



TEST REPORT NO: RU1068/4828  
COPY NO: -----  
ISSUE NO: 1  
FCC ID: NEO60-0561series

**REPORT ON THE CERTIFICATION TESTING OF A  
Aerial Facilities Limited  
BI-DIRECTIONAL AMPLIFIER SYSTEM (800MHz)  
WITH RESPECT TO  
THE FCC RULES CFR 47, PART 90 Subpart S  
PRIVATE LAND MOBLIE REPEATER.**

TEST DATE: 10<sup>th</sup> - 15<sup>th</sup> OCTOBER 2003

TESTED BY: ----- J CHARTERS  
APPROVED BY: ----- P GREEN  
PRODUCT MANAGER  
EMC  
DATE: -----

Distribution:

- Copy Nos:
1. Aerial Facilities Limited
  2. TCB: TRL Compliance Services Limited
  3. TRL EMC

THIS DOCUMENT MAY BE REPRODUCED ONLY IN ITS ENTIRETY AND WITHOUT CHANGE

**TRL COMPLIANCE SERVICES LTD EMC DIVISION**

LONG GREEN FORTHAMPTON GLOUCESTER GL19 4QH UNITED KINGDOM  
TELEPHONE +44 (0)1684 833818 FAX +44 (0)1684 833858  
E-MAIL [test@trlcompliance.com](mailto:test@trlcompliance.com) [www.trlcompliance.com](http://www.trlcompliance.com)



FS 21805

CONTENTS

	PAGE
CERTIFICATE OF CONFORMITY & COMPLIANCE	3
APPLICANT'S SUMMARY	4
EQUIPMENT TEST CONDITIONS	5
TESTS REQUIRED	5
TEST RESULTS	6-65

	ANNEX
PHOTOGRAPHS	A
PHOTOGRAPH No. 1: Test setup	
PHOTOGRAPH No. 2: Test setup	
APPLICANT'S SUBMISSION OF DOCUMENTATION LIST	B

- Notes:**
- |    |   |     |                                     |
|----|---|-----|-------------------------------------|
| 1. | Component failure during test   | YES | <input type="checkbox"/>            |
|    |   | NO  | <input checked="" type="checkbox"/> |
| 2. | If Yes, details of failure:   |     |                                     |
| 3. | The facilities used for the testing of the product contain in this report are FCC Listed. |     |                                     |



## CERTIFICATE OF CONFORMITY & COMPLIANCE

FCC IDENTITY: NEO60-0561series  
PURPOSE OF TEST: CERTIFICATION  
TEST SPECIFICATION: FCC RULES CFR 47, Part 90 Subpart S  
TEST RESULT: Compliant to Specification  
EQUIPMENT UNDER TEST: BI-DIRECTIONAL AMPLIFIER SYSTEM (800MHz)  
EQUIPMENT TYPE: Private Land Mobile Repeater  
MAXIMUM GAIN: 95dBm  
MAXIMUM INPUT: -77dBm  
MAXIMUM OUTPUT: 19.67dBm  
ANTENNA TYPE: Not applicable  
CHANNEL SPACING: 25kHz

Channel No.	Uplink	Downlink
1	812.7625MHz	857.7625MHz
2	814.9375MHz	859.9375MHz
3	814.7625MHz	859.7625MHz
4	812.9375MHz	857.9375MHz
5	813.2375MHz	858.2375MHz
6	815.4375MHz	860.4375MHz
7	814.4375MHz	859.4375MHz
8	813.7625MHz	858.7625MHz

FREQUENCY GENERATION: N/A  
MODULATION TYPE: F3E  
POWER SOURCE(s): 115V ac  
TEST DATE(s): 10<sup>th</sup> - 15<sup>th</sup> OCTOBER 2003  
ORDER No(s): 20424  
APPLICANT: Aerial Facilities Limited  
ADDRESS: Aerial House  
Latimer Park, Latimer  
Chesham  
Buckinghamshire  
HP5 1TU  
United Kingdom

