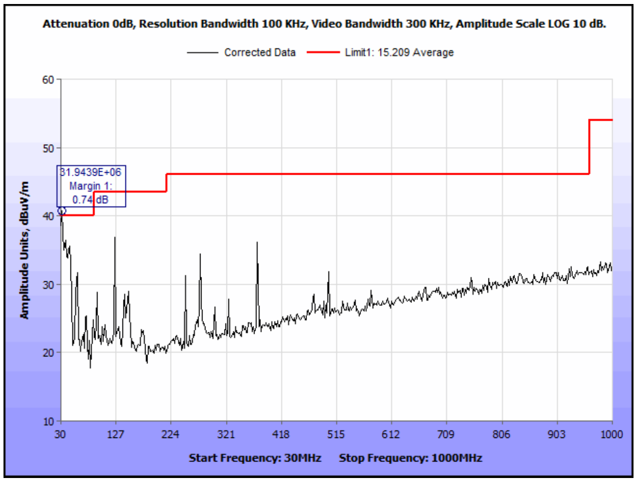
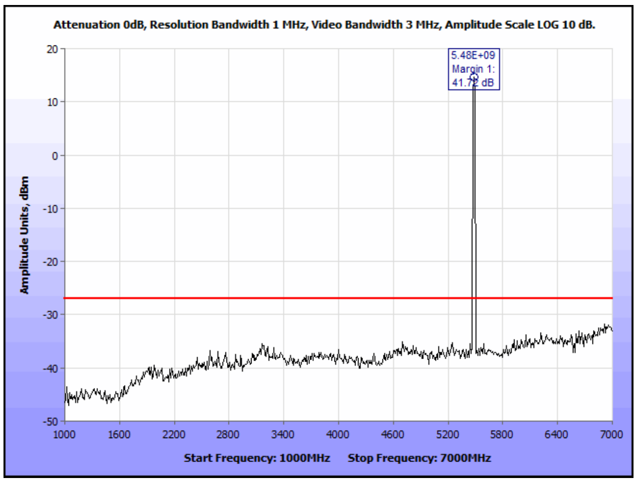
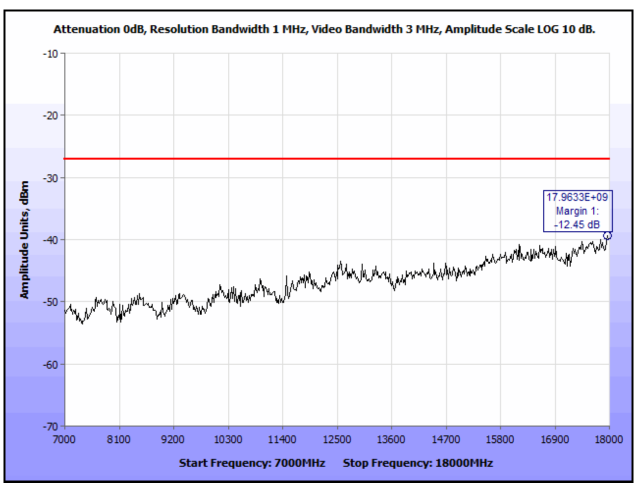
Radiated Spurious Emissions, 20 MHz, Upper Bands



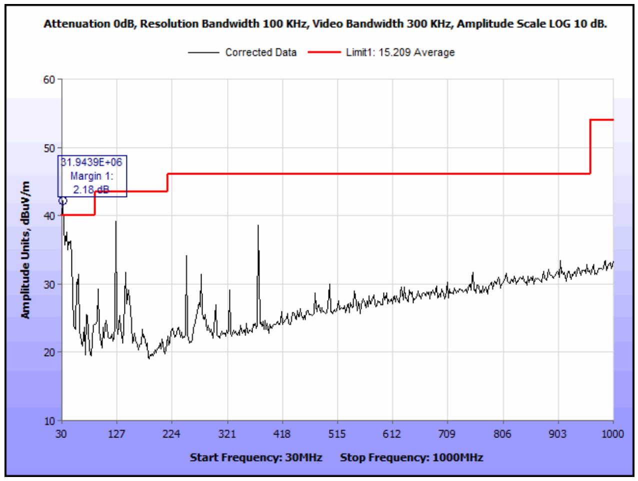
Plot 240. Radiated Spurious Emissions, 20 MHz, Low Channel, 30 MHz – 1 GHz, Upper Band



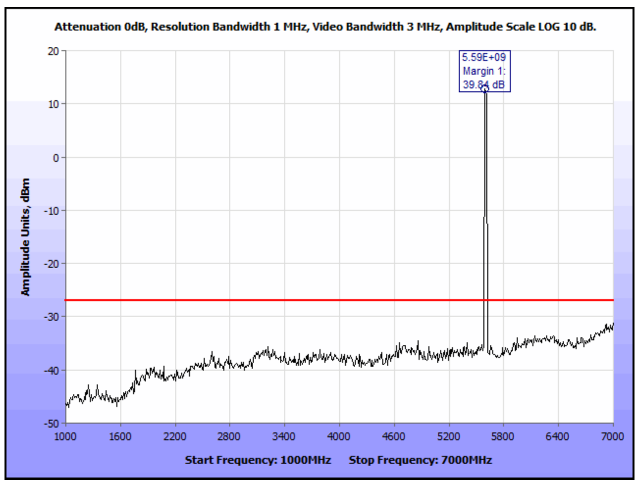
Plot 241. Radiated Spurious Emissions, 20 MHz, Low Channel, 1 GHz – 7 GHz, Upper Band



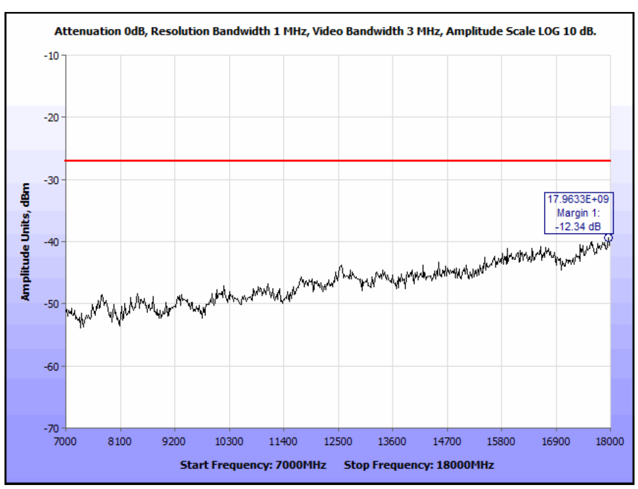
Plot 242. Radiated Spurious Emissions, 20 MHz, Low Channel, 7 GHz – 18 GHz, Upper Band



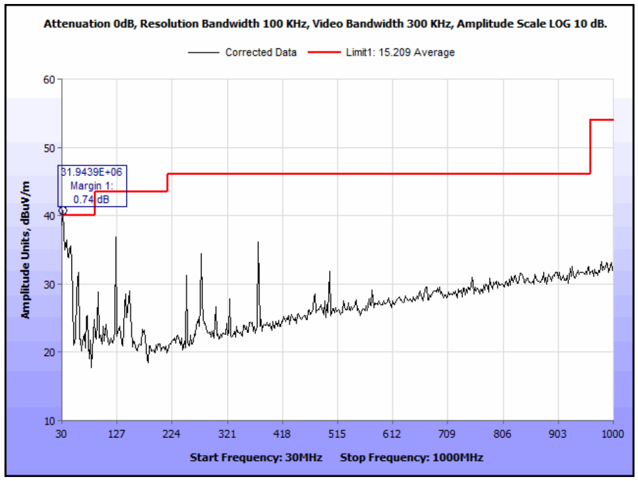
Plot 243. Radiated Spurious Emissions, 20 MHz, Mid Channel, 30 MHz – 1 GHz, Upper Band



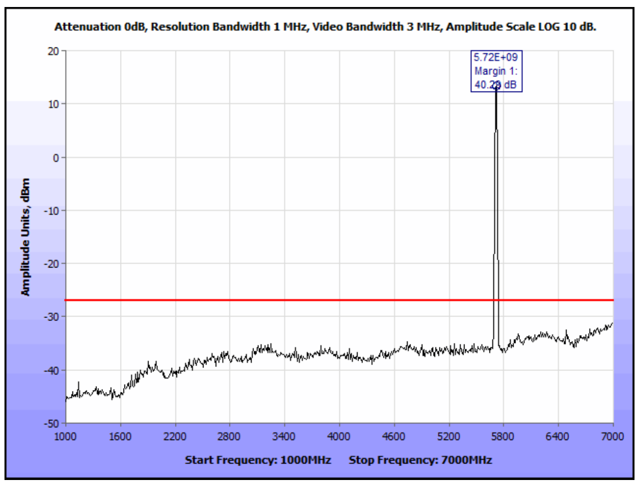
Plot 244. Radiated Spurious Emissions, 20 MHz, Mid Channel, 1 GHz – 7 GHz, Upper Band



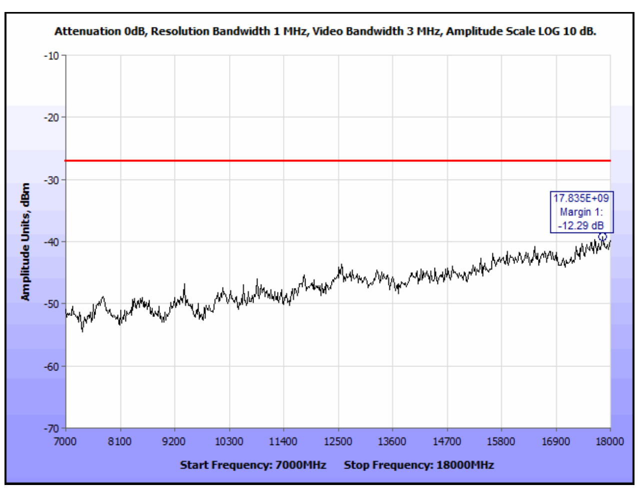
Plot 245. Radiated Spurious Emissions, 20 MHz, Mid Channel, 7 GHz – 18 GHz, Upper Band



Plot 246. Radiated Spurious Emissions, 20 MHz, High Channel, 30 MHz – 1 GHz, Upper Band

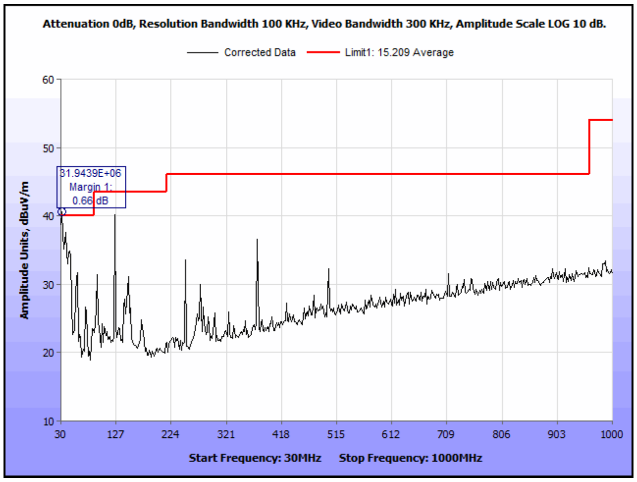


Plot 247. Radiated Spurious Emissions, 20 MHz, High Channel, 1 GHz – 7 GHz, Upper Band

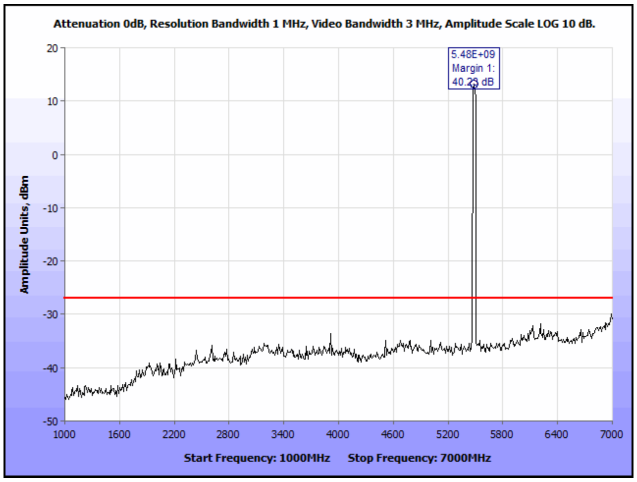


Plot 248. Radiated Spurious Emissions, 20 MHz, High Channel, 7 GHz – 18 GHz, Upper Band

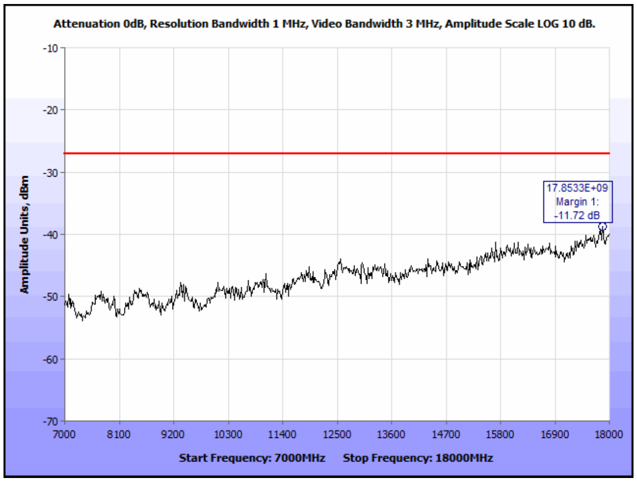
Radiated Spurious Emissions, 30 MHz, Upper Bands



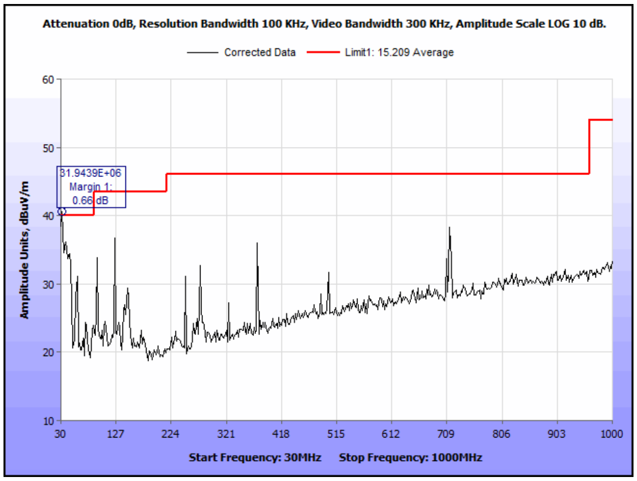
Plot 249. Radiated Spurious Emissions, 30 MHz, Low Channel, 30 MHz – 1 GHz, Upper Band



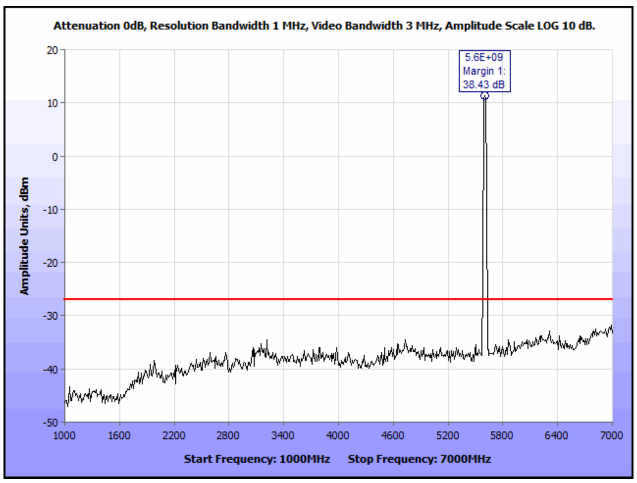
Plot 250. Radiated Spurious Emissions, 30 MHz, Low Channel, 1 GHz – 7 GHz, Upper Band



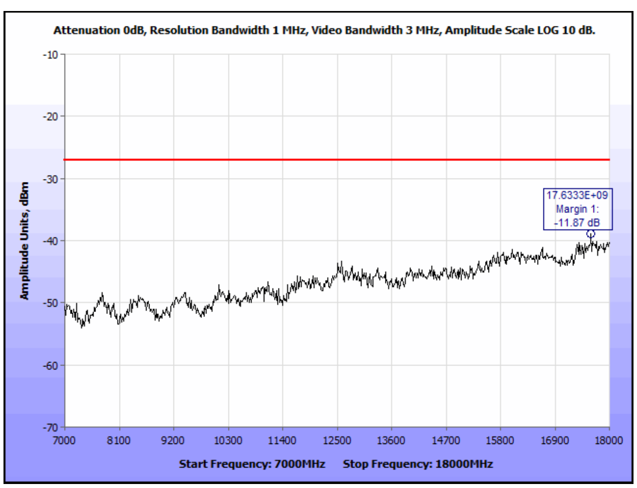
Plot 251. Radiated Spurious Emissions, 30 MHz, Low Channel, 7 GHz – 18 GHz, Upper Band



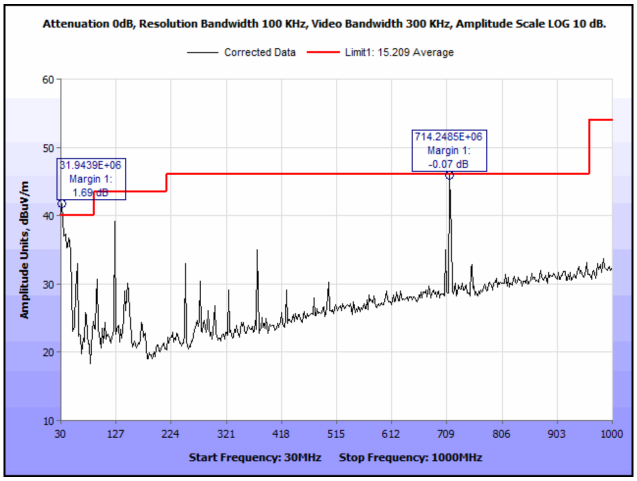
Plot 252. Radiated Spurious Emissions, 30 MHz, Mid Channel, 30 MHz – 1 GHz, Upper Band



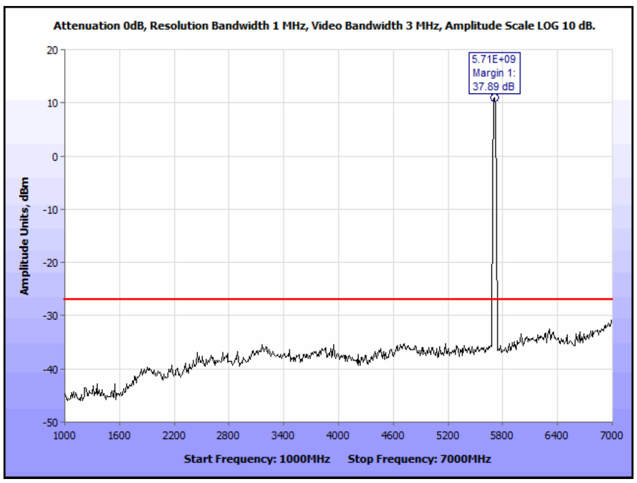
Plot 253. Radiated Spurious Emissions, 30 MHz, Mid Channel, 1 GHz – 7 GHz, Upper Band



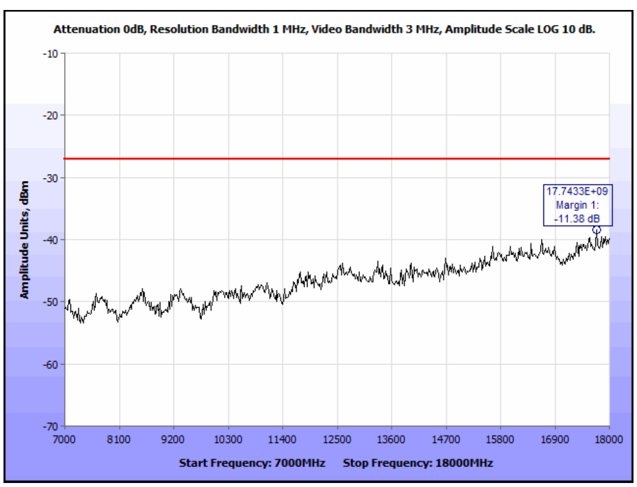
Plot 254. Radiated Spurious Emissions, 30 MHz, Mid Channel, 7 GHz – 18 GHz, Upper Band



Plot 255. Radiated Spurious Emissions, 30 MHz, High Channel, 30 MHz – 1 GHz, Upper Band

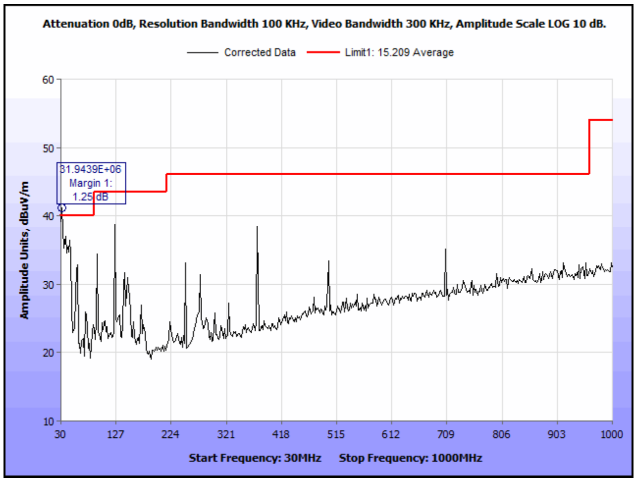


Plot 256. Radiated Spurious Emissions, 30 MHz, High Channel, 1 GHz – 7 GHz, Upper Band

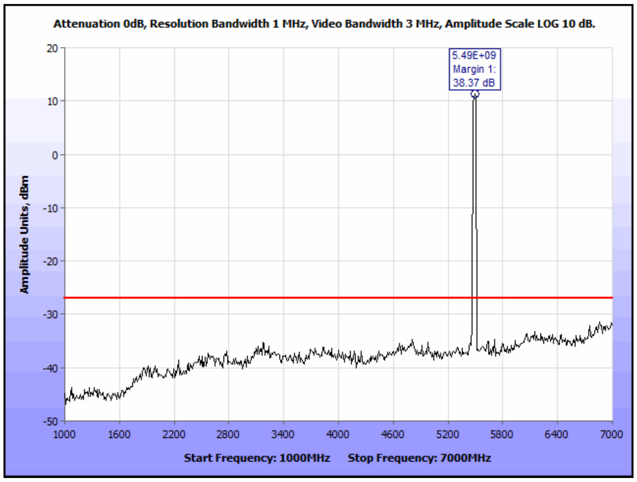


Plot 257. Radiated Spurious Emissions, 30 MHz, High Channel, 7 GHz – 18 GHz, Upper Band

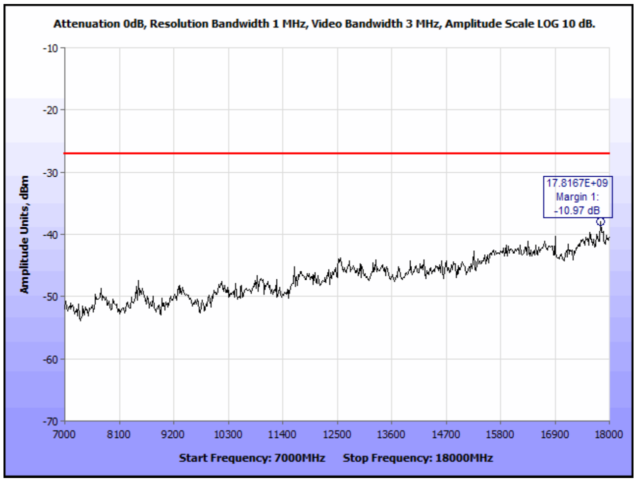
Radiated Spurious Emissions, 40 MHz, Upper Bands



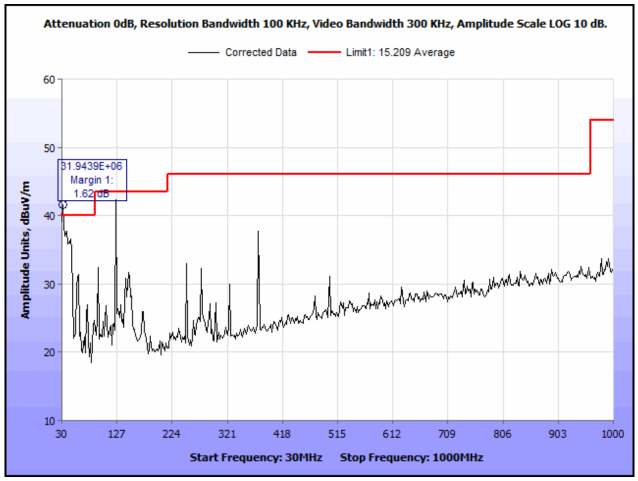
Plot 258. Radiated Spurious Emissions, 40 MHz, Low Channel, 30 MHz – 1 GHz, Upper Band



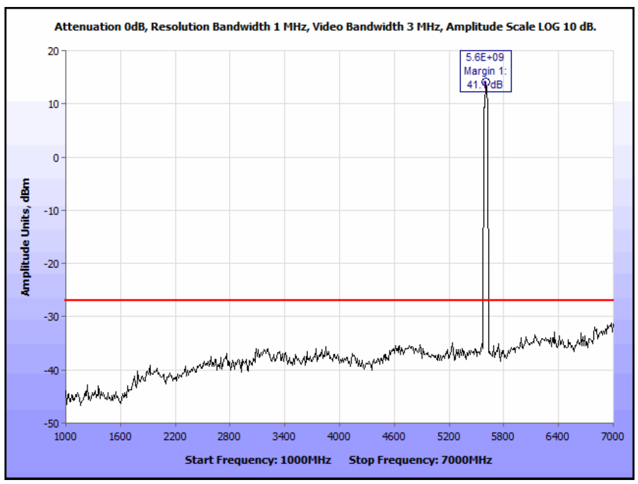
Plot 259. Radiated Spurious Emissions, 40 MHz, Low Channel, 1 GHz – 7 GHz, Upper Band



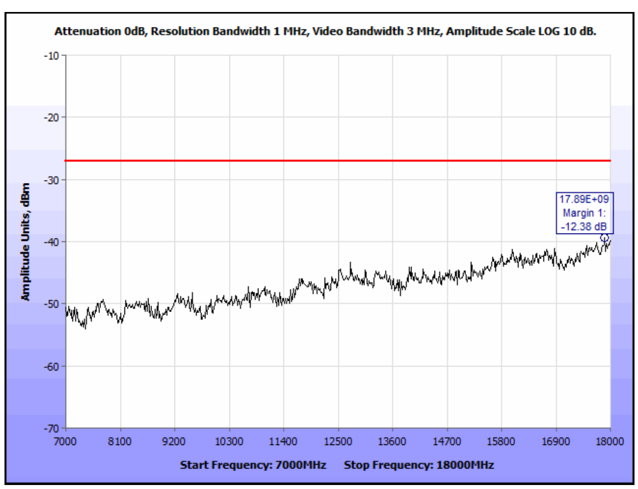
Plot 260. Radiated Spurious Emissions, 40 MHz, Low Channel, 7 GHz – 18 GHz, Upper Band



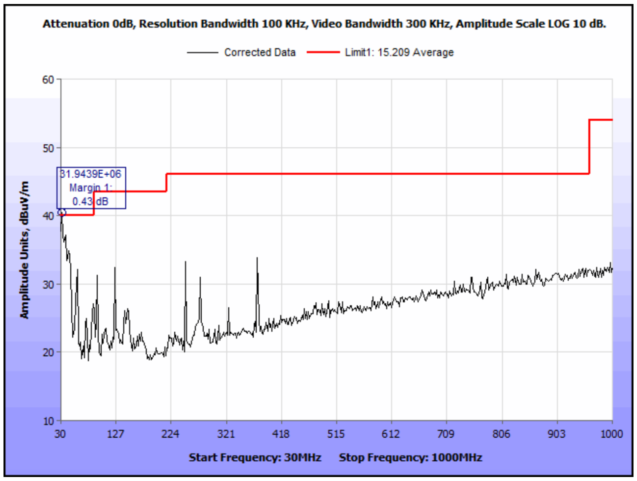
Plot 261. Radiated Spurious Emissions, 40 MHz, Mid Channel, 30 MHz – 1 GHz, Upper Band



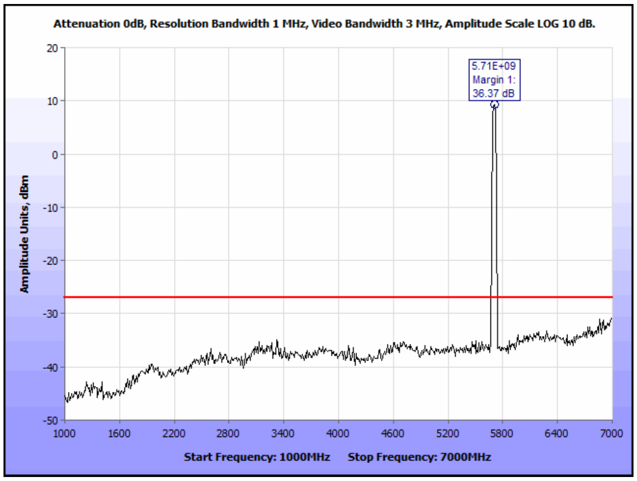
Plot 262. Radiated Spurious Emissions, 40 MHz, Mid Channel, 1 GHz – 7 GHz, Upper Band



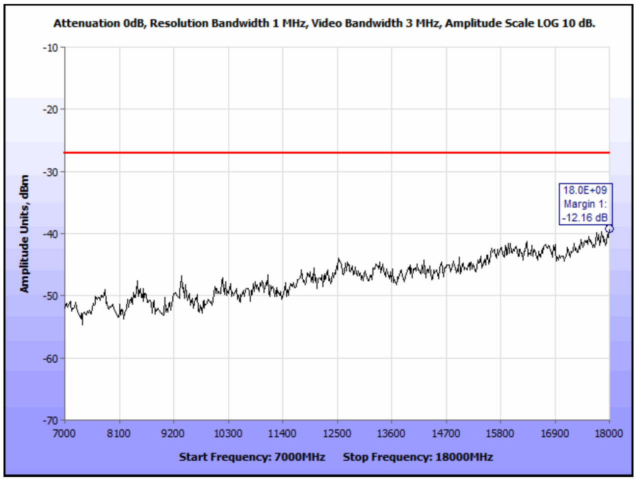
Plot 263. Radiated Spurious Emissions, 40 MHz, Mid Channel, 7 GHz – 18 GHz, Upper Band



Plot 264. Radiated Spurious Emissions, 40 MHz, High Channel, 30 MHz – 1 GHz, Upper Band

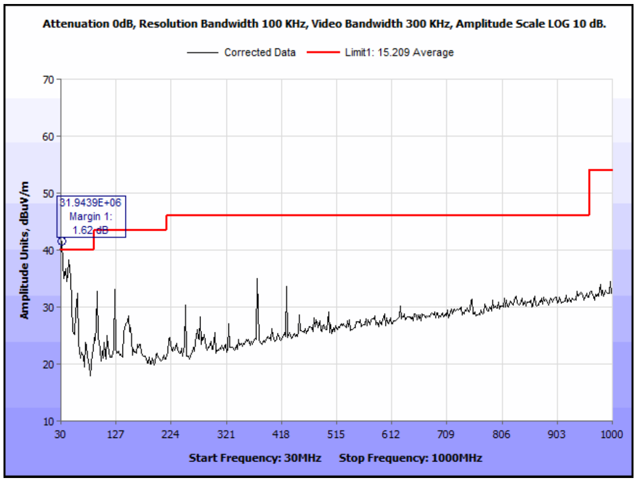


Plot 265. Radiated Spurious Emissions, 40 MHz, High Channel, 1 GHz – 7 GHz, Upper Band

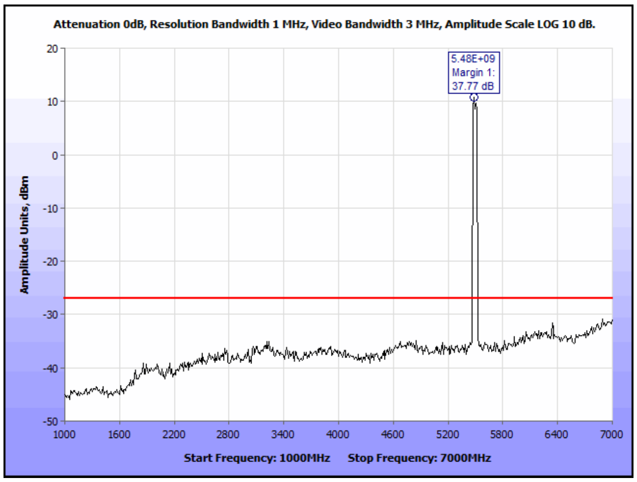


Plot 266. Radiated Spurious Emissions, 40 MHz, High Channel, 7 GHz – 18 GHz, Upper Band

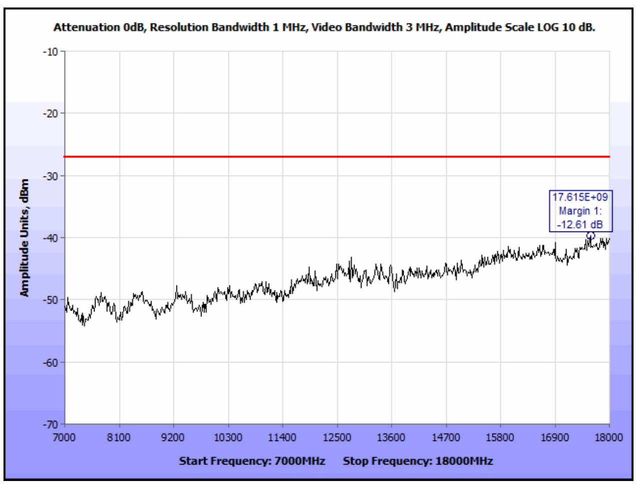
Radiated Spurious Emissions, 50 MHz, Upper Bands



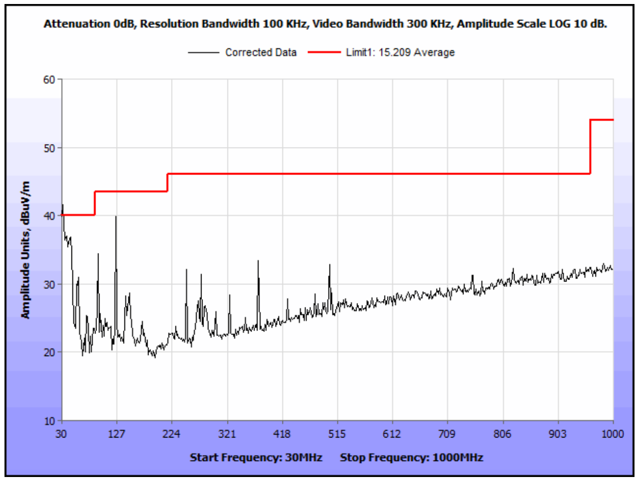
Plot 267. Radiated Spurious Emissions, 50 MHz, Low Channel, 30 MHz – 1 GHz, Upper Band



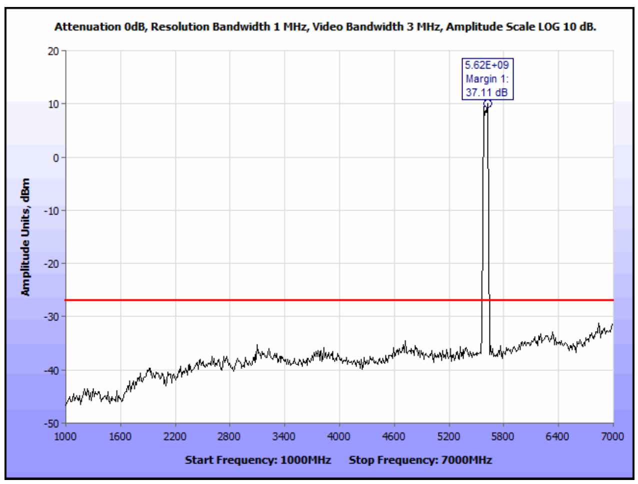
Plot 268. Radiated Spurious Emissions, 50 MHz, Low Channel, 1 GHz – 7 GHz, Upper Band



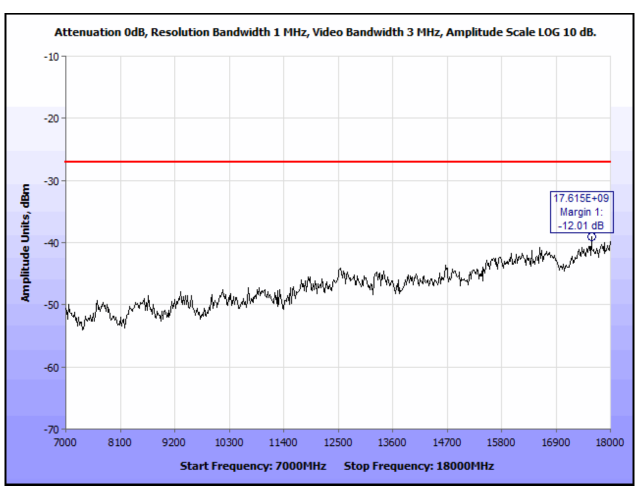
Plot 269. Radiated Spurious Emissions, 50 MHz, Low Channel, 7 GHz – 18 GHz, Upper Band



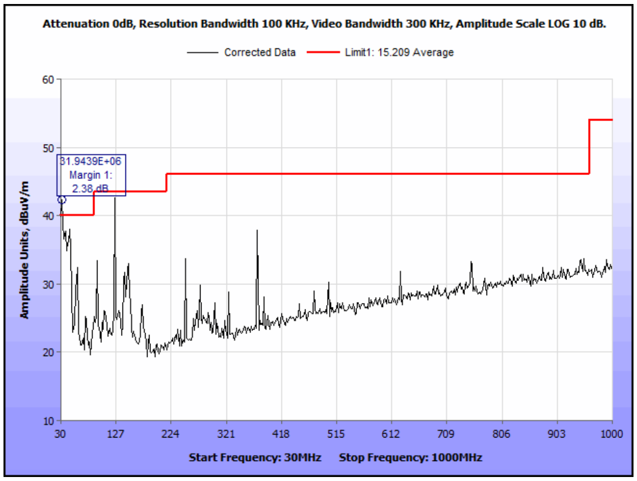
Plot 270. Radiated Spurious Emissions, 50 MHz, Mid Channel, 30 MHz – 1 GHz, Upper Band



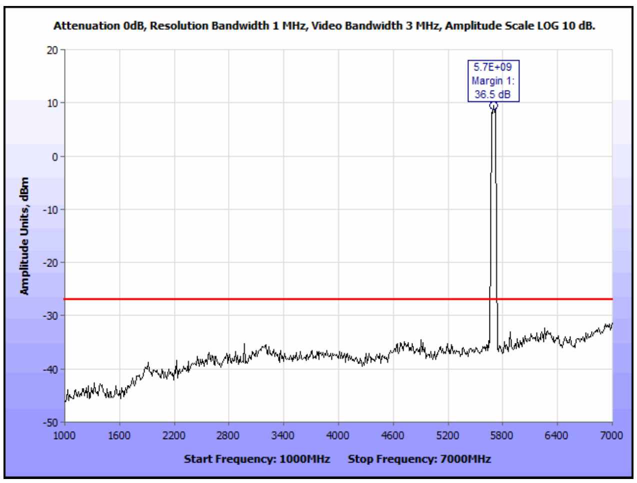
Plot 271. Radiated Spurious Emissions, 50 MHz, Mid Channel, 1 GHz – 7 GHz, Upper Band



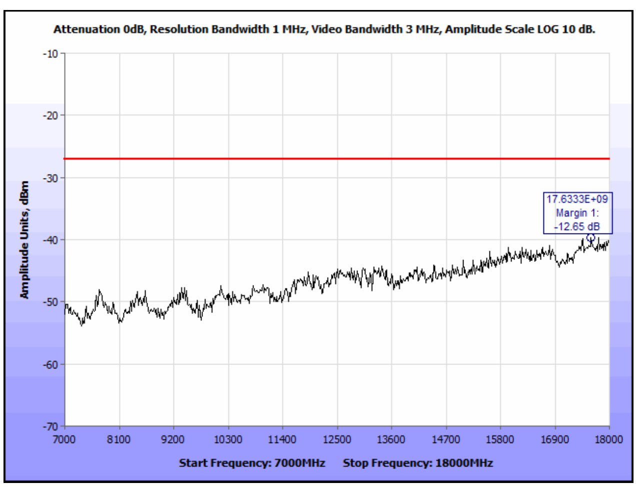
Plot 272. Radiated Spurious Emissions, 50 MHz, Mid Channel, 7 GHz – 18 GHz, Upper Band



Plot 273. Radiated Spurious Emissions, 50 MHz, High Channel, 30 MHz – 1 GHz, Upper Band

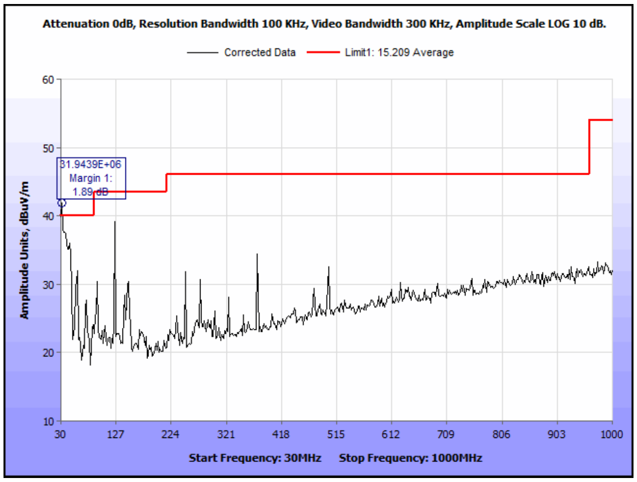


Plot 274. Radiated Spurious Emissions, 50 MHz, High Channel, 1 GHz – 7 GHz, Upper Band

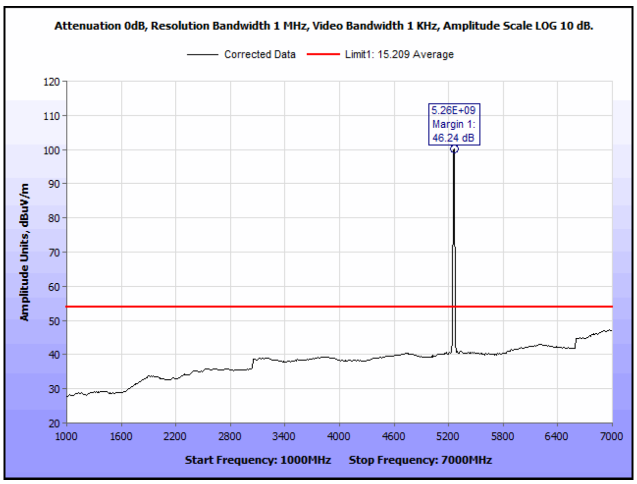


Plot 275. Radiated Spurious Emissions, 50 MHz, High Channel, 7 GHz – 18 GHz, Upper Band

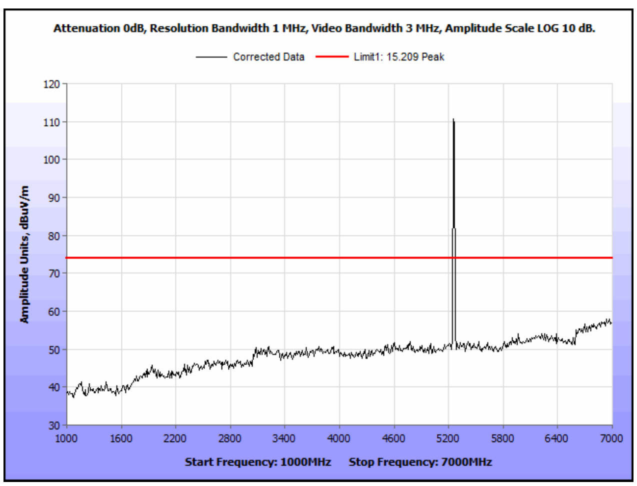
Radiated Spurious Emissions, 10 MHz, Lower Band, 23 dBi Antenna



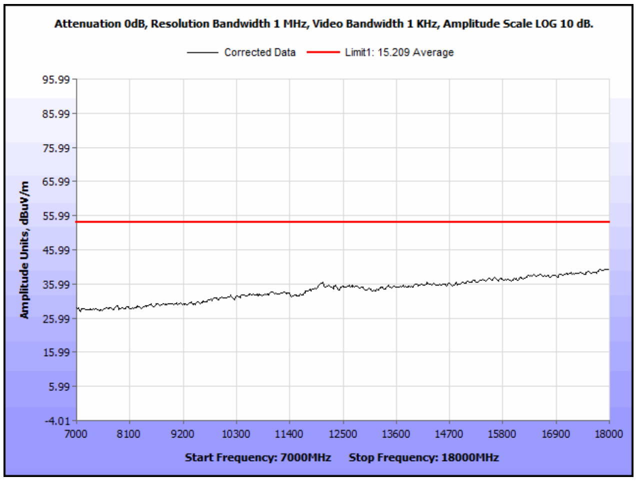
Plot 276. Radiated Spurious Emissions, 10 MHz, Low Channel, 30 MHz – 1 GHz, Lower Band, 23 dBi Antenna



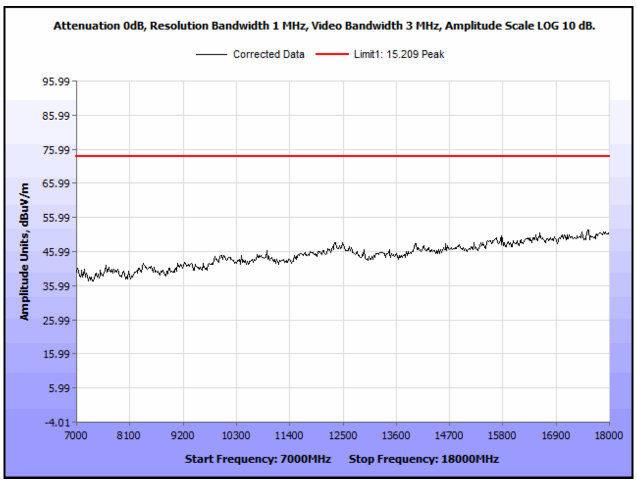
Plot 277. Radiated Spurious Emissions, 10 MHz, Low Channel, 1 GHz – 7 GHz, Average, Lower Band, 23 dBi Antenna



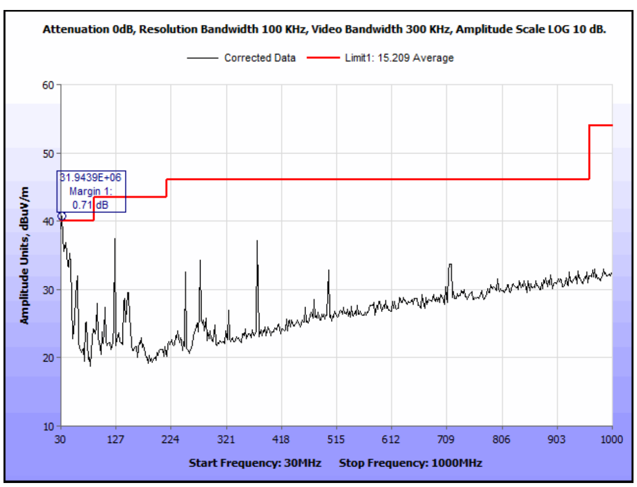
Plot 278. Radiated Spurious Emissions, 10 MHz, Low Channel, 1 GHz – 7 GHz, Peak, Lower Band, 23 dBi Antenna



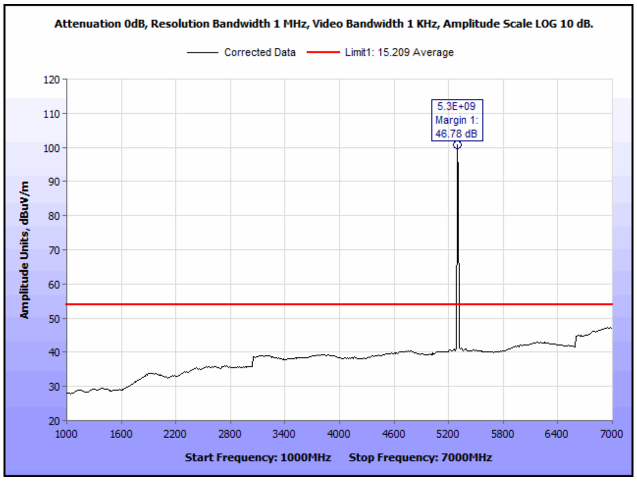
Plot 279. Radiated Spurious Emissions, 10 MHz, Low Channel, 7 GHz – 18 GHz, Average, Lower Band, 23 dBi Antenna



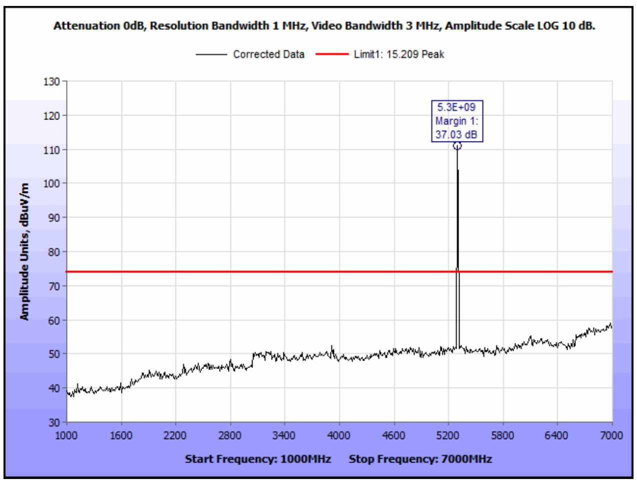
Plot 280. Radiated Spurious Emissions, 10 MHz, Low Channel, 7 GHz – 18 GHz, Peak, Lower Band, 23 dBi Antenna



