHz, Ant. 1

Peak Power Spectral Density				
Carrier Channel	**Frequency (MHz)**	**Measured PPSD (dBm)**	**Limit (dBm)**	**Margin (dB)**
Low	5745	-3.74	8	-11.74
Mid	5785	-2.87	8	-10.87
High	5825	-1.22	8	-9.22

Table 101. Peak Power Spectral Density, Test Results, 802.11n 20 MHz, Ant. 2

Carrier Channel	Frequency (MHz)	Measured PPSD (dBm) Ant0	Measured PPSD (dBm) Ant1	Measured PPSD (dBm) Ant2	Total PPSD (dBm)	Limit (dBm)	Margin (dB)
Low	5745	-6.27	-7.84	-5.97	-1.84	5.29	-7.13
Mid	5785	-5.374	-6.42	-5.24	-0.87	5.29	-6.1
High	5825	-5.719	-6.6	-7.13	-1.67	5.29	-6.96

Table 102. Peak Power Spectral Density, Test Results, 802.11n 20 MHz, Ant. 2, MIMO

© 2014, MET Laboratories, Inc.

Peak Power Spectral Density				
Carrier Channel	**Frequency (MHz)**	**Measured PPSD (dBm)**	**Limit (dBm)**	**Margin (dB)**
Low	5755	-4.295	8	-12.295
High	5795	-5.097	8	-13.097

Table 103. Peak Power Spectral Density, Test Results, 802.11a 40 MHz, Ant. 0

Peak Power Spectral Density				
Carrier Channel	**Frequency (MHz)**	**Measured PPSD (dBm)**	**Limit (dBm)**	**Margin (dB)**
Low	5755	-8.74	8	-16.74
High	5795	-8.27	8	-16.27

Table 104. Peak Power Spectral Density, Test Results, 802.11a 40 MHz, Ant. 1

Peak Power Spectral Density				
Carrier Channel	**Frequency (MHz)**	**Measured PPSD (dBm)**	**Limit (dBm)**	**Margin (dB)**
Low	5755	-5.91	8	-13.91
High	5795	-5.96	8	-13.96

Table 105. Peak Power Spectral Density, Test Results, 802.11a 40 MHz, Ant. 2

Carrier Channel	Frequency (MHz)	Measured PPSD (dBm) Ant0	Measured PPSD (dBm) Ant1	Measured PPSD (dBm) Ant2	Total PPSD (dBm)	Limit (dBm)	Margin (dB)
Low	5745	-7.631	-10.02	-9.51	-4.15	5.29	-9.44
High	5825	-8.137	-10.24	-8.54	-4.11	5.29	-9.400

Table 106. Peak Power Spectral Density, Test Results, 802.11ac 40 MHz, MIMO

Peak Power Spectral Density				
Carrier Channel	**Frequency (MHz)**	**Measured PPSD (dBm)**	**Limit (dBm)**	**Margin (dB)**
Low	5755	-5.184	8	-13.184
High	5795	-2.535	8	-10.535

Table 107. Peak Power Spectral Density, Test Results, 802.11n 40 MHz, Ant. 0

Peak Power Spectral Density				
Carrier Channel	**Frequency (MHz)**	**Measured PPSD (dBm)**	**Limit (dBm)**	**Margin (dB)**
Low	5755	-8.38	8	-16.38
High	5795	-7.49	8	-15.49

Table 108. Peak Power Spectral Density, Test Results, 802.11n 40 MHz, Ant. 1

Peak Power Spectral Density				
Carrier Channel	**Frequency (MHz)**	**Measured PPSD (dBm)**	**Limit (dBm)**	**Margin (dB)**
Low	5755	-5.73	8	-13.73
High	5795	-5.71	8	-13.71

Table 109. Peak Power Spectral Density, Test Results, 802.11n 40 MHz, Ant. 2

 © 2014, MET Laboratories, Inc.

Carrier Channel	Frequency (MHz)	Measured PPSD (dBm) Ant0	Measured PPSD (dBm) Ant1	Measured PPSD (dBm) Ant2	Total PPSD (dBm)	Limit (dBm)	Margin (dB)
Low	5745	-6.445	-7.68	-7.86	-2.51	5.29	-7.80
Mid	5825	-7.279	-7.95	-6.83	-2.55	5.29	-7.84

Table 110. Peak Power Spectral Density, Test Results, 802.11n 40 MHz, MIMO

Peak Power Spectral Density				
Carrier Port	**Frequency (MHz)**	**Measured PPSD (dBm)**	**Limit (dBm)**	**Margin (dB)**
Ant. 0	5775	-7.813	8	-15.813
Ant. 1	5775	-11.7	8	-19.7
Ant. 2	5775	-9.09	8	-17.09

Table 111. Peak Power Spectral Density, Test Results, 802.11a 80 MHz

Peak Power Spectral Density				
Carrier Port	**Frequency (MHz)**	**Measured PPSD (dBm)**	**Limit (dBm)**	**Margin (dB)**
Ant. 0	5775	-6.961	8	-14.961
Ant. 1	5775	-11.15	8	-19.15
Ant. 2	5775	-8.51	8	-16.51

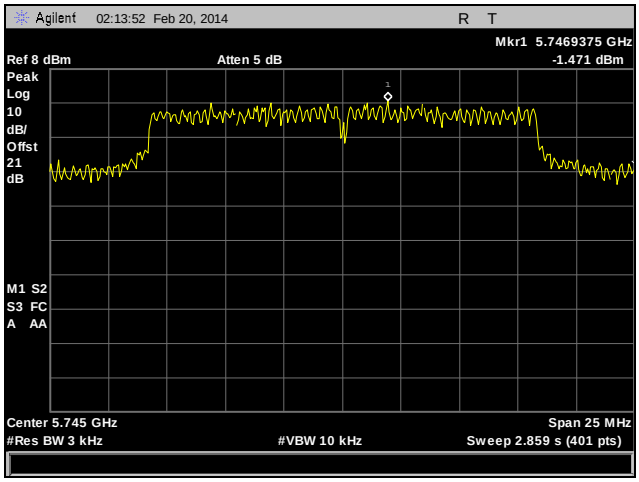
Table 112. Peak Power Spectral Density, Test Results, 802.11ac 80 MHz

Carrier Channel	Frequency (MHz)	Measured PPSD (dBm) Ant0	Measured PPSD (dBm) Ant1	Measured PPSD (dBm) Ant2	Total PPSD (dBm)	Limit (dBm)	Margin (dB)
Low	5755	-11.78	-13.59	-9.1	-6.32	5.29	-11.61

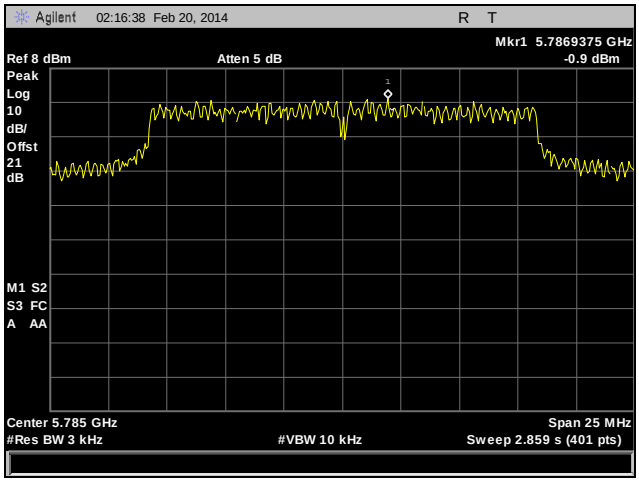
Table 113. Peak Power Spectral Density, Test Results, 802.11ac 80 MHz, MIMO

© 2014, MET Laboratories, Inc.

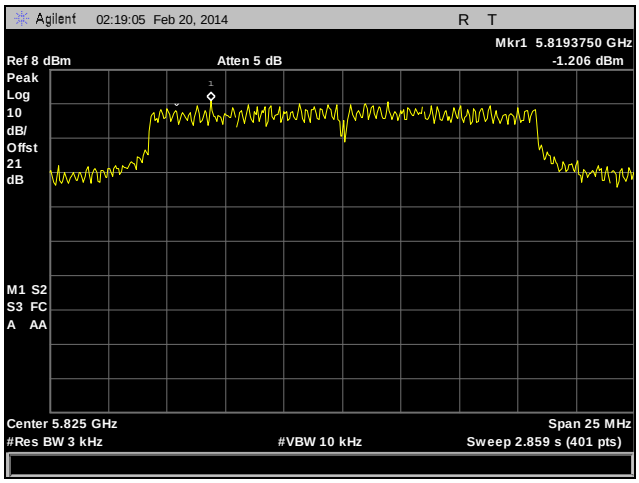
Peak Power Spectral Density, 802.11a 20 MHz



Plot 506. Peak Power Spectral Density, Low Channel, 802.11a, Ant. 0

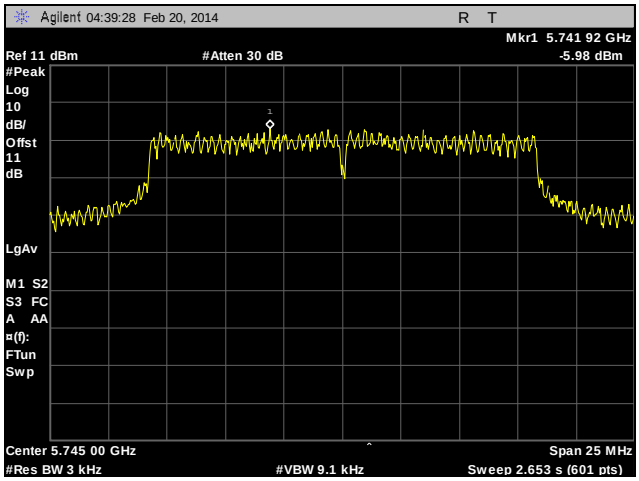


Plot 507. Peak Power Spectral Density, Mid Channel, 802.11a, Ant. 0

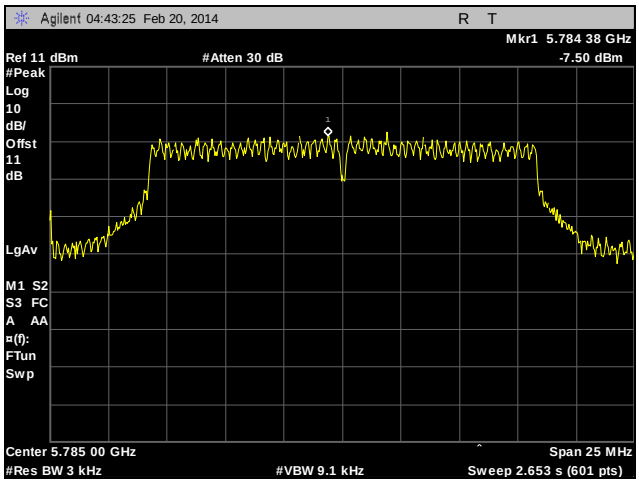


Plot 508. Peak Power Spectral Density, High Channel, 802.11a, Ant. 0

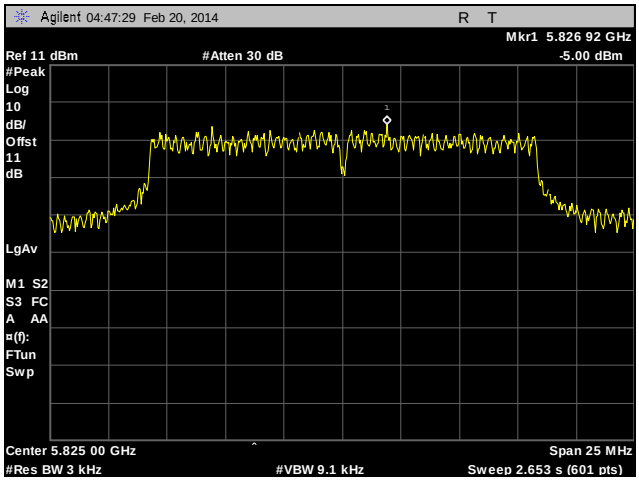
© 2014, MET Laboratories, Inc.



