Rigol DSA815 SSC-DSA/2FSK Mode

The purpose of the SSC-DSA/2FSK mode of the DSA815 Spectrum Analyzers is to improve the capability of the instrument when measuring signals with significant off time. In sweeping mode, the minimum sweep time of the instrument is 10 msec. This makes it difficult to capture and analyze signals that only last for microseconds at a time. Just as importantly, many of the ASK and FSK modulation schemes (and many others) use short bursts of power to minimize power and spectrum usage. It is very typical of data bursts from remote control toys, automotive key fobs, garage door openers, and these types of devices to power on the transmitter for a length too short to reliably measure in a 10 millisecond sweep.

SSC-DSA mode is a special measurement mode of the instrument that enables analysis of a 1.5 MHz span of spectrum to be captured and analyzed up to 6500 times per second. This makes it possible to capture much shorter modulation sequences. SSC-DSA mode is easy to setup. Once in the SSC-DSA measurement mode, only the center frequency needs adjusted. The span is always 1.5 MHz with 30 kHz RBW and a consistent rep rate of 6500 captures per second.

Sig Capture

The Sig Capture function can continuously capture signals whose power values change suddenly. This function is only available when the SSC-DSA option is installed. You can press **Sig Capture** to set the related parameters.

Note: Under the two conditions below, the instrument screen turns dark for a few seconds; this is a normal phenomenon foe mode switching.

- When pressing **Sig Capture** to enable the Sig Capture function.
- When pressing **Preset** to exit the Sig Capture function.

1. **RT Trace**
   Turn the real time trace ON or OFF. RT Trace, MaxHold, and 2FSK are mutually exclusive.

2. **MaxHold**
   Turn max hold ON or OFF. When max hold is turned ON, the signal capture each time will be compared with the previously captured signal, the greater value of which will be displayed. Rt Trace, MaxHold, and 2FSK are mutually exclusive.
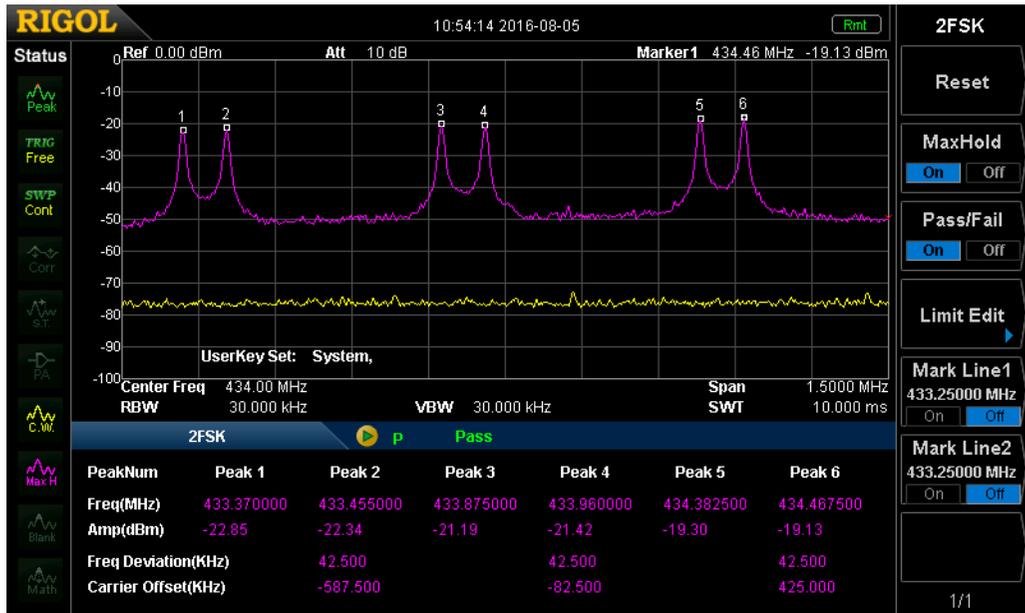
3. **MaxHold Rst**
   Delete the original signal(s) and capture new signals for the max hold trace reset. The reset operation has no effect on the user settings. You can also turn max hold OFF and then turn it ON the function of MaxHold Rst.

4. **2FSK**
   Enable or disable the 2FSK function. When thev2FSK function is enabled, the user

interface is divided into two areas automatically (the upper side is the basic measurement window and display the sweep trace; the lower side is the measurement result display window). You can press [**Meas Setup**] to set the related parameters. RT Trace, MaxHold, and 2FSK are mutually exclusive.

SSC-DSA/2FSK Measurement Interface

2FSK Measurement Result

For the three pairs of 2FSK signals, the frequency and amplitude of each peak, the Freq Deviation and Carrier Offset are shown.

Taking the first pair of 2FSK signal as an example,
Freq Deviation = |Peak 1 Freq – Peak 2 Freq|/2
Carrier Offset = (Peak1 Freq + Peak2 Freq)/2 - Center Frequency

The measurement results are based on the max hold trace if the max hold is turned on. If else, the measurement results are based on the real time trace.

1. **Reset**
Delete the original signal and capture new signals. The reset operation has no effect on the user settings.

2. **MaxHold**
Turn max hold on or off. When max hold is turned on, the signal captured

each time will be compared with the previously captured signal, the greater value of which will be displayed as the max hold trace. The max hold trace is displayed in pink and the real time trace is displayed in yellow.

3. **Pass/Fail**

Enable or disable the pass/fail function. Before enabling the pass/fail function, edit the amplitude limits referring to the introduction below.

● On: ▶ is displayed in the test result display window. If the amplitudes of the six peaks are within the amplitude limit range, the instrument passes the test and the test result display window shows "P" (green) and "Pass". If else, the test fails and the test result display window shows "F" (red) and "Fail".

● Off: ⏸ is displayed in the test result display window. The test result display window shows " - " and "---".

4. **Limit Edit**

Set the amplitude limit range of each peaks in the pass/fail test.

● Signal: select the signal to be modified. The signal and the corresponding peaks are shown in the table below.

Signal	Peaks
1	Peak 1 and Peak 2
2	Peak 3 and Peak 4
3	Peak 5 and Peak 6

● Ampt Up: set the amplitude upper limit.
● Ampt Down: set the amplitude lower limit.

5. **Mark Line1**

Turn Marker1 on or off. When Marker1 is turned on, a blue vertical line is displayed in the basic measurement window. In addition, the frequency at Marker1 is displayed in this menu or you can set the frequency at Marker1 via this menu. You can use the numeric keys, knob or direction keys to modify this parameter.

6. **Mark Line2**

Turn Marker2 on or off. When Marker2 is turned on, a red vertical line is displayed in the basic measurement window. In addition, the frequency at Marker2 is displayed in this menu or you can set the frequency at Marker2 via this menu. You can use the numeric keys, knob or direction keys to modify this parameter.

Note: If the frequencies at Marker1 and Marker2 are the same, the two vertical lines will overlap with the red vertical line corresponding to Marker2 being displayed at the upper layer.