TESTED BY: \_\_\_\_\_ J CHARTERS

APPROVED BY: \_\_\_\_\_ P GREEN  
PRODUCT  
MANAGER EMC

## APPLICANT'S SUMMARY

EQUIPMENT UNDER TEST (EUT):	BI-DIRECTIONAL AMPLIFIER SYSTEM (800MHz)
EQUIPMENT TYPE:	55-056104
PURPOSE OF TEST:	CERTIFICATION
TEST SPECIFICATION(s):	FCC RULES CFR 47, Part 90 Subpart S
TEST RESULT:	COMPLIANT      Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
APPLICANT'S CATEGORY:	MANUFACTURER <input checked="" type="checkbox"/> IMPORTER <input type="checkbox"/> DISTRIBUTOR <input type="checkbox"/> TEST HOUSE <input type="checkbox"/> AGENT <input type="checkbox"/>
APPLICANT'S ORDER No(s):	19801
APPLICANT'S CONTACT PERSON(s):	Mr Peter Bradfield
E-mail address:	Peterb@aerial.co.uk
APPLICANT:	Aerial Facilities Limited
ADDRESS:	Aerial House Latimer Park, Latimer Chesham Buckinghamshire HP5 1TU United Kingdom
TEL:	+44 (0)1494777020
FAX:	+44 (0)149477020
MANUFACTURER:	Aerial Facilities Limited
EUT(s) COUNTRY OF ORIGIN:	United Kingdom
TEST LABORATORY:	TRL EMC
UKAS ACCREDITATION No:	0728
TEST DATE(s)	10 <sup>th</sup> - 15 <sup>th</sup> OCTOBER 2003
TEST REPORT No:	RU1068/4828

## EQUIPMENT TEST / EXAMINATIONS REQUIRED

1.	<b>TEST/EXAMINATION</b>	<b>RULE PART</b>	<b>APPLICABILITY</b>	<b>RESULT</b>
	RF Power Output	90.205	Yes	Complies
	Audio Frequency Response	TIA EIA-603.3.2.6	N/A	N/A
	Audio Low-Pass Filter Response	TIA EIA-603.3.2.6	N/A	N/A
	Modulation Limiting	TIA EIA-603.3.2.6	N/A	N/A
	Occupied Bandwidth	90.210	Yes	Complies
	Spurious Emissions at Antenna Terminals	90.210	Yes	Complies
	Field Strength of Spurious Emissions	90.210	Yes	Complies
	Frequency Stability	90.213	N/A(note 1)	N/A
	Transient behaviour	90.214	N/A(note 2)	N/A

**Notes:**

1 The EUT does not contain modulation circuitry, therefore the test was not performed.

2 The EUT is not a keyed carrier system, therefore the test was not performed.

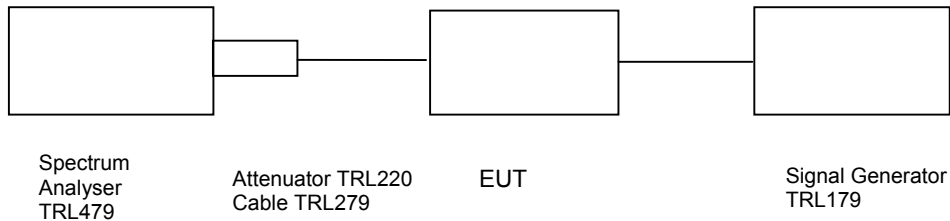
2. Product Use: Private Land Mobile Repeater
3. Emission Designator: F3E
4. Temperatures: Ambient (Tnom) 24°C
5. Supply Voltages: Vnom 115V ac
- Note: Vnom voltages are as stated above unless otherwise shown on the test report page
6. Equipment Category: Single channel ☐  
Two channel ☐  
Multi-channel ☒
7. Channel spacing: Narrowband ☒ 25kHz  
Wideband ☐
8. Test Location: TRL Compliance Services  
Up Holland ☒  
Long Green ☐
9. Modifications made during test program: No modifications were performed.