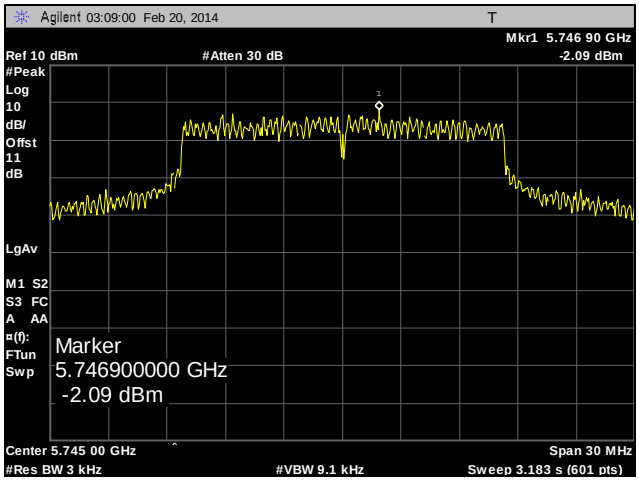
Plot 509. Peak Power Spectral Density, Low Channel, 802.11a, Ant. 1



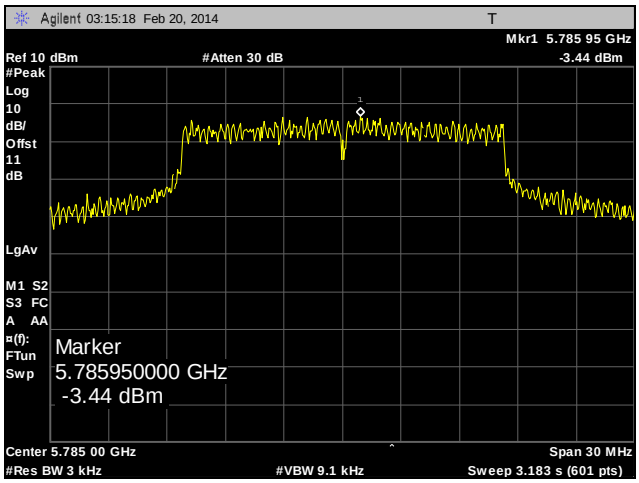
Plot 510. Peak Power Spectral Density, Mid Channel, 802.11a, Ant. 1



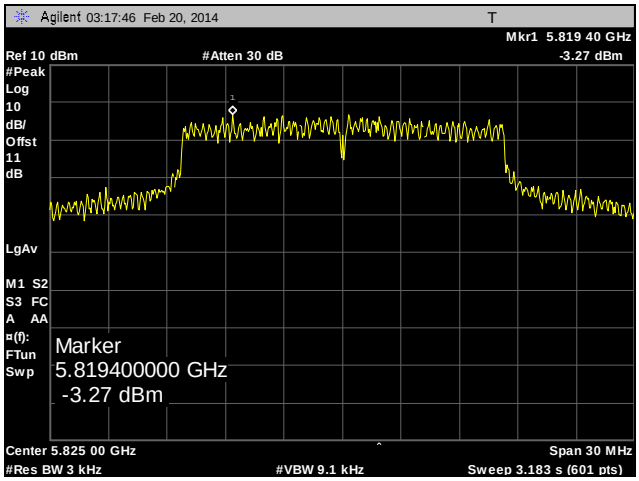
Plot 511. Peak Power Spectral Density, High Channel, 802.11a, Ant. 1



Plot 512. Peak Power Spectral Density, Low Channel, 802.11a, Ant. 2

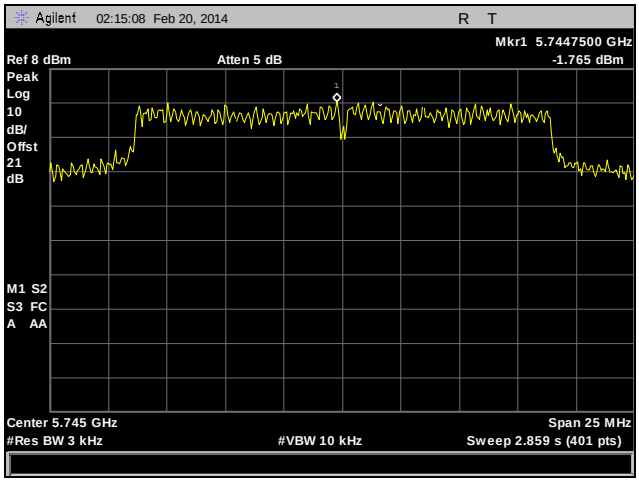


Plot 513. Peak Power Spectral Density, Mid Channel, 802.11a, Ant. 2

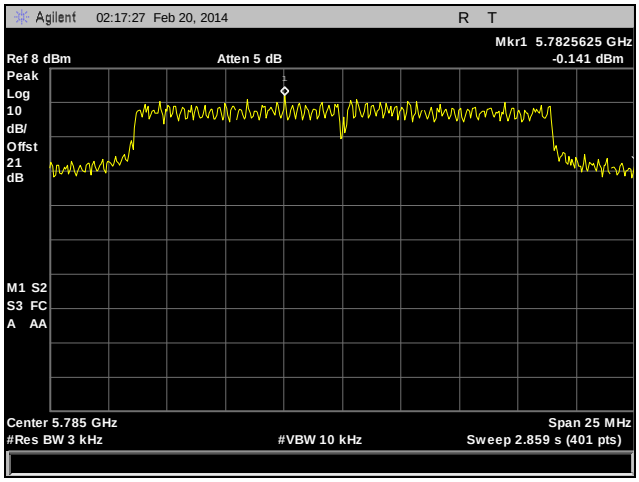


Plot 514. Peak Power Spectral Density, High Channel, 802.11a, Ant. 2

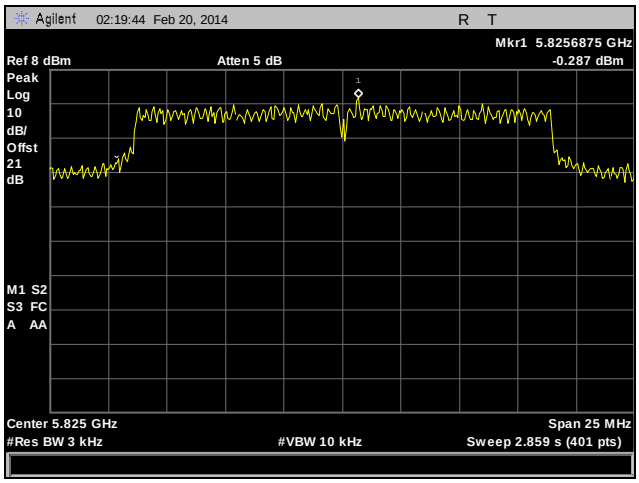
Peak Power Spectral Density, 802.11ac 20 MHz



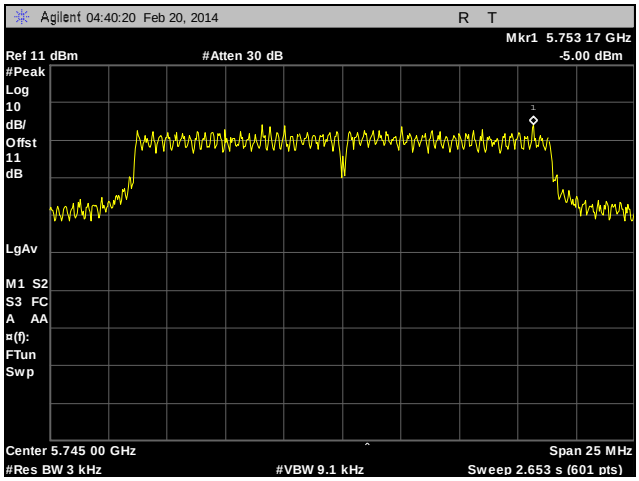
Plot 515. Peak Power Spectral Density, Low Channel, 802.11ac 20 MHz, Ant. 0



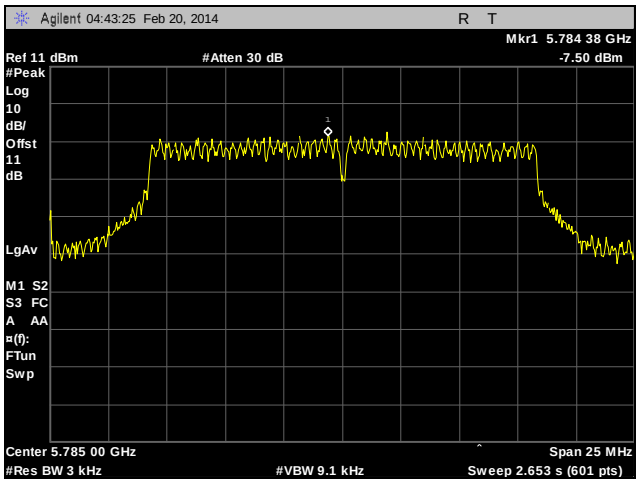
Plot 516. Peak Power Spectral Density, Mid Channel, 802.11ac 20 MHz, Ant. 0



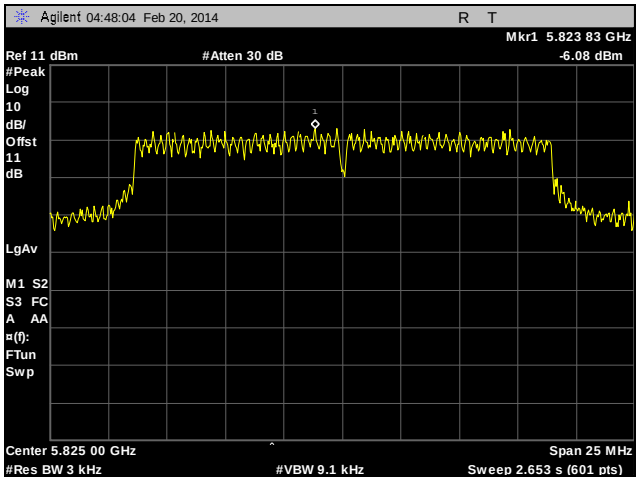
Plot 517. Peak Power Spectral Density, High Channel, 802.11ac 20 MHz, Ant. 0



Plot 518. Peak Power Spectral Density, Low Channel, 802.11ac 20 MHz, Ant. 1

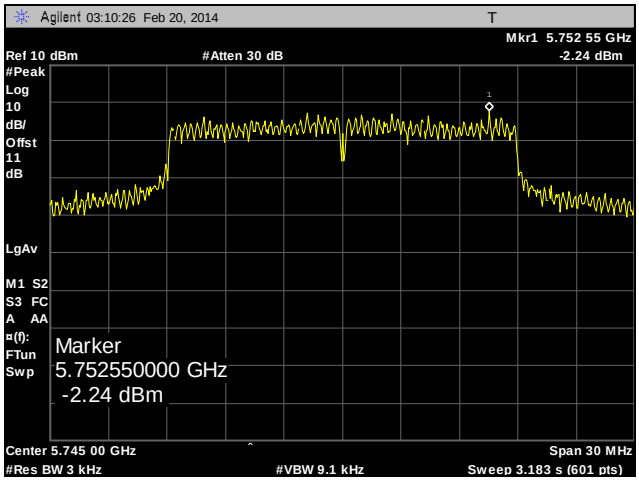


Plot 519. Peak Power Spectral Density, Mid Channel, 802.11ac 20 MHz, Ant. 1

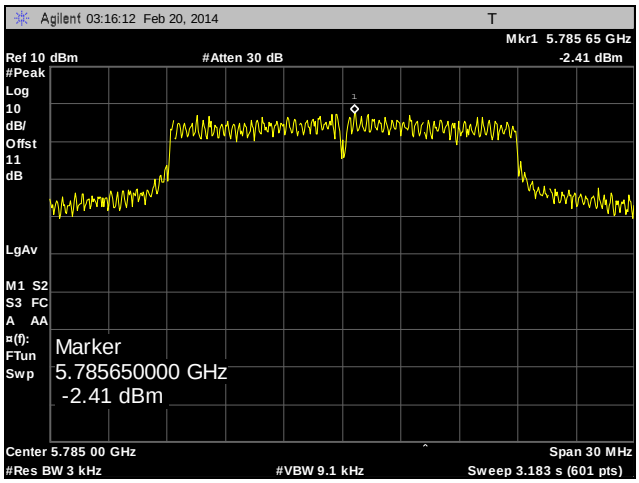


Plot 520. Peak Power Spectral Density, High Channel, 802.11ac 20 MHz, Ant. 1

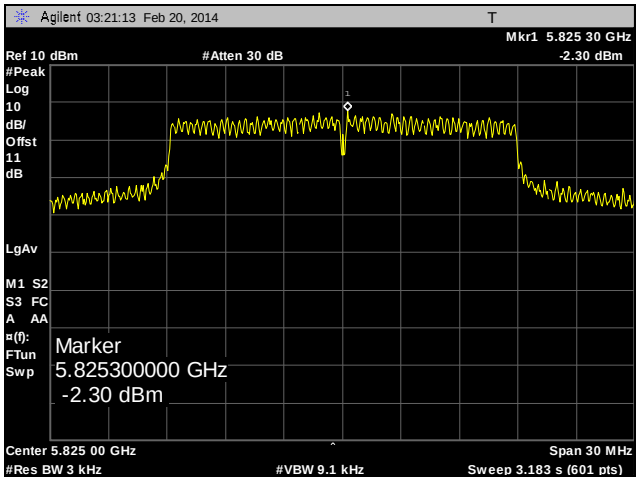
© 2014, MET Laboratories, Inc.