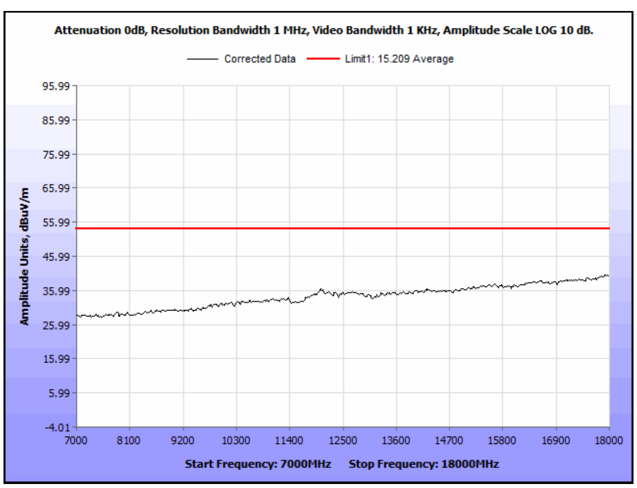
Plot 281. Radiated Spurious Emissions, 10 MHz, Mid Channel, 30 MHz – 1 GHz, Lower Band, 23 dBi Antenna



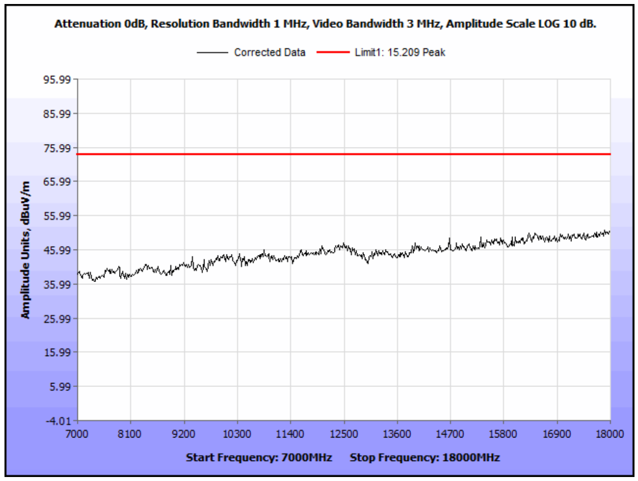
Plot 282. Radiated Spurious Emissions, 10 MHz, Mid Channel, 1 GHz – 7 GHz, Average, Lower Band, 23 dBi Antenna



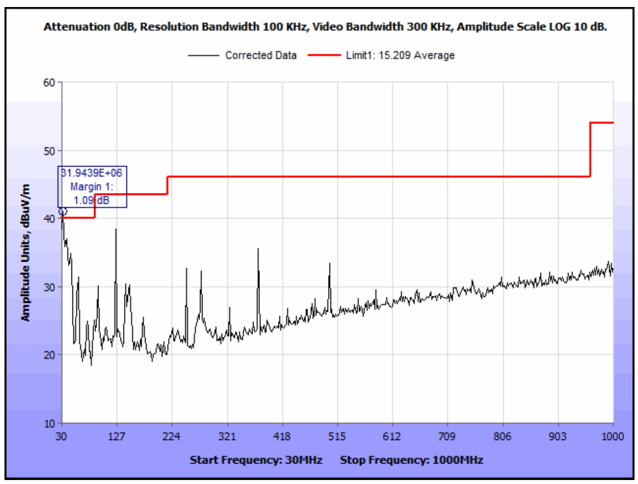
Plot 283. Radiated Spurious Emissions, 10 MHz, Mid Channel, 1 GHz – 7 GHz, Peak, Lower Band, 23 dBi Antenna



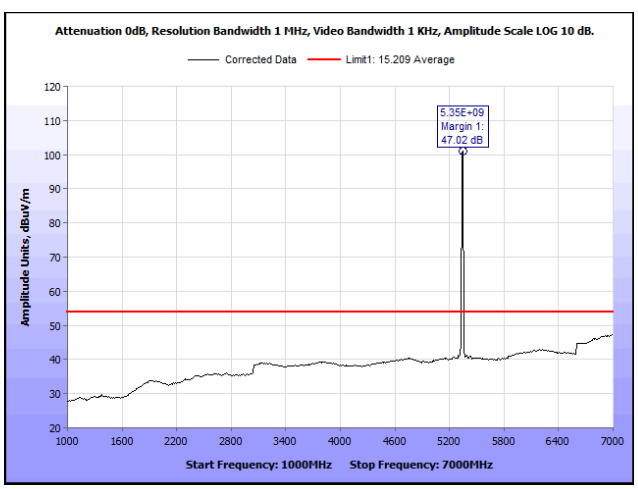
Plot 284. Radiated Spurious Emissions, 10 MHz, Mid Channel, 7 GHz – 18 GHz, Average, Lower Band, 23 dBi Antenna



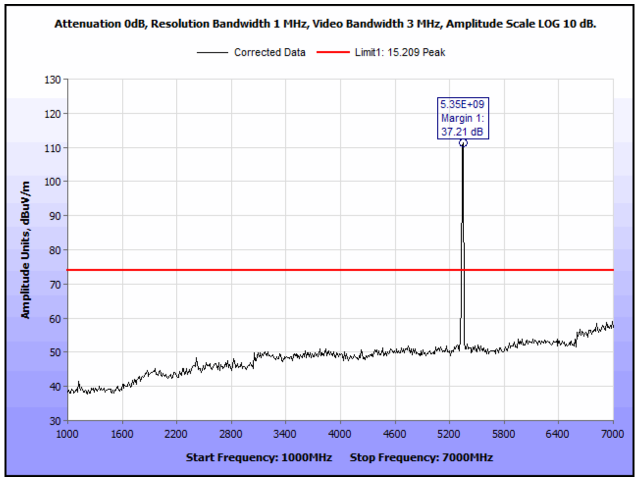
Plot 285. Radiated Spurious Emissions, 10 MHz, Mid Channel, 7 GHz – 18 GHz, Peak, Lower Band, 23 dBi Antenna



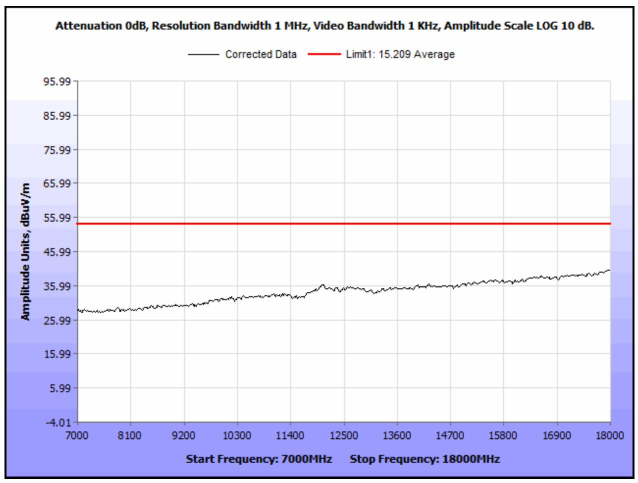
Plot 286. Radiated Spurious Emissions, 10 MHz, High Channel, 30 MHz – 1 GHz, Lower Band, 23 dBi Antenna



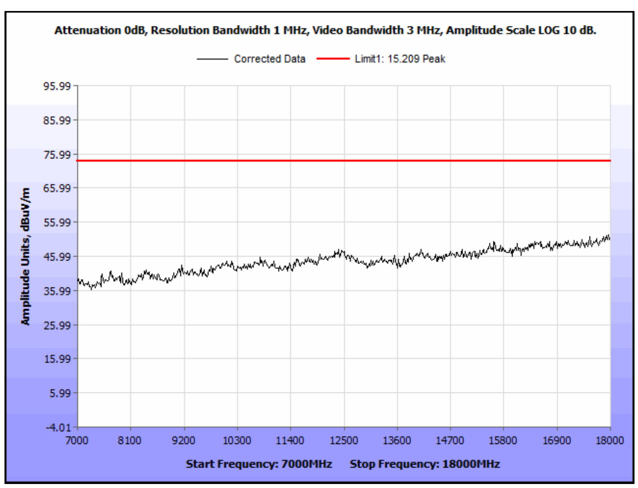
Plot 287. Radiated Spurious Emissions, 10 MHz, High Channel, 1 GHz – 7 GHz, Average, Lower Band, 23 dBi Antenna



Plot 288. Radiated Spurious Emissions, 10 MHz, High Channel, 1 GHz – 7 GHz, Peak, Lower Band, 23 dBi Antenna

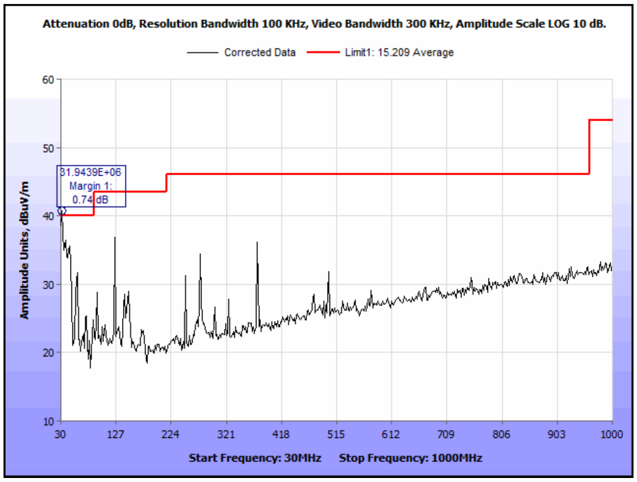


Plot 289. Radiated Spurious Emissions, 10 MHz, High Channel, 7 GHz – 18 GHz, Average, Lower Band, 23 dBi Antenna

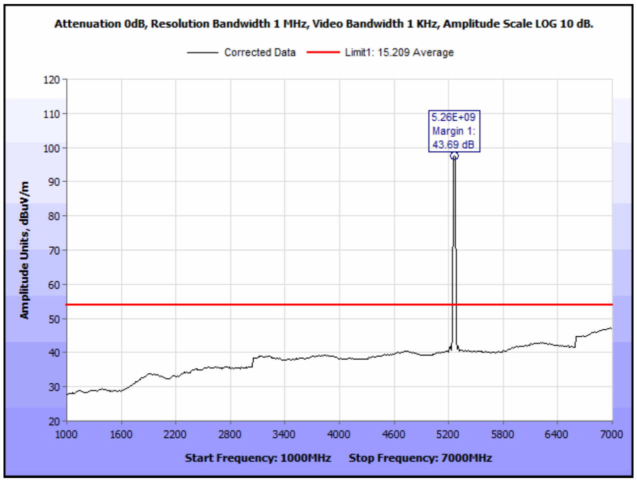


Plot 290. Radiated Spurious Emissions, 10 MHz, High Channel, 7 GHz – 18 GHz, Peak, Lower Band, 23 dBi Antenna

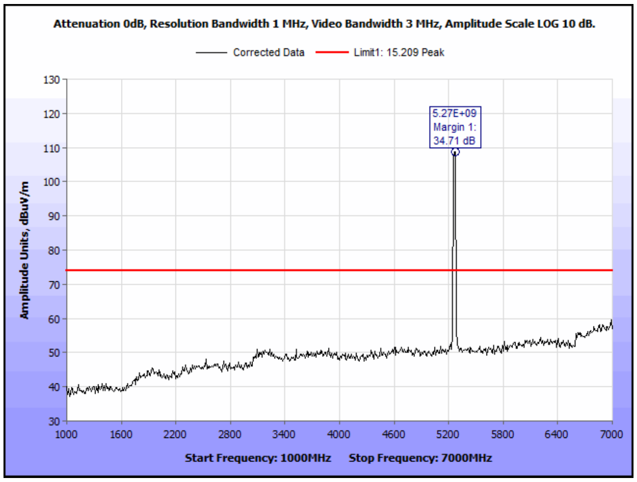
Radiated Spurious Emissions, 20 MHz, Lower Band, 23 dBi Antenna



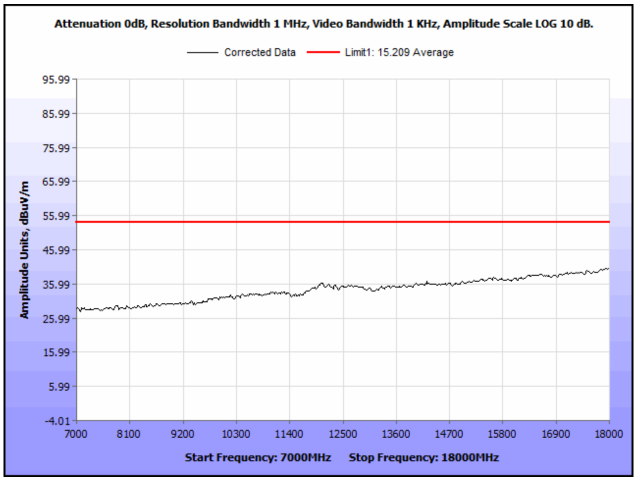
Plot 291. Radiated Spurious Emissions, 20 MHz, Low Channel, 30 MHz – 1 GHz, Lower Band, 23 dBi Antenna



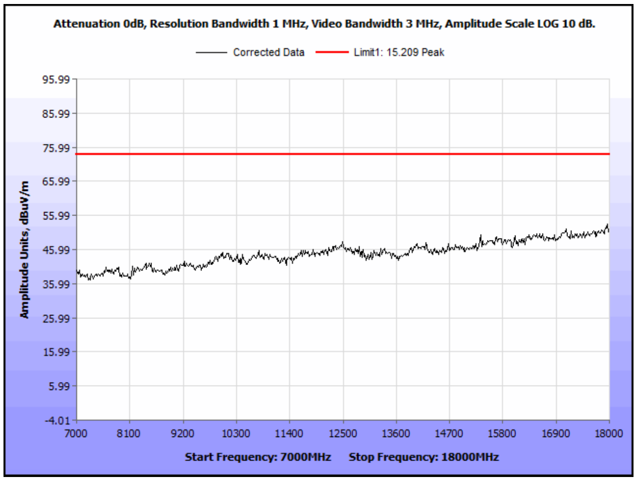
Plot 292. Radiated Spurious Emissions, 20 MHz, Low Channel, 1 GHz – 7 GHz, Average, Lower Band, 23 dBi Antenna



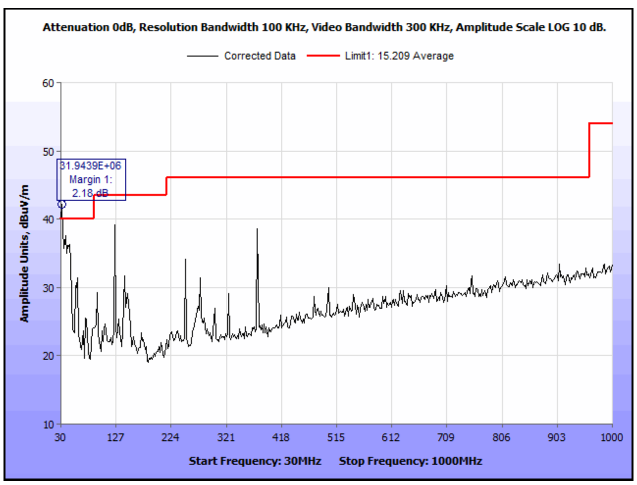
Plot 293. Radiated Spurious Emissions, 20 MHz, Low Channel, 1 GHz – 7 GHz, Peak, Lower Band, 23 dBi Antenna



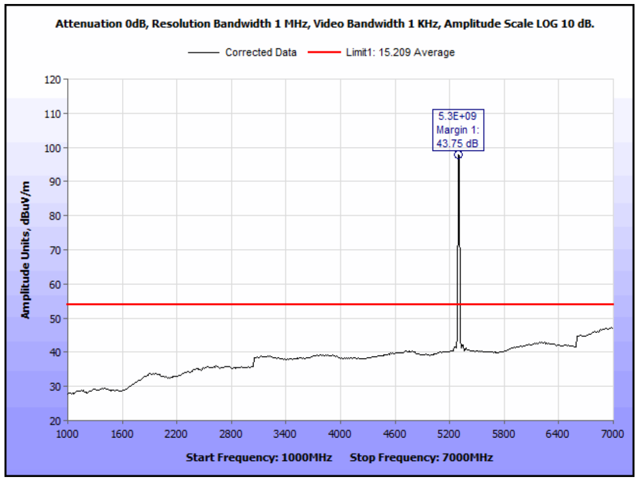
Plot 294. Radiated Spurious Emissions, 20 MHz, Low Channel, 7 GHz – 18 GHz, Average, Lower Band, 23 dBi Antenna



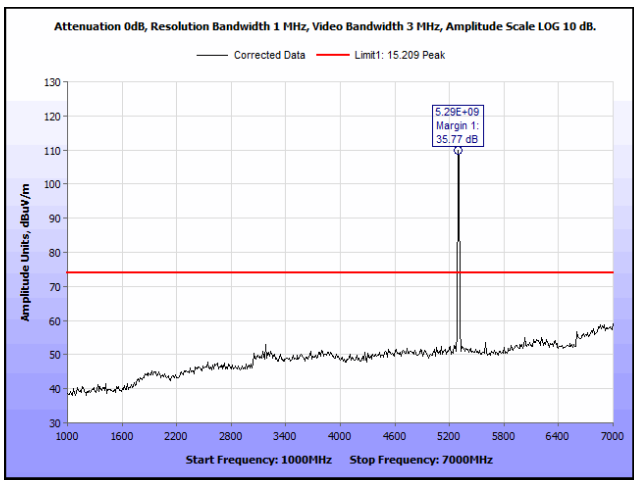
Plot 295. Radiated Spurious Emissions, 20 MHz, Low Channel, 7 GHz – 18 GHz, Peak, Lower Band, 23 dBi Antenna



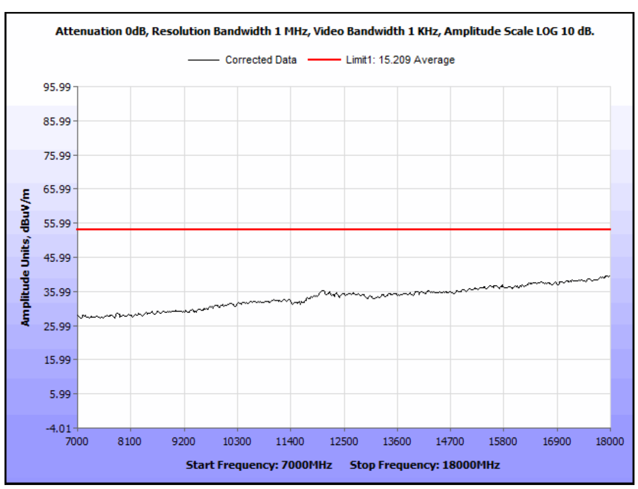
Plot 296. Radiated Spurious Emissions, 20 MHz, Mid Channel, 30 MHz – 1 GHz, Lower Band, 23 dBi Antenna



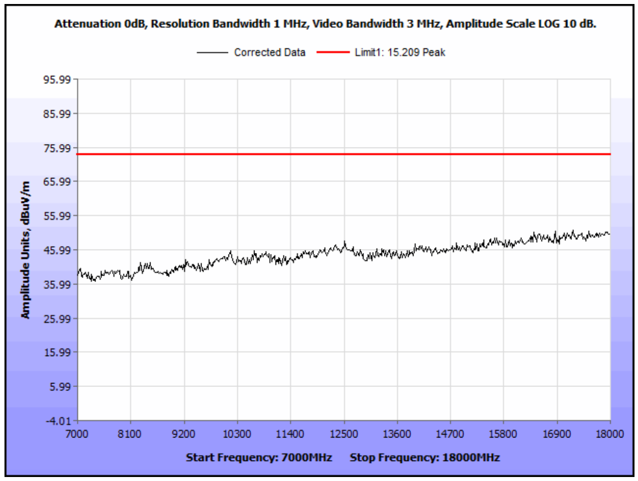
Plot 297. Radiated Spurious Emissions, 20 MHz, Mid Channel, 1 GHz – 7 GHz, Average, Lower Band, 23 dBi Antenna



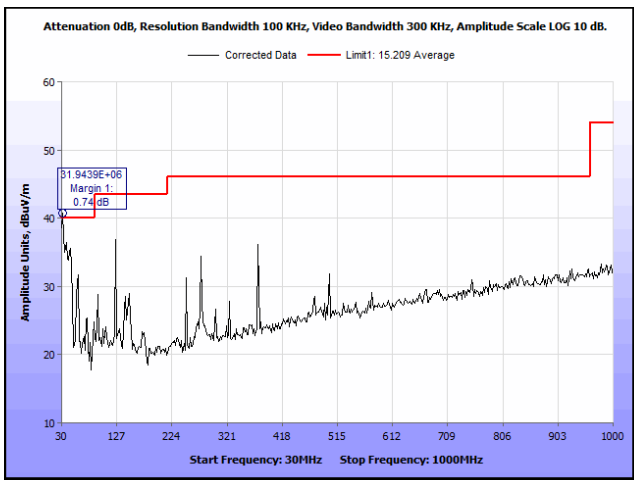
Plot 298. Radiated Spurious Emissions, 20 MHz, Mid Channel, 1 GHz – 7 GHz, Peak, Lower Band, 23 dBi Antenna



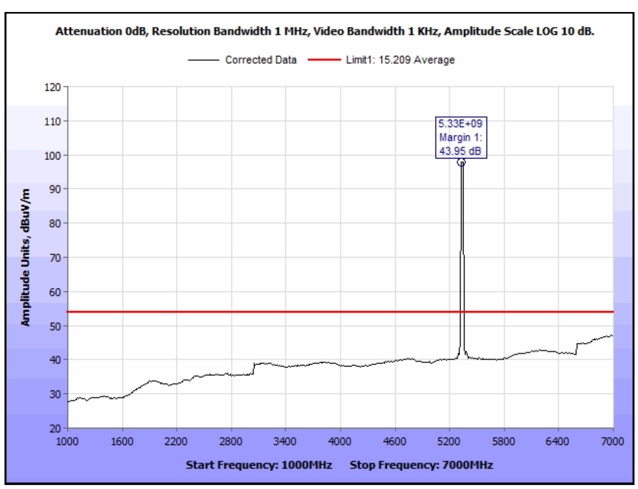
Plot 299. Radiated Spurious Emissions, 20 MHz, Mid Channel, 7 GHz – 18 GHz, Average, Lower Band, 23 dBi Antenna



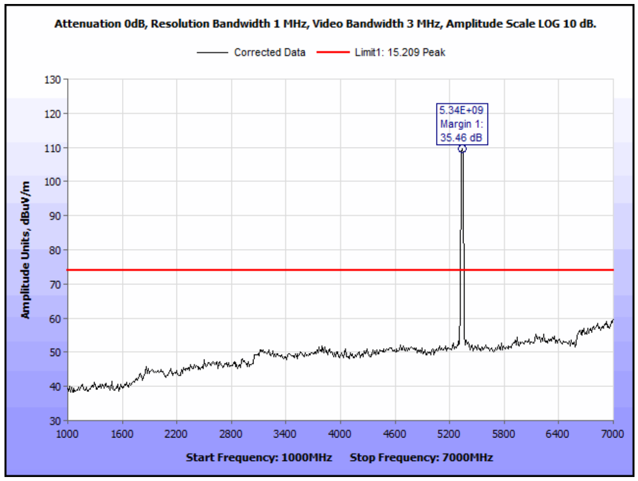
Plot 300. Radiated Spurious Emissions, 20 MHz, Mid Channel, 7 GHz – 18 GHz, Peak, Lower Band, 23 dBi Antenna



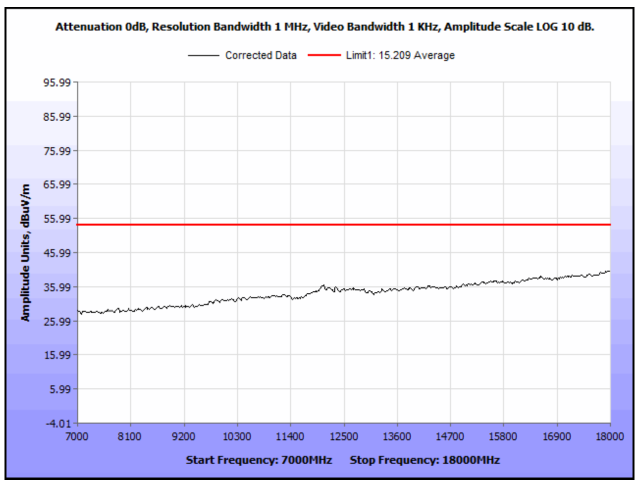
Plot 301. Radiated Spurious Emissions, 20 MHz, High Channel, 30 MHz – 1 GHz, Lower Band, 23 dBi Antenna



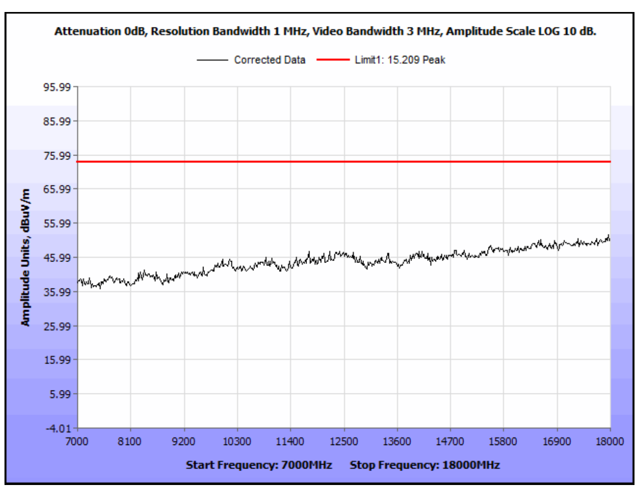
Plot 302. Radiated Spurious Emissions, 20 MHz, High Channel, 1 GHz – 7 GHz, Average, Lower Band, 23 dBi Antenna



Plot 303. Radiated Spurious Emissions, 20 MHz, High Channel, 1 GHz – 7 GHz, Peak, Lower Band, 23 dBi Antenna

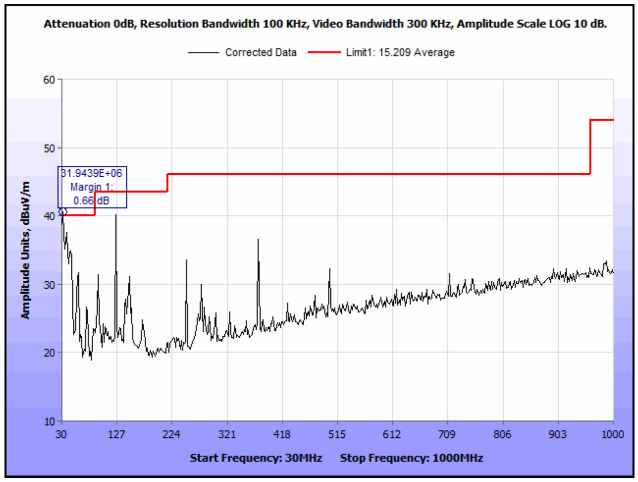


Plot 304. Radiated Spurious Emissions, 20 MHz, High Channel, 7 GHz – 18 GHz, Average, Lower Band, 23 dBi Antenna

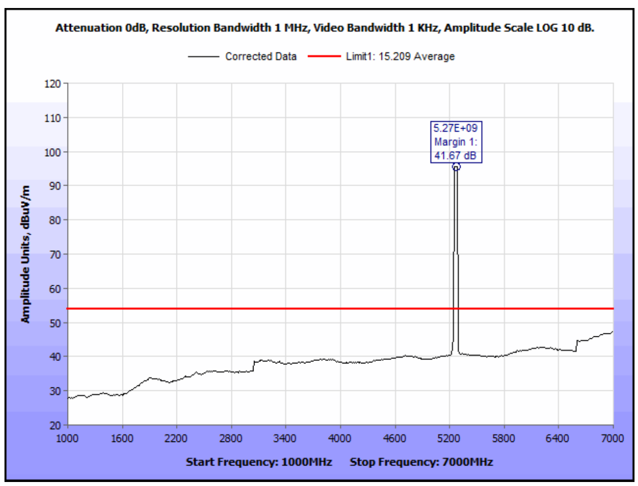


Plot 305. Radiated Spurious Emissions, 20 MHz, High Channel, 7 GHz – 18 GHz, Peak, Lower Band, 23 dBi Antenna

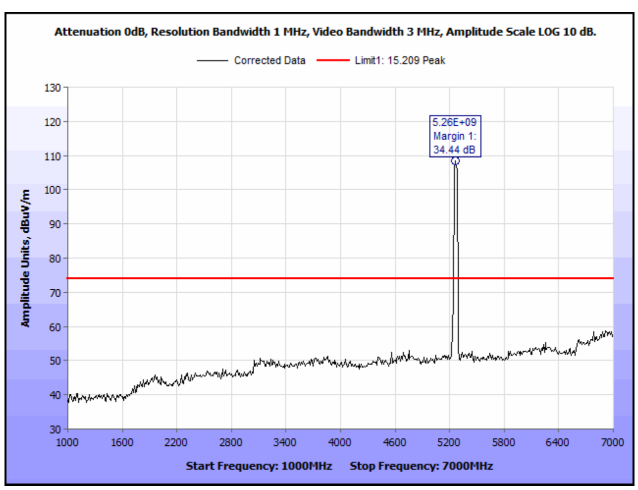
Radiated Spurious Emissions, 30 MHz, Lower Band, 23 dBi Antenna



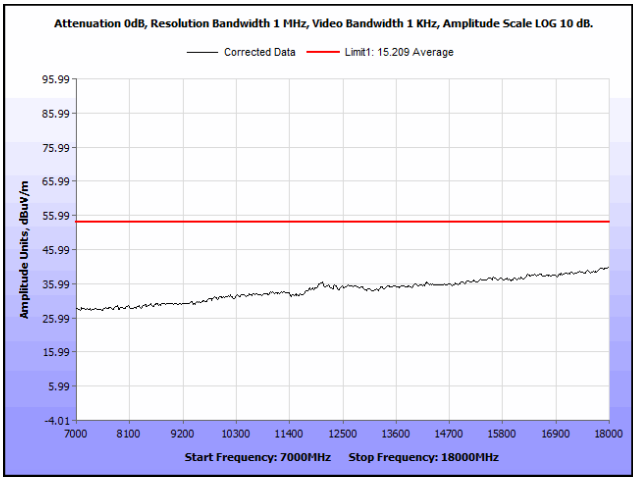
Plot 306. Radiated Spurious Emissions, 30 MHz, Low Channel, 30 MHz – 1 GHz, Lower Band, 23 dBi Antenna



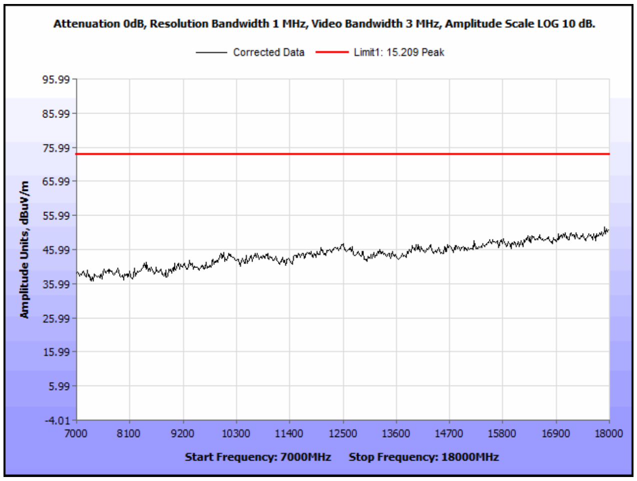
Plot 307. Radiated Spurious Emissions, 30 MHz, Low Channel, 1 GHz – 7 GHz, Average, Lower Band, 23 dBi Antenna



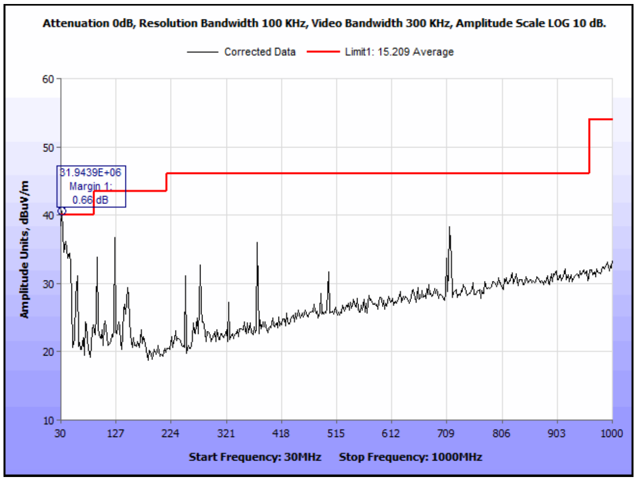
Plot 308. Radiated Spurious Emissions, 30 MHz, Low Channel, 1 GHz – 7 GHz, Peak, Lower Band, 23 dBi Antenna



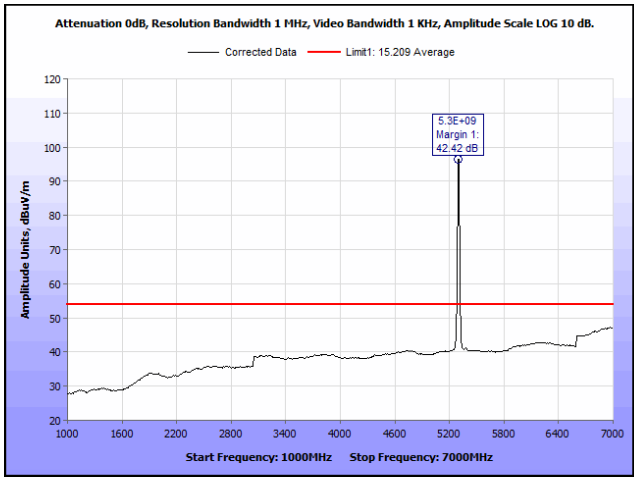
Plot 309. Radiated Spurious Emissions, 30 MHz, Low Channel, 7 GHz – 18 GHz, Average, Lower Band, 23 dBi Antenna



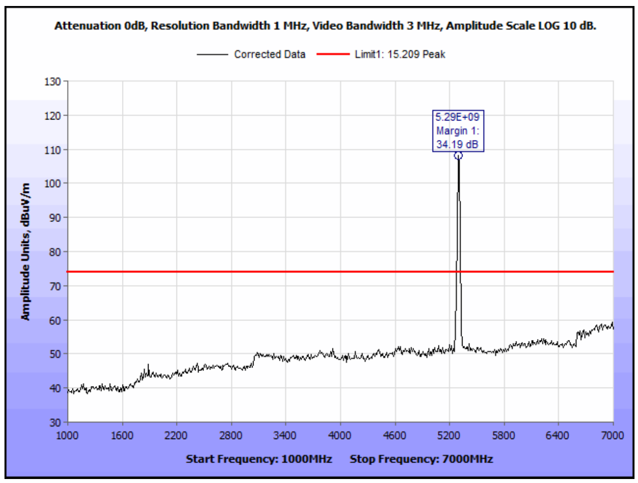
Plot 310. Radiated Spurious Emissions, 30 MHz, Low Channel, 7 GHz – 18 GHz, Peak, Lower Band, 23 dBi Antenna



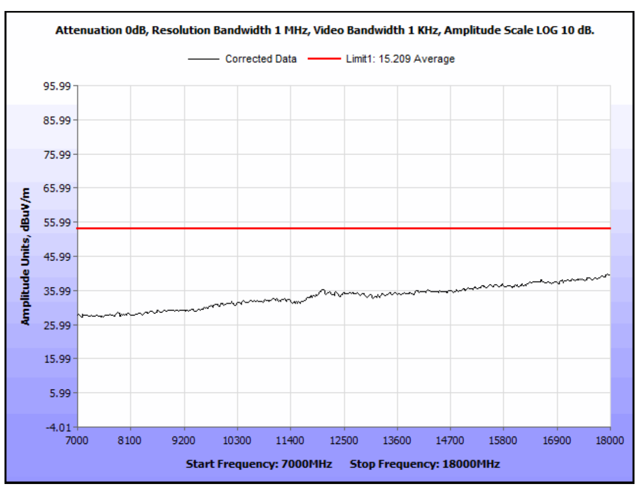
Plot 311. Radiated Spurious Emissions, 30 MHz, Mid Channel, 30 MHz – 1 GHz, Lower Band, 23 dBi Antenna



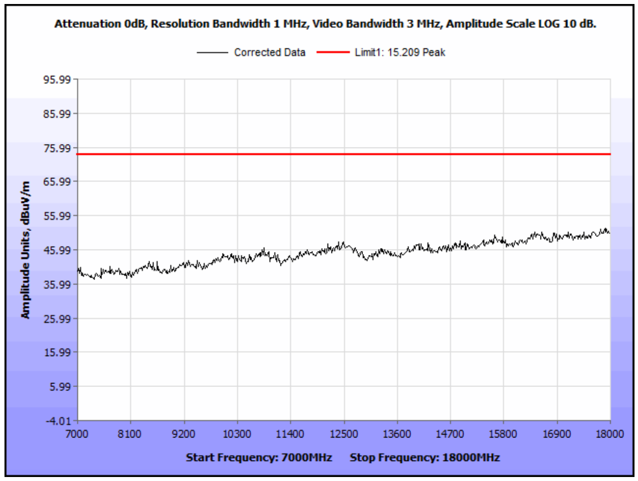
Plot 312. Radiated Spurious Emissions, 30 MHz, Mid Channel, 1 GHz – 7 GHz, Average, Lower Band, 23 dBi Antenna



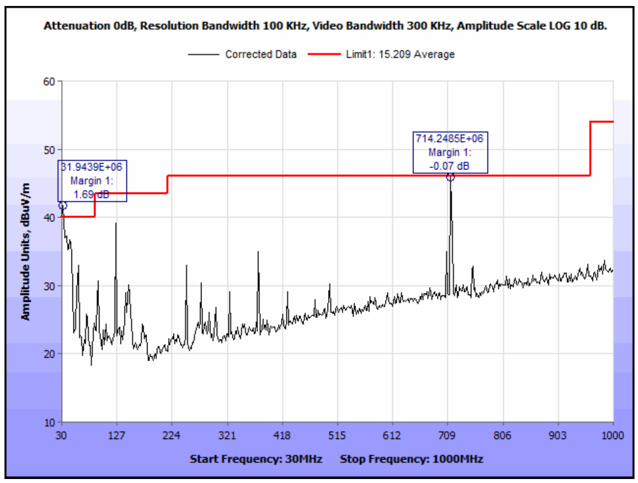
Plot 313. Radiated Spurious Emissions, 30 MHz, Mid Channel, 1 GHz – 7 GHz, Peak, Lower Band, 23 dBi Antenna



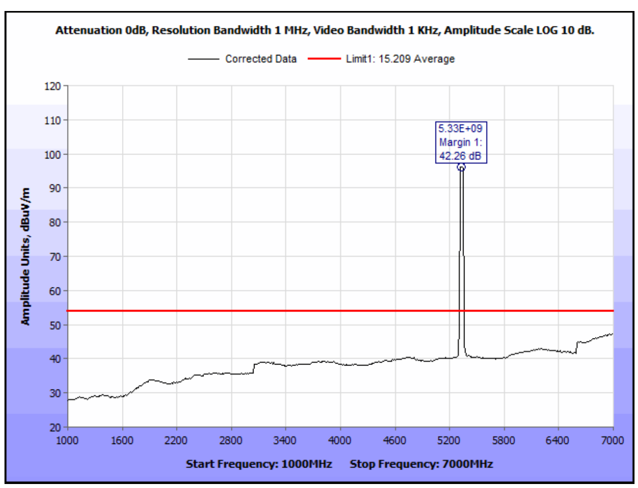
Plot 314. Radiated Spurious Emissions, 30 MHz, Mid Channel, 7 GHz – 18 GHz, Average, Lower Band, 23 dBi Antenna



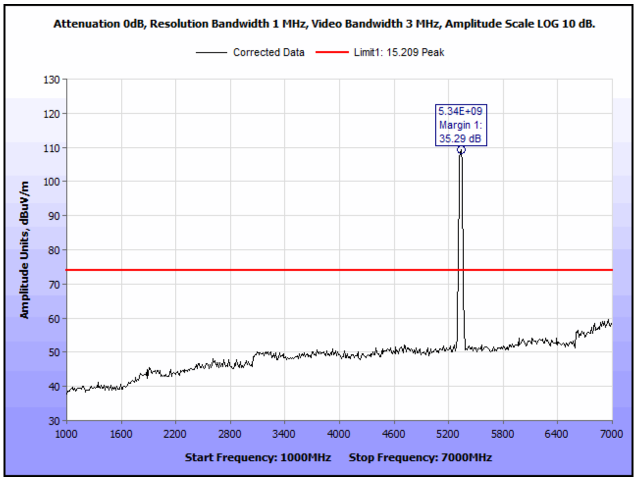
Plot 315. Radiated Spurious Emissions, 30 MHz, Mid Channel, 7 GHz – 18 GHz, Peak, Lower Band, 23 dBi Antenna



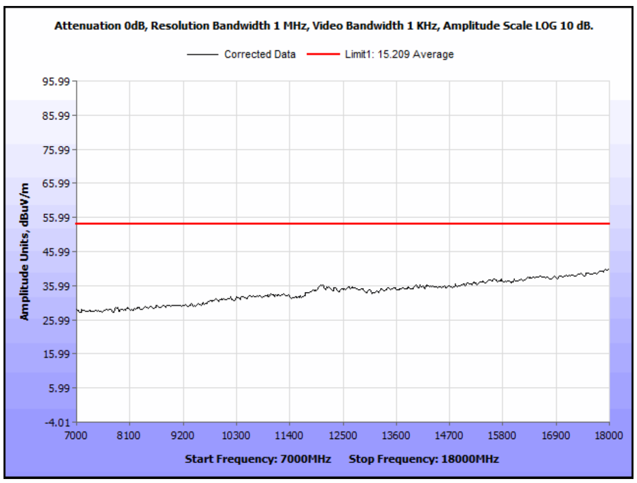
Plot 316. Radiated Spurious Emissions, 30 MHz, High Channel, 30 MHz – 1 GHz, Lower Band, 23 dBi Antenna



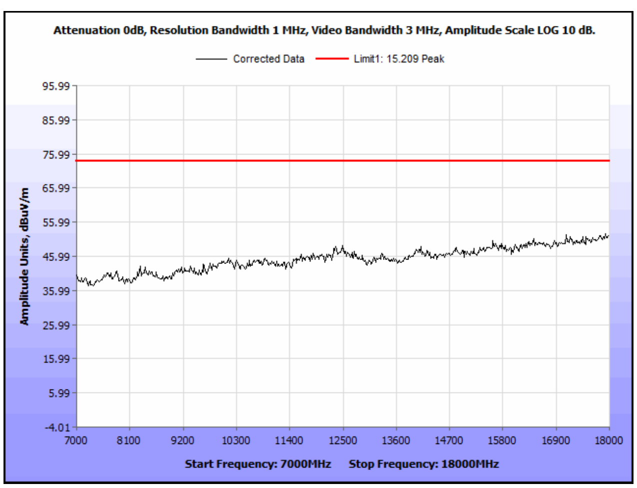
Plot 317. Radiated Spurious Emissions, 30 MHz, High Channel, 1 GHz – 7 GHz, Average, Lower Band, 23 dBi Antenna



Plot 318. Radiated Spurious Emissions, 30 MHz, High Channel, 1 GHz – 7 GHz, Peak, Lower Band, 23 dBi Antenna

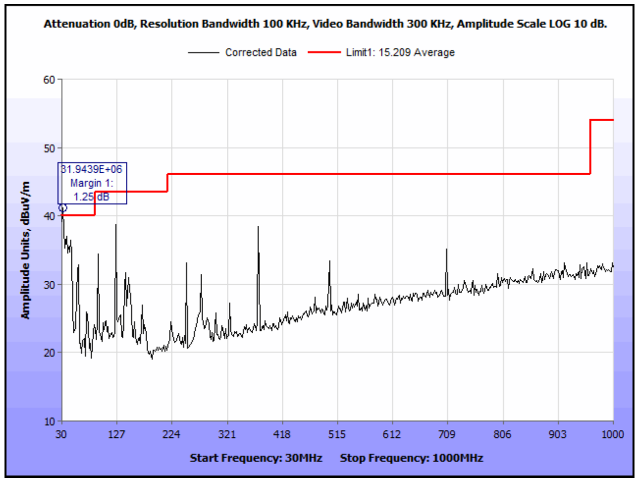


Plot 319. Radiated Spurious Emissions, 30 MHz, High Channel, 7 GHz – 18 GHz, Average, Lower Band, 23 dBi Antenna

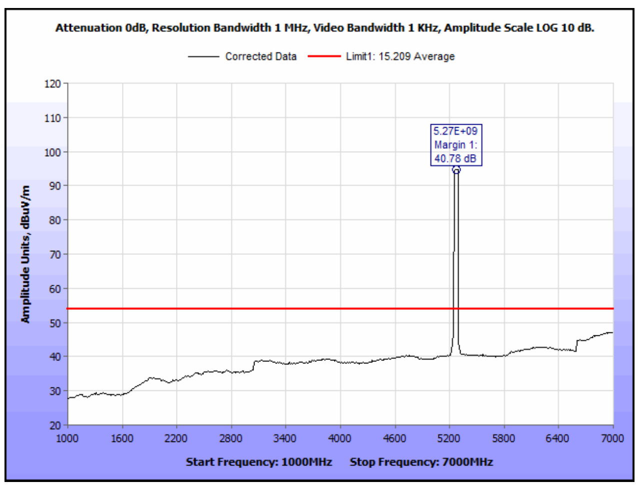


Plot 320. Radiated Spurious Emissions, 30 MHz, High Channel, 7 GHz – 18 GHz, Peak, Lower Band, 23 dBi Antenna

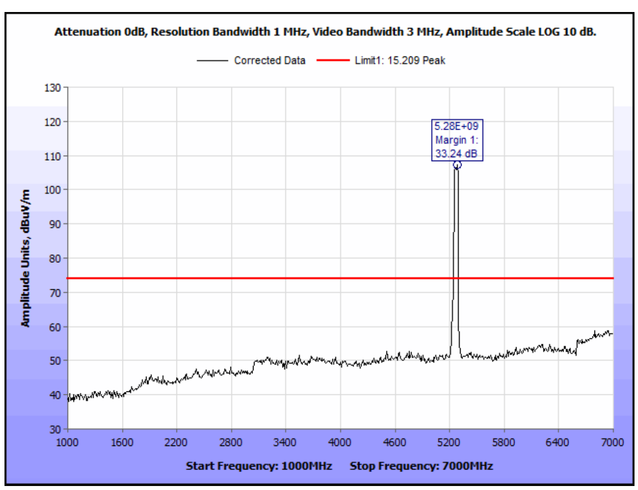
Radiated Spurious Emissions, 40 MHz, Lower Band, 23 dBi Antenna



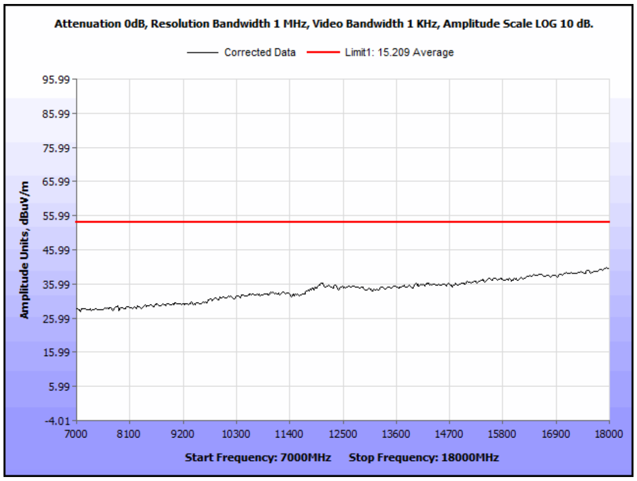
Plot 321. Radiated Spurious Emissions, 40 MHz, Low Channel, 30 MHz – 1 GHz, Lower Band, 23 dBi Antenna



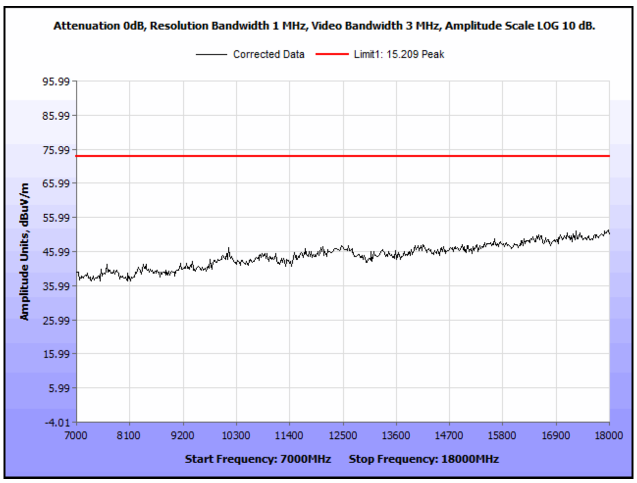
Plot 322. Radiated Spurious Emissions, 40 MHz, Low Channel, 1 GHz – 7 GHz, Average, Lower Band, 23 dBi Antenna



