

Electromagnetic Compatibility Criteria for Intentional Radiators

Co-location

Test Requirements: Devices designed to transmit simultaneously in multiple channels in single or multiple frequency bands or those using new “carrier aggregation techniques”, excluding cellular base stations or where specific guidance has been proved.

All devices that are capable of transmitting simultaneously in more than one Part-15 band between 5 and 6 GHz (*i.e.*, in two or more of the four U-NII bands or in the 5.8 GHz 15.247 band and at least one U-NII band) are subject to Permit But Ask provisions. This includes devices marketed as IEEE Std 802.11ac or “pre-standard” IEEE Std 802.11ac.

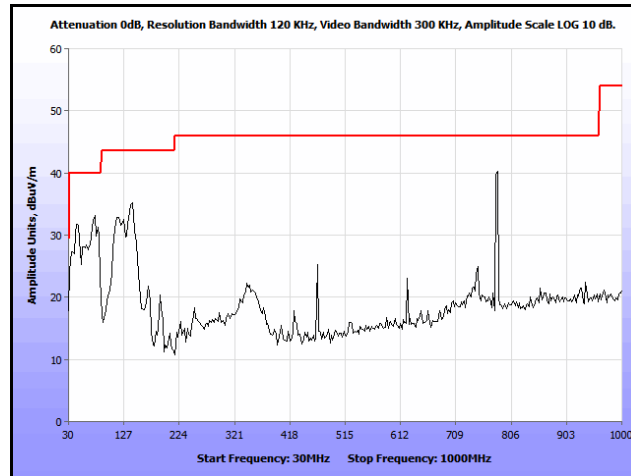
Test Procedure: The transmitter was placed on an 80cm wooden table inside in a semi-anechoic chamber. Measurements were performed with the EUT rotated 360 degrees and varying the adjustable antenna mast height to determine worst case orientation for maximum emissions. A preamp was used in the range from 7-18GHz to improve noise floor. Plots were corrected for cable loss, antenna, and preamp gain.

For frequencies from 30 MHz to 1 GHz, measurements were made using a quasi-peak detector with a 120 kHz bandwidth.

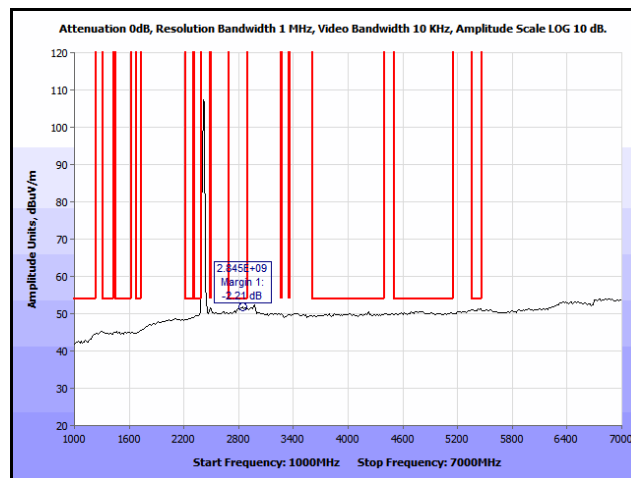
For measurements above 1 GHz, measurements were made with a Peak detector with 1 MHz resolution bandwidth. Where the spurious emissions fell into a restricted band, measurements were also made with an average detector to make sure they complied with 15.209 limits. Only noise floor was seen above 18 GHz.

The EUT uses 2 radios that are co-located. The EUT was set to transmit on both radios using the following matrix below.

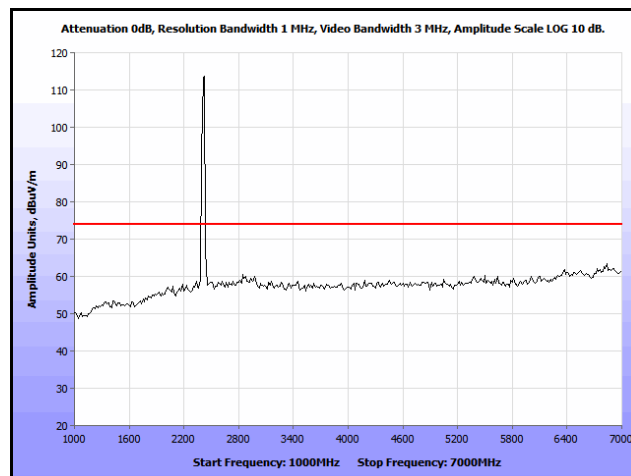
Omni (Each port is 2.4-5.8GHz)						Patch, Ports 1-3 is 2.4GHz only. Ports 4-6 is 5GHz Only	
Radio 1	Radio 2	Radio 1	Radio 2	Radio 1	Radio 2	Radio 1	Radio 2
802.11n 20MHz	802.11n 20MHz	802.11n 20MHz	802.11n 20MHz	802.11n 20MHz	802.11n 20MHz	802.11n 20MHz	802.11n 20MHz
2412	5200	2412	2412	5200	5200	2412	2412
2437	5300	2437	2437	5300	5300	2437	2437
2462	5580	2462	2462	5580	5580	2462	2462
--	5785	--	--	5785	5785	--	5200
--	--	--	--	--	--	--	5300
--	--	--	--	--	--	--	5580
--	--	--	--	--	--	--	5785



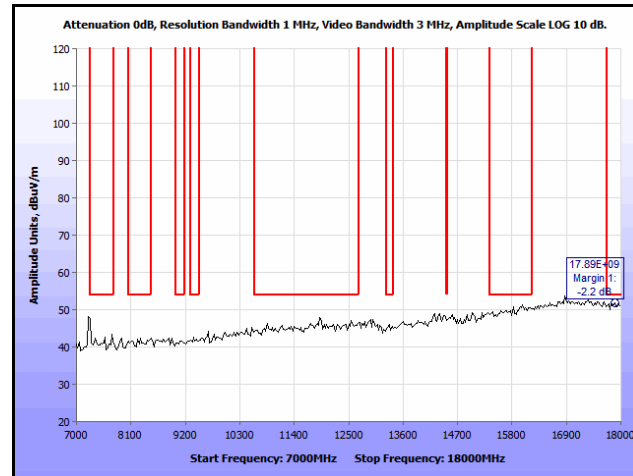
Plot 558. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 2412 & 2412 MHz, 30 MHz – 1 GHz



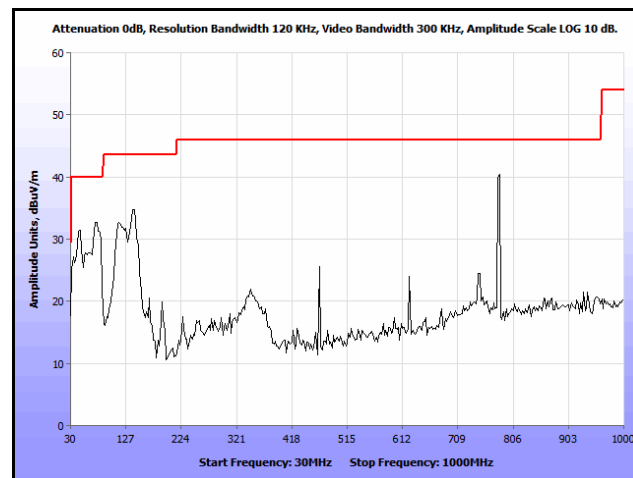
Plot 559. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 2412 & 2412 MHz, 1 GHz – 7 GHz, Avg.



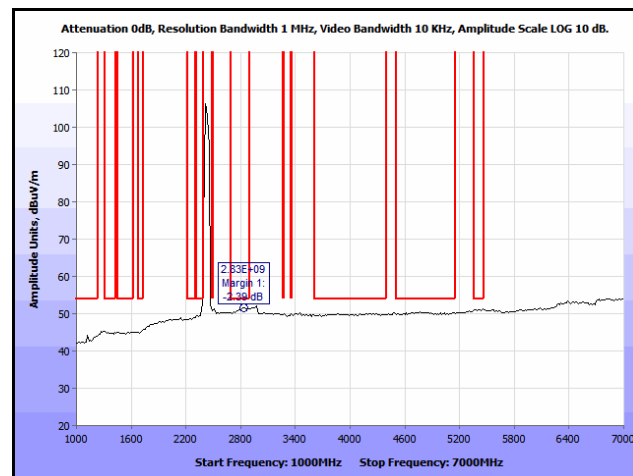
Plot 560. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 2412 & 2412 MHz, 1 GHz – 7 GHz, Peak



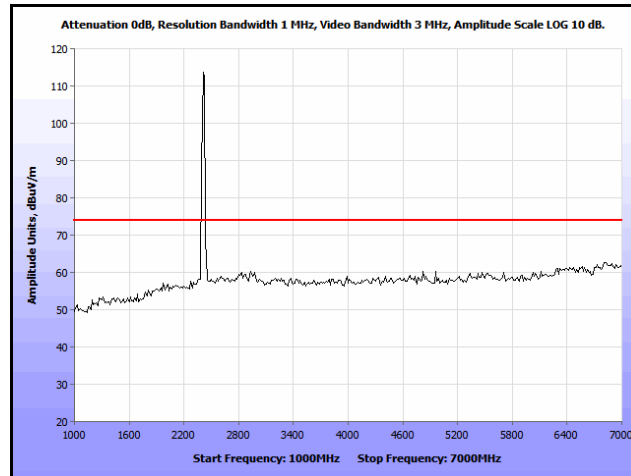
Plot 561. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 2412 & 2412 MHz, 7 GHz – 18 GHz, Peak



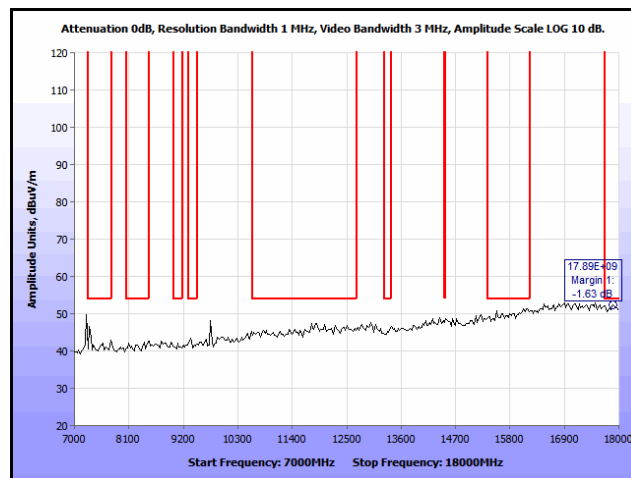
Plot 562. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 2412 & 2437 MHz, 30 MHz – 1 GHz



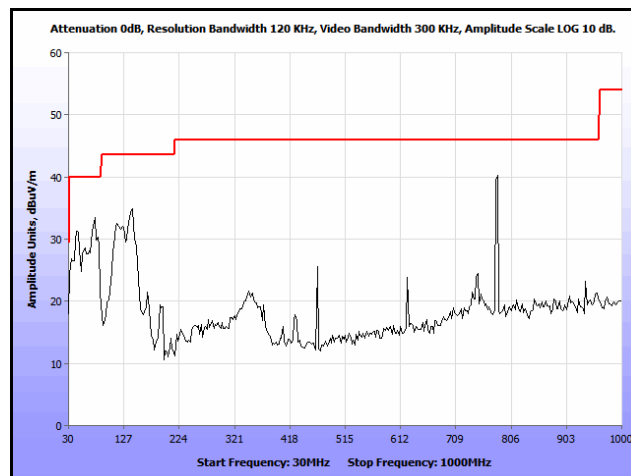
Plot 563. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 2412 & 2437 MHz, 1 GHz – 7 GHz, Avg.



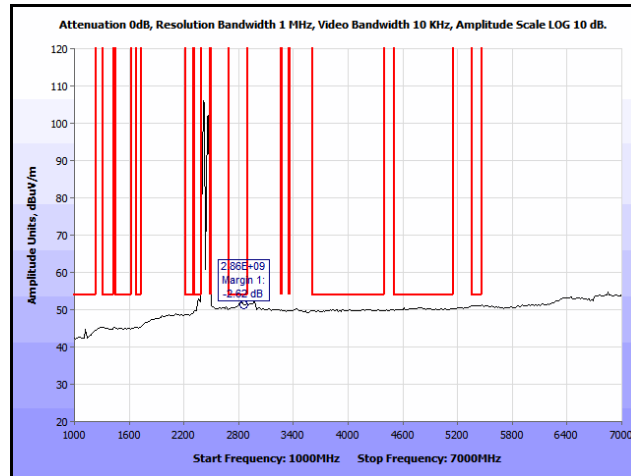
Plot 564. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 2412 & 2437 MHz, 1 GHz – 7 GHz, Peak



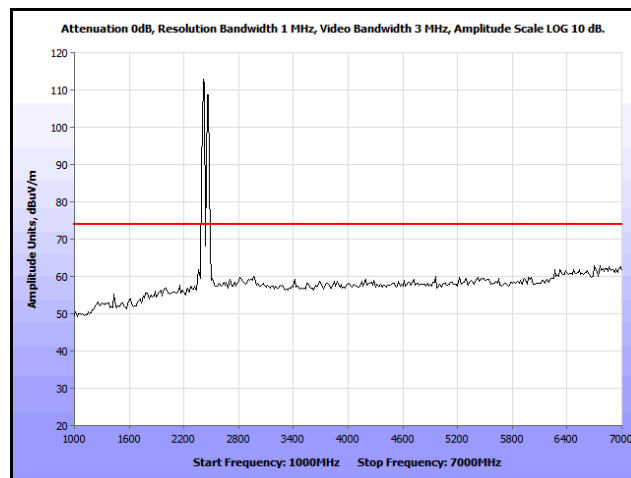
Plot 565. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 2412 & 2437 MHz, 7 GHz – 18 GHz, Peak



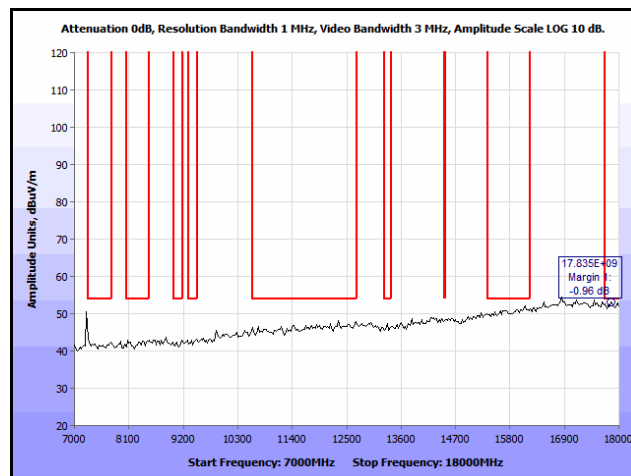
Plot 566. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 2412 & 2462 MHz, 30 MHz – 1 GHz



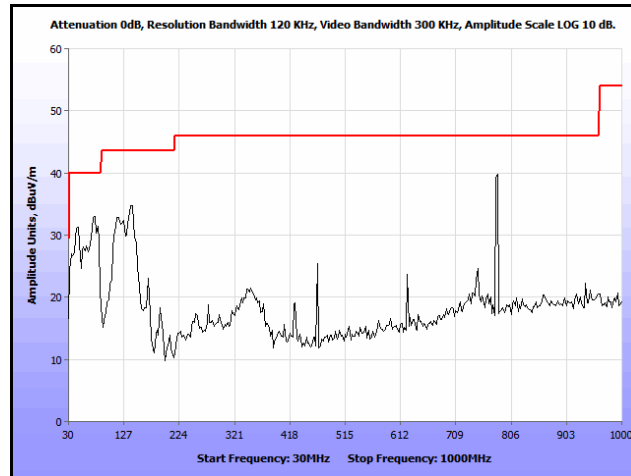
Plot 567. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 2412 & 2462 MHz, 1 GHz – 7 GHz, Avg.



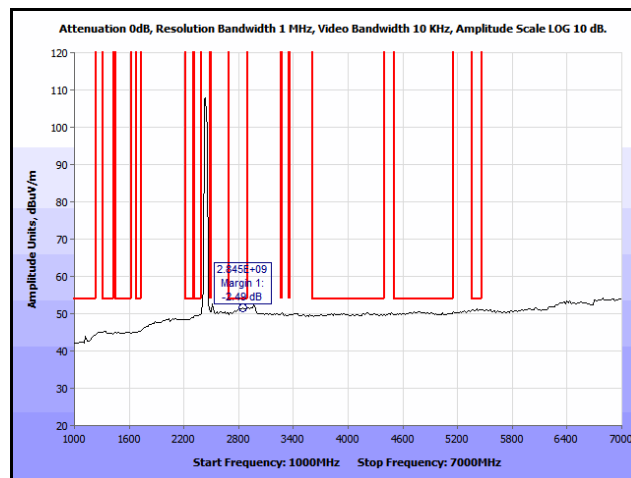
Plot 568. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 2412 & 2462 MHz, 1 GHz – 7 GHz, Peak



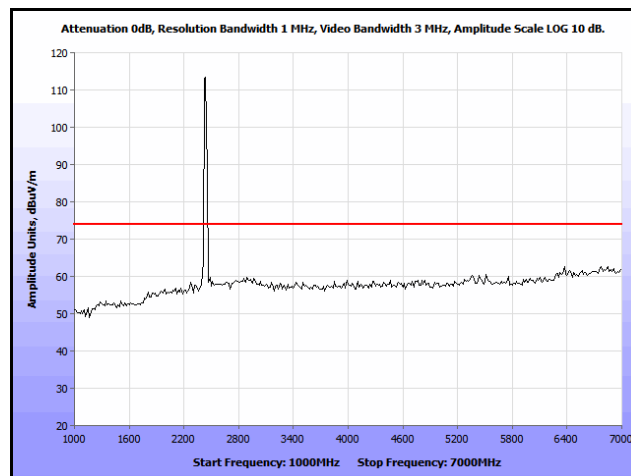
Plot 569. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 2412 & 2462 MHz, 7 GHz – 18 GHz, Peak



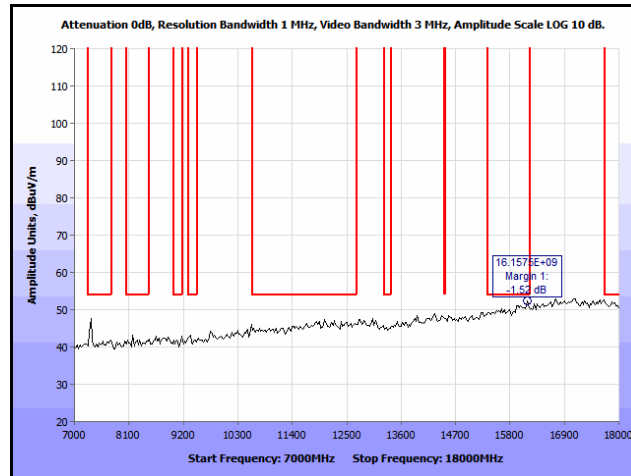
Plot 570. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 2437 & 2437 MHz, 30 MHz – 1 GHz



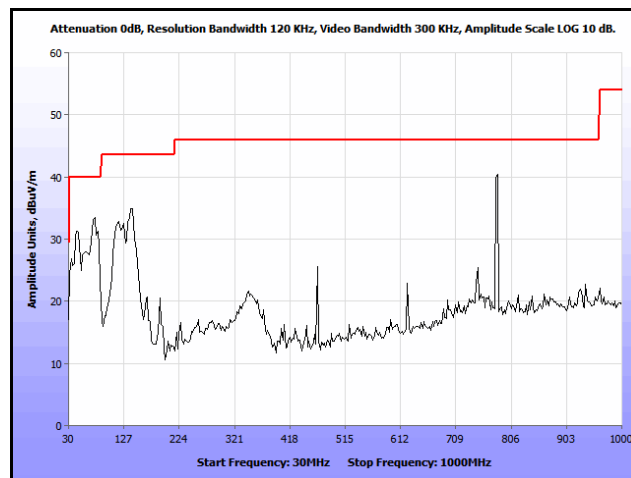
Plot 571. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 2437 & 2437 MHz, 1 GHz – 7 GHz, Avg.



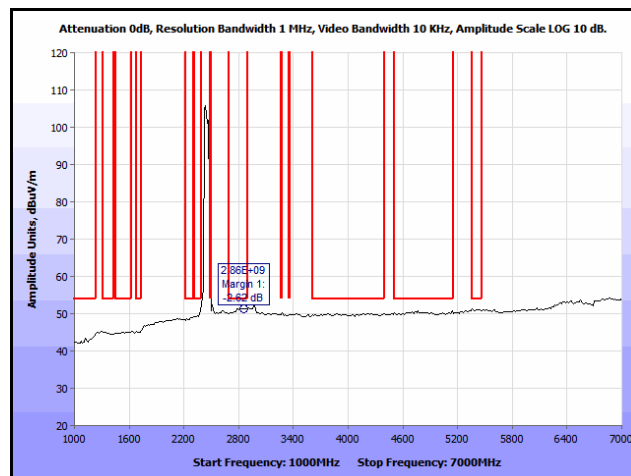
Plot 572. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 2437 & 2437 MHz, 1 GHz – 7 GHz, Peak



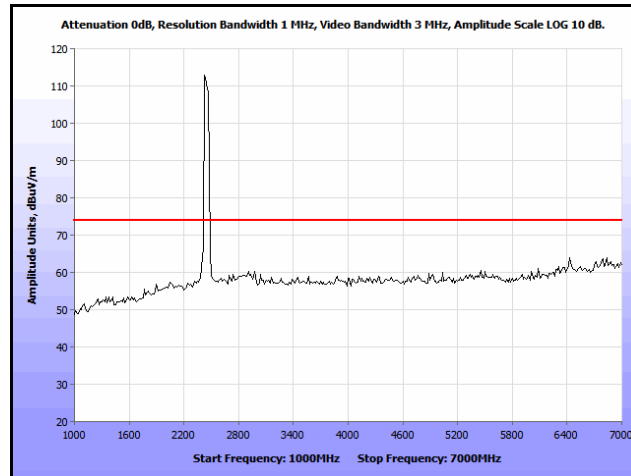
Plot 573. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 2437 & 2437 MHz, 7 GHz – 18 GHz, Peak



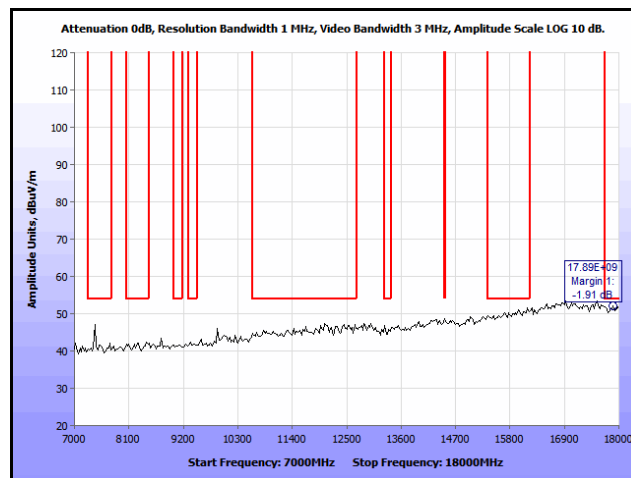
Plot 574. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 2437 & 2462 MHz, 30 MHz – 1 GHz



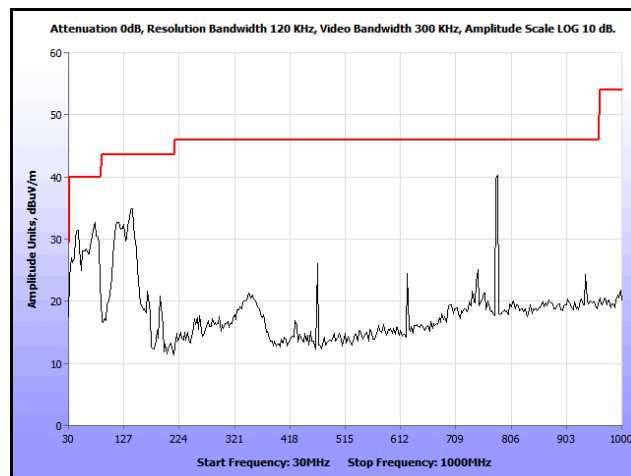
Plot 575. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 2437 & 2462 MHz, 1 GHz – 7 GHz, Avg.



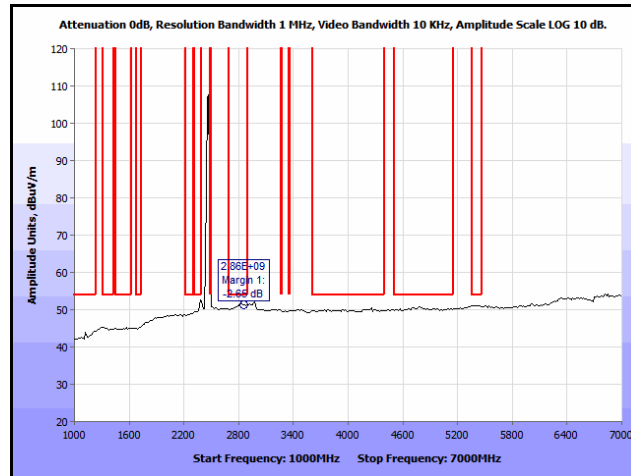
Plot 576. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 2437 & 2462 MHz, 1 GHz – 7 GHz, Peak



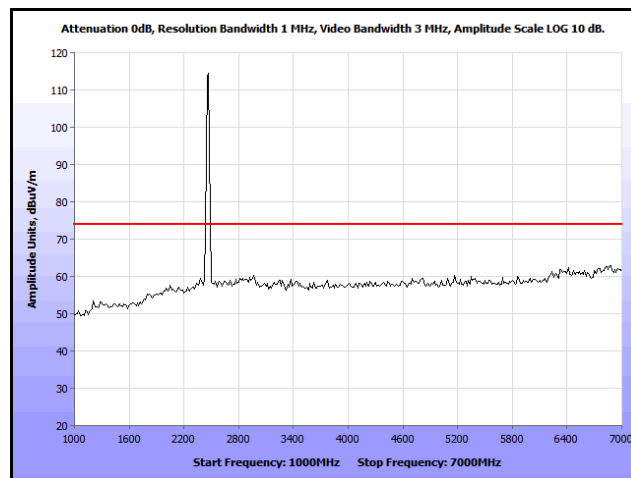
Plot 577. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 2437 & 2462 MHz, 7 GHz – 18 GHz, Avg.