Plot 521. Peak Power Spectral Density, Low Channel, 802.11ac 20 MHz, Ant. 2

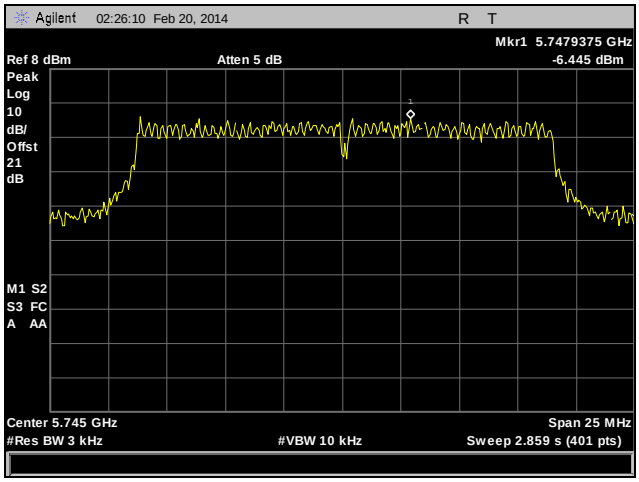


Plot 522. Peak Power Spectral Density, Mid Channel, 802.11ac 20 MHz, Ant. 2

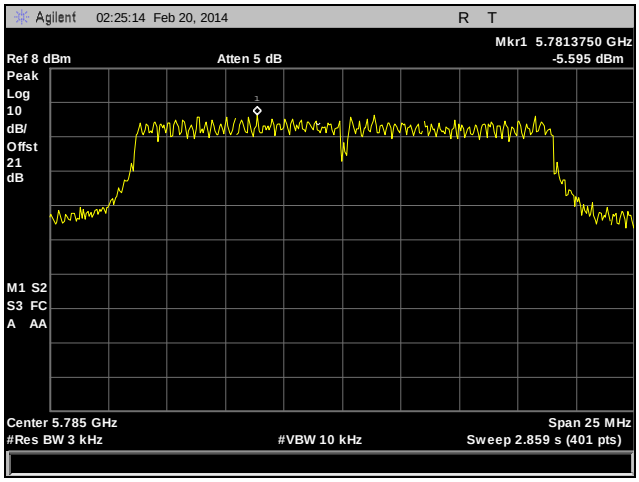


Plot 523. Peak Power Spectral Density, High Channel, 802.11ac 20 MHz, Ant. 2

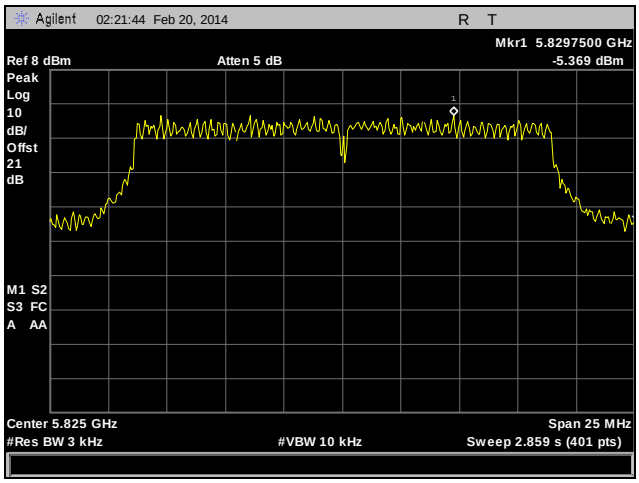
Peak Power Spectral Density, 802.11ac 20 MHz, MIMO



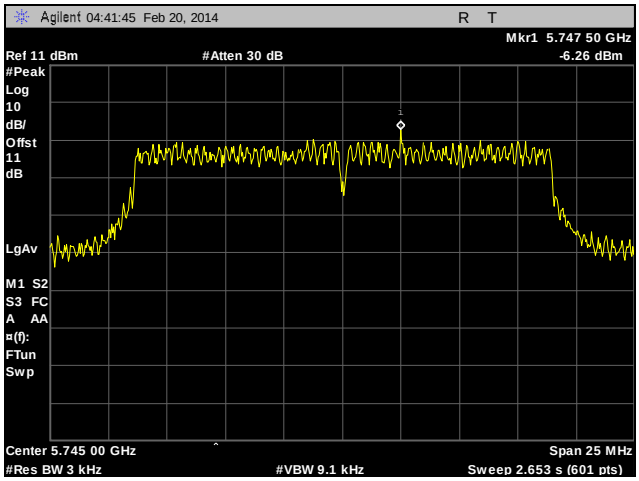
Plot 524. Peak Power Spectral Density, Low Channel, 802.11ac 20 MHz, Ant. 0, MIMO



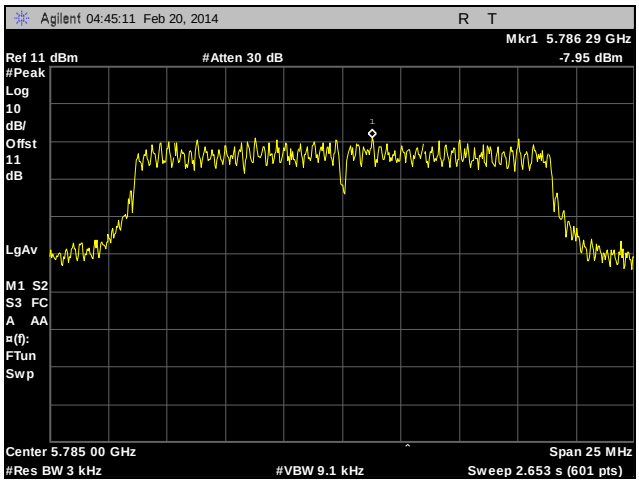
Plot 525. Peak Power Spectral Density, Mid Channel, 802.11ac 20 MHz, Ant. 0, MIMO



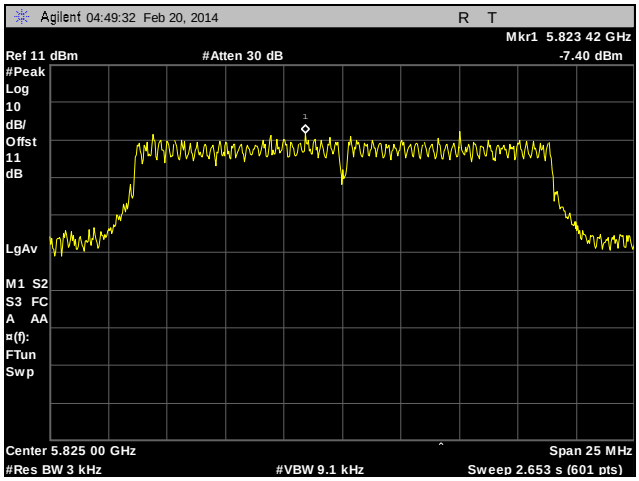
Plot 526. Peak Power Spectral Density, High Channel, 802.11ac 20 MHz, Ant. 0, MIMO



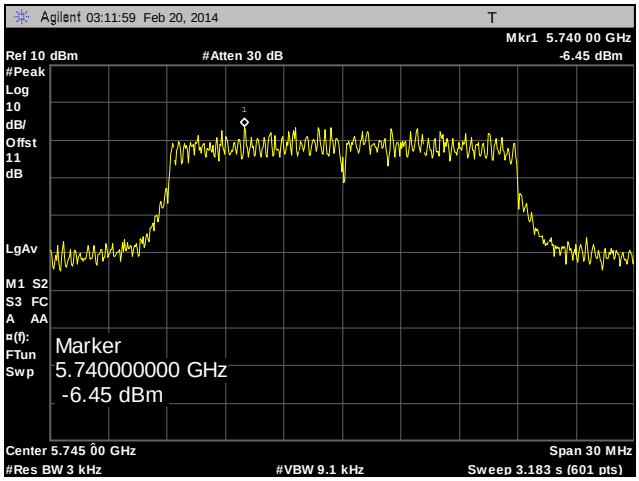
Plot 527. Peak Power Spectral Density, Low Channel, 802.11ac 20 MHz, Ant. 1, MIMO



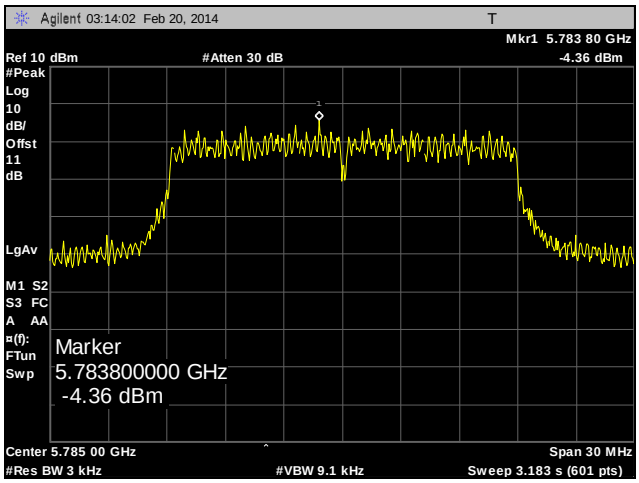
Plot 528. Peak Power Spectral Density, Mid Channel, 802.11ac 20 MHz, Ant. 1, MIMO



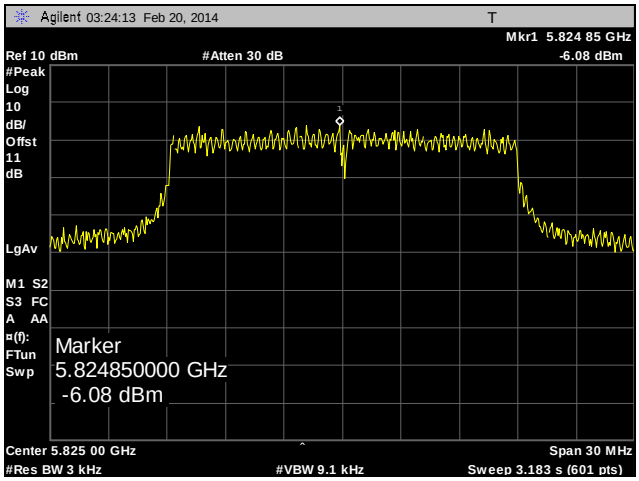
Plot 529. Peak Power Spectral Density, High Channel, 802.11ac 20 MHz, Ant. 1, MIMO



Plot 530. Peak Power Spectral Density, Low Channel, 802.11ac 20 MHz, Ant. 2, MIMO

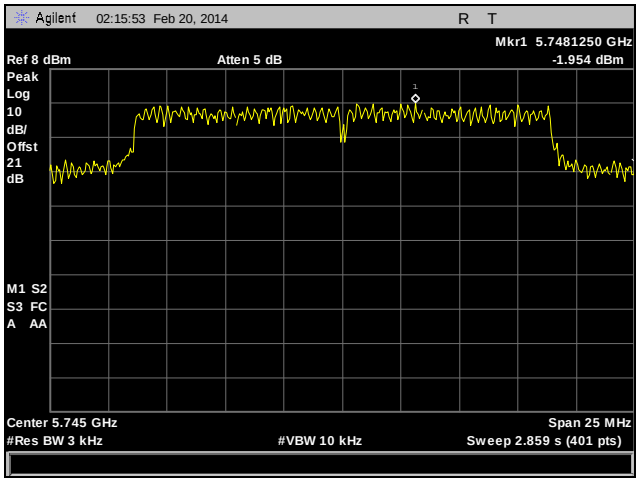


Plot 531. Peak Power Spectral Density, Mid Channel, 802.11ac 20 MHz, Ant. 2, MIMO

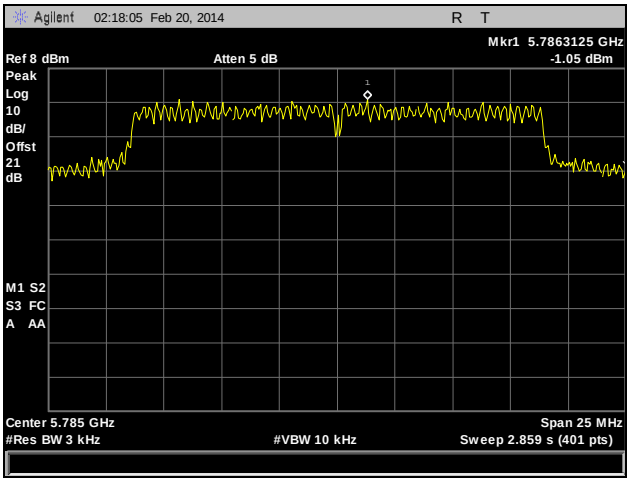


Plot 532. Peak Power Spectral Density, High Channel, 802.11ac 20 MHz, Ant. 2, MIMO

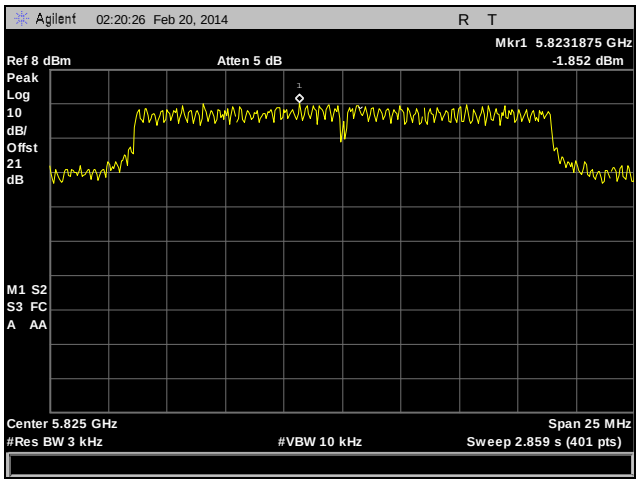
Peak Power Spectral Density, 802.11n 20 MHz



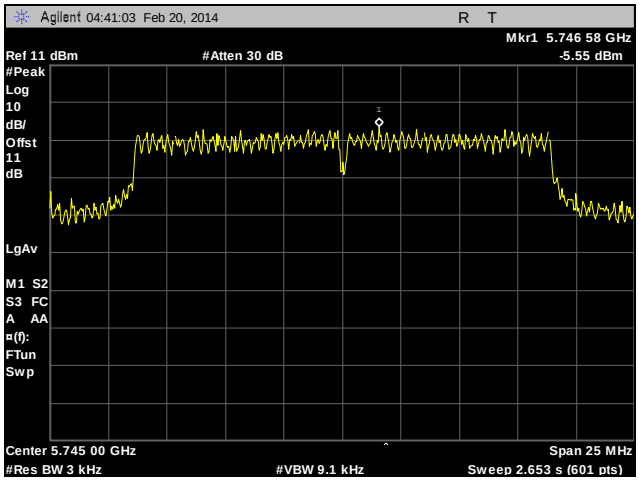
Plot 533. Peak Power Spectral Density, Low Channel, 802.11n 20 MHz, Ant. 0