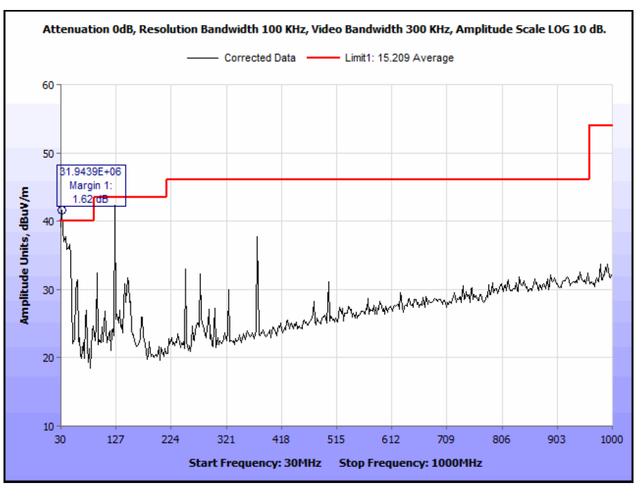
Plot 323. Radiated Spurious Emissions, 40 MHz, Low Channel, 1 GHz – 7 GHz, Peak, Lower Band, 23 dBi Antenna



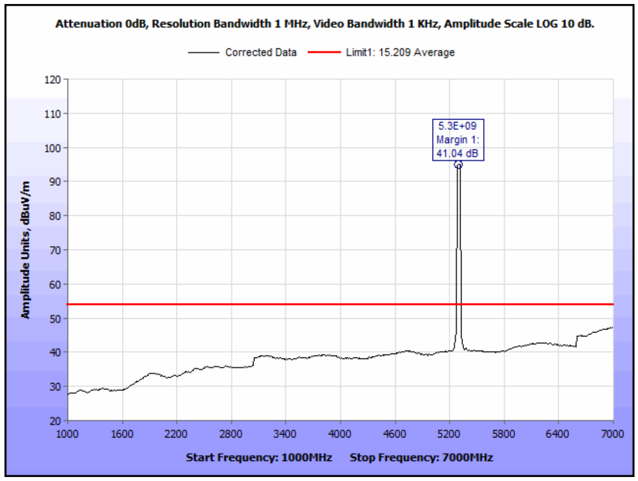
Plot 324. Radiated Spurious Emissions, 40 MHz, Low Channel, 7 GHz – 18 GHz, Average, Lower Band, 23 dBi Antenna



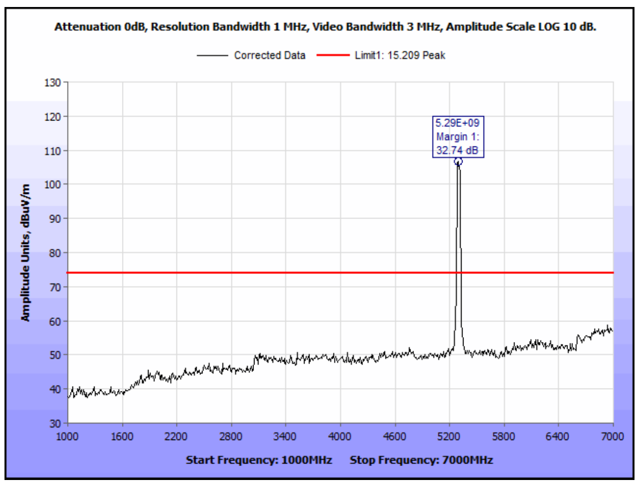
Plot 325. Radiated Spurious Emissions, 40 MHz, Low Channel, 7 GHz – 18 GHz, Peak, Lower Band, 23 dBi Antenna



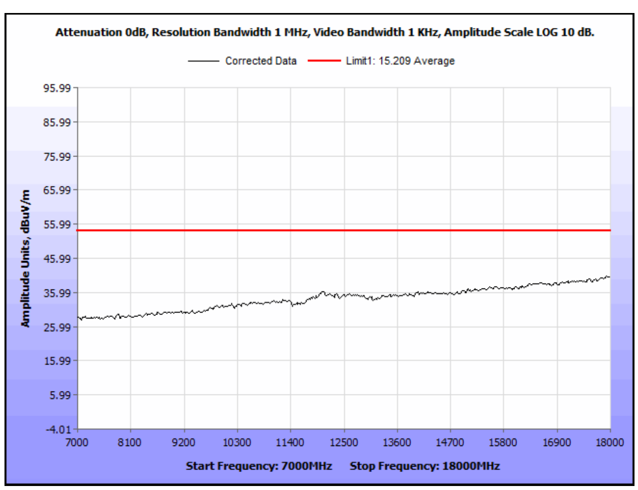
Plot 326. Radiated Spurious Emissions, 40 MHz, Mid Channel, 30 MHz – 1 GHz, Lower Band, 23 dBi Antenna



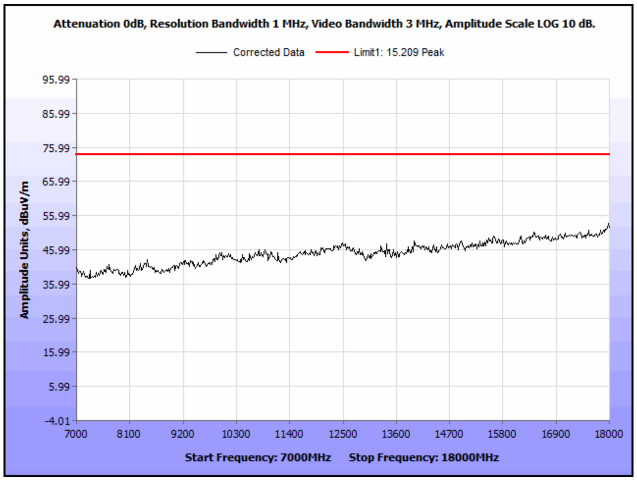
Plot 327. Radiated Spurious Emissions, 40 MHz, Mid Channel, 1 GHz – 7 GHz, Average, Lower Band, 23 dBi Antenna



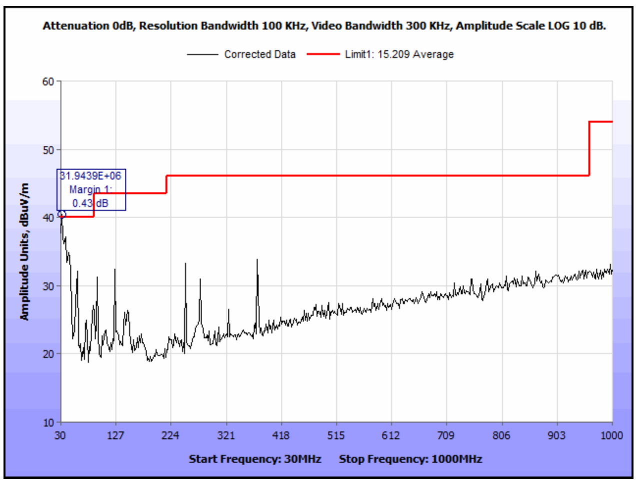
Plot 328. Radiated Spurious Emissions, 40 MHz, Mid Channel, 1 GHz – 7 GHz, Peak, Lower Band, 23 dBi Antenna



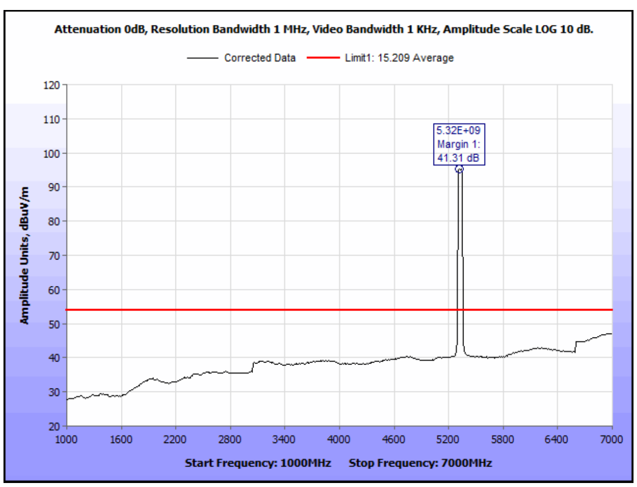
Plot 329. Radiated Spurious Emissions, 40 MHz, Mid Channel, 7 GHz – 18 GHz, Average, Lower Band, 23 dBi Antenna



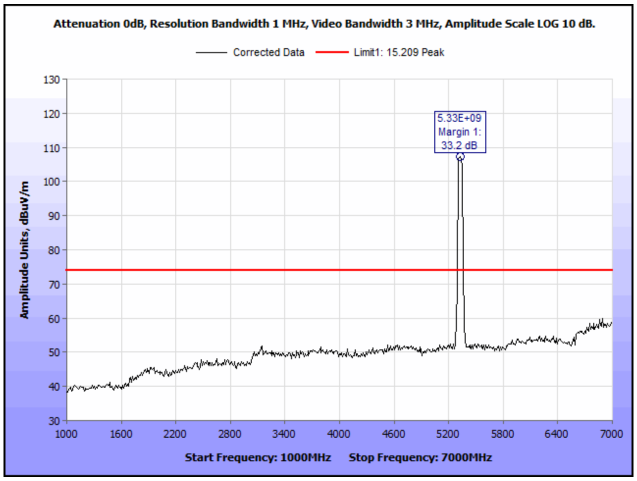
Plot 330. Radiated Spurious Emissions, 40 MHz, Mid Channel, 7 GHz – 18 GHz, Peak, Lower Band, 23 dBi Antenna



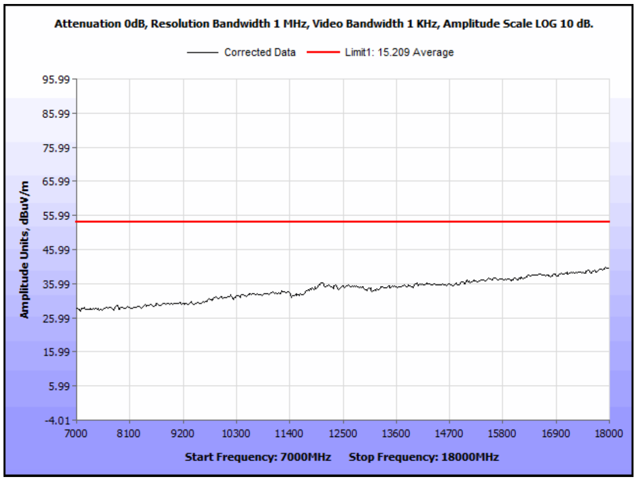
Plot 331. Radiated Spurious Emissions, 40 MHz, High Channel, 30 MHz – 1 GHz, Lower Band, 23 dBi Antenna



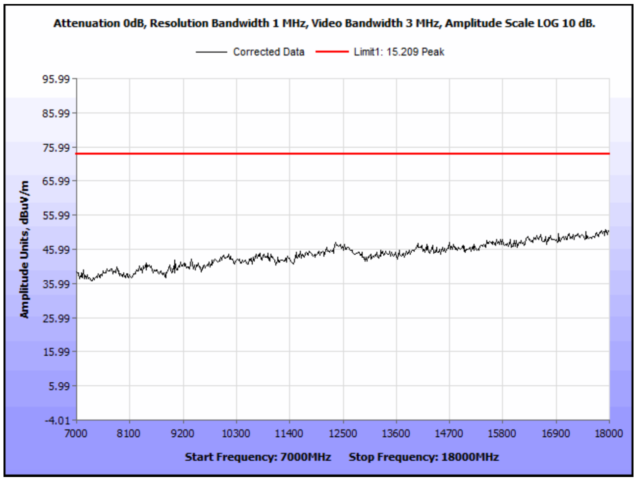
Plot 332. Radiated Spurious Emissions, 40 MHz, High Channel, 1 GHz – 7 GHz, Average, Lower Band, 23 dBi Antenna



Plot 333. Radiated Spurious Emissions, 40 MHz, High Channel, 1 GHz – 7 GHz, Peak, Lower Band, 23 dBi Antenna

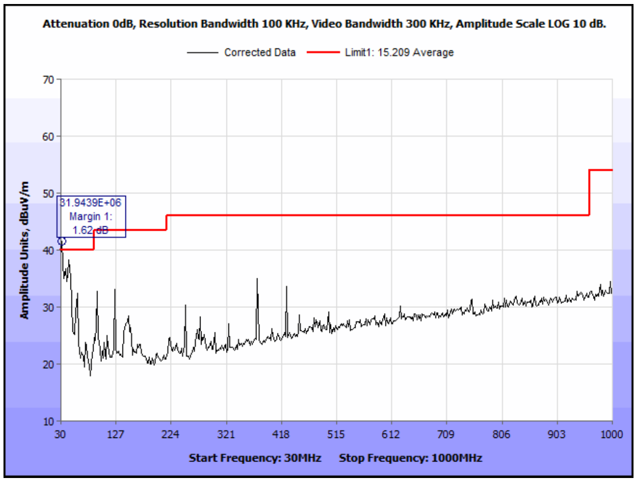


Plot 334. Radiated Spurious Emissions, 40 MHz, High Channel, 7 GHz – 18 GHz, Average, Lower Band, 23 dBi Antenna

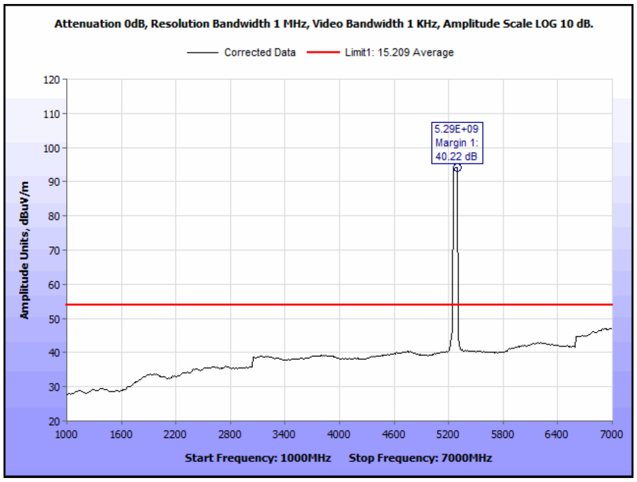


Plot 335. Radiated Spurious Emissions, 40 MHz, High Channel, 7 GHz – 18 GHz, Peak, Lower Band, 23 dBi Antenna

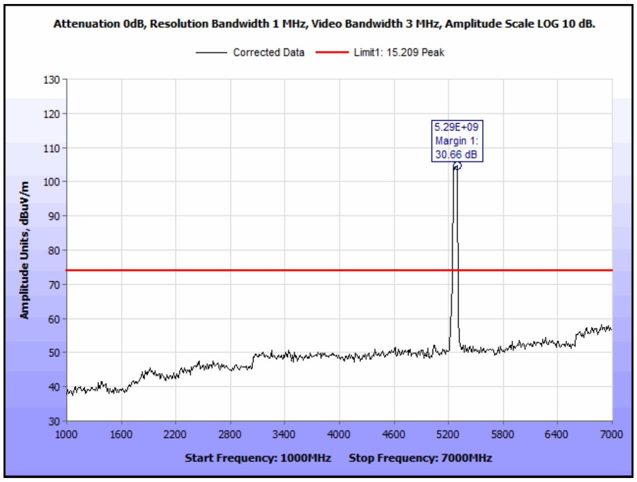
Radiated Spurious Emissions, 50 MHz, Lower Band, 23 dBi Antenna



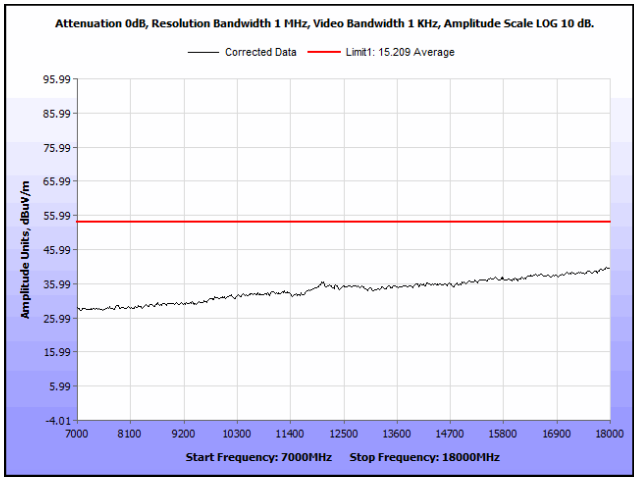
Plot 336. Radiated Spurious Emissions, 50 MHz, Low Channel, 30 MHz – 1 GHz, Lower Band, 23 dBi Antenna



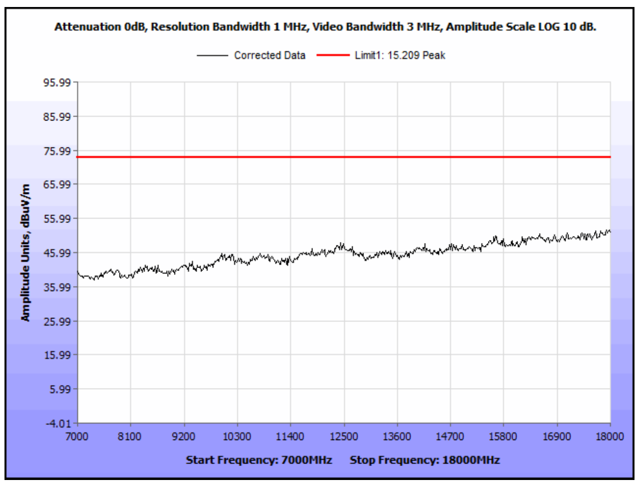
Plot 337. Radiated Spurious Emissions, 50 MHz, Low Channel, 1 GHz – 7 GHz, Average, Lower Band, 23 dBi Antenna



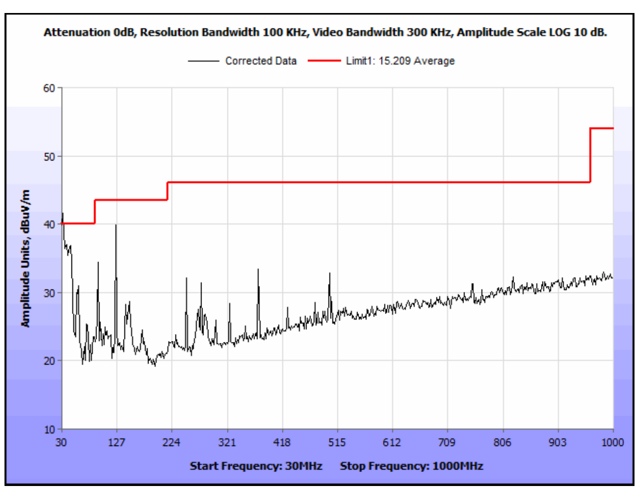
Plot 338. Radiated Spurious Emissions, 50 MHz, Low Channel, 1 GHz – 7 GHz, Peak, Lower Band, 23 dBi Antenna



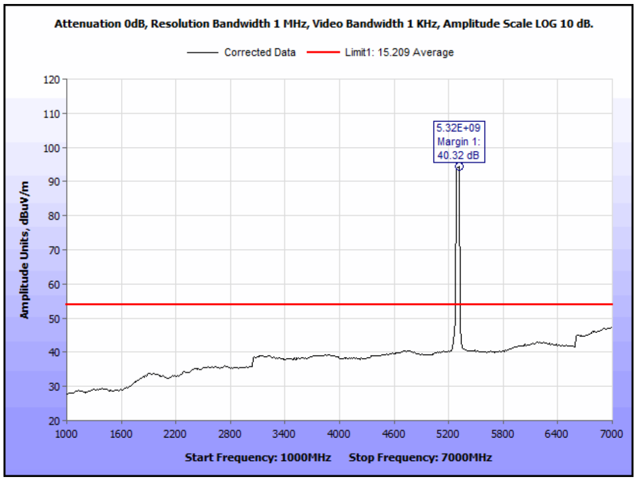
Plot 339. Radiated Spurious Emissions, 50 MHz, Low Channel, 7 GHz – 18 GHz, Average, Lower Band, 23 dBi Antenna



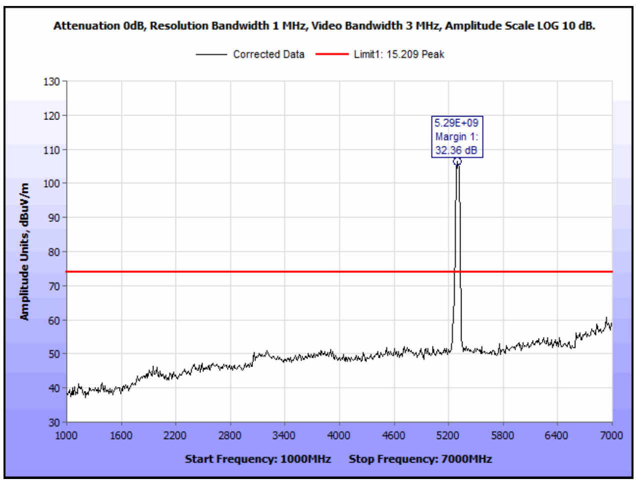
Plot 340. Radiated Spurious Emissions, 50 MHz, Low Channel, 7 GHz – 18 GHz, Peak, Lower Band, 23 dBi Antenna



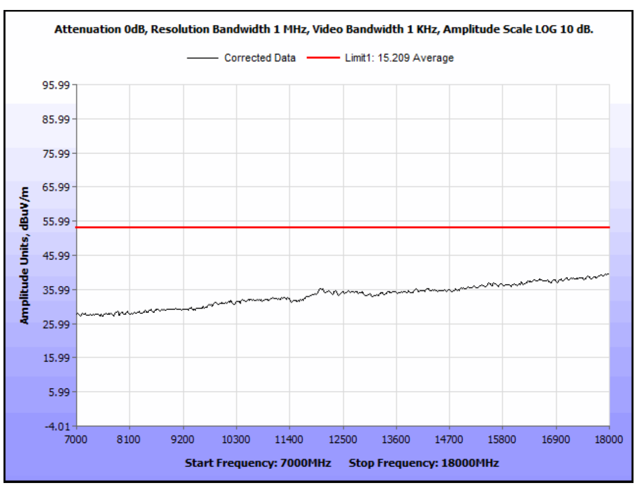
Plot 341. Radiated Spurious Emissions, 50 MHz, Mid Channel, 30 MHz – 1 GHz, Lower Band, 23 dBi Antenna



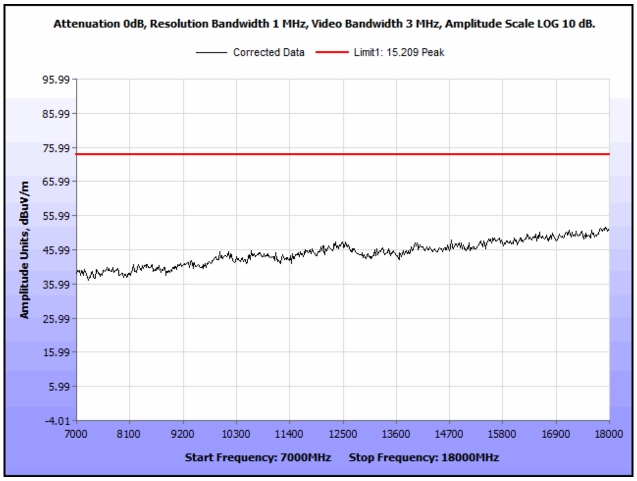
Plot 342. Radiated Spurious Emissions, 50 MHz, Mid Channel, 1 GHz – 7 GHz, Average, Lower Band, 23 dBi Antenna



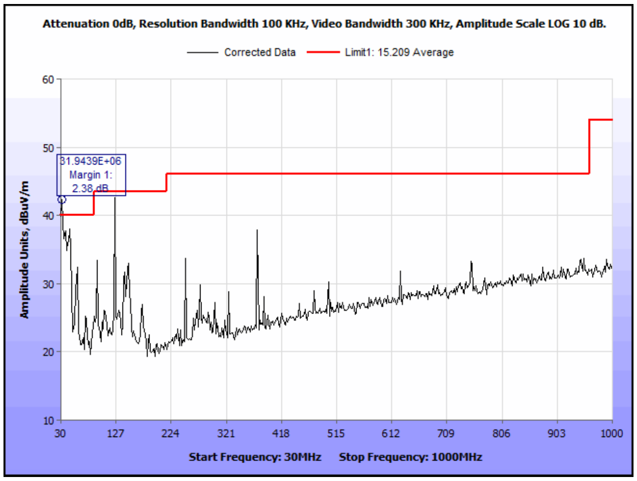
Plot 343. Radiated Spurious Emissions, 50 MHz, Mid Channel, 1 GHz – 7 GHz, Peak, Lower Band, 23 dBi Antenna



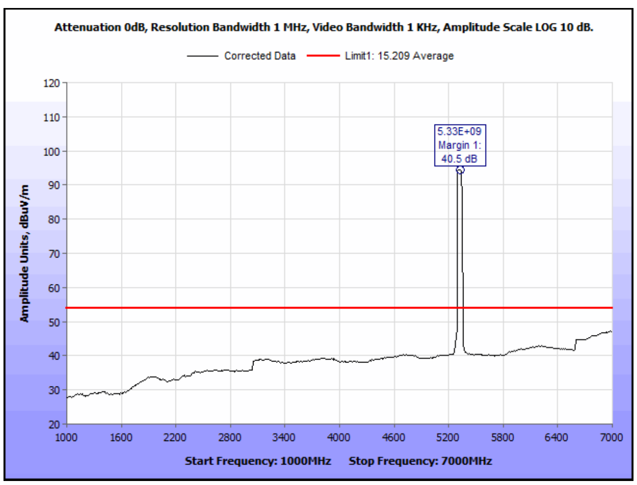
Plot 344. Radiated Spurious Emissions, 50 MHz, Mid Channel, 7 GHz – 18 GHz, Average, Lower Band, 23 dBi Antenna



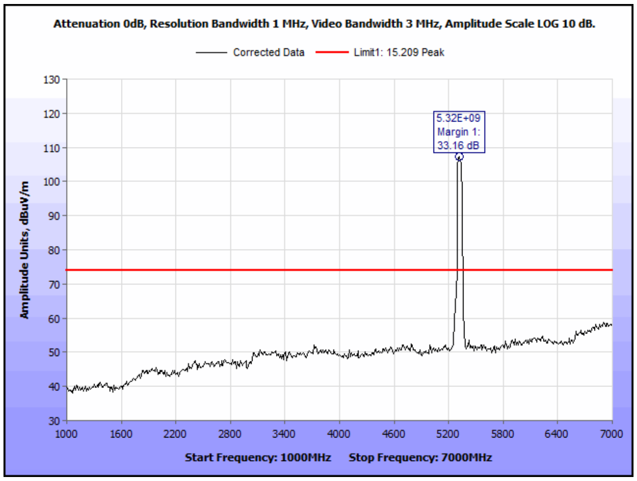
Plot 345. Radiated Spurious Emissions, 50 MHz, Mid Channel, 7 GHz – 18 GHz, Peak, Lower Band, 23 dBi Antenna



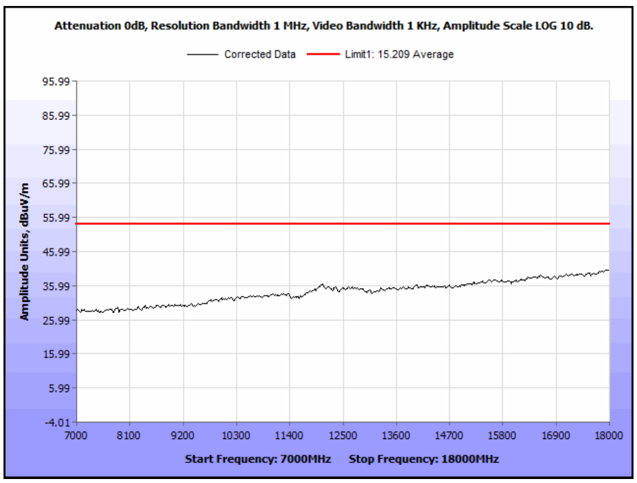
Plot 346. Radiated Spurious Emissions, 50 MHz, High Channel, 30 MHz – 1 GHz, Lower Band, 23 dBi Antenna



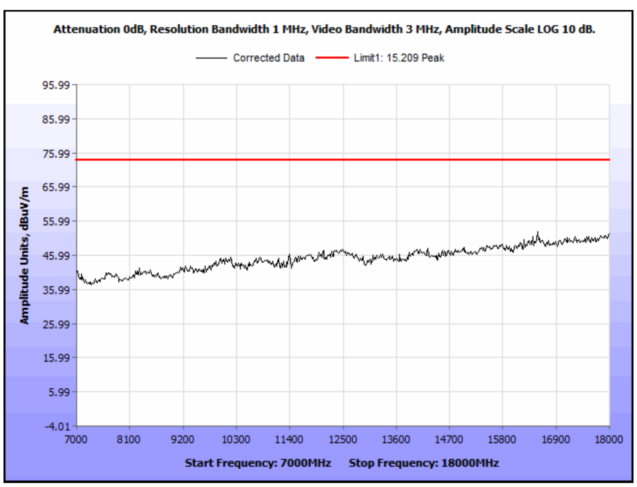
Plot 347. Radiated Spurious Emissions, 50 MHz, High Channel, 1 GHz – 7 GHz, Average, Lower Band, 23 dBi Antenna



Plot 348. Radiated Spurious Emissions, 50 MHz, High Channel, 1 GHz – 7 GHz, Peak, Lower Band, 23 dBi Antenna

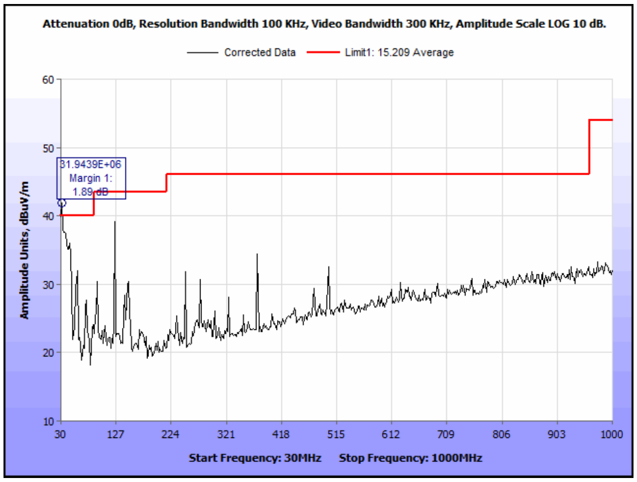


Plot 349. Radiated Spurious Emissions, 50 MHz, High Channel, 7 GHz – 18 GHz, Average, Lower Band, 23 dBi Antenna

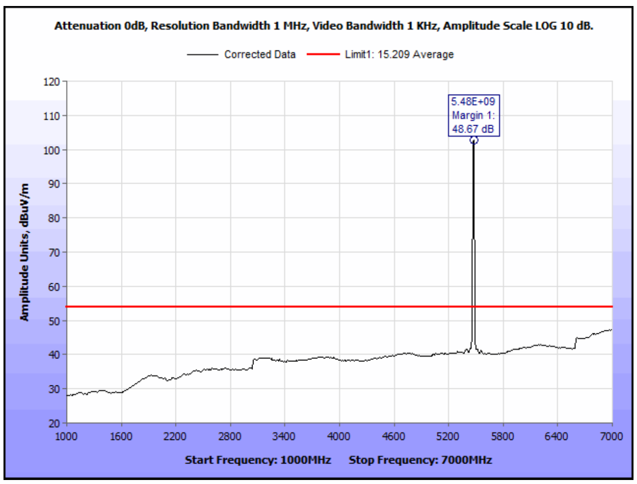


Plot 350. Radiated Spurious Emissions, 50 MHz, High Channel, 7 GHz – 18 GHz, Peak, Lower Band, 23 dBi Antenna

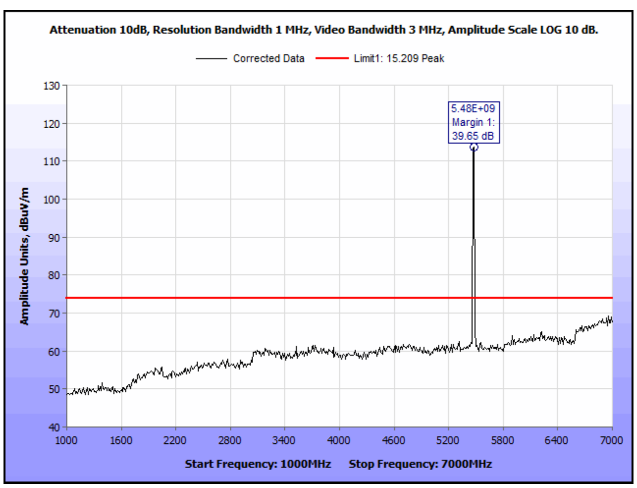
Radiated Spurious Emissions, 10 MHz, Upper Band, 23 dBi Antenna



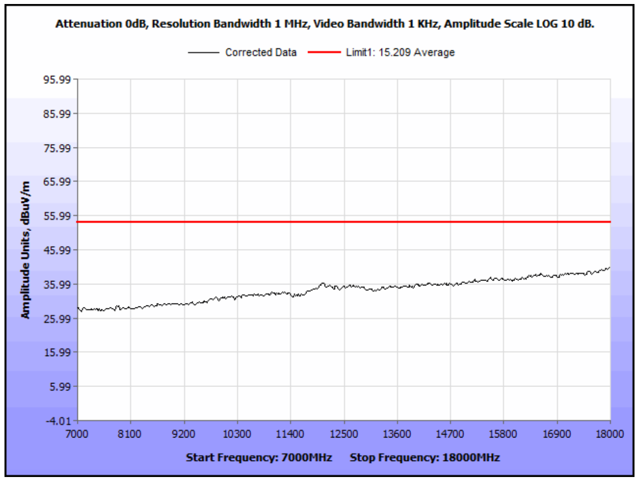
Plot 351. Radiated Spurious Emissions, 10 MHz, Low Channel, 30 MHz – 1 GHz, Upper Band, 23 dBi Antenna



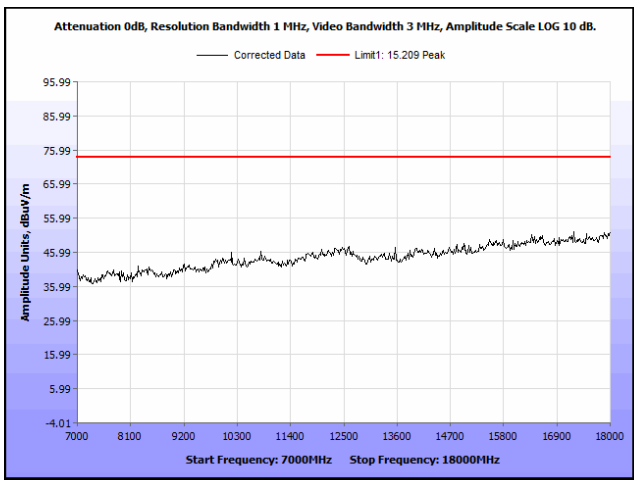
Plot 352. Radiated Spurious Emissions, 10 MHz, Low Channel, 1 GHz – 7 GHz, Average, Upper Band, 23 dBi Antenna



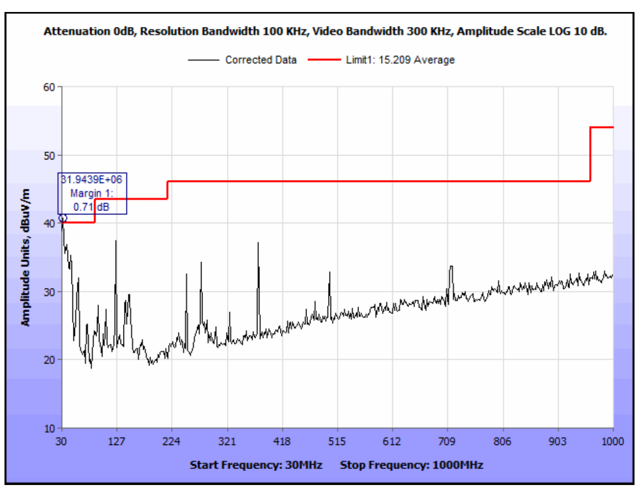
Plot 353. Radiated Spurious Emissions, 10 MHz, Low Channel, 1 GHz – 7 GHz, Peak, Upper Band, 23 dBi Antenna



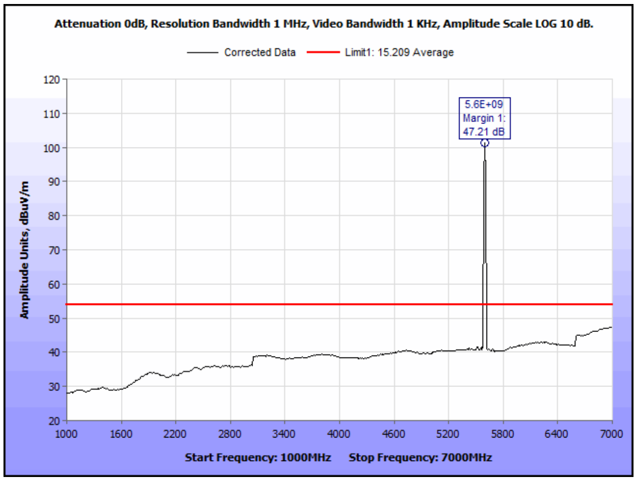
Plot 354. Radiated Spurious Emissions, 10 MHz, Low Channel, 7 GHz – 18 GHz, Average, Upper Band, 23 dBi Antenna



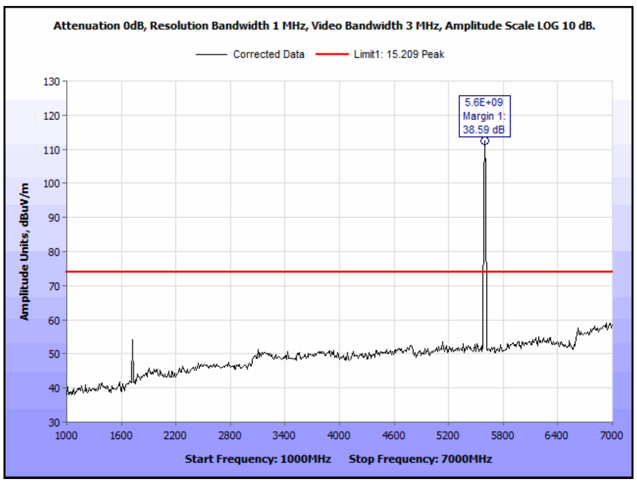
Plot 355. Radiated Spurious Emissions, 10 MHz, Low Channel, 7 GHz – 18 GHz, Peak, Upper Band, 23 dBi Antenna



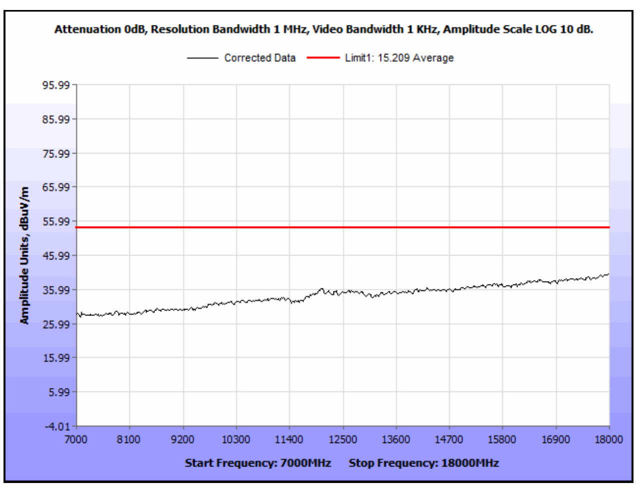
Plot 356. Radiated Spurious Emissions, 10 MHz, Mid Channel, 30 MHz – 1 GHz, Upper Band, 23 dBi Antenna



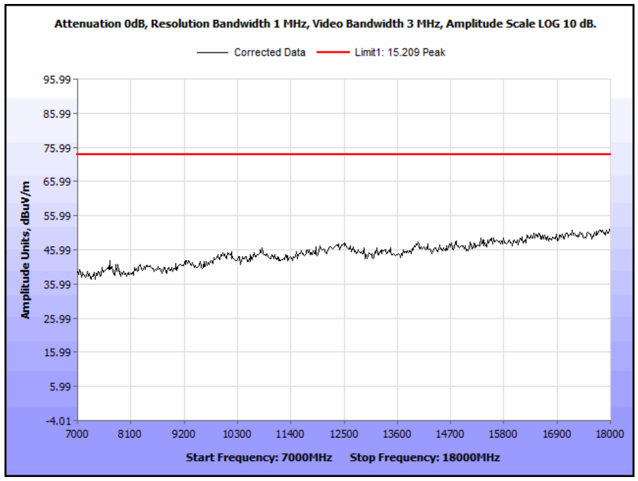
Plot 357. Radiated Spurious Emissions, 10 MHz, Mid Channel, 1 GHz – 7 GHz, Average, Upper Band, 23 dBi Antenna



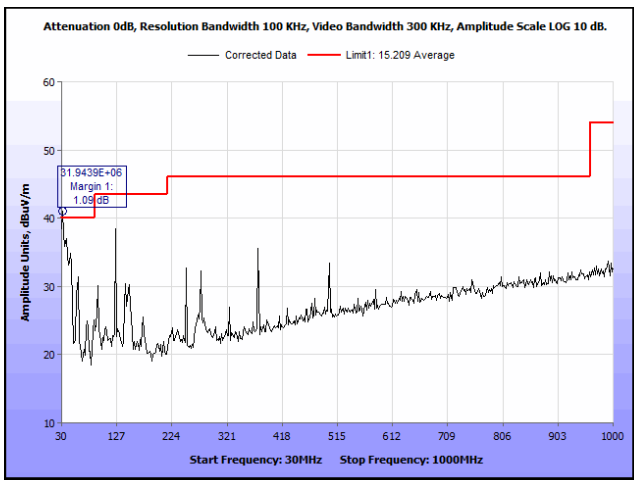
Plot 358. Radiated Spurious Emissions, 10 MHz, Mid Channel, 1 GHz – 7 GHz, Peak, Upper Band, 23 dBi Antenna



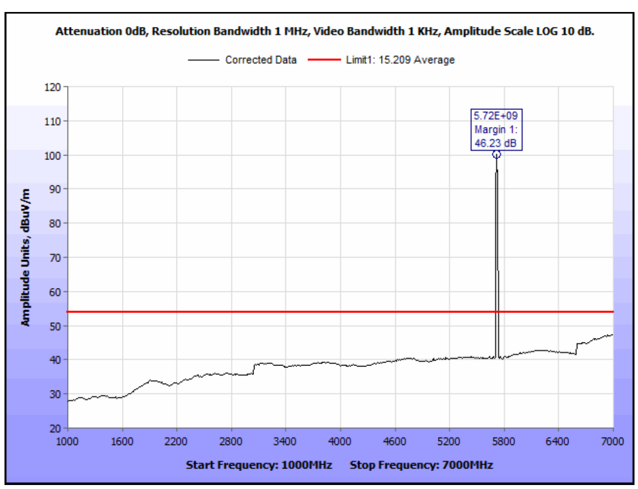
Plot 359. Radiated Spurious Emissions, 10 MHz, Mid Channel, 7 GHz – 18 GHz, Average, Upper Band, 23 dBi Antenna



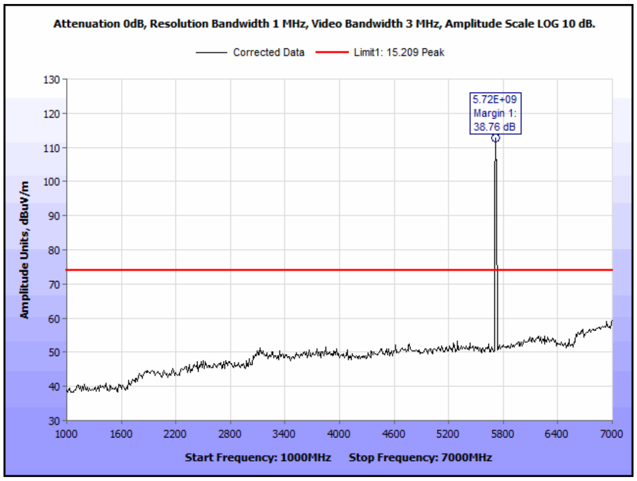
Plot 360. Radiated Spurious Emissions, 10 MHz, Mid Channel, 7 GHz – 18 GHz, Peak, Upper Band, 23 dBi Antenna



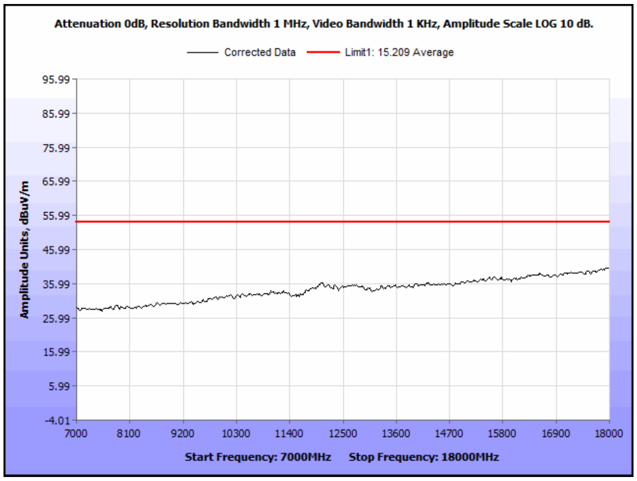
Plot 361. Radiated Spurious Emissions, 10 MHz, High Channel, 30 MHz – 1 GHz, Upper Band, 23 dBi Antenna



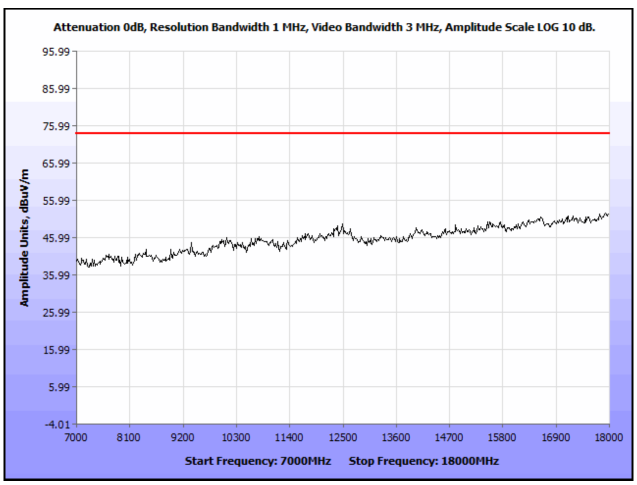
Plot 362. Radiated Spurious Emissions, 10 MHz, High Channel, 1 GHz – 7 GHz, Average, Upper Band, 23 dBi Antenna



Plot 363. Radiated Spurious Emissions, 10 MHz, High Channel, 1 GHz – 7 GHz, Peak, Upper Band, 23 dBi Antenna

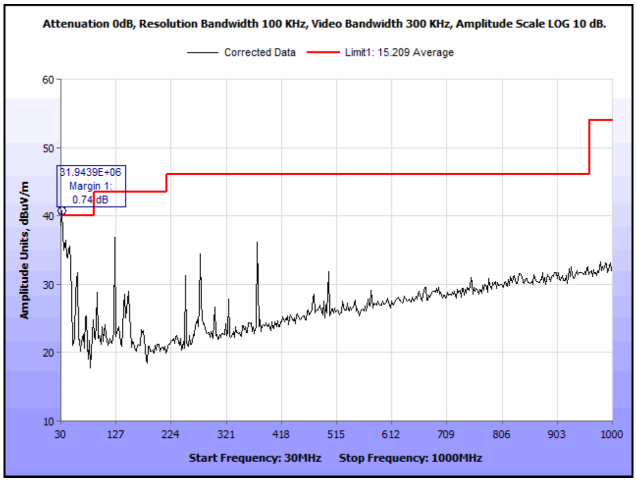


Plot 364. Radiated Spurious Emissions, 10 MHz, High Channel, 7 GHz – 18 GHz, Average, Upper Band, 23 dBi Antenna

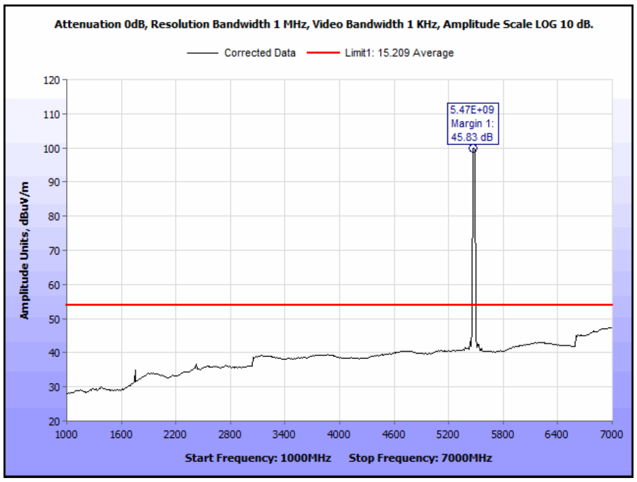


Plot 365. Radiated Spurious Emissions, 10 MHz, High Channel, 7 GHz – 18 GHz, Peak, Upper Band, 23 dBi Antenna

