Agilent E5070B/E5071B ENA Series RF Network Analyzers

Save Trace Data in Touchstone Format

Second Edition

Agilent Technologies

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VBA Macro

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Overview

Use the following VBA macro to save measurement data into a file in Touchstone format.

Folder	VBA macro name (project name)
D:\Agilent	SaveToTouchstone.vba

This VBA macro saves measurement data of any channel into a Touchstone format file, based on 1 to 4 port models.

You can use data saved in Touchstone format for a circuit simulator such as Agilent Advanced Design System (ADS) on your PC (personal computer) or workstation. For more information on the ADS, refer to the operation manual that comes with the system.

For information on data structure in a saved file, refer to "Data structure in Touchstone file" in this document.

Note on use

When the fixture simulator is ON and the port impedance conversion is ON, Z0 of all ports to be saved must be set to the same value.
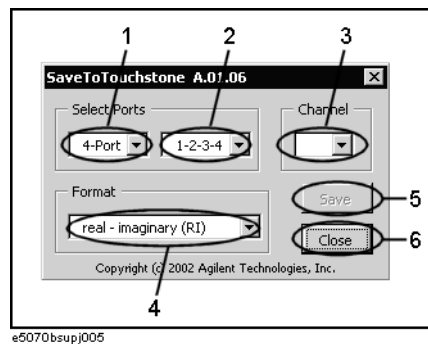
Operating procedure

1. Starting VBA macro

Step 1. Press **[Macro Setup]**.

Step 2. Press **Load Project**.

Step 3. The Open dialog box appears. Specify the file name "D:\Agilent\SaveToTouchstone.vba" and press the **Open** button.

Step 4. Press **[Macro Run]** to start the macro. (Refer to Figure 1-1.)

Figure 1-1   **SaveToTouchstone**

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2. Saving data

Step 1. Select the number of ports (1 in Figure 1-1) and test ports (2 in Figure 1-1).

NOTE   You can selects 1 port or 2 ports as the number of ports when the maximum number of channels/traces is 16 channels/4 traces or 12 channels/6 traces.

Step 2. Select a channel (3 in Figure 1-1).

NOTE   The channel selected in this step has no relation to active channel.

Step 3. Select the data saving format (4 in Figure 1-1).

real - imaginary (RI)	real and imaginary parts
magunitude - angle (MA)	linear magnitude and phase (degree)
dB - angle (DB)	logarithmic magnitude (dB) and phase (degree)

Step 4. Press the **Save** button (5 in Figure 1-1). Measurement of necessary data for the selected channel in Step 2 starts.

NOTE   Regardless of state of the trigger system, measurement is automatically performed once.

NOTE   Regardless of on/off state of the balance-unbalance conversion, measurement is performed without the balance-unbalance conversion.

Step 5. When the measurement is complete, the Save As dialog box appears. Specify a file name and press the **Save** button.

Step 6. When saving to the file is complete, the start screen appears again.
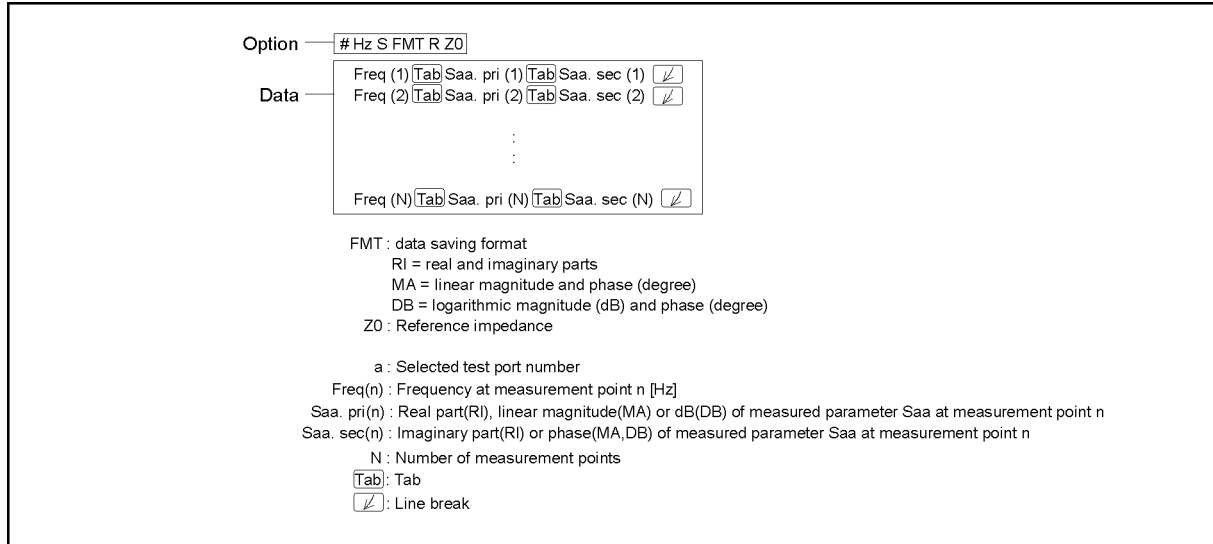
3. Closing VBA macro

Step 1. Press the **Close** button (6 in Figure 1-1) to exit from the macro.