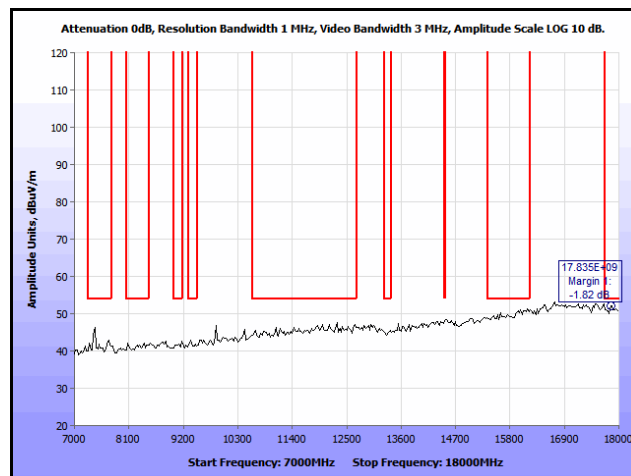
Plot 578. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 2462 & 2462 MHz, 30 MHz – 1 GHz



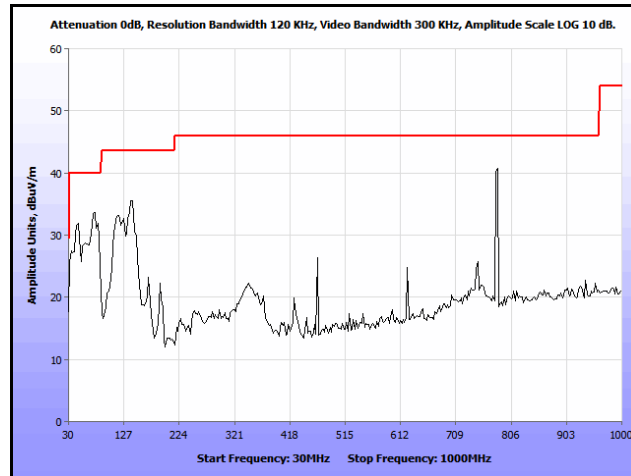
Plot 579. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 2462 & 2462 MHz, 1 GHz – 7 GHz, Avg.



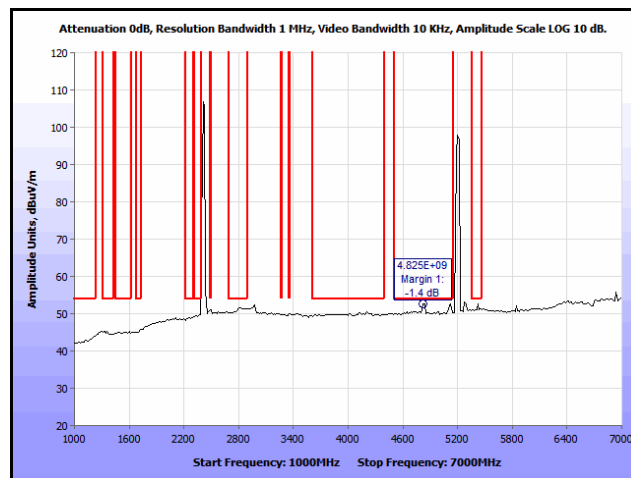
Plot 580. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 2462 & 2462 MHz, 1 GHz – 7 GHz, Peak



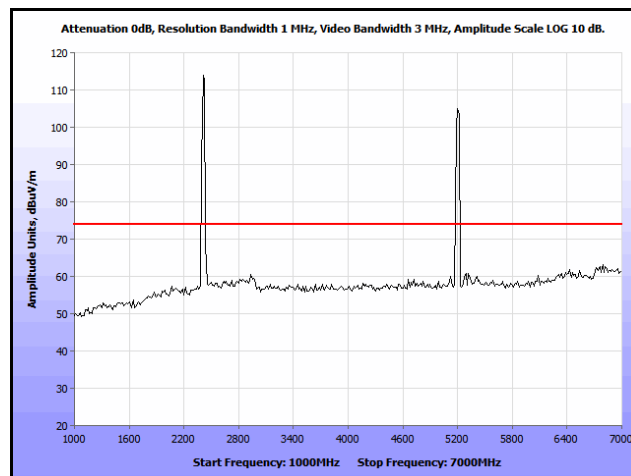
Plot 581. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 2462 & 2462 MHz, 7 GHz – 18 GHz, Peak



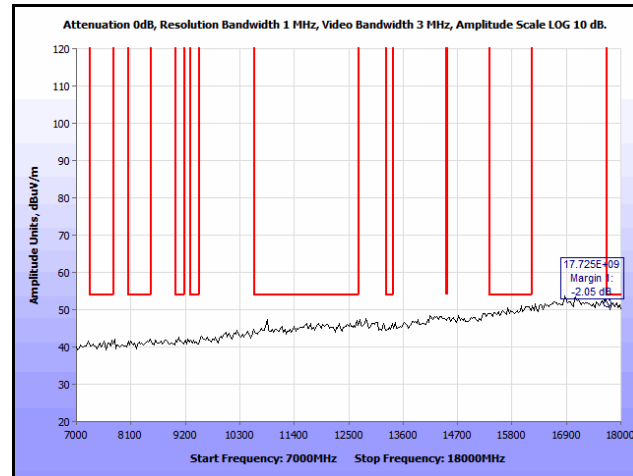
Plot 582. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 2412 & 5200 MHz, 30 MHz – 1 GHz



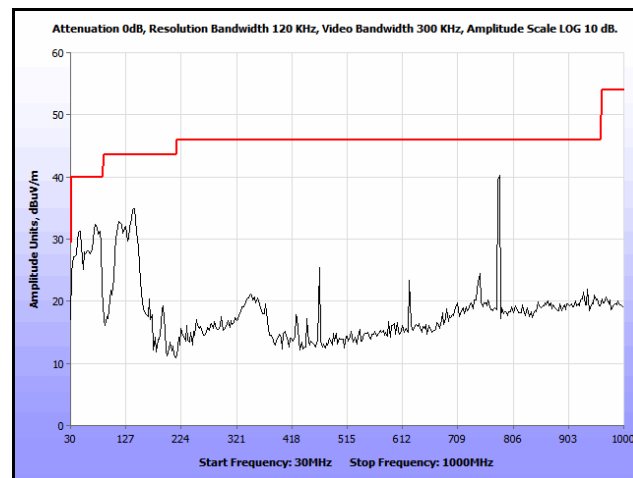
Plot 583. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 2412 & 5200 MHz, 1 GHz – 7 GHz, Avg.



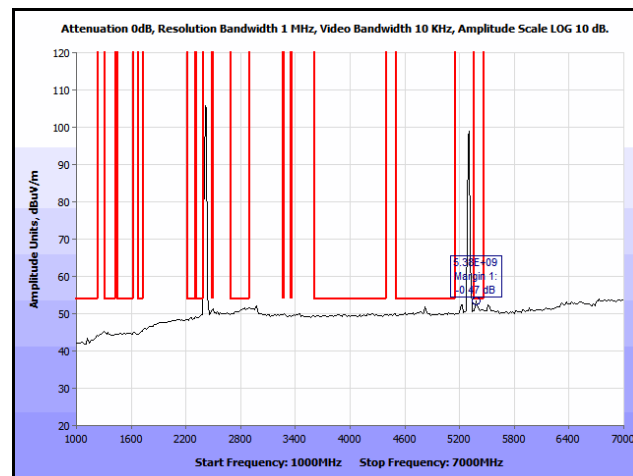
Plot 584. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 2412 & 5200 MHz, 1 GHz – 7 GHz, Peak



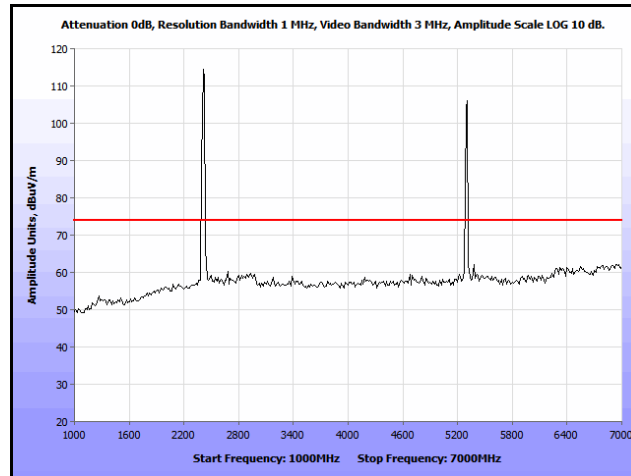
Plot 585. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 2412 & 5200 MHz, 7 GHz – 18 GHz, Peak



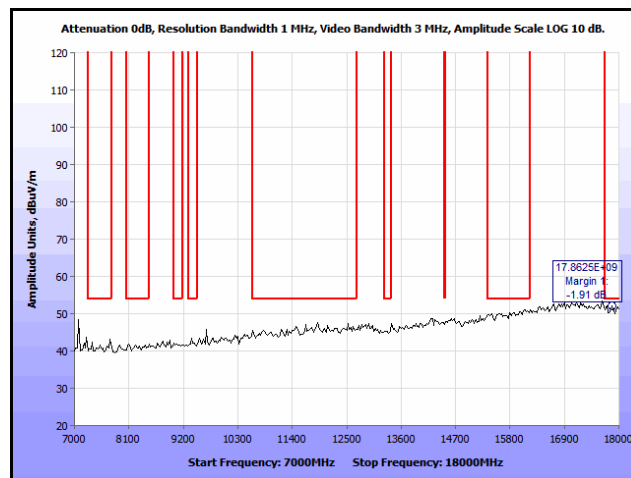
Plot 586. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 2412 & 5300 MHz, 30 MHz – 1 GHz



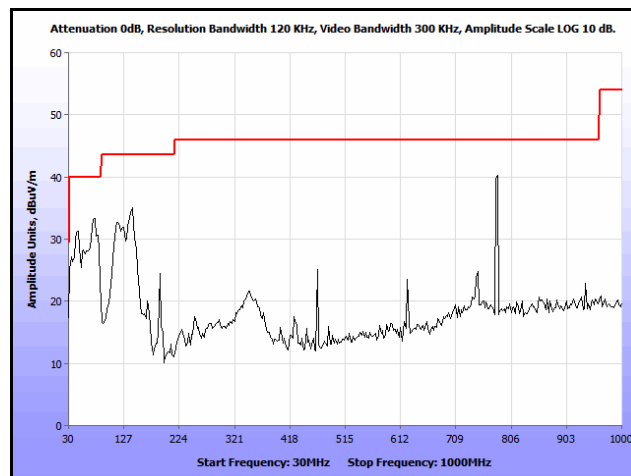
Plot 587. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 2412 & 5300 MHz, 1 GHz – 7 GHz, Avg.



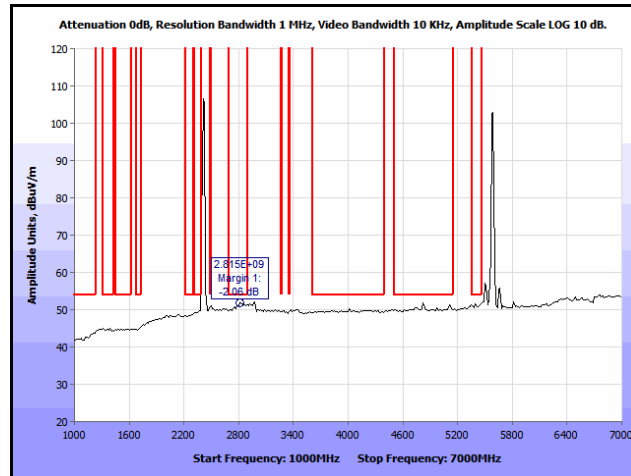
Plot 588. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 2412 & 5300 MHz, 1 GHz – 7 GHz, Peak



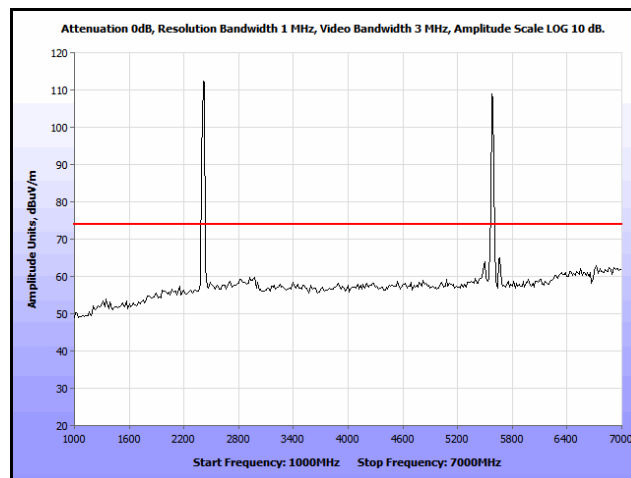
Plot 589. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 2412 & 5300 MHz, 7 GHz – 18 GHz, Peak



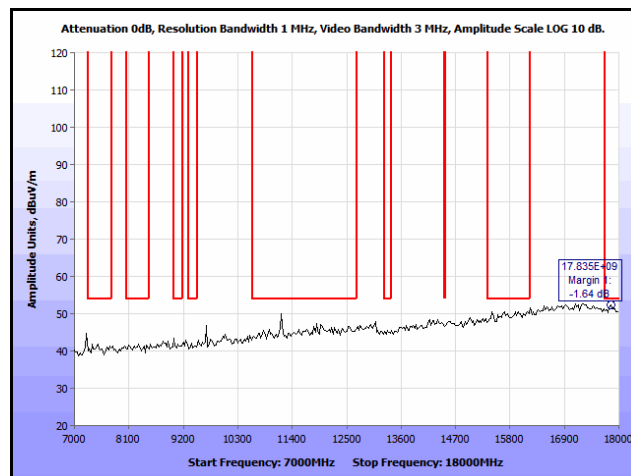
Plot 590. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 2412 & 5580 MHz, 30 MHz – 1 GHz



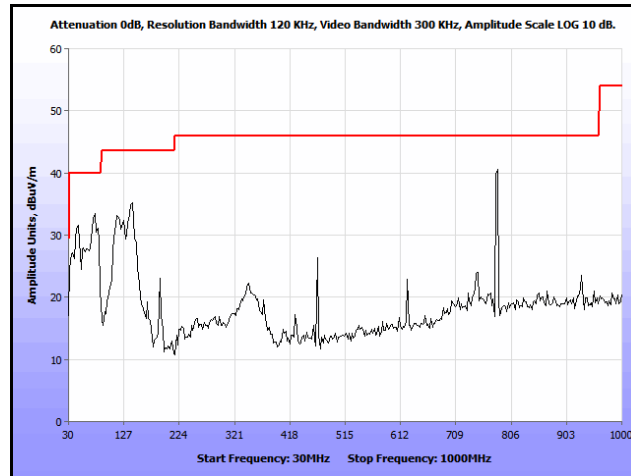
Plot 591. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 2412 & 5580 MHz, 1 GHz – 7 GHz, Avg.



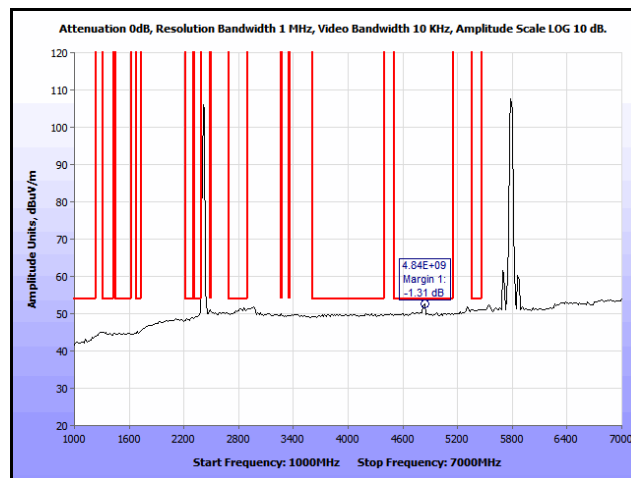
Plot 592. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 2412 & 5580 MHz, 1 GHz – 7 GHz, Peak



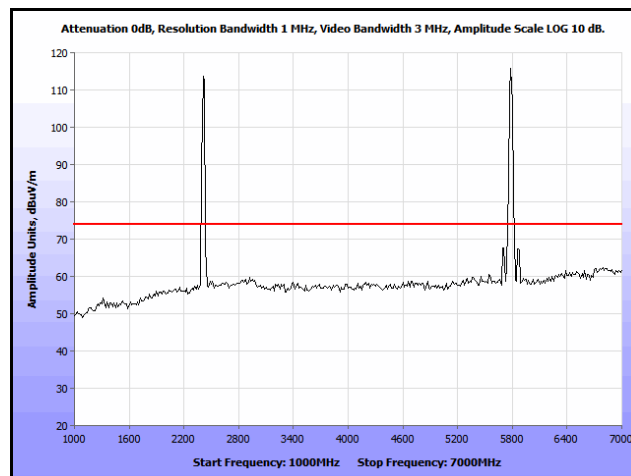
Plot 593. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 2412 & 5580 MHz, 7 GHz – 18 GHz, Peak



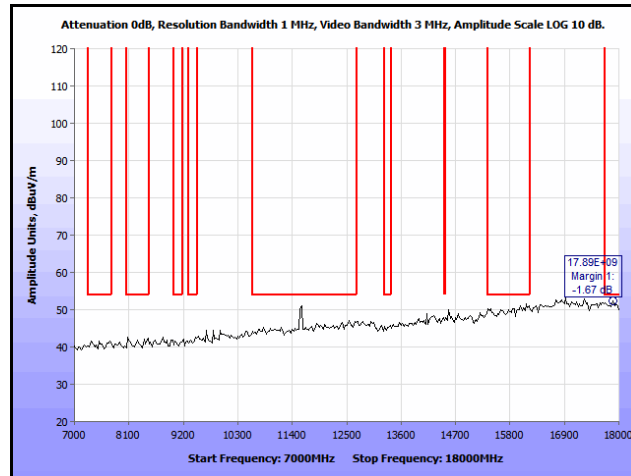
Plot 594. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 2412 & 5785 MHz, 30 MHz – 1 GHz



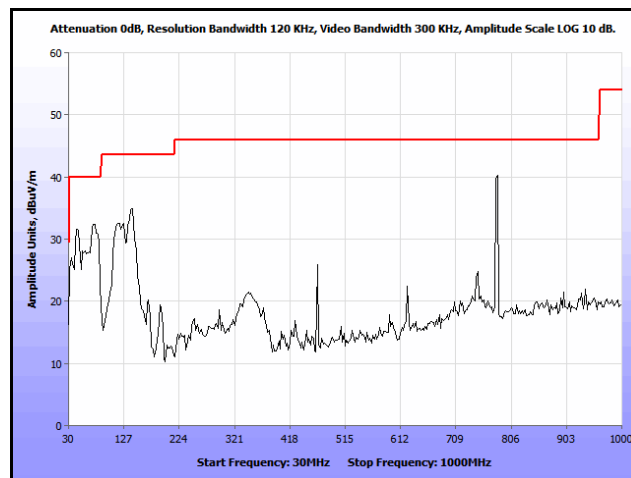
Plot 595. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 2412 & 5785 MHz, 1 GHz – 7 GHz, Avg.



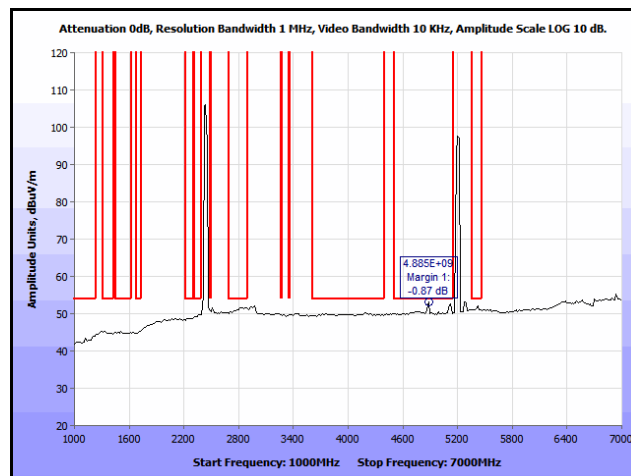
Plot 596. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 2412 & 5785 MHz, 1 GHz – 7 GHz, Peak



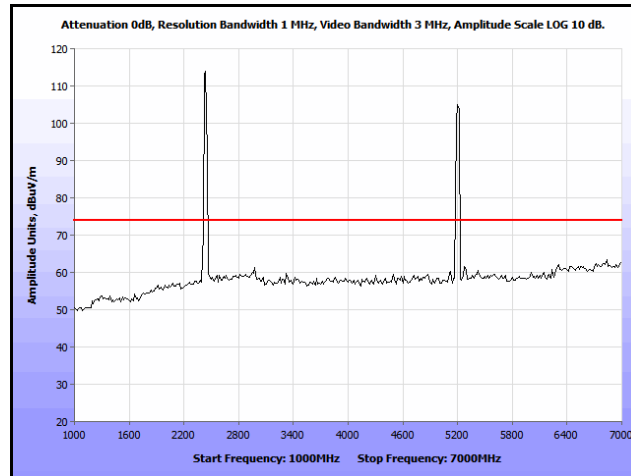
Plot 597. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 2412 & 5785 MHz, 7 GHz – 18 GHz, Peak



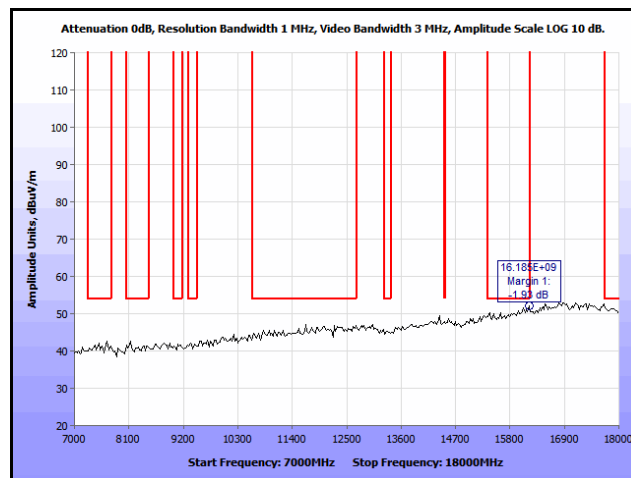
Plot 598. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 2437 & 5200 MHz, 30 MHz – 1 GHz



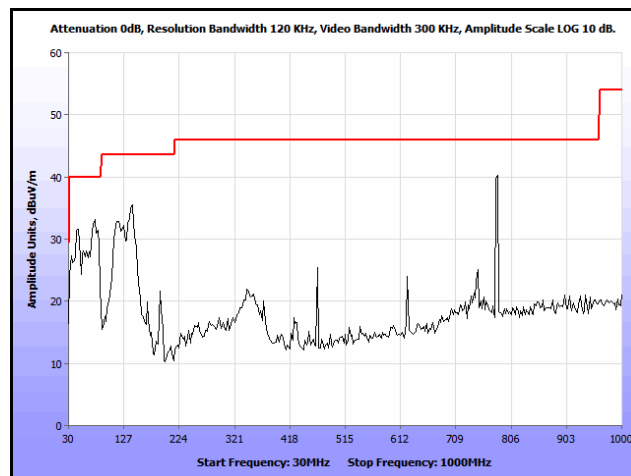
Plot 599. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 2437 & 5200 MHz, 1 GHz – 7 GHz, Avg.



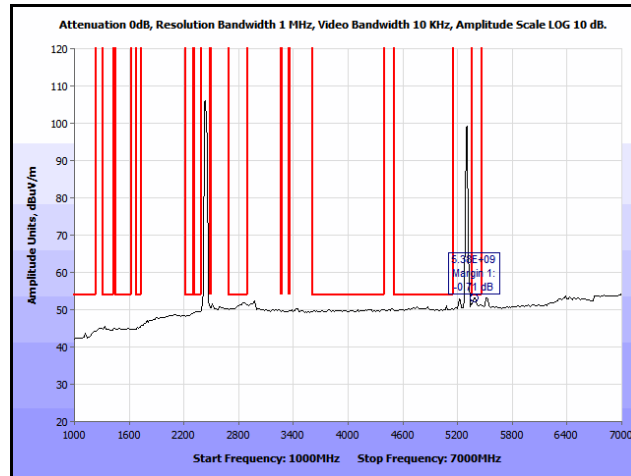
Plot 600. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 2437 & 5200 MHz, 1 GHz – 7 GHz, Peak



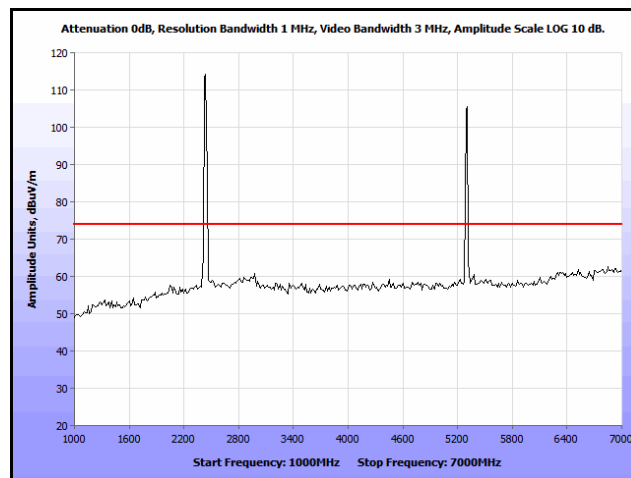
Plot 601. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 2437 & 5200 MHz, 7 GHz – 18 GHz, Peak



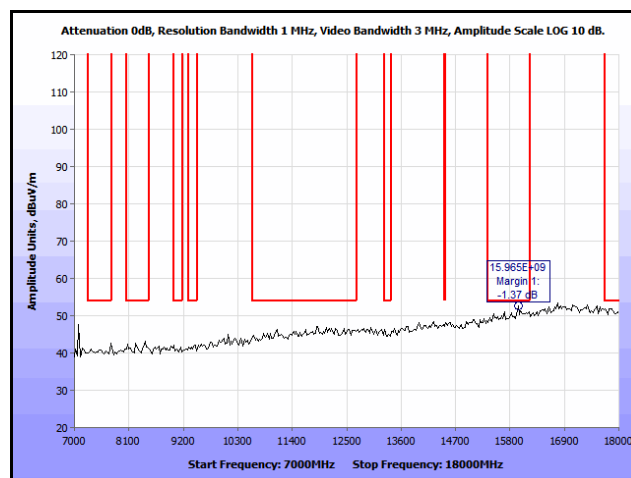
Plot 602. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 2437 & 5300 MHz, 30 MHz – 1 GHz



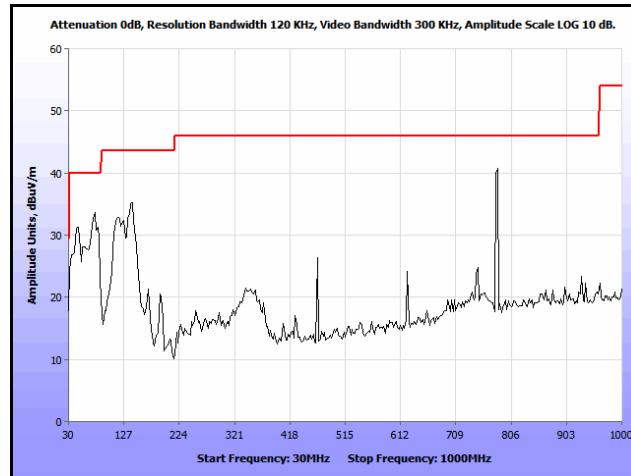
Plot 603. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 2437 & 5300 MHz, 1 GHz – 7 GHz, Avg.