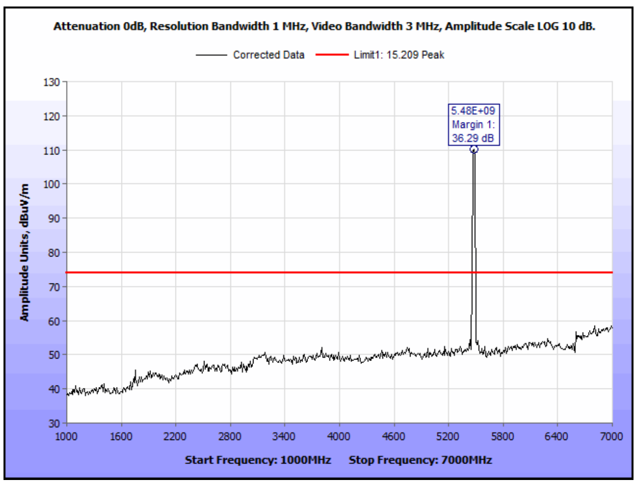
Radiated Spurious Emissions, 20 MHz, Upper Band, 23 dBi Antenna



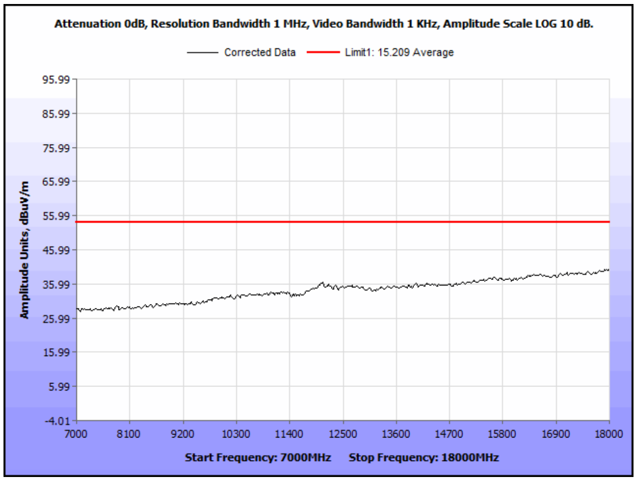
Plot 366. Radiated Spurious Emissions, 20 MHz, Low Channel, 30 MHz – 1 GHz, Upper Band, 23 dBi Antenna



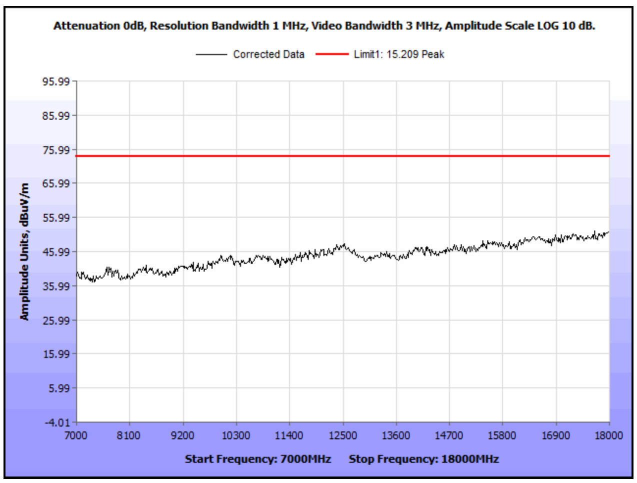
Plot 367. Radiated Spurious Emissions, 20 MHz, Low Channel, 1 GHz – 7 GHz, Average, Upper Band, 23 dBi Antenna



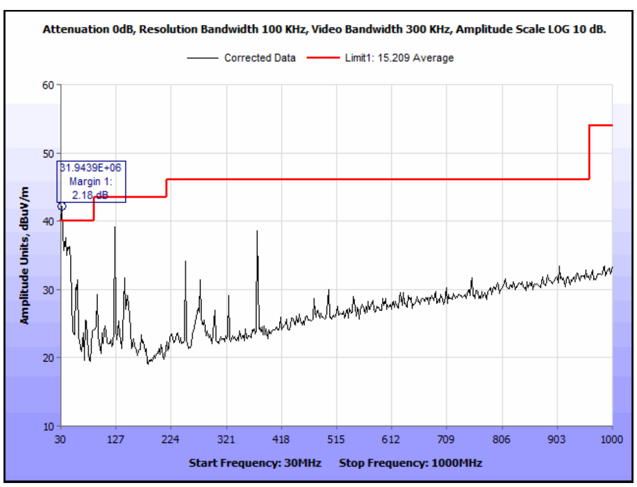
Plot 368. Radiated Spurious Emissions, 20 MHz, Low Channel, 1 GHz – 7 GHz, Peak, Upper Band, 23 dBi Antenna



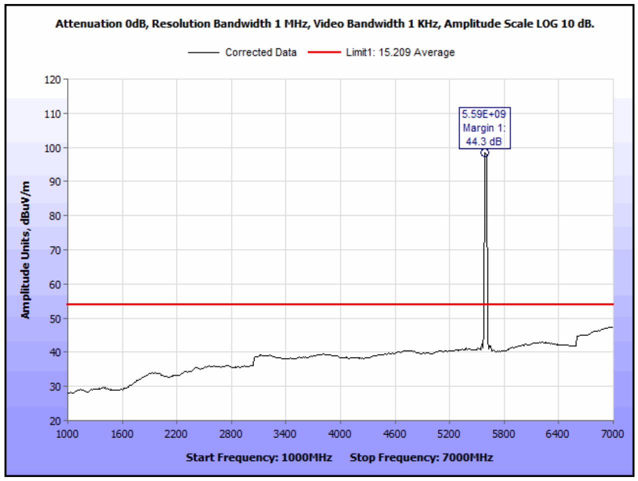
Plot 369. Radiated Spurious Emissions, 20 MHz, Low Channel, 7 GHz – 18 GHz, Average, Upper Band, 23 dBi Antenna



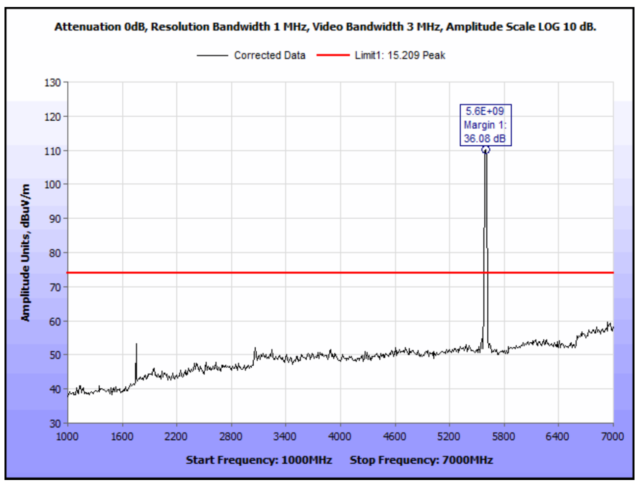
Plot 370. Radiated Spurious Emissions, 20 MHz, Low Channel, 7 GHz – 18 GHz, Peak, Upper Band, 23 dBi Antenna



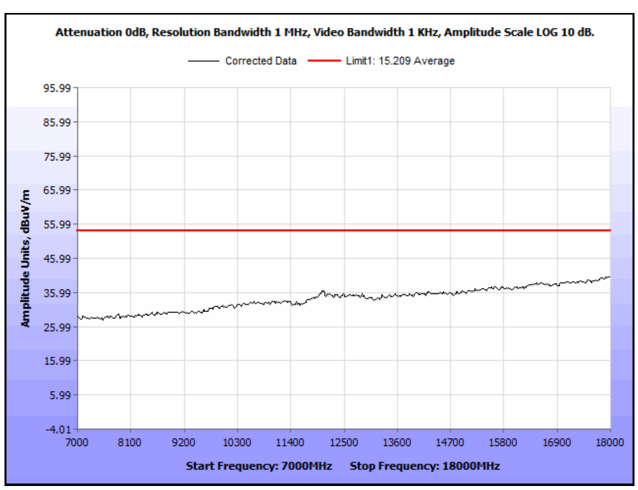
Plot 371. Radiated Spurious Emissions, 20 MHz, Mid Channel, 30 MHz – 1 GHz, Upper Band, 23 dBi Antenna



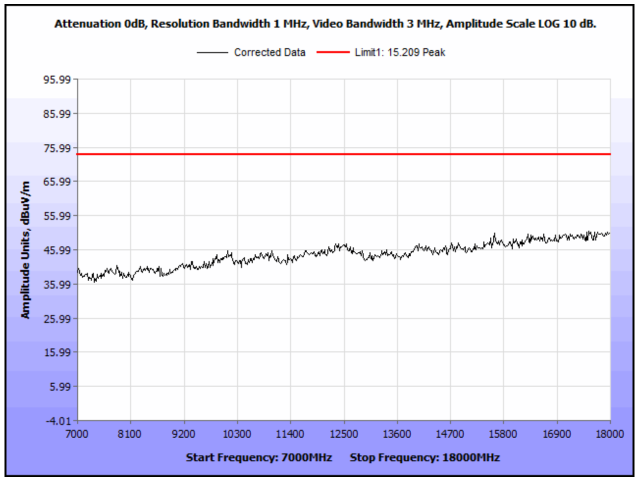
Plot 372. Radiated Spurious Emissions, 20 MHz, Mid Channel, 1 GHz – 7 GHz, Average, Upper Band, 23 dBi Antenna



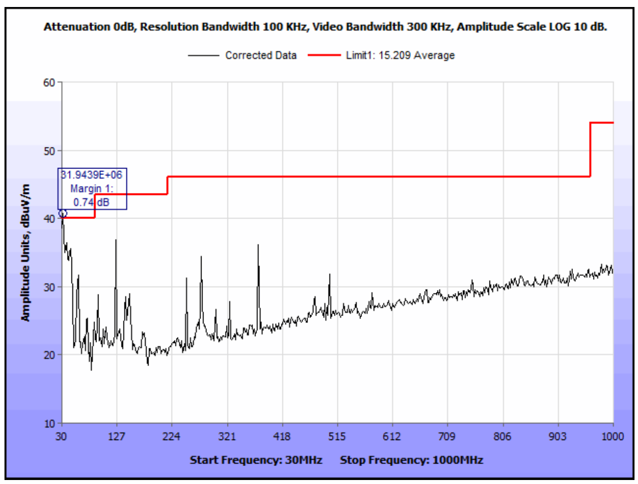
Plot 373. Radiated Spurious Emissions, 20 MHz, Mid Channel, 1 GHz – 7 GHz, Peak, Upper Band, 23 dBi Antenna



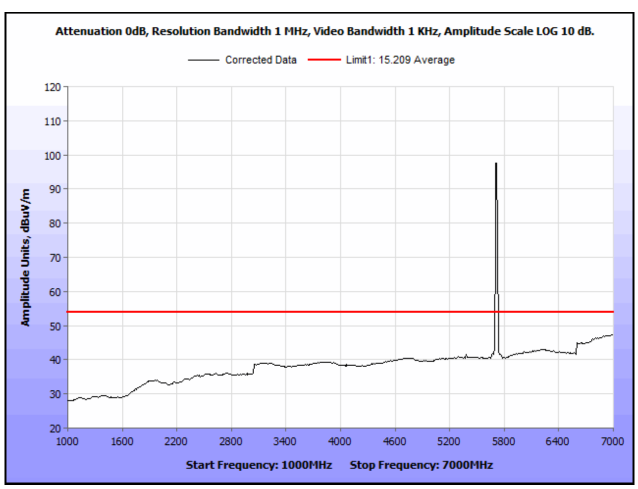
Plot 374. Radiated Spurious Emissions, 20 MHz, Mid Channel, 7 GHz – 18 GHz, Average, Upper Band, 23 dBi Antenna



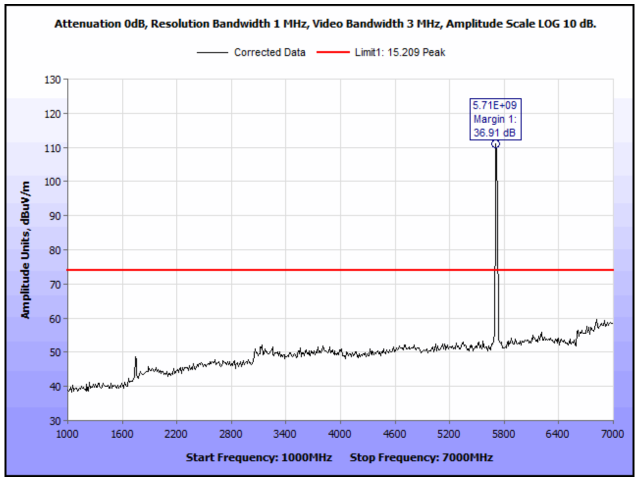
Plot 375. Radiated Spurious Emissions, 20 MHz, Mid Channel, 7 GHz – 18 GHz, Peak, Upper Band, 23 dBi Antenna



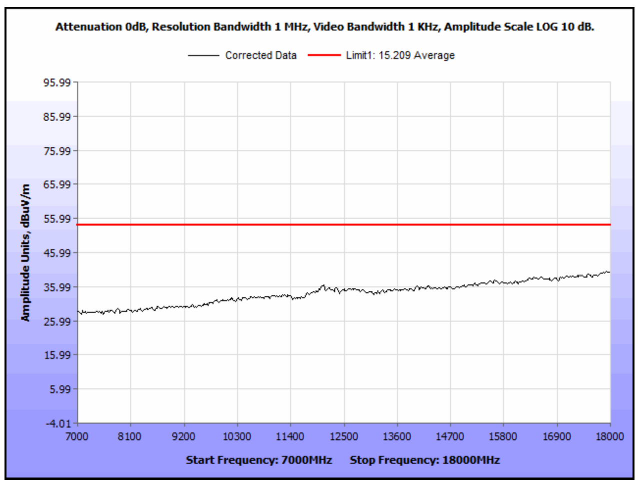
Plot 376. Radiated Spurious Emissions, 20 MHz, High Channel, 30 MHz – 1 GHz, Upper Band, 23 dBi Antenna



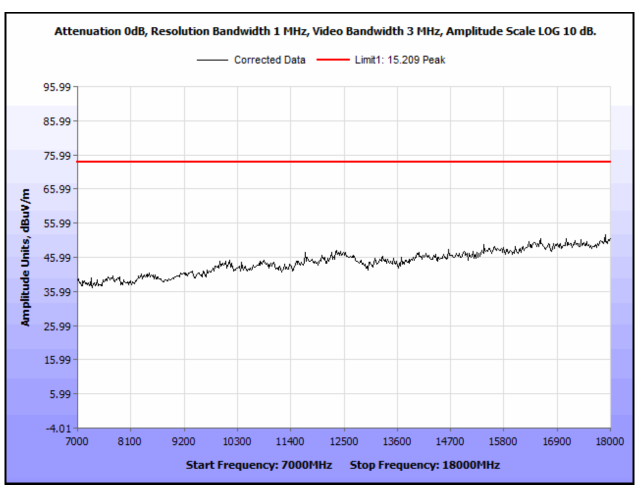
Plot 377. Radiated Spurious Emissions, 20 MHz, High Channel, 1 GHz – 7 GHz, Average, Upper Band, 23 dBi Antenna



Plot 378. Radiated Spurious Emissions, 20 MHz, High Channel, 1 GHz – 7 GHz, Peak, Upper Band, 23 dBi Antenna

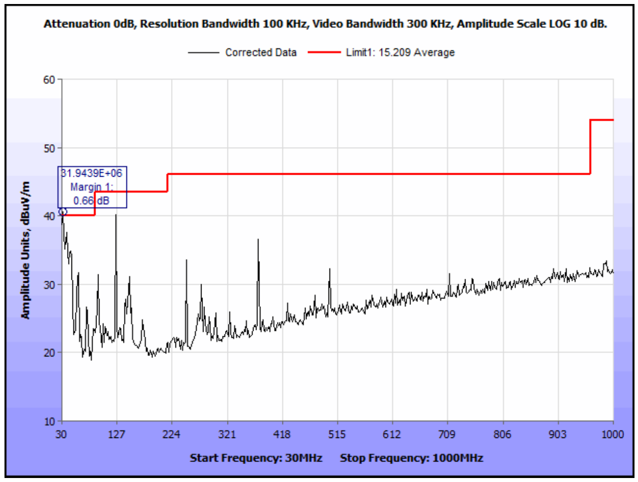


Plot 379. Radiated Spurious Emissions, 20 MHz, High Channel, 7 GHz – 18 GHz, Average, Upper Band, 23 dBi Antenna

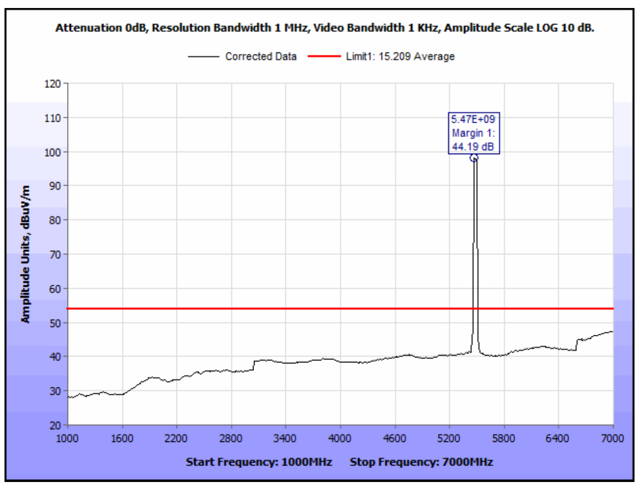


Plot 380. Radiated Spurious Emissions, 20 MHz, High Channel, 7 GHz – 18 GHz, Peak, Upper Band, 23 dBi Antenna

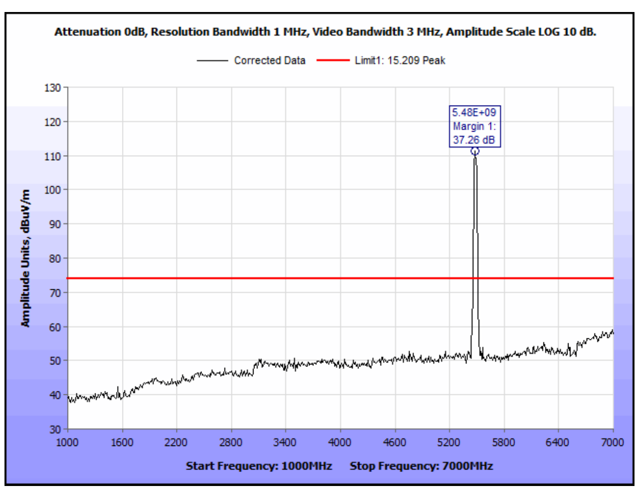
Radiated Spurious Emissions, 30 MHz, Upper Band, 23 dBi Antenna



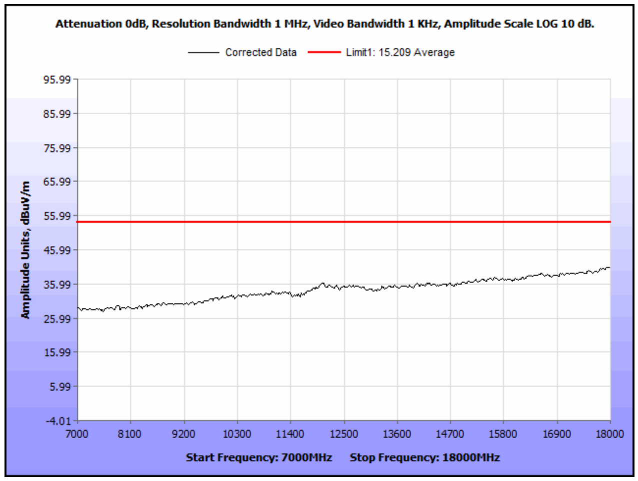
Plot 381. Radiated Spurious Emissions, 30 MHz, Low Channel, 30 MHz – 1 GHz, Upper Band, 23 dBi Antenna



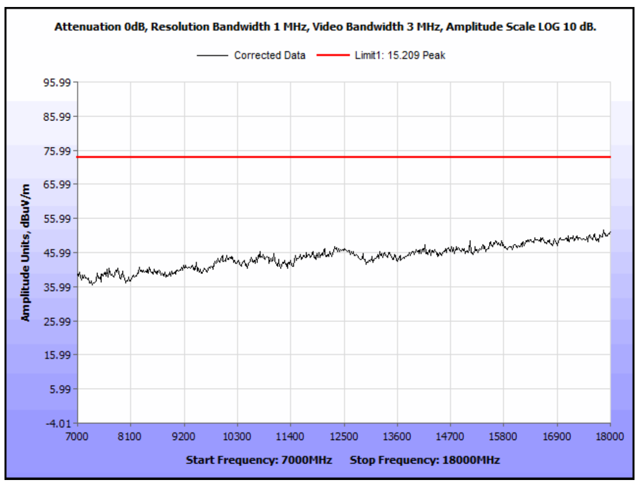
Plot 382. Radiated Spurious Emissions, 30 MHz, Low Channel, 1 GHz – 7 GHz, Average, Upper Band, 23 dBi Antenna



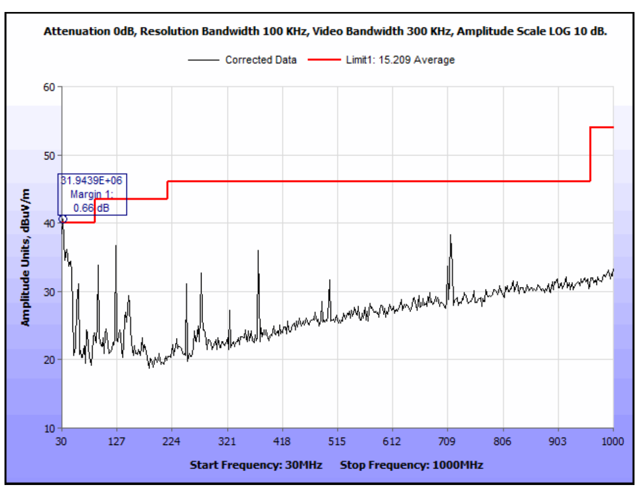
Plot 383. Radiated Spurious Emissions, 30 MHz, Low Channel, 1 GHz – 7 GHz, Peak, Upper Band, 23 dBi Antenna



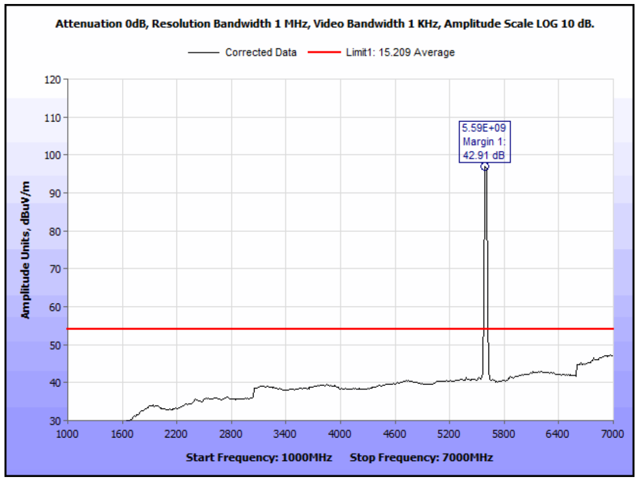
Plot 384. Radiated Spurious Emissions, 30 MHz, Low Channel, 7 GHz – 18 GHz, Average, Upper Band, 23 dBi Antenna



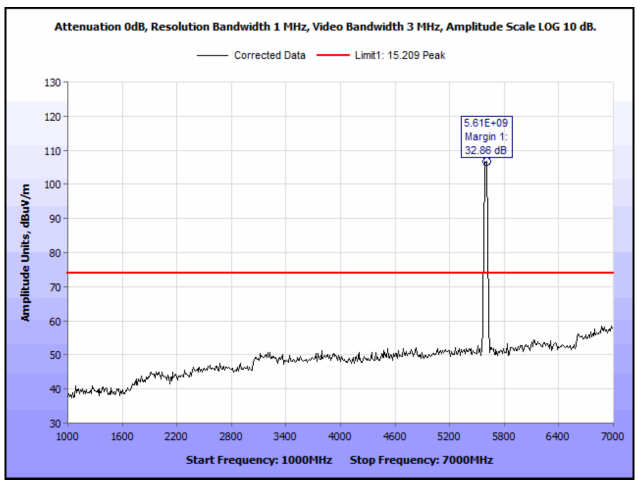
Plot 385. Radiated Spurious Emissions, 30 MHz, Low Channel, 7 GHz – 18 GHz, Peak, Upper Band, 23 dBi Antenna



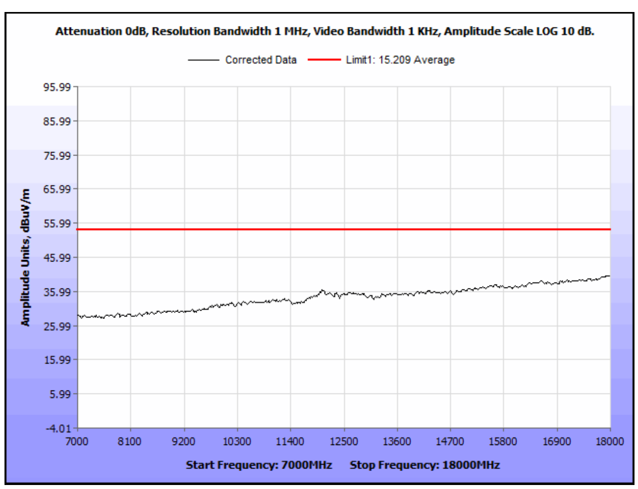
Plot 386. Radiated Spurious Emissions, 30 MHz, Mid Channel, 30 MHz – 1 GHz, Upper Band, 23 dBi Antenna



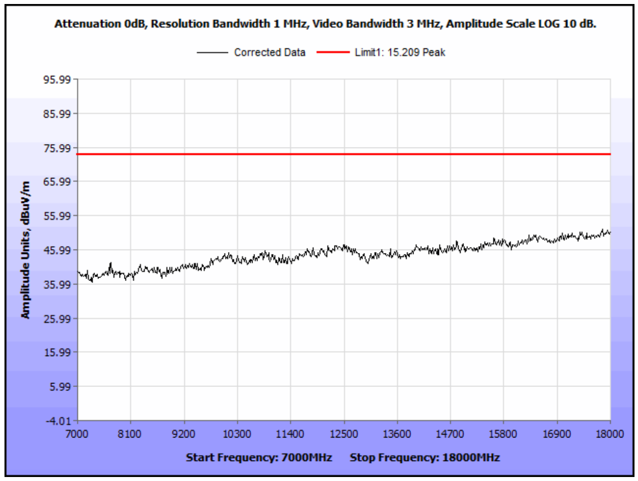
Plot 387. Radiated Spurious Emissions, 30 MHz, Mid Channel, 1 GHz – 7 GHz, Average, Upper Band, 23 dBi Antenna



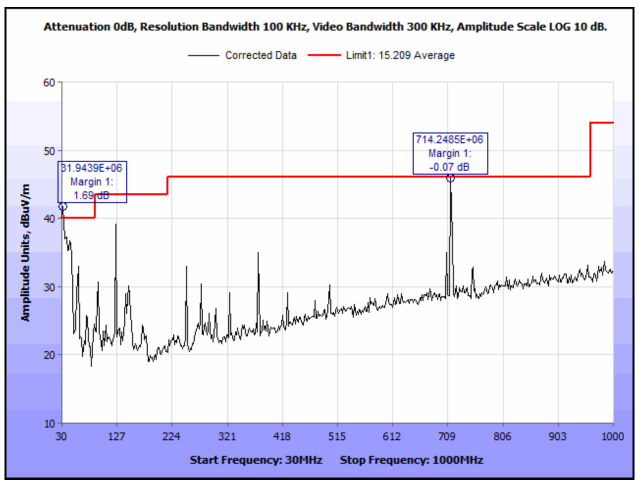
Plot 388. Radiated Spurious Emissions, 30 MHz, Mid Channel, 1 GHz – 7 GHz, Peak, Upper Band, 23 dBi Antenna



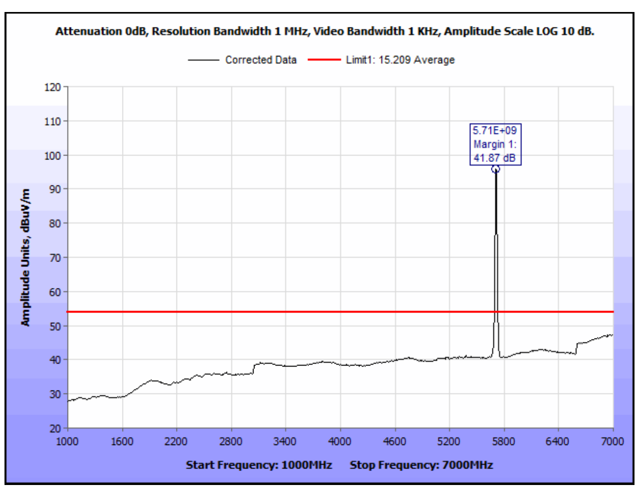
Plot 389. Radiated Spurious Emissions, 30 MHz, Mid Channel, 7 GHz – 18 GHz, Average, Upper Band, 23 dBi Antenna



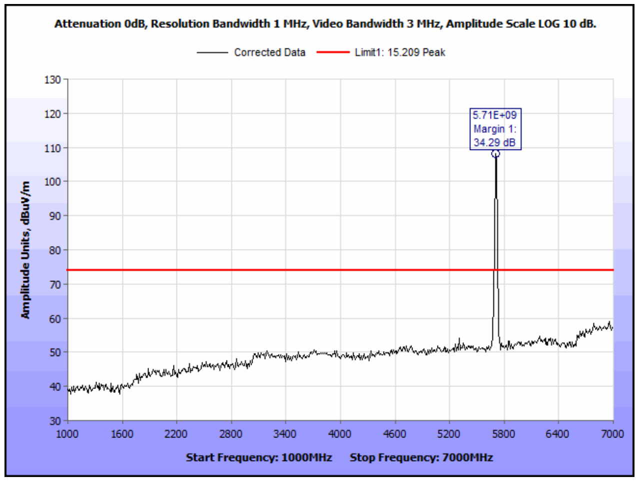
Plot 390. Radiated Spurious Emissions, 30 MHz, Mid Channel, 7 GHz – 18 GHz, Peak, Upper Band, 23 dBi Antenna



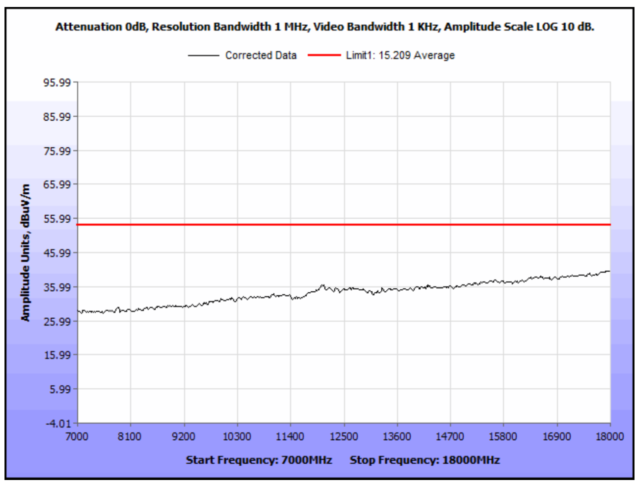
Plot 391. Radiated Spurious Emissions, 30 MHz, High Channel, 30 MHz – 1 GHz, Upper Band, 23 dBi Antenna



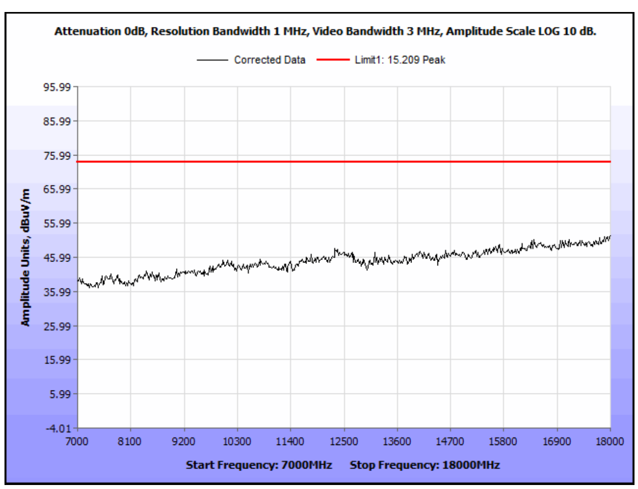
Plot 392. Radiated Spurious Emissions, 30 MHz, High Channel, 1 GHz – 7 GHz, Average, Upper Band, 23 dBi Antenna



Plot 393. Radiated Spurious Emissions, 30 MHz, High Channel, 1 GHz – 7 GHz, Peak, Upper Band, 23 dBi Antenna

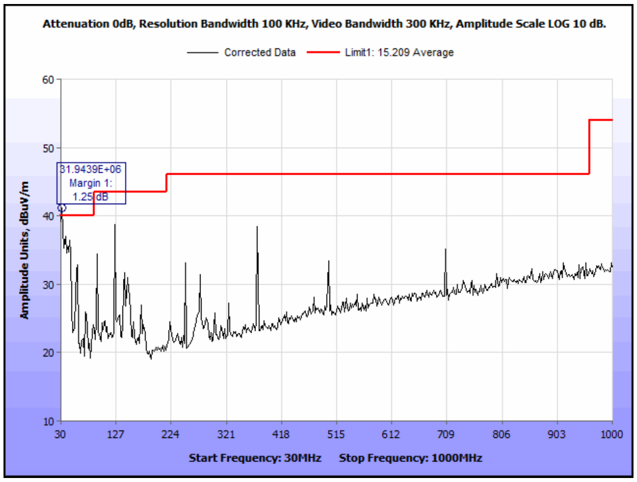


Plot 394. Radiated Spurious Emissions, 30 MHz, High Channel, 7 GHz – 18 GHz, Average, Upper Band, 23 dBi Antenna

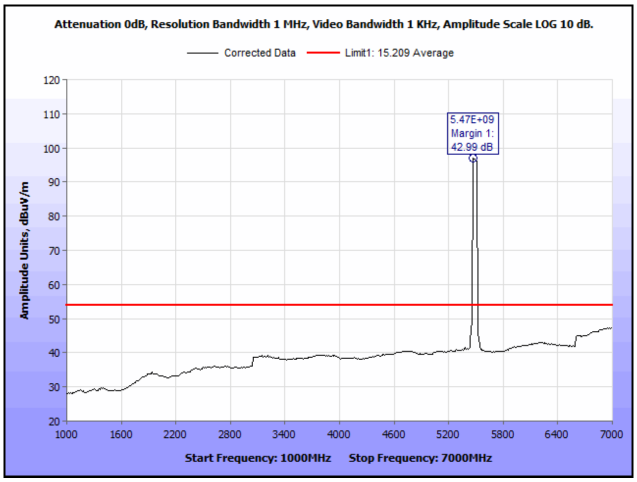


Plot 395. Radiated Spurious Emissions, 30 MHz, High Channel, 7 GHz – 18 GHz, Peak, Upper Band, 23 dBi Antenna

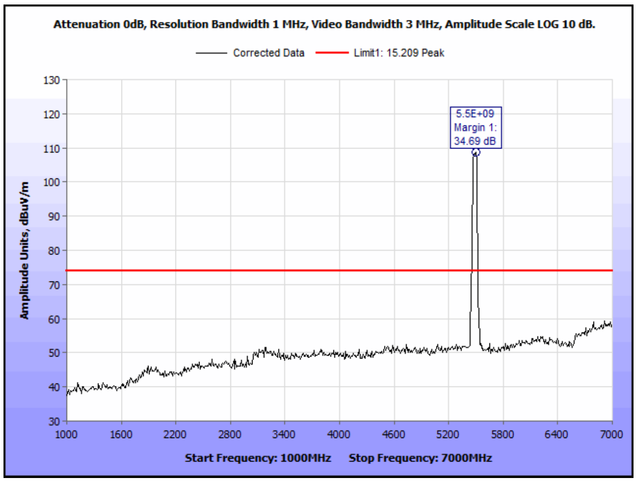
Radiated Spurious Emissions, 40 MHz, Upper Band, 23 dBi Antenna



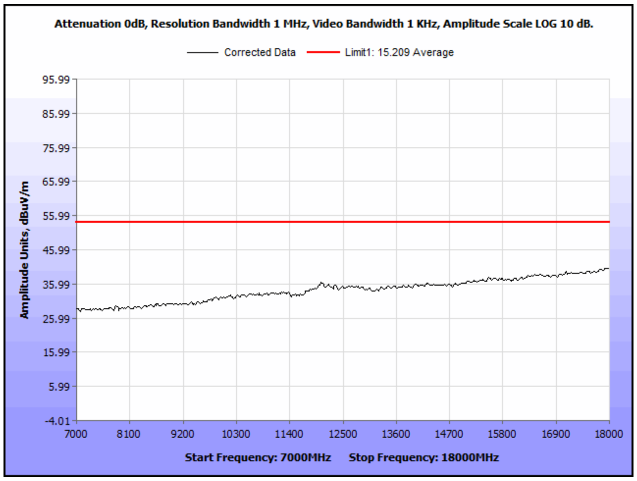
Plot 396. Radiated Spurious Emissions, 40 MHz, Low Channel, 30 MHz – 1 GHz, Upper Band, 23 dBi Antenna



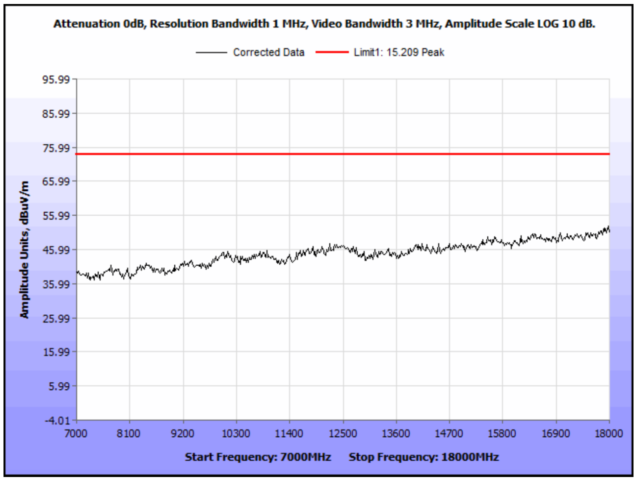
Plot 397. Radiated Spurious Emissions, 40 MHz, Low Channel, 1 GHz – 7 GHz, Average, Upper Band, 23 dBi Antenna



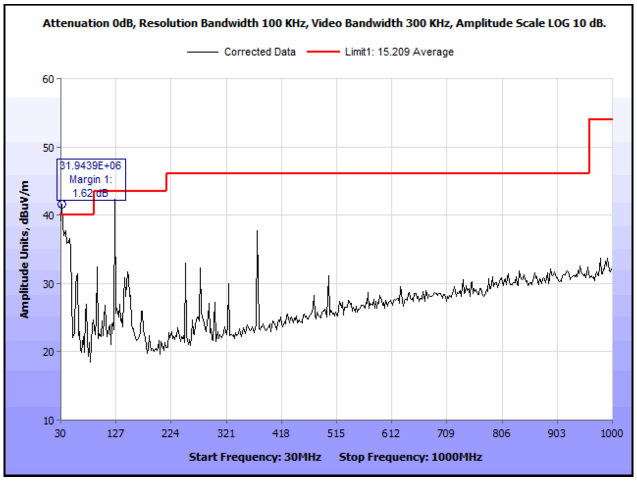
Plot 398. Radiated Spurious Emissions, 40 MHz, Low Channel, 1 GHz – 7 GHz, Peak, Upper Band, 23 dBi Antenna



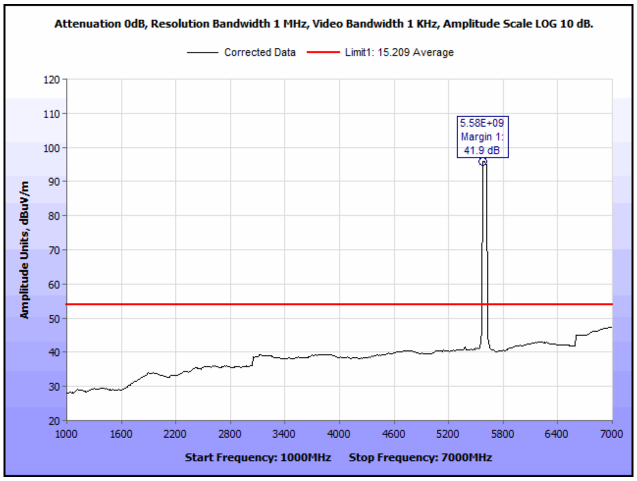
Plot 399. Radiated Spurious Emissions, 40 MHz, Low Channel, 7 GHz – 18 GHz, Average, Upper Band, 23 dBi Antenna



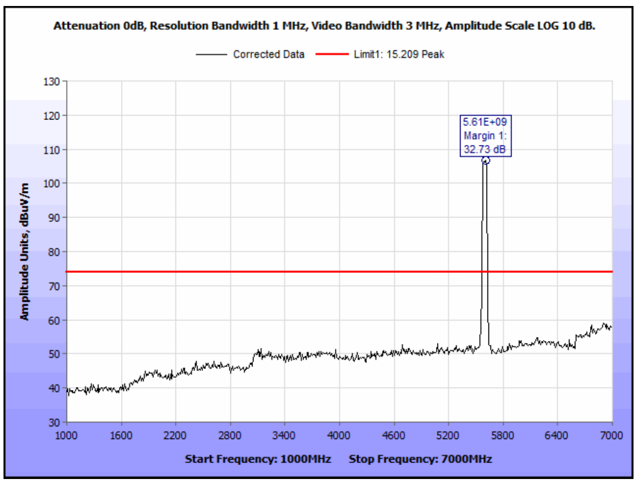
Plot 400. Radiated Spurious Emissions, 40 MHz, Low Channel, 7 GHz – 18 GHz, Peak, Upper Band, 23 dBi Antenna



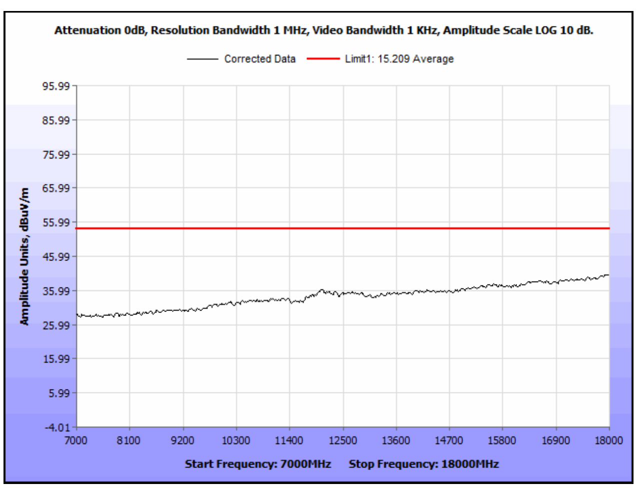
Plot 401. Radiated Spurious Emissions, 40 MHz, Mid Channel, 30 MHz – 1 GHz, Upper Band, 23 dBi Antenna



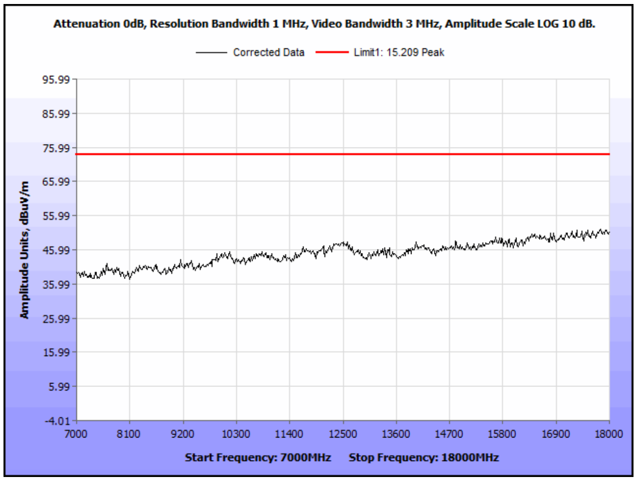
Plot 402. Radiated Spurious Emissions, 40 MHz, Mid Channel, 1 GHz – 7 GHz, Average, Upper Band, 23 dBi Antenna



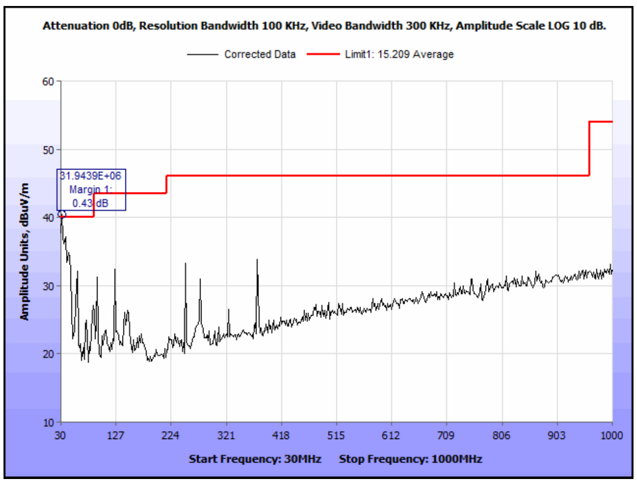
Plot 403. Radiated Spurious Emissions, 40 MHz, Mid Channel, 1 GHz – 7 GHz, Peak, Upper Band, 23 dBi Antenna



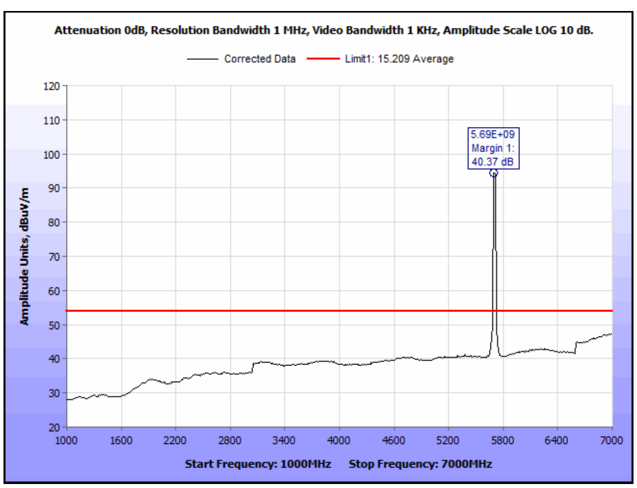
Plot 404. Radiated Spurious Emissions, 40 MHz, Mid Channel, 7 GHz – 18 GHz, Average, Upper Band, 23 dBi Antenna



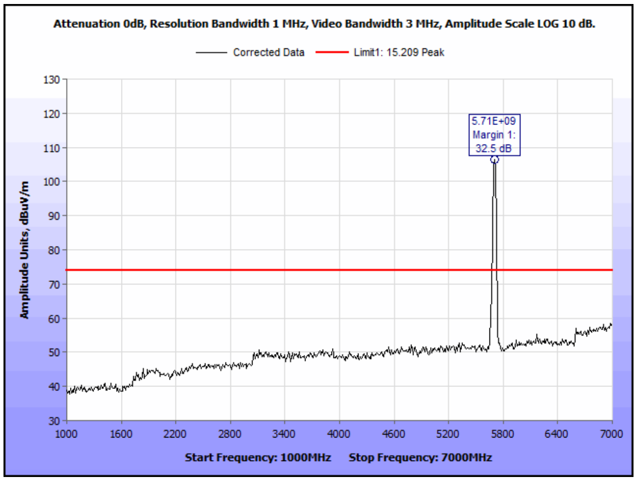
Plot 405. Radiated Spurious Emissions, 40 MHz, Mid Channel, 7 GHz – 18 GHz, Peak, Upper Band, 23 dBi Antenna



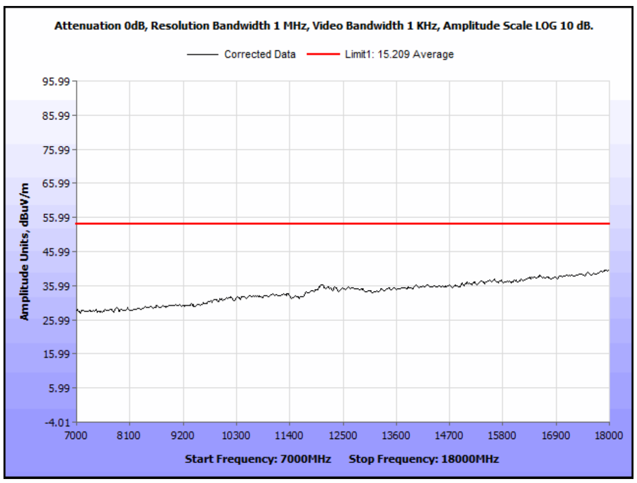
Plot 406. Radiated Spurious Emissions, 40 MHz, High Channel, 30 MHz – 1 GHz, Upper Band, 23 dBi Antenna



