Application Note

MG3710A Vector Signal Generator Optimization Technique using Two-signal Combine Function

MG3710A
Vector Signal Generator

Contents

1. Introduction

This document introduces the two-signal combine function of the MG3710A Vector Signal Generator (MG3710A hereafter) and explains an optimized technique for measurement using this function.

1.1. Technical Terms

This section explains the technical terms used in this document.

Baseband frequency · LO frequency

A vector signal generator is composed of a baseband block for generating the I/Q signal and an RF block for converting the I/Q signal to an RF signal for output. The RF block uses a quadrature modulator to convert the I/Q signal to the RF signal. In this article, the frequency of the I/Q signal generated by the baseband block is called the baseband frequency, while the frequency at conversion to the RF signal is called the LO frequency (Figure 1).

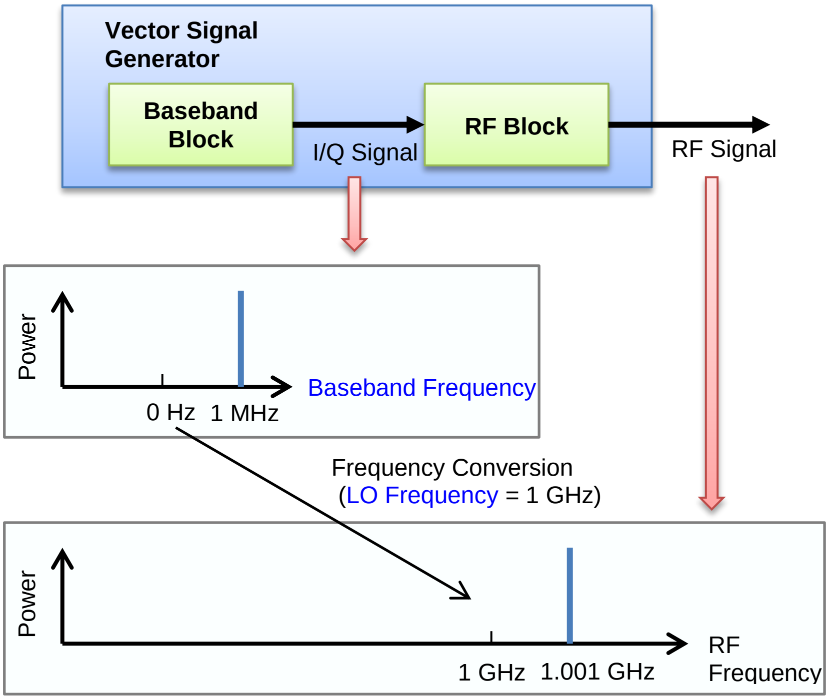


Figure 1. Baseband Frequency and LO Frequency

Measured Value

Performance not warranted. Data actually measured by randomly selected measuring instruments.

2. Two-signal Combine Function

A general vector signal generator outputs one type of waveform pattern from one RF output. Using the two-signal combine function, the MG3710A can combine the waveform selected in Memory A with the waveform selected in Memory B for simultaneous output. In addition, the level ratio, frequency offset and time offset of each selected waveform can be set easily from the panel (Figure 2).

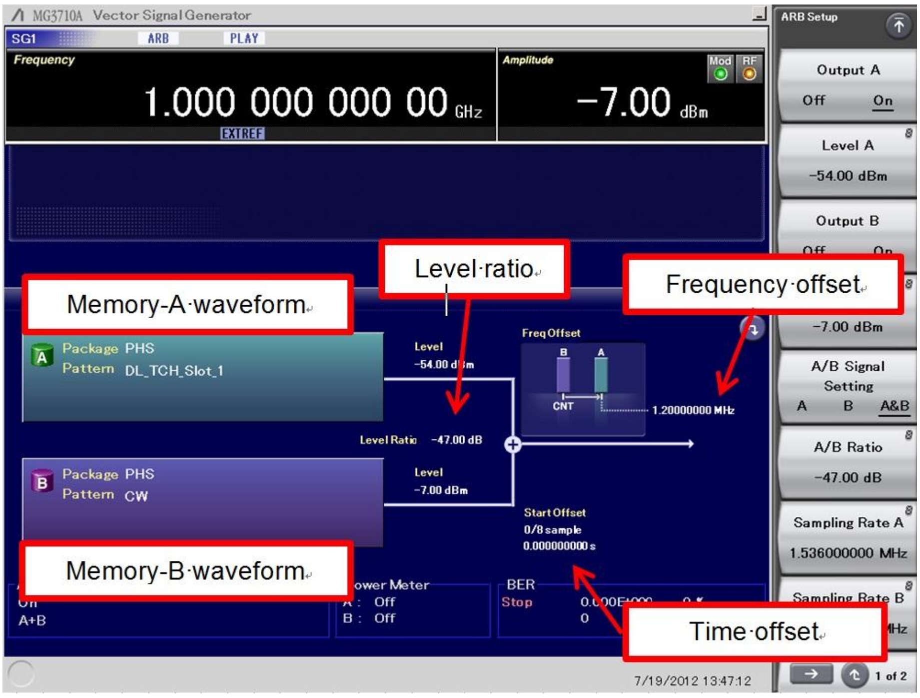


Figure 2. Example of Two-signal Combine Setting Display

The setting range and resolution of the parameters can be specified as follows:

Level ratio (A/B Ratio)
Setting range: –80 to 80 dB
Resolution: 0.01 dB

Frequency offset (Freq Offset A/B)
Setting range: –100 to +100 MHz
Resolution: 1 Hz

Time offset (Start Offset)
Setting range: 0 to (whichever is smaller of Memory-B waveform data points – 1 or 9,999,99)
Resolution: 1 sample (sampling rate of Memory-B waveform)

Adding the following option enables the two-signal combine function.

- MG3710A-048 Combination of Baseband Signal for 1stRF
  (MG3710A-078 Combination of Baseband Signal for 2ndRF)

Figure 3 shows an example of the output-signal spectrum using the two-signal combine function.

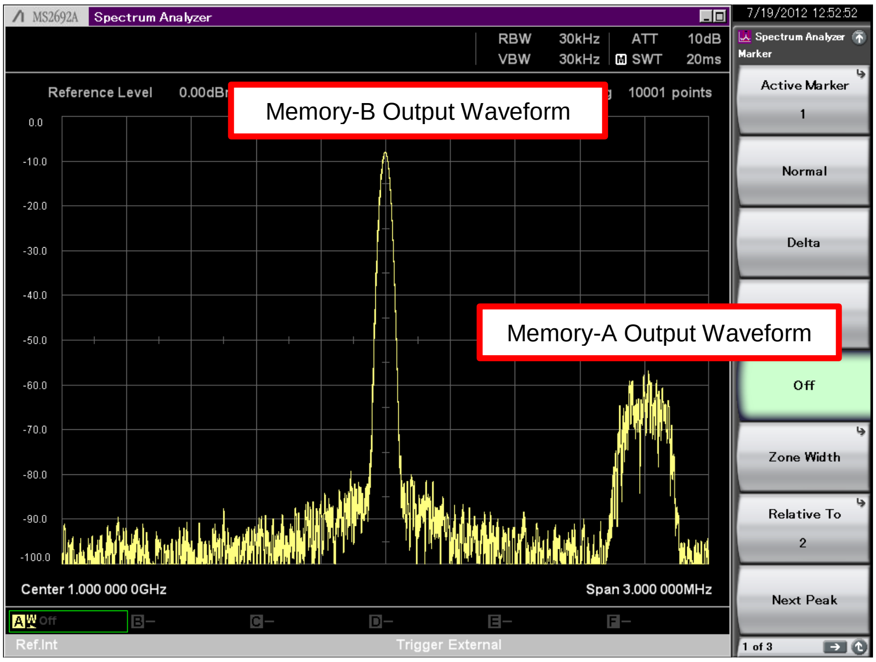


Figure 3. Example of Two-signal Combine Function Spectrum

2.1. Advantages of Two-Signal Combine Function

Evaluation of Rx characteristics such as Adjacent Channel Selectivity (ACS), Intermodulation Characteristics (IM), etc., requires measurements of characteristics when an interference wave is added to the wanted wave.

In a conventional signal generator, one unit can only output either the wanted or the interference wave so a test requiring the wanted wave and the interference wave requires two signal generators as well as a coupler to combine the two signals. Additionally, the work required to set the level ratio of the wanted and interference waves is quite difficult (Figure 4).

Using the all-in-one MG3710A two-signal combine function outputs both the wanted and interference signals and offers the following advantages (Figure 4).