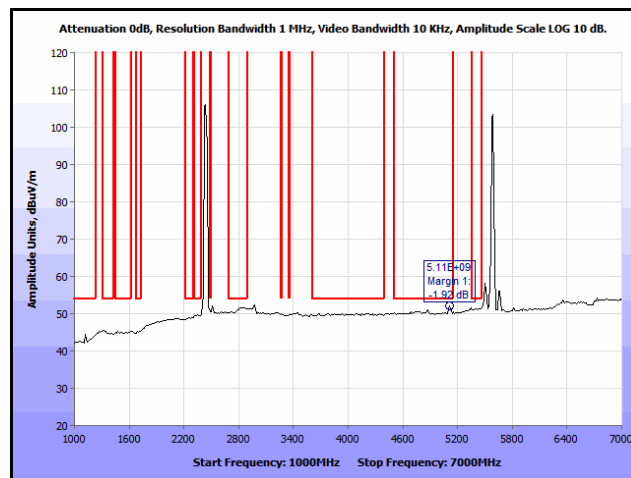
Plot 604. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 2437 & 5300 MHz, 1 GHz – 7 GHz, Peak



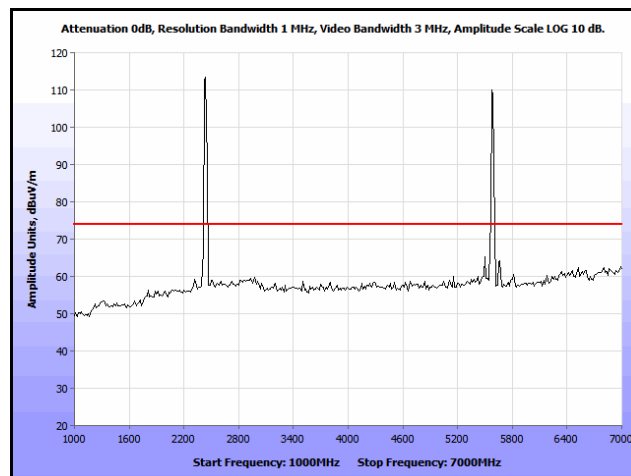
Plot 605. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 2437 & 5300 MHz, 7 GHz – 18 GHz, Peak



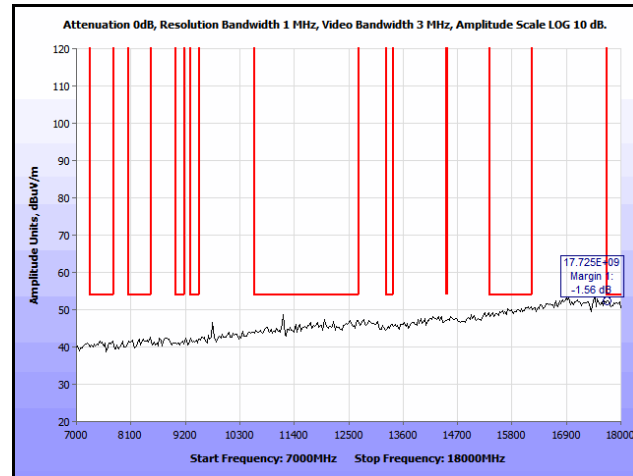
Plot 606. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 2437 & 5580 MHz, 30 MHz – 1 GHz



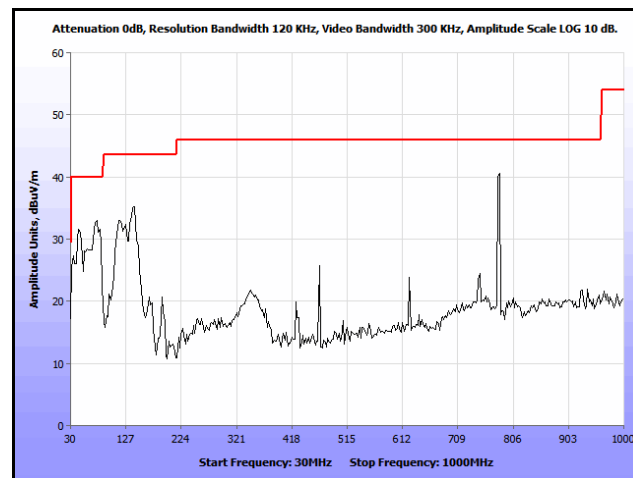
Plot 607. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 2437 & 5580 MHz, 1 GHz – 7 GHz, Avg.



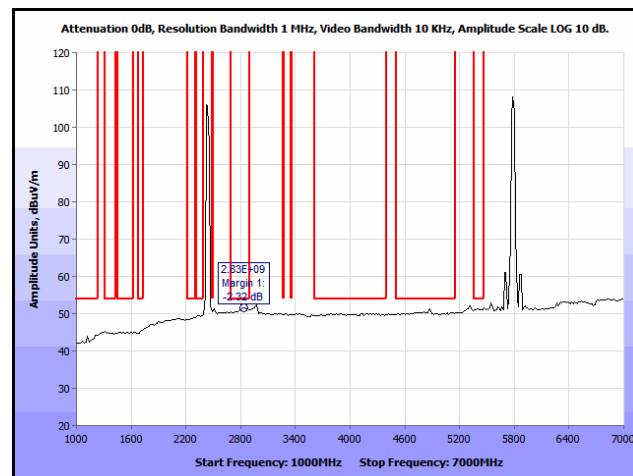
Plot 608. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 2437 & 5580 MHz, 1 GHz – 7 GHz, Peak



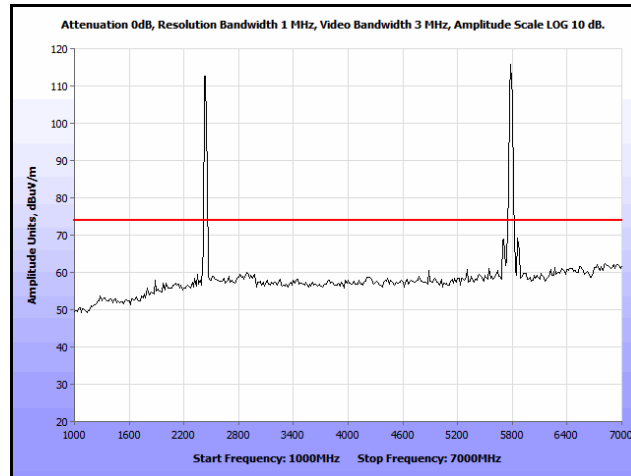
Plot 609. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 2437 & 5580 MHz, 7 GHz – 18 GHz, Peak



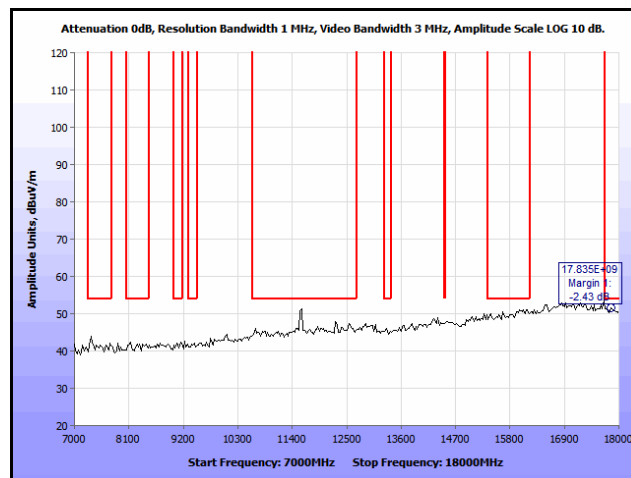
Plot 610. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 2437 & 5785 MHz, 30 MHz – 1 GHz



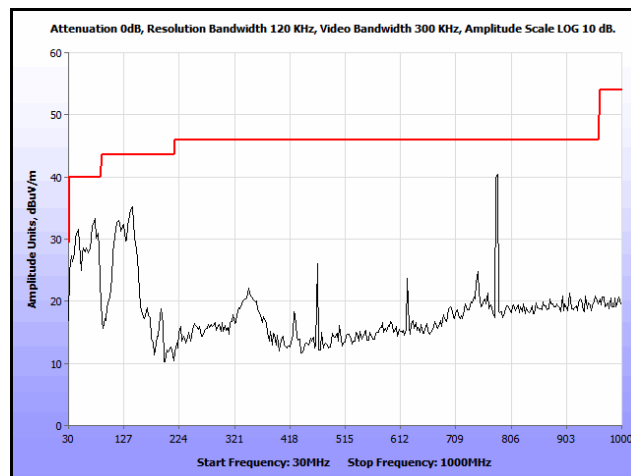
Plot 611. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 2437 & 5785 MHz, 1 GHz – 7 GHz, Avg.



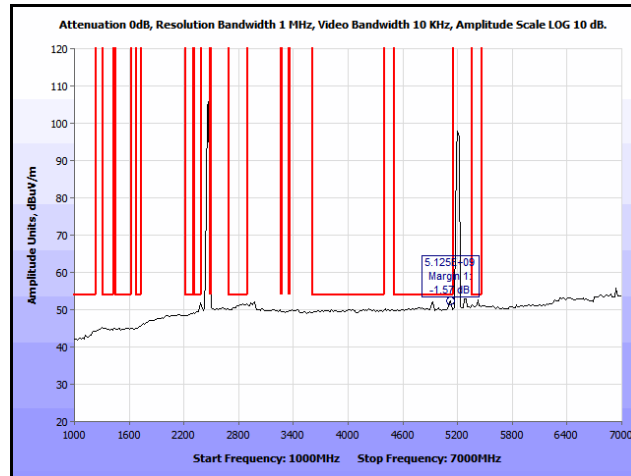
Plot 612. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 2437 & 5785 MHz, 1 GHz – 7 GHz, Peak



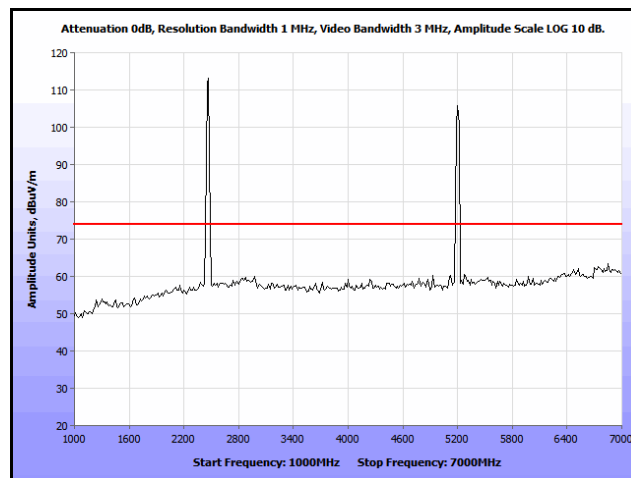
Plot 613. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 2437 & 5785 MHz, 7 GHz – 18 GHz, Peak



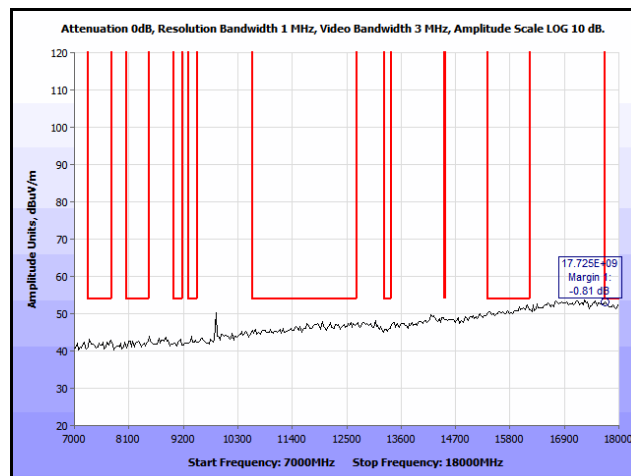
Plot 614. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 2462 & 5200 MHz, 30 MHz – 1 GHz



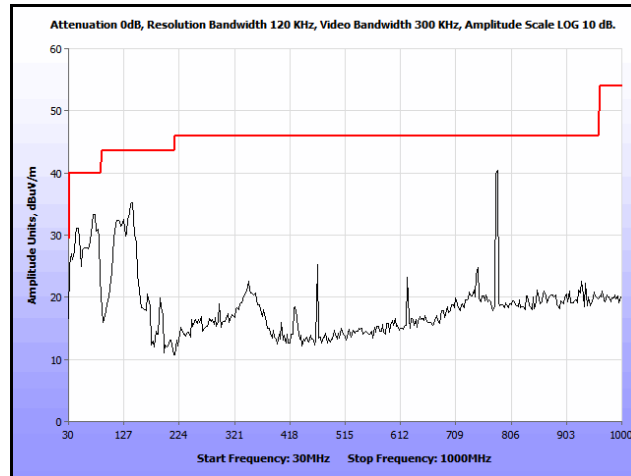
Plot 615. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 2462 & 5200 MHz, 1 GHz – 7 GHz, Avg.



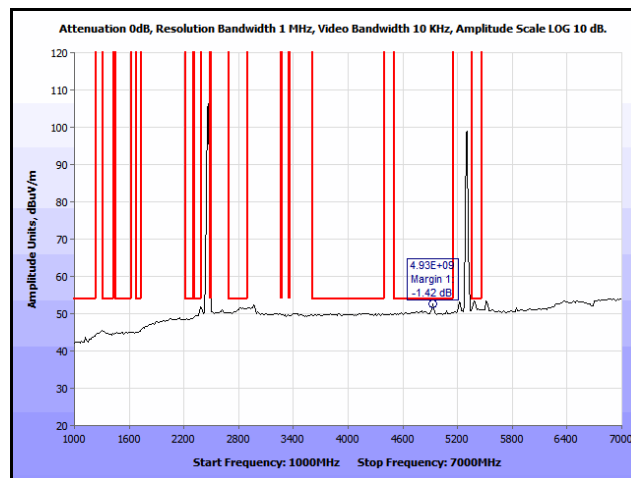
Plot 616. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 2462 & 5200 MHz, 1 GHz – 7 GHz, Peak



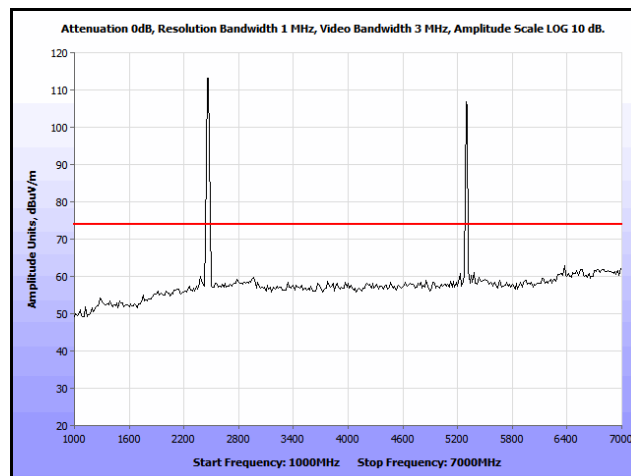
Plot 617. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 2462 & 5200 MHz, 7 GHz – 18 GHz, Peak



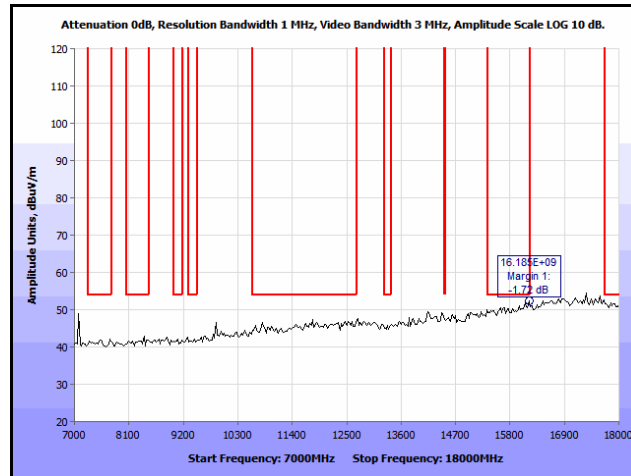
Plot 618. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 2462 & 5300 MHz, 30 MHz – 1 GHz



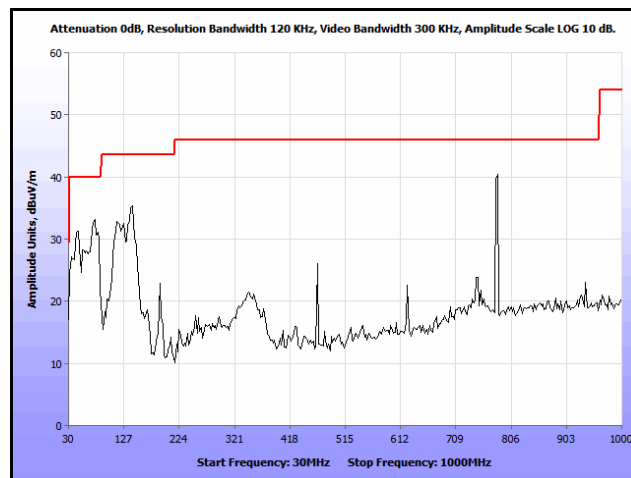
Plot 619. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 2462 & 5300 MHz, 1 GHz – 7 GHz, Avg.



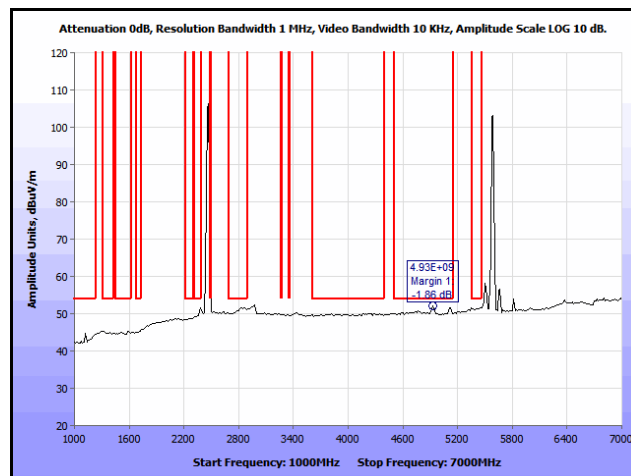
Plot 620. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 2462 & 5300 MHz, 1 GHz – 7 GHz, Peak



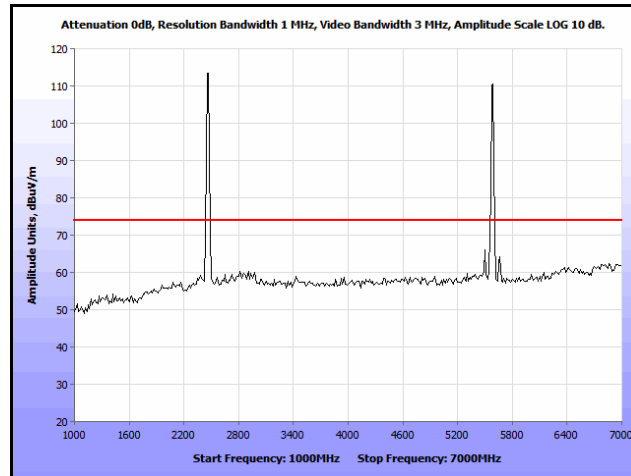
Plot 621. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 2462 & 5300 MHz, 7 GHz – 18 GHz, Peak



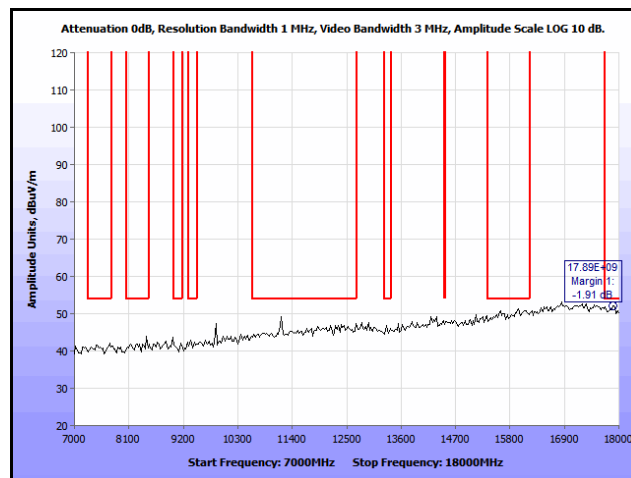
Plot 622. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 2462 & 5580 MHz, 30 MHz – 1 GHz



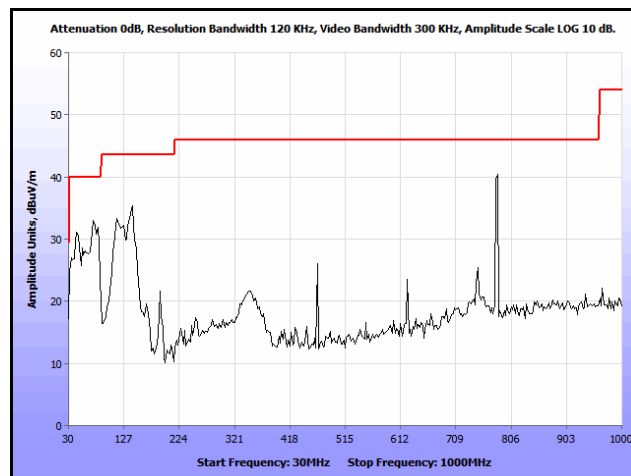
Plot 623. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 2462 & 5580 MHz, 1 GHz – 7 GHz, Avg.



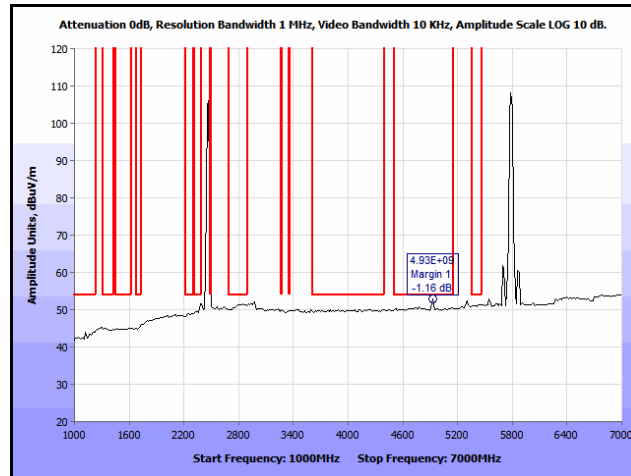
Plot 624. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 2462 & 5580 MHz, 1 GHz – 7 GHz, Peak



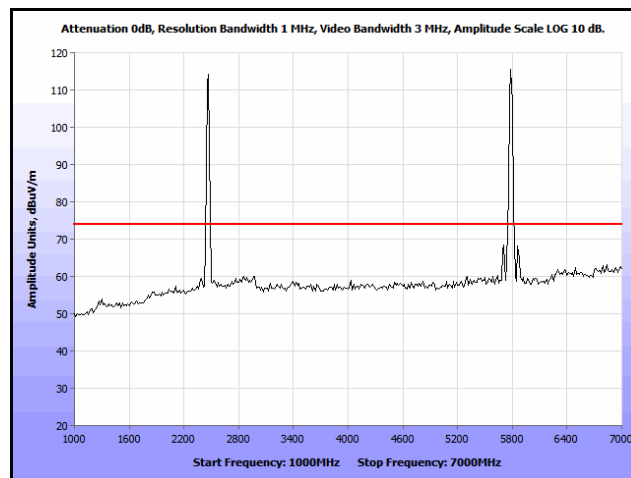
Plot 625. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 2462 & 5580 MHz, 7 GHz – 18 GHz, Peak



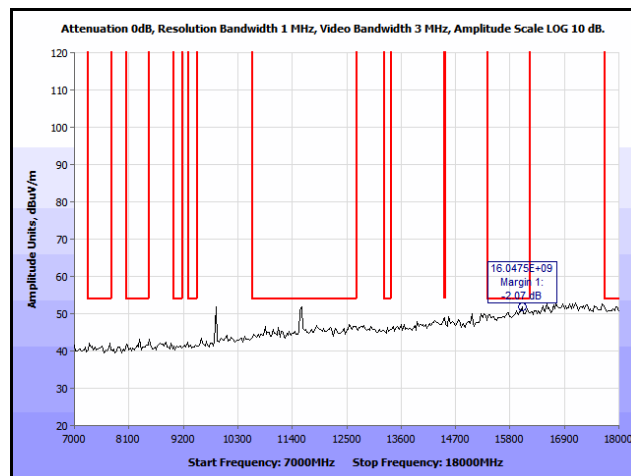
Plot 626. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 2462 & 5785 MHz, 30 MHz – 1 GHz



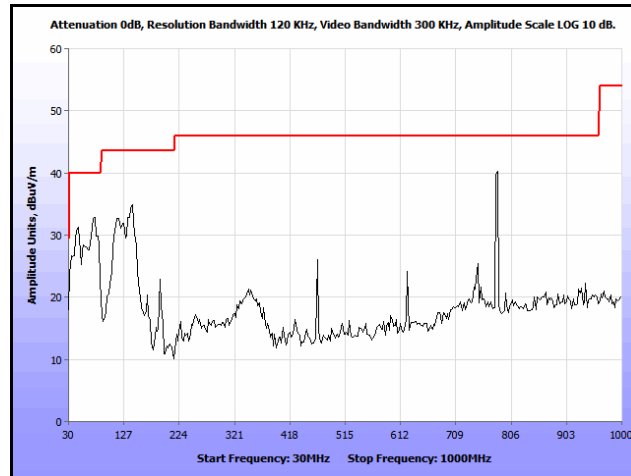
Plot 627. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 2462 & 5785 MHz, 1 GHz – 7 GHz, Avg.



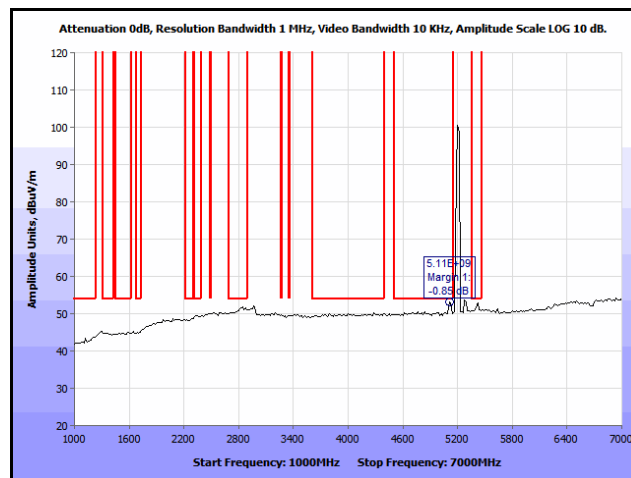
Plot 628. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 2462 & 5785 MHz, 1 GHz – 7 GHz, Peak



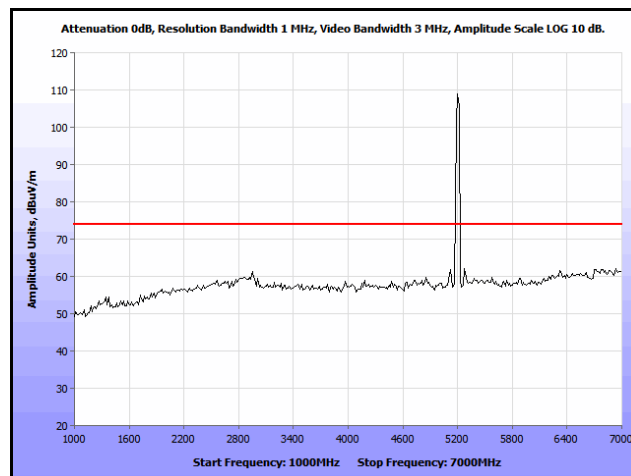
Plot 629. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 2462 & 5785 MHz, 7 GHz – 18 GHz, Peak



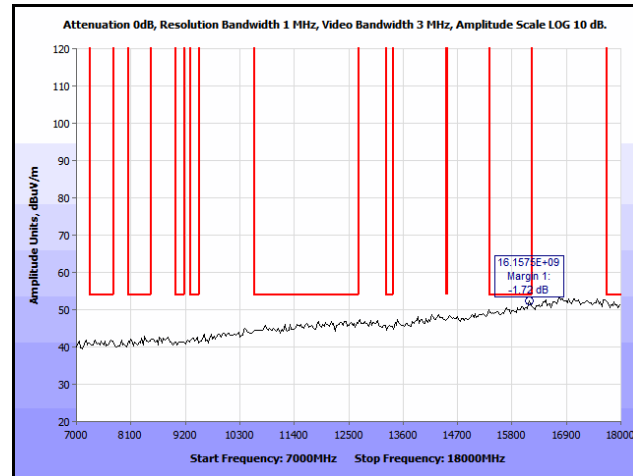
Plot 630. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 5200 & 5200 MHz, 30 MHz – 1 GHz



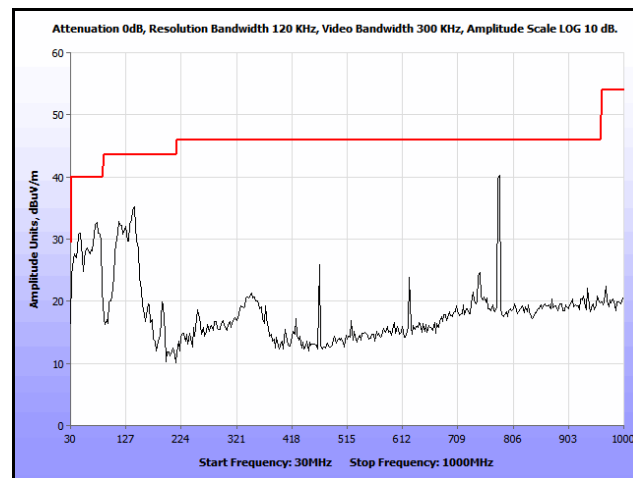
Plot 631. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 5200 & 5200 MHz, 1 GHz – 7 GHz, Avg.