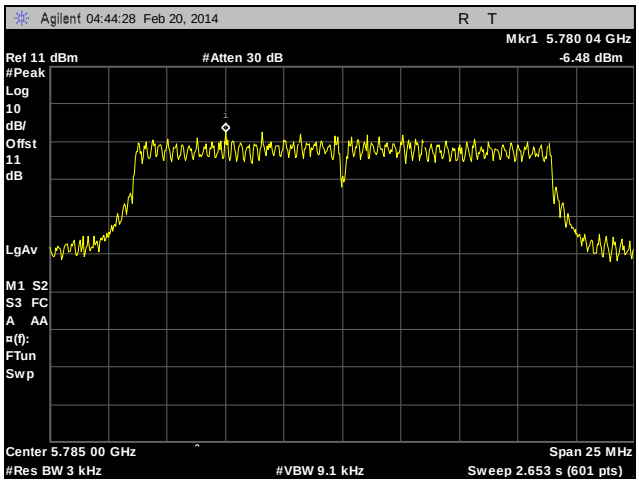
Plot 534. Peak Power Spectral Density, Mid Channel, 802.11n 20 MHz, Ant. 0



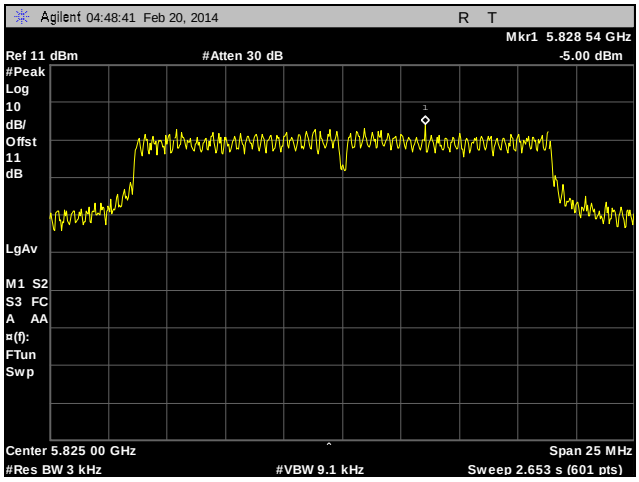
Plot 535. Peak Power Spectral Density, High Channel, 802.11n 20 MHz, Ant. 0



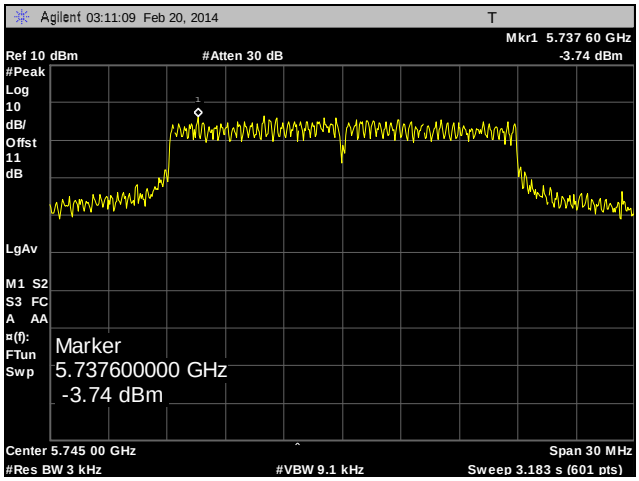
Plot 536. Peak Power Spectral Density, Low Channel, 802.11n 20 MHz, Ant. 1



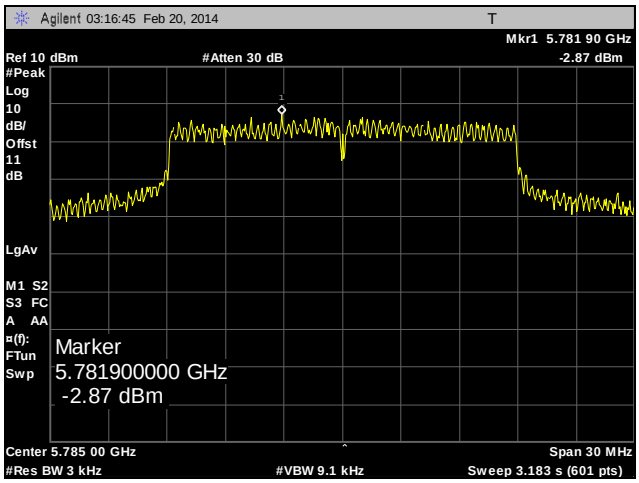
Plot 537. Peak Power Spectral Density, Mid Channel, 802.11n 20 MHz, Ant. 1



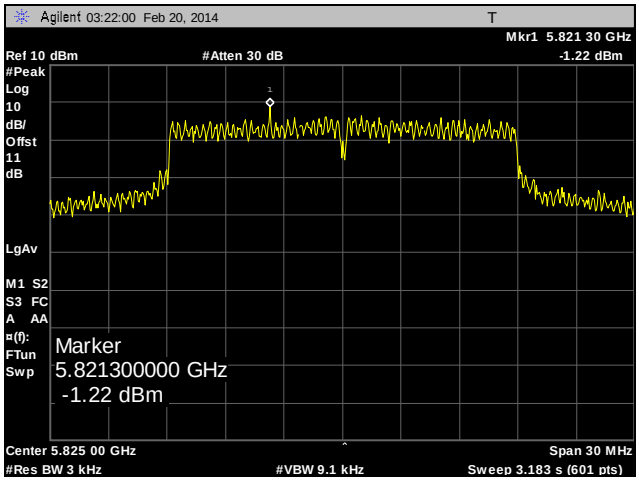
Plot 538. Peak Power Spectral Density, High Channel, 802.11n 20 MHz, Ant. 1



Plot 539. Peak Power Spectral Density, Low Channel, 802.11n 20 MHz, Ant. 2



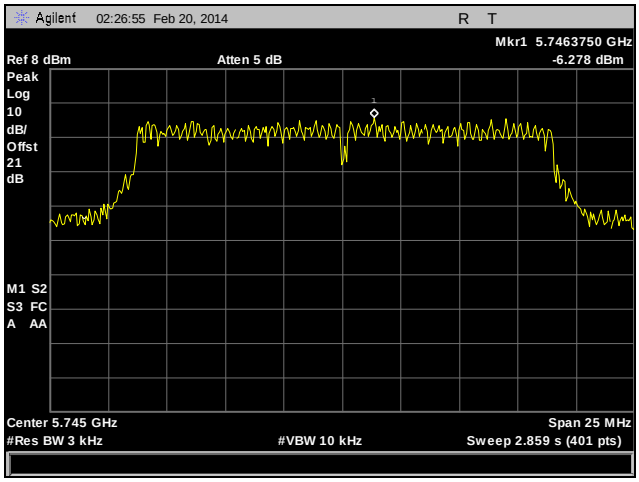
Plot 540. Peak Power Spectral Density, Mid Channel, 802.11n 20 MHz, Ant. 2



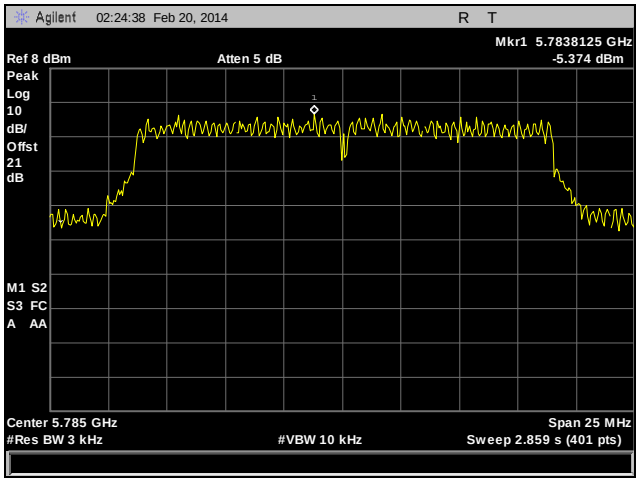
Plot 541. Peak Power Spectral Density, High Channel, 802.11n 20 MHz, Ant. 2

© 2014, MET Laboratories, Inc.

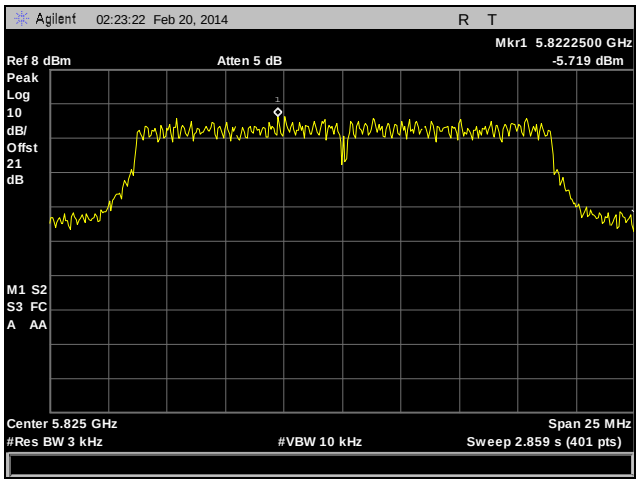
Peak Power Spectral Density, 802.11n 20 MHz, MIMO



Plot 542. Peak Power Spectral Density, Low Channel, 802.11n 20 MHz, Ant. 0, MIMO

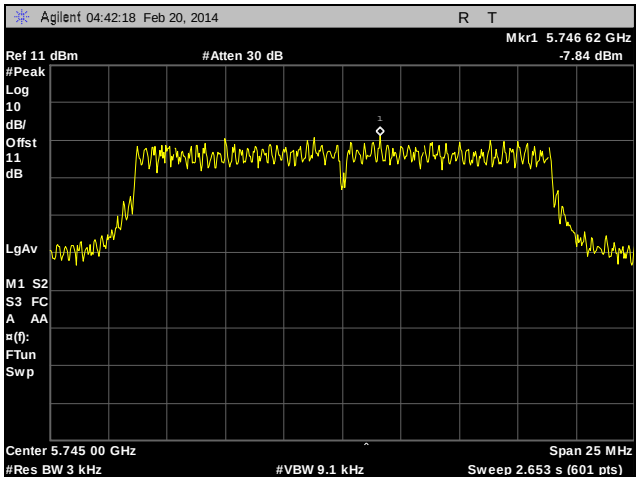


Plot 543. Peak Power Spectral Density, Mid Channel, 802.11n 20 MHz, Ant. 0, MIMO

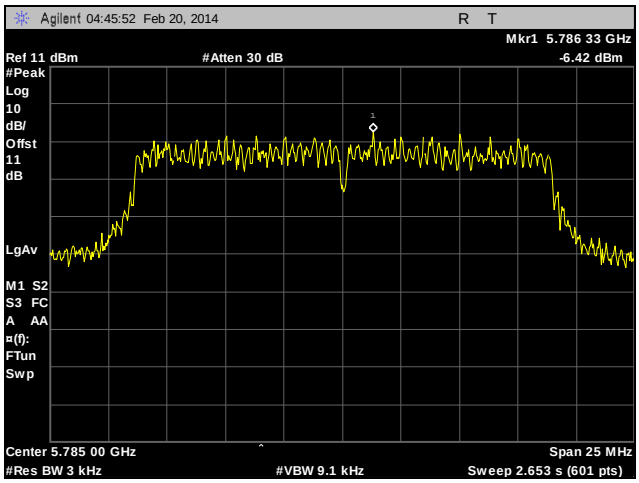


Plot 544. Peak Power Spectral Density, High Channel, 802.11n 20 MHz, Ant. 0, MIMO

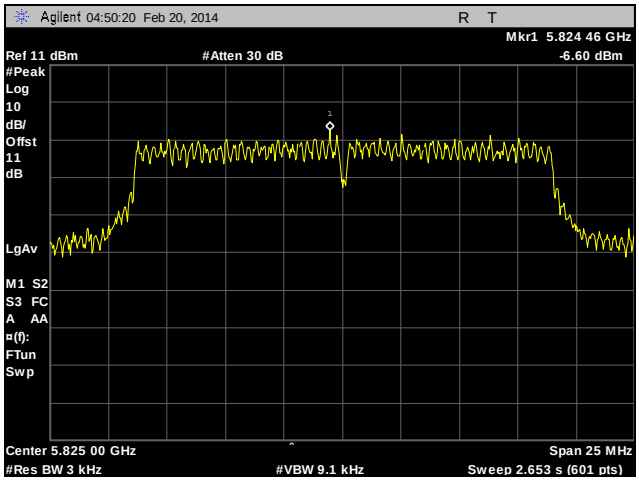
© 2014, MET Laboratories, Inc.



