Agilent 89450A DMCA
(Digital Multi-Channel Access) Radio Test Application Personality

Product Overview

Reduce the time it takes to develop and test DMCA transmitters and receivers with Agilent Technologies' complete DMCA test solution. Using the Agilent 89400 Series vector signal analyzer as the measurement platform, the Agilent 89450A DMCA radio test application personality customizes the analyzer to perform "one-button" DMCA tests, without sacrificing the measurement flexibility needed to troubleshoot difficult system problems.

The 89450A DMCA application personality provides "one-button" tests to measure adjacent channel power, occupied bandwidth, modulation accuracy, antenna power, carrier-off leakage, and transmission ramp up/down power profiles. These "one-button" tests save time setting up routine measurement tasks and meet the measurement specifications outlined in the RCR-32 (Research and Development Center for Radio Systems) DMCA radio standard.

Measurement speed and accuracy are other attributes that have a direct effect on reducing test time. The 89400 Series VSAs' DSP (Digital Signal Processing) -based measurement architecture quickly calculates adjacent channel power or occupied bandwidth power of DMCA signals. Measurement performance of .1 dB amplitude accuracy, 75 dB dynamic range, and -116 dBc/Hz (10 kHz offset) phase noise ensures accurate and repeatable measurement results. Overall, the 89450A application personality customizes the measurement power of Agilent's vector signal analyzers into an easy to use, high speed, and accurate DMCA radio tester.

One button operation to select desired DMCA measurement

With the press of a single button the analyzer is configured to make modulation, adjacent channel power, occupied bandwidth power, and burst power measurements based on the RCR-32 standard. Flexible display formats allow the data to be viewed in a variety of ways to show maximum information about the signal. Coupled markers allow quantitative data comparison at specific symbol times across different display types.
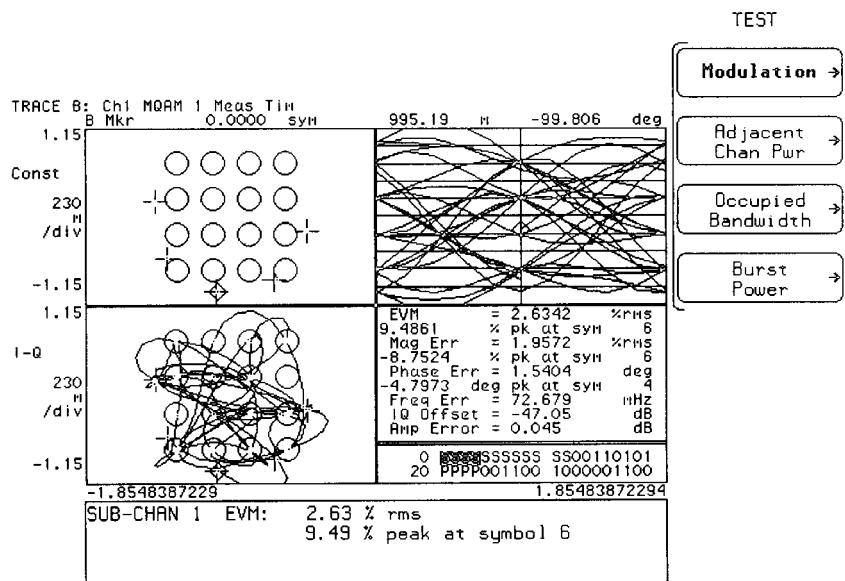

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Display flexibility aids the R&D process

With a four sub-carrier signal like DMCA, sub-carrier phases can inadvertently align, causing large peak power conditions. In order to reduce the ratio of peak-to-average power, power control is applied to the DMCA signal when the instantaneous power exceeds a set threshold. Flexible and scaleable display formats allow a complete characterization of this process. Zoom into a small region of interest on any display, such as the vector diagram, for an uncluttered examination of overlaid subchannel results. Precise power control timing checks are ensured with the up to 20-points-per-symbol clock.
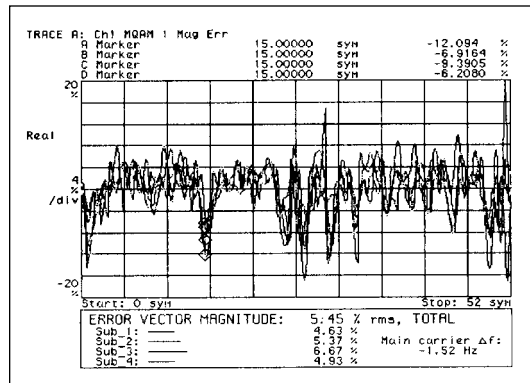