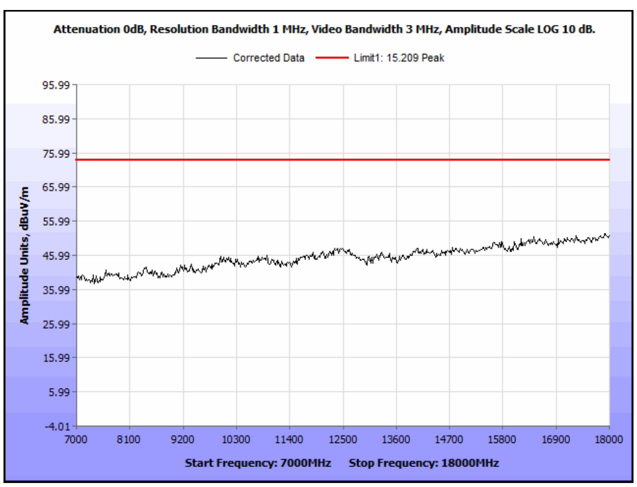
Plot 407. Radiated Spurious Emissions, 40 MHz, High Channel, 1 GHz – 7 GHz, Average, Upper Band, 23 dBi Antenna



Plot 408. Radiated Spurious Emissions, 40 MHz, High Channel, 1 GHz – 7 GHz, Peak, Upper Band, 23 dBi Antenna

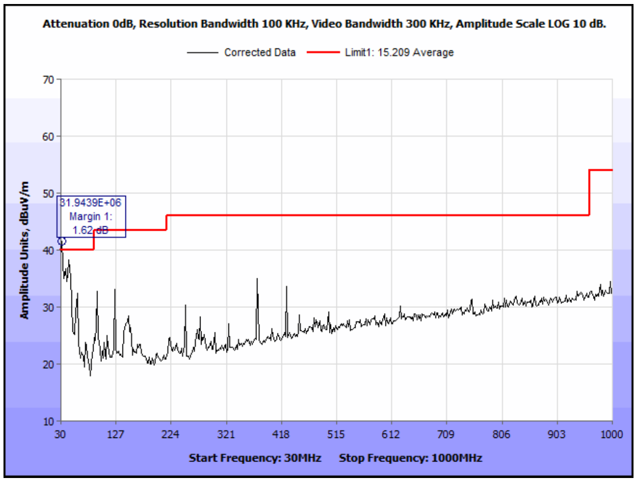


Plot 409. Radiated Spurious Emissions, 40 MHz, High Channel, 7 GHz – 18 GHz, Average, Upper Band, 23 dBi Antenna

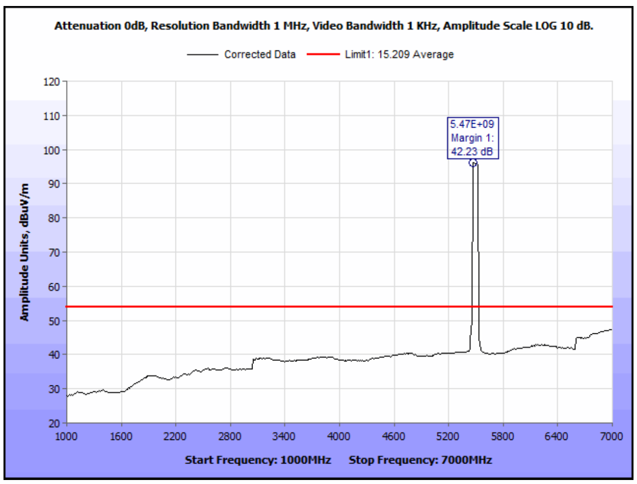


Plot 410. Radiated Spurious Emissions, 40 MHz, High Channel, 7 GHz – 18 GHz, Peak, Upper Band, 23 dBi Antenna

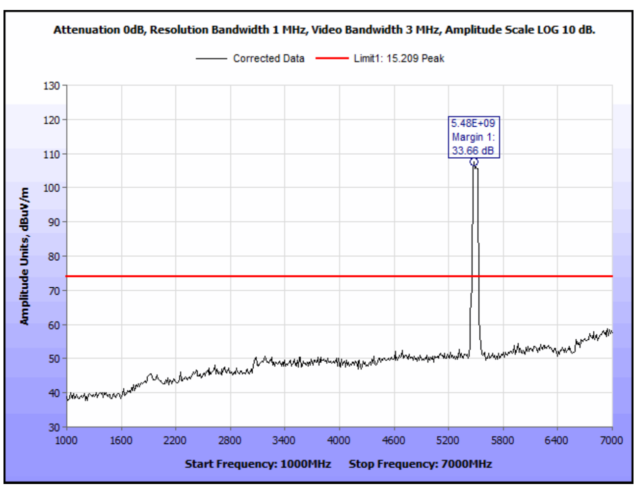
Radiated Spurious Emissions, 50 MHz, Upper Band, 23 dBi Antenna



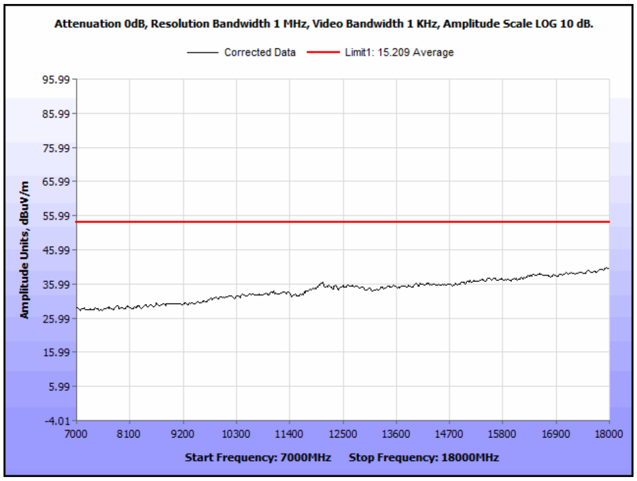
Plot 411. Radiated Spurious Emissions, 50 MHz, Low Channel, 30 MHz – 1 GHz, Upper Band, 23 dBi Antenna



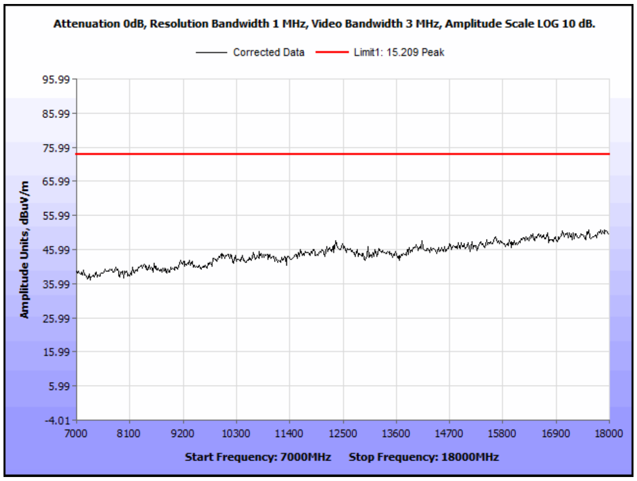
Plot 412. Radiated Spurious Emissions, 50 MHz, Low Channel, 1 GHz – 7 GHz, Average, Upper Band, 23 dBi Antenna



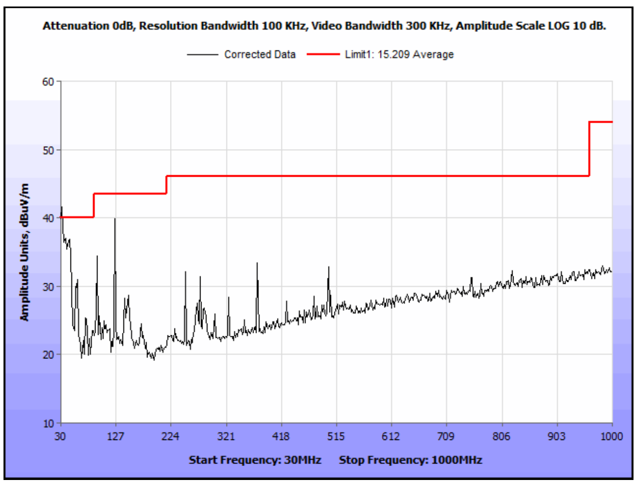
Plot 413. Radiated Spurious Emissions, 50 MHz, Low Channel, 1 GHz – 7 GHz, Peak, Upper Band, 23 dBi Antenna



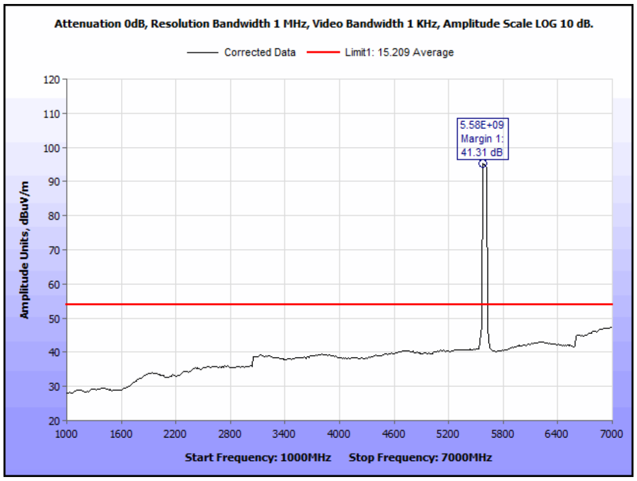
Plot 414. Radiated Spurious Emissions, 50 MHz, Low Channel, 7 GHz – 18 GHz, Average, Upper Band, 23 dBi Antenna



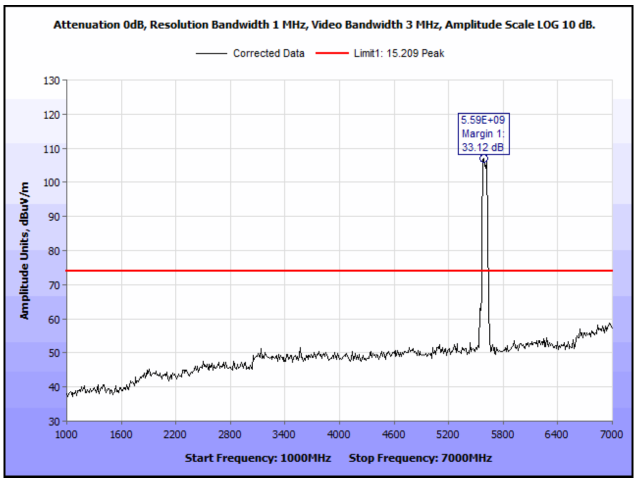
Plot 415. Radiated Spurious Emissions, 50 MHz, Low Channel, 7 GHz – 18 GHz, Peak, Upper Band, 23 dBi Antenna



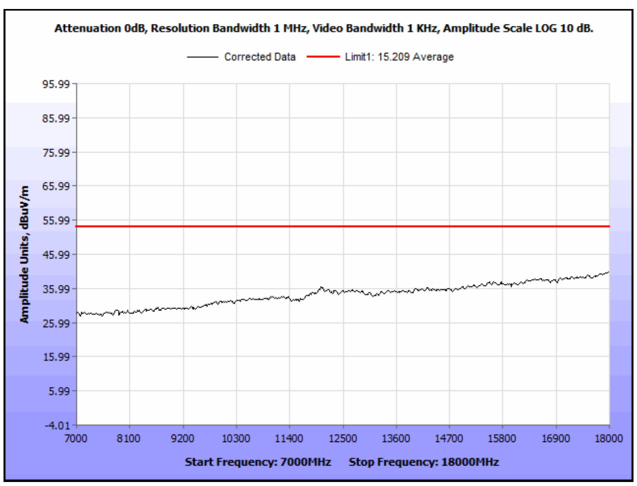
Plot 416. Radiated Spurious Emissions, 50 MHz, Mid Channel, 30 MHz – 1 GHz, Upper Band, 23 dBi Antenna



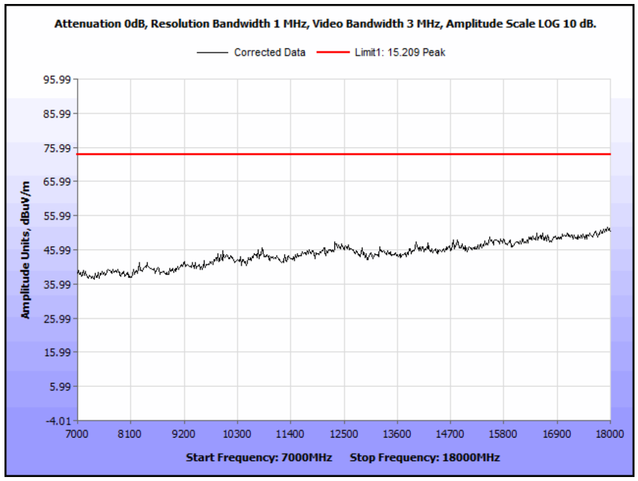
Plot 417. Radiated Spurious Emissions, 50 MHz, Mid Channel, 1 GHz – 7 GHz, Average, Upper Band, 23 dBi Antenna



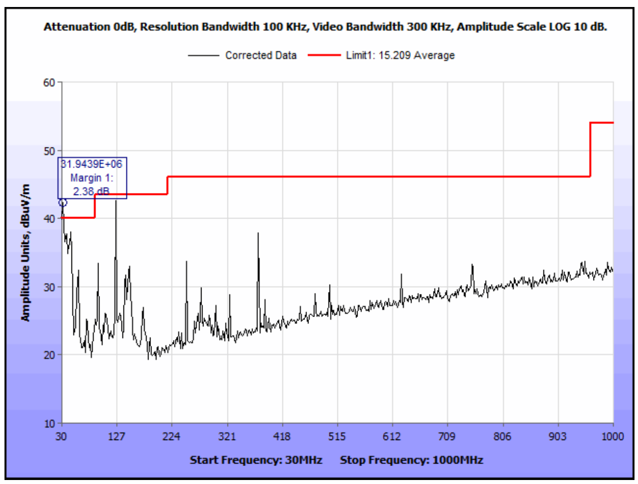
Plot 418. Radiated Spurious Emissions, 50 MHz, Mid Channel, 1 GHz – 7 GHz, Peak, Upper Band, 23 dBi Antenna



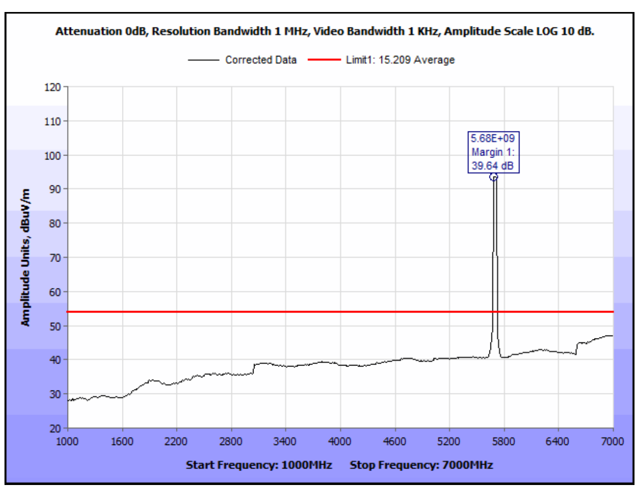
Plot 419. Radiated Spurious Emissions, 50 MHz, Mid Channel, 7 GHz – 18 GHz, Average, Upper Band, 23 dBi Antenna



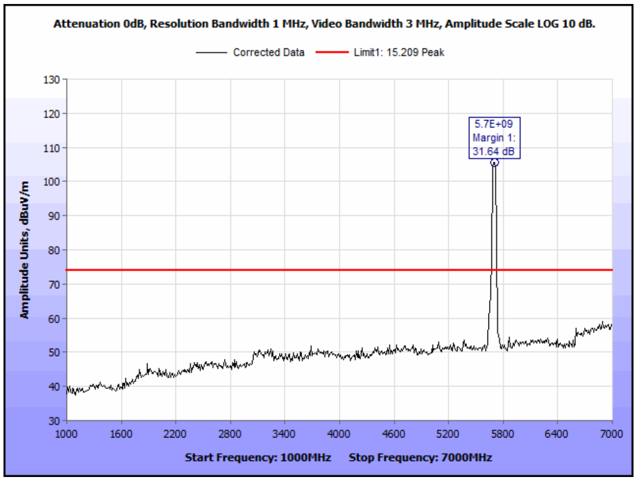
Plot 420. Radiated Spurious Emissions, 50 MHz, Mid Channel, 7 GHz – 18 GHz, Peak, Upper Band, 23 dBi Antenna



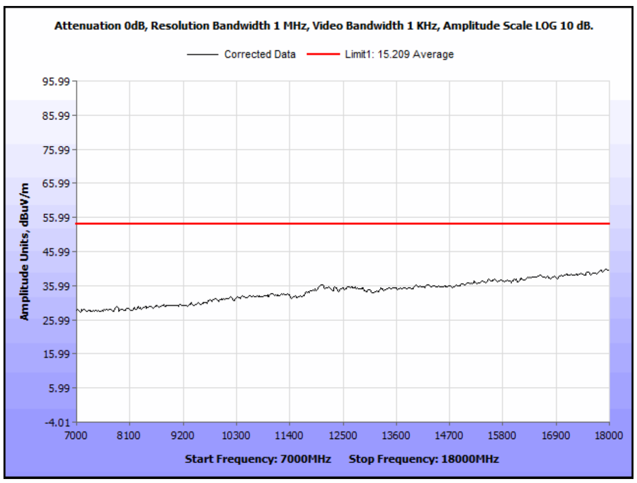
Plot 421. Radiated Spurious Emissions, 50 MHz, High Channel, 30 MHz – 1 GHz, Upper Band, 23 dBi Antenna



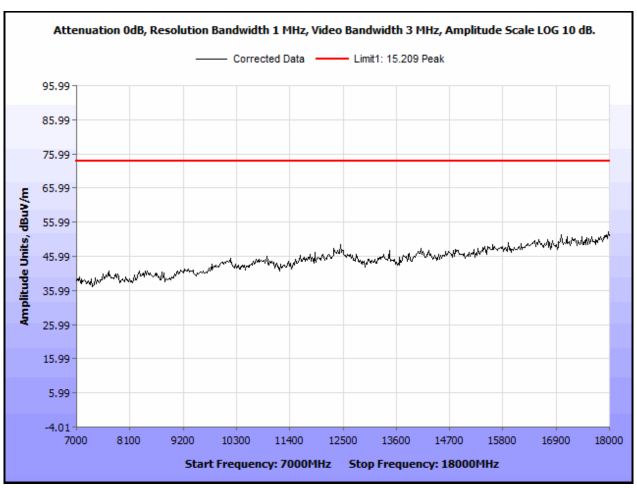
Plot 422. Radiated Spurious Emissions, 50 MHz, High Channel, 1 GHz – 7 GHz, Average, Upper Band, 23 dBi Antenna



Plot 423. Radiated Spurious Emissions, 50 MHz, High Channel, 1 GHz – 7 GHz, Peak, Upper Band, 23 dBi Antenna

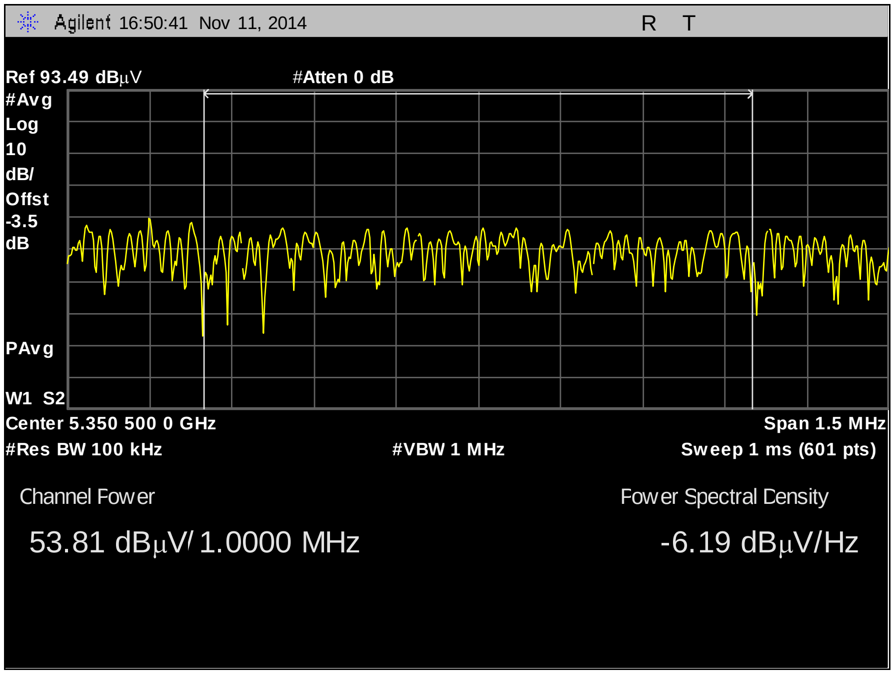


Plot 424. Radiated Spurious Emissions, 50 MHz, High Channel, 7 GHz – 18 GHz, Average, Upper Band, 23 dBi Antenna

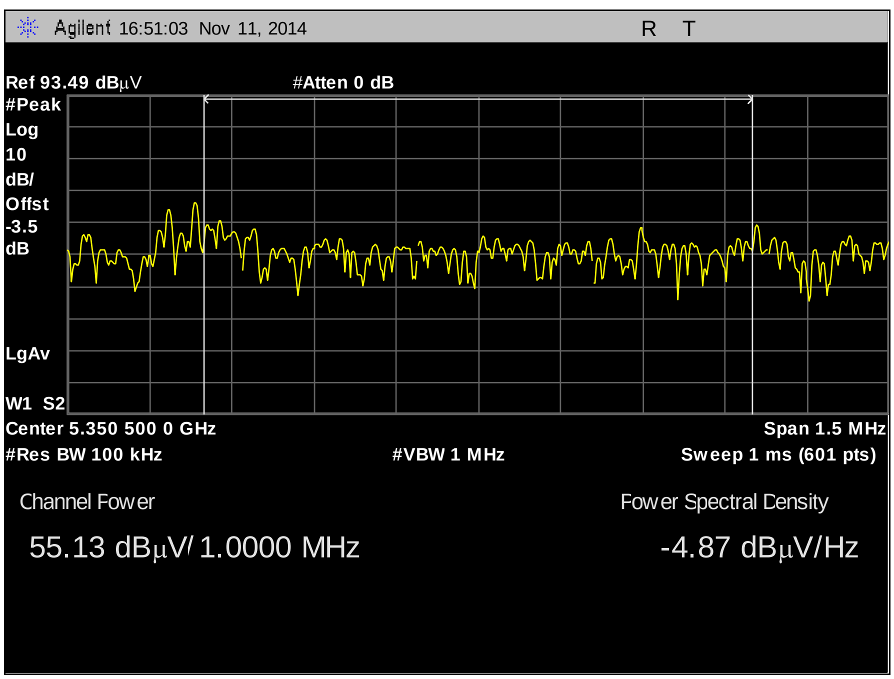


Plot 425. Radiated Spurious Emissions, 50 MHz, High Channel, 7 GHz – 18 GHz, Peak, Upper Band, 23 dBi Antenna