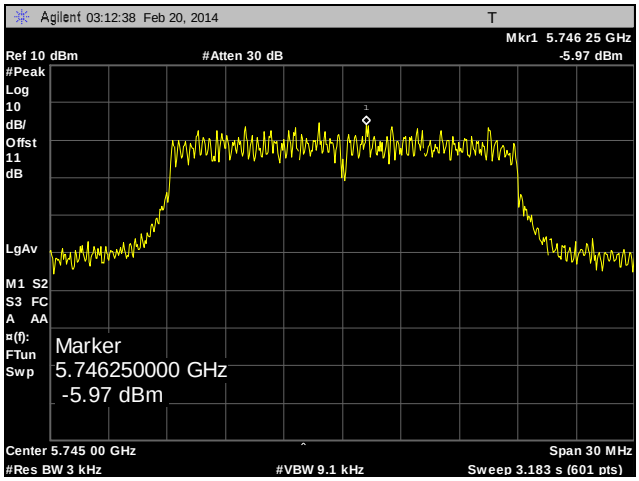
Plot 545. Peak Power Spectral Density, Low Channel, 802.11n 20 MHz, Ant. 1, MIMO



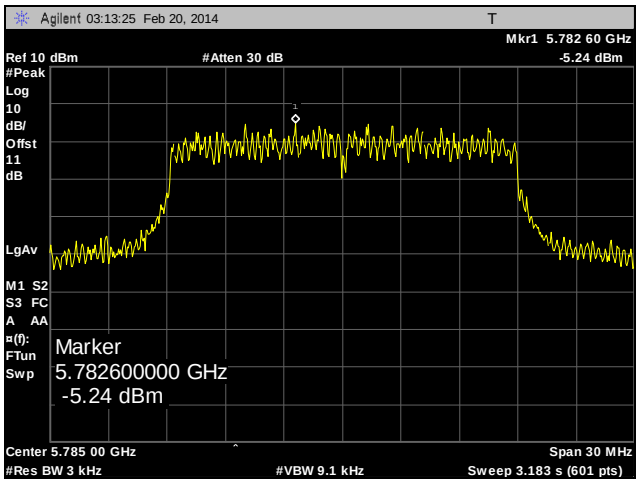
Plot 546. Peak Power Spectral Density, Mid Channel, 802.11n 20 MHz, Ant. 1, MIMO



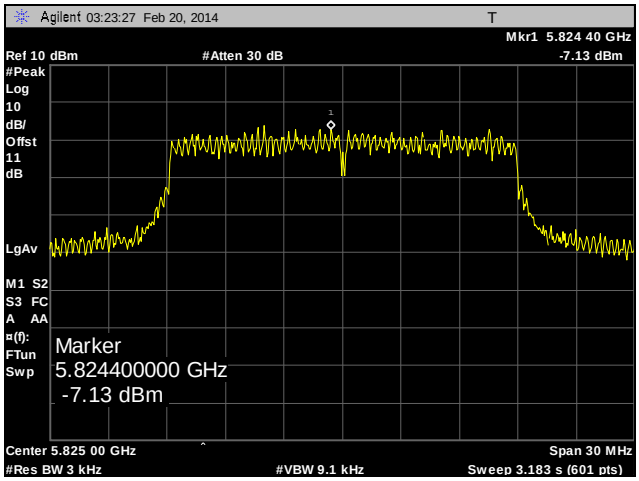
Plot 547. Peak Power Spectral Density, High Channel, 802.11n 20 MHz, Ant. 1, MIMO



Plot 548. Peak Power Spectral Density, Low Channel, 802.11n 20 MHz, Ant. 2, MIMO

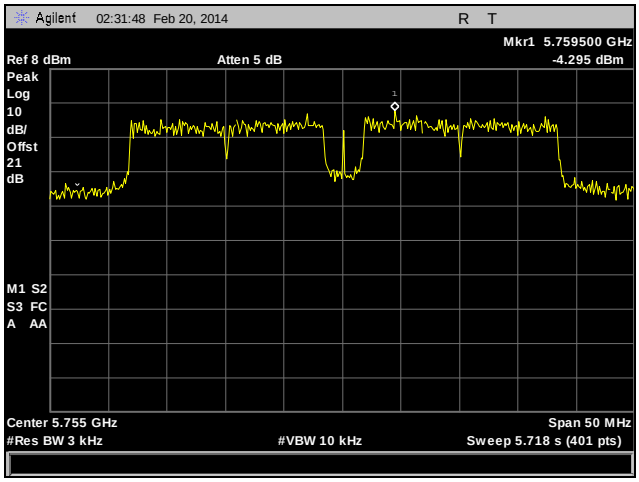


Plot 549. Peak Power Spectral Density, Mid Channel, 802.11n 20 MHz, Ant. 2, MIMO

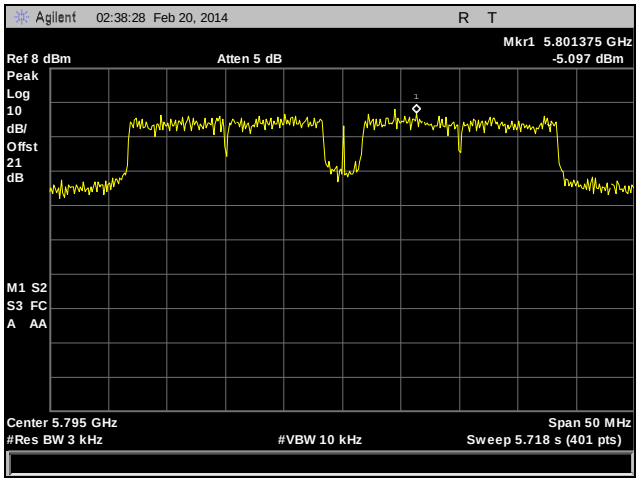


Plot 550. Peak Power Spectral Density, High Channel, 802.11n 20 MHz, Ant. 2, MIMO

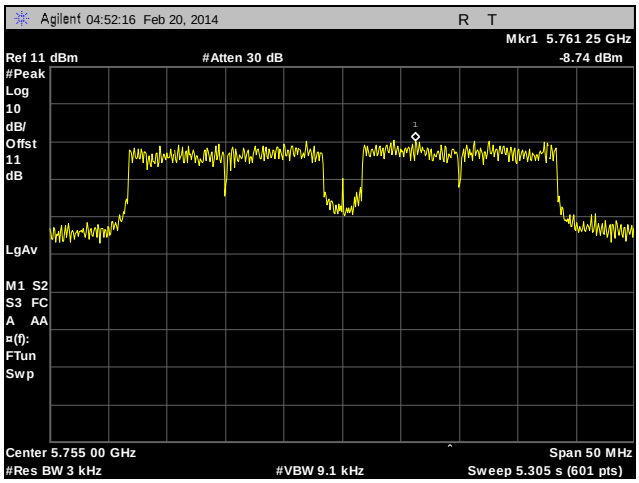
Peak Power Spectral Density, 802.11a 40 MHz



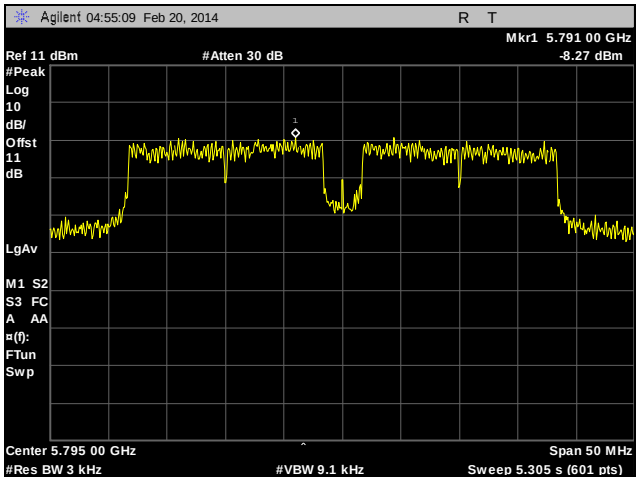
Plot 551. Peak Power Spectral Density, Low Channel, 802.11a 40 MHz, Ant. 0



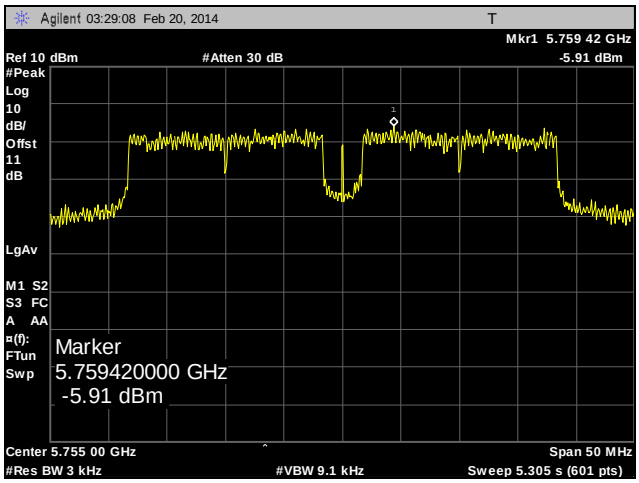
Plot 552. Peak Power Spectral Density, High Channel, 802.11a 40 MHz, Ant. 0



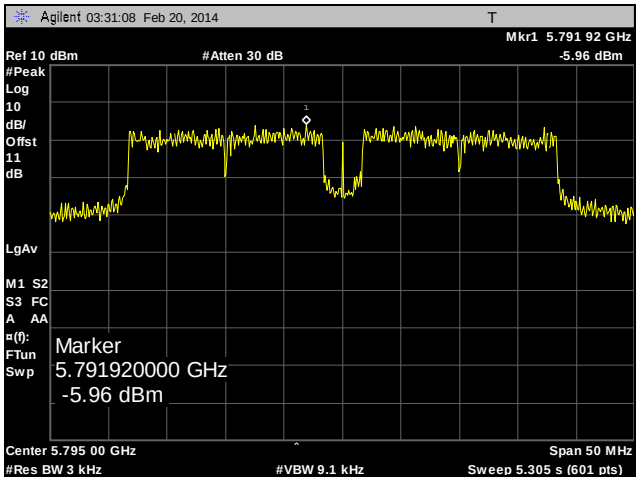
Plot 553. Peak Power Spectral Density, Low Channel, 802.11a 40 MHz, Ant. 1



Plot 554. Peak Power Spectral Density, High Channel, 802.11a 40 MHz, Ant. 1

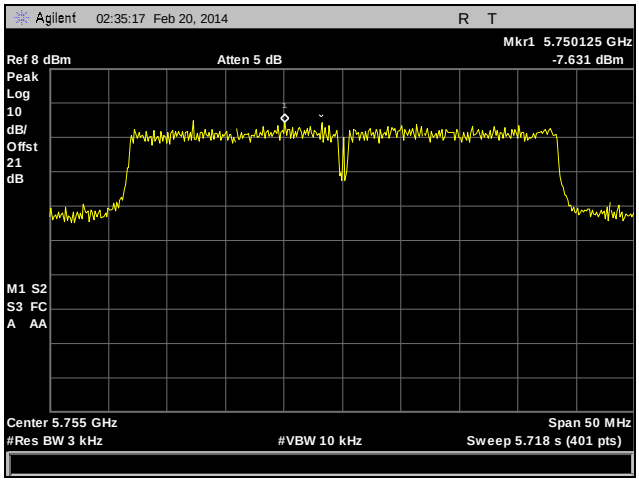


Plot 555. Peak Power Spectral Density, Low Channel, 802.11a 40 MHz, Ant. 2

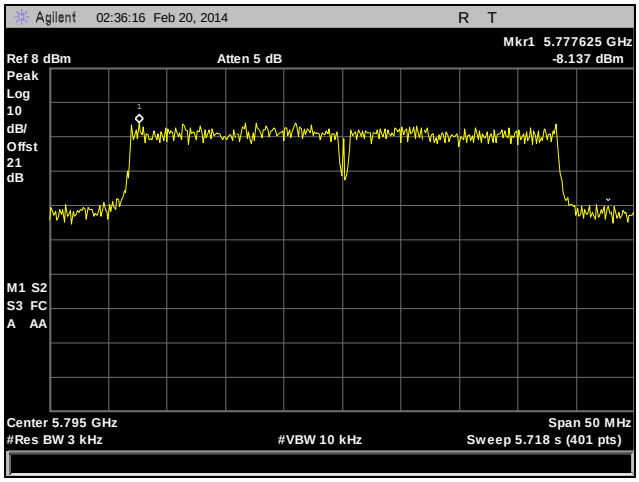


Plot 556. Peak Power Spectral Density, High Channel, 802.11a 40 MHz, Ant. 2

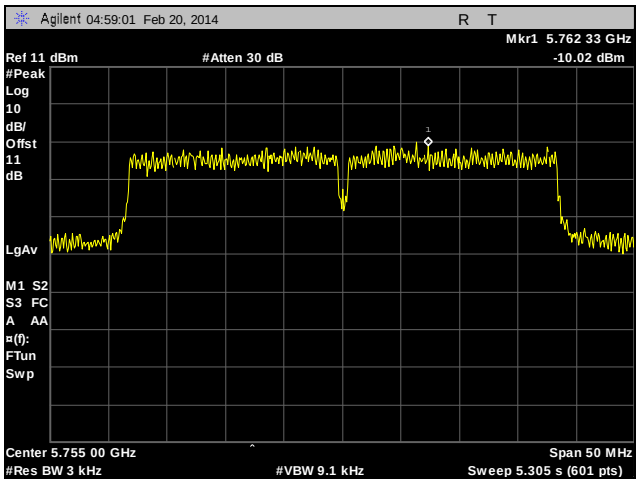
Peak Power Spectral Density, 802.11ac 40 MHz, MIMO