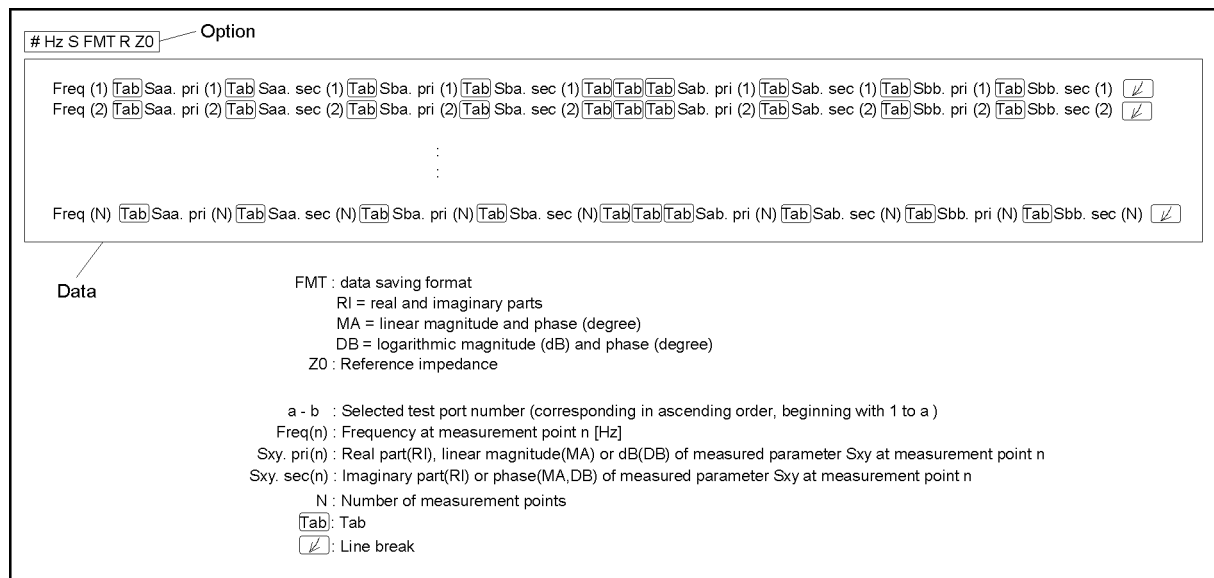# Data structure in Touchstone file

Figure 1-2 through Figure 1-5 show the data structure of a file saved in Touchstone format. Contents of the file is text data, which is ready for being read with your text editor.

Figure 1-2   **One port Touchstone file**

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Figure 1-3   **Two port Touchstone file**

e5070bsupe002

Figure 1-4   **Three port Touchstone file**

Option   オプション ── # Hz S FMT R Z0

Data   データ

Freq (1) [Tab] Saa. pri (1) [Tab] Saa. sec (1) [Tab] Sab. pri (1) [Tab] Sab. sec (1) [Tab] Sac. pri (1) [Tab] Sac. sec (1) [↙]
[Tab][Tab][Tab] Sba. pri (1) [Tab] Sba. sec (1) [Tab] Sbb. pri (1) [Tab] Sbb. sec (1) [Tab] Sbc. pri (1) [Tab] Sbc. sec (1) [↙]
[Tab][Tab][Tab] Sca. pri (1) [Tab] Sca. sec (1) [Tab] Scb. pri (1) [Tab] Scb. sec (1) [Tab] Scc. pri (1) [Tab] Scc. sec (1) [↙]
Freq (2) [Tab] Saa. pri (2) [Tab] Saa. sec (2) [Tab] Sab. pri (2) [Tab] Sab. sec (2) [Tab] Sac. pri (2) [Tab] Sac. sec (2) [↙]
[Tab][Tab][Tab] Sba. pri (2) [Tab] Sba. sec (2) [Tab] Sbb. pri (2) [Tab] Sbb. sec (2) [Tab] Sbc. pri (2) [Tab] Sbc. sec (2) [↙]
[Tab][Tab][Tab] Sca. pri (2) [Tab] Sca. sec (2) [Tab] Scb. pri (2) [Tab] Scb. sec (2) [Tab] Scc. pri (2) [Tab] Scc. sec (2) [↙]

:
:

Freq (N) [Tab] Saa. pri (N) [Tab] Saa. sec (N) _Sab. pri (N)[Tab] Sab. sec (N)[Tab] Sac. pri (N)[Tab] Sac. sec (N) [↙]
[Tab][Tab][Tab] Sba. pri (N) [Tab] Sba. sec (N) _Sbb. pri (N)[Tab] Sbb. sec (N)[Tab] Sbc. pri (N)[Tab] Sbc. sec (N) [↙]
[Tab][Tab][Tab] Sca. pri (N) [Tab] Sca. sec (N) _Scb. pri (N)[Tab] Scb. sec (N)[Tab] Scc. pri (N)[Tab] Scc. sec (N) [↙]