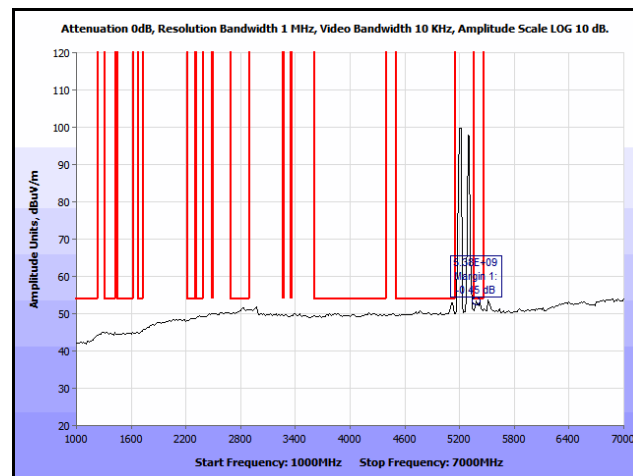
Plot 632. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 5200 & 5200 MHz, 1 GHz – 7 GHz, Peak



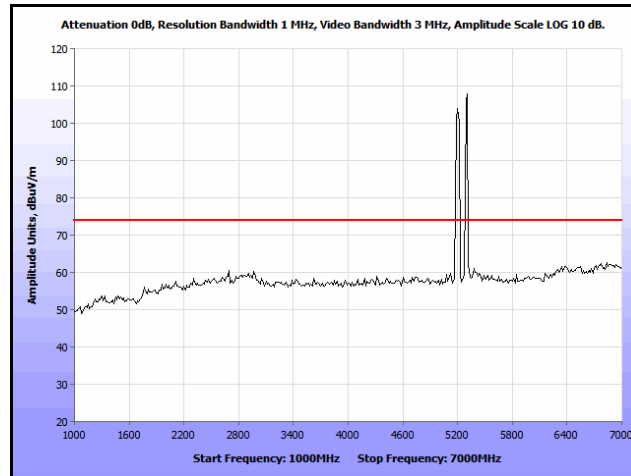
Plot 633. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 5200 & 5200 MHz, 7 GHz – 18 GHz, Peak



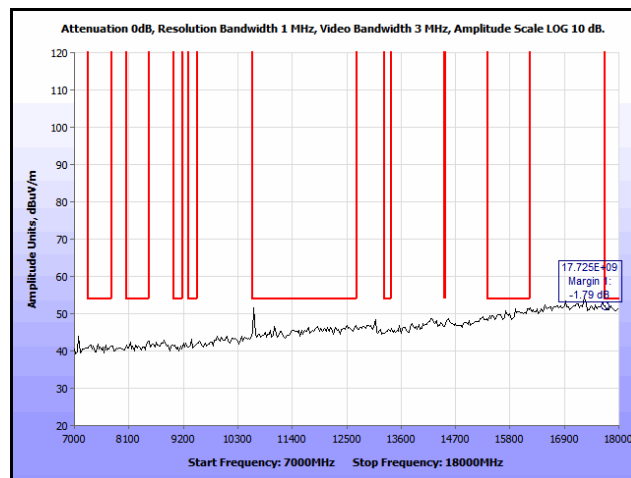
Plot 634. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 5200 & 5300 MHz, 30 MHz – 1 GHz



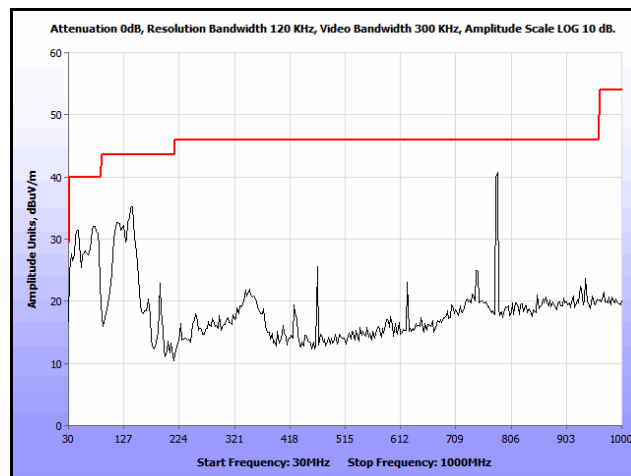
Plot 635. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 5200 & 5300 MHz, 1 GHz – 7 GHz, Avg.



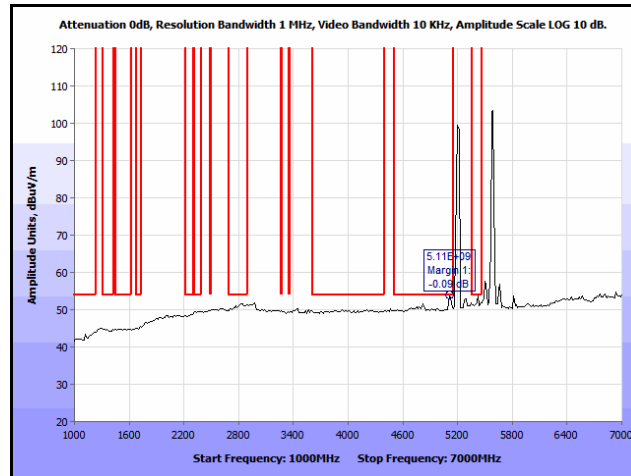
Plot 636. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 5200 & 5300 MHz, 1 GHz – 7 GHz, Peak



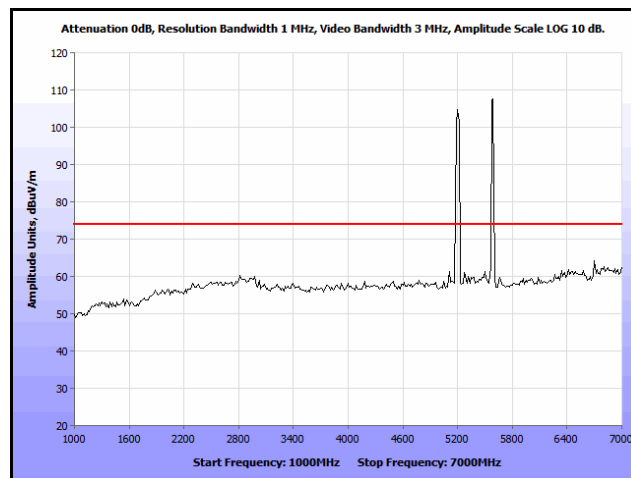
Plot 637. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 5200 & 5300 MHz, 7 GHz – 18 GHz, Peak



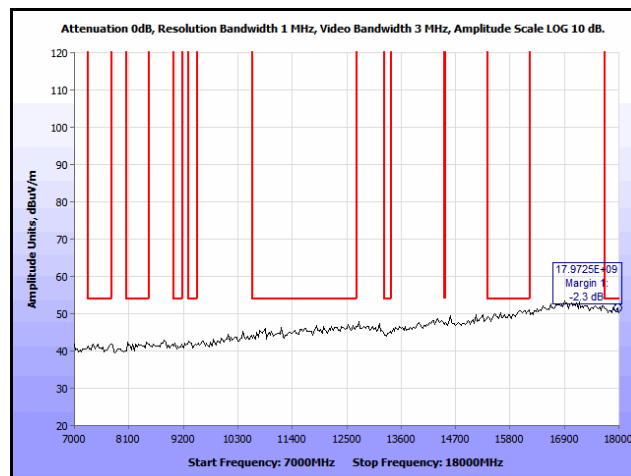
Plot 638. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 5200 & 5580 MHz, 30 MHz – 1 GHz



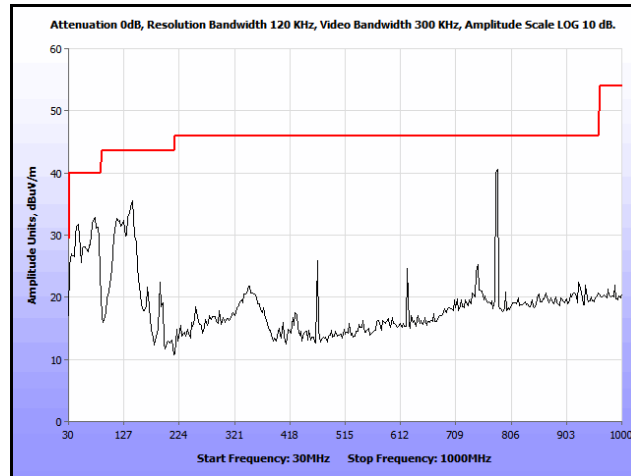
Plot 639. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 5200 & 5580 MHz, 1 GHz – 7 GHz, Avg.



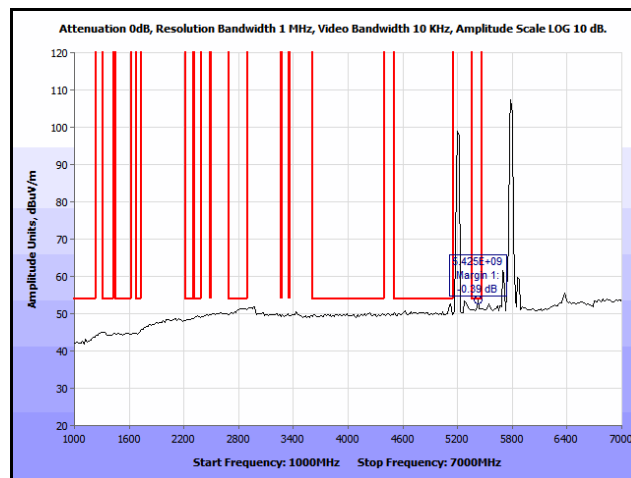
Plot 640. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 5200 & 5580 MHz, 1 GHz – 7 GHz, Peak



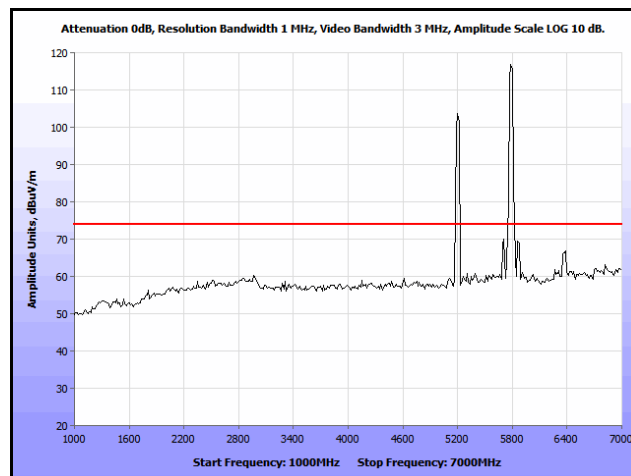
Plot 641. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 5200 & 5580 MHz, 7 GHz – 18 GHz, Peak



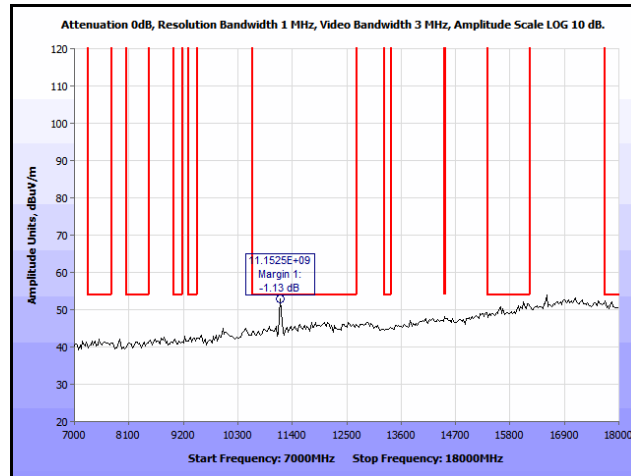
Plot 642. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 5200 & 5785 MHz, 30 MHz – 1 GHz



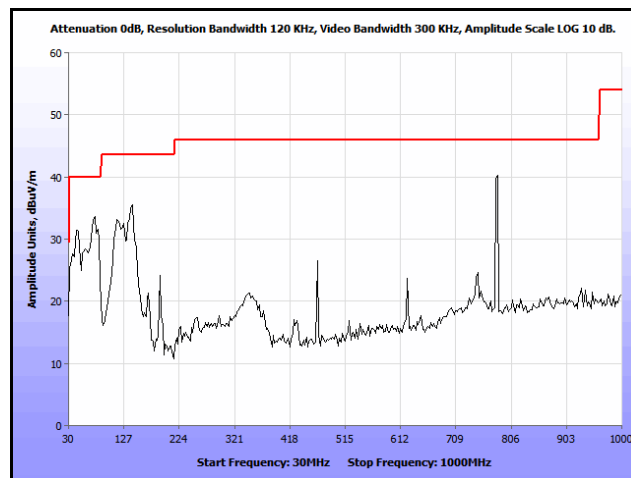
Plot 643. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 5200 & 5785 MHz, 1 GHz – 7 GHz, Avg.



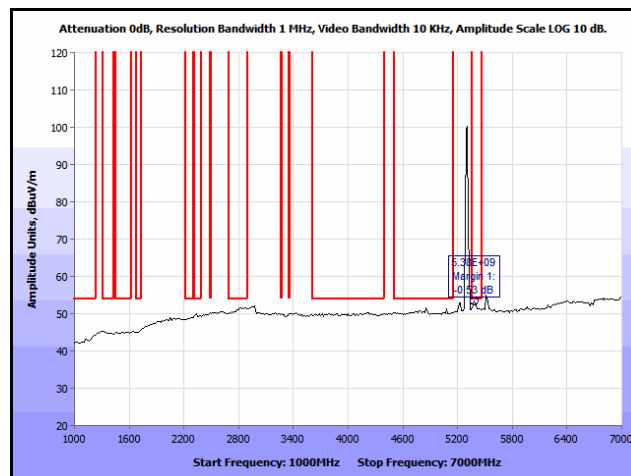
Plot 644. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 5200 & 5785 MHz, 1 GHz – 7 GHz, Peak



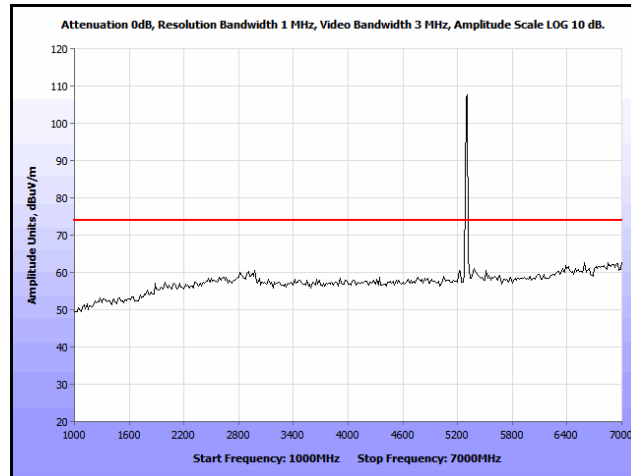
Plot 645. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 5200 & 5785 MHz, 7 GHz – 18 GHz, Peak



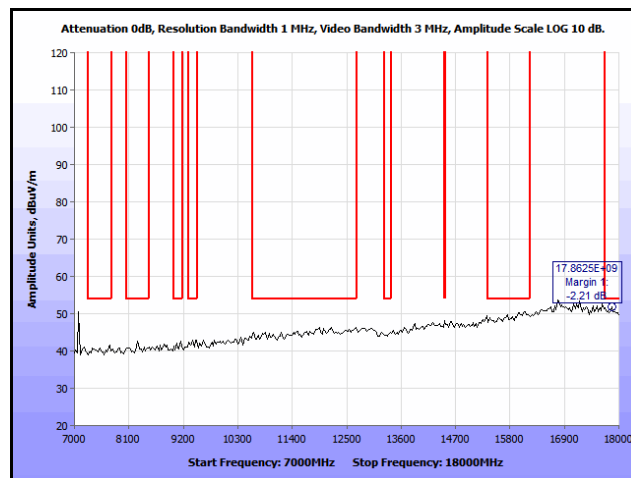
Plot 646. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 5300 & 5300 MHz, 30 MHz – 1 GHz



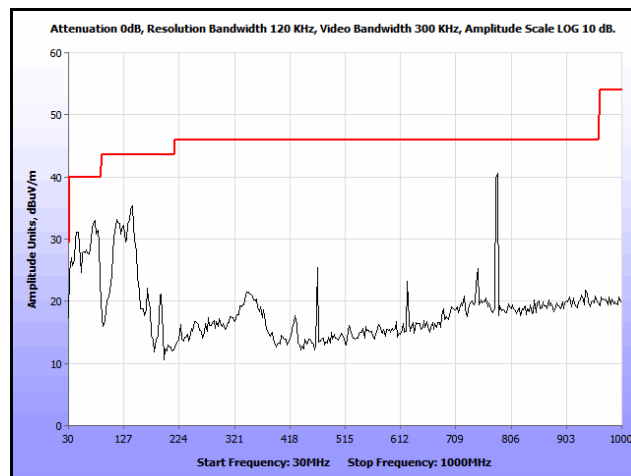
Plot 647. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 5300 & 5300 MHz, 1 GHz – 7 GHz, Avg.



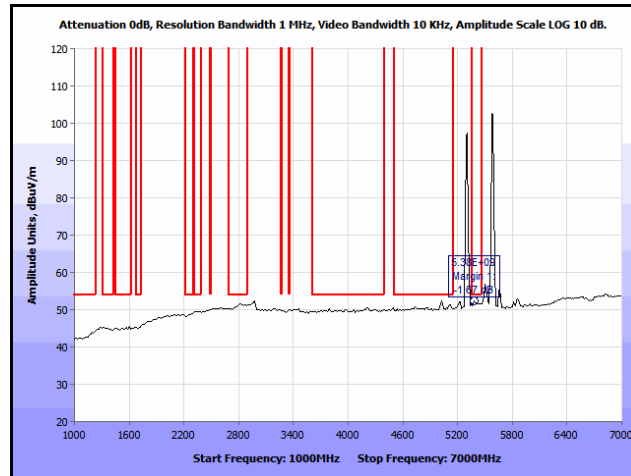
Plot 648. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 5300 & 5300 MHz, 1 GHz – 7 GHz, Peak



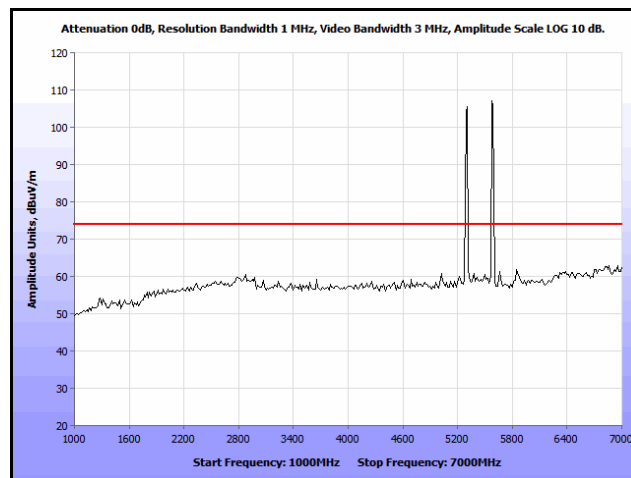
Plot 649. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 5300 & 5300 MHz, 7 GHz – 18 GHz, Peak



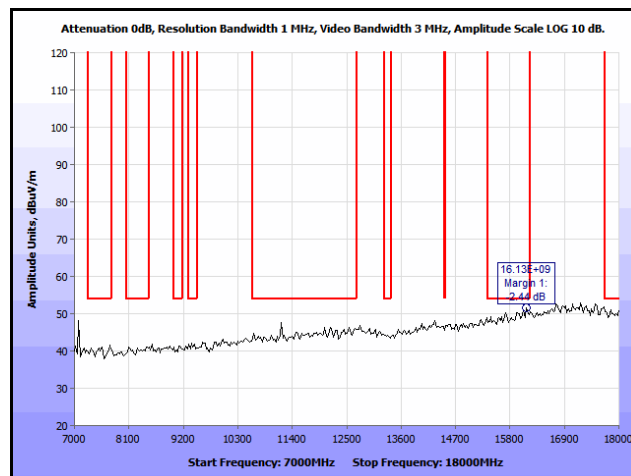
Plot 650. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 5300 & 5580 MHz, 30 MHz – 1 GHz



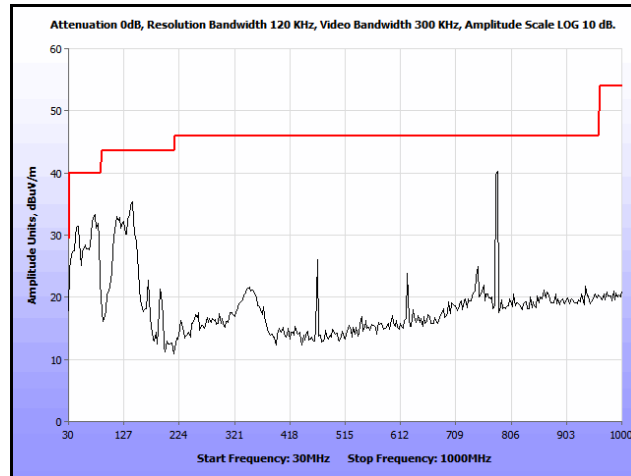
Plot 651. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 5300 & 5580 MHz, 1 GHz – 7 GHz, Avg.



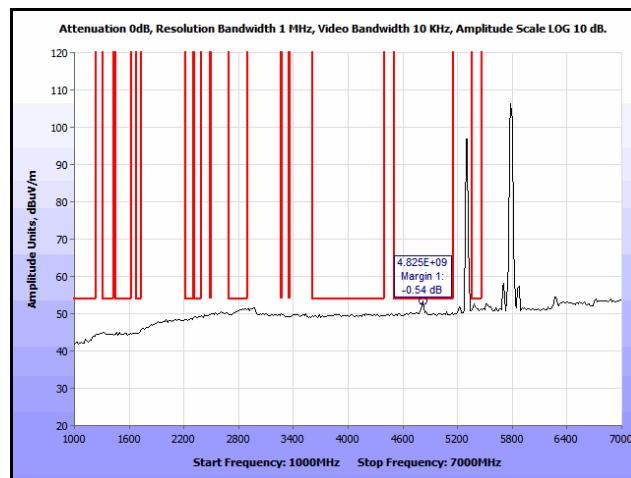
Plot 652. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 5300 & 5580 MHz, 1 GHz – 7 GHz, Peak



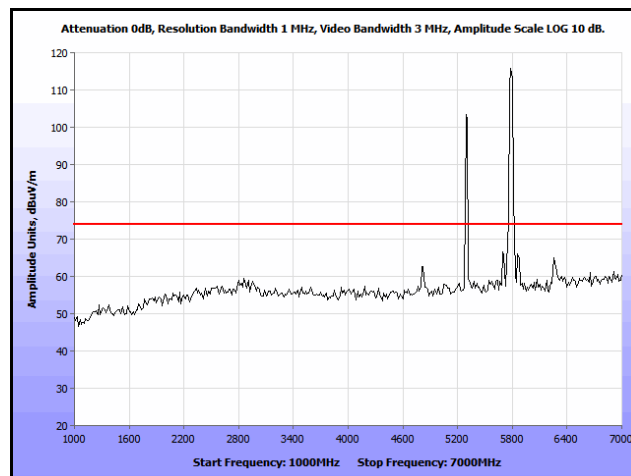
Plot 653. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 5300 & 5580 MHz, 7 GHz – 18 GHz, Peak



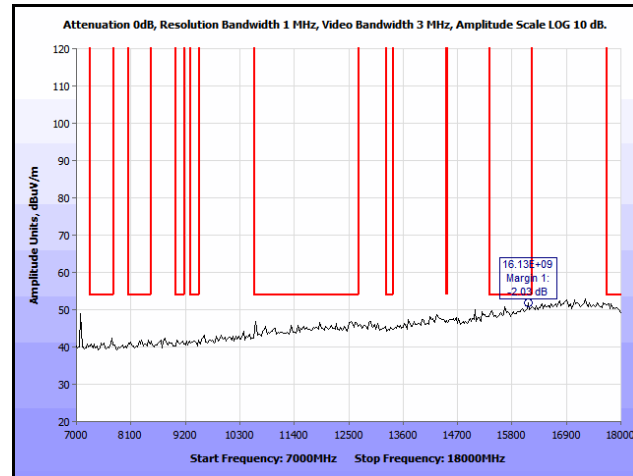
Plot 654. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 5300 & 5785 MHz, 30 MHz – 1 GHz



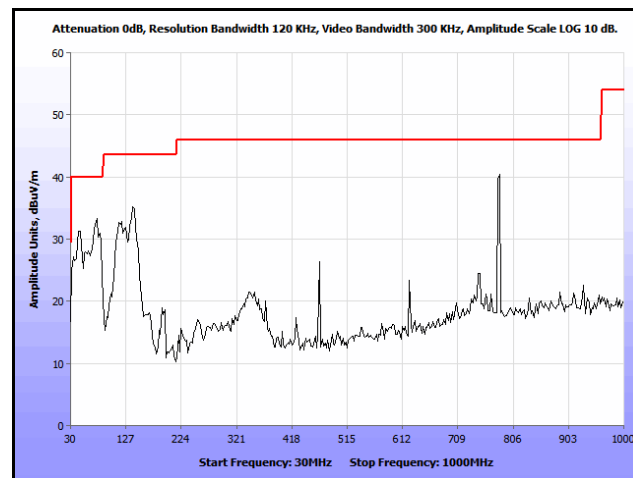
Plot 655. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 5300 & 5785 MHz, 1 GHz – 7 GHz, Avg.