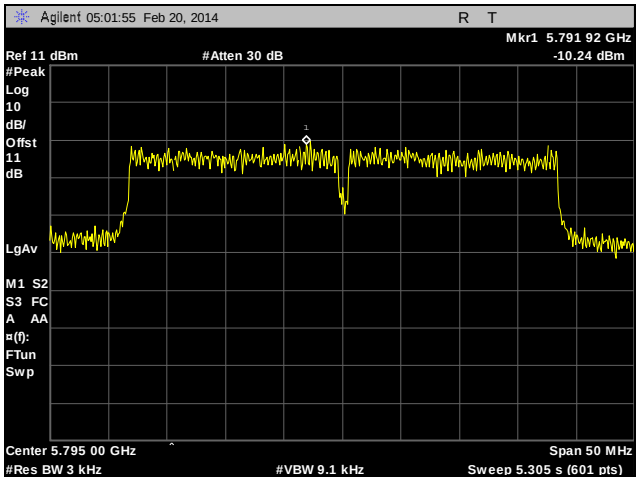
Plot 557. Peak Power Spectral Density, Low Channel, 802.11ac 40 MHz, Ant. 0, MIMO



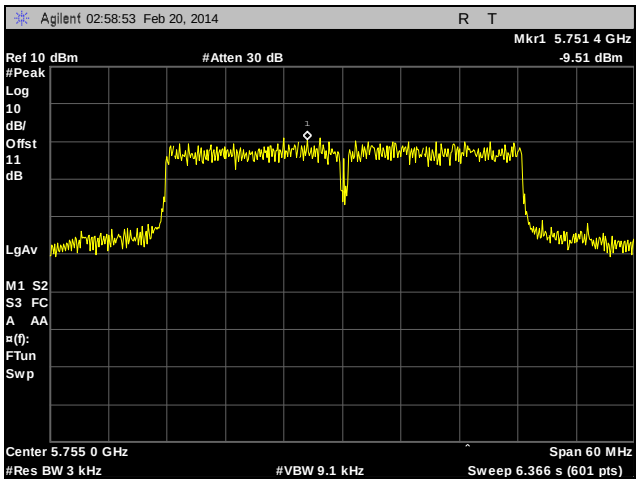
Plot 558. Peak Power Spectral Density, High Channel, 802.11ac 40 MHz, Ant. 0, MIMO



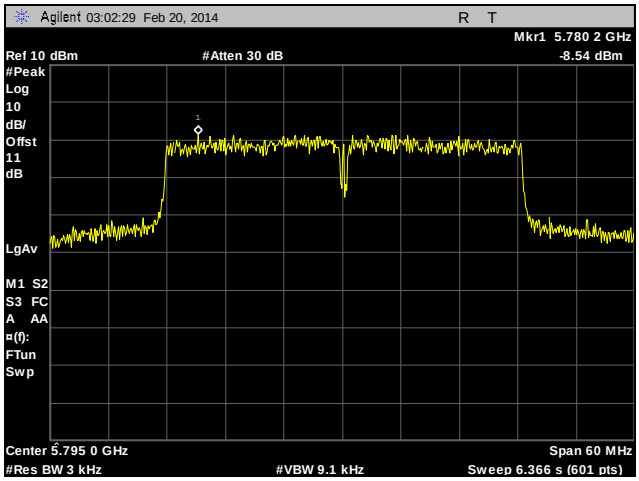
Plot 559. Peak Power Spectral Density, Low Channel, 802.11ac 40 MHz, Ant. 1, MIMO



Plot 560. Peak Power Spectral Density, High Channel, 802.11ac 40 MHz, Ant. 1, MIMO

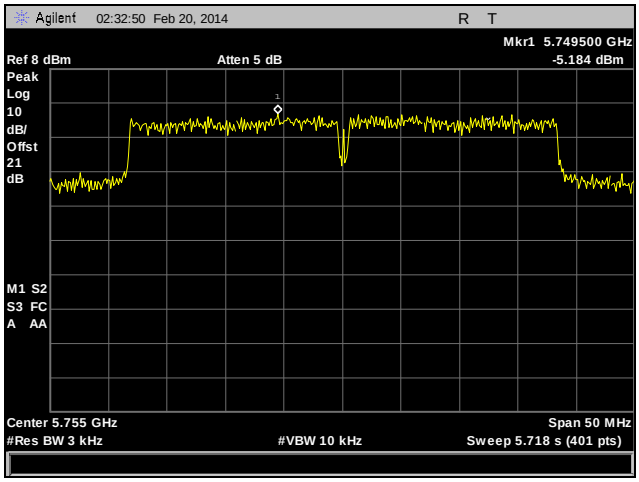


Plot 561. Peak Power Spectral Density, Low Channel, 802.11ac 40 MHz, Ant. 2, MIMO

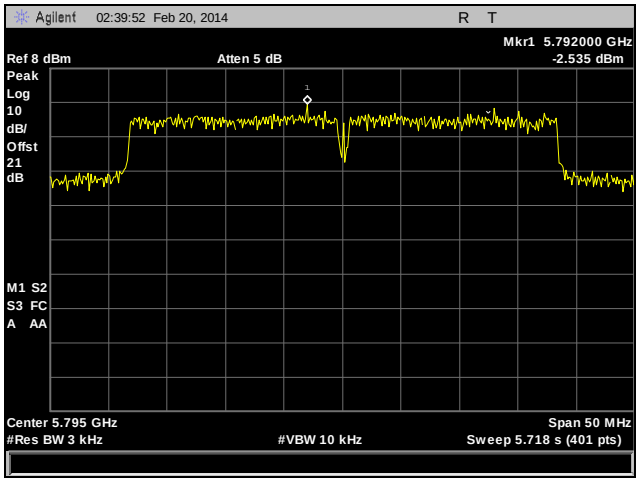


Plot 562. Peak Power Spectral Density, High Channel, 802.11ac 40 MHz, Ant. 2, MIMO

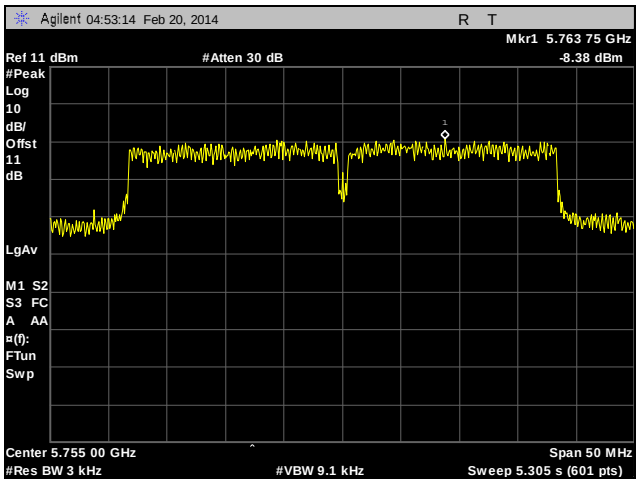
Peak Power Spectral Density, 802.11n 40 MHz



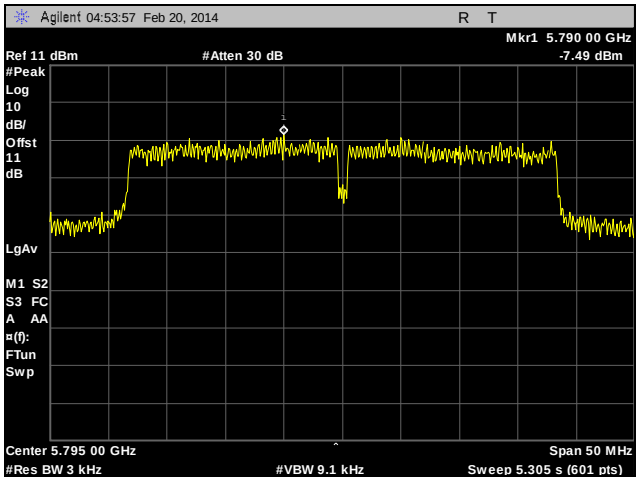
Plot 563. Peak Power Spectral Density, Low Channel, 802.11n 40 MHz, Ant. 0



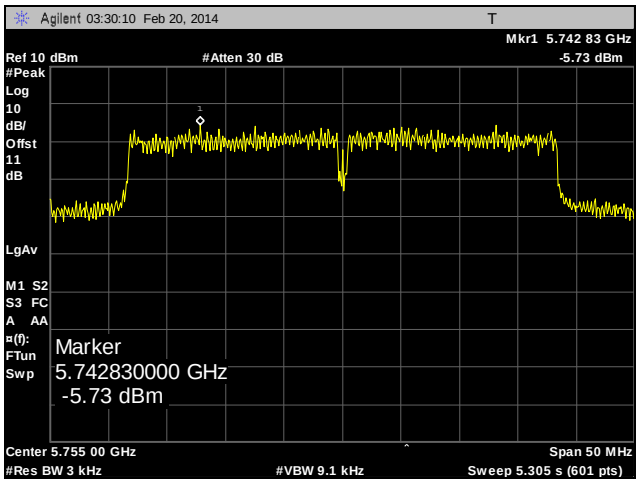
Plot 564. Peak Power Spectral Density, High Channel, 802.11n 40 MHz, Ant. 0



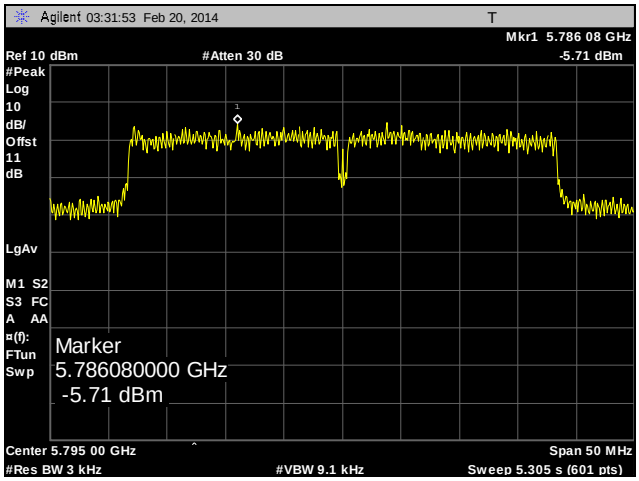
Plot 565. Peak Power Spectral Density, Low Channel, 802.11n 40 MHz, Ant. 1



Plot 566. Peak Power Spectral Density, High Channel, 802.11n 40 MHz, Ant. 1



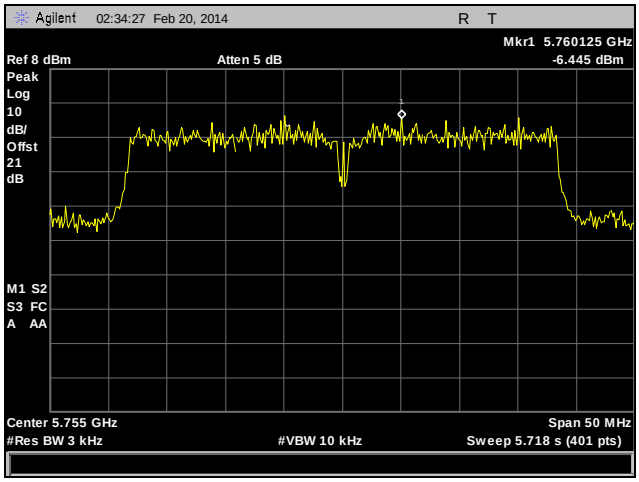
Plot 567. Peak Power Spectral Density, Low Channel, 802.11n 40 MHz, Ant. 2



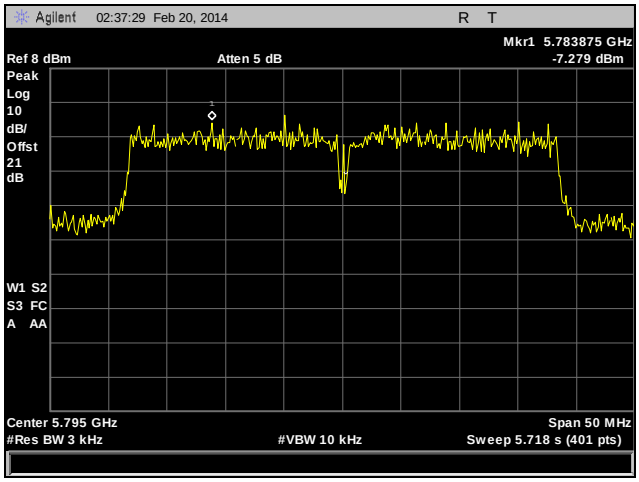
Plot 568. Peak Power Spectral Density, High Channel, 802.11n 40 MHz, Ant. 2

© 2014, MET Laboratories, Inc.