Band Edge, 10 MHz, Lower Band

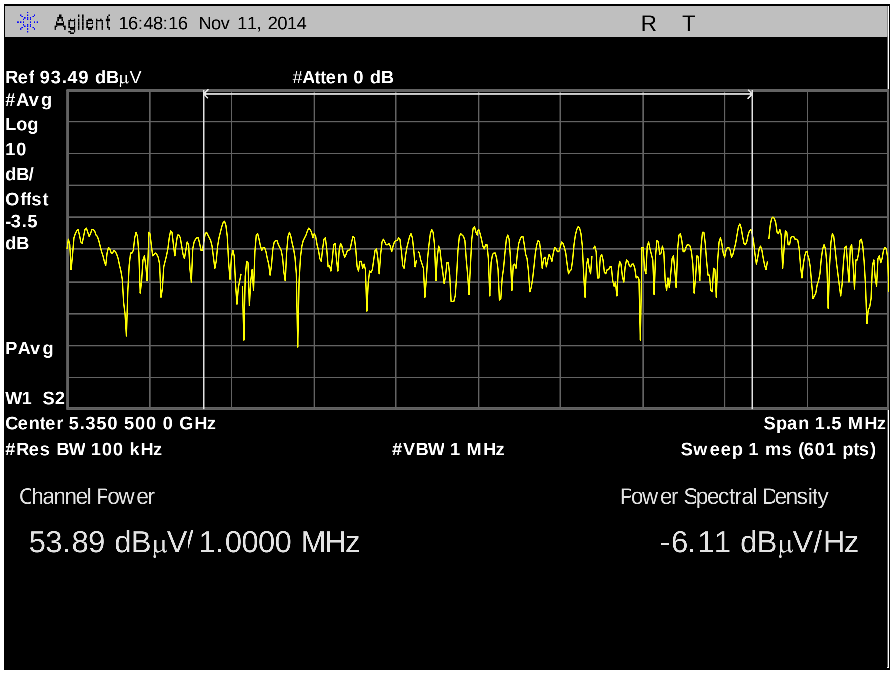


Plot 426. Radiated Band Edge, 10 MHz, High Channel, Lower Band, Average

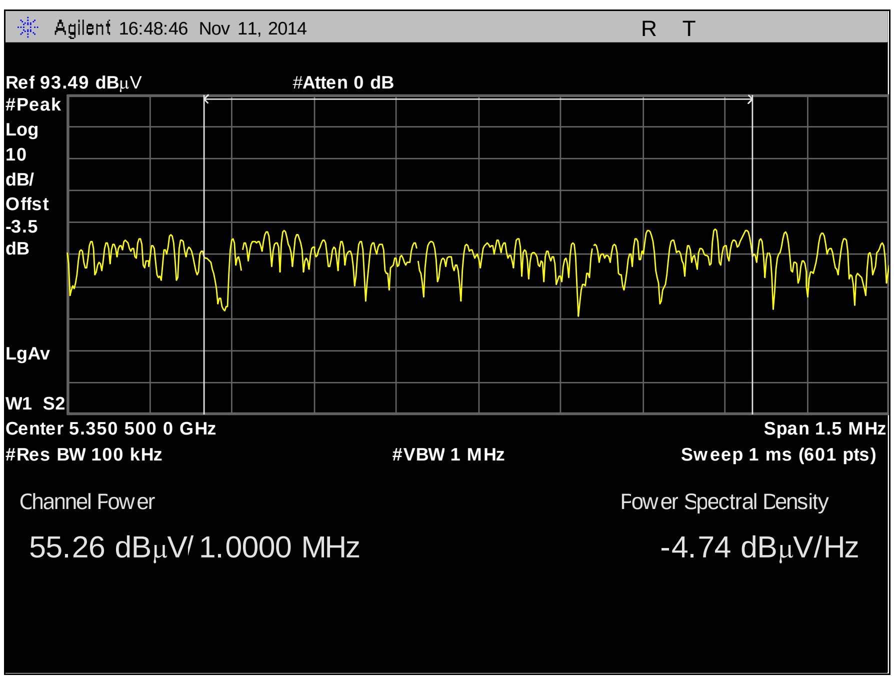


Plot 427. Radiated Band Edge, 10 MHz, High Channel, Lower Band, Peak

Band Edge, 20 MHz, Lower Band

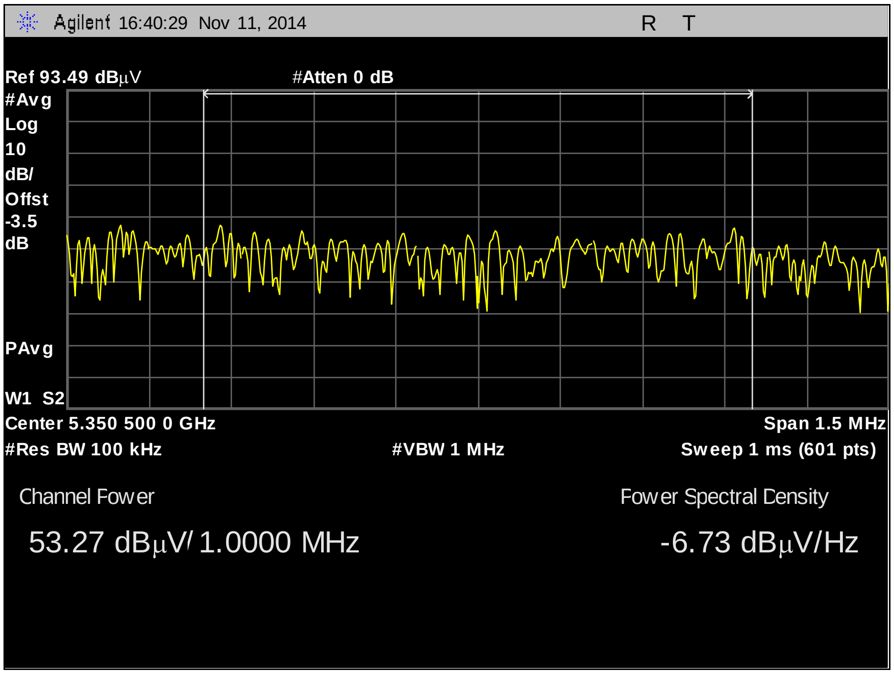


Plot 428. Radiated Band Edge, 20 MHz, High Channel, Lower Band, Average

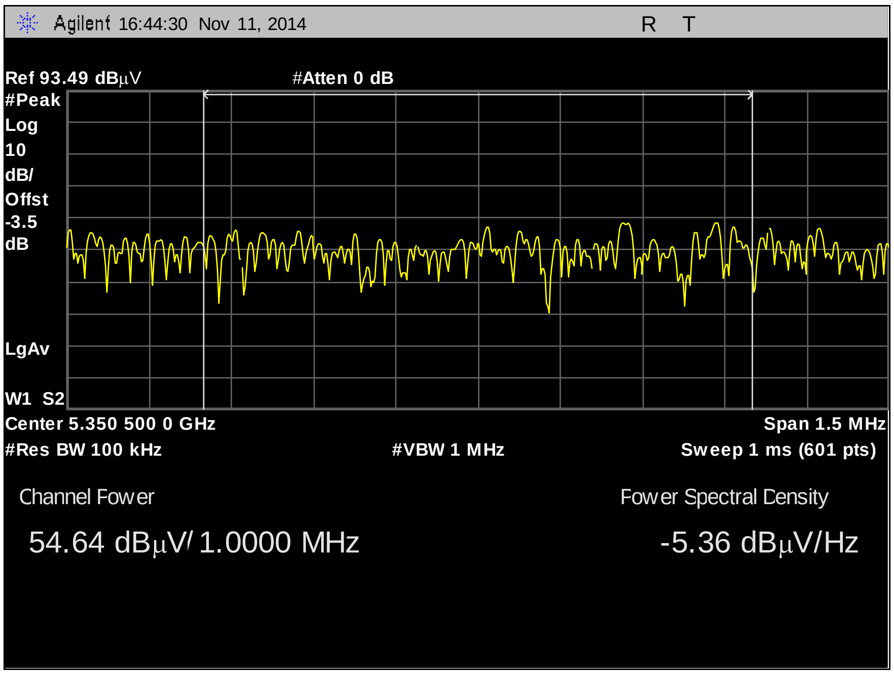


Plot 429. Radiated Band Edge, 20 MHz, High Channel, Lower Band, Peak

Band Edge, 30 MHz, Lower Band

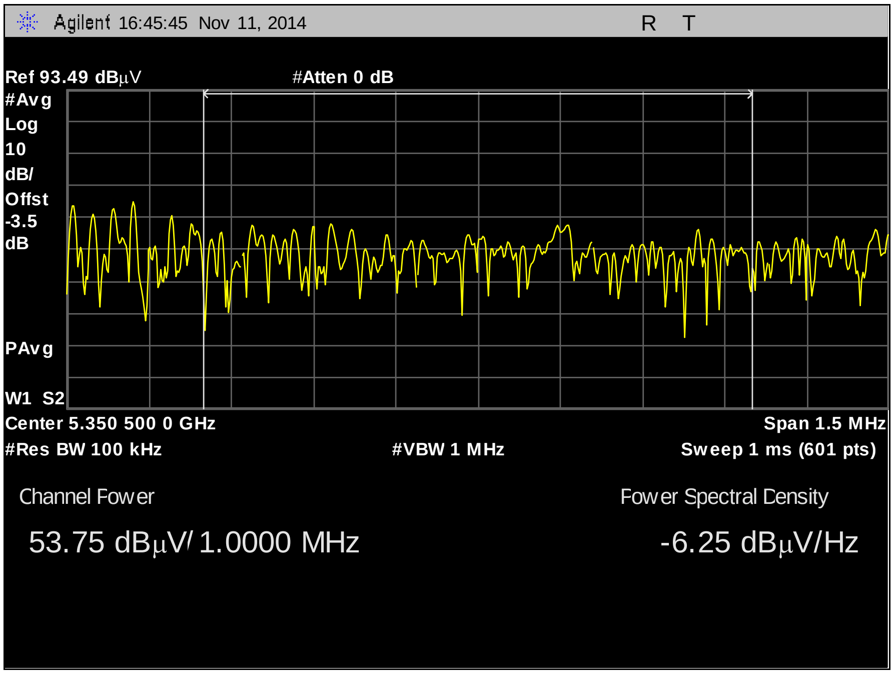


Plot 430. Radiated Band Edge, 30 MHz, High Channel, Lower Band, Average

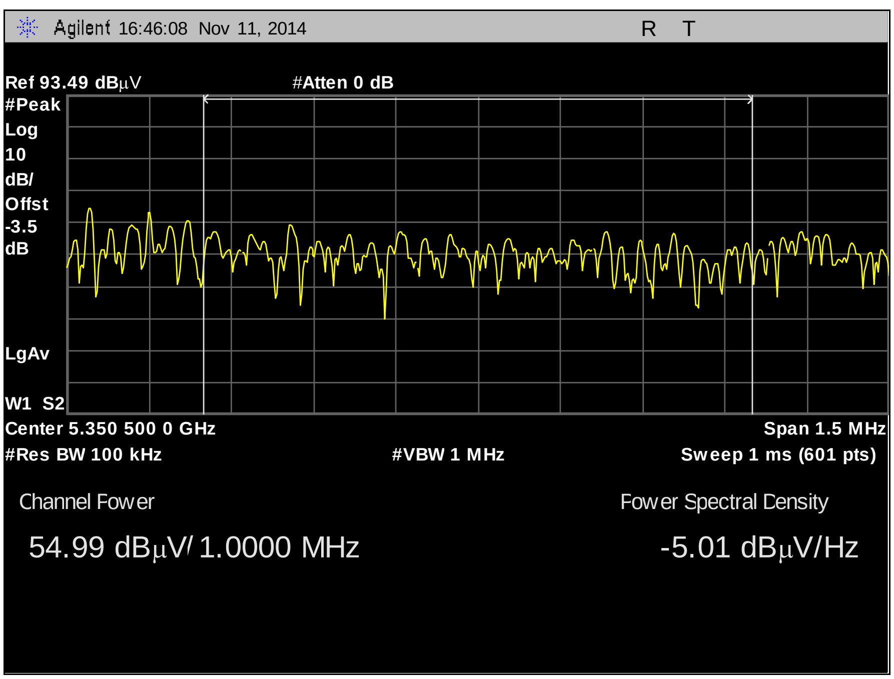


Plot 431. Radiated Band Edge, 30 MHz, High Channel, Lower Band, Peak

Band Edge, 40 MHz, Lower Band

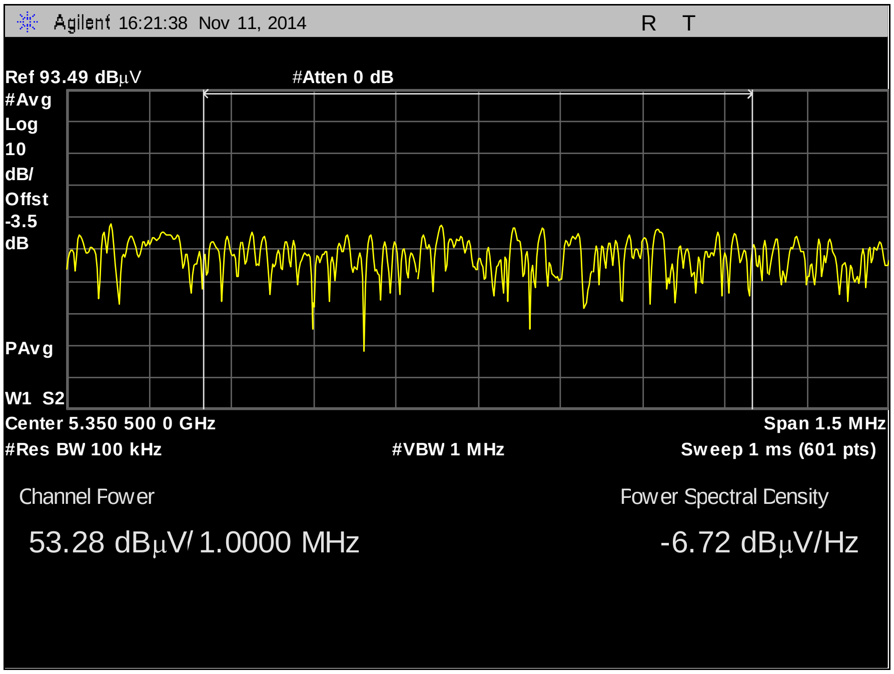


Plot 432. Radiated Band Edge, 40 MHz, High Channel, Lower Band, Average

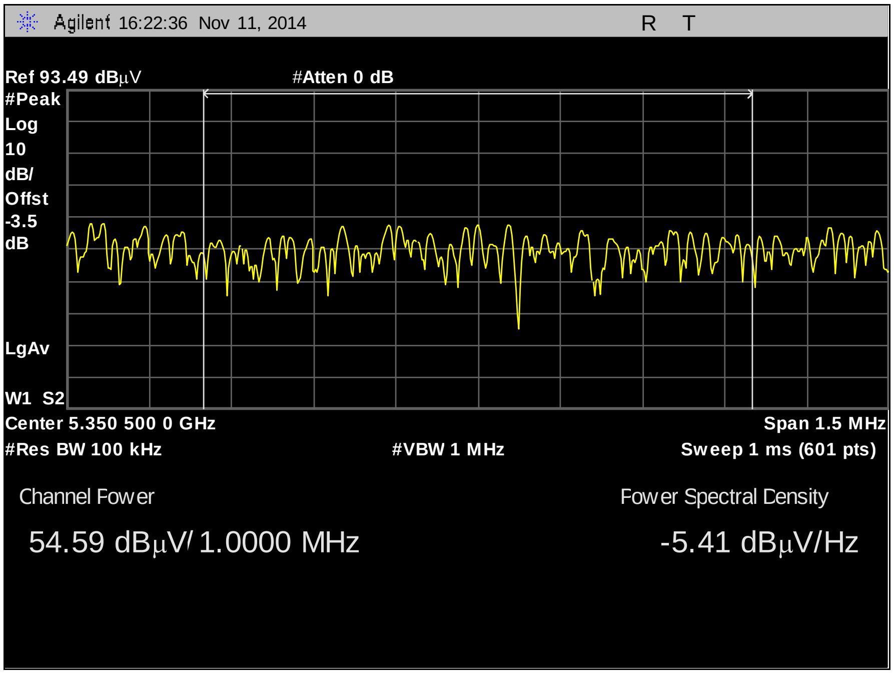


Plot 433. Radiated Band Edge, 40 MHz, High Channel, Lower Band, Peak

Band Edge, 50 MHz, Lower Band

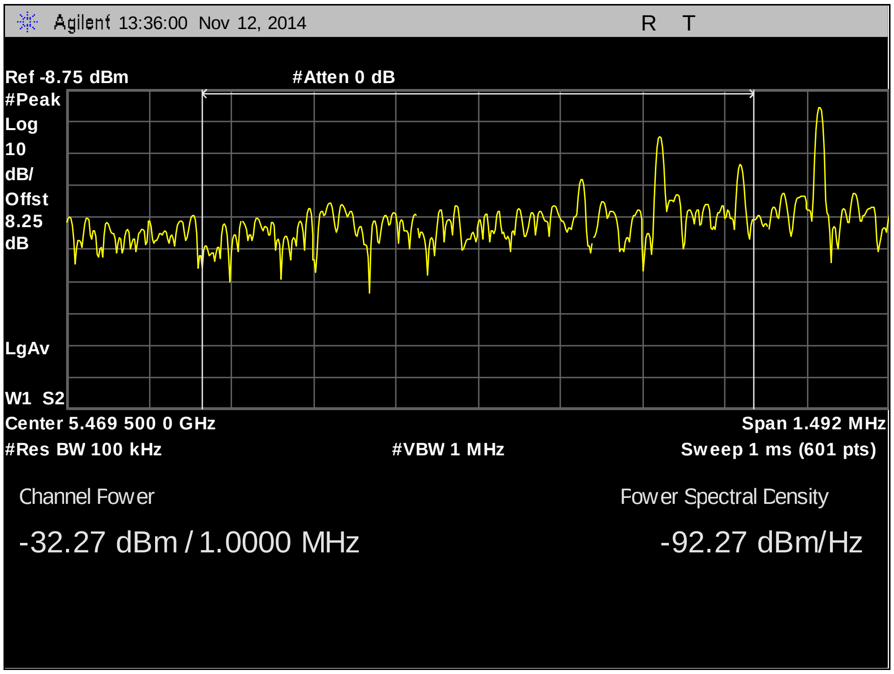


Plot 434. Radiated Band Edge, 50 MHz, High Channel, Lower Band, Average

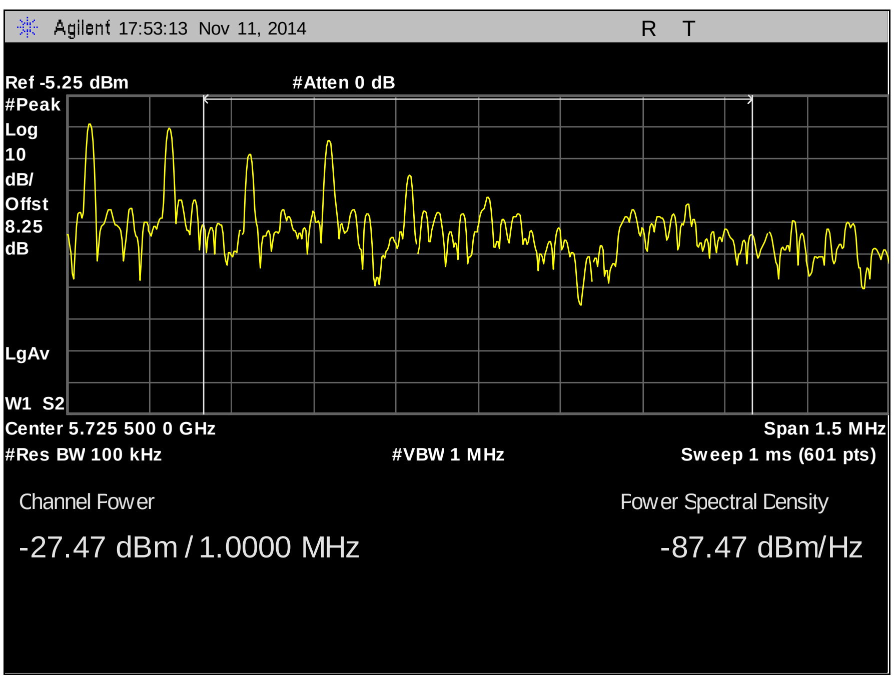


Plot 435. Radiated Band Edge, 50 MHz, High Channel, Lower Band, Peak

Band Edge, 10 MHz, Upper Band

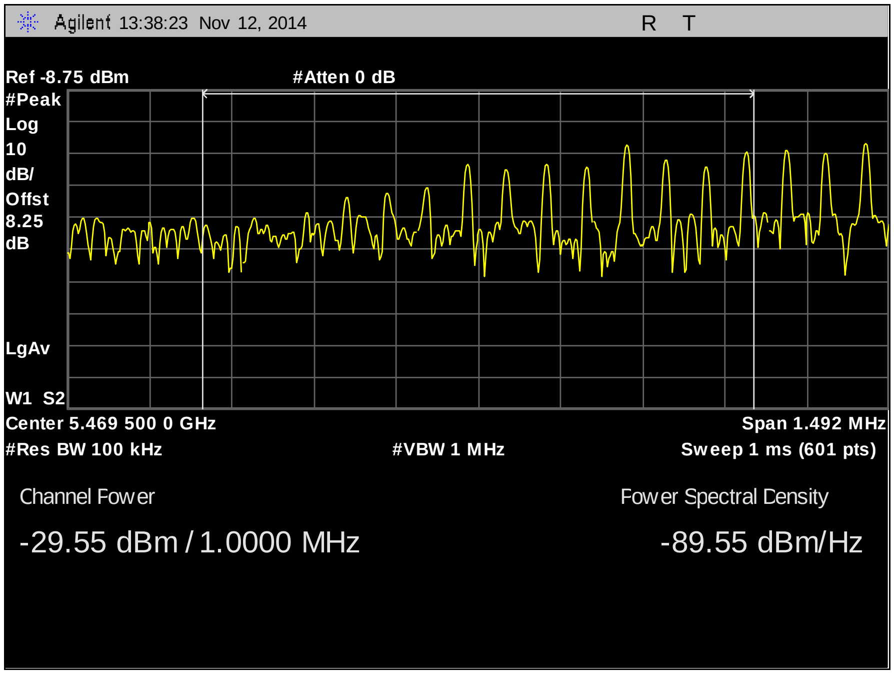


Plot 436. Radiated Band Edge, 10 MHz, Low Channel, Upper Band

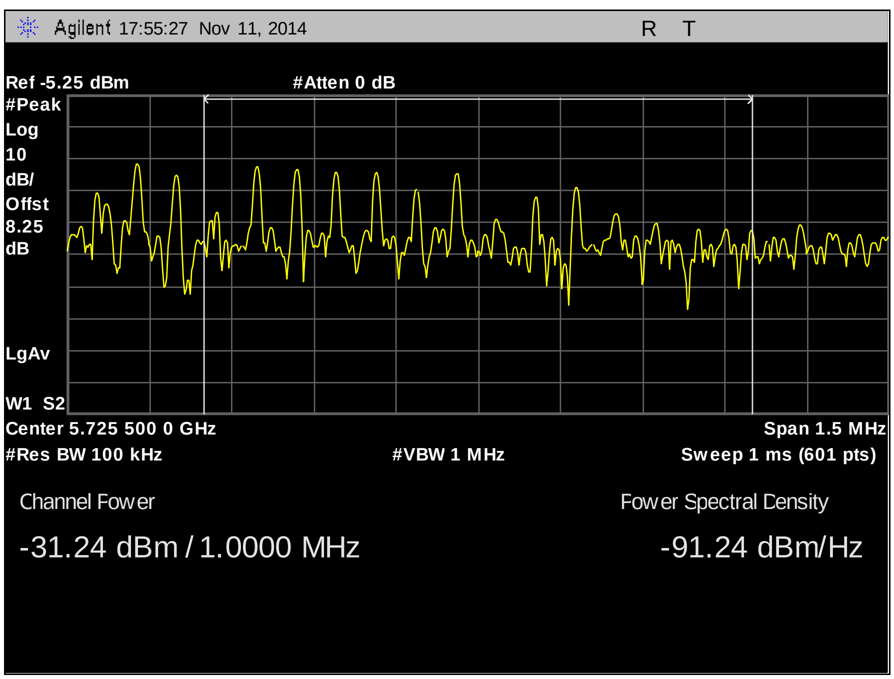


Plot 437. Radiated Band Edge, 10 MHz, High Channel, Upper Band

Band Edge, 20 MHz, Upper Band

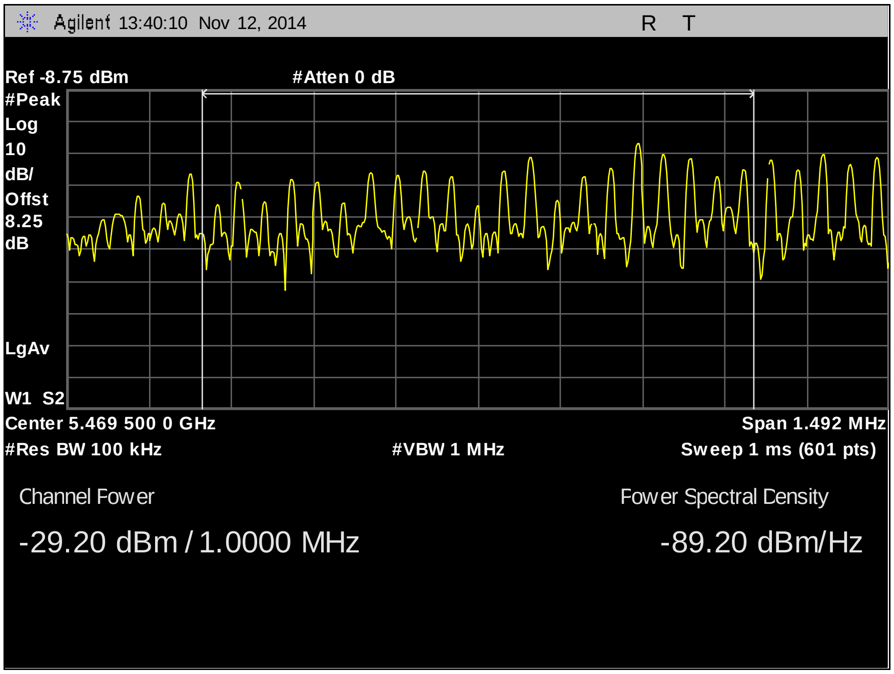


Plot 438. Radiated Band Edge, 20 MHz, Low Channel, Upper Band

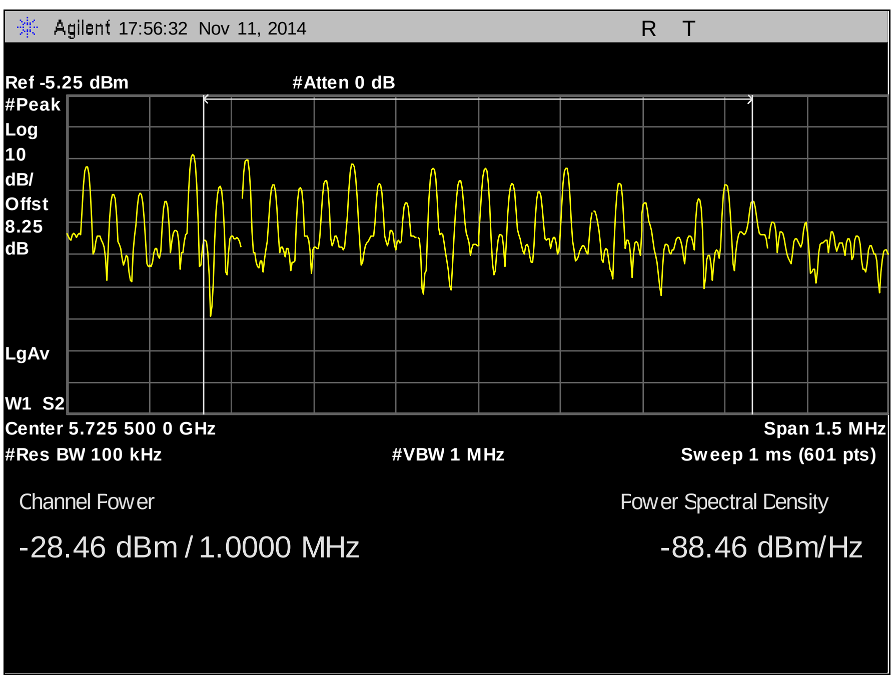


Plot 439. Radiated Band Edge, 20 MHz, High Channel, Upper Band

Band Edge, 30 MHz, Upper Band

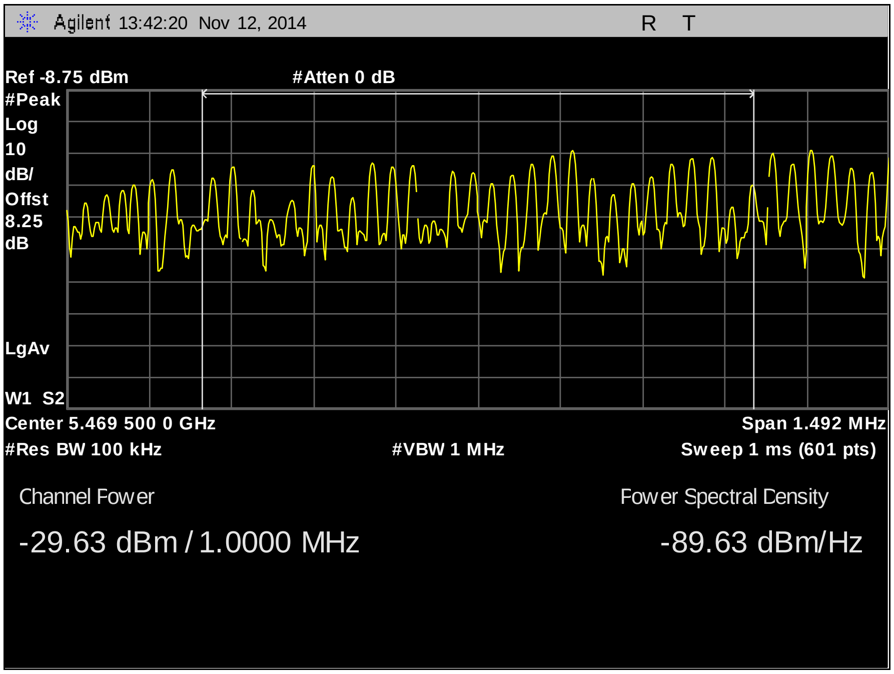


Plot 440. Radiated Band Edge, 30 MHz, Low Channel, Upper Band

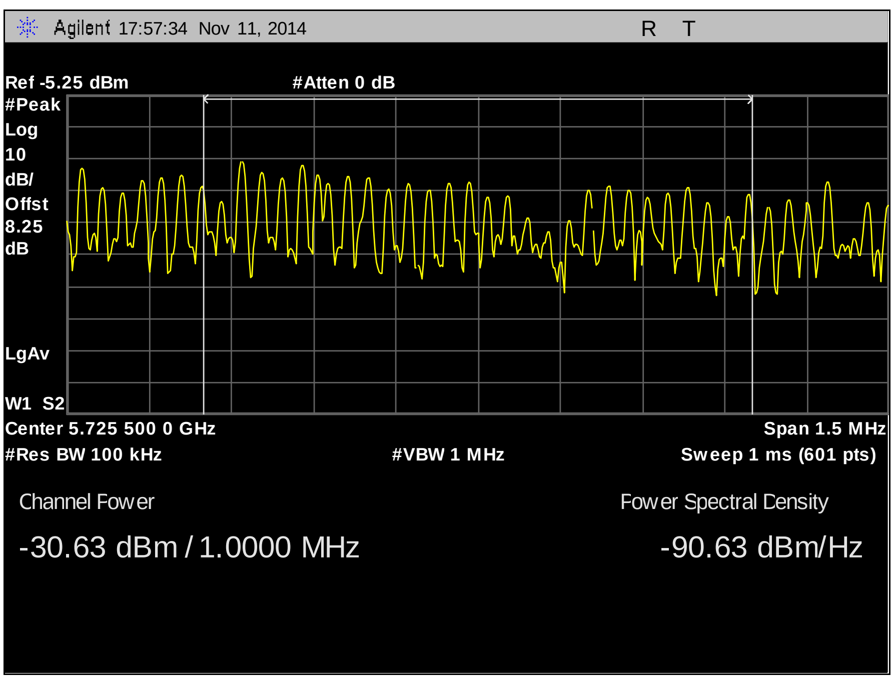


Plot 441. Radiated Band Edge, 30 MHz, High Channel, Upper Band

Band Edge, 40 MHz, Upper Band

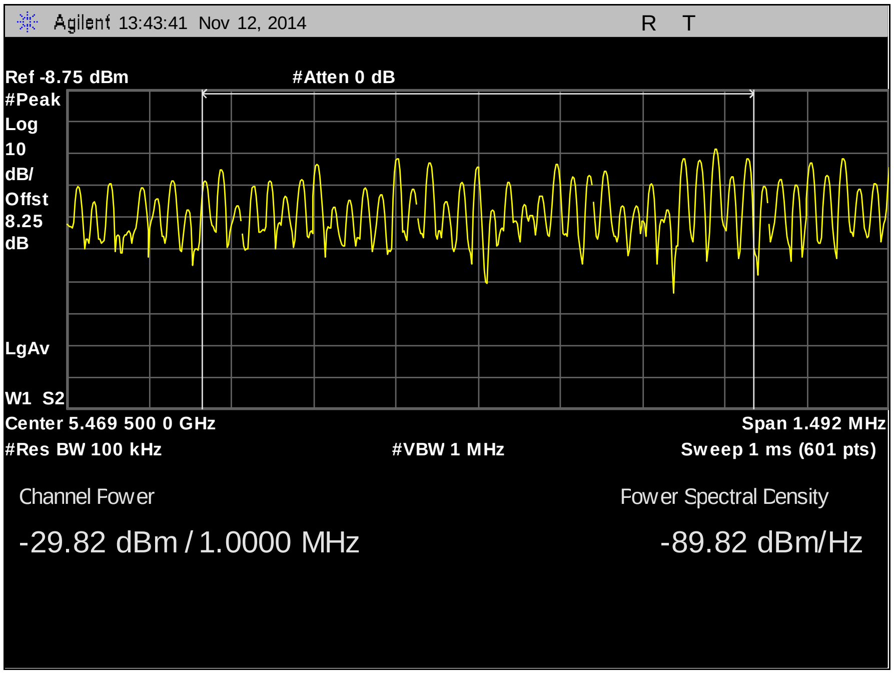


Plot 442. Radiated Band Edge, 40 MHz, Low Channel, Upper Band

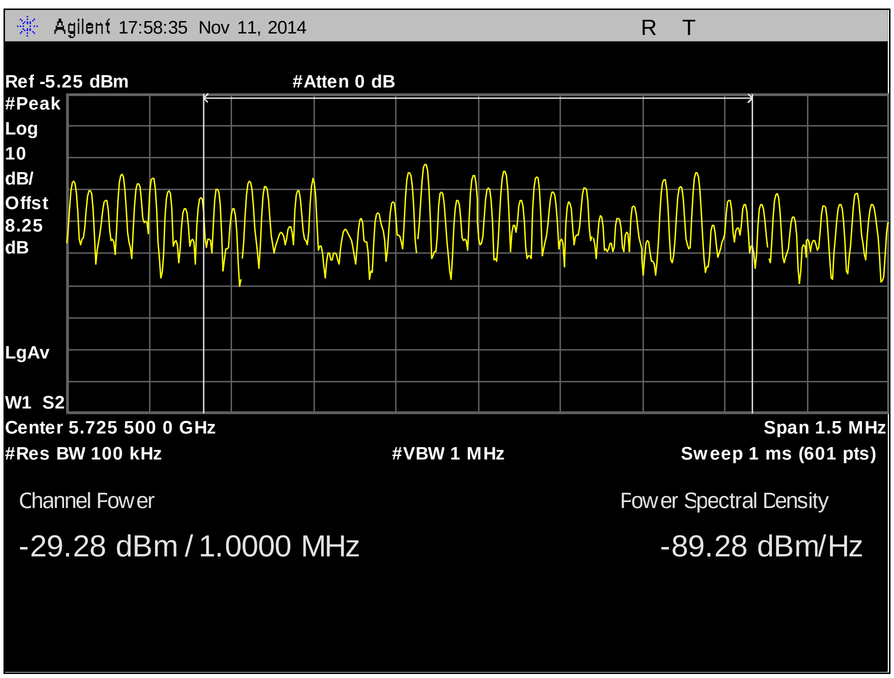


Plot 443. Radiated Band Edge, 40 MHz, High Channel, Upper Band

Band Edge, 50 MHz, Upper Band

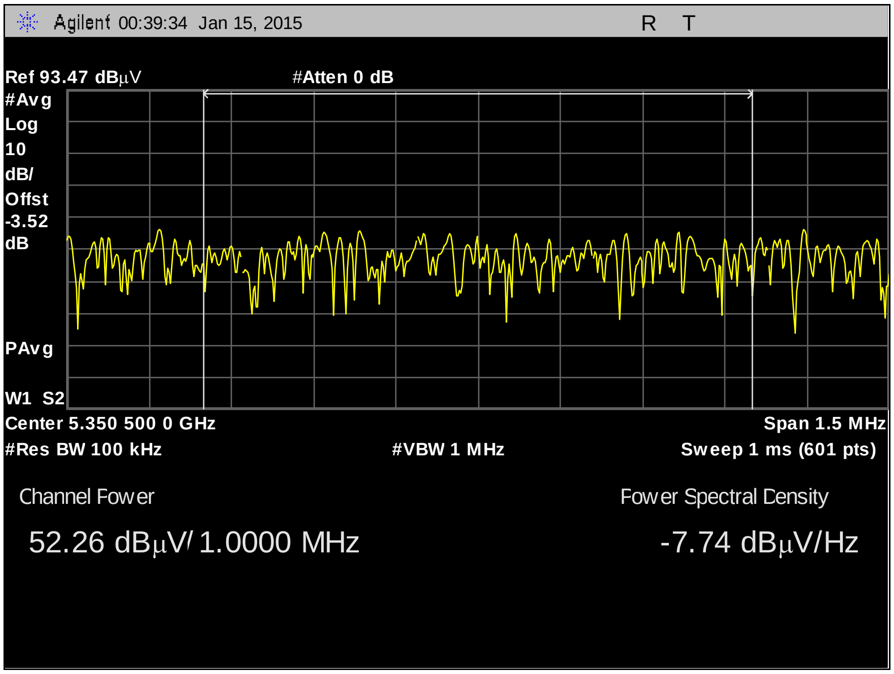


Plot 444. Radiated Band Edge, 50 MHz, Low Channel, Upper Band

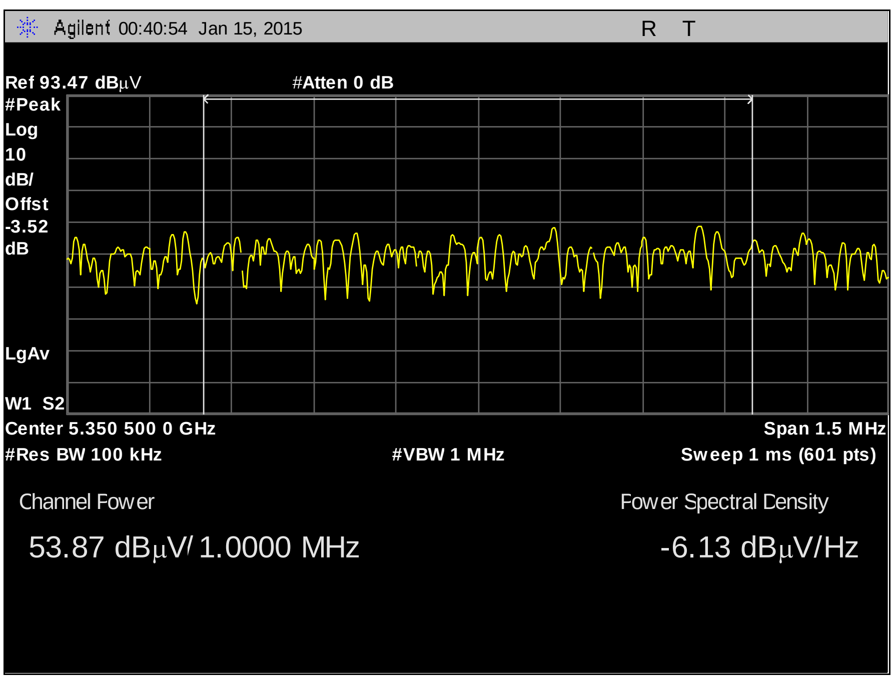


Plot 445. Radiated Band Edge, 50 MHz, High Channel, Upper Band

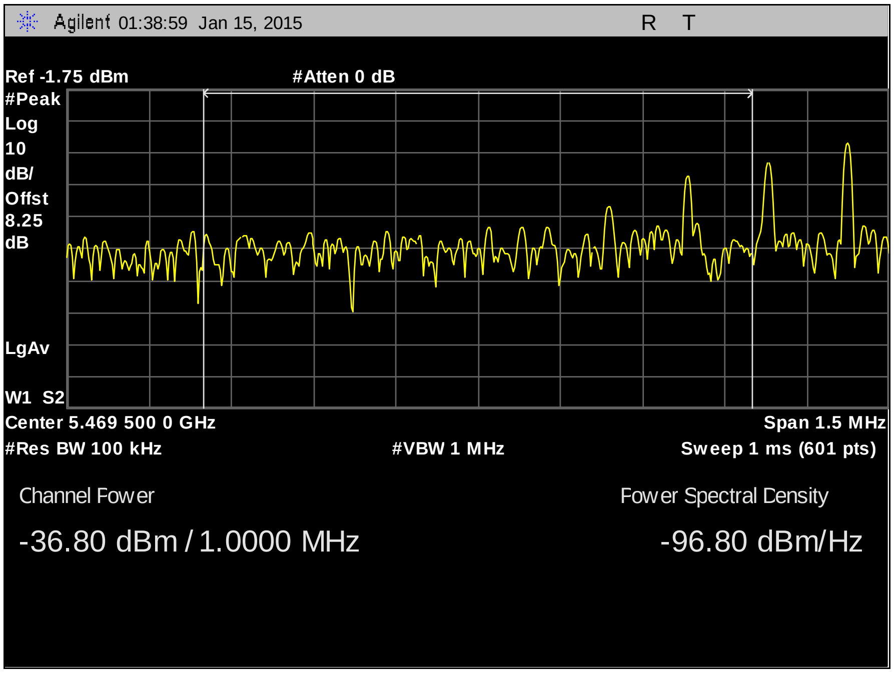
Band Edge, 10 MHz, 34 dBi Antenna



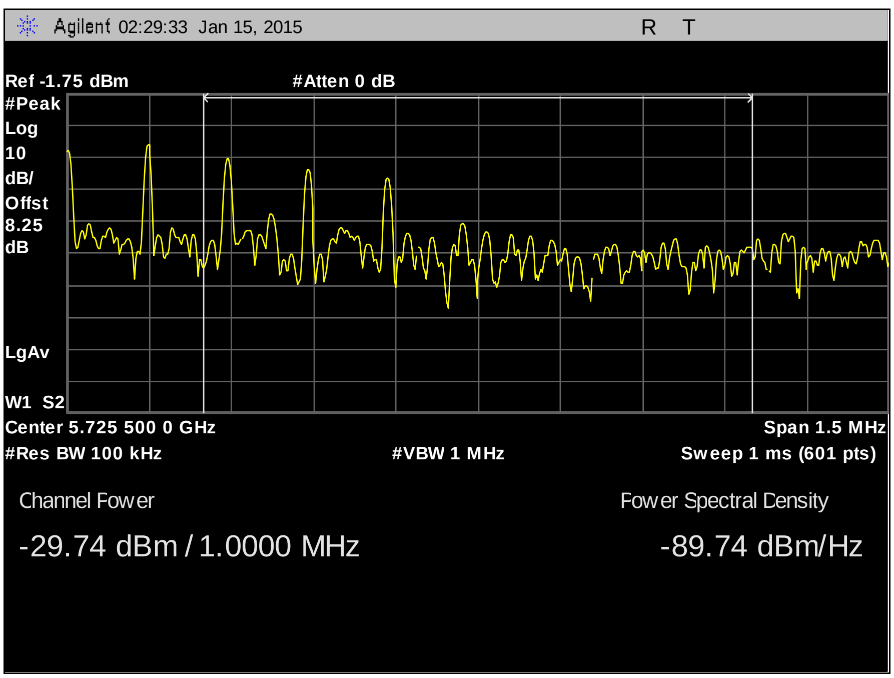
Plot 446. Radiated Emissions, 10 MHz, Channel 5342 MHz, Band Edge 5350, Average 54 Limit, 34 dBi Antenna



Plot 447. Radiated Emissions, 10 MHz, Channel 5342 MHz, Band Edge 5350, Peak 74 Limit, 34 dBi Antenna

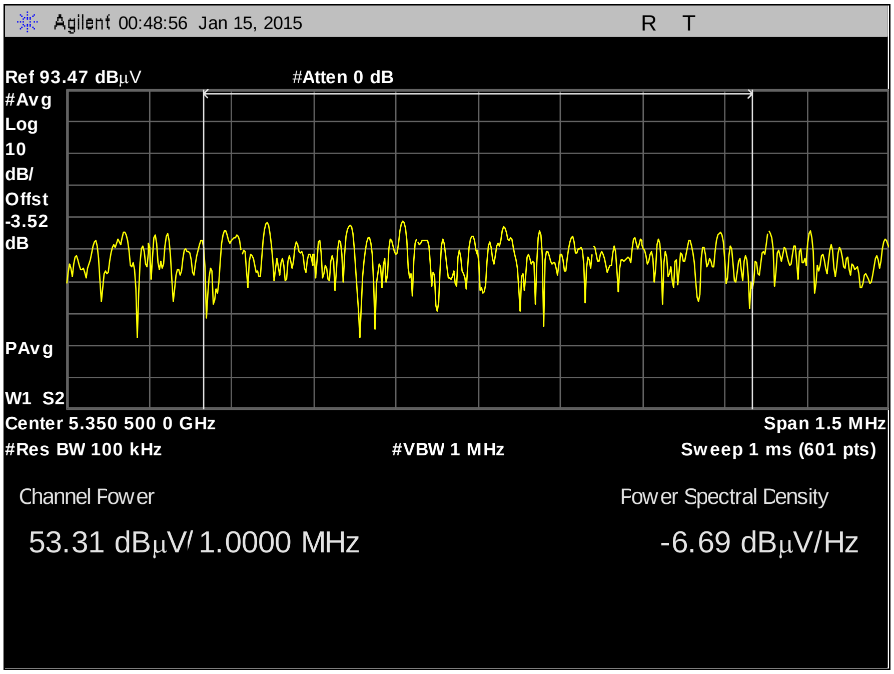


Plot 448. Radiated Emissions, 10 MHz, Channel 5475 MHz, Band Edge 5470, -27 dBm, 34 dBi Antenna

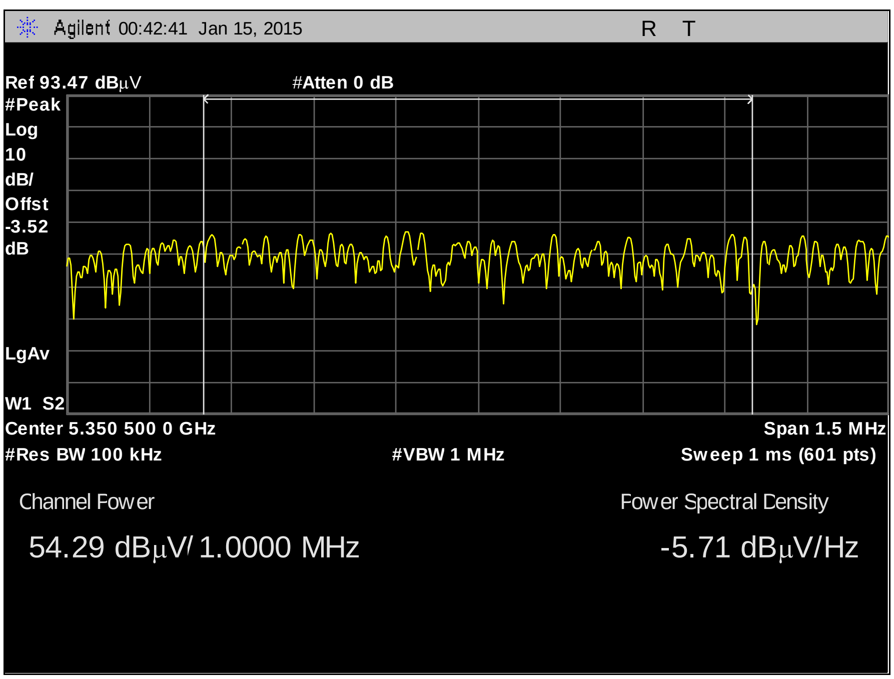


Plot 449. Radiated Emissions, 10 MHz, Channel 5720 MHz, Band Edge 5725, -27 dBm, 34 dBi Antenna

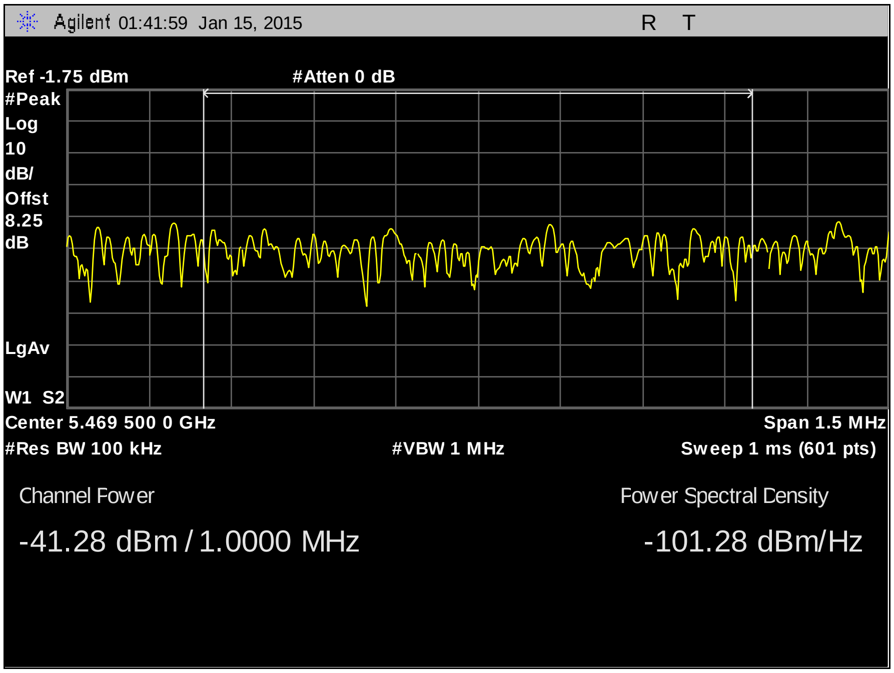
Band Edge, 20 MHz, 34 dBi Antenna



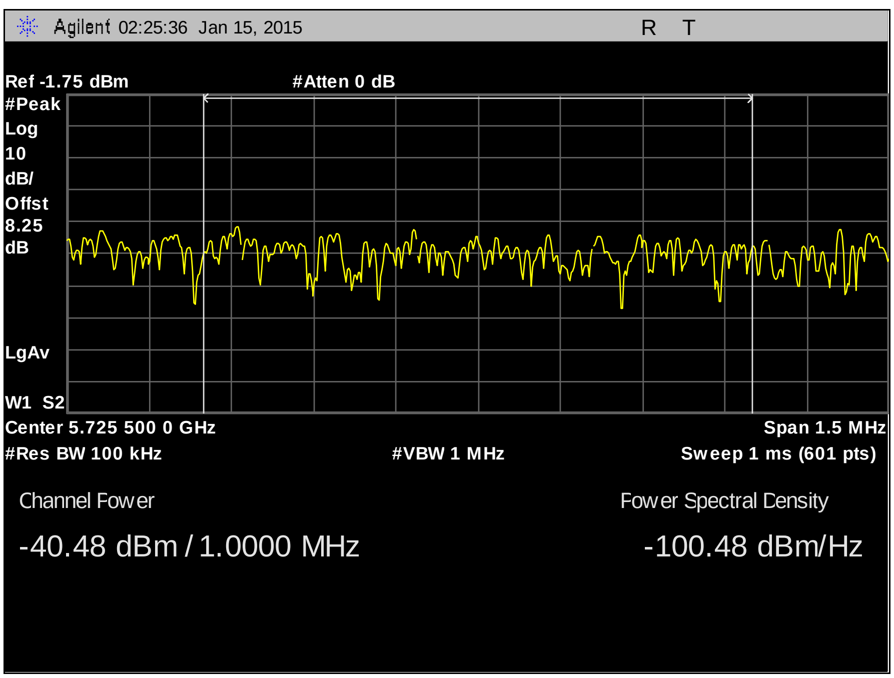
Plot 450. Radiated Emissions, 20 MHz, Channel 5338 MHz, Band Edge 5350, Average 54 Limit, 34 dBi Antenna



Plot 451. Radiated Emissions, 20 MHz, Channel 5338MHz, Band Edge 5350, Peak 74 Limit, 34 dBi Antenna

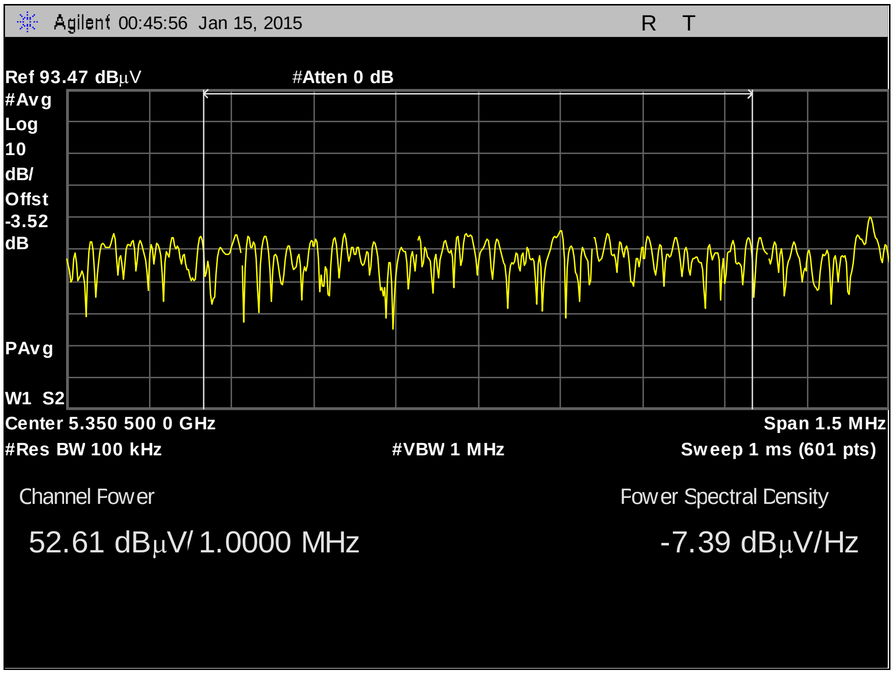


Plot 452. Radiated Emissions, 20 MHz, Channel 5480 MHz, Band Edge 5470, -27 dBm, 34 dBi Antenna

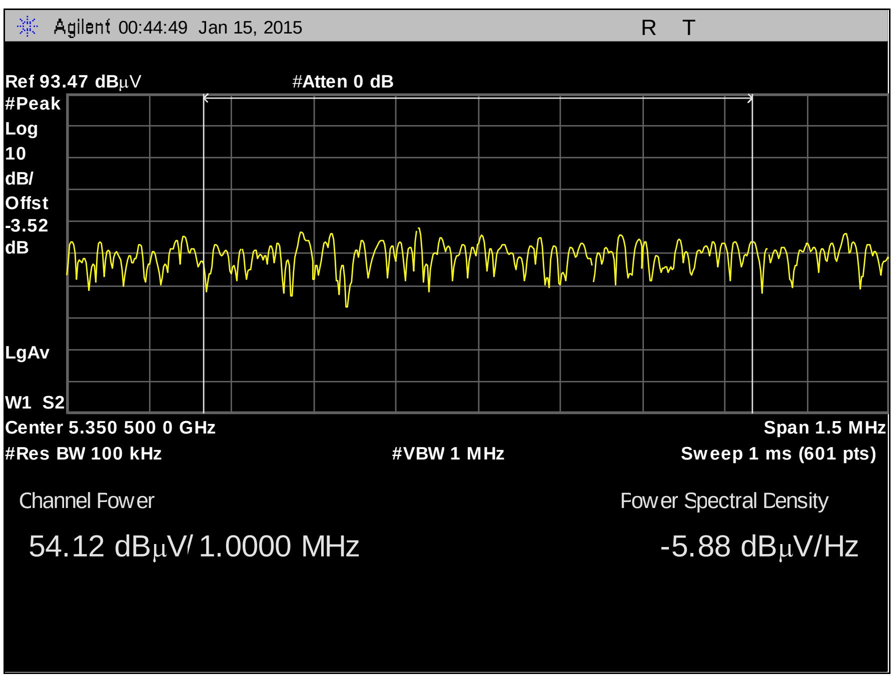


Plot 453. Radiated Emissions, 20 MHz, Channel 5715 MHz, Band Edge 5725, -27 dBm, 34 dBi Antenna

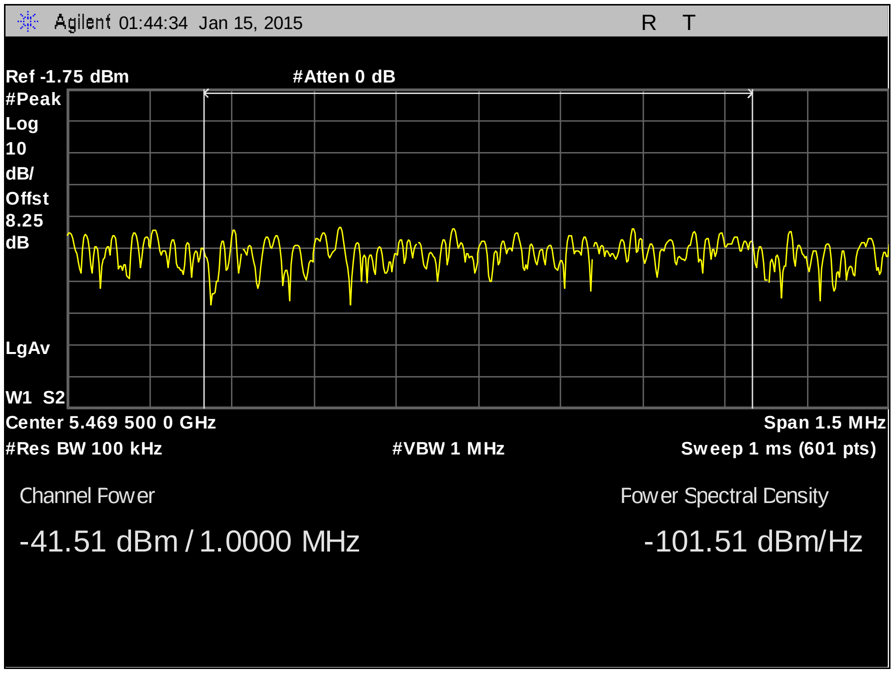
Band Edge, 30 MHz, 34 dBi Antenna



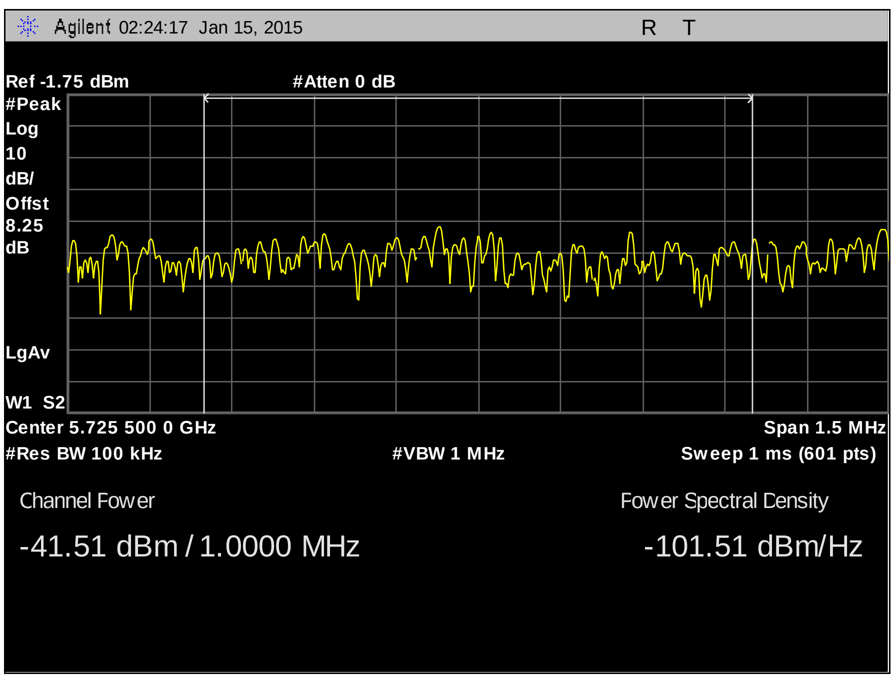
Plot 454. Radiated Emissions, 30 MHz, Channel 5333 MHz, Band Edge 5350, Average 54 Limit, 34 dBi Antenna



Plot 455. Radiated Emissions, 30 MHz, Channel 5333 MHz, Band Edge 5350, Peak 74 Limit, 34 dBi Antenna

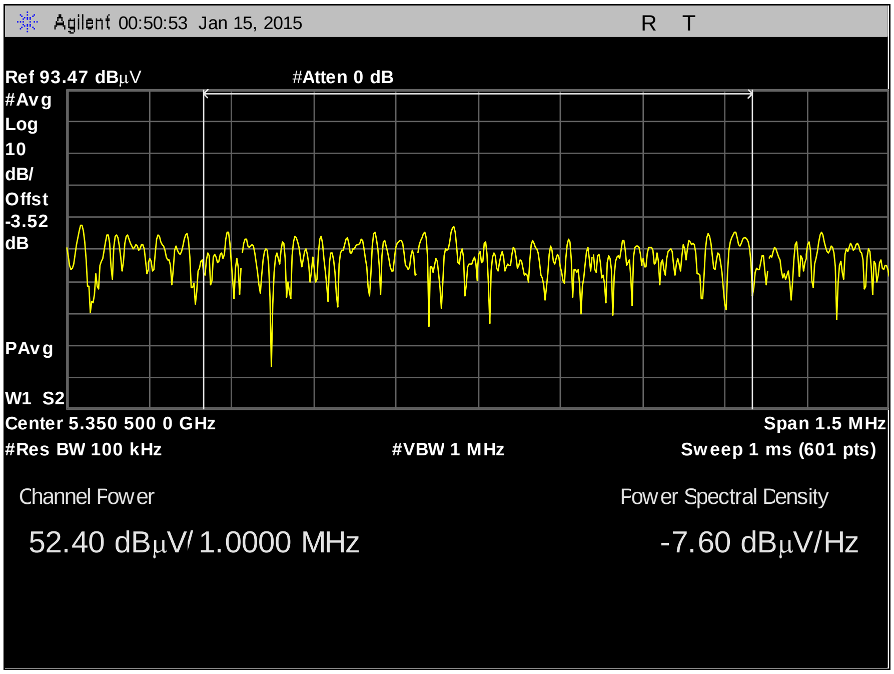


Plot 456. Radiated Emissions, 30 MHz, Channel 5485 MHz, Band Edge 5470, -27 dBm, 34 dBi Antenna

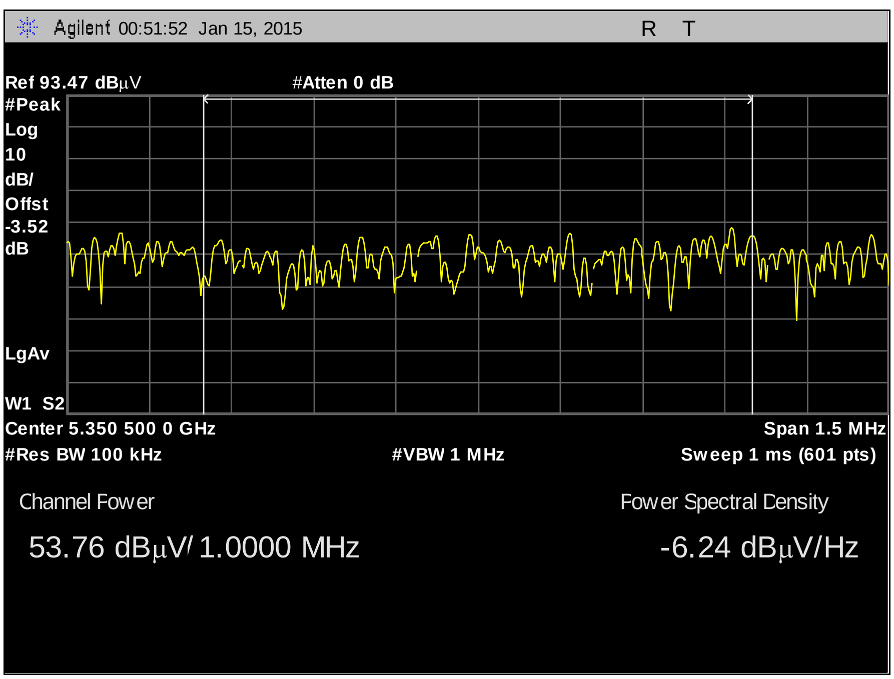


Plot 457. Radiated Emissions, 30 MHz, Channel 5710 MHz, Band Edge 5725, -27 dBm, 34 dBi Antenna

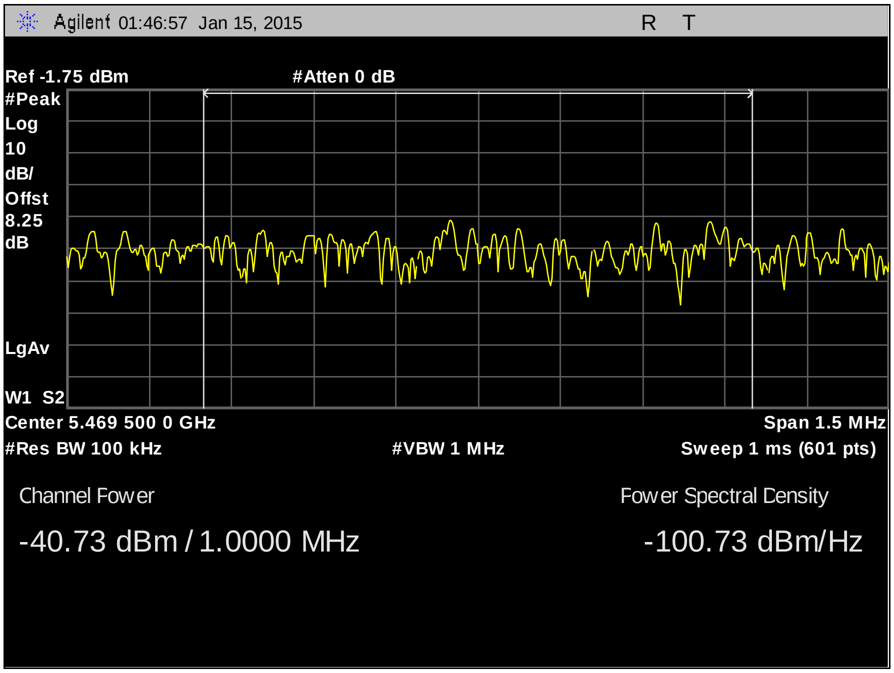
Band Edge, 40 MHz, 34 dBi Antenna



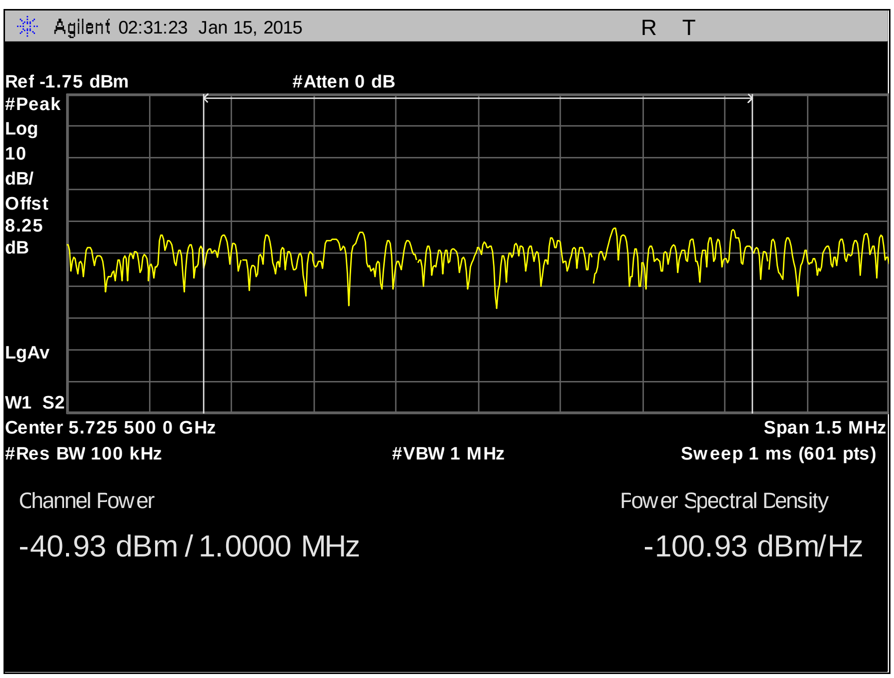
Plot 458. Radiated Emissions, 40 MHz, Channel 5328 MHz, Band Edge 5350, Average 54 Limit, 34 dBi Antenna



Plot 459. Radiated Emissions, 40 MHz, Channel 5328 MHz, Band Edge 5350, Peak 74 Limit, 34 dBi Antenna

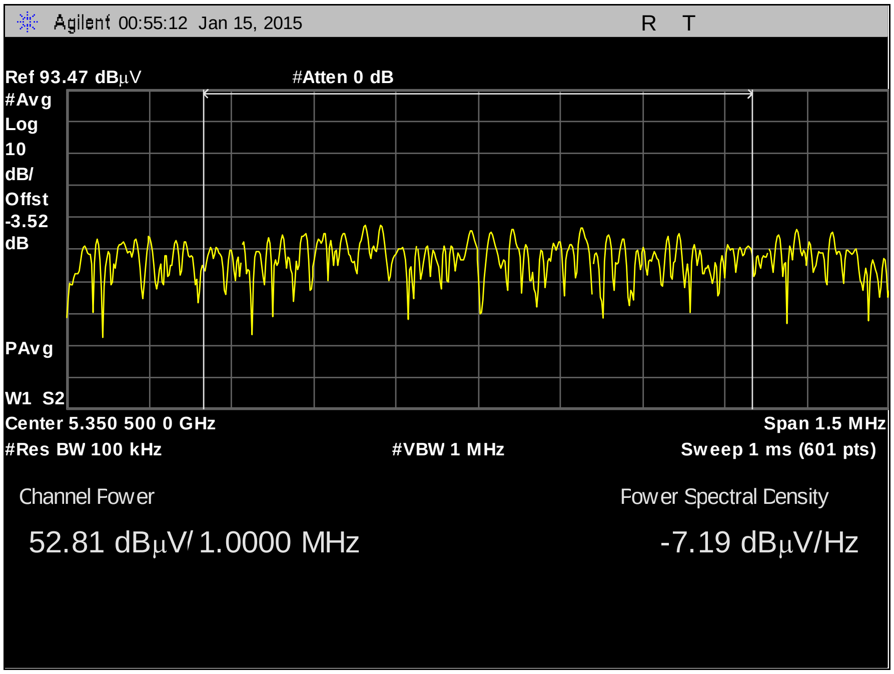


Plot 460. Radiated Emissions, 40 MHz, Channel 5490 MHz, Band Edge 5470, -27 dBm, 34 dBi Antenna

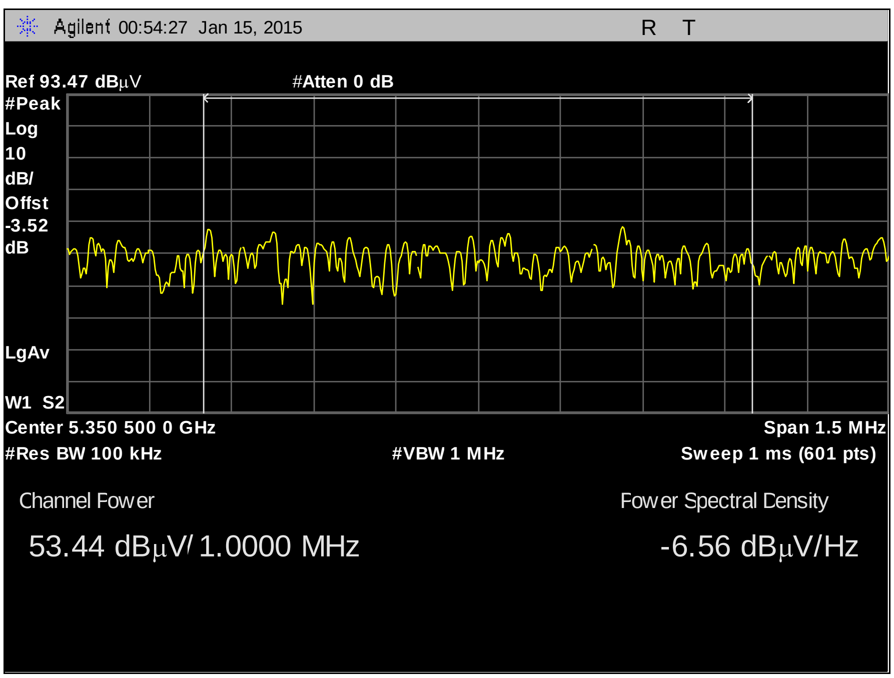


Plot 461. Radiated Emissions, 40 MHz, Channel 5705 MHz, Band Edge 5725, -27 dBm, 34 dBi Antenna