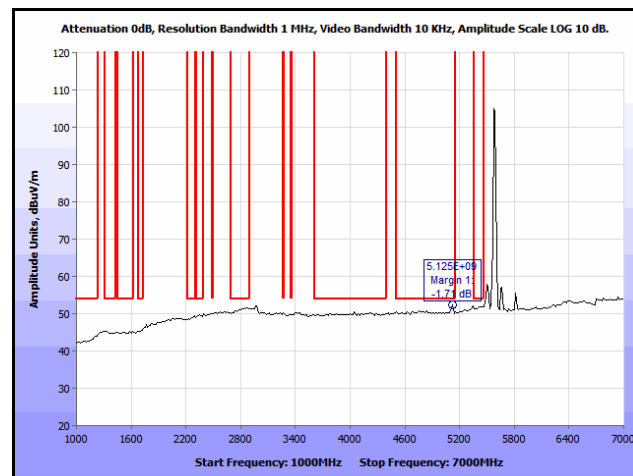
Plot 656. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 5300 & 5785 MHz, 1 GHz – 7 GHz, Peak



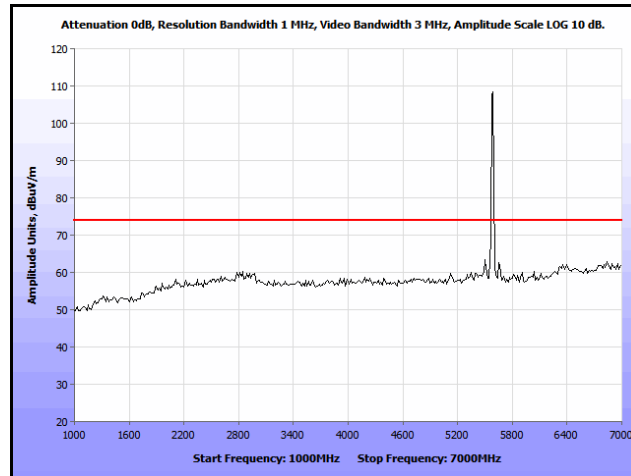
Plot 657. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 5300 & 5785 MHz, 7 GHz – 18 GHz, Peak



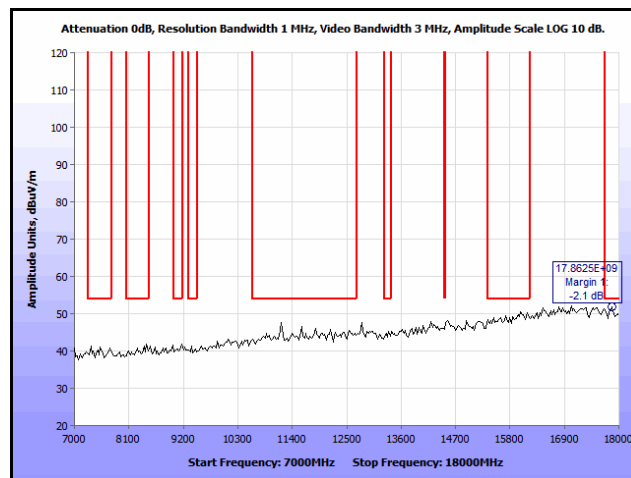
Plot 658. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 5580 & 5580 MHz, 30 MHz – 1 GHz



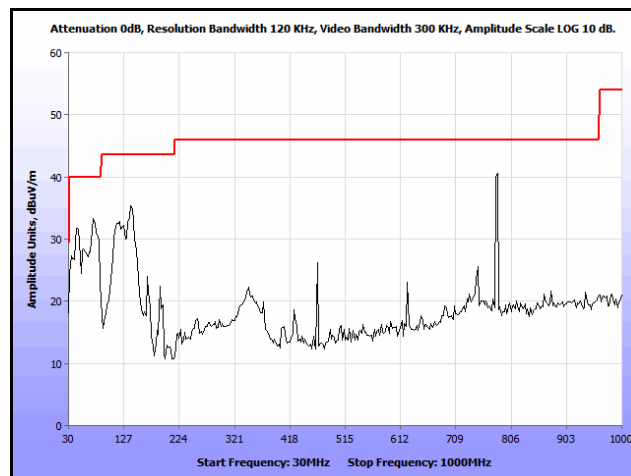
Plot 659. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 5580 & 5580 MHz, 1 GHz – 7 GHz, Avg.



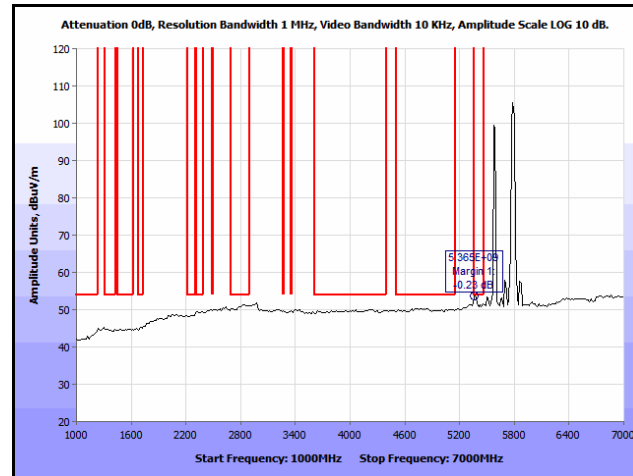
Plot 660. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 5580 & 5580 MHz, 1 GHz – 7 GHz, Peak



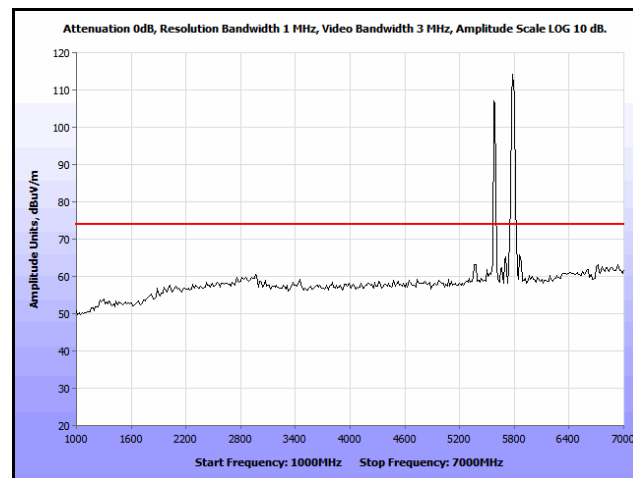
Plot 661. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 5580 & 5580 MHz, 7 GHz – 18 GHz, Peak



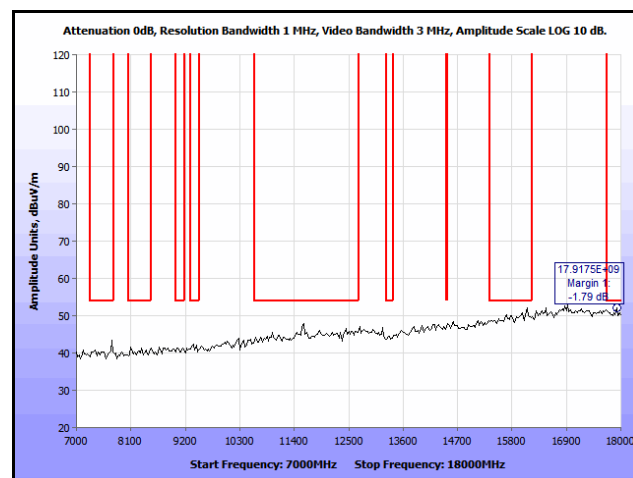
Plot 662. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 5580 & 5785 MHz, 30 MHz – 1 GHz



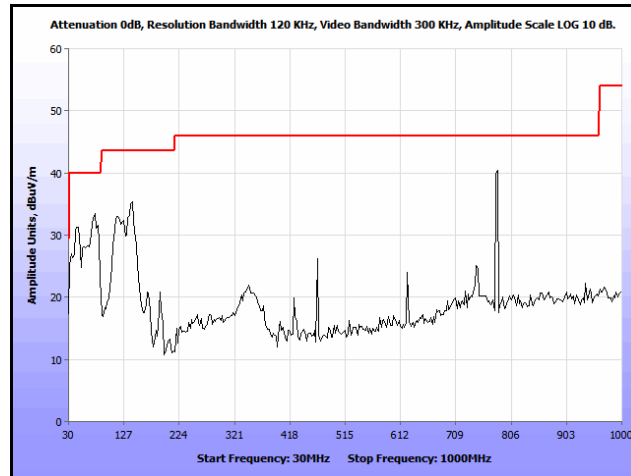
Plot 663. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 5580 & 5785 MHz, 1 GHz – 7 GHz, Avg.



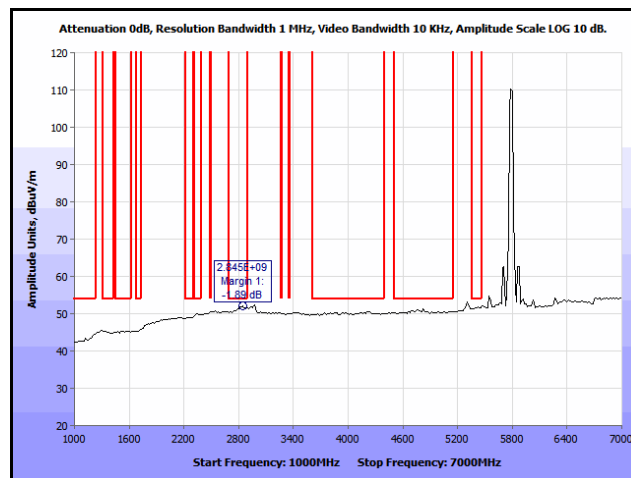
Plot 664. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 5580 & 5785 MHz, 1 GHz – 7 GHz, Peak



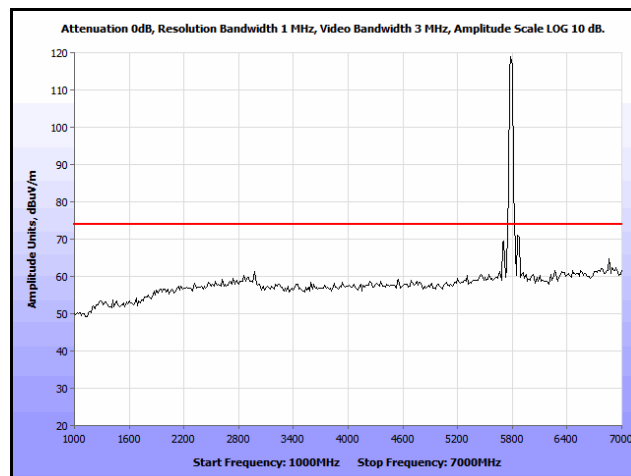
Plot 665. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 5580 & 5785 MHz, 7 GHz – 18 GHz, Peak



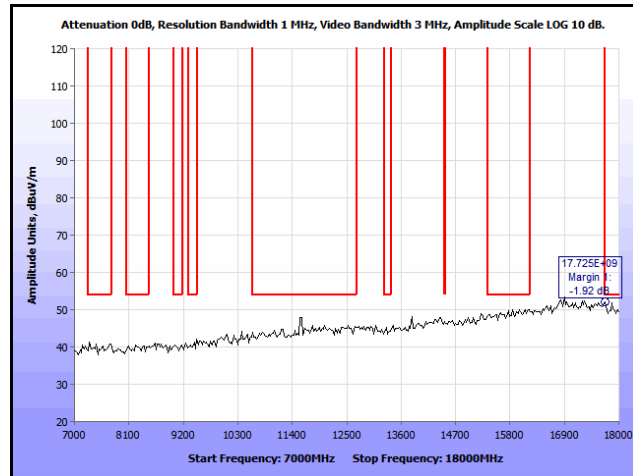
Plot 666. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 5785 & 5785 MHz, 30 MHz – 1 GHz



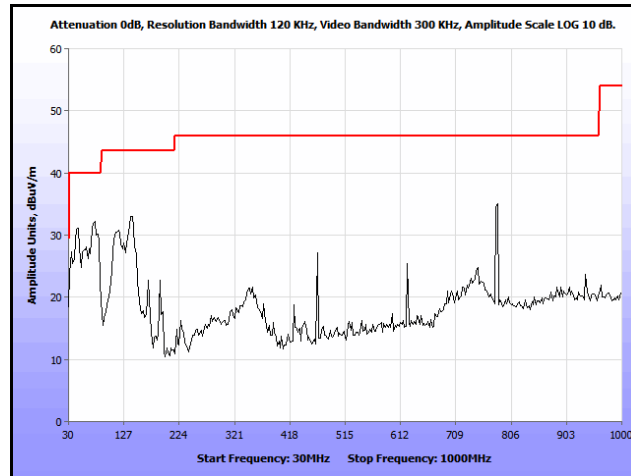
Plot 667. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 5785 & 5785 MHz, 1 GHz – 7 GHz, Avg.



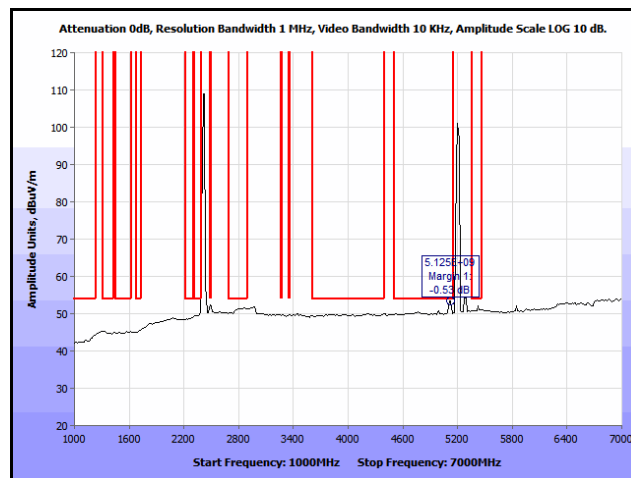
Plot 668. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 5785 & 5785 MHz, 1 GHz – 7 GHz, Peak



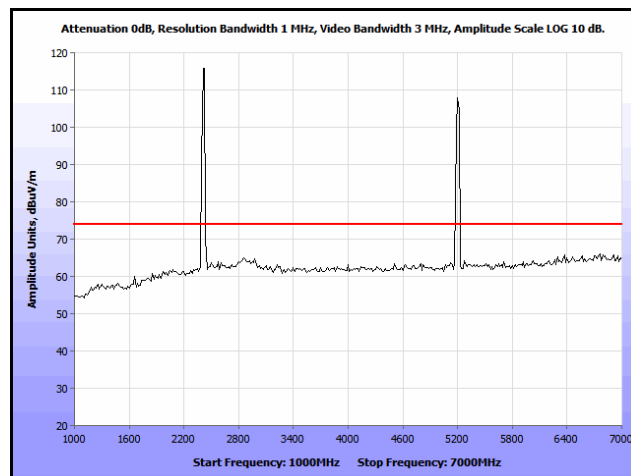
Plot 669. Co-location, Radiated Spurious Emissions, Omni, 802.11n 20 MHz, 5785 & 5785 MHz, 7 GHz – 18 GHz, Peak



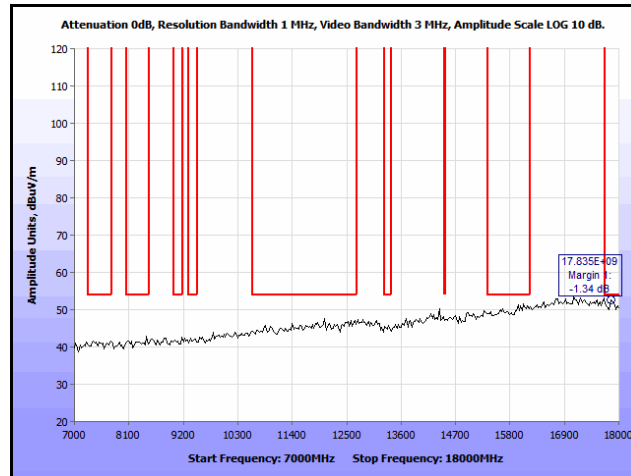
Plot 670. Co-location, Radiated Spurious Emissions, Patch, 802.11n 20 MHz, 2412 & 5200 MHz, 30 MHz – 1 GHz



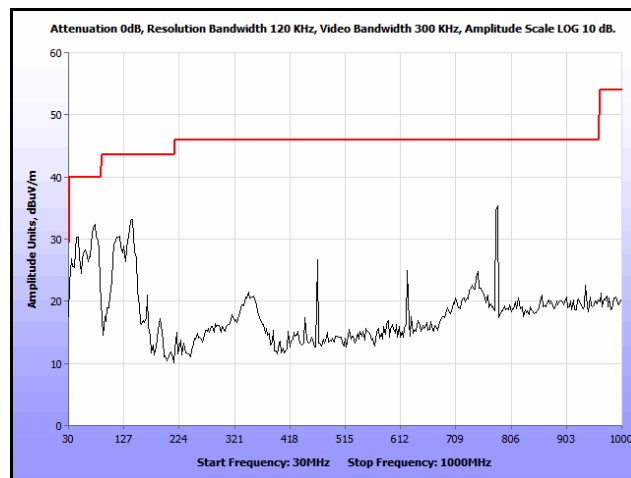
Plot 671. Co-location, Radiated Spurious Emissions, Patch, 802.11n 20 MHz, 2412 & 5200 MHz, 1 GHz – 7 GHz, Avg.



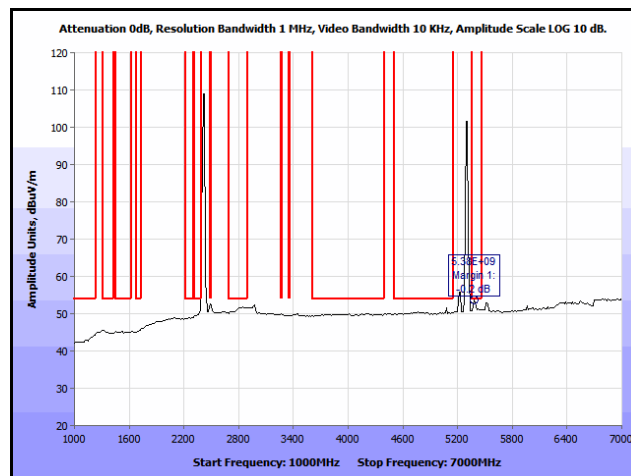
Plot 672. Co-location, Radiated Spurious Emissions, Patch, 802.11n 20 MHz, 2412 & 5200 MHz, 1 GHz – 7 GHz, Peak



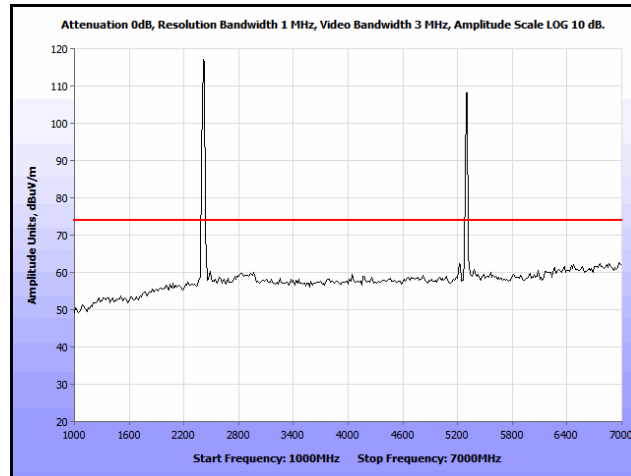
Plot 673. Co-location, Radiated Spurious Emissions, Patch, 802.11n 20 MHz, 2412 & 5200 MHz, 7 GHz – 18 GHz, Peak



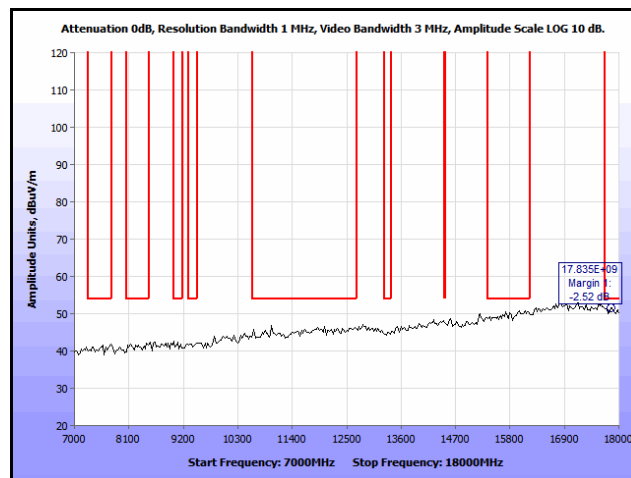
Plot 674. Co-location, Radiated Spurious Emissions, Patch, 802.11n 20 MHz, 2412 & 5300 MHz, 30 MHz – 1 GHz



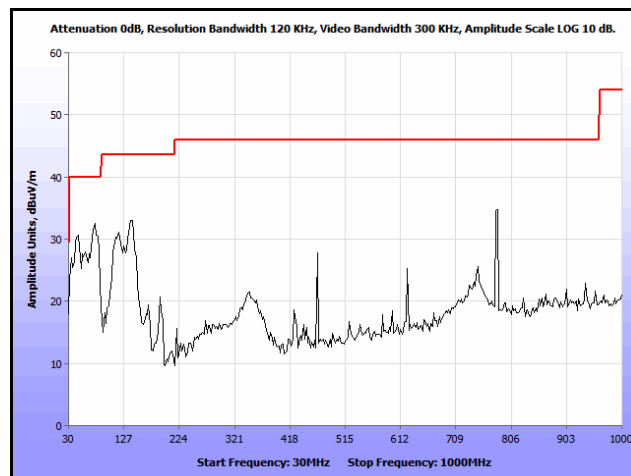
Plot 675. Co-location, Radiated Spurious Emissions, Patch, 802.11n 20 MHz, 2412 & 5300 MHz, 1 GHz – 7 GHz, Avg.



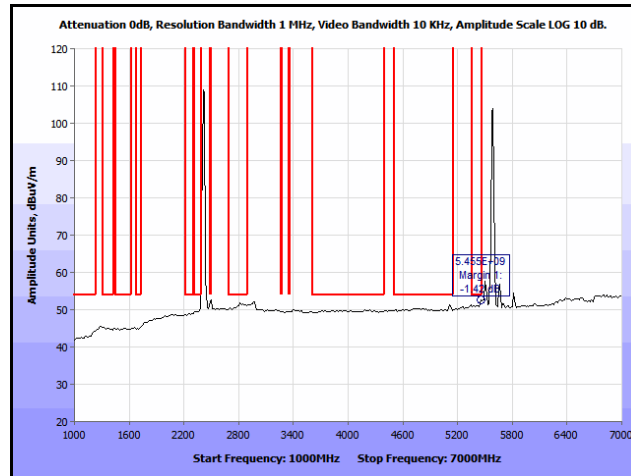
Plot 676. Co-location, Radiated Spurious Emissions, Patch, 802.11n 20 MHz, 2412 & 5300 MHz, 1 GHz – 7 GHz, Peak



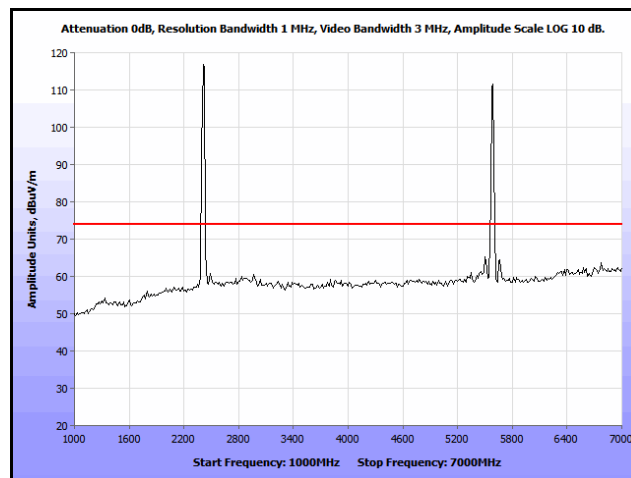
Plot 677. Co-location, Radiated Spurious Emissions, Patch, 802.11n 20 MHz, 2412 & 5300 MHz, 7 GHz – 18 GHz, Peak



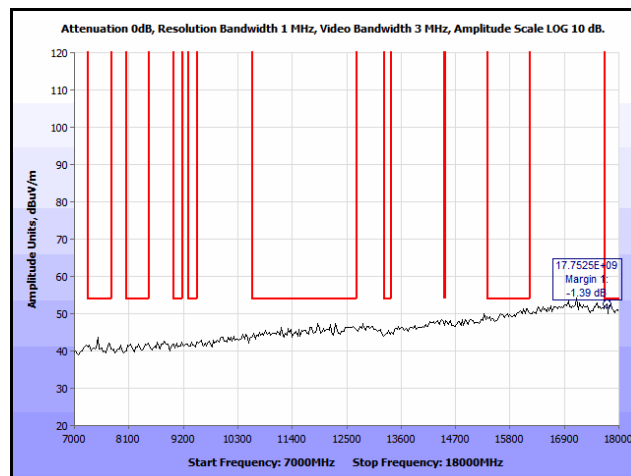
Plot 678. Co-location, Radiated Spurious Emissions, Patch, 802.11n 20 MHz, 2412 & 5580 MHz, 30 MHz – 1 GHz



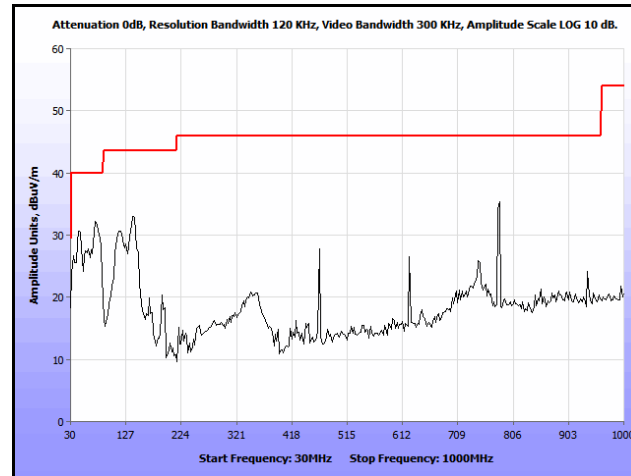
Plot 679. Co-location, Radiated Spurious Emissions, Patch, 802.11n 20 MHz, 2412 & 5580 MHz, 1 GHz – 7 GHz, Avg.