- Advantage 1: Only one SG required
- Advantage 2: External coupler not required
- Advantage 3: Level ratio adjustment not required

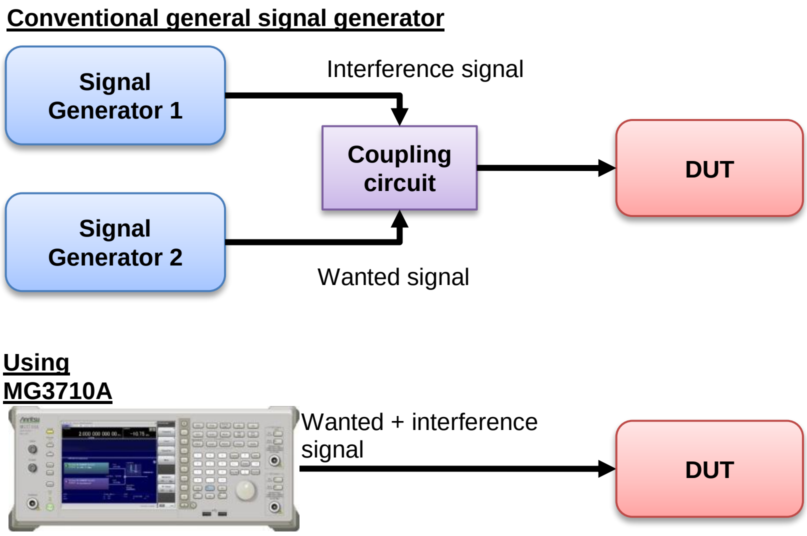


Figure 4. Example of Rx Characteristics Test Setup

When using two signals simultaneously like this, the MG3710A Two-Signal Combine Function supports easy setup of the test environment.

2.2. Linearity

Because the MG3710ATwo-Signal Combine Function synthesizes the signal digitally, the combined signal is output with an accurate level ratio.

Figure 5 shows an example of the MG3710A Two-Signal Combine Function level ratio settings and linearity error, indicating that the two-signal combine output has high linearity.

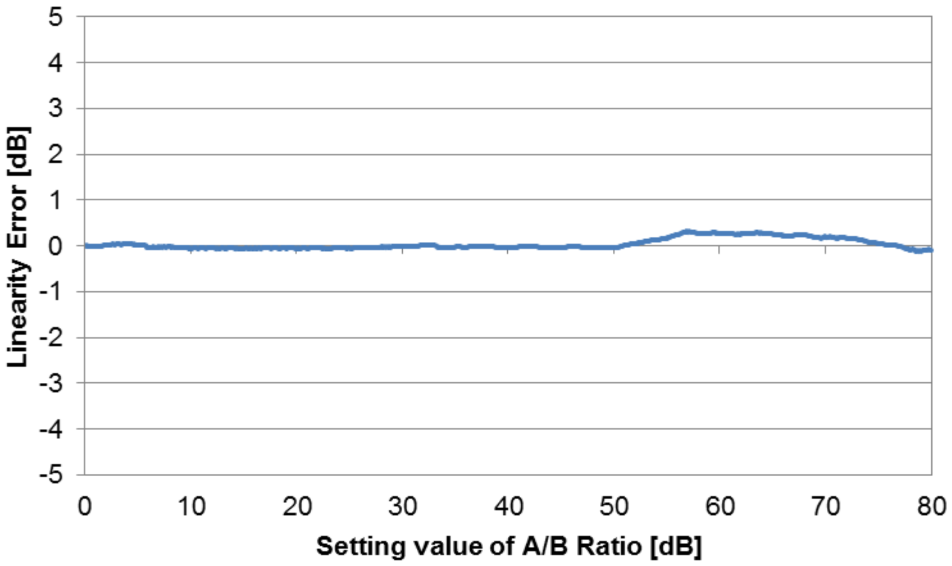


Figure 5. Linearity Error (Measurement Value)

In Figure 5, two-signal combination was performed to output a CW signal at MG3710A baseband frequencies of 0 Hz (signal A) and 20 MHz (signal B). The level of signal A was fixed while the level ratio of signal A/B was varied from 0 to 80 dB to measure the linearity error of signal B.

2.3. Combining Different Wireless Systems

3GPP Release 9 defines Multi-Standard Radio (MSR) base stations capable of sending and receiving signals for multiple radio systems simultaneously. MSR requires the ability to handle different systems such as LTE, W-CDMA, GSM/EDGE, TD-SCDMA, etc., simultaneously. Irrespective of MSR, each of the different waveform data for these types of systems also has a different sampling rate. Creating different sampling rate signals as one waveform data requires complex signal processing such as rate conversion and data cycle adjustment. In addition, the size of the synthesized waveform data tends to be much too large due not a little to the inadequate recovery performance from the signal generator.

Although the MG3700A Vector Signal Generator has a built-in two-signal combine function for synthesizing two signals at the baseband, it is still necessary to match the sampling rates of the waveform data in advance. This requires waveform data rate conversion, causing problems with the increase in the size of the waveform data after conversion.

To solve this problem, the MG3710A has a rate matching function (Figure 6) to output the combined two signals with each sampling rate maintained even for the same signals with different sampling rates.

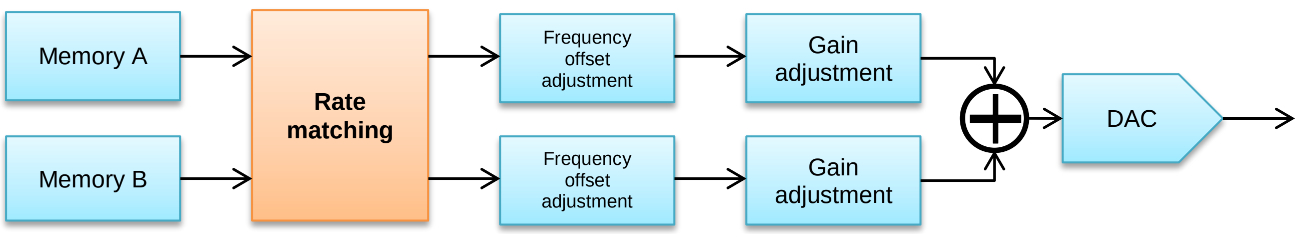


Figure 6. MG3710A Baseband Block

Using the MG3710A, a combined signal for wireless systems with different sampling rates can be output easily without requiring any special procedures.

*Refer to Creation of Multi-Standard Radio Signals using MG3710A Two-Signal Combine Function (MG3710A-J-F-1) for a description of how to create MSR signals.

3. Optimization Technique

This section explains the MG3710A optimization technique for obtaining the best performance when using the two-signal combine function.

3.1. Avoiding Carrier Leak and Image

3.1.1. Carrier Leak and Image

A signal generator generates the RF signal by synthesizing the baseband signal and LO signal at the quadrature modulator, but spurious components called carrier leak an image are also generated at this time. Carrier leak is generated at the position where the baseband frequency is 0 Hz. Image is generated at the $-f_c$ (Hz) position when the output signal baseband frequency is f_c (Hz).

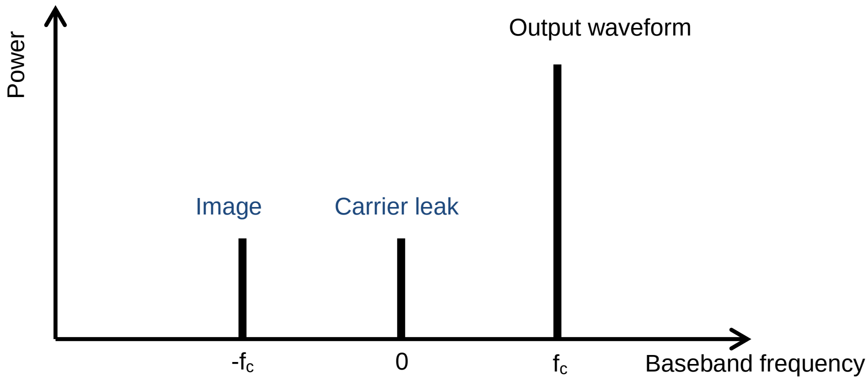


Figure 7. Carrier Leak and Image

Carrier leak is caused mainly by the DC offset of the baseband signal input to the quadrature modulator as well as by DC offset generated within the quadrature modulator. Image is caused mainly by orthogonality error of the quadrature modulator, amplitude error of the I/Q signal, and skew error.

3.1.2 Effect on Wanted Signal

When the carrier leak and image spurious signals are at the same position as the wanted waveform, they can have deleterious effects on the signal quality such as the modulation accuracy and level accuracy.

Figure 8 plots the distribution of the Continuous Wave (CW) predicted by the carrier leak and image for the center frequency of the required wave (W-CDMA) and the change in the Error Vector Magnitude when the CW level is changed.
The x-axis is the ratio of the CW output and the W-CDMA signal output level.