**Sub-carrier phase alignment causes a peak power condition.**
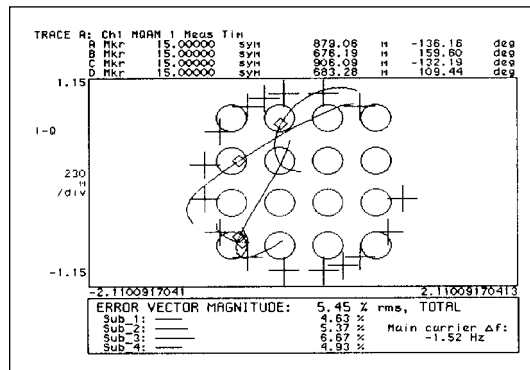
Display flexibility shows the complete picture.

Pilot track ensures a precise modulation accuracy measurement

Most DMCA radio systems have a significant amount of LO drift during each time slot, which introduces carrier phase drift. Power control also introduces rapid amplitude compression in the DMCA signal. DMCA radios must compensate for these impairments to achieve accurate and reliable demodulation. This compensation is accomplished in the radios using built-in software that tracks the pilot symbols. The 89450A provides pilot track software algorithms to ensure a precise modulation accuracy measurement.
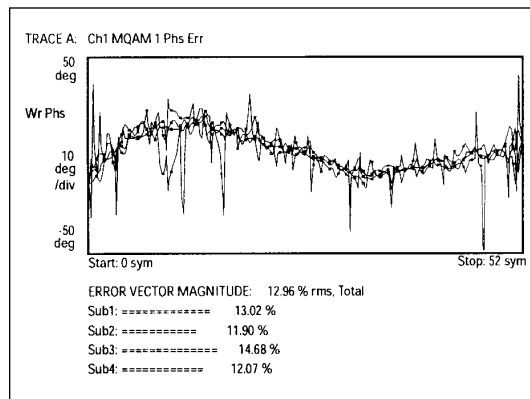

**Pilot Track OFF**
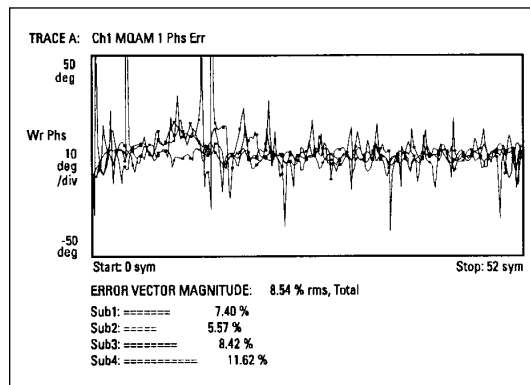
Pilot Track ON

One button test setup for adjacent channel power and occupied bandwidth

With the press of one button all the necessary displays and measurement parameters are automatically set up. The one-button tests for both adjacent channel power and occupied bandwidth offer the flexibility of measuring burst signals only during the modulation or over the entire signal, including the burst edges. Compare power due to modulation and power over the entire burst to find the spectral energy due to burst edges, a primary source of spectral splatter.
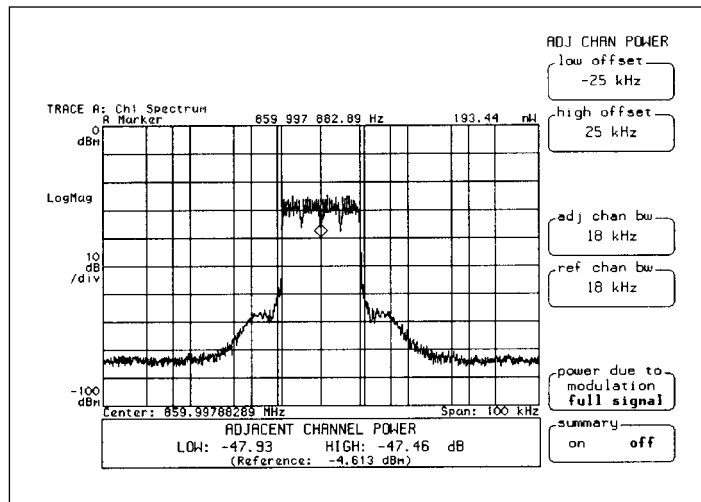
One button test setup for burst power profile