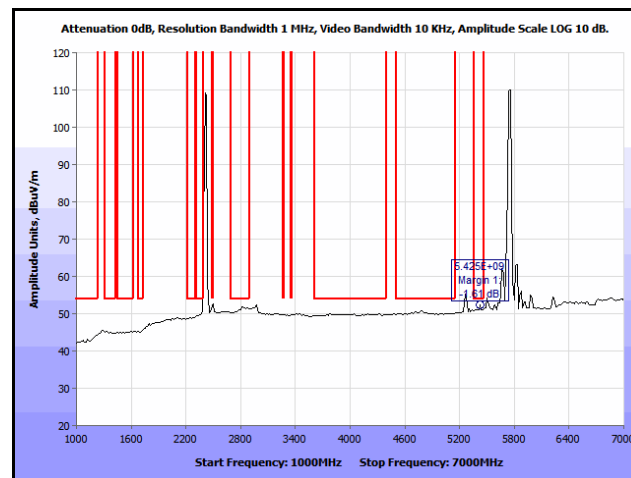
Plot 680. Co-location, Radiated Spurious Emissions, Patch, 802.11n 20 MHz, 2412 & 5580 MHz, 1 GHz – 7 GHz, Peak



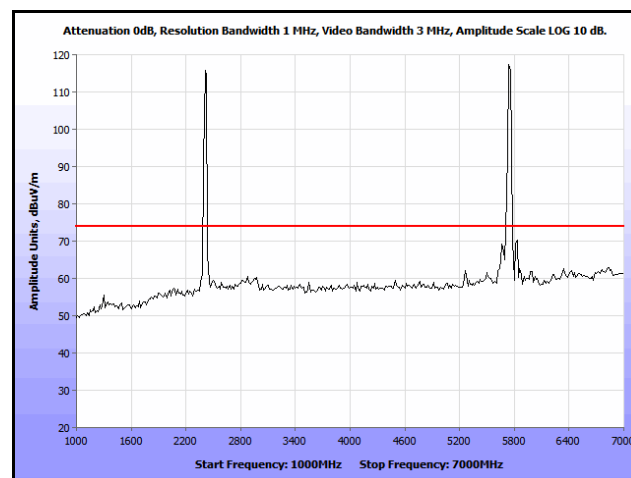
Plot 681. Co-location, Radiated Spurious Emissions, Patch, 802.11n 20 MHz, 2412 & 5580 MHz, 7 GHz – 18 GHz, Peak



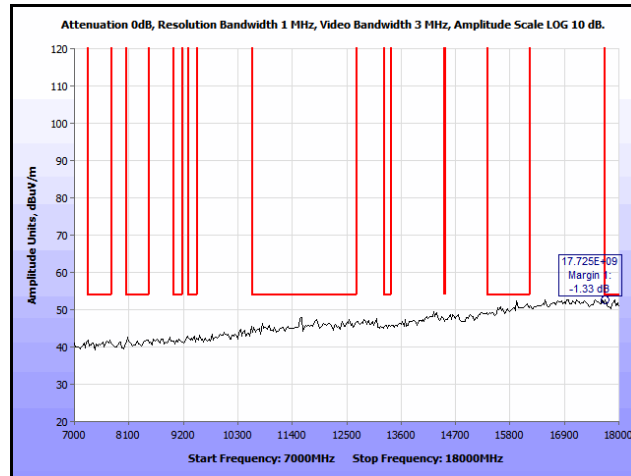
Plot 682. Co-location, Radiated Spurious Emissions, Patch, 802.11n 20 MHz, 2412 & 5785 MHz, 30 MHz – 1 GHz



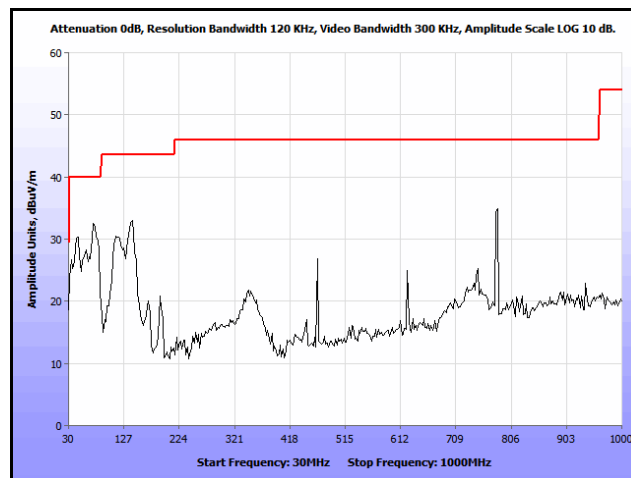
Plot 683. Co-location, Radiated Spurious Emissions, Patch, 802.11n 20 MHz, 2412 & 5785 MHz, 1 GHz – 7 GHz, Avg.



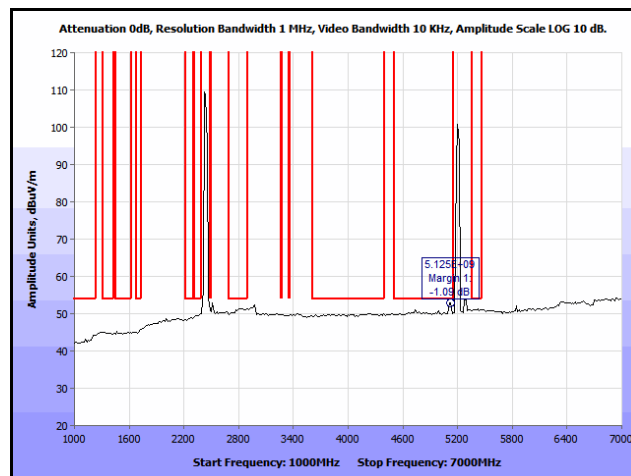
Plot 684. Co-location, Radiated Spurious Emissions, Patch, 802.11n 20 MHz, 2412 & 5785 MHz, 1 GHz – 7 GHz, Peak



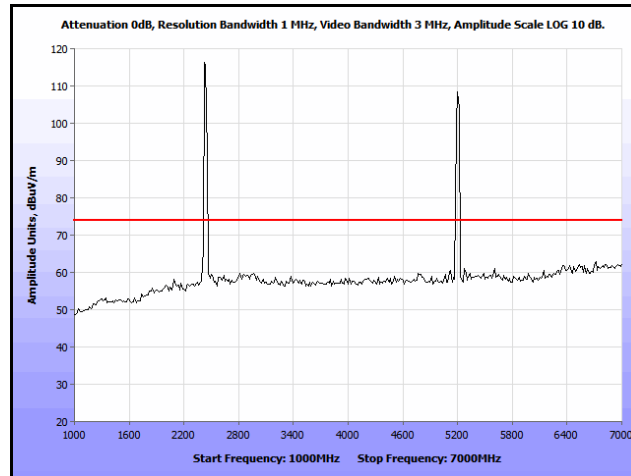
Plot 685. Co-location, Radiated Spurious Emissions, Patch, 802.11n 20 MHz, 2412 & 5785 MHz, 7 GHz – 18 GHz, Peak



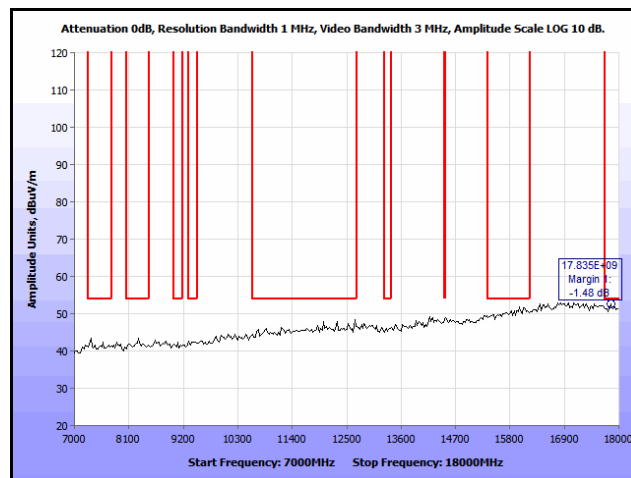
Plot 686. Co-location, Radiated Spurious Emissions, Patch, 802.11n 20 MHz, 2437 & 5200 MHz, 30 MHz – 1 GHz



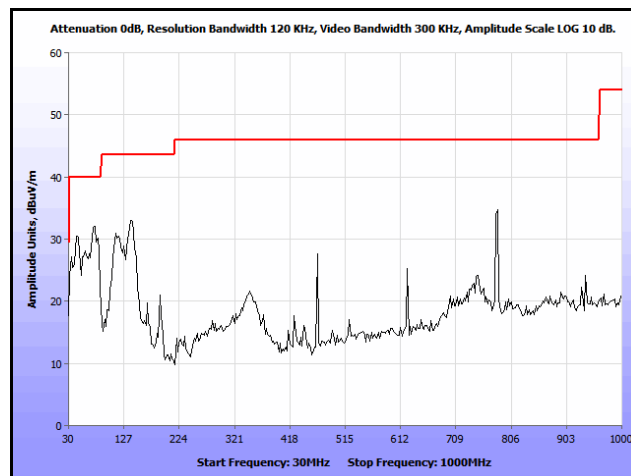
Plot 687. Co-location, Radiated Spurious Emissions, Patch, 802.11n 20 MHz, 2437 & 5200 MHz, 1 GHz – 7 GHz, Avg.



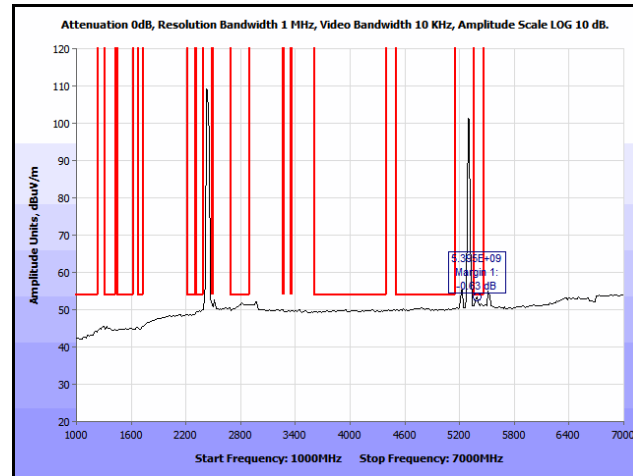
Plot 688. Co-location, Radiated Spurious Emissions, Patch, 802.11n 20 MHz, 2437 & 5200 MHz, 1 GHz – 7 GHz, Peak



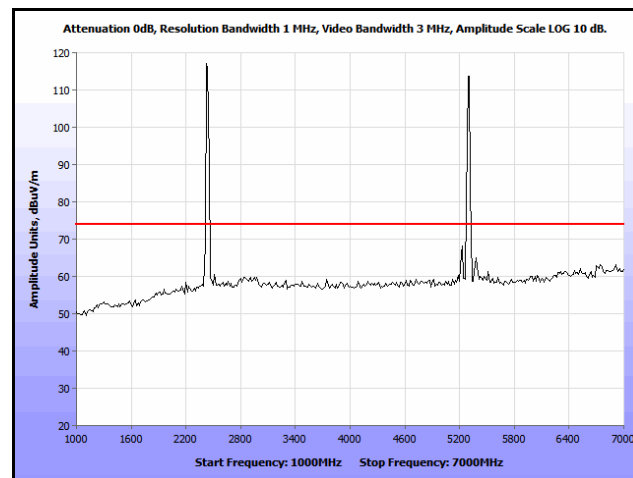
Plot 689. Co-location, Radiated Spurious Emissions, Patch, 802.11n 20 MHz, 2437 & 5200 MHz, 7 GHz – 18 GHz, Peak



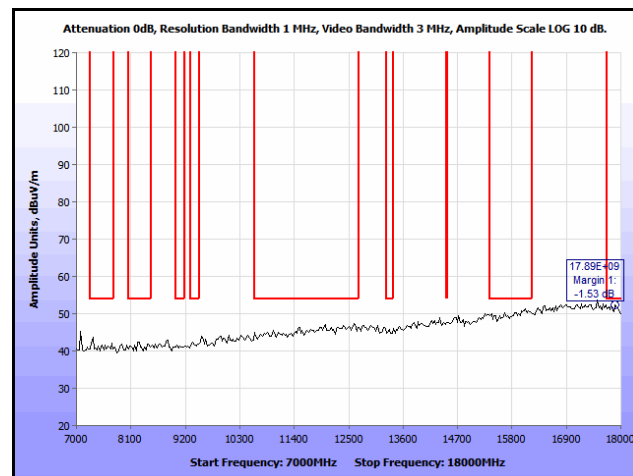
Plot 690. Co-location, Radiated Spurious Emissions, Patch, 802.11n 20 MHz, 2437 & 5300 MHz, 30 MHz – 1 GHz



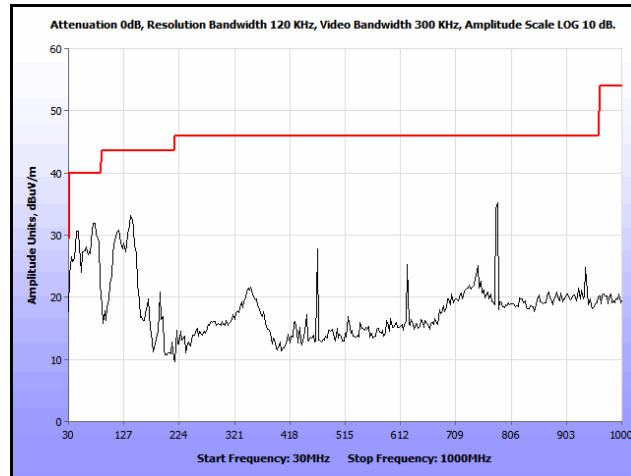
Plot 691. Co-location, Radiated Spurious Emissions, Patch, 802.11n 20 MHz, 2437 & 5300 MHz, 1 GHz – 7 GHz, Avg.



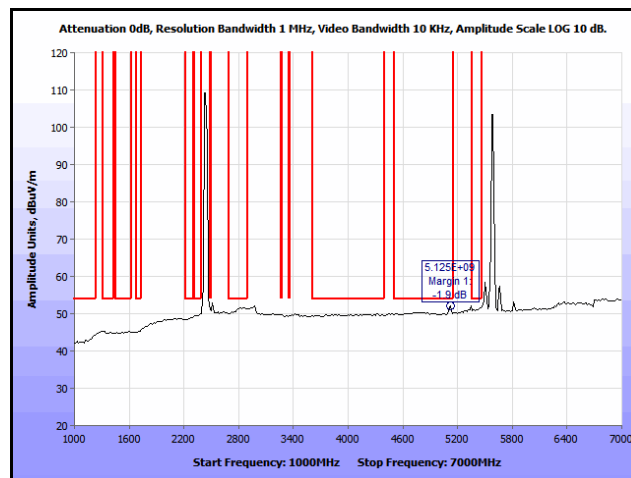
Plot 692. Co-location, Radiated Spurious Emissions, Patch, 802.11n 20 MHz, 2437 & 5300 MHz, 1 GHz – 7 GHz, Peak



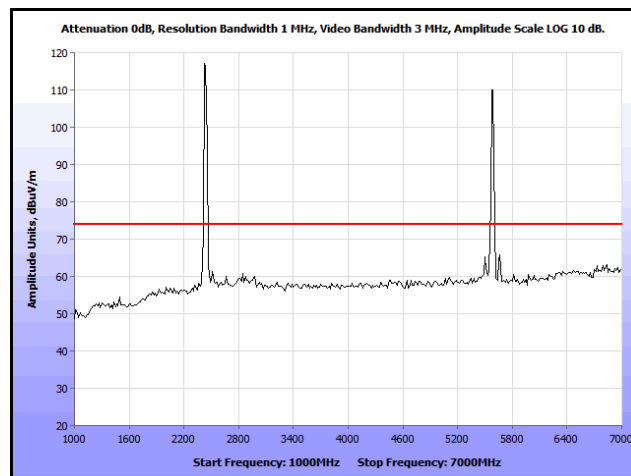
Plot 693. Co-location, Radiated Spurious Emissions, Patch, 802.11n 20 MHz, 2437 & 5300 MHz, 7 GHz – 18 GHz, Peak



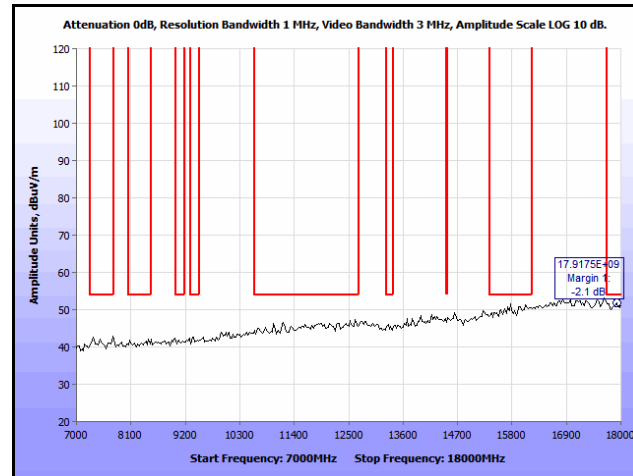
Plot 694. Co-location, Radiated Spurious Emissions, Patch, 802.11n 20 MHz, 2437 & 5580 MHz, 30 MHz – 1 GHz



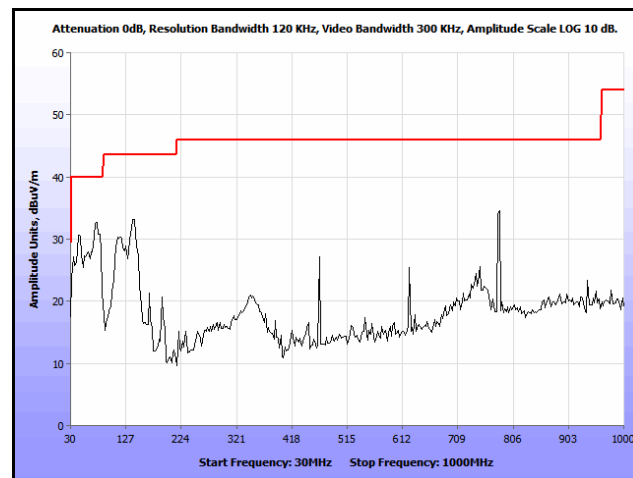
Plot 695. Co-location, Radiated Spurious Emissions, Patch, 802.11n 20 MHz, 2437 & 5580 MHz, 1 GHz – 7 GHz, Avg.



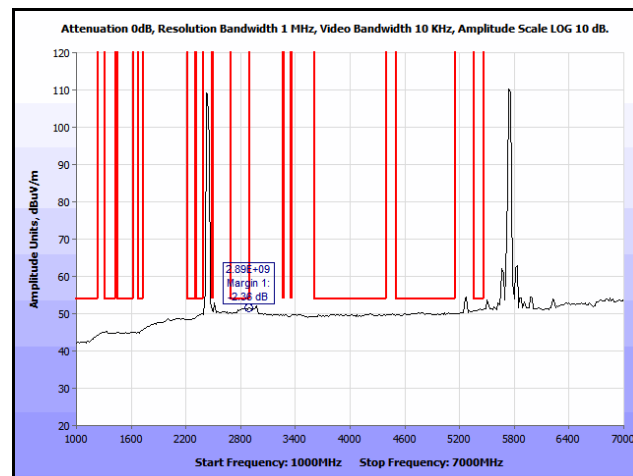
Plot 696. Co-location, Radiated Spurious Emissions, Patch, 802.11n 20 MHz, 2437 & 5580 MHz, 1 GHz – 7 GHz, Peak



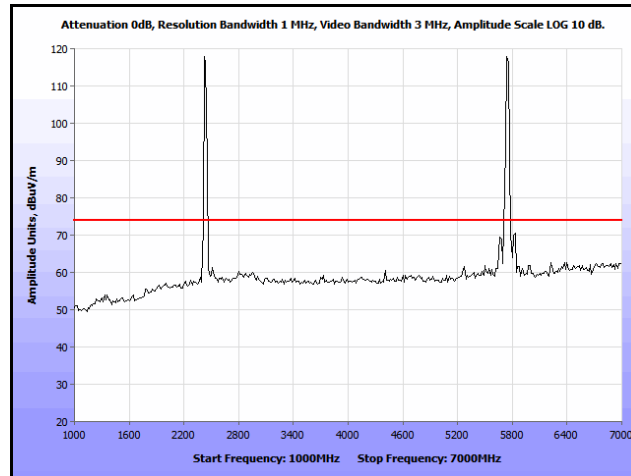
Plot 697. Co-location, Radiated Spurious Emissions, Patch, 802.11n 20 MHz, 2437 & 5580 MHz, 7 GHz – 18 GHz, Peak



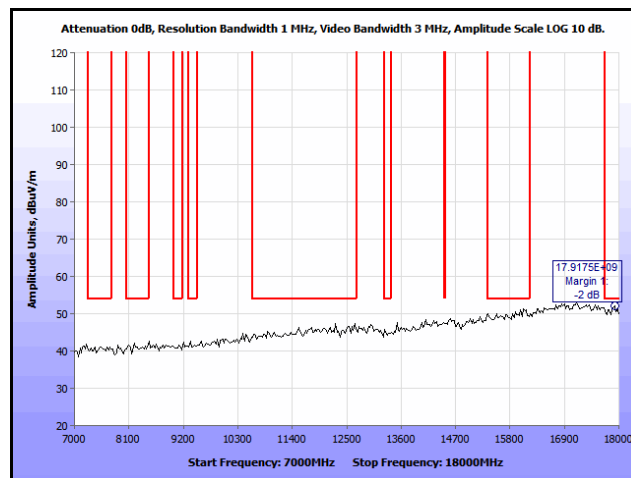
Plot 698. Co-location, Radiated Spurious Emissions, Patch, 802.11n 20 MHz, 2437 & 5785 MHz, 30 MHz – 1 GHz



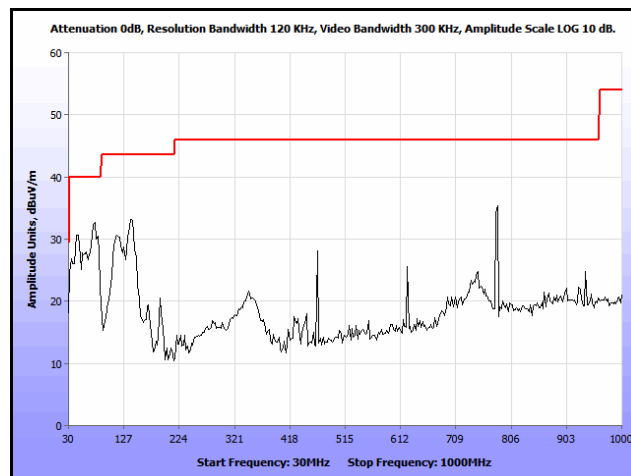
Plot 699. Co-location, Radiated Spurious Emissions, Patch, 802.11n 20 MHz, 2437 & 5785 MHz, 1 GHz – 7 GHz, Avg.



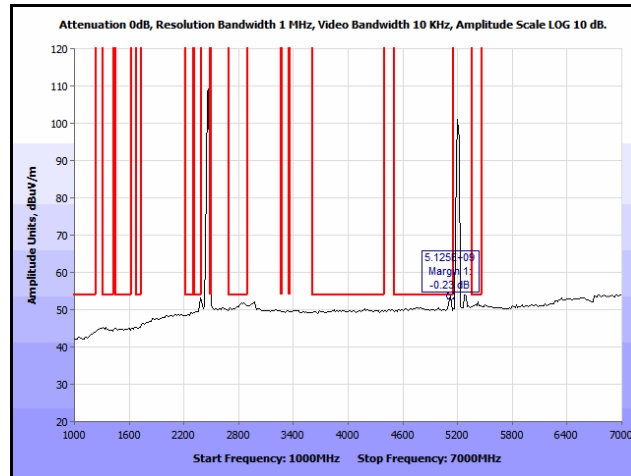
Plot 700. Co-location, Radiated Spurious Emissions, Patch, 802.11n 20 MHz, 2437 & 5785 MHz, 1 GHz – 7 GHz, Peak



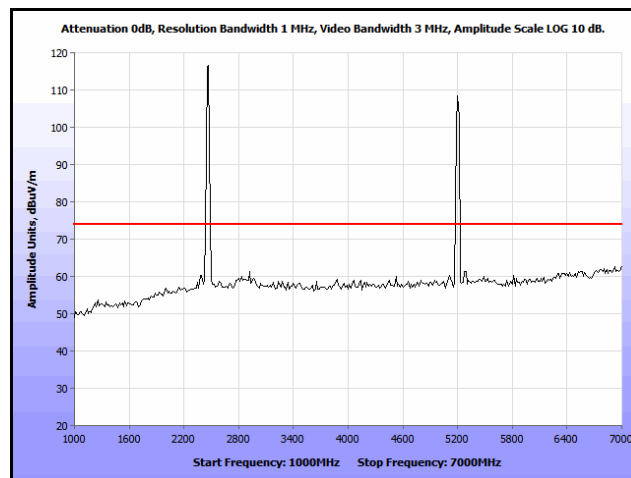
Plot 701. Co-location, Radiated Spurious Emissions, Patch, 802.11n 20 MHz, 2437 & 5785 MHz, 7 GHz – 18 GHz, Peak



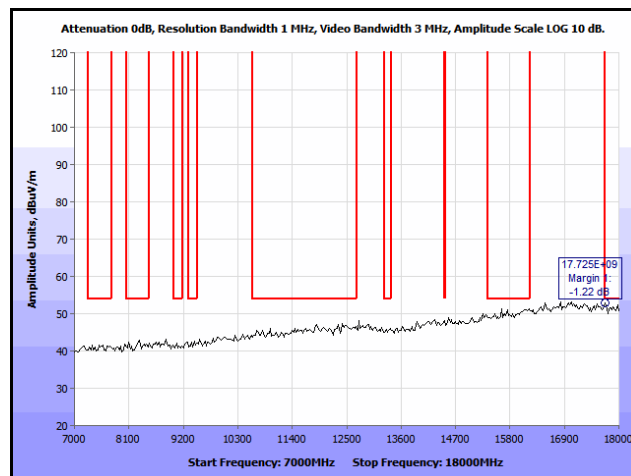
Plot 702. Co-location, Radiated Spurious Emissions, Patch, 802.11n 20 MHz, 2462 & 5200 MHz, 30 MHz – 1 GHz



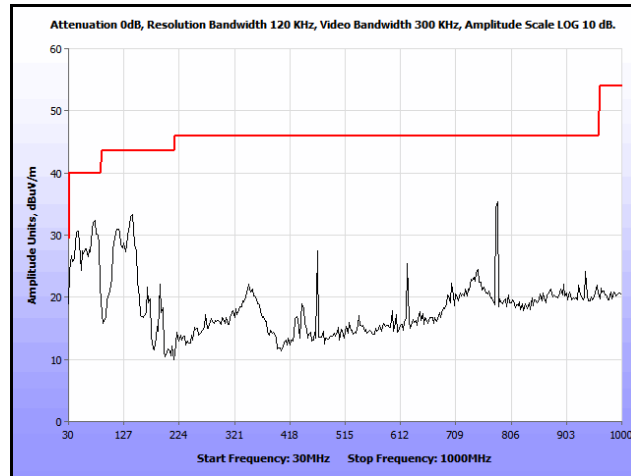
Plot 703. Co-location, Radiated Spurious Emissions, Patch, 802.11n 20 MHz, 2462 & 5200 MHz, 1 GHz – 7 GHz, Avg.