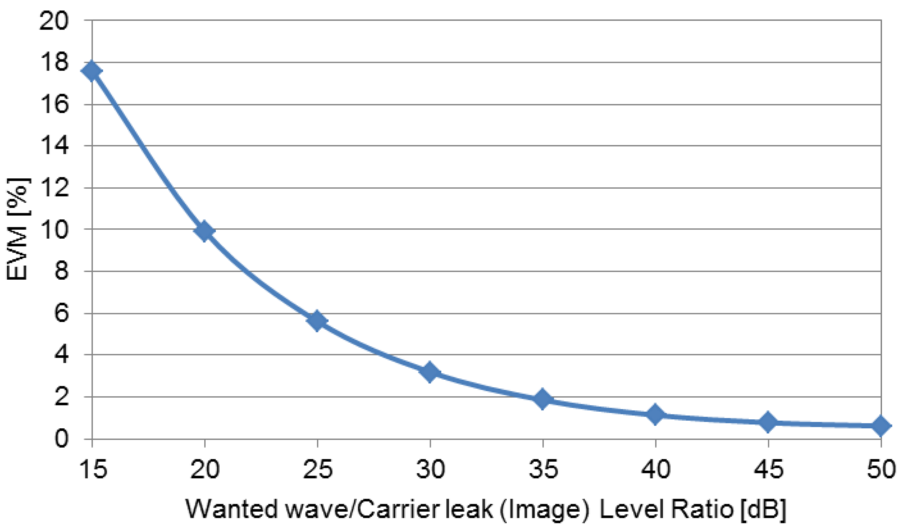


Figure 8. EVM Changes due to Spurious (Measurement Value)

We can see that the EVM degrades as the carrier leak becomes larger. (This is in the case for W-CDMA, but the results are sometimes different for other modulation methods.)

Moreover, when the CW is at the same frequency as the carrier leak/image, these two signals become stronger when at the same phase, and weaker when out of phase, causing a change in the level error at CW due to this phase relationship (Figure 9).

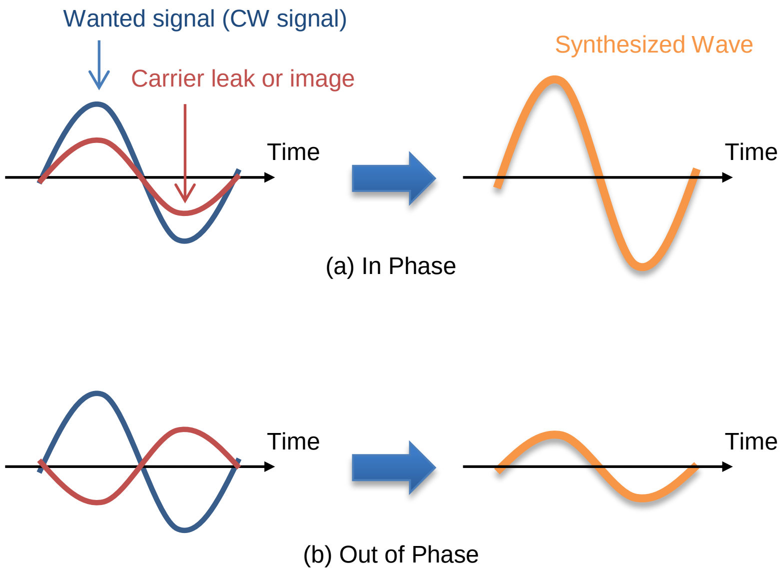


Figure 9. Phase Relationship and Synthesized Wave

Figure 10 plots the CW signal carrier leak (image) level ratio against the calculated level error of the CW signal.

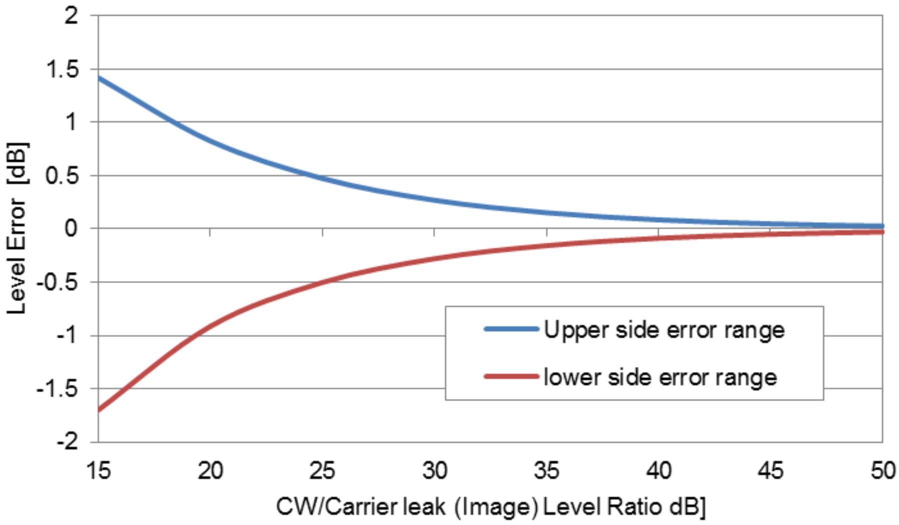
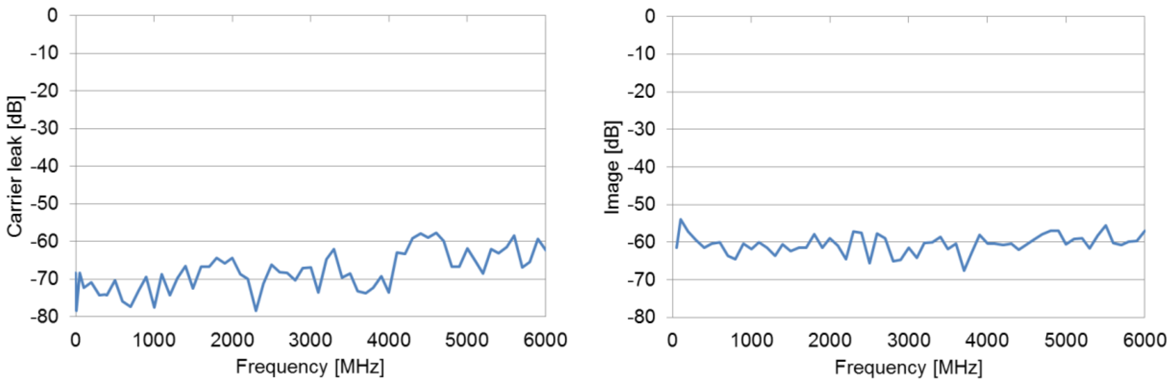


Figure 10. Change in Level Error due to Carrier Leak and Image

The modulation accuracy and level accuracy are adversely impacted by this overlap between the CW, the modulation wave, and the position of the carrier leak/image generation. When using the two signal combine function, it is necessary to note that there may be a larger effect when the two signal level ratio is large, because the lower level signal may approach the level of the carrier leak/image.

3.1.3. Improvement and Prevention Methods

The MG3710A can automatically adjust the quadrature modulator using the I/Q Calibration function.
(Key operation: I/Q key – [F5] I/Q Calibration – [F1] Execute)
Using this function, auto-adjustment is performed to minimize the carrier leak and image.
Figure 11 shows the carrier leak and image frequency plots after using this function. The plots show the measured values at input of a CW signal with a 10-MHz frequency offset.



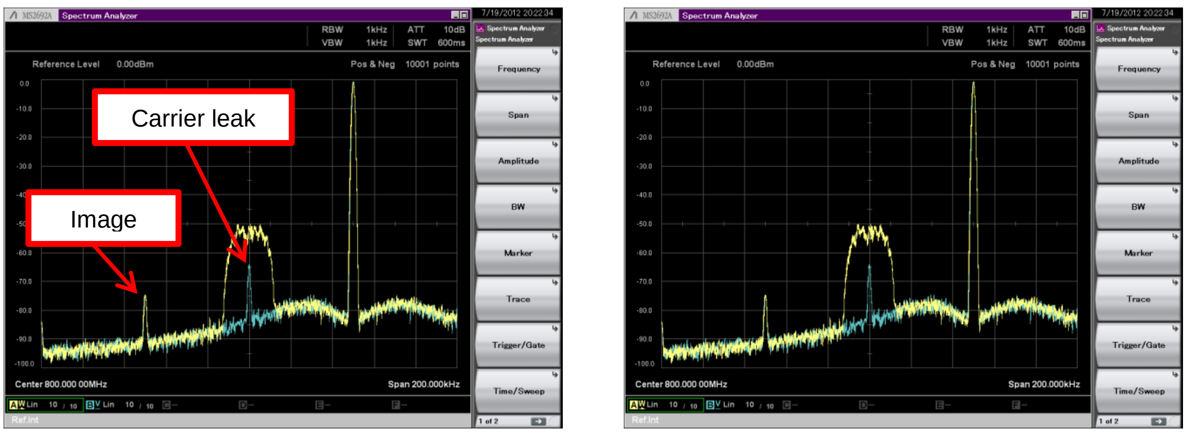
(a) Carrier leak *(b) Image*

Figure 11. MG3710A Carrier Leak and Image Frequency Characteristics (after I/Q Calibration) (Measured Values)

Although the I/Q Calibration function minimizes the carrier leak and image, it does not completely remove them. When the carrier leak/image reduction effect using the I/Q Calibration function is inadequate, adjusting the frequency offset so that the output waveform and carrier leak/image do not overlap can prevent the effect.