FMT : data saving format
   RI = real and imaginary parts
   MA = linear magnitude and phase (degree)
   DB = logarithmic magnitude (dB) and phase (degree)
Z0 : Reference impedance

a - c   : Selected test port number (corresponding in ascending order, beginning with 1 to a)
Freq(n) : Frequency at measurement point n [Hz]
Sxy. pri(n) : Real part(RI), linear magnitude(MA) or dB(DB) of measured parameter Sxy at measurement point n
Sxy. sec(n) : Imaginary part(RI) or phase(MA,DB) of measured parameter Sxy at measurement point n
N : Number of measurement points
[Tab] : Tab
[↙] : Line break

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Figure 1-5   **Four port Touchstone file**

Hz S FMT R Z0 ── Option

Freq (1) [Tab] S11. pri (1) [Tab] S11. sec (1) [Tab] S12. pri (1) [Tab] S12. sec (1) [Tab] S13. pri (1) [Tab] S13. sec (1) [Tab] S14. pri (1) [Tab] S14. sec (1) [↙]
[Tab][Tab][Tab] S21. pri (1) [Tab] S21. sec (1) [Tab] S22. pri (1) [Tab] S22. sec (1) [Tab] S23. pri (1) [Tab] S23. sec (1) [Tab] S24. pri (1) [Tab] S24. sec (1) [↙]
[Tab][Tab][Tab] S31. pri (1) [Tab] S31. sec (1) [Tab] S32. pri (1) [Tab] S32. sec (1) [Tab] S33. pri (1) [Tab] S33. sec (1) [Tab] S34. pri (1) [Tab] S34. sec (1) [↙]
[Tab][Tab][Tab] S41. pri (1) [Tab] S41. sec (1) [Tab] S42. pri (1) [Tab] S42. sec (1) [Tab] S43. pri (1) [Tab] S43. sec (1) [Tab] S44. pri (1) [Tab] S44. sec (1) [↙]
Freq (2) [Tab] S11. pri (2) [Tab] S11. sec (2) [Tab] S12. pri (2) [Tab] S12. sec (2) [Tab] S13. pri (2) [Tab] S13. sec (2) [Tab] S14. pri (2) [Tab] S14. sec (2) [↙]
[Tab][Tab][Tab] S21. pri (2) [Tab] S21. sec (2) [Tab] S22. pri (2) [Tab] S22. sec (2) [Tab] S23. pri (2) [Tab] S23. sec (2) [Tab] S24. pri (2) [Tab] S24. sec (2) [↙]
[Tab][Tab][Tab] S31. pri (2) [Tab] S31. sec (2) [Tab] S32. pri (2) [Tab] S32. sec (2) [Tab] S33. pri (2) [Tab] S33. sec (2) [Tab] S34. pri (2) [Tab] S34. sec (2) [↙]
[Tab][Tab][Tab] S41. pri (2) [Tab] S41. sec (2) [Tab] S42. pri (2) [Tab] S42. sec (2) [Tab] S43. pri (2) [Tab] S43. sec (2) [Tab] S44. pri (2) [Tab] S44. sec (2) [↙]

:
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Freq (N) [Tab] S11. pri (N) [Tab] S11. sec (N) [Tab] S12. pri (N) [Tab] S12. sec (N) [Tab] S13. pri (N) [Tab] S13. sec (N) [Tab] S14. pri (N) [Tab] S14. sec (N) [↙]
[Tab][Tab][Tab] S21. pri (N) [Tab] S21. sec (N) [Tab] S22. pri (N) [Tab] S22. sec (N) [Tab] S23. pri (N) [Tab] S23. sec (N) [Tab] S24. pri (N) [Tab] S24. sec (N) [↙]
[Tab][Tab][Tab] S31. pri (N) [Tab] S31. sec (N) [Tab] S32. pri (N) [Tab] S32. sec (N) [Tab] S33. pri (N) [Tab] S33. sec (N) [Tab] S34. pri (N) [Tab] S34. sec (N) [↙]
[Tab][Tab][Tab] S41. pri (N) [Tab] S41. sec (N) [Tab] S42. pri (N) [Tab] S42. sec (N) [Tab] S43. pri (N) [Tab] S43. sec (N) [Tab] S44. pri (N) [Tab] S44. sec (N) [↙]

Data

FMT : data saving format
   RI = real and imaginary parts
   MA = linear magnitude and phase (degree)
   DB = logarithmic magnitude (dB) and phase (degree)
Z0 : Reference impedance

Freq(n) : Frequency at measurement point n [Hz]
Sxy. pri(n) : Real part(RI), linear magnitude(MA) or dB(DB) of measured parameter Sxy at measurement point n
Sxy. sec(n) : Imaginary part(RI) or phase(MA,DB) of measured parameter Sxy at measurement point n
N : Number of measurement points
[Tab] : Tab
[↙] : Line break

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