Analyze transmitter turn on/off parameters using the burst power test mode. Burst power shows the DMCA envelope aligned to the symbol clock for detailed analysis of the AGC (automatic gain control) preamble and power amplifier turn off. Measure power relative to the average power due to modulation or relative to absolute power. Use band power markers for custom power measurements over any portion of the DMCA signal. Examine power due to the AGC preamble and power due to modulation. In addition, a summary view gives detailed power calculations in a tabular format.
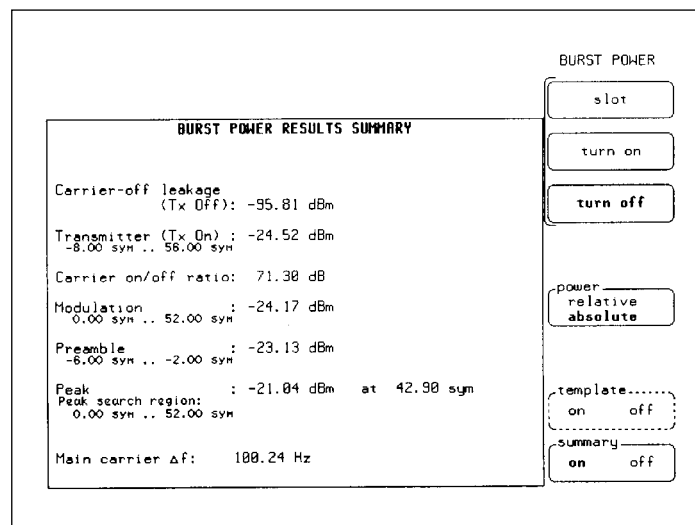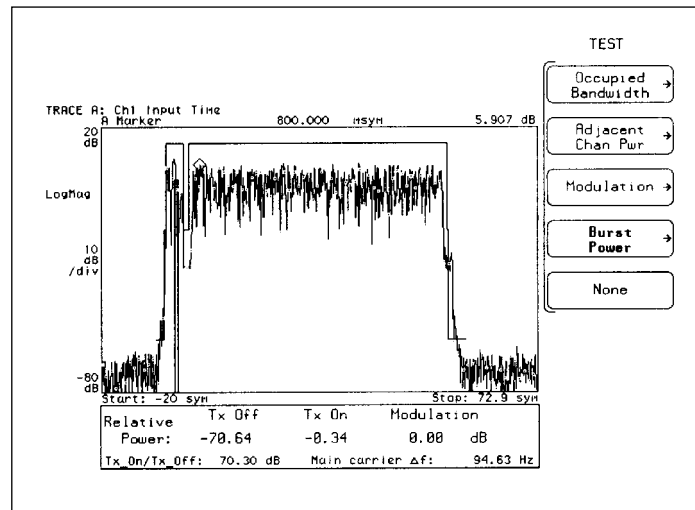
Agilent 89450A Measurement Specifications
The 89450A implements the following RCR-32 tests
- Frequency Tolerance
- Occupied Bandwidth
- Antenna Power
- Adjacent Channel Power
- Carrier-Off Leakage Power
- Modulation Accuracy
- Sub-Carrier Frequency Tolerance
- Transmission Response

Measurement display formats
The 89450A specifications and display formats are given in the 89410A, 89440A, and 89441A vector signal analyzer technical data sheets.

Required vector signal analyzer configuration
The following analyzers support the 89450A application personality:

Agilent 89410A	0 to 10 MHz
Agilent 89440A	0 to 1.80 GHz
Agilent 89441A	0 to 2.65 GHz

These analyzers must be configured with Option AYA (vector modulation analysis). For example, to order the 89450A with the 89441A, the minimum configuration would be:

Agilent 89450A	DMCA radio test application personality	Quantity 1
Agilent 89441A	0 to 2.65 GHz vector signal analyzer	Quantity 1
Option AYA	vector modulation analysis	Quantity 1

Note: Upgrading a vector signal analyzer with 89450A may require a new digital filter hardware upgrade. An analyzer with a serial number less than 3416A00619 requires a new 89410-69550 digital filter board.

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