The following considers an example when outputting a modulation wave and CW wave with a 50-kHz gap. Figure 12 (a) shows the spectrum when the modulation wave is positioned at the baseband frequency 0 Hz and CW is positioned at 50 kHz, and the frequency setting is 800 MHz. (The blue line is the trace when modulation is off.) With this arrangement, the modulation accuracy is degraded because the carrier leak tends to overlap the modulation wave.

Figure 12 (b) shows the spectrum when the modulation wave is positioned at the baseband frequency –50 kHz, CW is positioned at 0 kHz and the frequency setting is 800.05 MHz. (The blue line is the trace when modulation is off.)
With this arrangement, the modulation and level accuracies are not degraded because the carrier leak/image do not overlap the modulation wave and the combined two signals can be output. The carrier leak does not overlap the CW as shown in the example in Figure 12 (b), and the level ratio of the carrier leak to CW is 65 dB, so the impact on the CW level error is less than 0.005 dB and can be practically ignored. (Refer to section 3.1.2 Effect on Wanted Signal for a description of the carrier leak on the wanted signal.)



(a) Carrier Leak overlapping modulation wave (b) Carrier Leak not overlapping modulation wave

Figure 12. Preventing Carrier Leak and Image

When the level of the wanted wave is small relative to the interference wave in this type of wanted wave (modulation wave) + interference wave (CW or modulation wave), setting the optimum baseband frequency can be an effective method for minimizing error.

The optimum baseband frequency is usually found as follows.
When frequency difference of two signals is f_o [Hz]:
Wanted waveform baseband frequency: $-f_o$ [Hz] or f_o [Hz]
Interference waveform baseband frequency: 0 [Hz]

Although the carrier leak overlaps the interference wave, when the carrier leak level is sufficiently low compared to the interference wave level, it can be ignored because the impact on the interference wave is small (0 Effect on Wanted Signal.)

Using the MG3710A, the baseband frequency for Memory A and Memory B can be set at Frequency Offset A and Frequency Offset B, respectively.
(Key operation: Mode key – [F2]ARB Setup – More key – [F2]Freq Offset A/[F3]Freq Offset B)

Note the following points when setting the baseband frequency to a value other than 0 Hz.

- Level error occurs due to the in-band frequency characteristics. Refer to section 3.3 In-band Frequency Characteristics for a description of the effect of in-band frequency characteristics.

3.2. Reducing Two-Signal Third Order Distortion

3.2.1. Two-Signal Third Order Distortion

Distortion components caused by intermodulation between two or more signals or their harmonics is called intermodulation distortion, and there is an extremely large number of types, depending on the signal order. The distortion with the largest impact when using the two-signal combine function is called Two-Signal Third Order Distortion.

Two-Signal Third Order Distortion is observed at the two locations defined as $2f_{c1} - f_{c2}$ and $2f_{c2} - f_{c1}$ [Hz] when the baseband frequencies are f_{c1} [Hz], and f_{c2} [Hz], respectively (Figure 13).

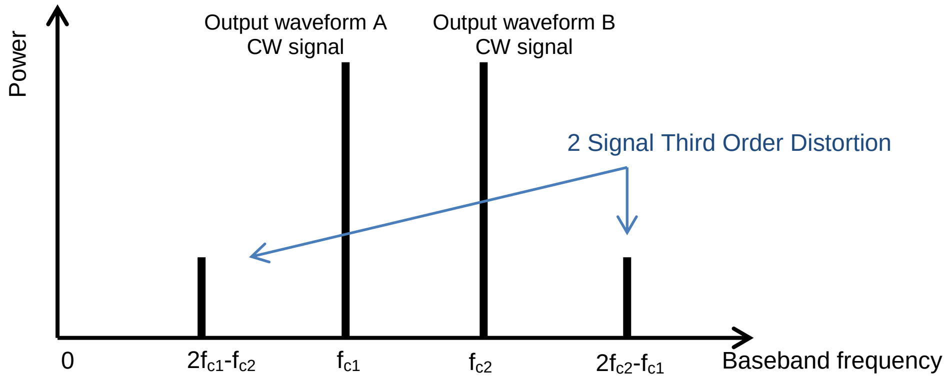


Figure 13. Two-Signal Third Order Distortion

Two-signal third order distortion is generated by three main factors: baseband block quantization error, quadrature modulator non-linearity, and RF block non-linearity.

Like carrier leak/image, two-signal third order distortion degrades the modulation wave and CW signal quality and level accuracy. Care is required when using the two-signal combine function with two signals with close levels.

3.2.2. Reduction Method

When the distortion level ratio of two signals does not change even when changing the SG Level setting (Key operation: Level key), the two-signal third order distortion is dominated either by quantization error in the baseband block or by non-linearity effects of the quadrature modulator. The generated distortion amount can be optimized by adjusting the level diagram of the digital block(s) using the RMS Value Tuning function.

(Key operation): Mode key – More key – [F6]RMS Value Tuning)

When the RMS Value Tuning setting is large, the baseband block gain becomes large and has the effect of reducing quantization error. However, when the effect of the quadrature modulator non-linearity is large, this distortion becomes large.
On the other hand, when the RMS Value Tuning setting is small, the baseband block gain becomes small and the quantization error becomes large while the quadrature amplifier non-linearity effect conversely becomes small. The optimum value is tuned to minimize the generated distortion because the amount of distortion is determined by the simultaneous action of each. (Sometimes, this type of simple action does not occur due to the phase relationships of each distortion characteristic.)

Note the following points when tuning with the RMS Value Tuning function.

- If the RMS Value Tuning setting is too large, sometimes waveform data clipping occurs in the baseband block. If clipping occurs, BBDAC is displayed in the MG3710A warning field and large spurious occurs. Select the RMS Value Tuning setting to prevent clipping (Figure 14, Figure 15).

- Sometimes UNLVL is displayed in the Amplitude display when adjusting the RMS Value Tuning setting. This indicates that the output level is out of the guaranteed range. If UNLVL is displayed, it is necessary to confirm that the correct level is output using a power sensor, etc. (Figure 15).

- RMS Value Tuning has an effect on the floor noise. Refer to section 4.3 Floor Noise for a description of the effect on floor noise.

(a) Without clipping (b) With clipping

Figure 14. Spectrum With and Without Clipping Effect

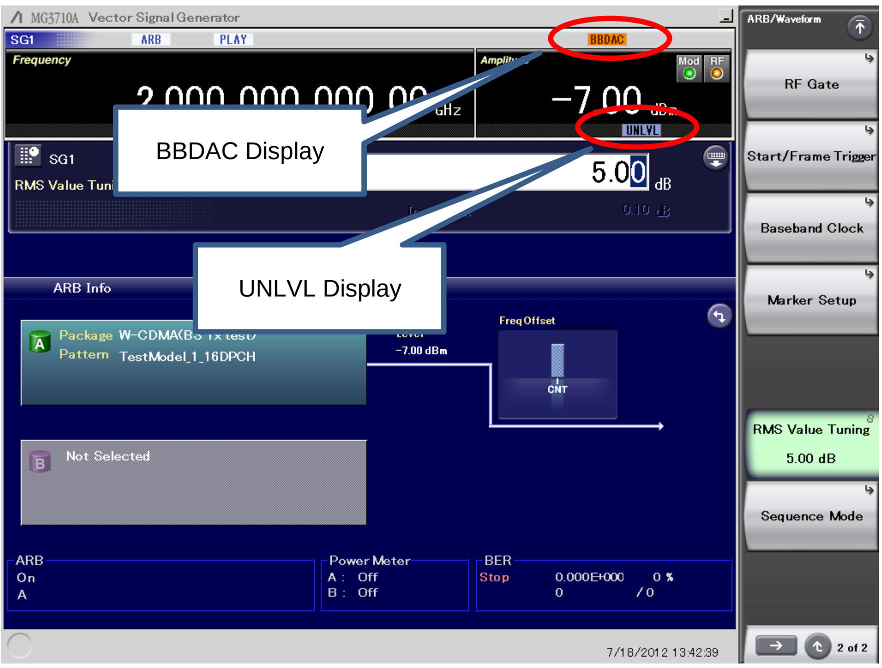


Figure 15. BBDAC and UNLVL

3.3. Improvement of In-band Frequency Characteristics

Although a vector signal generator can output a modulation signal for any band in the modulation band, the in-band level accuracy has non-even frequency characteristics (in-band frequency characteristics). As a result, when outputting a signal with added offset frequency, it is necessary to consider the in-band frequency characteristics. When adding offset frequency or when handling wideband modulation signals, note that the level error becomes larger further from the 0 Hz baseband frequency.