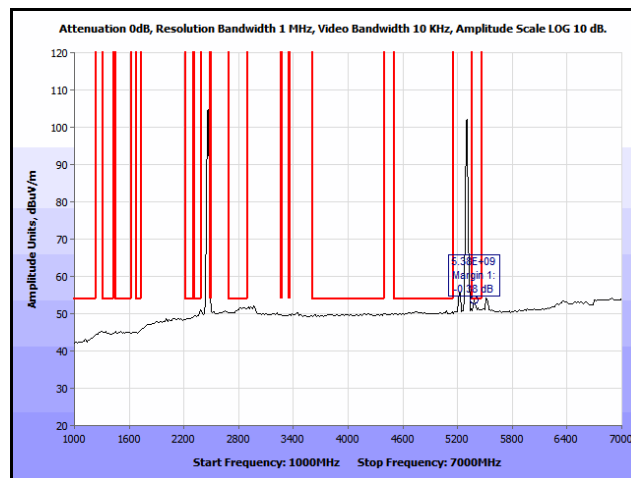
Plot 704. Co-location, Radiated Spurious Emissions, Patch, 802.11n 20 MHz, 2462 & 5200 MHz, 1 GHz – 7 GHz, Peak



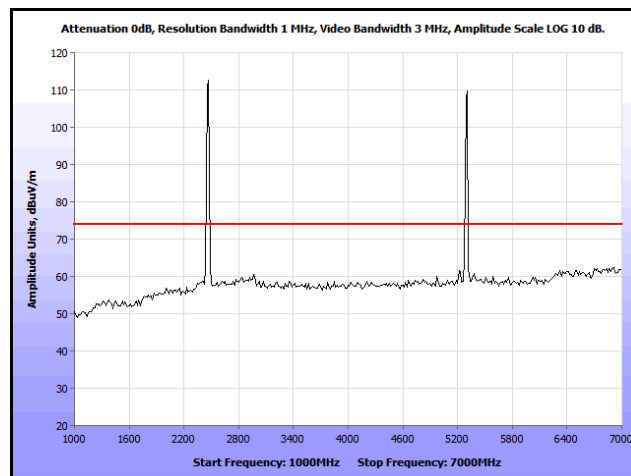
Plot 705. Co-location, Radiated Spurious Emissions, Patch, 802.11n 20 MHz, 2462 & 5200 MHz, 7 GHz – 18 GHz, Peak



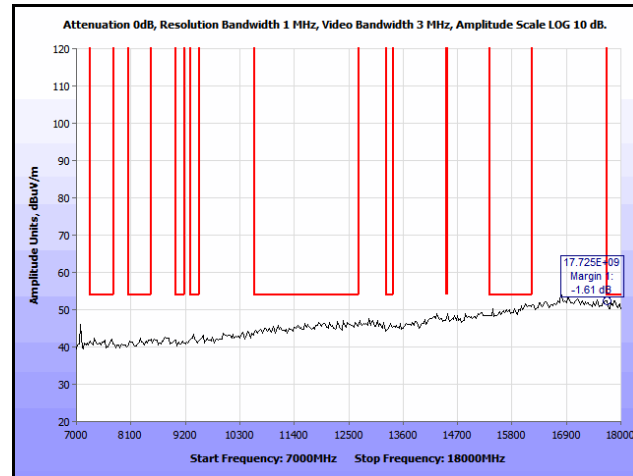
Plot 706. Co-location, Radiated Spurious Emissions, Patch, 802.11n 20 MHz, 2462 & 5300 MHz, 30 MHz – 1 GHz



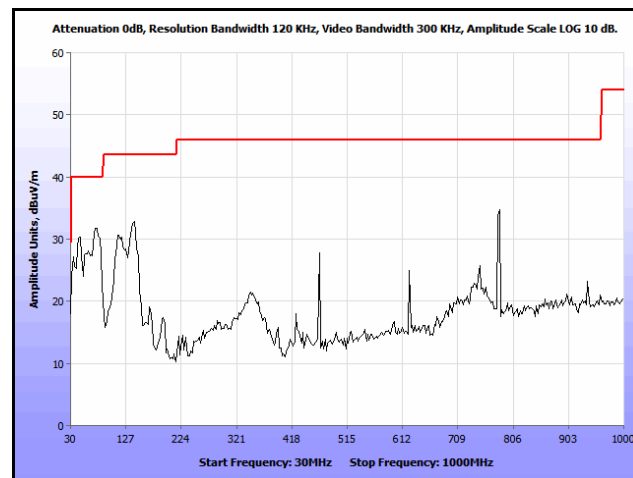
Plot 707. Co-location, Radiated Spurious Emissions, Patch, 802.11n 20 MHz, 2462 & 5300 MHz, 1 GHz – 7 GHz, Avg.



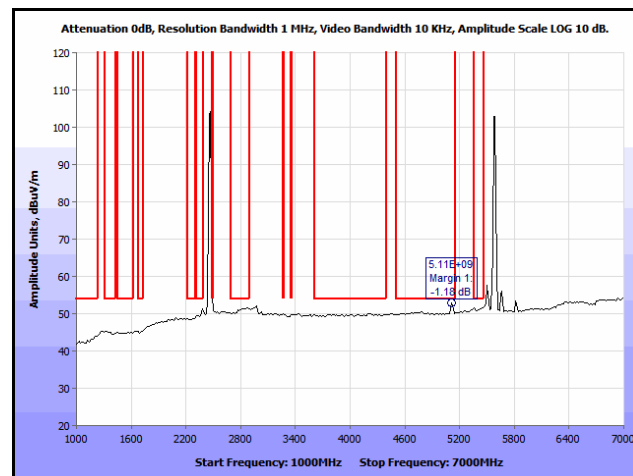
Plot 708. Co-location, Radiated Spurious Emissions, Patch, 802.11n 20 MHz, 2462 & 5300 MHz, 1 GHz – 7 GHz, Peak



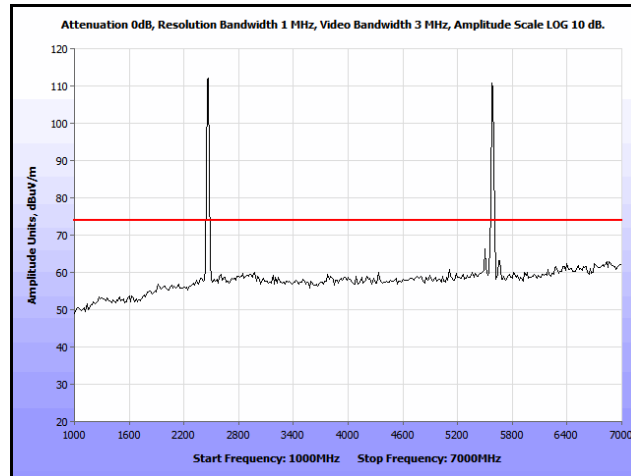
Plot 709. Co-location, Radiated Spurious Emissions, Patch, 802.11n 20 MHz, 2462 & 5300 MHz, 7 GHz – 18 GHz, Peak



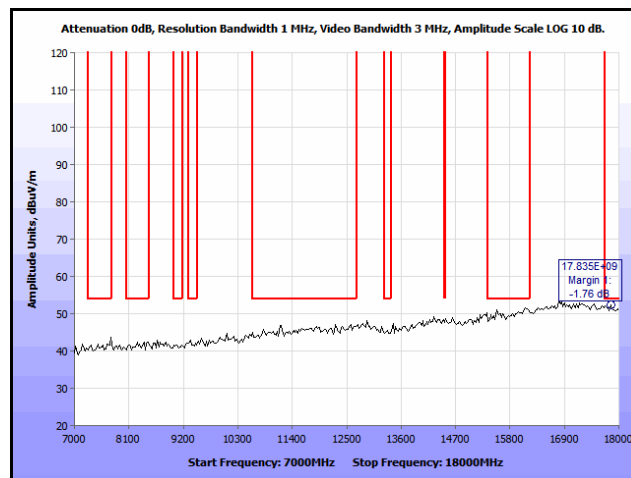
Plot 710. Co-location, Radiated Spurious Emissions, Patch, 802.11n 20 MHz, 2462 & 5580 MHz, 30 MHz – 1 GHz



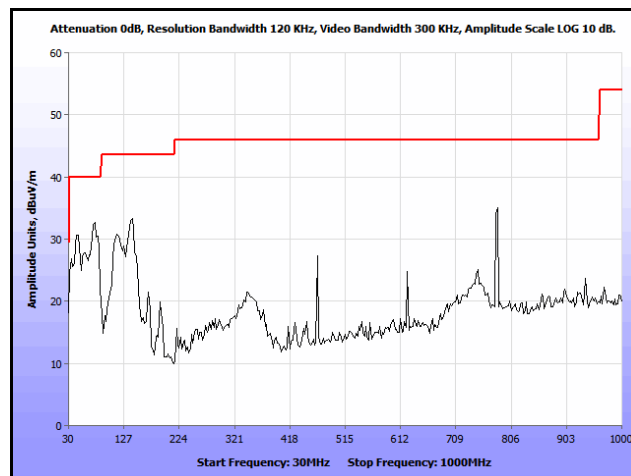
Plot 711. Co-location, Radiated Spurious Emissions, Patch, 802.11n 20 MHz, 2462 & 5580 MHz, 1 GHz – 7 GHz, Avg.



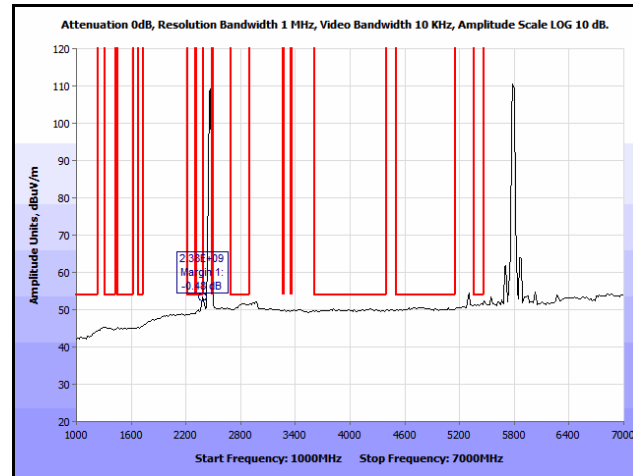
Plot 712. Co-location, Radiated Spurious Emissions, Patch, 802.11n 20 MHz, 2462 & 5580 MHz, 1 GHz – 7 GHz, Peak



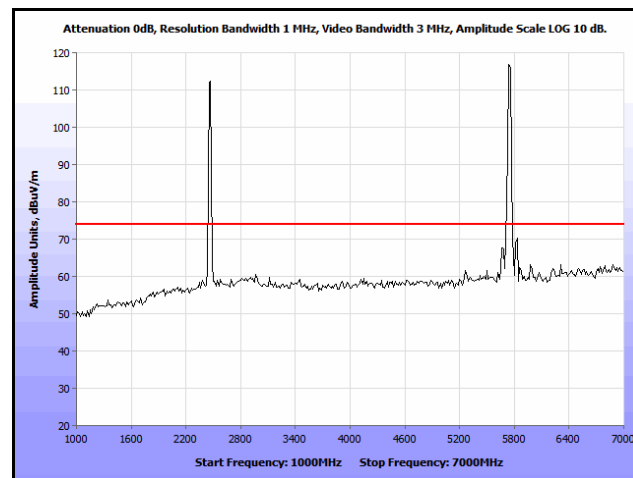
Plot 713. Co-location, Radiated Spurious Emissions, Patch, 802.11n 20 MHz, 2462 & 5580 MHz, 7 GHz – 18 GHz, Peak



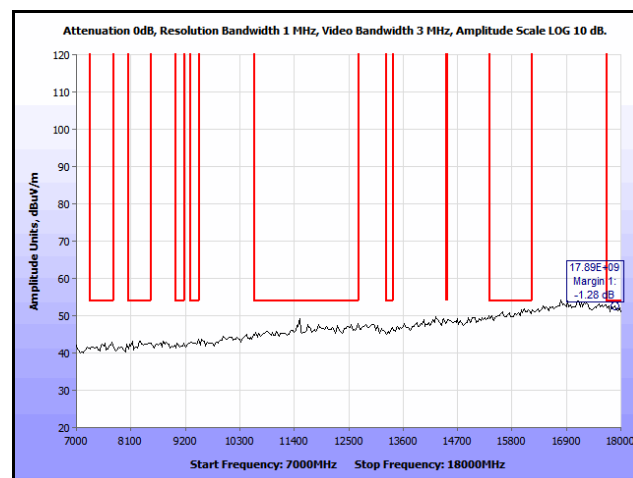
Plot 714. Co-location, Radiated Spurious Emissions, Patch, 802.11n 20 MHz, 2462 & 5785 MHz, 30 MHz – 1 GHz



Plot 715. Co-location, Radiated Spurious Emissions, Patch, 802.11n 20 MHz, 2462 & 5785 MHz, 1 GHz – 7 GHz, Avg.



Plot 716. Co-location, Radiated Spurious Emissions, Patch, 802.11n 20 MHz, 2462 & 5785 MHz, 1 GHz – 7 GHz, Peak



Plot 717. Co-location, Radiated Spurious Emissions, Patch, 802.11n 20 MHz, 2462 & 5785 MHz, 7 GHz – 18 GHz, Peak

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 @ 5260-5310MHz & 5500-5700MHz; highest conducted power = 21.35 dBm therefore, **Limit for Uncontrolled exposure: 1 mW/cm² or 10 W/m²**

Equation from page 18 of OET 65, Edition 97-01

$$S = PG / 4\pi R^2 \quad \text{or} \quad R = \sqrt{PG / 4\pi S}$$

where, S = Power Density (1 mW/cm²)
P = Power Input to antenna (136.458mW)
G = Highest Antenna Gain 11.77dBi (15.03 numeric)
R = Minimum Distance between User and Antenna (20 cm)

$$S = (21.35 * 15.03) / (4 * 3.14 * 20^2) = 0.4082 \text{ mW/cm}^2$$

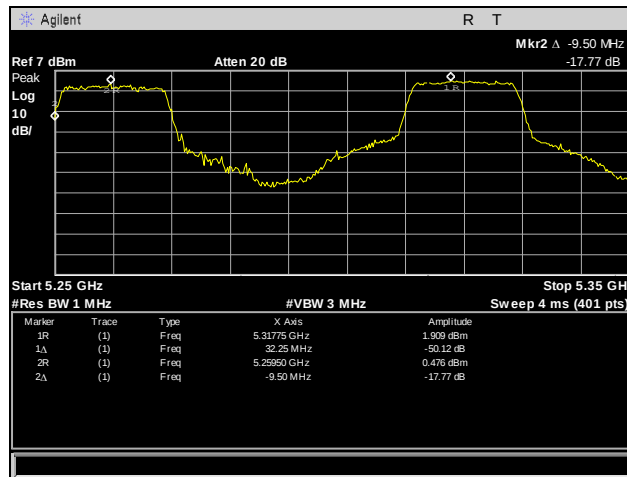
Since $S < 1 \text{ mW/cm}^2$, the minimum distance (R) is 20cm

Electromagnetic Compatibility Criteria for Intentional Radiators

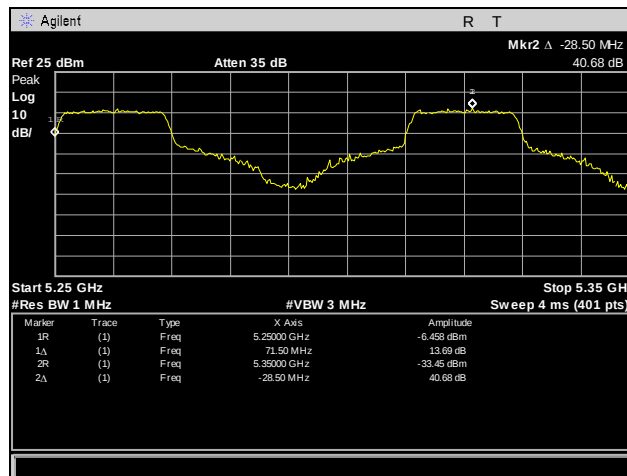
§ 15.407(g) Frequency Stability

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 Procedure:	The EUT was connected directly to a spectrum analyzer through an attenuator. The resolution band width of the spectrum analyzer was set to 1 MHz. The Low and High channels were transmitted and viewed from the 5150MHz and 5350MHz edge.
Test Results:	The EUT was compliant with the requirements of §15.407(g).
Test Engineer(s):	Jonathan Chao
Test Date(s):	02/15/13

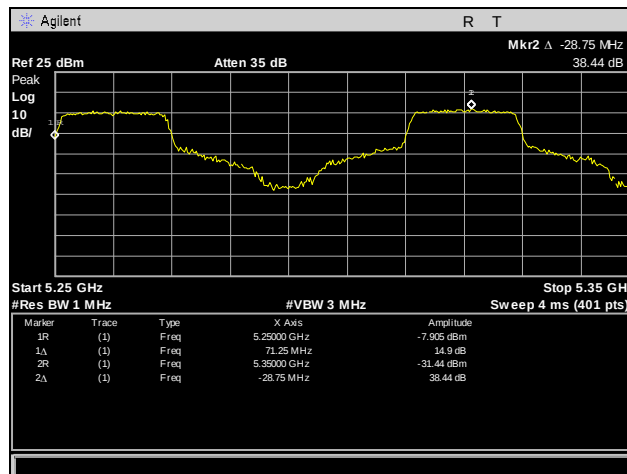
Frequency Stability



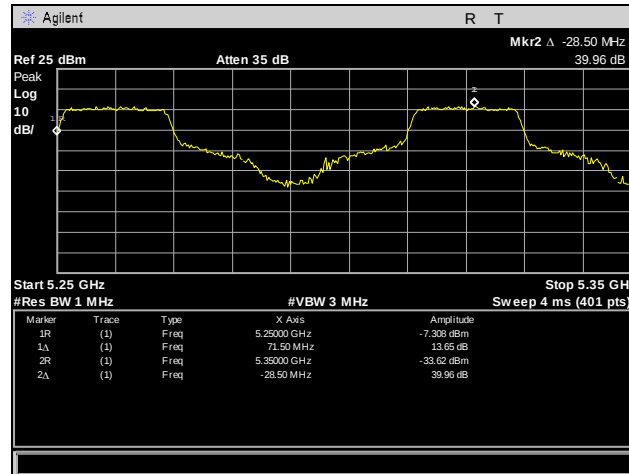
Plot 718. Frequency Stability, 5250 – 5350 MHz, -40°C, 120 V



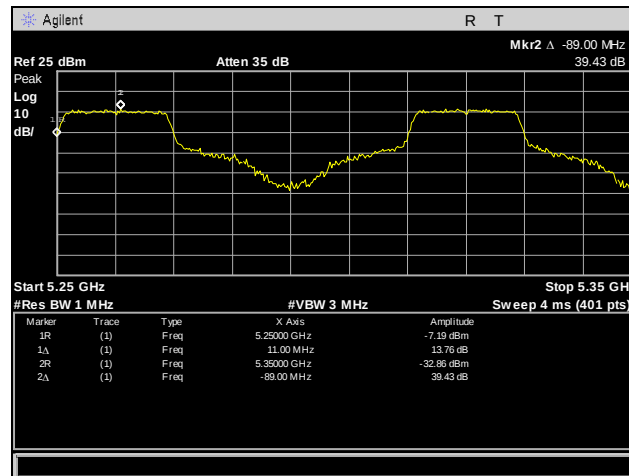
Plot 719. Frequency Stability, 5250 – 5350 MHz, -30°C, 120 V



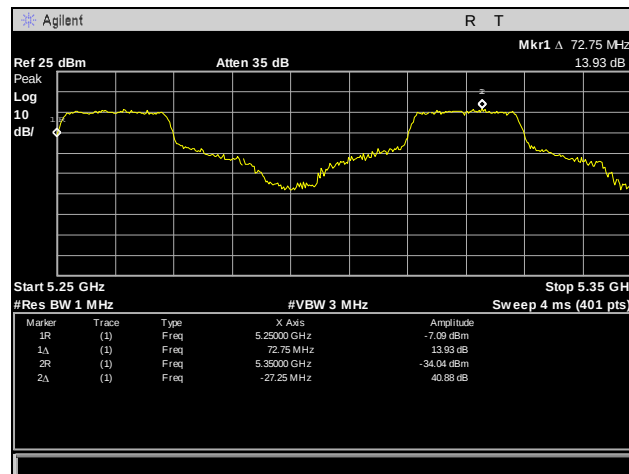
Plot 720. Frequency Stability, 5250 – 5350 MHz, -20°C, 120 V



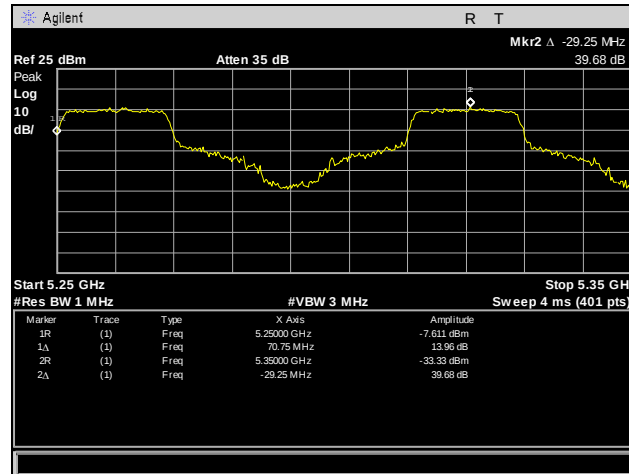
Plot 721. Frequency Stability, 5250 – 5350 MHz, -10°C, 120 V



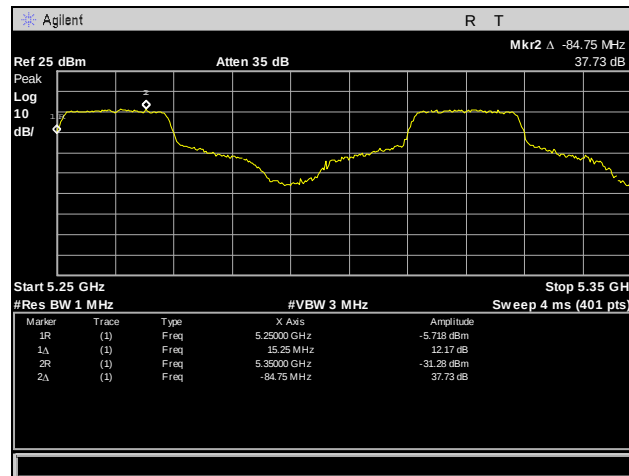
Plot 722. Frequency Stability, 5250 – 5350 MHz, 0°C, 120 V



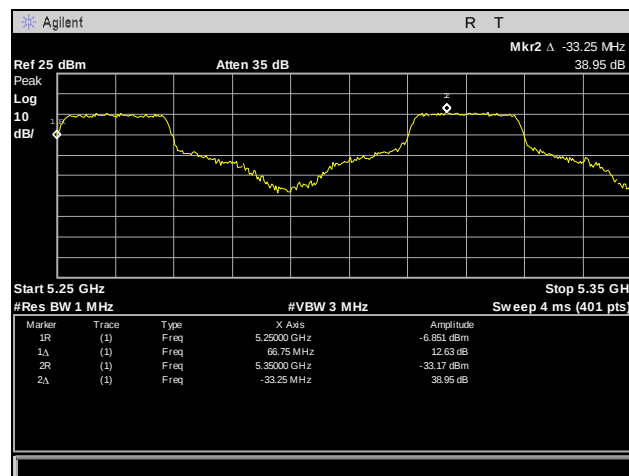
Plot 723. Frequency Stability, 5250 – 5350 MHz, 10°C, 120 V



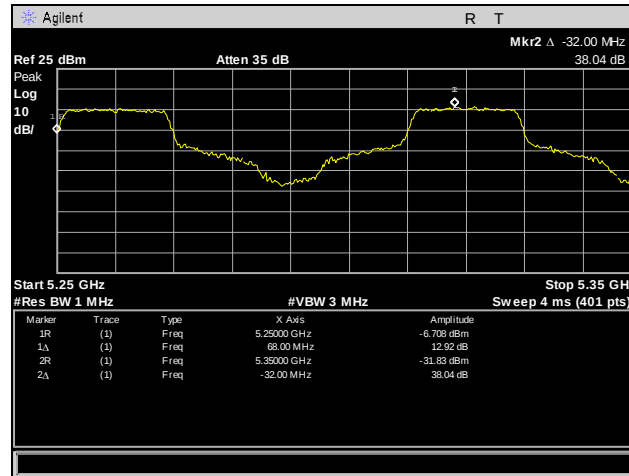
Plot 724. Frequency Stability, 5250 – 5350 MHz, 20°C, 108 V



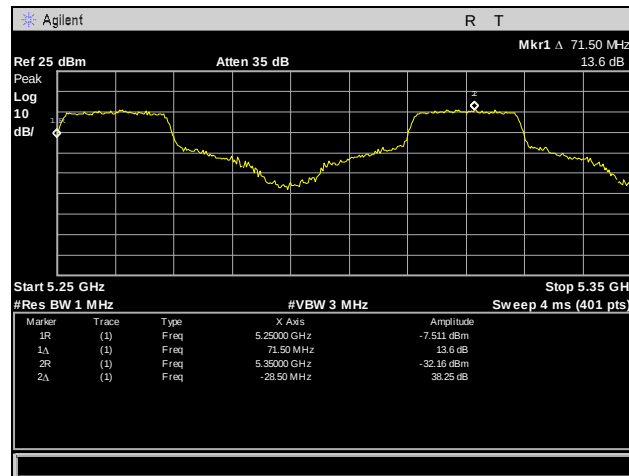
Plot 725. Frequency Stability, 5250 – 5350 MHz, 20°C, 120 V



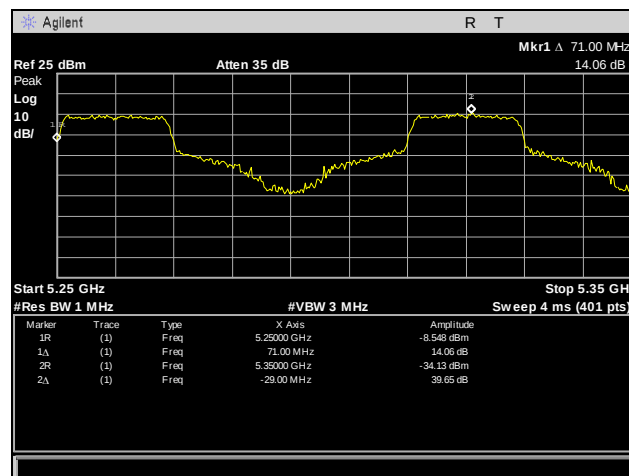
Plot 726. Frequency Stability, 5250 – 5350 MHz, 20°C, 132 V



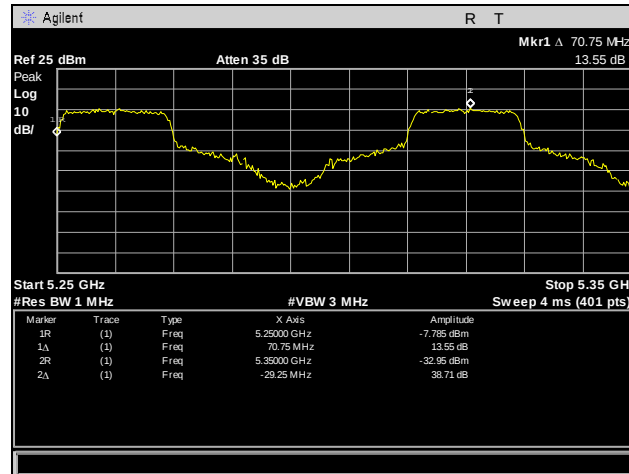
Plot 727. Frequency Stability, 5250 – 5350 MHz, 30°C, 120 V