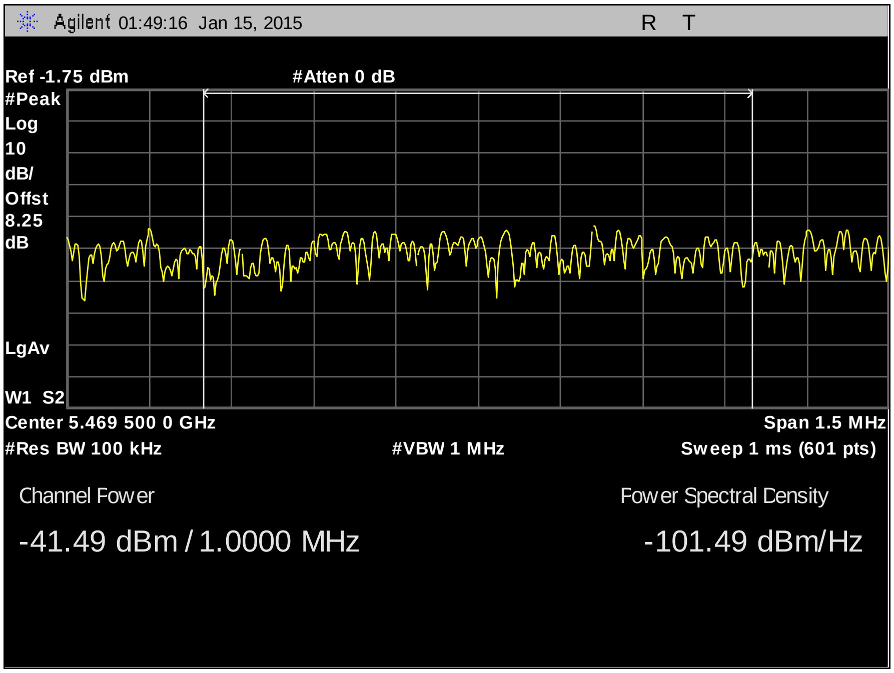
Band Edge, 50 MHz, 34 dBi Antenna



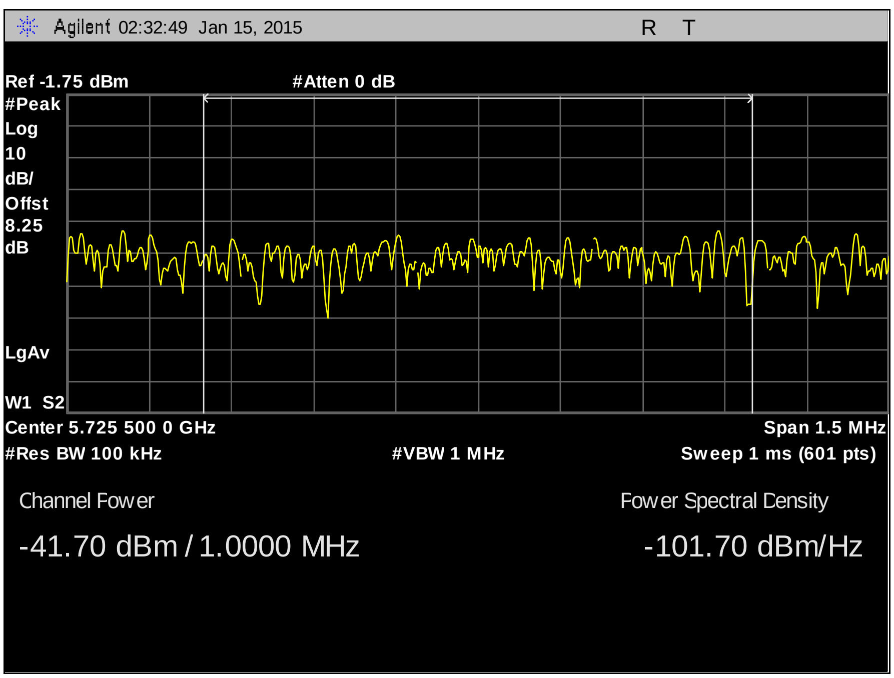
Plot 462. Radiated Emissions, 50 MHz, Channel 5322 MHz, Band Edge 5350, Average 54 Limit, 34 dBi Antenna



Plot 463. Radiated Emissions, 50 MHz, Channel 5322 MHz, Band Edge 5350, Peak 74 Limit, 34 dBi Antenna

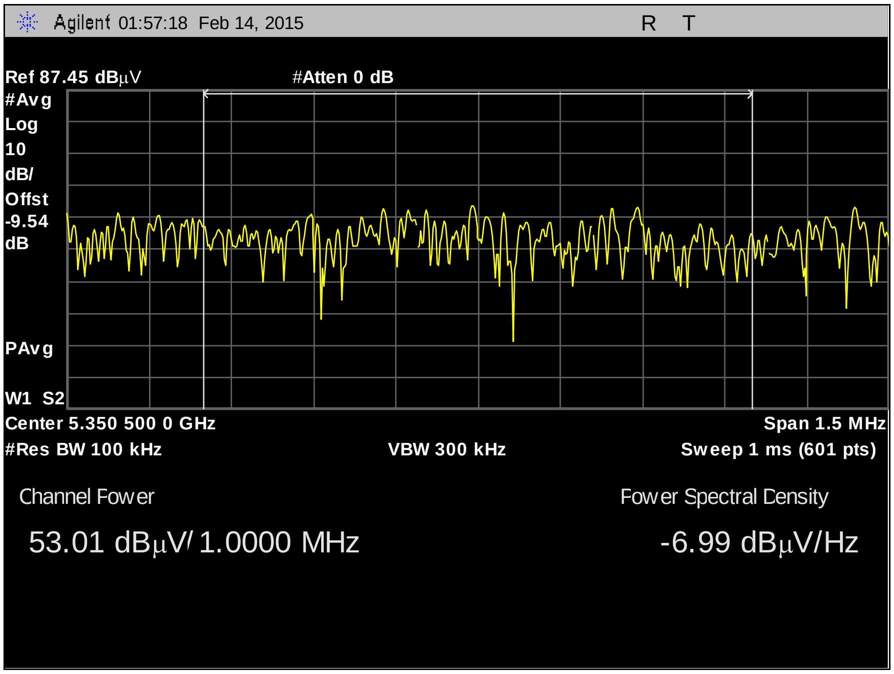


Plot 464. Radiated Emissions, 50 MHz, Channel 5495 MHz, Band Edge 5470, -27 dBm, 34 dBi Antenna

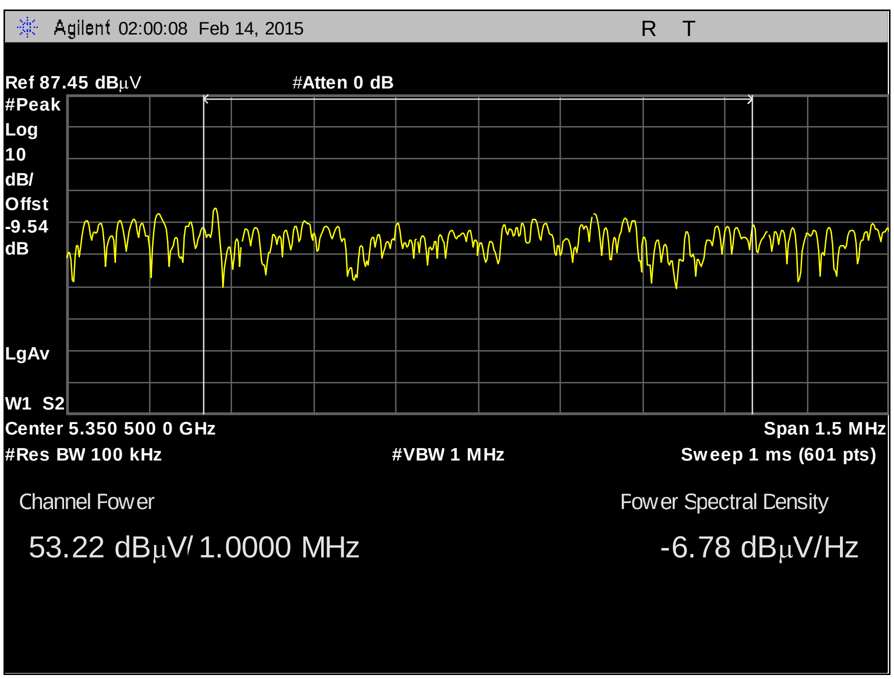


Plot 465. Radiated Emissions, 50 MHz, Channel 5725 MHz, Band Edge 5725, -27 dBm, 34 dBi Antenna

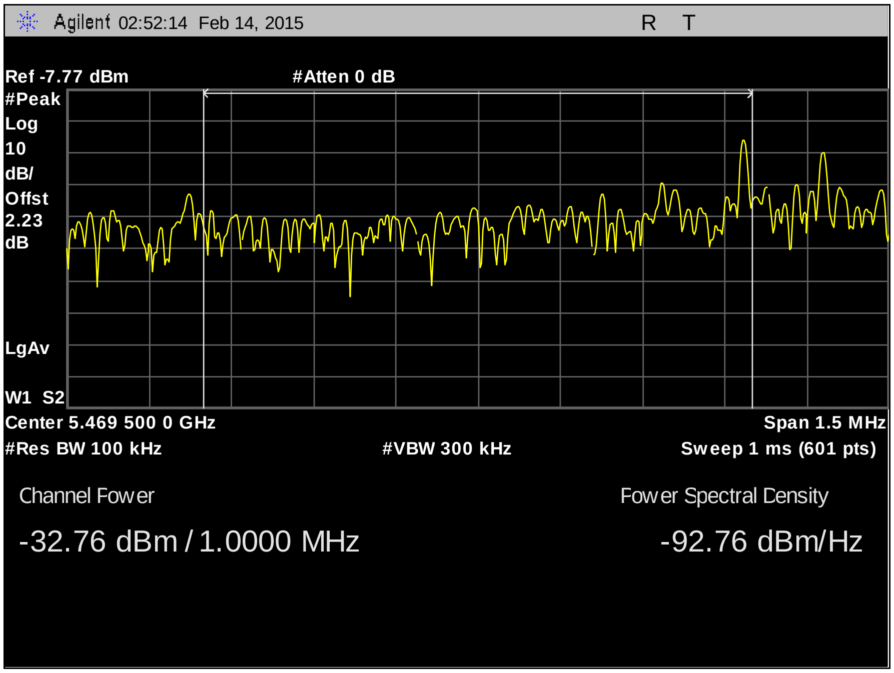
Band Edge, 10 MHz, 23 dBi Antenna



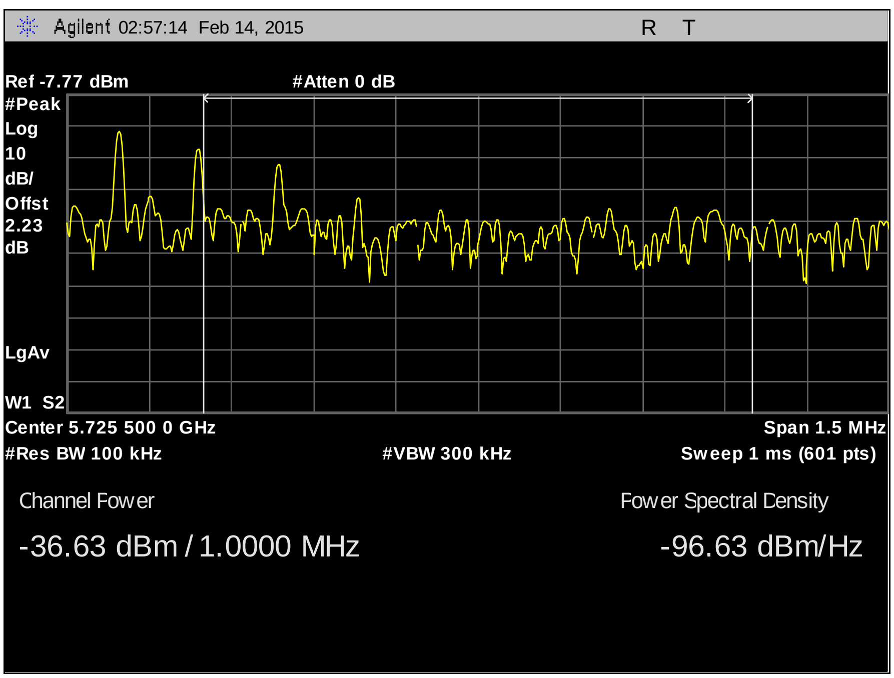
Plot 466. Radiated Emissions, 10 MHz, Channel 5344 MHz, 5350 MHz Band Edge, Average, 23 dBi Antenna



Plot 467. Radiated Emissions, 10 MHz, Channel 5344 MHz, 5350 MHz Band Edge, Peak, 23 dBi Antenna

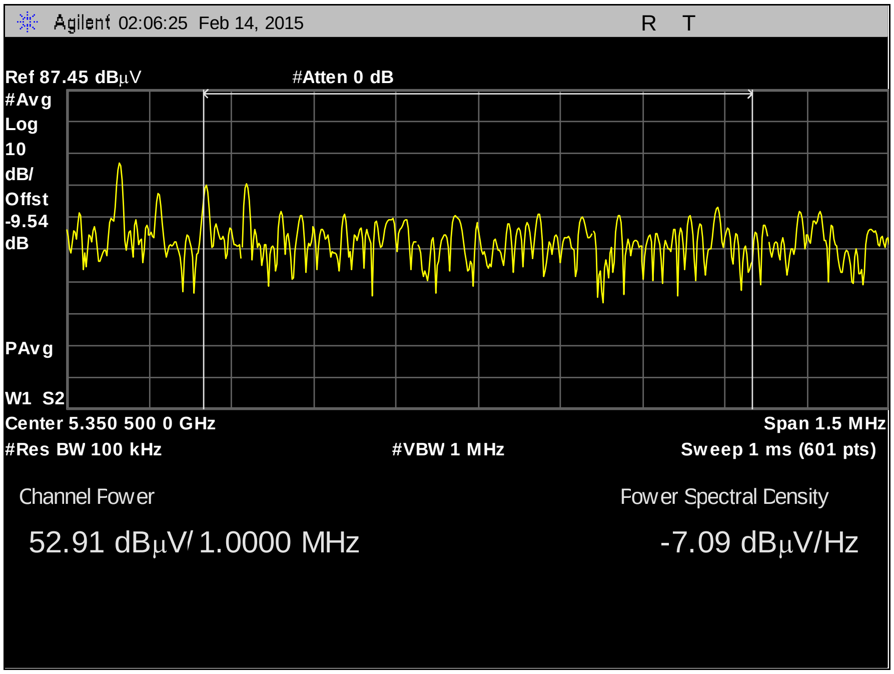


Plot 468. Radiated Emissions, 10 MHz, Channel 5475 MHz, 5470 MHz Band Edge, -27 dBm, 23 dBi Antenna

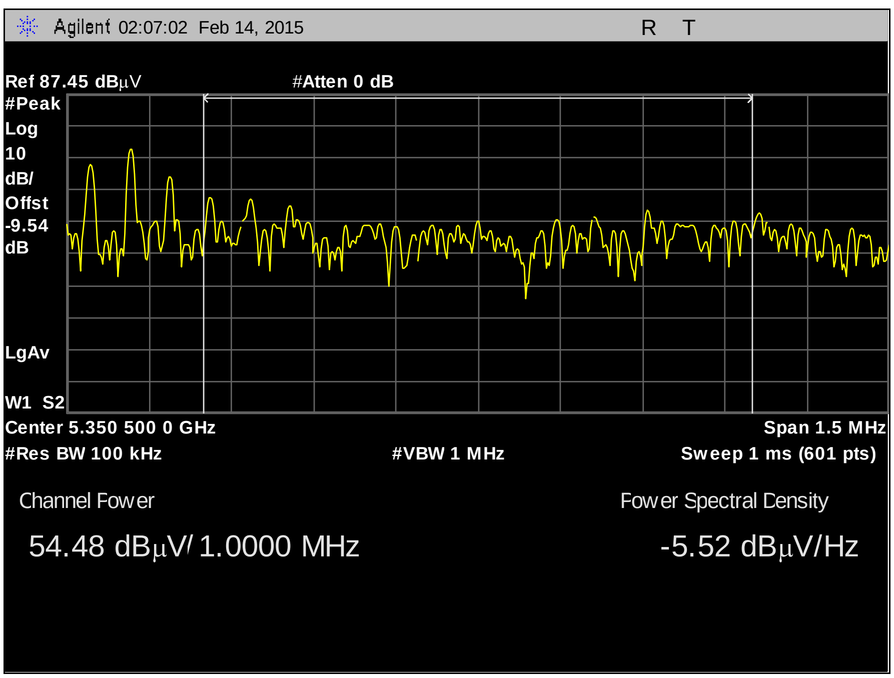


Plot 469. Radiated Emissions, 10 MHz, Channel 5720 MHz, 5725 MHz Band Edge, -27 dBm, 23 dBi Antenna

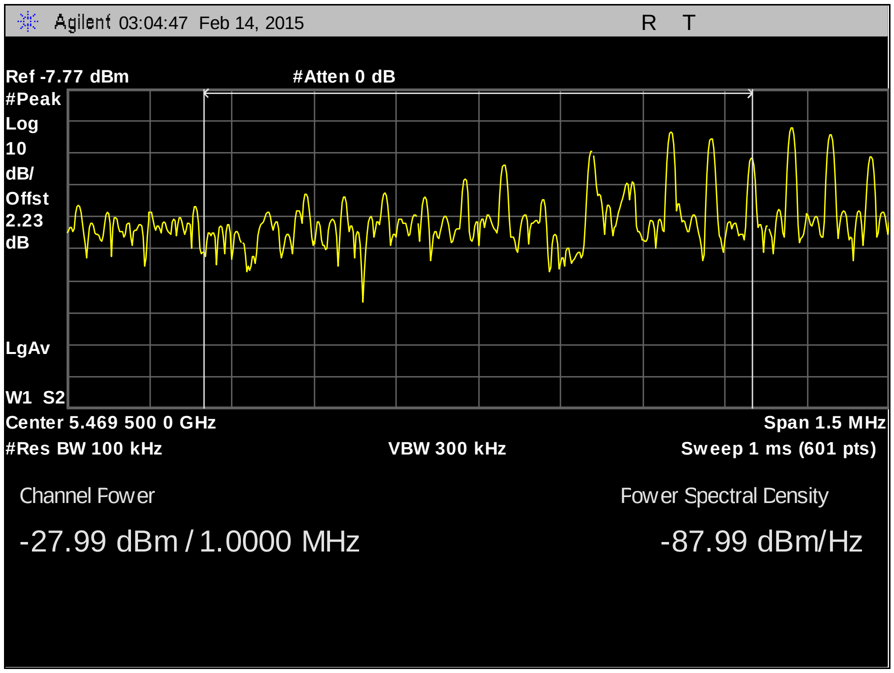
Band Edge, 20 MHz, 23 dBi Antenna



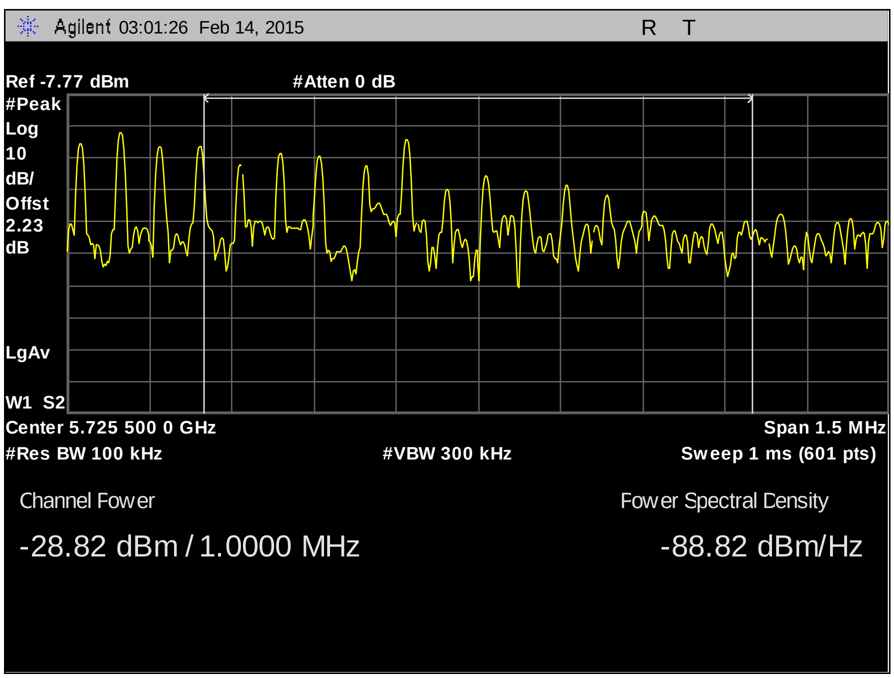
Plot 470. Radiated Emissions, 20 MHz, Channel 5339 MHz, 5350 MHz Band Edge, Average, 23 dBi Antenna



Plot 471. Radiated Emissions, 20 MHz, Channel 5338MHz, 5350 MHz Band Edge, Peak, 23 dBi Antenna

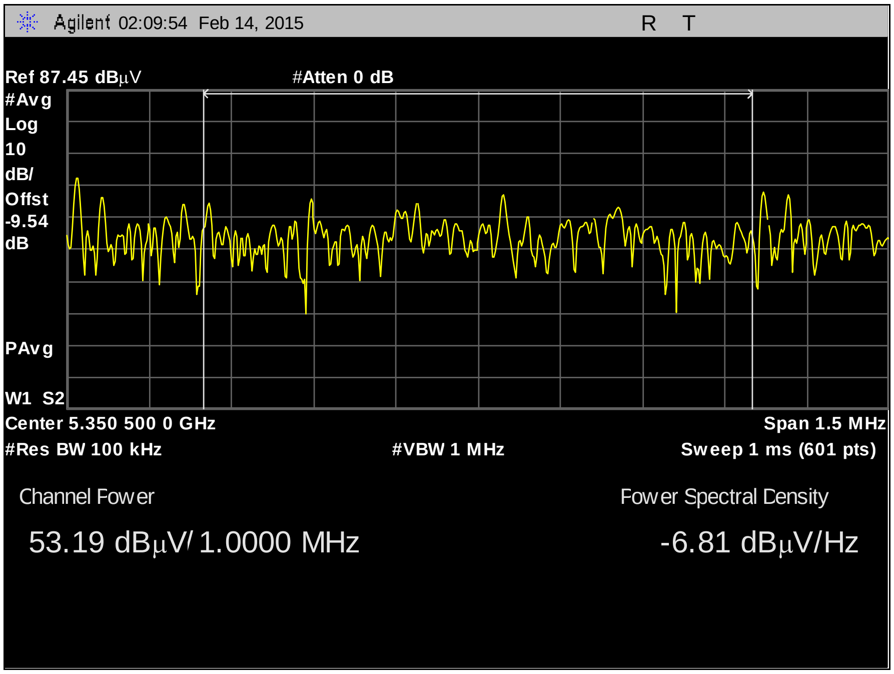


Plot 472. Radiated Emissions, 20 MHz, Channel 5480 MHz, Band Edge 5470, -27 dBm, 23 dBi Antenna

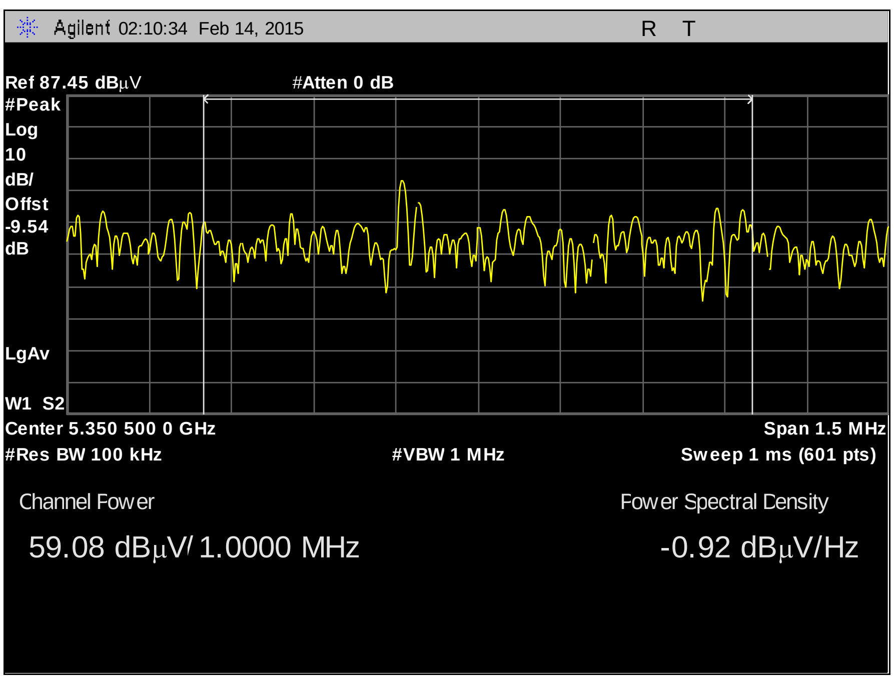


Plot 473. Radiated Emissions, 20 MHz, Channel 5715 MHz, Band Edge 5725, -27 dBm, 23 dBi Antenna

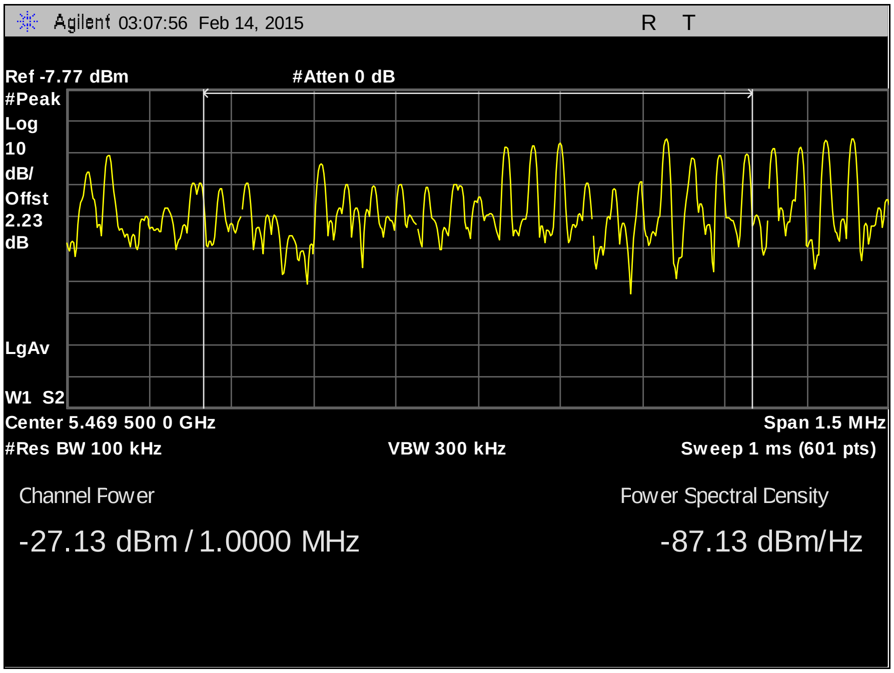
Band Edge, 30 MHz, 23 dBi Antenna



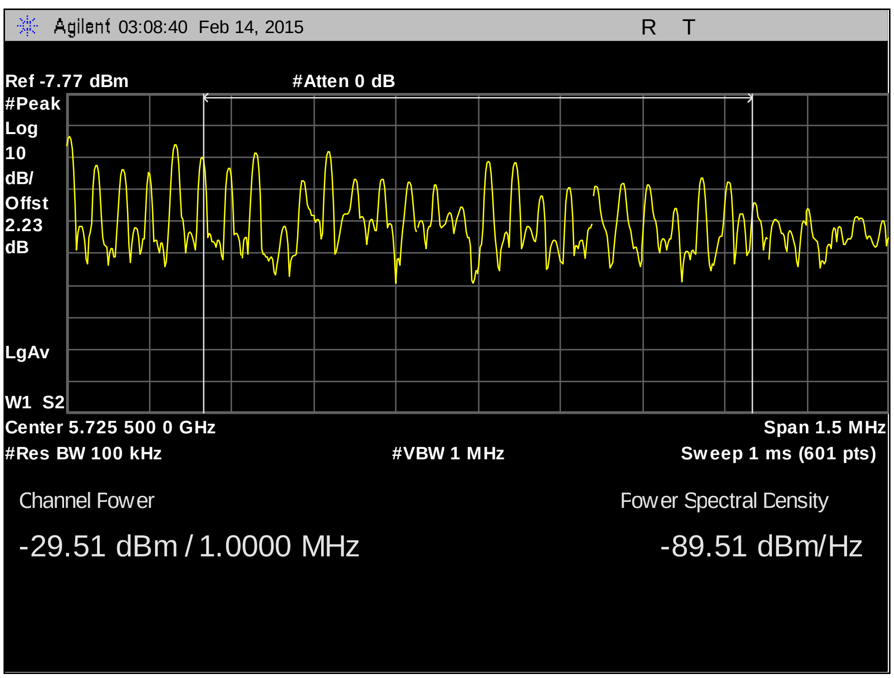
Plot 474. Radiated Emissions, 30 MHz, Channel 5333 MHz,5350 MHz Band Edge, Average, 23 dBi Antenna



Plot 475. Radiated Emissions, 30 MHz, Channel 5333 MHz, 5350 MHz Band Edge, Peak, 23 dBi Antenna

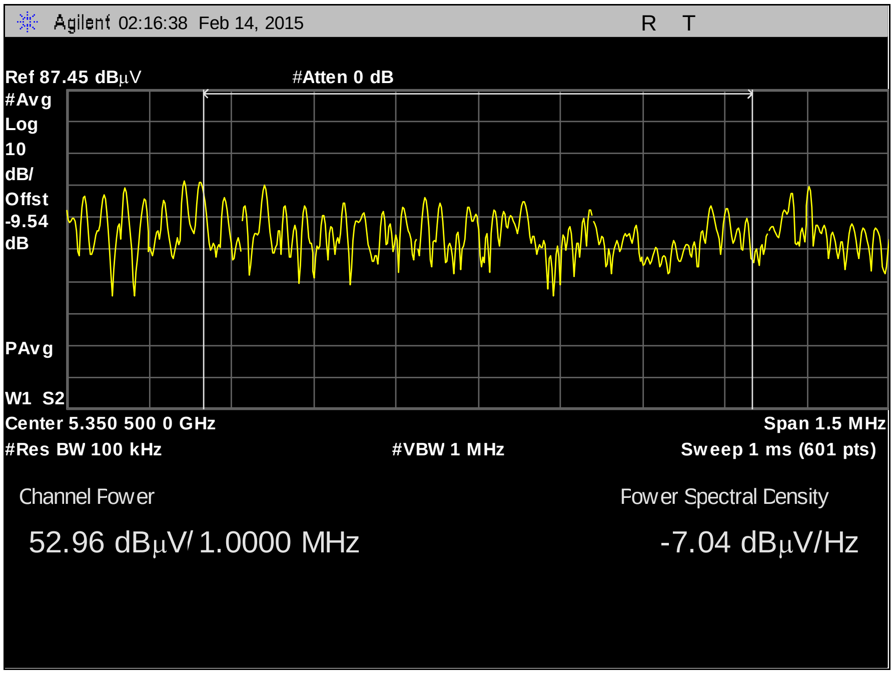


Plot 476. Radiated Emissions, 30 MHz, Channel 5485 MHz, Band Edge 5470, -27 dBm, 23 dBi Antenna

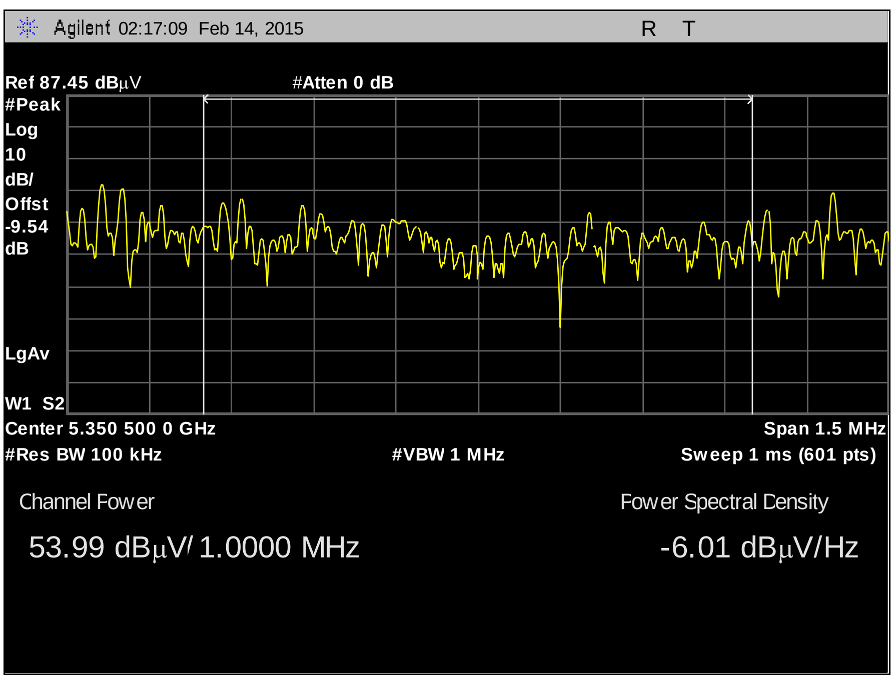


Plot 477. Radiated Emissions, 30 MHz, Channel 5710 MHz, Band Edge 5725, -27 dBm, 23 dBi Antenna

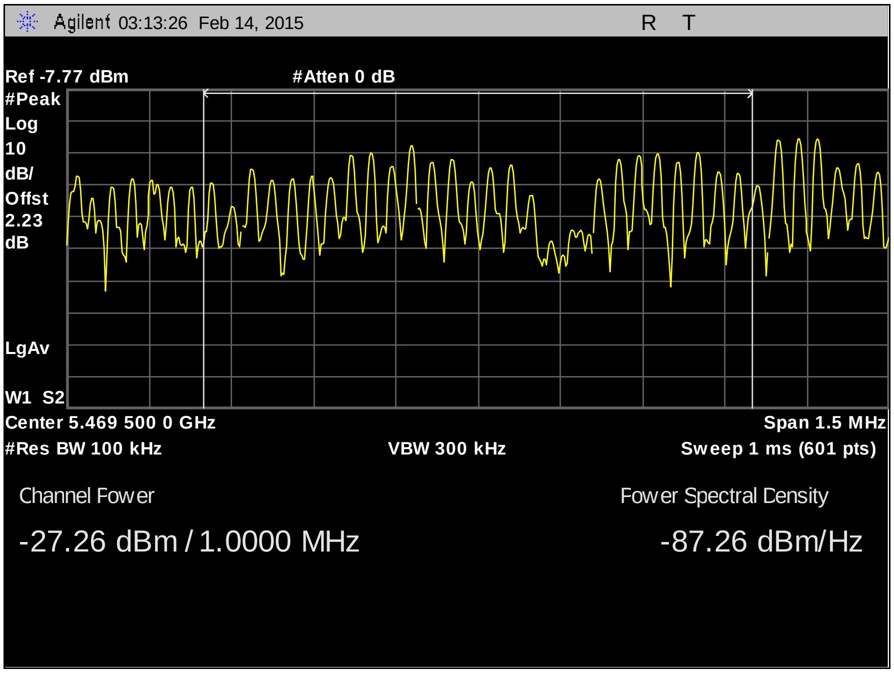
Band Edge, 40 MHz, 23 dBi Antenna



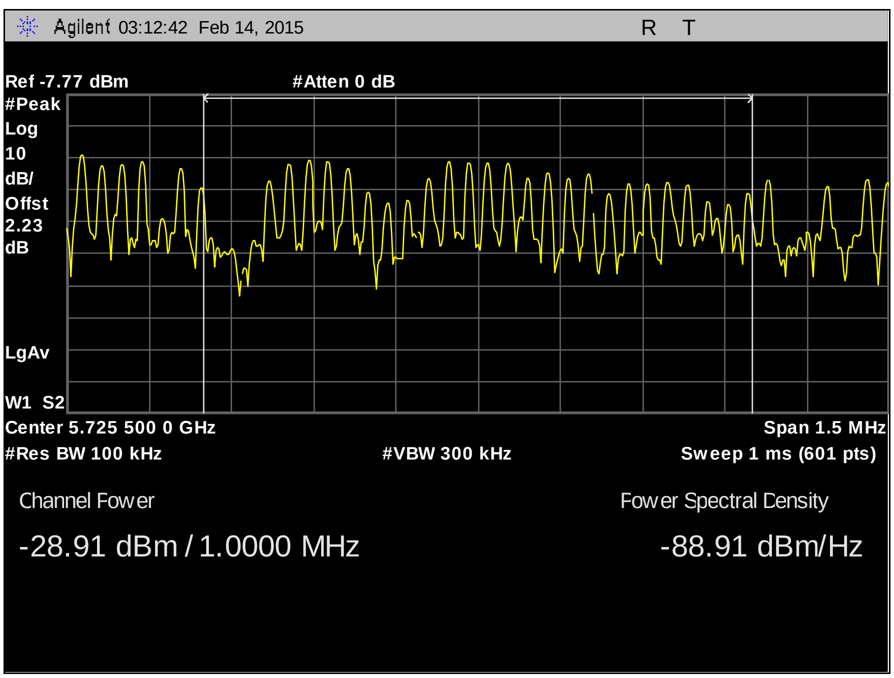
Plot 478. Radiated Emissions, 40 MHz, Channel 5328 MHz, 5350 MHz Band Edge, Average, 23 dBi Antenna



Plot 479. Radiated Emissions, 40 MHz, Channel 5328 MHz, 5350 MHz Band Edge, Peak, 23 dBi Antenna

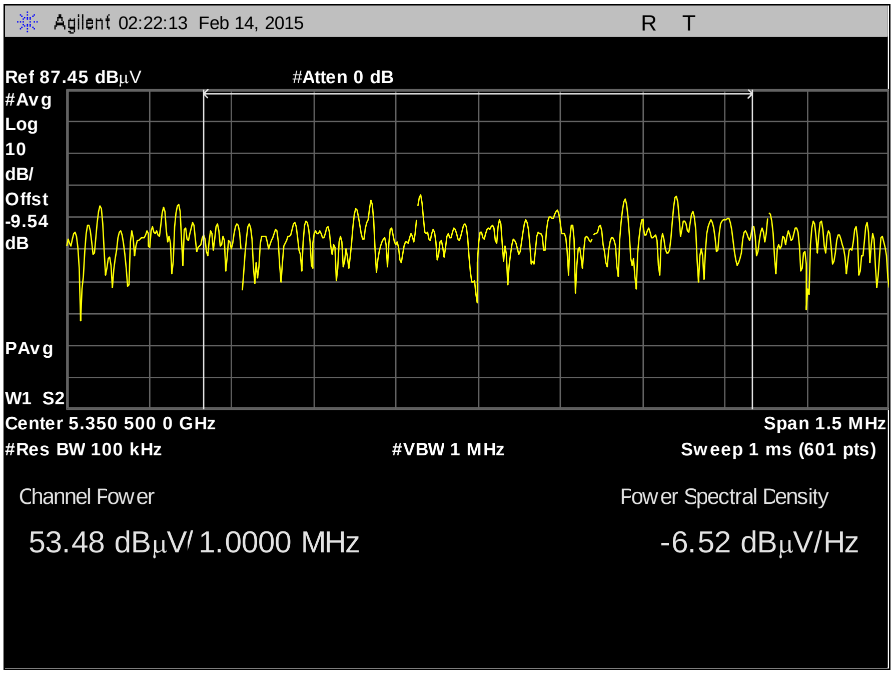


Plot 480. Radiated Emissions, 40 MHz, Channel 5490 MHz, Band Edge 5470, -27 dBm, 23 dBi Antenna

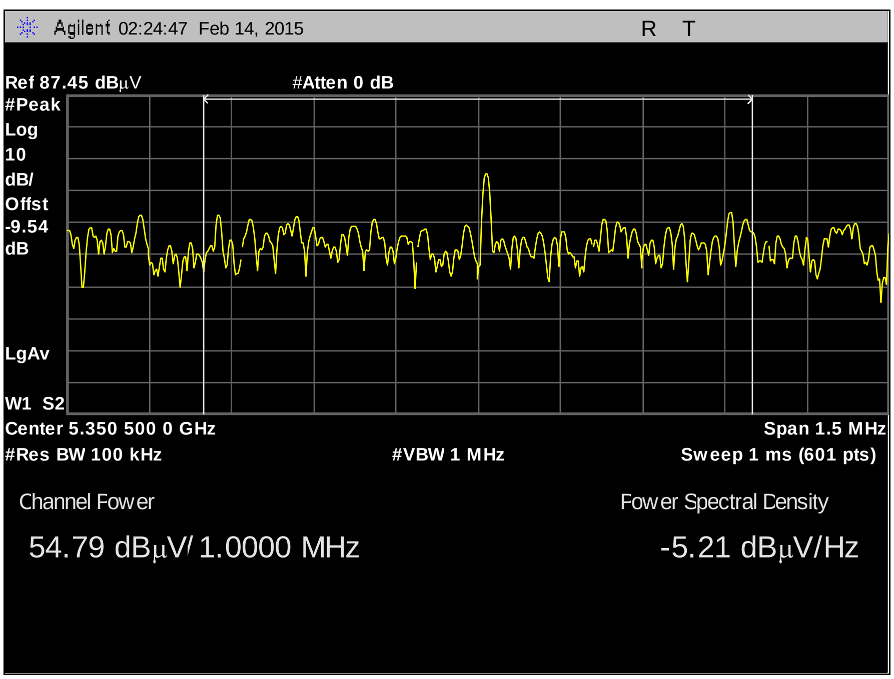


Plot 481. Radiated Emissions, 40 MHz, Channel 5705 MHz, Band Edge 5725, -27 dBm, 23 dBi Antenna

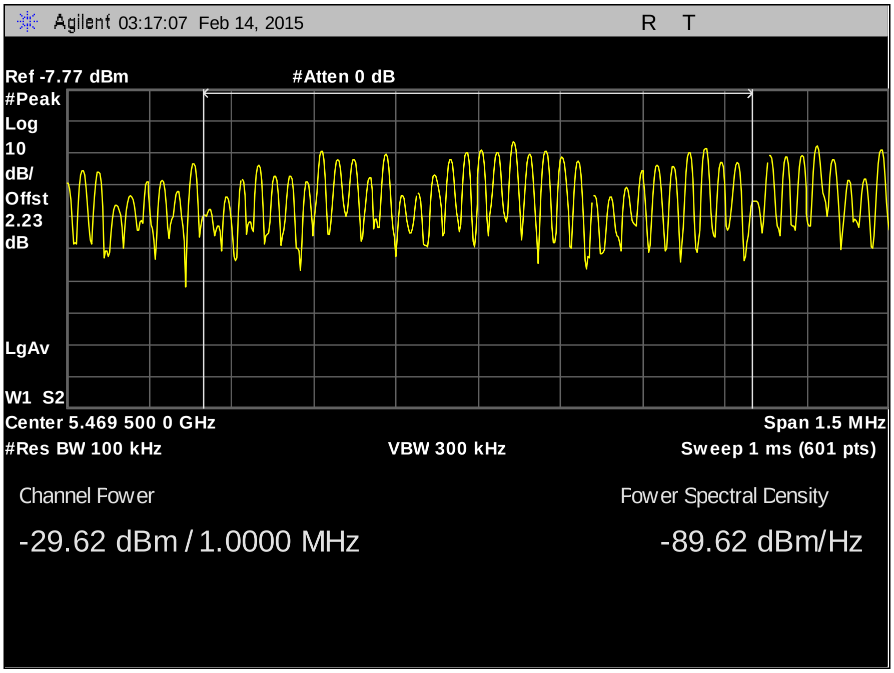
Band Edge, 50 MHz, 23 dBi Antenna



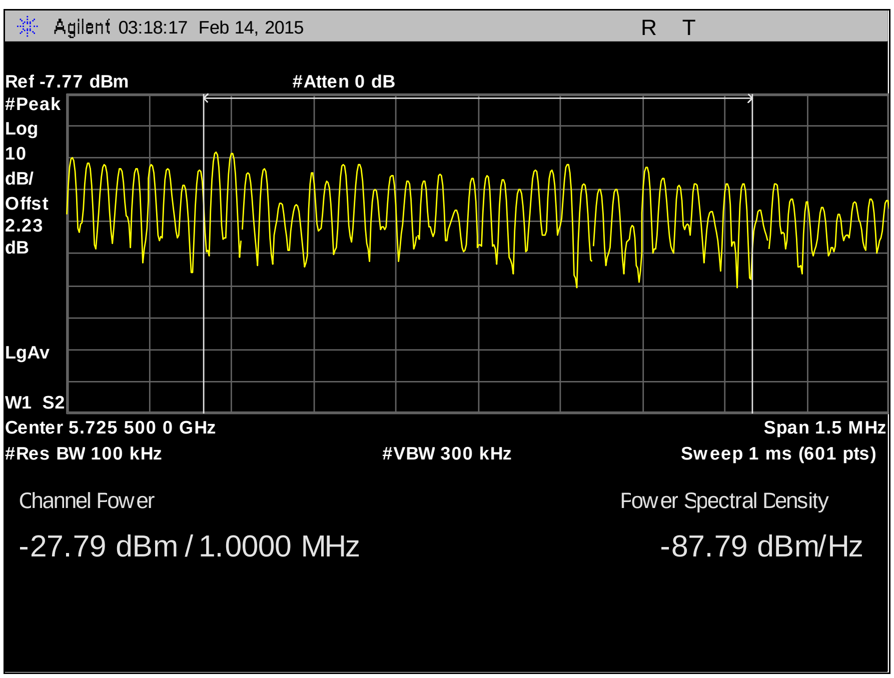
Plot 482. Radiated Emissions, 50 MHz, Channel 5322 MHz, 5350 MHz Band Edge, Average, 23 dBi Antenna



Plot 483. Radiated Emissions, 50 MHz, Channel 5322 MHz, 5350 MHz Band Edge, Peak, 23 dBi Antenna



Plot 484. Radiated Emissions, 50 MHz, Channel 5495 MHz, Band Edge 5470, -27 dBm, 23 dBi Antenna



Plot 485. Radiated Emissions, 50 MHz, Channel 5725 MHz, Band Edge 5725, -27 dBm, 23 dBi Antenna

Electromagnetic Compatibility Criteria for Intentional Radiators

§ 15.407(f) RF 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.

MPE Limit Calculation: EUT's operating frequencies @ 5250 - 5350 & 5470 - 5850 MHz; highest conducted power = 1.25 mW (i.e. 0.96 dBm) (avg) therefore, Limit for Uncontrolled exposure: 1 mW/cm^2 or 10 W/m^2

EUT maximum antenna gain = 29 dBi.

Equation from page 19 of OET 65, Edition 97-01

S = PG / 4ΠR2

where, S = Power Density
P = Power Input to antenna
G = Antenna Gain (numeric value = 10^(dB/10))
R = Distance to the center of Radiation of the antenna

P = 1.25 mW
R = 20 cm
G = 29 dbi (numeric value 794.33)

S = 1.25 x 794.33 / 4 x pi x 20^2
S = 0.197 mW/cm^2

Therefore, EUT meets the Uncontrolled Exposure limit at 20 cm. The MPE measurement is higher for a 29 dBi antenna and its associated conducted power.

Electromagnetic Compatibility Criteria for Intentional Radiators

§ 15.407(g) Frequency Stability

Test Requirements: **§ 15.407(g):** Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

Test Results: The EUT was not applicable with the requirements of **§15.407(g)**.

V. DFS Requirements and Radar Waveform Description & Calibration

A. DFS Requirements

Requirement	Operational Mode		
	Master	Client Without Radar Detection	Client With Radar Detection
Non-Occupancy Period	Yes	Not required	Yes
DFS Detection Threshold	Yes	Not required	Yes
Channel Availability Check Time	Yes	Not required	Not required
U-NII Detection Bandwidth	Yes	Not required	Yes

Table 27. Applicability of DFS Requirements Prior to Use of a Channel

Requirement	Operational Mode	
	Master Device or Client with Radar Detection	Client Without Radar Detection
DFS Detection Threshold	Yes	Not required
Channel Closing Transmission Time	Yes	Yes
Channel Move Time	Yes	Yes
U-NII Detection Bandwidth	Yes	Not required

Additional requirements for devices with multiple bandwidth modes	Master Device or Client with Radar Detection	Client Without Radar Detection
U-NII Detection Bandwidth and Statistical Performance Check	All BW modes must be tested	Not required
Channel Move Time and Channel Closing Transmission Time	Test using widest BW mode available	Test using the widest BW mode available for the link
All other tests	Any single BW mode	Not required
Note: Frequencies selected for statistical performance check (Section 7.8.4) should include several frequencies within the radar detection bandwidth and frequencies near the edge of the radar detection bandwidth. For 802.11 devices it is suggested to select frequencies in each of the bonded 20 MHz channels and the channel center frequency.		

Table 28. Applicability of DFS Requirements During Normal Operation

Maximum Transmit Power	**Value (See Notes 1, 2, and 3)**
EIRP ≥ 200 milliwatt	-64 dBm
EIRP < 200 milliwatt and power spectral density < 10 dBm/MHz	-62 dBm
EIRP < 200 milliwatt that do not meet the power spectral density requirement	-64 dBm
Note 1: This is the level at the input of the receiver assuming a 0 dBi receive antenna. **Note 2:** Throughout these test procedures an additional 1 dB has been added to the amplitude of the test transmission waveforms to account for variations in measurement equipment. This will ensure that the test signal is at or above the detection threshold level to trigger a DFS response. **Note3:** EIRP is based on the highest antenna gain. For MIMO devices refer to KDB Publication 662911 D01.	

Table 29. DFS Detection Thresholds for Master or Client Devices Incorporating DFS

Parameter	**Value**
Non-occupancy period	Minimum 30 minutes
Channel Availability Check Time	60 seconds
Channel Move Time	10 seconds See Note 1.
Channel Closing Transmission Time	200 milliseconds + an aggregate of 60 milliseconds over remaining 10 second period. See Notes 1 and 2.
U-NII Detection Bandwidth	Minimum 100% of the U-NII 99% transmission power bandwidth. See Note 3.
Note 1: *Channel Move Time* and the *Channel Closing Transmission Time* should be performed with Radar Type 0. The measurement timing begins at the end of the Radar Type 0 burst. **Note 2:** The *Channel Closing Transmission Time* is comprised of 200 milliseconds starting at the beginning of the *Channel Move Time* plus any additional intermittent control signals required to facilitate a *Channel* move (an aggregate of 60 milliseconds) during the remainder of the 10 second period. The aggregate duration of control signals will not count quiet periods in between transmissions. **Note 3:** During the *U-NII Detection Bandwidth* detection test, radar type 0 should be used. For each frequency step the minimum percentage of detection is 90 percent. Measurements are performed with no data traffic.	

