Information Classification: COMPANY RESTRICTED

Re: R&S PA Compression Test v 1.3 > Opportunity at M/A Com (Smithfield, RI) /cr/

Greg Bonaguide to: Nick Lalic 07/17/2015 03:10 PM

Cc: Mike Leffel, Steve Varani

History: This message has been replied to.

Hi Nick,

Boy, when it rains it pours...

Here's some feedback from my customer meeting today with M/ACom, who is going to be opening a new design facility in Smithfield, RI, and will need to fully outfit 6 test benches and a loadpull station. All 7 will require VNA's (they're considering 6 ZVA8's and 1 ZVA24), as well as Siggens, SpecA's, and Power sensors for the 6 test benches. This group was formerly NXP who recently left the company en masse (when it was sold to Chinese investors) and they've mostly all hired on with M/ACom.

I'll intersperse replies to your earlier comments (previous e-mail) with new requests, and try to prioritize them. Items in RED are show-stoppers.

First, they really like your tool. They were under the impression that only PNA-X had the capability to perform n-dB compression pt. vs. frequency sweeps. Your macro is a bit slower, but for the number of points they usually measure (~51 freq points, 51 power steps), it's really not noticeable (and not a show-stopper). And they *really* like the fact that you have all the trace data available for review.

Item #1 (remote controllable) isn't a concern for this customer. They're old-school, in that they do their development work on a bench with a soldering iron in one hand. But because they use a "cut and try" approach, **they'd like to have a way of recording the last two or three sweeps** , so they can tell at a glance if they're getting closer or further from their objective when they "increase capacitor x" or "decrease copper trace y." (This isn't as much a show stopper as it is something that would significantly enhance our chance of winning this opportunity.)

Item #2 (Refl. Coef) and #3 (Nom. Gain): Would be nice to give the user the option of choosing to display measurement results under nominal conditions or compression conditions (or display both by default).

Item #4: (Memory Traces on Display) and #5 (update VNA screen): Their feedback was a bit different from my original query, but it deals with the data displayed on ZNB traces: **They would definitely like to see continuous update of the trace progress .** Could you update the "Pout" and "Pin" traces after each measurement point, so they can see the progress of the measurement? (I'd suggest minimizing your dialog as soon as the user enters "Measure.")

Other things: You have a number of pull-down options under your "Results" tab. Perhaps do something like in the FSW, where you can select the data for the "X" axis from one pull-down, and select the data for the "Y" axis from a separate pull-down, for maximum flexibility. This may be needed because they also mentioned other things they'd like to see:

- **Phase vs. Pin or Pout (at comp. pt.)** Perhaps put both AM/AM and AM/PM on the same graph (two traces).

Other important needs:

- **Ability to stop the comp . pt sweep after reaching the desired comp . pt. -- no more than an additional 0.25 dB of drive allowed , to avoid damaging DUT !** BTW, they definitely like the option to turn off RF at the end of the sweep.

- **Ability to perform measurements relative to a "small-signal" gain (like the sweep start value) OR**

relative to the maximum device gain . (Their preference is the latter.)

- They'd also like you to incorporate the ability to measure PAE as part of this measurement function, using the voltmeter(s) built into the ZVA. Tom has done this before using the ZVA while performing power sweeps, and it works (works well enough in the context of relative tuning to maximize PAE).

- This customer builds PA's for RADAR customers, so the **ability to make measurements under pulse conditions is vital** . You might consider adding a checkbox on the measurement settings tab that, when clicked, opens another tab for setting up the measurement triggering. (A separate tab to keep things from getting unnecessarily cluttered on the main "Settings" tab.) This is definitely a show-stopper.

- We also discussed ways to effectively display data. One suggestion they came up with was when you have the data you like on the "Results" screen, have an "Export to VNA" button that would export this data to a new, unique diagram area on the VNA, similar to what you currently do for the Pout and Pin values. This would allow them to create a "photo album" display that they could then refer to or export as a screenshot.

One other thing (for Mike to feed back to the Product Line for Next Gen ZVA): They'd like to have the ability to customize their pulse shape. Apparently, using a sloping rising edge and falling edge is important for some measurement conditions (to keep currents at reasonable levels), and the measurement is performed in a "point in pulse" fashion when the pulse has reached it's maximum value.

Whew! I know this is a lot, but all this feedback suggests they were truly excited about PA Compression Test and what it can do to simplify/improve their workflow. This would be a nice sale, too. We don't often get the chance to outfit a completely new lab. My customer, Tom Kelly, was the only one at NXP that used a ZVA (for his pulse work). All the other test benches used PNA-X's. At the new facility, they're looking to standardize on a single platform. I'm trying to do all I can to see that it's our platform!

Regards,

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Nick Lalic | Greg, Thanks for the feedback! I'll try to answ... | 07/17/2015 01:31:08 PM

From: Nick Lalic/RSA
To: Greg Bonaguide/RSA@RSA,
Cc: Mike Leffel/RSA@RSA
Date: 07/17/2015 01:31 PM
Subject: Re: R&S PA Compression Test v1.3 /cr/

Greg,

Thanks for the feedback! I'll try to answer your questions

1. Remote controllable

This is something that I have considered. I've been working on creating a TCP socket-based SCPI server. The customer would then connect to it from their code and control it similar to an instrument. Because of the structure of PA Compression Test, I would have to reorganize and possibly rewrite

large parts of the application so that it would work both with a GUI and with SCPI commands.

If this is something that your customer needs I can do it. In fact, it's something I plan on doing for the next release (you are not the first person to ask), but it will take some time to develop.

2. Reflection Coefficient

This is the gain at the lowest power level ("small signal"). I could overlay traces for the reflection coefficient at compression. It might be interesting to see how it changes.

On that note, if you want the raw data you can go to File -> Export. This exports all data in touchstone format, as well as CSV files of the compression points and what I call "nominal gain" (see next point).

3. Nominal Gain

I am using the lowest power point as the nominal gain.

4. Memory Traces on VNA display

Yes, they are memory traces. After I finish generating the results, I create a second channel with two data traces, and write the Pin and Pout compression point data to these data traces.

5. Update VNA screen with results

This is a good idea. I'll consider this in the next release.

6. Use maximum gain for compression calculation (Gain expansion)

Yes, I got this feedback from Barry Adkins also. His customer (Freescale) had an amplifier with gain expansion. It's something that I plan on putting into the next release.

These are all really good points. Thanks Greg!
I plan on revisiting this application soon and adding the things that you've mentioned. I'll let you know when I start work on it. Maybe you can give me some feedback on a tentative feature set and user interface when I get started?

Best Regards,
Nick Lalic

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Greg Bonaguide	Hi Nick, I had the chance to try R&S PA Com...	07/17/2015 07:33:36 AM
Nick Lalic	Greg, Here is the latest version of the PA Co...	07/16/2015 07:12:27 PM