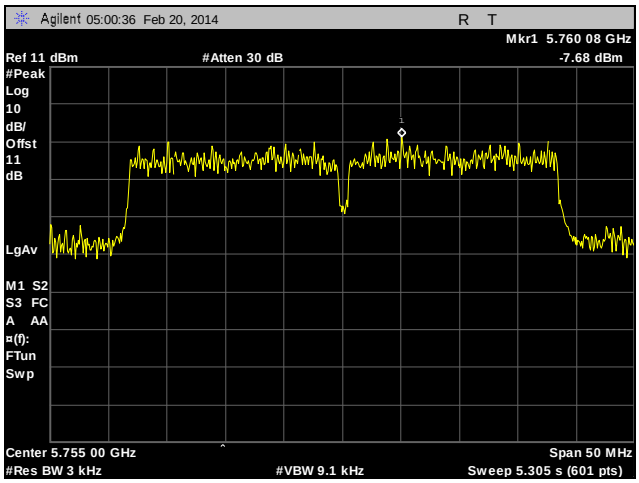
Peak Power Spectral Density, 802.11n 40 MHz, MIMO



Plot 569. Peak Power Spectral Density, Low Channel, 802.11n 40 MHz, Ant. 0, MIMO

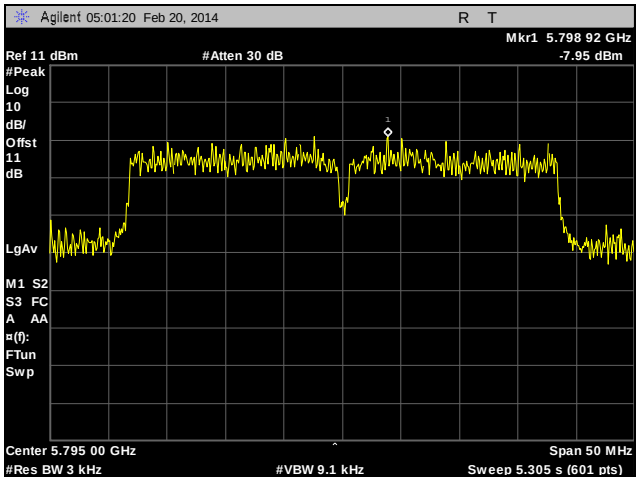


Plot 570. Peak Power Spectral Density, High Channel, 802.11n 40 MHz, Ant. 0, MIMO

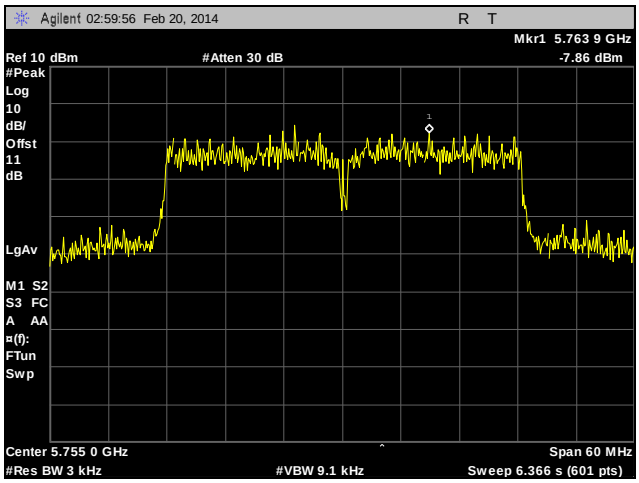


Plot 571. Peak Power Spectral Density, Low Channel, 802.11n 40 MHz, Ant. 1, MIMO

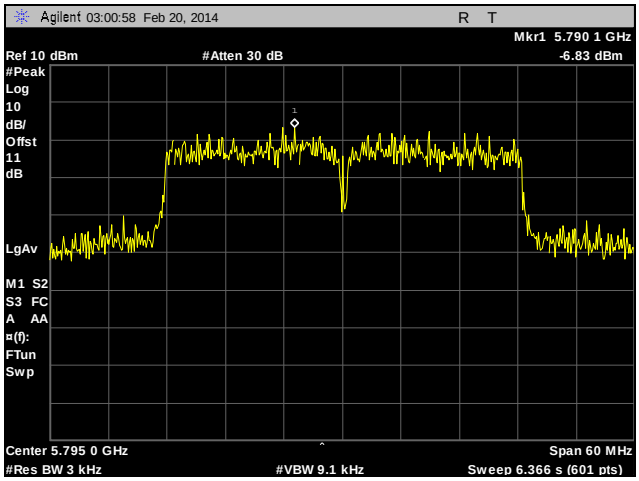
© 2014, MET Laboratories, Inc.



Plot 572. Peak Power Spectral Density, High Channel, 802.11n 40 MHz, Ant. 1, MIMO

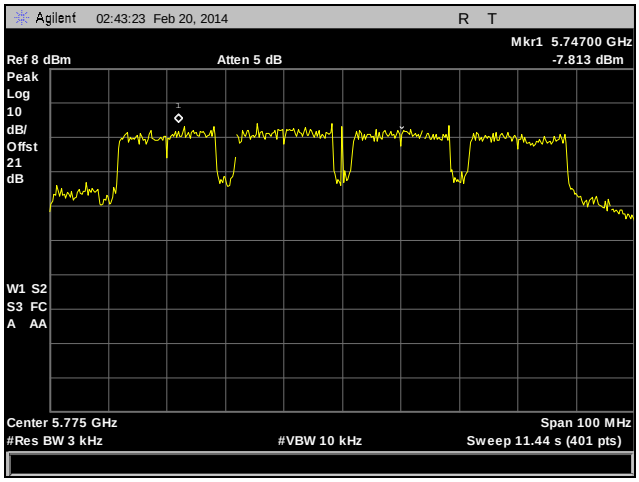


Plot 573. Peak Power Spectral Density, Low Channel, 802.11n 40 MHz, Ant. 2, MIMO

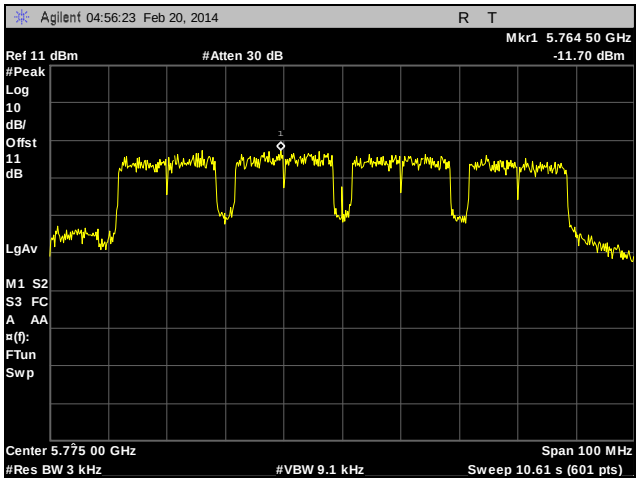


Plot 574. Peak Power Spectral Density, High Channel, 802.11n 40 MHz, Ant. 2, MIMO

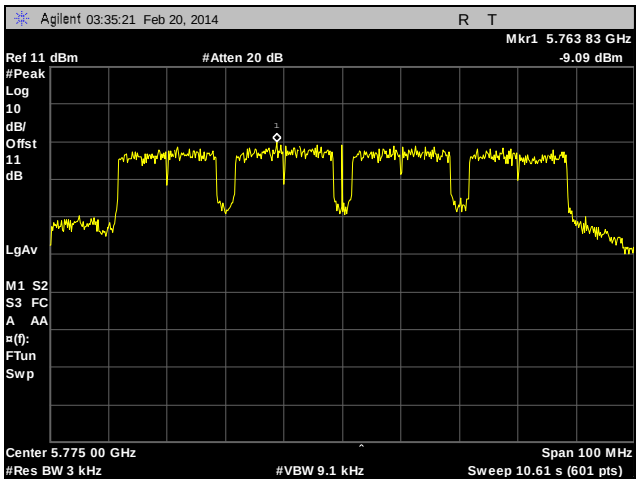
Peak Power Spectral Density, 802.11a 80 MHz



Plot 575. Peak Power Spectral Density, 802.11a 80 MHz, Ant. 0

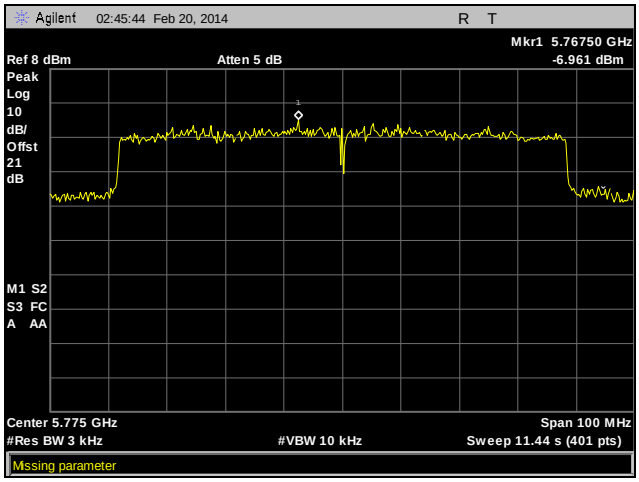


Plot 576. Peak Power Spectral Density, 802.11a 80 MHz, Ant. 1

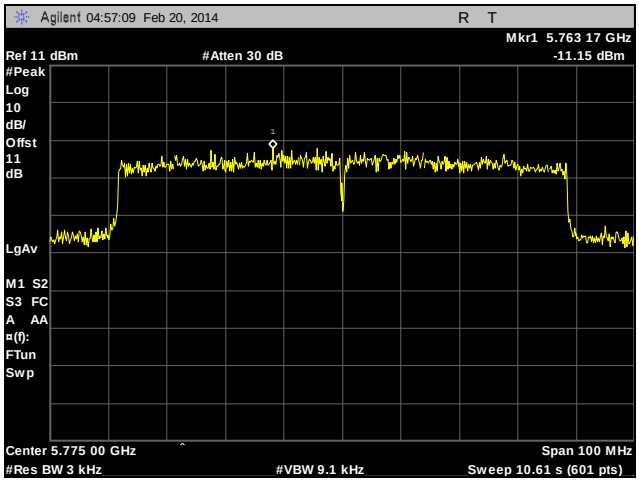


Plot 577. Peak Power Spectral Density, 802.11a 80 MHz, Ant. 2

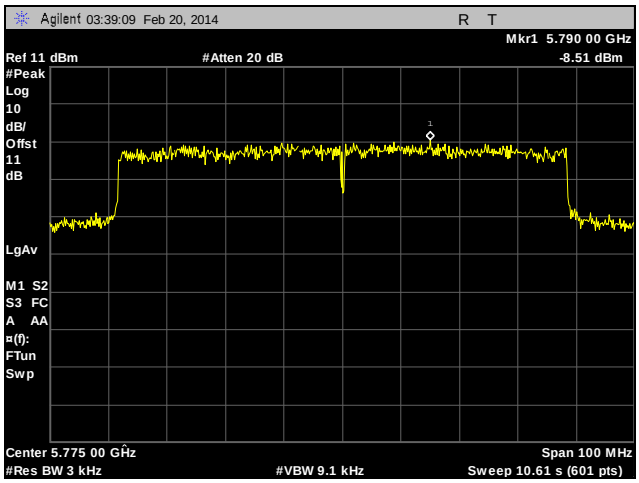
Peak Power Spectral Density, 802.11ac 80 MHz



Plot 578. Peak Power Spectral Density, 802.11ac 80 MHz, Ant. 0

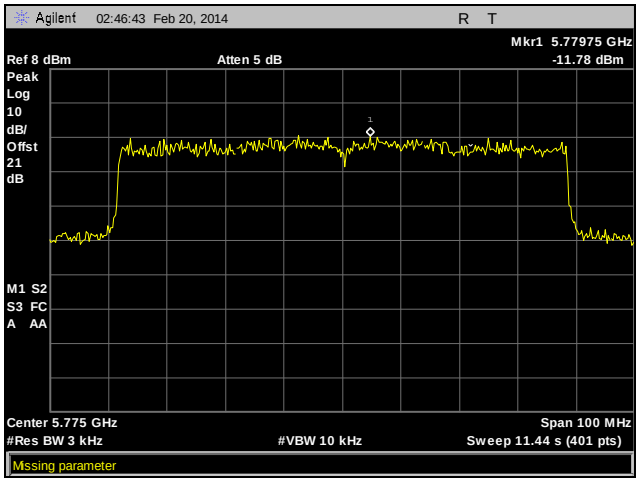


Plot 579. Peak Power Spectral Density, 802.11ac 80 MHz, Ant. 1

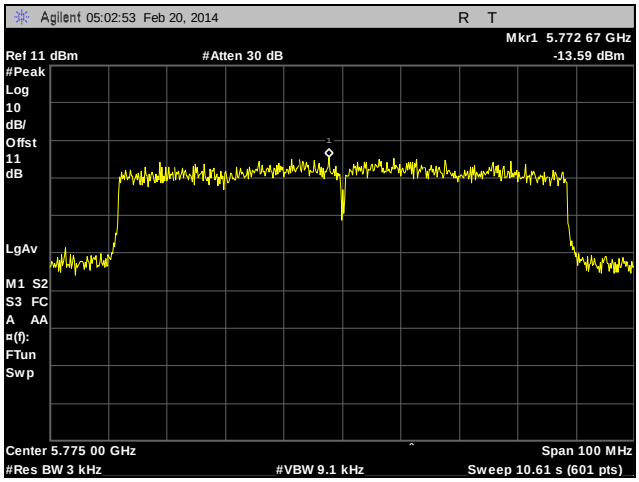


Plot 580. Peak Power Spectral Density, 802.11ac 80 MHz, Ant. 2

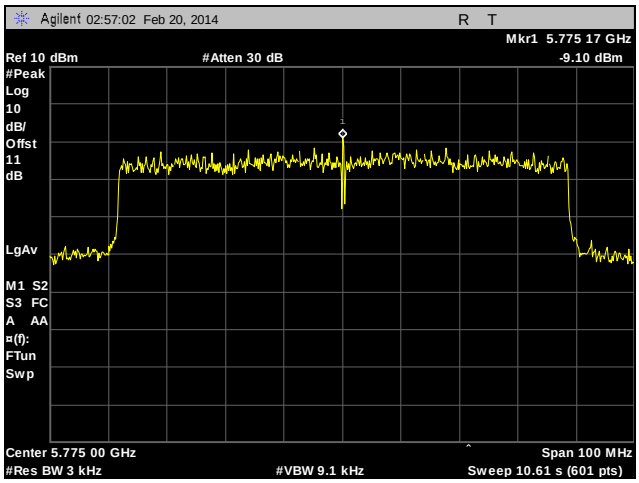
Peak Power Spectral Density, 802.11ac 80 MHz, MIMO



Plot 581. Peak Power Spectral Density, 802.11ac 80 MHz, Ant. 0, MIMO



Plot 582. Peak Power Spectral Density, 802.11ac 80 MHz, Ant. 1, MIMO



Plot 583. Peak Power Spectral Density, 802.11ac 80 MHz, Ant. 2, MIMO

Electromagnetic Compatibility Criteria for Intentional Radiators

§ 15.247(i) Maximum Permissible Exposure

RF Exposure Requirements: **§1.1307(b)(1) and §1.1307(b)(2):** Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess of the Commission's guidelines.