3.3.1. Improvement Method

The MG3710A has an Internal Channel Correction function for correcting the in-band frequency characteristics. Figures 16 and 17 show the sample values for the in-band frequency characteristics when this function is Off and On, respectively.

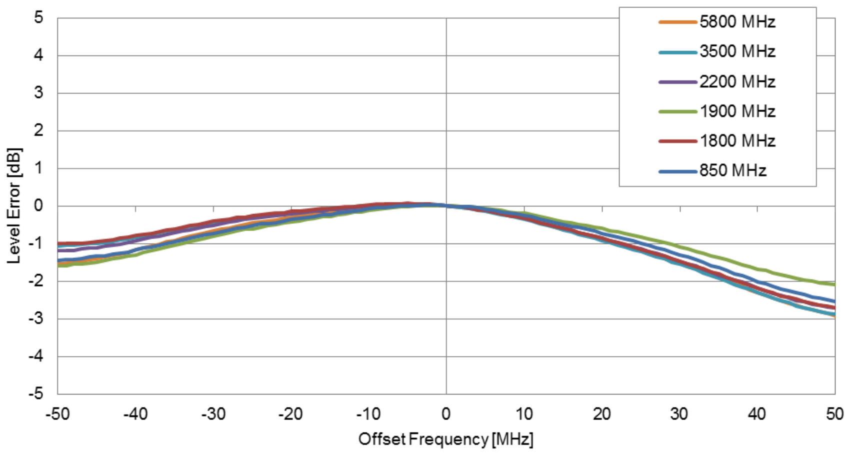


Figure 16. In-band Frequency Characteristics (Internal Channel Correction = Off) (Measurement Value)

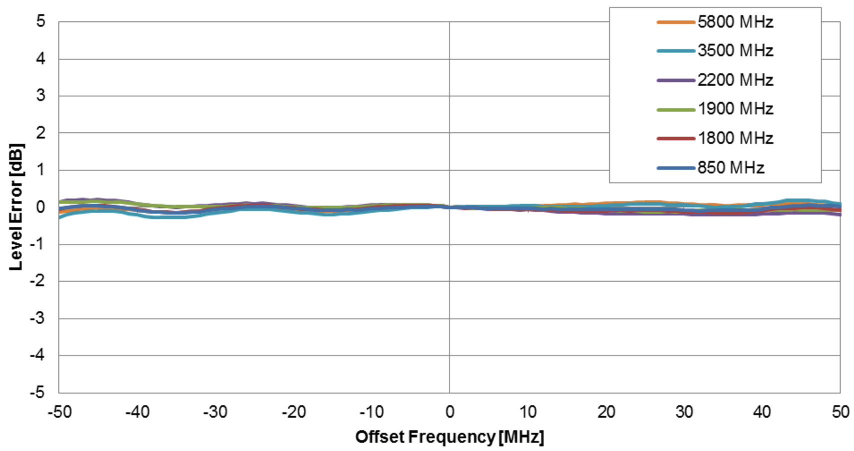


Figure 17. In-band Frequency Characteristics (Internal Channel Correction = On) (Measurement Value)

4. Other Consideration Points

This section explains other precautionary points when using a signal generator, excluding the two-signal combine function.

4.1. Phase Noise

The ideal CW signal is a simple spectrum. However, in actual use, the ideal oscillator does not exist and the signal is always frequency modulated by slight noise. This effect is observed as the spectrum widens and is called phase noise.
Phase noise becomes larger approaching the CW oscillation frequency, and smaller further away. When the two-signal frequency gap is narrow and the level difference is small, it is important to note that the signal with the smaller level suffers degraded SNR due to the phase noise (Figure 18).

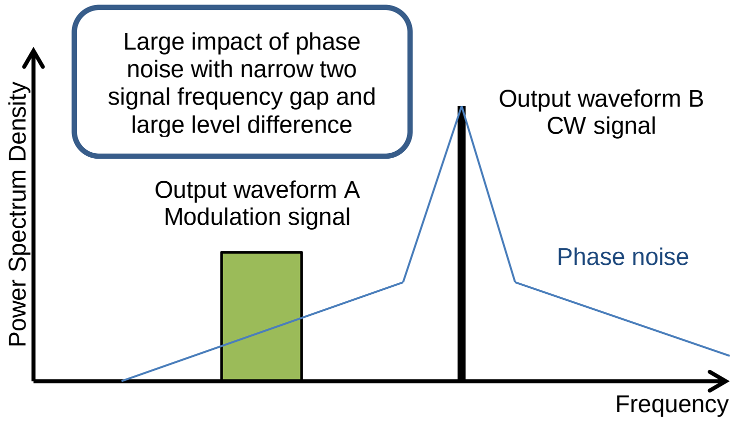


Figure 18. Phase Noise

Using the MG3710A Phase Noise Optimize function optimizes the phase noise by selecting from the near and far phase noise characteristics. Switching the Phase Noise setting value performs optimization according to the offset frequency to be used.

(Key operation: Frequency key – More key – [F1]Phase Noise Opt.)

Figures 19 and 20 show the phase noise characteristics at modulation output.

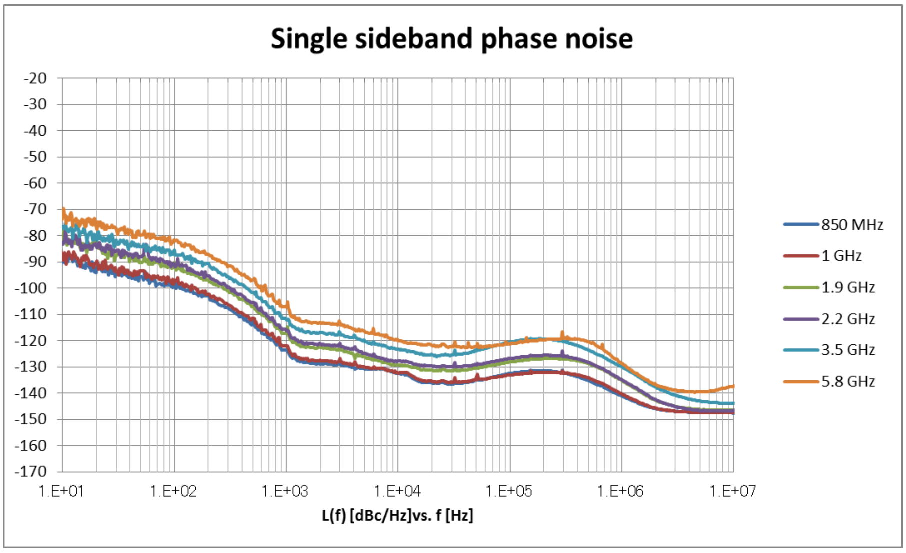


Figure 19. MG3710A Phase Noise Characteristics (Phase Noise Opt.: <200 kHz) (Measurement Value)

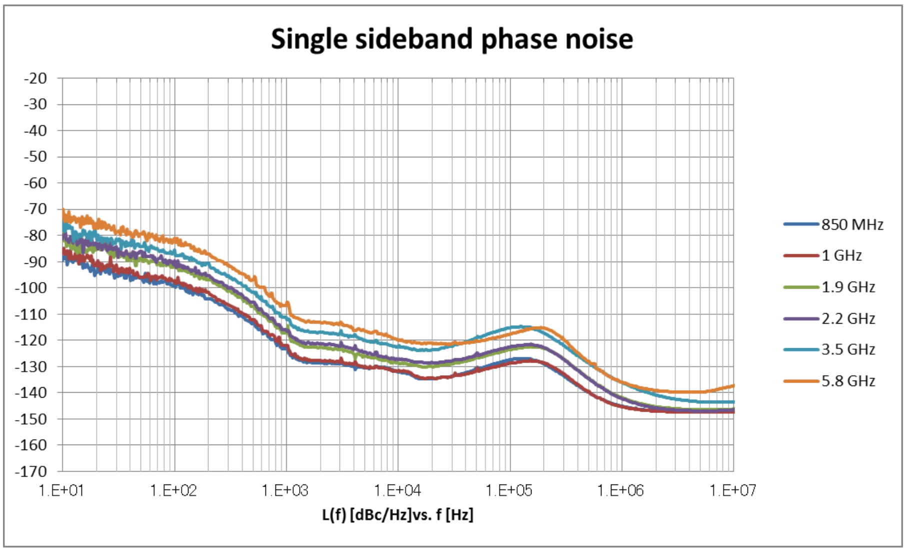


Figure 20. MG3710A Phase Noise Characteristics (Phase Noise Opt.: >300 kHz) (Measurement Value)

4.2. AM Noise

In contrast to phase noise generated by noise in the phase direction, AM noise occurs as the spectrum widens due to noise in the amplitude direction. AM noise is mainly generated by the ALC (auto level control) circuit and becomes larger closer to the CW oscillation frequency, and smaller further away, similar to phase noise. When the two-signal frequency gap is narrow and the level difference is large, it is important to note that the signal with the smaller level suffers degraded SNR due to the AM noise (Figure 21).