Table 30. DFS Response Requirement Values

B. Radar Test Waveforms

This section provides the parameters for required test waveforms, minimum percentage of successful detections, and the minimum number of trials that must be used for determining DFS conformance. Step intervals of 0.1 microsecond for Pulse Width, 1 microsecond for PRI, 1 MHz for chirp width and 1 for the number of pulses will be utilized for the random determination of specific test waveforms.

Short Pulse Radar Test Waveforms

Radar Type	Pulse Width (µsec)	PRI (µsec)	Number of Pulses	Minimum Percentage of Successful Detection	Minimum Number of Trials
0	1	1428	18	See Note 1	See Note 1
1	1	Test A: 15 unique PRI values randomly selected from the list of 23 PRI values in Table 5a	$\text{Roundup}\left\{\left(\frac{1}{360}\right)\cdot\left(\frac{19\cdot 10^{6}}{PRI_{\mu sec}}\right)\right\}$	60%	30
		Test B: 15 unique PRI values randomly selected within the range of 518-3066 µsec, with a minimum increment of 1 µsec, excluding PRI values selected in Test A			
2	1-5	150-230	23-29	60%	30
3	6-10	200-500	16-18	60%	30
4	11-20	200-500	12-16	60%	30
Aggregate (Radar Types 1-4)				80%	120
Note 1: Short Pulse Radar Type 0 should be used for the detection bandwidth test, channel move time, and channel closing time tests.					

A minimum of 30 unique waveforms are required for each of the short pulse radar types 2 through 4. If more than 30 waveforms are used for short pulse radar types 2 through 4, then each additional waveform must also be unique and not repeated from the previous waveforms. If more than 30 waveforms are used for Short Pulse Radar Type1, then each additional waveform is generated with Test B and must also be unique and not repeated from the previous waveforms in Tests A or B.

For example if in Short Pulse Radar Type 1 Test B a PRI of 3066 usec is selected, the number of pulses would be $\text{Roundup}\left\{\left(\frac{1}{360}\right)\cdot\left(\frac{19\cdot 10^6}{3066}\right)\right\} = \text{Roundup}\{17.2\} = 18.$

Pulse Repetition Frequency Number	Pulse Repetition Frequency (Pulses Per Second)	Pulse Repetition Interval (Microseconds)
1	1930.5	518
2	1858.7	538
3	1792.1	558
4	1730.1	578
5	1672.2	598
6	1618.1	618
7	1567.4	638
8	1519.8	658
9	1474.9	678
10	1432.7	698
11	1392.8	718
12	1355	738
13	1319.3	758
14	1285.3	778
15	1253.1	798
16	1222.5	818
17	1193.3	838
18	1165.6	858
19	1139	878
20	1113.6	898
21	1089.3	918
22	1066.1	938
23	326.2	3066

Table 31. Pulse Repetition Intervals Values for Test A

The aggregate is the average of the percentage of successful detections of Short Pulse Radar Types 1-4. For example, the following table indicates how to compute the aggregate of percentage of successful detections.

Radar Type	Number of Trials	Number of Successful Detections	Minimum Percentage of Successful Detection
1	35	29	82.9%
2	30	18	60%
3	30	27	90%
4	50	44	88%
Aggregate (82.9% + 60% + 90% + 88%)/4 = 80.2%			

Long Pulse Radar Test Waveform

Radar Type	Pulse Width (μsec)	Chirp Width (MHz)	PRI (μsec)	Number of Pulses per Bursts	Number of Bursts	Minimum Percentage of Successful Detection	Minimum Trials
5	50-100	5-20	1000-2000	1-3	8-20	80%	30

The parameters for this waveform are randomly chosen. Thirty unique waveforms are required for the Long Pulse radar test signal. If more than 30 waveforms are used for the Long Pulse radar test signal, then each additional waveform must also be unique and not repeated from the previous waveforms.

Each waveform is defined as follows:

1) The transmission period for the Long Pulse Radar test signal is 12 seconds.
2) There are a total of 8 to 20 Bursts in the 12 second period, with the number of Bursts being randomly chosen. This number is Burst_Count.
3) Each Burst consists of 1 to 3 pulses, with the number of pulses being randomly chosen. Each Burst within the 12 second sequence may have a different number of pulses.
4) The pulse width is between 50 and 100 microseconds, with the pulse width being randomly chosen. Each pulse within a Burst will have the same pulse width. Pulses in different Bursts may have different pulse widths.
5) Each pulse has a linear FM chirp between 5 and 20 MHz, with the chirp width being randomly chosen. Each pulse within a Burst will have the same chirp width. Pulses in different Bursts may have different chirp widths. The chirp is centered on the pulse. For example, with radar frequency of 5300 MHz and a 20 MHz chirped signal, the chirp starts at 5290 MHz and ends at 5310 MHz.
6) If more than one pulse is present in a Burst, the time between the pulses will be between 1000 and 2000 microseconds, with the time being randomly chosen. If three pulses are present in a Burst, the time between the first and second pulses is chosen independently of the time between the second and third pulses.
7) The 12 second transmission period is divided into even intervals. The number of intervals is equal to Burst_Count. Each interval is of length (12,000,000 / Burst_Count) microseconds. Each interval contains one Burst. The start time for the Burst, relative to the beginning of the interval, is between 1 and [(12,000,000 / Burst_Count) – (Total Burst Length) + (One Random PRI Interval)] microseconds, with the start time being randomly chosen. The step interval for the start time is 1 microsecond. The start time for each Burst is chosen independently.

A representative example of a Long Pulse radar test waveform:

1) The total test signal length is 12 seconds.
2) 8 Bursts are randomly generated for the Burst_Count.
3) Burst 1 has 2 randomly generated pulses.
4) The pulse width (for both pulses) is randomly selected to be 75 microseconds.
5) The PRI is randomly selected to be at 1213 microseconds.
6) Bursts 2 through 8 are generated using steps 3 – 5.
7) Each Burst is contained in even intervals of 1,500,000 microseconds. The starting location for Pulse 1, Burst 1 is randomly generated (1 to 1,500,000 minus the total Burst 1 length + 1 random PRI interval) at the 325,001 microsecond step. Bursts 2 through 8 randomly fall in successive 1,500,000 microsecond intervals (i.e. Burst 2 falls in the 1,500,001 – 3,000,000 microsecond range).

Graphical Representation of a Long Pulse radar Test Waveform

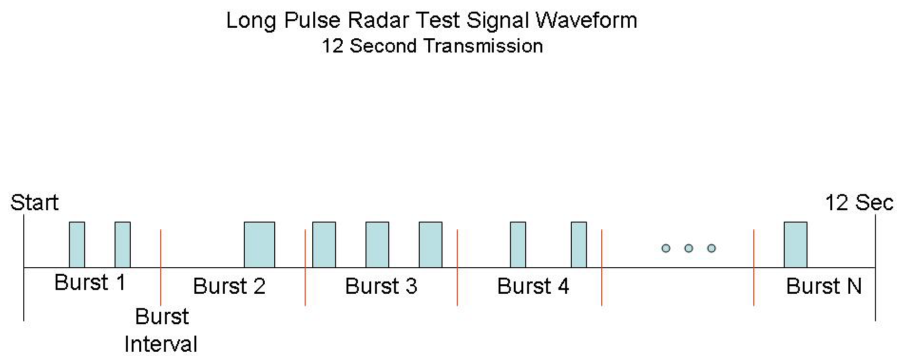


Figure 4. Long Pulse Radar Test Signal Waveform

Frequency Hopping Radar Test Waveform

Radar Type	Pulse Width (µsec)	PRI (µsec)	Pulses per Hop	Hopping Rate (kHz)	Hopping Sequence Length (msec)	Minimum Percentage of Successful Detection	Minimum Trials
6	1	333	9	.333	300	70%	30

For the Frequency Hopping Radar Type, the same *Burst* parameters are used for each waveform. The hopping sequence is different for each waveform and a 100-length segment is selected1 from the hopping sequence defined by the following algorithm:

The first frequency in a hopping sequence is selected randomly from the group of 475 integer frequencies from 5250 – 5724 MHz. Next, the frequency that was just chosen is removed from the group and a frequency is randomly selected from the remaining 474 frequencies in the group. This process continues until all 475 frequencies are chosen for the set. For selection of a random frequency, the frequencies remaining within the group are always treated as equally likely.

C. Radar Waveform Calibration

The following equipment setup was used to calibrate the radiated Radar Waveform. A spectrum analyzer was used to establish the test signal level for each radar type. During this process there were no transmissions by either the Master or Client Device. The spectrum analyzer was switched to the zero span (Time Domain) mode at the frequency of the Radar Waveform generator. Peak detection was utilized. The spectrum analyzer's resolution bandwidth (RBW) was set to 3 MHz and the video bandwidth (VBW) was set to 3 MHz. The calibration setup is diagrammed in Figure 5.

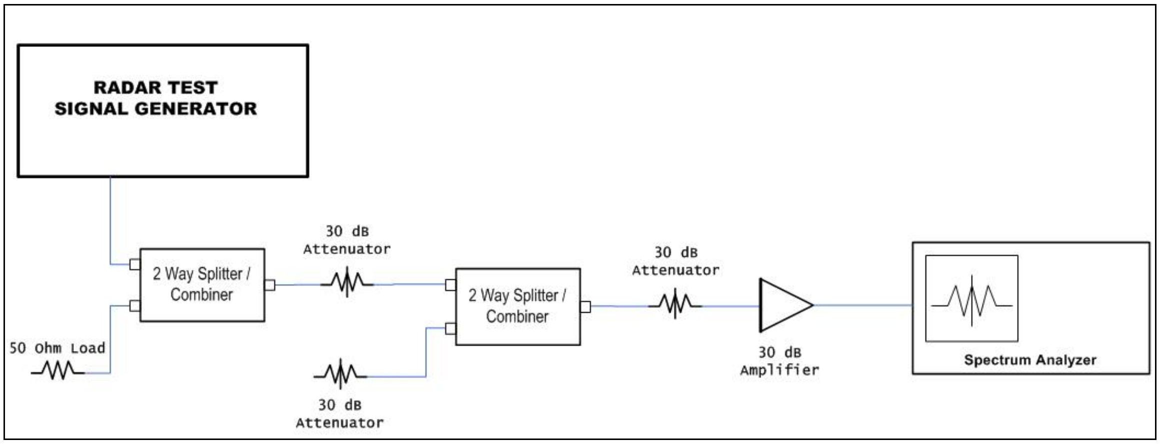
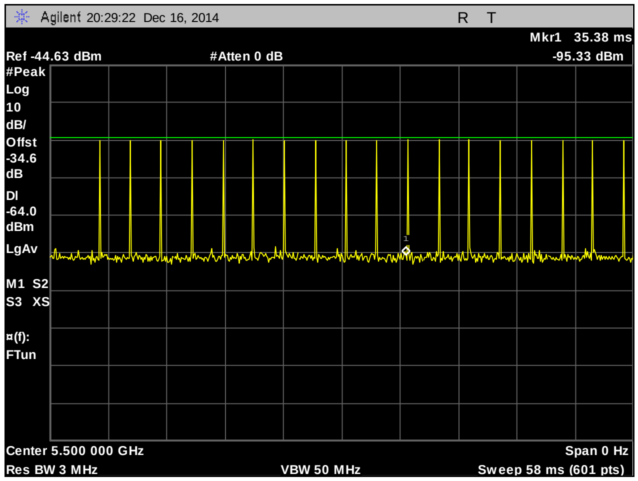
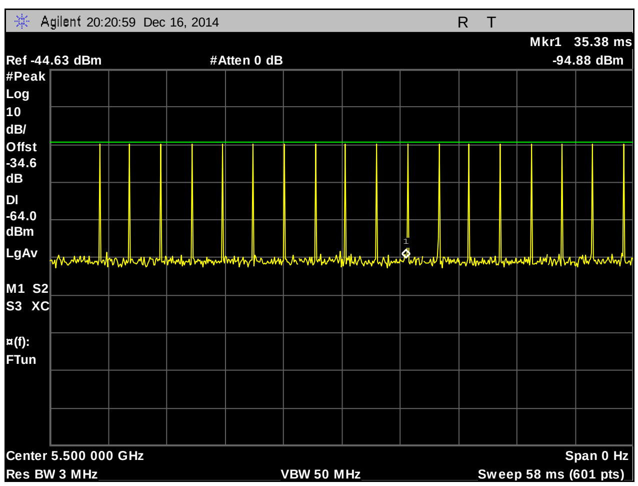


Figure 5. Calibration Test Setup

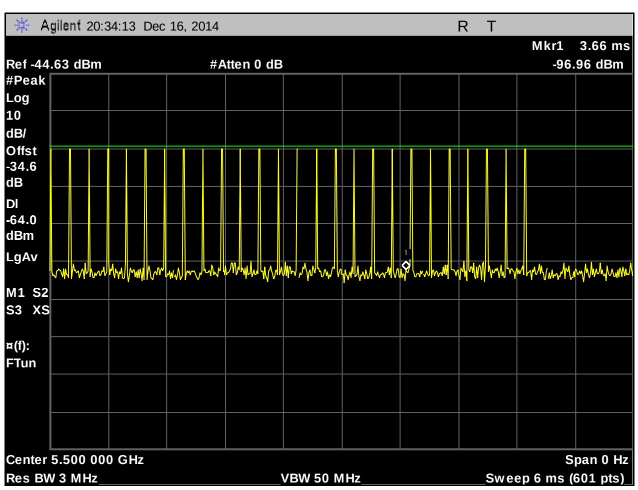
Radar Waveform Calibration



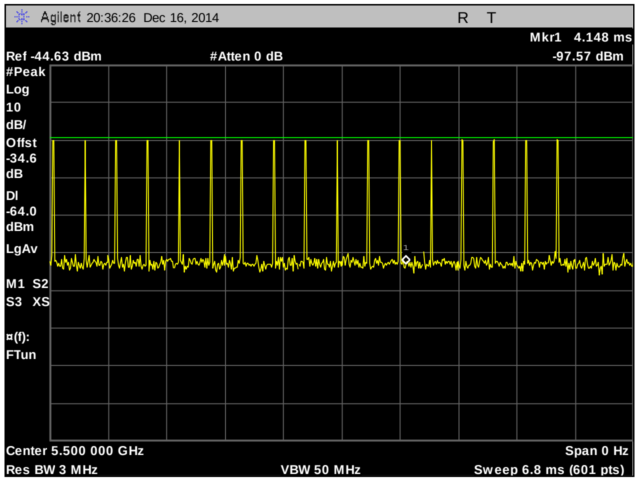
Plot 486. Radar Type 0 Calibration



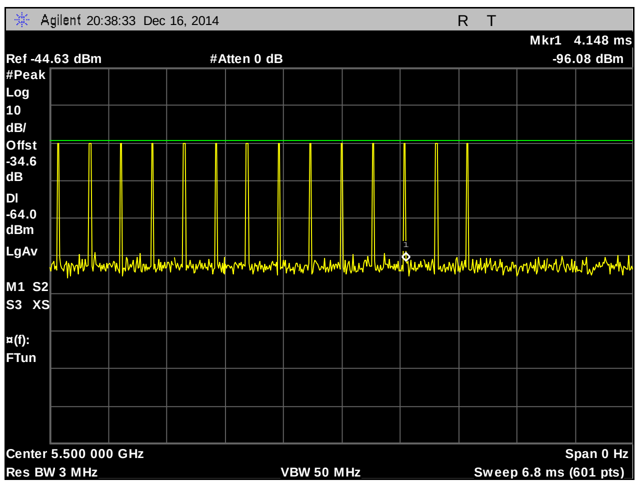
Plot 487. Radar Type 1 Calibration



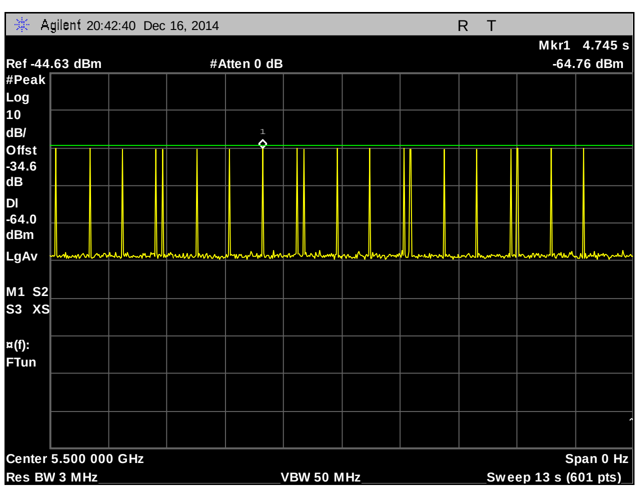
Plot 488. Radar Type 2 Calibration



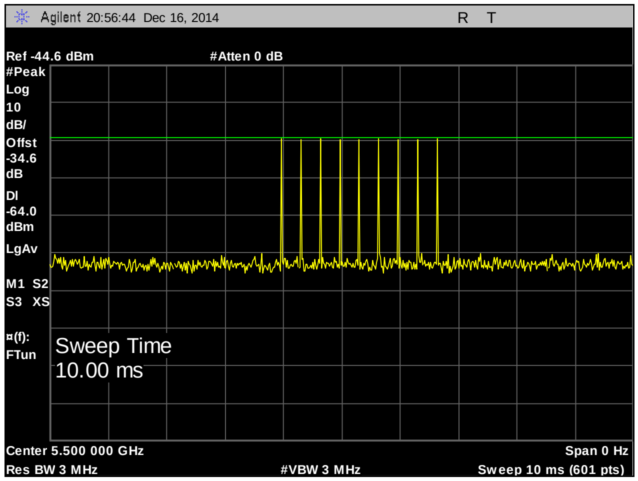
Plot 489. Radar Type 3 Calibration



Plot 490. Radar Type 4 Calibration



Plot 491. Radar Type 5 Calibration



Plot 492. Radar Type 6 Calibration

VI. DFS Test Procedure and Test Results

A. DFS Test Setup

1. A spectrum analyzer is used as a monitor to verify that the Unit Under Test (UUT) has vacated the Channel within the Channel Closing Transmission Time and Channel Move Time, and does not transmit on a Channel during the Non-Occupancy Period after the detection and subsequent Channel move. It is also used to monitor UUT transmissions during the Channel Availability Check Time.
2. The test setup, which consists of test equipment and equipment under test (EUT), is diagrammed in Figure 6.

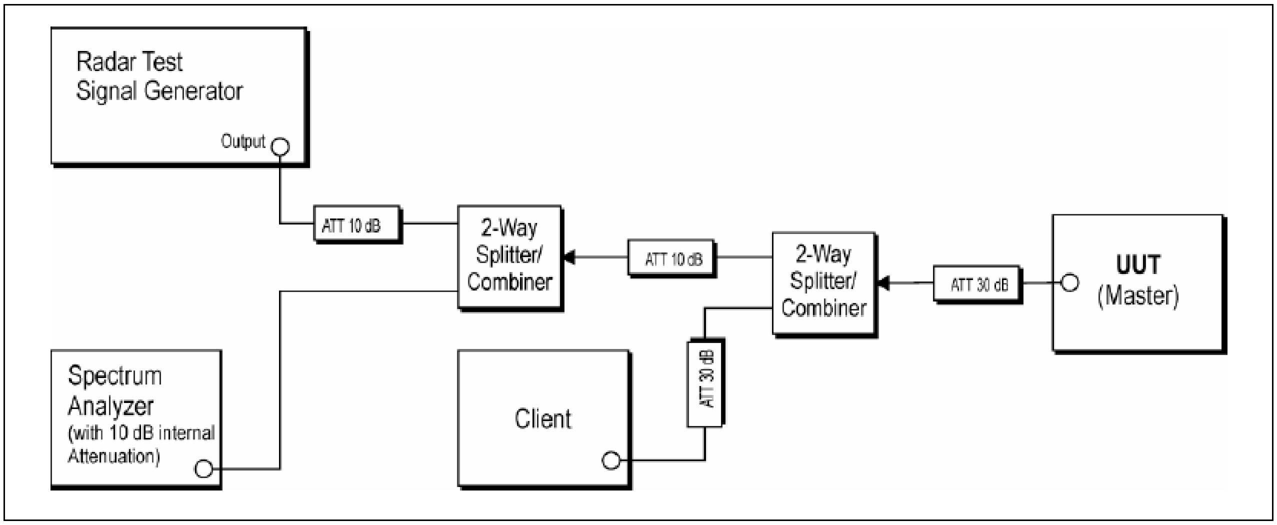


Figure 6. Test Setup Diagram

B. Description of Master Device

1. Operating Frequency Range: 5160 – 5245 MHz, 5255 – 5342 MHz, 5475 – 5720 MHz, and 5730 – 5845 MHz

2. Modes of Operation: Master device

3. List all antennas and associated gains: Lowest Antenna Gain (dBi) - 23dBi; Highest Antenna Gain (dBi) - 34dBi

4. List output power ranges: The Output Power Range is +24.44 to +57.38 dBm EIRP

5. List antenna impedance: 50 Ohms

6. Antenna gain verification - Use antenna data sheet

7. State test file that is transmitted: 6.5 magical hours

8. TCP description: Radios when receiving signal is greater than -30dBm and the highest modulation is unable to be maintained will cause the transmitter of the radio to back the power down by 1dB increments as much as 6dB total to maintain the TPC requirement.

9. Time for master to complete its power-on-cycle: approximately 3 minutes

10. Describe EUT's uniform channel spreading: The manufacturer provided special software that over-rode the non-occupancy mechanism (allowing return to the same channel) for the purposes of determining the probability of detection. The streamed file was the "FCC" test file as required by FCC Part 15 Subpart E. During the in-service monitoring detection probability and channel moving tests the system was configured with a streaming video file. The radio also provided sudo random data to simulate uniform traffic loading along with the "FCC" test file.

C. UNII Detection Bandwidth

Test Requirement(s): **§ 15.407** A minimum 100% detection rate is required across an EUT's 99% bandwidth.

Test Procedure: All UNII channels for this device have identical channel bandwidths.

A single burst of the short pulse radar type 1 is produced at 5476 MHz for 10 MHz wide signal, 5340 MHz for 20 MHz wide signal, 5709 MHz for 30 MHz wide signal, 5270 MHz for 40 MHz wide signal, and 5500 MHz for 50 MHz wide signal, at the -63dBm test level. The UUT is set up as a standalone device (no associated client, and no data traffic).

A single radar burst is generated for a minimum of 10 trials, and the response of the UUT is recorded. The UUT must detect the radar waveform 90% or more of the time.

The radar frequency is increased in 1 MHz steps, repeating the above test sequence, until the detection rate falls below 90%. The highest frequency at which detection is greater than or equal to 90% is denoted F_H.

The radar frequency is decreased in 1 MHz steps, repeating the above test sequence, until the detection rate falls below 90%. The lowest frequency at which detection is greater than or equal to 90% is denoted F_L.

The U-NII Detection Bandwidth is calculated as follows:

$$\text{U-NII Detection Bandwidth} = F_H - F_L$$

Test Engineer: Jason Allnutt

Test Date: 12/19/14

UNII Detection Bandwidth – Test Results

10 MHz Bandwidth											
EUT Frequency- 5476 MHz											
DFS Detection Trials (1=Detection, 0= No Detection)											
Radar Frequency (MHz)	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**Detection Rate (%)**
5471	1	1	1	1	1	1	1	1	1	1	100
5476	1	1	1	1	1	1	1	1	1	1	100
5481	1	1	1	1	1	1	1	1	1	1	100
Detection Bandwidth = fh - fl = 5481 – 5471 = 10 MHz											
OBW* 100% = 10 MHz											
Type 0											

Table 32. UNII Detection Bandwidth, Test Results, 10 MHz

20 MHz Bandwidth											
EUT Frequency- 5340MHz											
DFS Detection Trials (1=Detection, 0= No Detection)											
Radar Frequency (MHz)	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**Detection Rate (%)**
5330	1	1	1	1	1	1	1	1	1	1	100
5335	1	1	1	1	1	1	1	1	1	1	100
5340	1	1	1	1	1	1	1	1	1	1	100
5345	1	1	1	1	1	1	1	1	1	1	100
5350	1	1	1	1	1	1	1	1	1	1	100
5330	1	1	1	1	1	1	1	1	1	1	100
Detection Bandwidth = fh - fl = 5350 – 5330 = 20 MHz											
OBW* 100% = 20 MHz											
Type 0											

Table 33. UNII Detection Bandwidth, Test Results, 20 MHz

30 MHz Bandwidth											
EUT Frequency- 5709 MHz											
DFS Detection Trials (1=Detection, 0= No Detection)											
Radar Frequency (MHz)	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**Detection Rate (%)**
5694	1	1	1	1	1	1	1	1	1	1	100
5699	1	1	1	1	1	1	1	1	1	1	100
5704	1	1	1	1	1	1	1	1	1	1	100
5709	1	1	1	1	1	1	1	1	1	1	100
5714	1	1	1	1	1	1	1	1	1	1	100
5719	1	1	1	1	1	1	1	1	1	1	100
5724	1	1	1	1	1	1	1	1	1	1	100
Detection Bandwidth = fh - fl = 5724 – 5694 = 30 MHz											
OBW* 100% = 30 MHz											
Type 0											

Table 34. UNII Detection Bandwidth, Test Results, 30 MHz

40 MHz Bandwidth											
EUT Frequency- 5270MHz											
DFS Detection Trials (1=Detection, 0= No Detection)											
Radar Frequency (MHz)	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**Detection Rate (%)**
5250	1	1	1	1	1	1	1	1	1	1	100
5255	1	1	1	1	1	1	1	1	1	1	100
5260	1	1	1	1	1	1	1	1	1	1	100
5265	1	1	1	1	1	1	1	1	1	1	100
5270	1	1	1	1	1	1	1	1	1	1	100
5275	1	1	1	1	1	1	1	1	1	1	100
5280	1	1	1	1	1	1	1	1	1	1	100
5285	1	1	1	1	1	1	1	1	1	1	100
5290	1	1	1	1	1	1	1	1	1	1	100
Detection Bandwidth = fh - fl = 5290 – 5250 = 40 MHz											
OBW* 100% = 40 MHz											
Type 0											

Table 35. UNII Detection Bandwidth, Test Results, 40 MHz

50 MHz Bandwidth											
EUT Frequency- 5500MHz											
DFS Detection Trials (1=Detection, 0= No Detection)											
Radar Frequency (MHz)	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**Detection Rate (%)**
5475	0	1	1	1	1	1	1	1	1	1	90
5480	1	1	1	1	1	1	1	1	1	1	100
5485	1	1	1	1	1	1	1	1	1	1	100
5490	1	1	1	1	1	1	1	1	1	1	100
5495	1	1	1	1	1	1	1	1	1	1	100
5500	1	1	1	1	1	1	1	1	1	1	100
5505	1	1	1	1	1	1	1	1	1	1	100
5510	1	1	1	1	1	1	1	1	1	1	100
5515	1	1	1	1	1	1	1	1	1	0	90
5520	1	1	1	1	1	1	1	1	1	1	100
5525	1	1	1	1	1	1	1	1	1	1	100
Detection Bandwidth = fh - fl = 5525 – 5475 = 50 MHz											
OBW* 100% = 50 MHz											
Type 0											

Table 36. UNII Detection Bandwidth, Test Results, 50 MHz

Initial Channel Availability Check Time

Test Requirements: **§ 15.407** The Initial Channel Availability Check Time tests that the UUT does not emit beacon, control, or data signals on the test channel until the power-up sequence has been completed and the U-NII device has checked for radar waveforms, for one minute, on the test channel. This test does not use any of the radar waveforms and only needs to be performed once.

The UUT should not make any transmissions over the test channel, for at least 1 minute after completion of its power-on cycle.

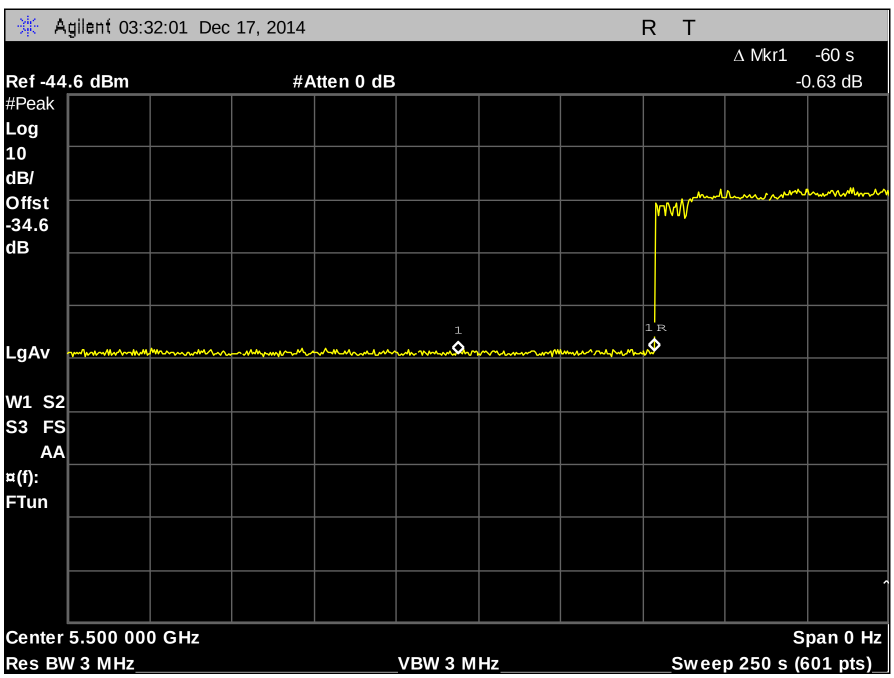
Test Procedure: The U-NII device is powered on and instructed to operate at 5300 – 5500 MHz. At the same time the UUT is powered on, the spectrum analyzer is set to 5300 – 5500 MHz with a zero span and a 2.5 minute sweep time. The analyzer is triggered at the same time power is applied to the U-NII device.

Test Results: Marker 1R on Plot 493 indicates the start of the channel availability check time.

The Equipment was compliant with § 15.407 Initial Channel Availability Check Time.

Test Engineer: Jason Allnutt

Test Date: 12/19/14



Plot 493. Initial Channel Availability Check Time, 60 seconds

D. Radar Burst at the Beginning of Channel Availability Check Time

Test Requirements: **§ 15.407** A Radar Burst at the Beginning of the Channel Availability Check Time tests that the UUT does not emit beacon, control, or data signals on the test Channel if it has detected a radar burst during that time period until the power-up sequence has been completed and the U-NII device checks for Radar Waveforms for one minute on the test Channel. The steps below define the procedure to verify successful radar detection on the selected Channel during a period equal to the Channel Availability Check Time and avoidance of operation on that Channel when a radar Burst with a level equal to the DFS Detection Threshold + 1 dB (-63dBm) occurs at the beginning of the Channel Availability Check Time.

Test Procedure: The UUT is powered on at T0. T1 denotes the instant when the UUT has completed its power-up sequence. The Channel Availability Check Time commences at instant T1 and will end no sooner than T1 + 60 seconds.

A single Burst of short pulse radar type 1, at -63 dBm, will commence within a 6 second window starting at T1.

Visual indication of the UUT of successful detection of the radar Burst will be recorded and reported. Observation of transmission at 5300MHz will continue for 2.5 minutes after the radar Burst has been generated.

Verify that during the 2.5 minute measurement window, no UUT transmissions occur at 5300MHz.

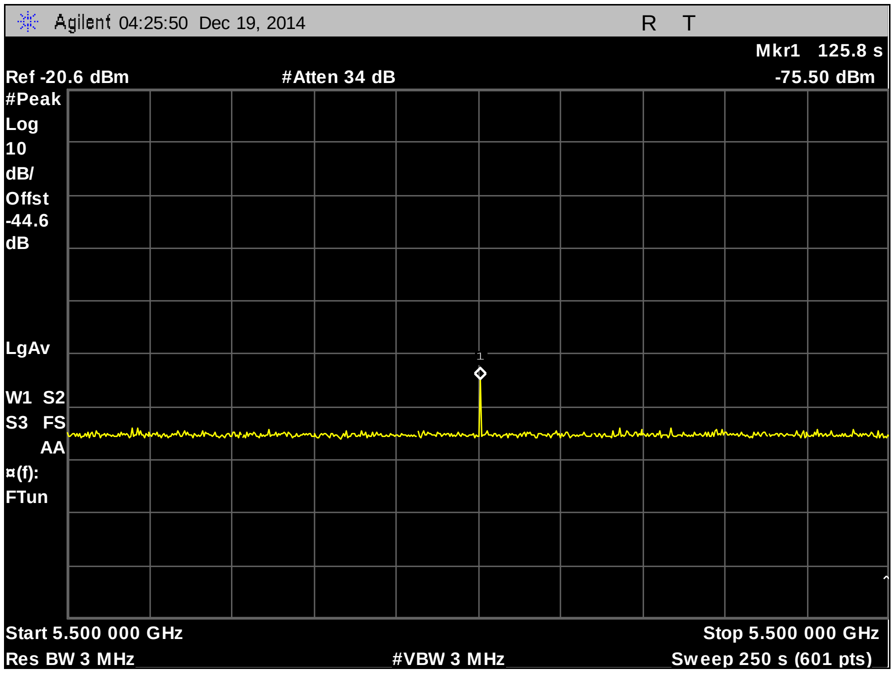
Test Results Plot 494 below indicates that there were no UUT transmissions during the 2.5 minute measurement window when a radar burst was injected 6 seconds into the CACT. Therefore, the UUT detected the presence of a radar during the CACT and moved away from that channel.

The equipment was compliant with § 15.407 Radar Burst at the Beginning of the Channel Availability Check Time.

Test Engineer: Jason Allnutt

Test Date: 12/19/14

Radar Burst at the Beginning of Channel Availability Check Time – Plot



Plot 494. Radar Burst at the Beginning of CACT, 2 seconds

E. Radar Burst at the End of Channel Availability Check Time

Test Requirements: **§ 15.407** A Radar Burst at the End of the Channel Availability Check Time tests that the UUT does not emit beacon, control, or data signals on the test Channel if it has detected a radar burst during that time period until the power-up sequence has been completed and the U-NII device checks for Radar Waveforms for one minute on the test Channel. The steps below define the procedure to verify successful radar detection on the selected Channel during a period equal to the Channel Availability Check Time and avoidance of operation on that Channel when a radar Burst with a level equal to the DFS Detection Threshold + 1 dB (-63dBm) occurs at the end of the Channel Availability Check Time.

Test Procedure: The steps below define the procedure to verify successful radar detection on the selected Channel during a period equal to the Channel Availability Check Time and avoidance of operation on that Channel when a radar Burst with a level equal to the DFS Detection Threshold + 1 dB (-63dBm) occurs at the end of the Channel Availability Check Time.

The UUT is powered on at T0. T1 denotes the instant when the UUT has completed its power-up sequence. The Channel Availability Check Time commences at instant T1 and will end no sooner than T1 + 60 seconds.

A single Burst of short pulse of radar type 1 at -63 dBm will commence within a 6 second window starting at T1+ 54 seconds.

Visual indication on the UUT of successful detection of the radar Burst will be recorded and reported. Observation of emissions at 5300MHz will continue for 2.5 minutes after the radar Burst has been generated.

Verify that during the 2.5 minute measurement window no UUT transmissions occurred at 5300MHz.

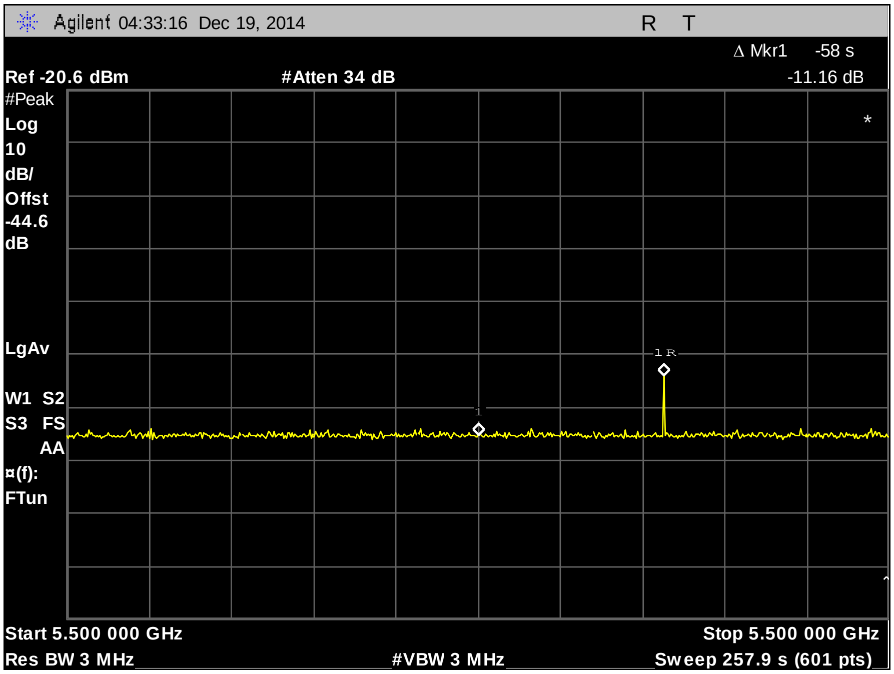
Test Results: Plot 495 indicates that no UUT transmissions occurred during the 2.5 minute measurement window when a radar burst was injected 6 seconds before the end of the CACT. Therefore, the UUT detected the presence of a radar and moved away from that channel.

The equipment was compliant with § 15.407 Radar Burst at the End of the Channel Availability Check Time.

Test Engineer: Jason Allnutt

Test Date: 11/21/14

Radar Burst at the End of Channel Availability Check Time – Plot



Plot 495. Radar Burst at the End of CACT, 58 seconds

F. In-Service Monitoring for Channel Move Time, Channel Closing Transmission Time, and Non-Occupancy Period

Test Requirements: **§ 15.407** (Refer to DFS Response Requirement Values table in section III-A of this report.) The UUT shall continuously monitor for radar transmissions in the operating test channel. When a radar burst occurs in the test channel, it has 10 seconds to move to another channel. This 10 second window is termed Channel Move Time (CMT).

When a radar burst occurs, the UUT has 200 milliseconds, plus an aggregate of 60 milliseconds over remaining 10 second period, to cease transmission in the operating test channel. This 200 ms + 60 ms over remaining 10 second period requirement is termed Channel Closing Transmission Time (CCT).

After radar burst and subsequent move to another channel, the UUT shall not resume transmission, on the channel it moved from, for a period of 30 minutes. This requirement is termed Non-Occupancy Period (NOP).

Test Procedure: These tests define how the following DFS parameters are verified during In-Service Monitoring: Channel Closing Transmission Time, Channel Move Time, and Non-Occupancy Period.

The steps below define the procedure to determine the above mentioned parameters when a radar Burst with a level equal to the DFS Detection Threshold + 1dB (-63dBm) is generated on the Operating Channel of the U-NII device.

A U-NII device operating as a Client Device will associate with the UUT (Master) at 5300 – 5500 MHz. Stream the MPEG test file from the Master Device to the Client Device on the selected Channel for the entire period of the test.

At time T0 the Radar Waveform generator sends a Burst of pulses for each of the radar types at -63dBm.

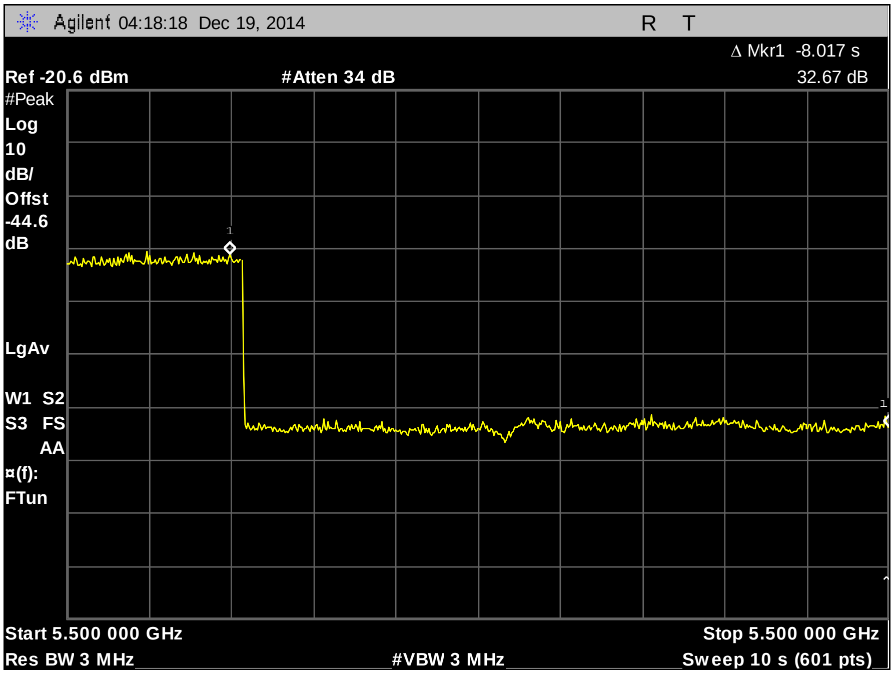
Observe the transmissions of the UUT at the end of the radar Burst on the Operating Channel for duration greater than 10 seconds. Measure and record the transmissions from the UUT during the observation time (Channel Move Time). Compare the Channel Move Time and Channel Closing Transmission Time results to the limits defined in the *DFS Response Requirement Values table*.

Test Results: The EUT was compliant with § 15.407 In-Service Monitoring for Channel Move Time, Channel Closing Transmission Time, and Non-Occupancy Period.

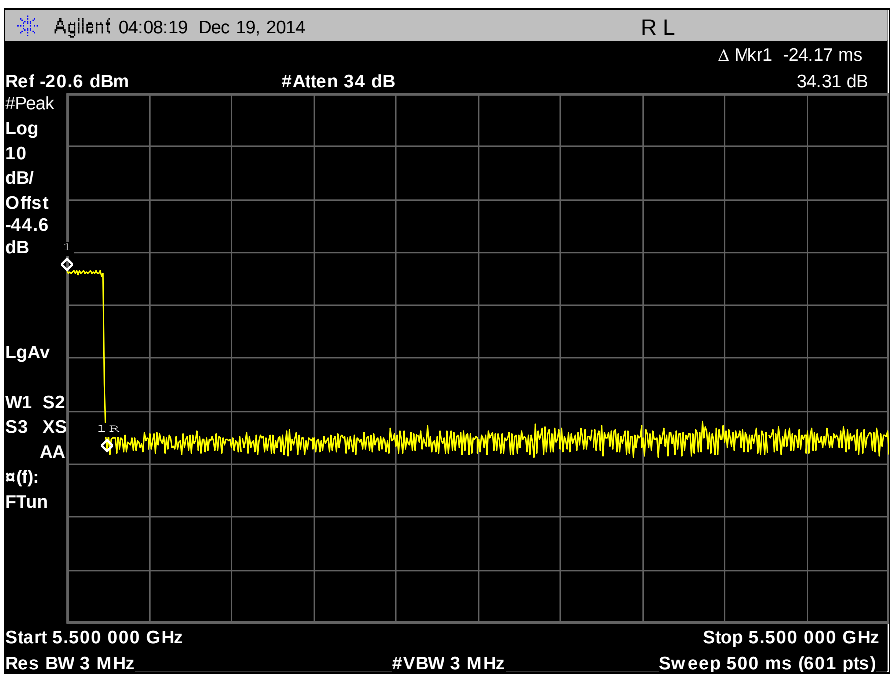
Test Engineer: Jason Allnutt

Test Date: 12/19/14

Channel Move Time – Plots

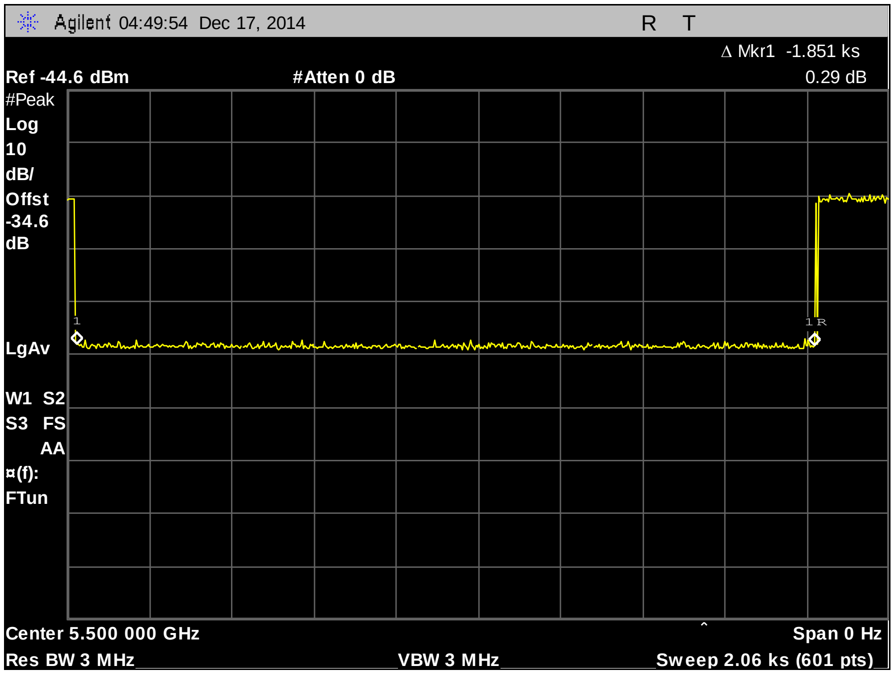


Plot 496. Channel Move Time



Plot 497. Channel Closing Transmission Time

Non-Occupancy Period – Plot



Plot 498. Non-Occupancy Period, 30 Minutes

G. Statistical Performance Check

Test Requirements: **§ 15.407** During In-Service Monitoring, the EUT requires a minimum percentage of successful radar detections from all required radar waveforms at a level equal to the DFS Detection Threshold + 1dB.

Test Procedure: Stream the MPEG test file from the Master Device to the Client Device on the selected Channel for the entire period of the test. The Radar Waveform generator sends the individual waveform for each of the radar types 1-6 at -63dbm. Statistical data is gathered to determine the ability of the device to detect the radar test waveforms. The device can utilize a test mode to demonstrate when detection occurs to prevent the need to reset the device between trial runs. The percentage of successful detection is calculated by:

$$\frac{TotalWaveformDetections}{TotalWaveformTrials} \times 100$$

The Minimum number of trails, minimum percentage of successful detection and the average minimum percentage of successful detection are found in the Radar Test Waveforms section.

Test Results: The equipment was compliant with § 15.407 Statistical Performance Check.

Test Engineer: Jason Allnutt

Test Date: 12/19/14

BW	Frequency	Radar Type 0 Detections (%)	Radar Type 1 Detections (%)	Radar Type 2 Detections (%)	Radar Type 3 Detections (%)	Radar Type 4 Detections (%)	Radar Type 5 Detections (%)	Radar Type 6 Detections (%)	Compliant (Yes/No)
10 MHz	5476 MHz	100	87	100	97	93	100	100	Yes
20 MHz	5340 MHz	100	100	100	100	87	97	100	Yes
30 MHz	5709 MHz	100	73	100	100	100	100	100	Yes
40 MHz	5270 MHz	100	80	100	97	87	100	100	Yes
50 MHz	5500 MHz	100	77	100	93	90	100	100	Yes

Table 37. Statistical Performance Check

VII. Test Equipment

Test Equipment

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

MET #	Equipment	Manufacturer	Model#	Cal Date	Cal Due
1T4681	SPECTRUM ANALYZER	AGILENT TECHNOLOGIES	E4448A	2/26/2014	2/26/2015
1T4829	SPECTRUM ANALYZER	AGILENT	E4407B	9/30/2014	9/30/2015
1T4483	ANTENNA; HORN	ETS-LINDGREN	7/13/1908	2/28/2014	8/28/2015
1T4564	LISN (24 AMP)	SOLAR ELECTRONICS	9252-50-R-24-BNC	6/3/2014	6/3/2015
1T4818	COMB GENERATOR	COM-POWER	CGO-520	SEE NOTE	
1T4870	THERM./CLOCK/HUMIDITY MONITOR	CONTROL COMPANY	06-662-4, FB70258	03/14/2014	03/14/2016
1T4751	ANTENNA - BILOG	SUNOL SCIENCES	JB6	07/20/2014	01/20/2016
1T4300A	SEMI-ANECHOIC 3M CHAMBER # 1 (VCCI)	EMC TEST SYSTEMS	NONE	07/24/2012	07/24/2015
1T4409	EMI RECEIVER	ROHDE & SCHWARZ	ESIB7	07/18/2014	07/18/2016
1T4442	PRE-AMPLIFIER, MICROWAVE	MITEQ	AFS42-01001800-30-10P	SEE NOTE	
1T4149	HIGH-FREQUENCY ANECHOIC CHAMBER	RAY-PROOF	3/21/1900	NOT REQUIRED	
1T2665	ANTENNA; HORN	EMCO	7/11/1908	4/3/2014	10/3/2015
1T4871	VECTOR SIGNAL GENERATOR	AGILENT	N5172B	6/16/2014	12/16/2015
1T4829	SPECTRUM ANALYZER	AGILENT	E4407B	9/30/2014	3/30/2016
1T4817	PREAMPLIFIER	A.H. SYSTEMS, INC.	PAM-0118P	SEE NOTE	

Table 38. Test Equipment List

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

VIII. Certification & User's Manual Information

Certification & User's Manual Information

J. 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.

(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.

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

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 users 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.

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.