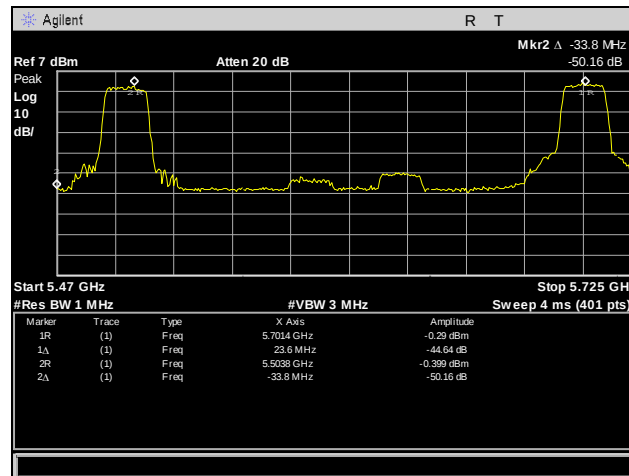
Plot 728. Frequency Stability, 5250 – 5350 MHz, 40°C, 120 V



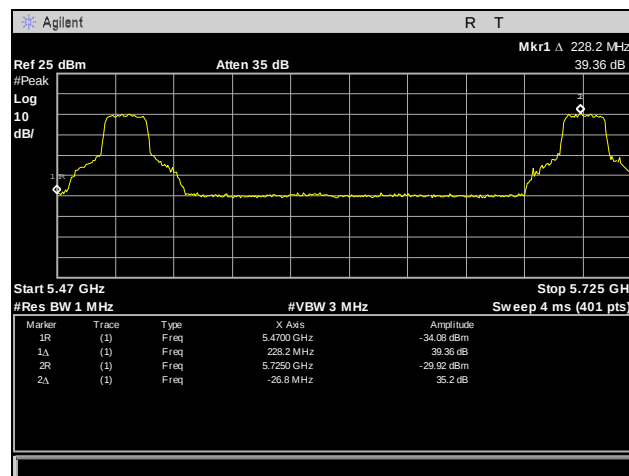
Plot 729. Frequency Stability, 5250 – 5350 MHz, 50°C, 120 V



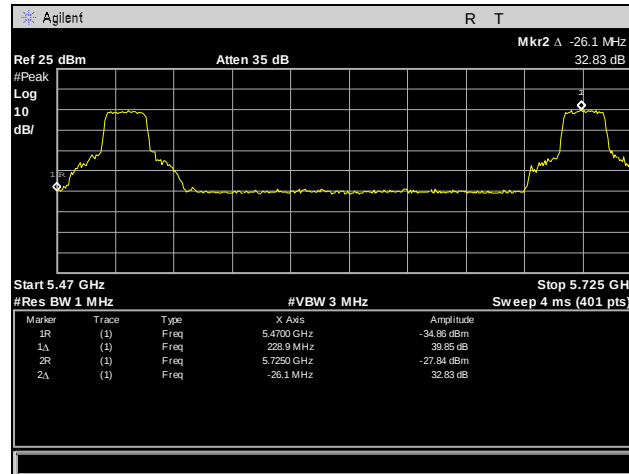
Plot 730. Frequency Stability, 5250 – 5350 MHz, 55°C, 120 V



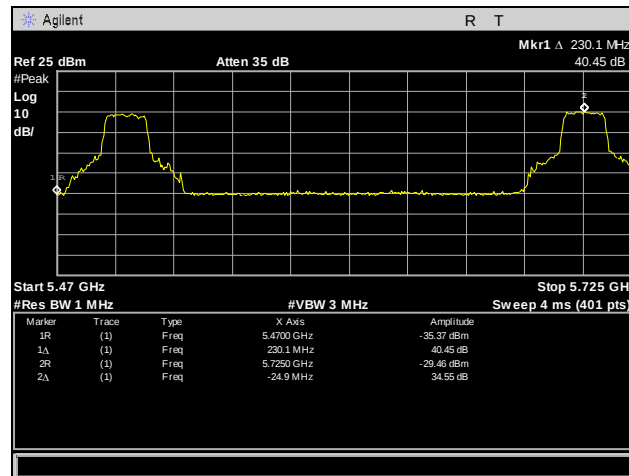
Plot 731. Frequency Stability, 5470 – 5725 MHz, -40°C, 120 V



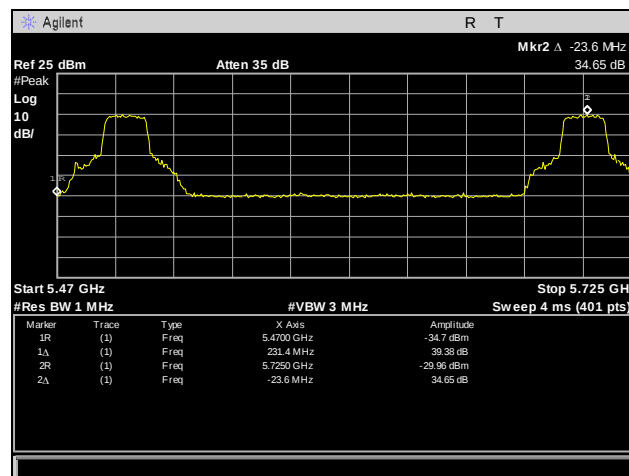
Plot 732. Frequency Stability, 5470 – 5725 MHz, -30°C, 120 V



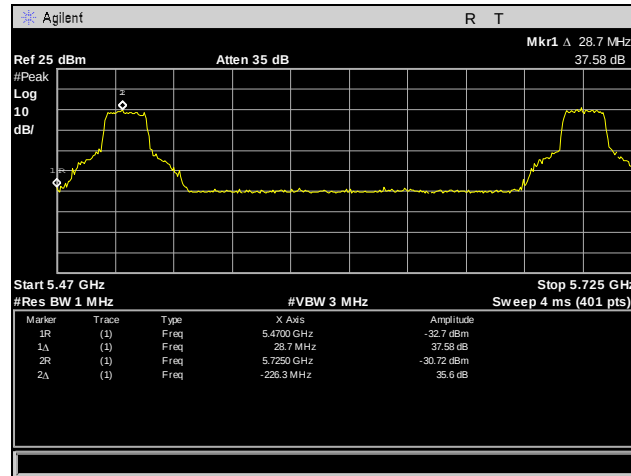
Plot 733. Frequency Stability, 5470 – 5725 MHz, -20°C, 120 V



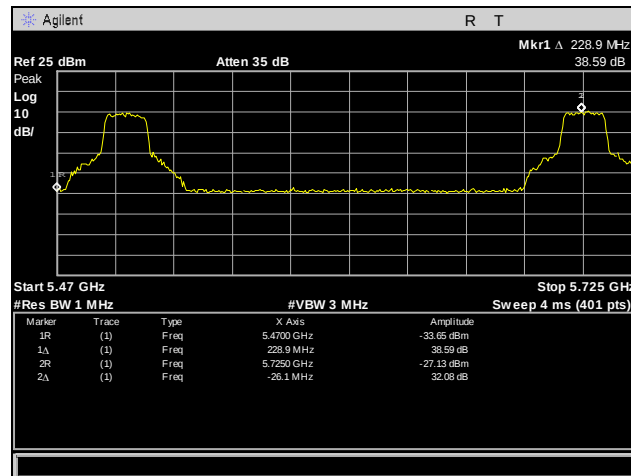
Plot 734. Frequency Stability, 5470 – 5725 MHz, -10°C, 120 V



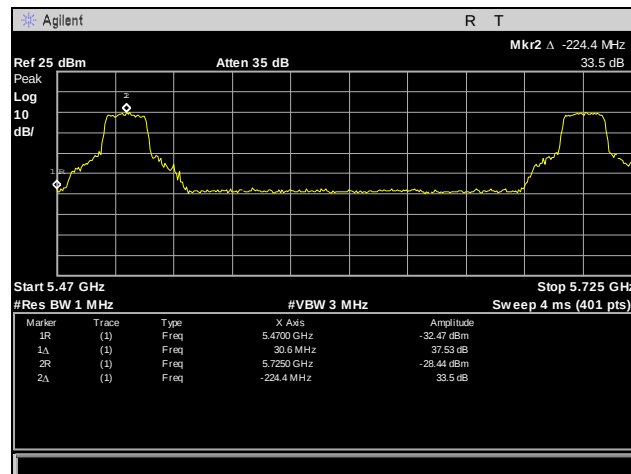
Plot 735. Frequency Stability, 5470 – 5725 MHz, 0°C, 120 V



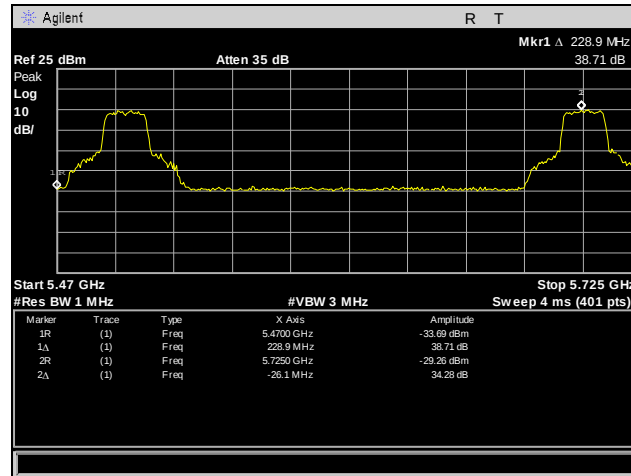
Plot 736. Frequency Stability, 5470 – 5725 MHz, 10°C, 120 V



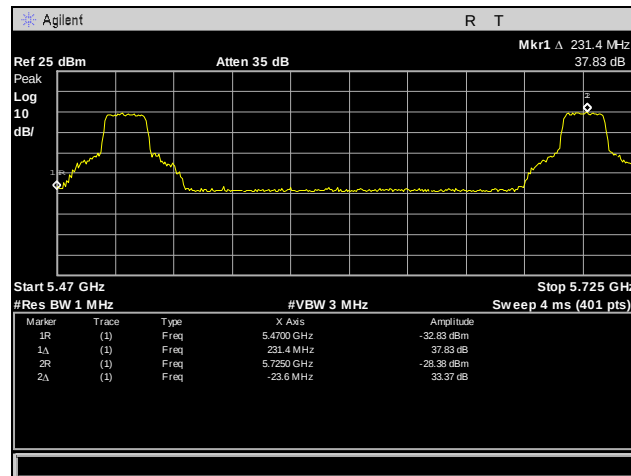
Plot 737. Frequency Stability, 5470 – 5725 MHz, 20°C, 108 V



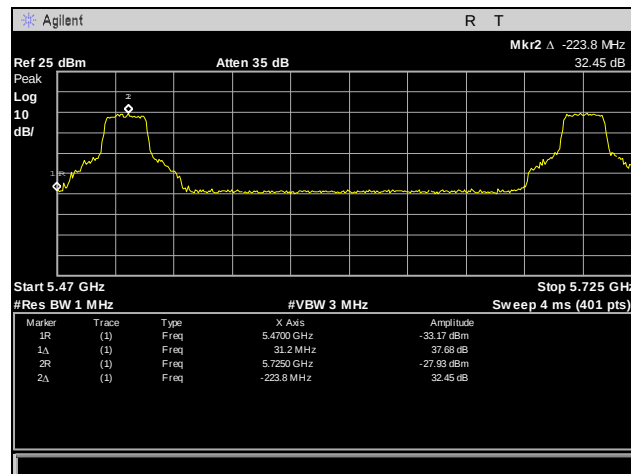
Plot 738. Frequency Stability, 5470 – 5725 MHz, 20°C, 120 V



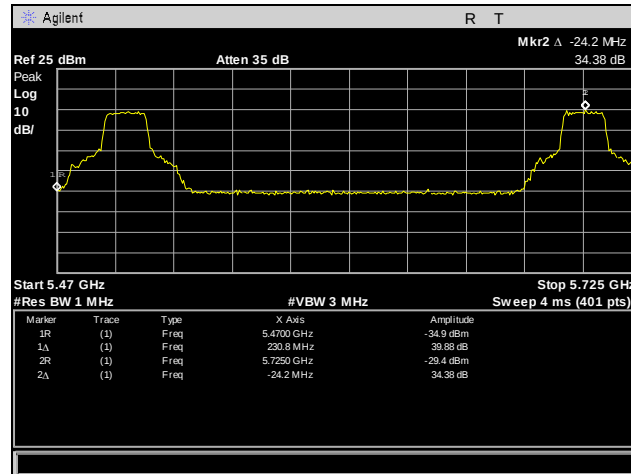
Plot 739. Frequency Stability, 5470 – 5725 MHz, 20°C, 132 V



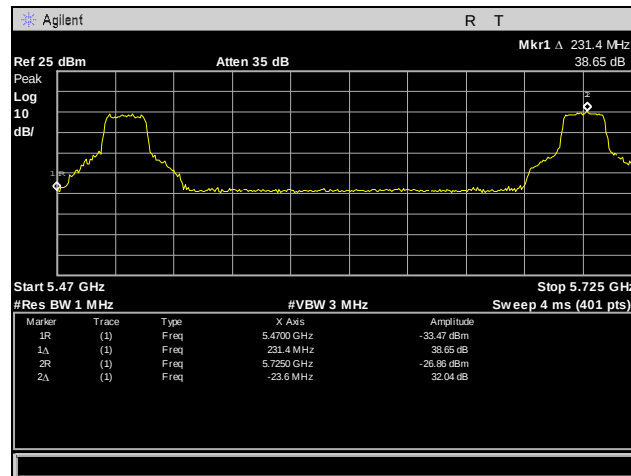
Plot 740. Frequency Stability, 5470 – 5725 MHz, 30°C, 120 V



Plot 741. Frequency Stability, 5470 – 5725 MHz, 40°C, 120 V



Plot 742. Frequency Stability, 5470 – 5725 MHz, 50°C, 120 V



Plot 743. Frequency Stability, 5470 – 5725 MHz, 55°C, 120 V

Electromagnetic Compatibility Criteria for Intentional Radiators

RSS-GEN Receiver Spurious Emissions Requirements

Test Requirements: The following receiver spurious emission limits shall be complied with:

- (a) If a radiated measurement is made, all spurious emissions shall comply with the limits of Table 25.

Spurious Frequency (MHz)	Field Strength (microvolt/m at 3 metres)
30 – 88	100
88 – 216	150
216 – 960	200
Above 960	500

Table 25. Spurious Emission Limits for Receivers

- (b) If a conducted measurement is made, no spurious output signals appearing at the antenna terminals shall exceed 2 nanowatts per any 4 kHz spurious frequency in the band 30-1000 MHz, or 5 nanowatts above 1 GHz.

Test Procedures: The EUT was programmed for receive mode only. Conducted measurements were taken at the antenna port of the EUT. 300 kHz resolution bandwidth was used from 30 MHz - 1 GHz and 1 MHz resolution was used for measurements done above 1 GHz. All plots are corrected for cable loss.

Test Results: Equipment is compliant with the Receiver Spurious Emissions Requirements of RSS-GEN.

Test Engineer(s): Anderson Soungpanya

Test Date(s): 01/30/13

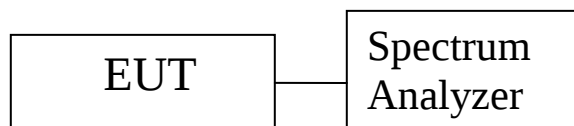
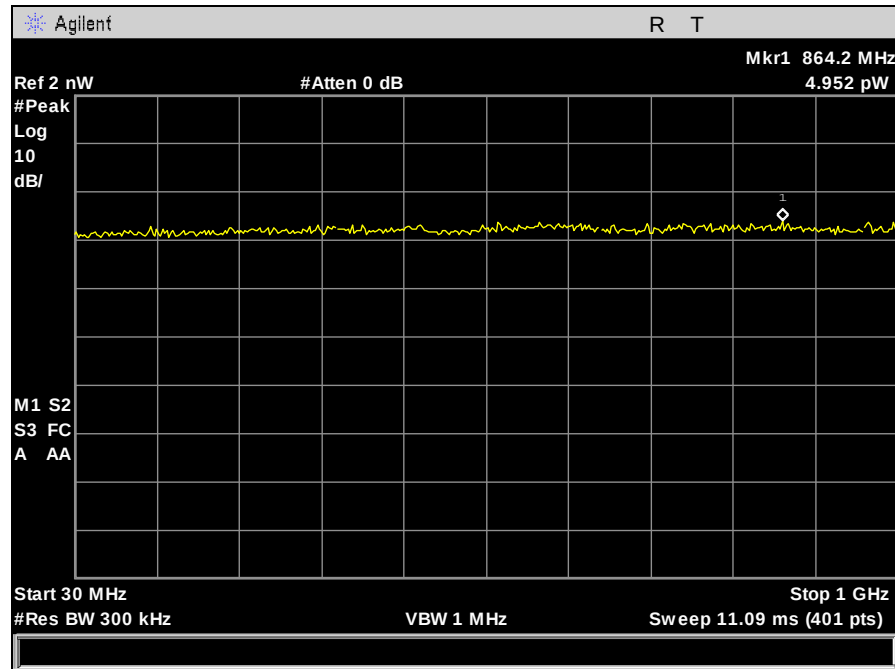
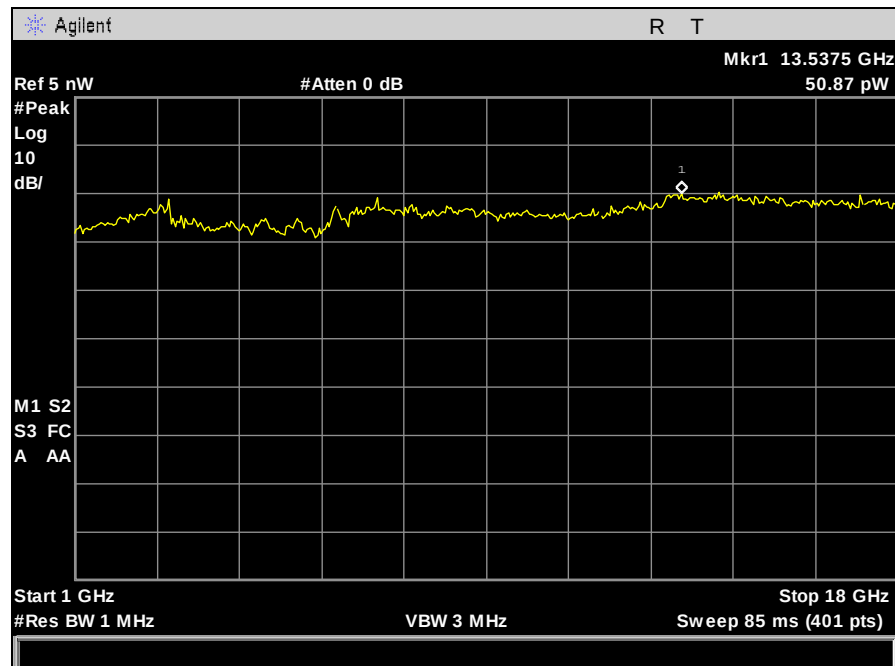


Figure 6. Block Diagram, Conducted Receiver Spurious Emissions Test Setup

Conducted Receiver Spurious Emissions, Port 1

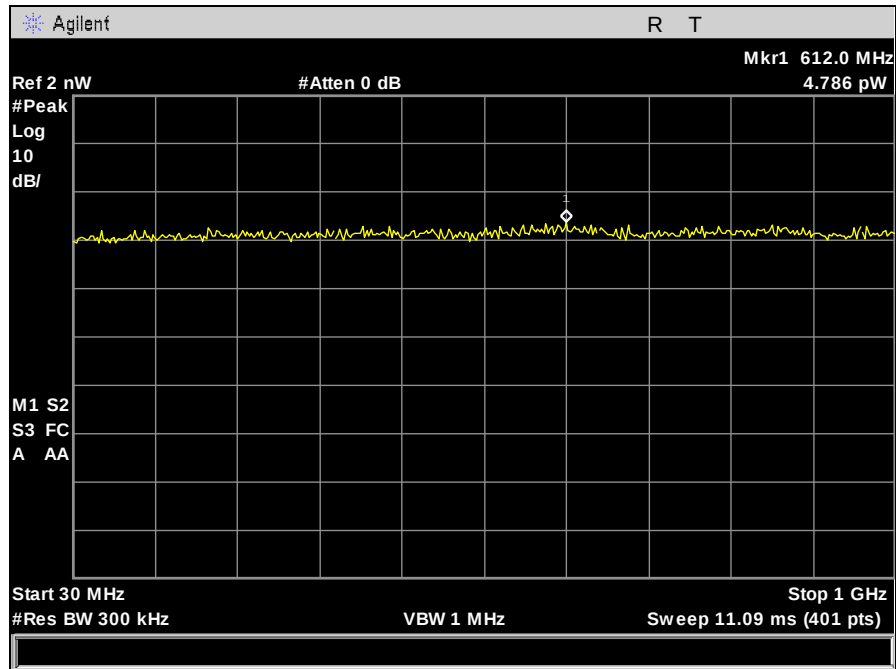


Plot 744. Receiver Spurious Emission, 30 MHz – 1 GHz, Port 1

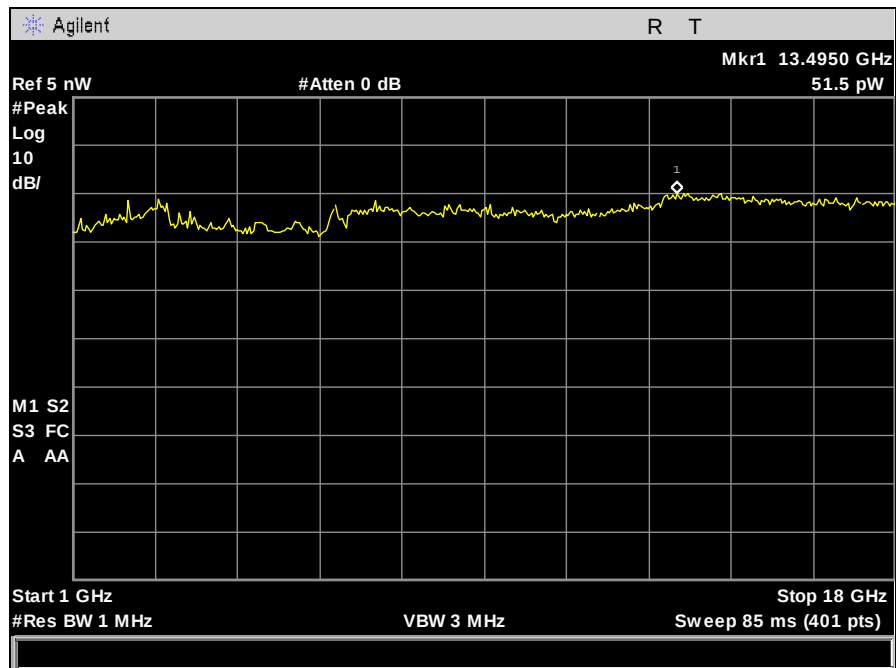


Plot 745. Receiver Spurious Emission, 1 GHz – 18 GHz, Port 1

Conducted Receiver Spurious Emissions, Port 2

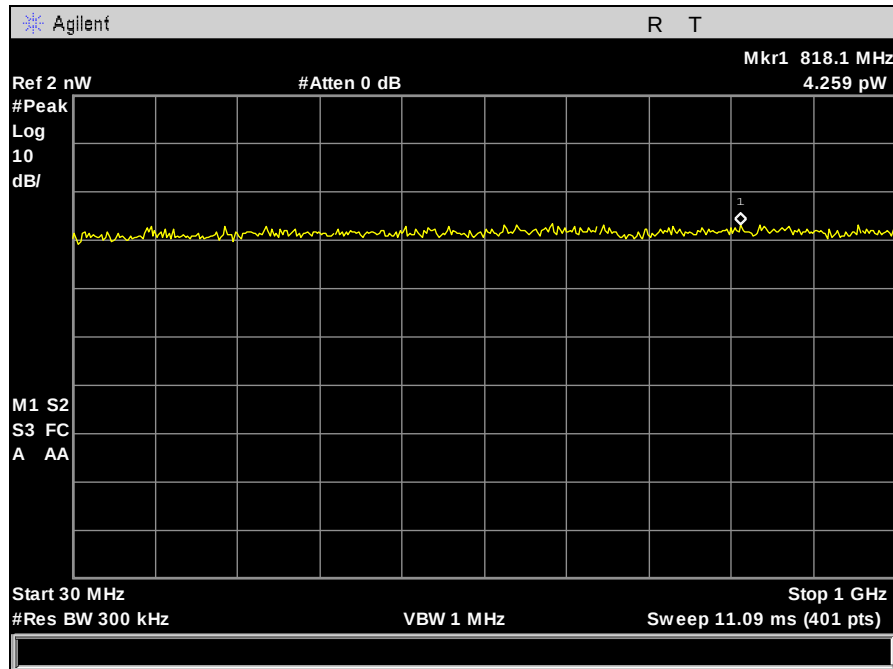


Plot 746. Receiver Spurious Emission, 30 MHz – 1 GHz, Port 2

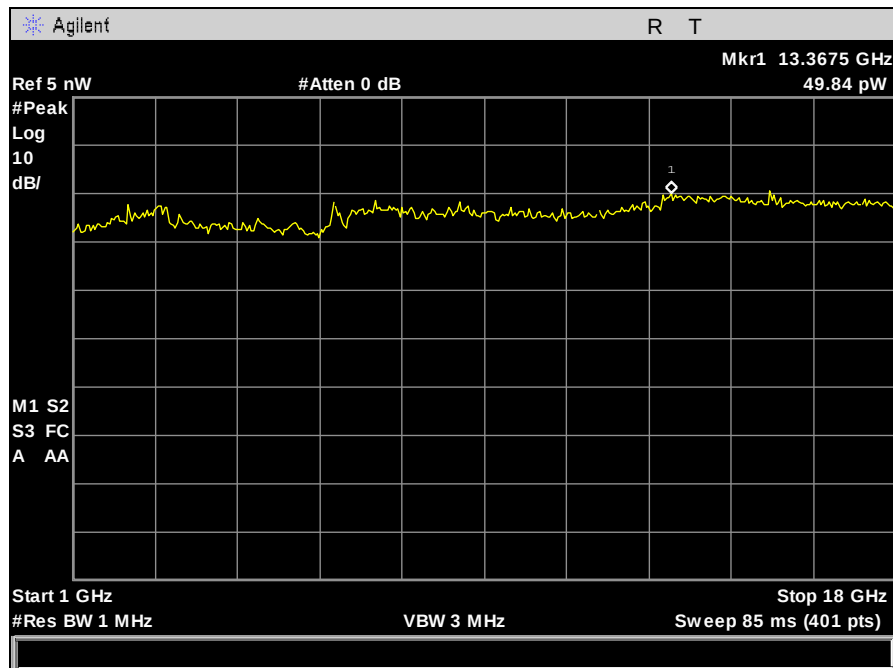


Plot 747. Receiver Spurious Emission, 1 GHz – 18 GHz, Port 2

Conducted Receiver Spurious Emissions, Port 3



Plot 748. Receiver Spurious Emission, 30 MHz – 1 GHz, Port 3



Plot 749. Receiver Spurious Emission, 1 GHz – 18 GHz, Port 3