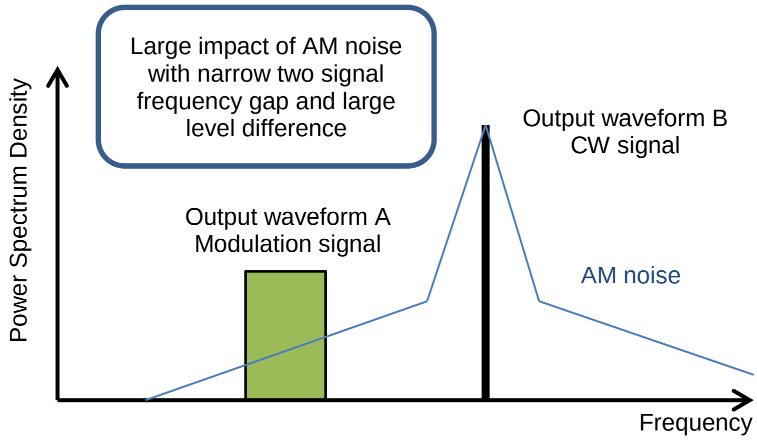


Figure 21. AM Noise

Figure 22 shows the AM noise characteristics of the MG3710A. CW means an unmodulated signal and ATT Hold = Off; Mod means a modulated or unmodulated signal and ATT Hold = On.

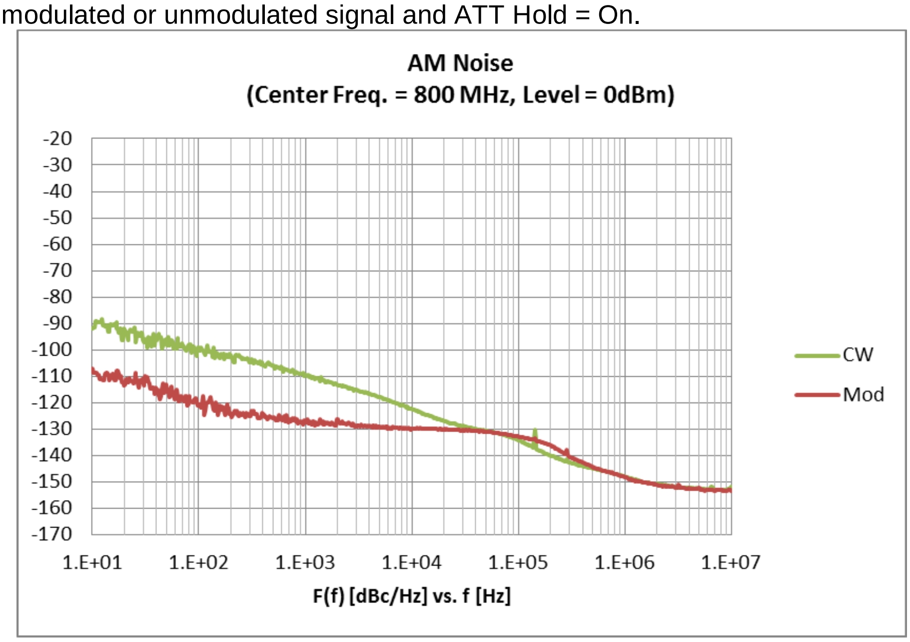


Figure 22. MG3710A AM Noise Characteristics (Measurement Value)

4.3. Floor Noise

A signal generator has its own floor noise determined by the SNR of the signal generator itself. Consequently, when the two signal ratio becomes larger, the output waveform with the smaller level of the two signals is closer to the floor noise of the signal generator. It is important to note that when the two-signal level difference is large, the SNR of the signal with the smaller level becomes degraded due to floor noise (Figure 23).

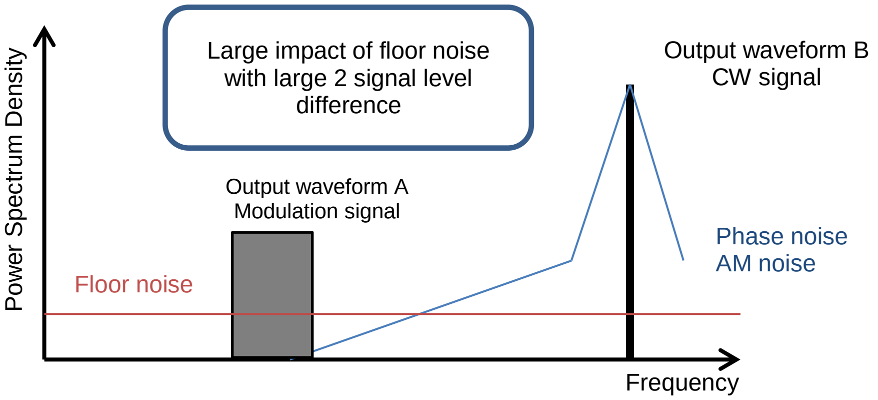


Figure 23. Floor Noise

The floor noise is determined by the combined SNR of the signal generator baseband and RF blocks. In the MG3710A, at modulation output the SNR of the baseband block always dominates.

The baseband block level diagram can be optimized for each application by adjustment using the RMS Value Tuning function.

(Key operation: Mode key – More key – [F6]RMS Value Tuning)

Increasing the RMS Value Tuning setting increases the baseband block gain, having the effect of reducing the floor noise. Conversely, reducing the RMS Value Tuning setting lowers the baseband block gain and increases the floor noise (Figure 24).

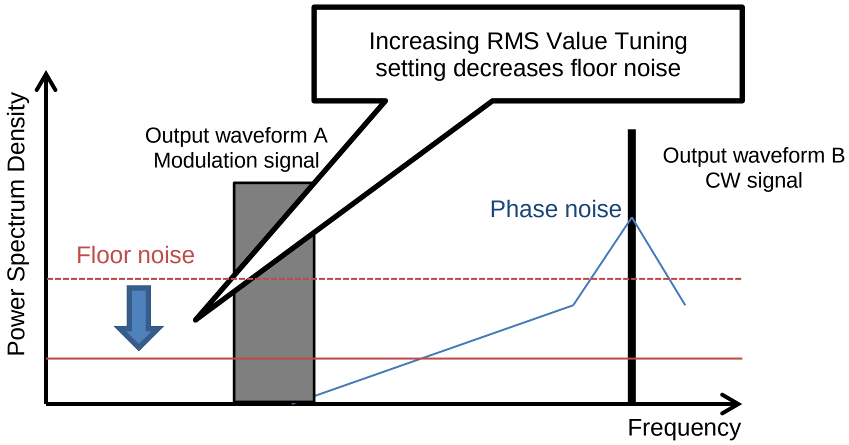


Figure 24. Floor Noise Optimization by RMS Value Tuning

Note the following precaution points when adjusting using the RMS Value Tuning function.

- If the RMS Value Tuning setting is too large, sometimes waveform data clipping occurs in the baseband block. If clipping occurs, BBDAC is displayed in the MG3710A warning field and large spurious occurs. Select the RMS Value Tuning setting to prevent clipping (Figure 14, Figure 15).

- Sometimes UNLVL is displayed in the Amplitude display when adjusting the RMS Value Tuning setting. This indicates that the output level is out of the guaranteed range. If UNLVL is displayed, it is necessary to confirm that the correct level is output using a power sensor, etc. (Figure 15).

- Sometimes the SNR of the RF block is dominant, depending on the selected waveform and level. In this case, the floor noise does not change even if the RMS Value Tuning setting is changed.