RF Radiation Exposure Limit: **§1.1310:** As specified in this section, the Maximum Permissible Exposure (MPE) Limit shall be used to evaluate the environmental impact of human exposure to radiofrequency (RF) radiation as specified in Sec. 1.1307(b), except in the case of portable devices which shall be evaluated according to the provisions of Sec. 2.1093 of this chapter.

Peak Conducted Power = 27.89 dBm = 615mW
Antenna gain = 8.71 dBi = 7.43
The limit for maximum RF exposure for 5.8GHz device is 1mW/cm^2
The formula for calculating RF exposure is given as $S= \frac{PG}{4\pi R^2}$
R=20cm, then S = 0.91 mW/cm^2 which was under the limit specified in 1.1310

IV. Test Equipment

© 2014, MET Laboratories, Inc.

Test Equipment

Calibrated test equipment utilized during testing was maintained in a current state of calibration per the requirements of ISO/IEC 17025:2005.

Asset	Equipment	Manufacturer	Model Number	Cal Date	Cal Due
1T4409	EMI RECEIVER	ROHDE & SCHWARZ	ESIB7	7/16/2012	7/16/2014
1T4818	COMB GENERATOR	COM-POWER	CGO-520	SEE NOTE	
1T4787	HYGROMETER / THERMOMETER / BAROMETER / DEW POINT PEN	CONTROL COMPANY	15-078-198, FB70423, 245CD	2/15/2012	2/15/2014
1T4483	ANTENNA; HORN	EMCO	3115	9/5/2012	3/5/2014
1T4300C	SEMI-ANECHOIC 3M CHAMBER # 1 (VCCI)	EMC TEST SYSTEMS	NONE	1/31/2012	1/31/2015
1T4612	SPECTRUM ANALYZER	AGILENT TECHNOLOGIES	E4407B	7/30/2013	7/30/2014

Table 114. Test Equipment List

Note: Functionally tested equipment is verified using calibrated instrumentation at the time of testing.

© 2014, MET Laboratories, Inc.

V. Certification & User's Manual Information

Certification & User's Manual Information

A. Certification Information

The following is extracted from Title 47 of the Code of Federal Regulations, Part 2, Subpart I — Marketing of Radio frequency devices:

§ 2.801 Radio-frequency device defined.

As used in this part, a radio-frequency device is any device which in its operation is capable of Emitting radio-frequency energy by radiation, conduction, or other means. Radio- frequency devices include, but are not limited to:

(a) The various types of radio communication transmitting devices described throughout this chapter.

(b) The incidental, unintentional and intentional radiators defined in Part 15 of this chapter.

(c) The industrial, scientific, and medical equipment described in Part 18 of this chapter.

(d) Any part or component thereof which in use emits radio-frequency energy by radiation, conduction, or other means.

§ 2.803 Marketing of radio frequency devices prior to equipment authorization.

(a) Except as provided elsewhere in this chapter, no person shall sell or lease, or offer for sale or lease (including advertising for sale or lease), or import, ship or distribute for the purpose of selling or leasing or offering for sale or lease, any radio frequency device unless:

(1) In the case of a device subject to certification, such device has been authorized by the Commission in accordance with the rules in this chapter and is properly identified and labeled as required by §2.925 and other relevant sections in this chapter; or

(2) In the case of a device that is not required to have a grant of equipment authorization issued by the Commission, but which must comply with the specified technical standards prior to use, such device also complies with all applicable administrative (including verification of the equipment or authorization under a Declaration of Conformity, where required), technical, labeling and identification requirements specified in this chapter.

(d) Notwithstanding the provisions of paragraph (a) of this section, the offer for sale solely to business, commercial, industrial, scientific or medical users (but not an offer for sale to other parties or to end users located in a residential environment) of a radio frequency device that is in the conceptual, developmental, design or pre-production stage is permitted prior to equipment authorization or, for devices not subject to the equipment authorization requirements, prior to a determination of compliance with the applicable technical requirements *provided* that the prospective buyer is advised in writing at the time of the offer for sale that the equipment is subject to the FCC rules and that the equipment will comply with the appropriate rules before delivery to the buyer or to centers of distribution.

 © 2014, MET Laboratories, Inc.

(e)(1) Notwithstanding the provisions of paragraph (a) of this section, prior to equipment authorization or determination of compliance with the applicable technical requirements any radio frequency device may be operated, but not marketed, for the following purposes and under the following conditions:

(i) Compliance testing;

(ii) Demonstrations at a trade show provided the notice contained in paragraph (c) of this section is displayed in a conspicuous location on, or immediately adjacent to, the device;

(iii) Demonstrations at an exhibition conducted at a business, commercial, industrial, scientific or medical location, but excluding locations in a residential environment, provided the notice contained in paragraphs (c) or (d) of this section, as appropriate, is displayed in a conspicuous location on, or immediately adjacent to, the device;

(iv) Evaluation of product performance and determination of customer acceptability, provided such operation takes place at the manufacturer's facilities during developmental, design or pre-production states; or

(v) Evaluation of product performance and determination of customer acceptability where customer acceptability of a radio frequency device cannot be determined at the manufacturer's facilities because of size or unique capability of the device, provided the device is operated at a business, commercial, industrial, scientific or medical user's site, but not at a residential site, during the development, design or pre-production stages.

(e)(2) For the purpose of paragraphs (e)(1)(iv) and (e)(1)(v) of this section, the term *manufacturer's facilities* includes the facilities of the party responsible for compliance with the regulations and the manufacturer's premises, as well as the facilities of other entities working under the authorization of the responsible party in connection with the development and manufacture, but not the marketing, of the equipment.

(f) For radio frequency devices subject to verification and sold solely to business, commercial, industrial, scientific and medical users (excluding products sold to other parties or for operation in a residential environment), parties responsible for verification of the devices shall have the option of ensuring compliance with the applicable technical specifications of this chapter at each end user's location after installation, provided that the purchase or lease agreement includes a proviso that such a determination of compliance be made and is the responsibility of the party responsible for verification of the equipment.

Certification & User's Manual Information

The following is extracted from Title 47 of the Code of Federal Regulations, Part 2, Subpart J — Equipment Authorization Procedures:

§ 2.901 Basis and Purpose

(a) In order to carry out its responsibilities under the Communications Act and the various treaties and international regulations, and in order to promote efficient use of the radio spectrum, the Commission has developed technical standards for radio frequency equipment and parts or components thereof. The technical standards applicable to individual types of equipment are found in that part of the rules governing the service wherein the equipment is to be operated.[1] *In addition to the technical standards provided, the rules governing the service may require that such equipment be verified by the manufacturer or importer*, be authorized under a Declaration of Conformity, or receive an equipment authorization from the Commission by one of the following procedures: certification or registration.

(b) The following sections describe the verification procedure, the procedure for a Declaration of Conformity, and the procedures to be followed in obtaining certification from the Commission and the conditions attendant to such a grant.

§ 2.907 Certification.

(a) Certification is an equipment authorization issued by the Commission, based on representation and test data submitted by the applicant.

(b) Certification attaches to all units subsequently marketed by the grantee which are identical (see Section 2.908) to the sample tested except for permissive changes or other variations authorized by the Commission pursuant to Section 2.1043.

[1] In this case, the equipment is subject to the rules of Part 15. More specifically, the equipment falls under Subpart B (of Part 15), which deals with unintentional radiators.

 © 2014, MET Laboratories, Inc.

Certification & User's Manual Information

§ 2.948 Description of measurement facilities.

(a) Each party making measurements of equipment that is subject to an equipment authorization under Part 15 or Part 18 of this chapter, regardless of whether the measurements are filed with the Commission or kept on file by the party responsible for compliance of equipment marketed within the U.S. or its possessions, shall compile a description of the measurement facilities employed.

(1) If the measured equipment is subject to the verification procedure, the description of the measurement facilities shall be retained by the party responsible for verification of the equipment.

(i) If the equipment is verified through measurements performed by an independent laboratory, it is acceptable for the party responsible for verification of the equipment to rely upon the description of the measurement facilities retained by or placed on file with the Commission by that laboratory. In this situation, the party responsible for the verification of the equipment is not required to retain a duplicate copy of the description of the measurement facilities.

(ii) If the equipment is verified based on measurements performed at the installation site of the equipment, no specific site calibration data is required. It is acceptable to retain the description of the measurement facilities at the site at which the measurements were performed.

(2) If the equipment is to be authorized by the Commission under the certification procedure, the description of the measurement facilities shall be filed with the Commission's Laboratory in Columbia, Maryland. The data describing the measurement facilities need only be filed once but must be updated as changes are made to the measurement facilities or as otherwise described in this section. At least every three years, the organization responsible for filing the data with the Commission shall certify that the data on file is current.

Certification & User's Manual Information

1. Label and User's Manual Information

The following is extracted from Title 47 of the Code of Federal Regulations, Part 15, Subpart A — General:

§ 15.19 Labeling requirements.

(a) In addition to the requirements in Part 2 of this chapter, a device subject to certification or verification shall be labeled as follows:

(1) Receivers associated with the operation of a licensed radio service, e.g., FM broadcast under Part 73 of this chapter, land mobile operation under Part 90, etc., shall bear the following statement in a conspicuous location on the device:

This device complies with Part 15 of the FCC Rules. Operation is subject to the condition that this device does not cause harmful interference.

(2) A stand-alone cable input selector switch, shall bear the following statement in a conspicuous location on the device:

This device is verified to comply with Part 15 of the FCC Rules for use with cable television service.

(3) All other devices shall bear the following statement in a conspicuous location on the device:

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

(4) Where a device is constructed in two or more sections connected by wires and marketed together, the statement specified under paragraph (a) of this section is required to be affixed only to the main control unit.

(5) When the device is so small or for such use that it is not practicable to place the statement specified under paragraph (a) of this section on it, the information required by this paragraph shall be placed in a prominent location in the instruction manual or pamphlet supplied to the user or, alternatively, shall be placed on the container in which the device is marketed. However, the FCC identifier or the unique identifier, as appropriate, must be displayed on the device.

§ 15.21 Information to user.

The user's manual or instruction manual for an intentional or unintentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

 © 2014, MET Laboratories, Inc.

Verification & User's Manual Information

The following is extracted from Title 47 of the Code of Federal Regulations, Part 15, Subpart B — Unintentional Radiators:

§ 15.105 Information to the user.

(a) For a Class A digital device or peripheral, the instructions furnished the user shall include the following or similar statement, placed in a prominent location in the text of the manual:

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at own expense.

(b) For a Class B digital device or peripheral, the instructions furnished the user shall include the following or similar statement, placed in a prominent location in the text of the manual:

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

– Reorient or relocate the receiving antenna.

– Increase the separation between the equipment and receiver.

– Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

– Consult the dealer or an experienced radio/TV technician for help.

 © 2014, MET Laboratories, Inc.

ICES-003 Procedural & Labeling Requirements

From the Industry Canada Electromagnetic Compatibility Advisory Bulletin entitled, "Implementation and Interpretation of the Interference-Causing Equipment Standard for Digital Apparatus, ICES-003" (EMCAB-3, Issue 2, July 1995):

> "At present, CISPR 22: 2002 and ICES technical requirements are essentially equivalent. Therefore, if you have CISPR 22: 2002 approval by meeting CISPR Publication 22, the only additional requirements are: to attach a note to the report of the test results for compliance, indicating that these results are deemed satisfactory evidence of compliance with ICES-003 of the Canadian Interference-Causing Equipment Regulations; to maintain these records on file for the requisite five year period; and to provide the device with a notice of compliance in accordance with ICES-003."

Procedural Requirements:

According to Industry Canada's Interference Causing Equipment Standard for Digital Apparatus ICES-003 Issue 5 August 2012:

Section 6.1: A record of the measurements and results, showing the date that the measurements were completed, shall be retained by the manufacturer or importer for a period of at least five years from the date shown in the record and made available for examination on the request of the Minister.

Section 6.2: A written notice indicating compliance must accompany each unit of digital apparatus to the end user. The notice shall be in the form of a label that is affixed to the apparatus. Where because of insufficient space or other constraints it is not feasible to affix a label to the apparatus, the notice may be in the form of a statement in the users' manual.

Labeling Requirements:

The suggested text for the notice, in English and in French, is provided below, from the Annex of ICES-003:

> This Class [2] digital apparatus complies with Canadian ICES-003.
>
> Cet appareil numérique de la classe [1] est conforme à la norme NMB-003 du Canada.

[2] Insert either A or B but not both as appropriate for the equipment requirements.

End of Report

 © 2014, MET Laboratories, Inc.