- RMS Value Tuning has an impact on two-signal third order distortion.
  Refer to section 3.2 Reducing Two-Signal Third Order Distortion for a description of the effect on two-signal third order distortion.

5. Practical Examples

This section gives some practical examples for ARIB STD-T61Adjacent Channel Selectivity measurements, and explains the MG3710A setting procedure in detail.
However, the measurement values in these examples are measurement data for randomly selected instruments and are not guaranteed values.

5.1. ARIB STD-T61Adjacent Channel Selectivity

The system for measuring ARIB STD-T61 Adjacent Channel Selectivity is described below.

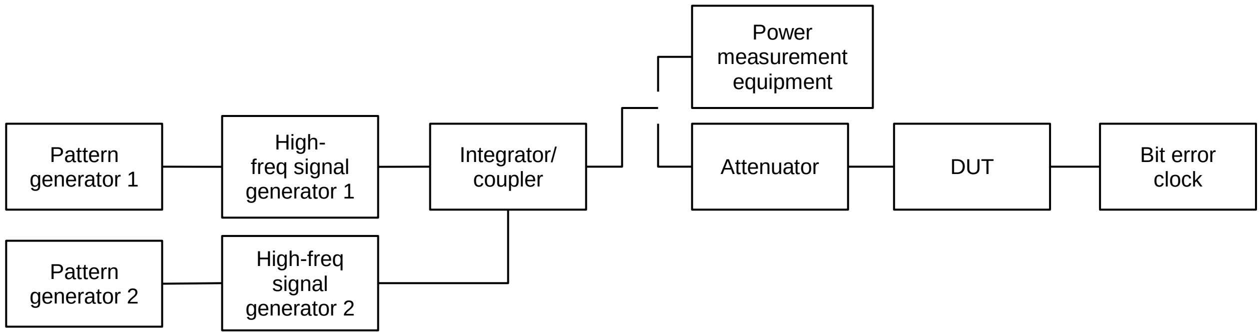


Figure 25. Adjacent Channel Selectivity Measurement System

Table 1 lists the names for each output waveform package and pattern.

Table 1. Adjacent Channel Selectivity Measurement Usage Pattern

Pattern	Signal Contents	Package Name	Pattern Name
Pattern 1	ARIB STD-T61 Test Signal 1	ARIB_STD-T61 (MX370002A)	UpDownLink
Pattern 2	ARIB STD-T61 Test Signal 2	ARIB_STD-T61 (MX370002A)	PN15

*The waveform pattern file must be provided separately.

5.1.1. Structure of Measurement System using MG3710A

Figure 26 shows the setup using the MG3710A instead of two pattern signal generators and two high-frequency signal generators.

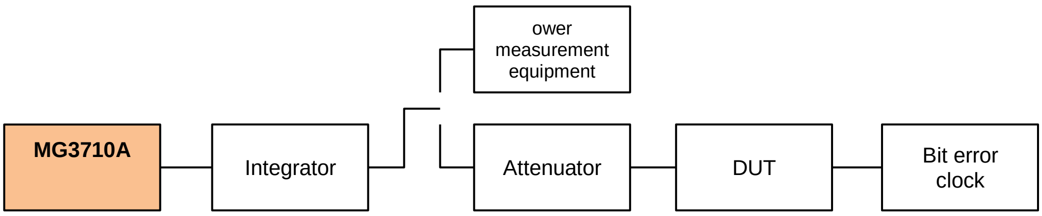


Figure 26. Adjacent Channel Selectivity Measurement System (using MG3710A)

The MG3710A settings for two-signal combined output are:
- ARIB STD-T61 Test Signal 1 in Memory A and level setting of –52 dBm
- ARIB STD-T61 Test Signal 2 in Memory B and level setting of –10 dBm
- Wanted waveform (Memory A) frequency of 400 MHz

The measuring instrument specifications for the ARIB STD-T61 standard are as follows:

High-frequency signal generator 1 and 2

• Frequency	Standard frequency range
• Stability	within $\pm 5\times10^{-8}$
• ACLR	±6.25kHz Separation: <–63 dB
• Modulation accuracy	EVM(rms) within 3% (recommended)

Consider each of the following points:

■ Frequency
Since the ARIB STD-T61 wireless frequency band is 400 MHz and 150 MHz, the MG3710A supports either band as an option.

■ Stability

To assure compliance with the standard, use either the Opt-001/101 (Rubidium Reference Oscillator) or the Opt-002/102 (High-Stability Reference Oscillator).

■ ACLR

The MG3710A measures the actual value of the adjacent channel leakage power using a spectrum analyzer. Figure 27 shows an example of the measurement results. The top leakage power is –73.44 dB, and the bottom is –73.60 dB, satisfying the standards.

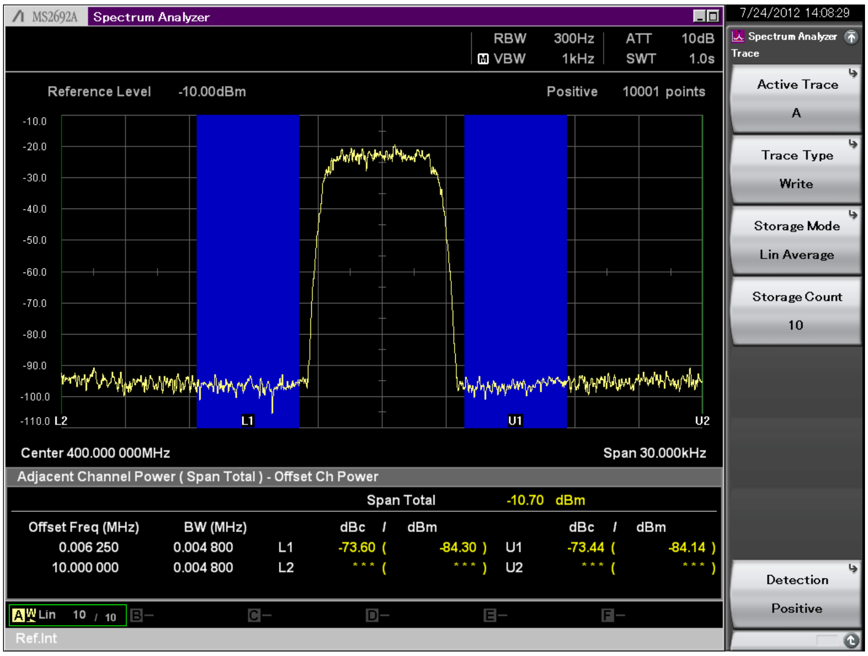


Figure 27. ARIB-STD T61 ACLR (Measurement Value)

■ Modulation accuracy

To prevent degraded modulation accuracy caused by carrier leak/image effects, the interference wave is positioned at the 0 Hz baseband frequency and the wanted wave is positioned at baseband frequency ±6.25 kHz.
Figure 28 shows an example of modulation measurement at this time. (The measurement result is only when the wanted wave is output.)
It is clear that the EVM(rms) of 0.48% satisfies the standard.

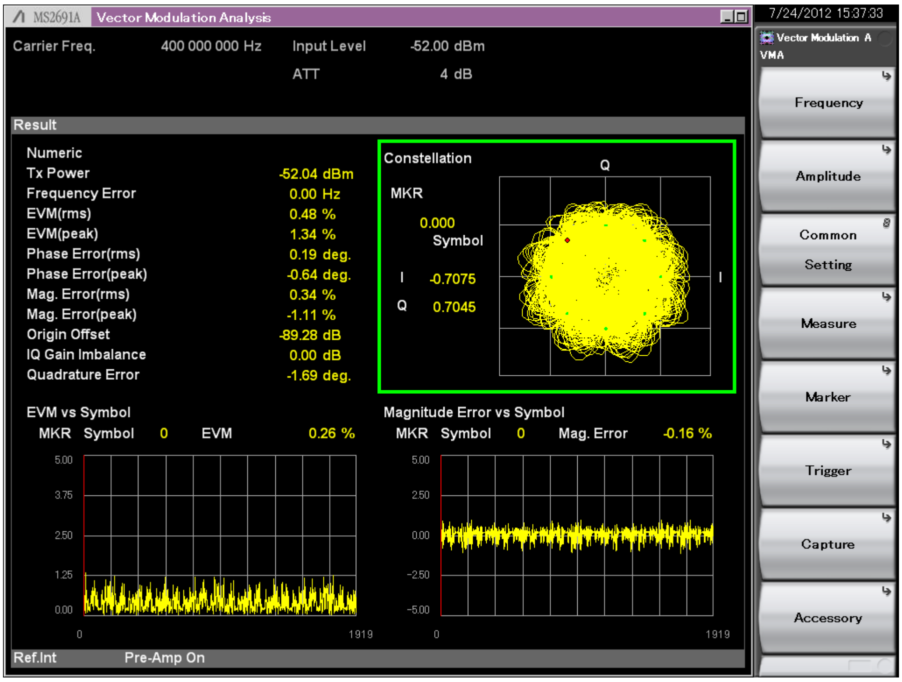


Figure 28. ARIB-STD T61 Modulation Accuracy (Measurement Value)

The above shows that the MG3710A meets the required conditions for satisfying the standard.

5.1.2. Setting Procedure

(1) Load the waveform pattern

Open the waveform pattern load screen.
(Key operation: Load key)

Load the ARIB STD-T61 test signal 1 into Memory A.
(Key operation: Set [F8] To Memory to A, select “ARIB_STD-T61(MX370002A)” for – Package and “UpDownLink” for Pattern, and press [F6] Load Pattern.)

Load the ARIB STD-T61 test signal 2 into Memory B.
(Key operation: Set [F8] To Memory to B, select “ARIB_STD-T61(MX370002A)” for – Package and “PN15” for Pattern, and press [F6] Load Pattern.)

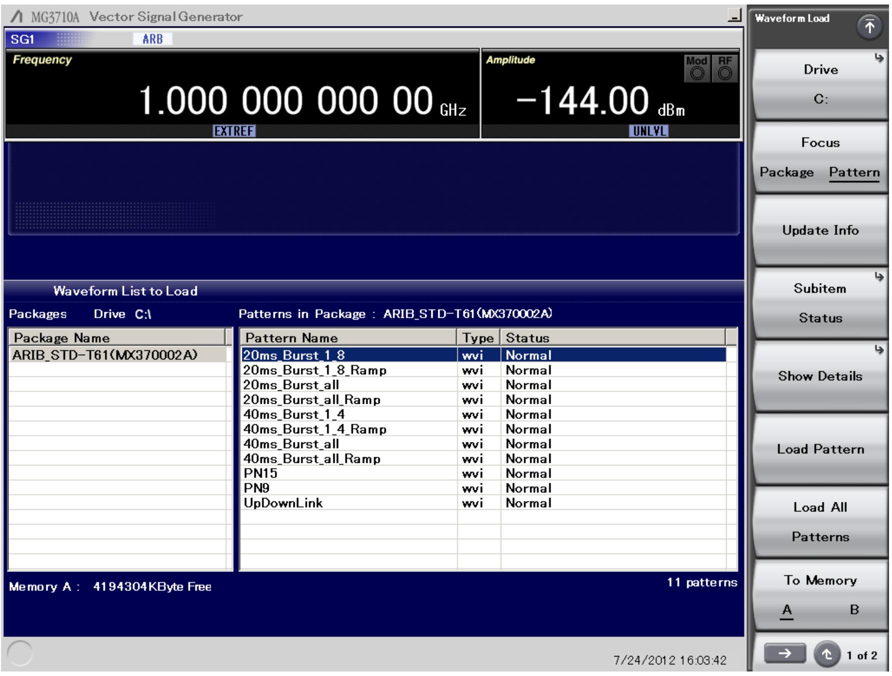


Figure 29. Load Screen

Note the following point when loading the waveform pattern.

- Pre-load waveform patterns into the MG3710A. Refer to the MG3700A/MG3710A Vector Signal Generator Instruction Manual for how to create waveform patterns and copy them to the MG3710A.

(2) Select the waveform pattern.

Set the Combination Mode to Edit to allow selection of each waveform pattern for Memory A and Memory B.
(Operation: Set Mode key – [F2] Combination Mode to Edit.)

Select the ARIB STD-T61 test signal 1 for Memory A.
(Key operation: Press the Select key and set [F8] On Memory to A, select “ARIB_STD-T61(MX370002A)” for Package, “UpDownLink” for Pattern, and press [F6] Select.)

Select ARIB STD-T61 test signal 2 for Memory B.
(Key operation: Press the Select key and set [F8] On Memory to B, select “ARIB_STD-T61(MX370002A)” for Package, “PN15” for Pattern, and press [F6] Select.)

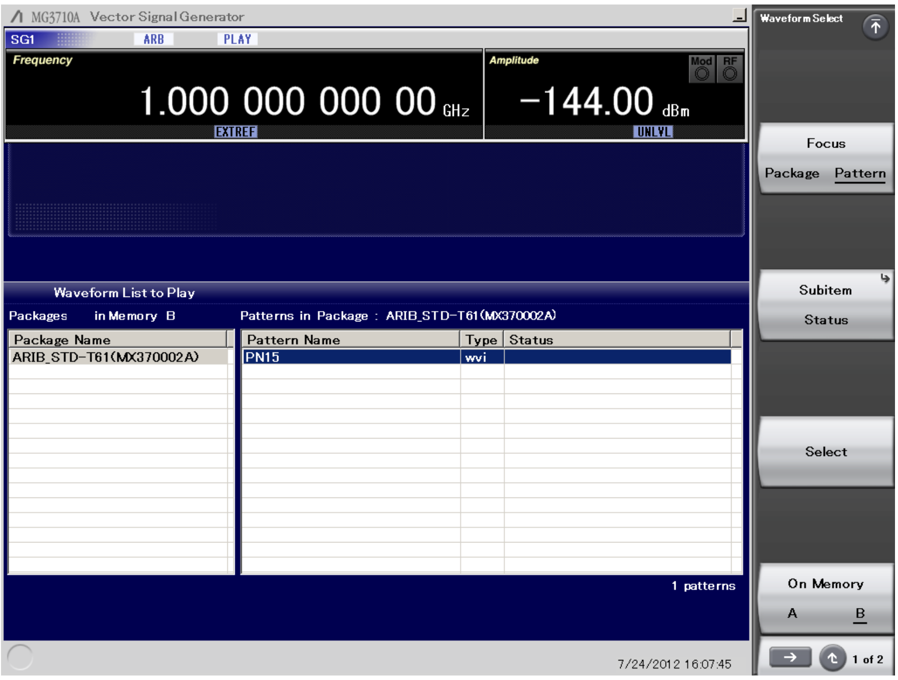


Figure 30. Select Screen

(3) Set the levels.

Set the output level for Memory A to –52 dBm.
(Key operation: Set Mode key – [F3] ARB Setup – [F2] Level A to –52 dBm.)

Set the Memory B output to On.
(Key operation: Set [F3] Output B to On.)

Set the output level for Memory A to –10 dBm.
(Key operation: Set [F4] Level B to –10 dBm.)

(4) Set the frequency offset.

Set Center Signal to A. By doing this the frequency display at the top of the MG3710A screen is referenced to Memory A. The Memory-B value is fixed at the LO frequency position.

(Key operation: Set Mode key – [F3] ARB Setup – Mode key – [F4] Center Signal to A.)

Set the frequency offset of Memory A to 6.25 kHz.

(Key operation: Set Mode key – [F3] ARB Setup – Mode key – [F1] Freq Offset to 6.25 kHz.)

> ***Hint***
> The Center Signal setting determines which of Memory A or Memory B becomes the reference value for the frequency display at the top of the screen.
>
> - When Center Signal is A, Memory A becomes the reference for the frequency at the top of the screen and Memory B is fixed at the LO frequency position.
> - When Center Signal is B, Memory B becomes the reference for the frequency at the top of the screen and the Memory B side is fixed at the LO frequency position.
> - When Center Signal is Baseband DC, the frequency at the top of the screen displays the LO frequency. Memory A and Memory B are set to baseband Frequency Offset A and Frequency Offset B, respectively.

(5) Set the output

Set the RF frequency for memory A to 400 MHz.

(Key operation: Press the Freq key to set to 400 MHz.)

Set Modulation to On.

(Key operation: Press the Mod On/Off key to set it to On.)

Set the RF Output to On.

(Key operation: Press the RF Output On/Off key to set it to On.)

Figure 31 shows an example of the MG3710A setting screen. The output signal spectrum is shown in Figure 32.

Figure 31. Example of MG3710A Setting Screen

Figure 32. Output Signal Spectrum

6. Summary

Evaluation of Rx characteristics such as Adjacent Channel Selectivity (ACS), Intermodulation Characteristics (IM), etc., requires measurements of characteristics when an interference wave is added to the wanted wave.
In a conventional signal generator, one unit can only output either the wanted or the interference wave so a test requiring the wanted wave and the interference wave requires two signal generators as well as a coupler to combine the two signals. Additionally, the work required to set the level ratio of the wanted and interference waves is quite difficult.

Using the two-signal combine function of the Anritsu MG3710A Vector Signal Generator supports easy setup of a test environment for outputting both the wanted and interference waves from one instrument.

Note

Specifications are subject to change without notice.

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