## COMPLIANCE TESTS

### AMPLIFIER GAIN – CONDUCTED – PART 2.1046 – UPLINK

Ambient temperature = 23°C  
 Relative humidity = 45%  
 Supply voltage = 115V ac  
 Channel number = See test results

Radio Laboratory



Frequency MHz	Signal Generator input level dBm	Cable & Attenuator loss dB	Level at Spectrum Analyser dBm	Gain dB	Gain after 20dB input level increase dBm
812.7625MHz	-77.3	26.62	-6.5	97.42	97.42
814.4375MHz	-77.5	26.62	-7.3	96.82	96.82
815.4375MHz	-77.4	26.62	-7.3	96.72	96.72

#### Notes:

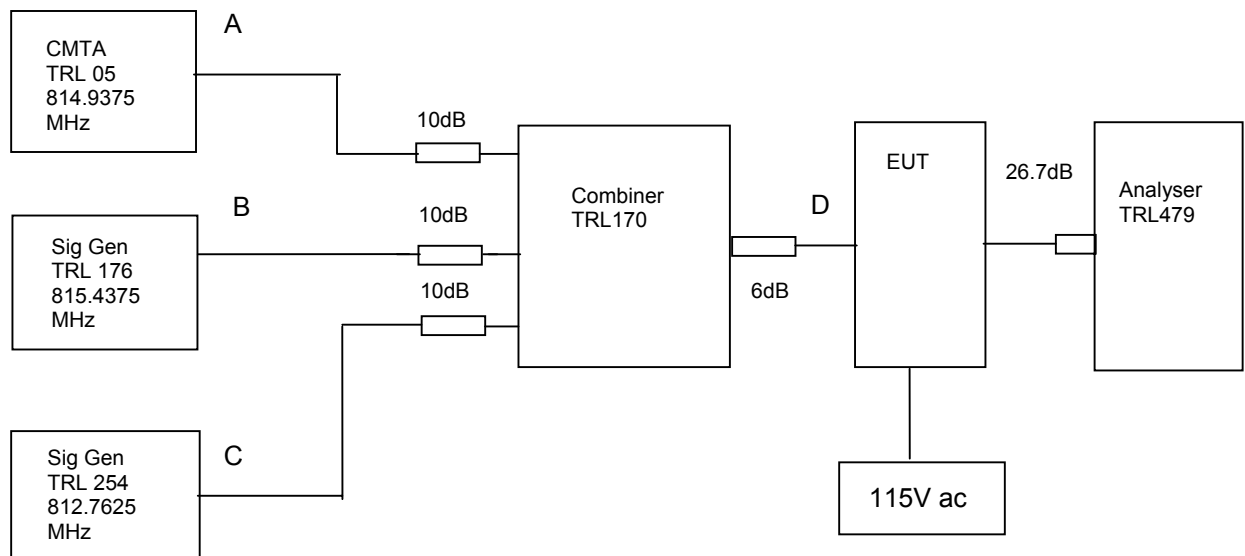
- The level of the signal generator takes into consideration the loss from the cable.
- The signal generator input was increased by 20dBs and the level of the output signal re-measured

TYPE OF EQUIPMENT	MAKER/ SUPPLIER	MODEL No	SERIAL No	TRL No	ACTUAL EQUIPMENT USED
SPECTRUM ANALYSER	ANRITSU	MS2665C	MT26089	479	<b>X</b>
ATTENUATOR	BIRD	8304-300-N	N/A	220	<b>X</b>
CABLE	ROSENBERGER	MICRO COAX	N/A	279	<b>X</b>
SIGNAL GENERATOR	MARCON	2042	119388/080	179	<b>X</b>

## AMPLIFIER INTERMODULATION SPURIOUS EMISSIONS – CONDUCTED – PART 2.1053– UPLINK

Ambient temperature = 24°C  
Relative humidity = 45%  
Supply voltage = 115V ac

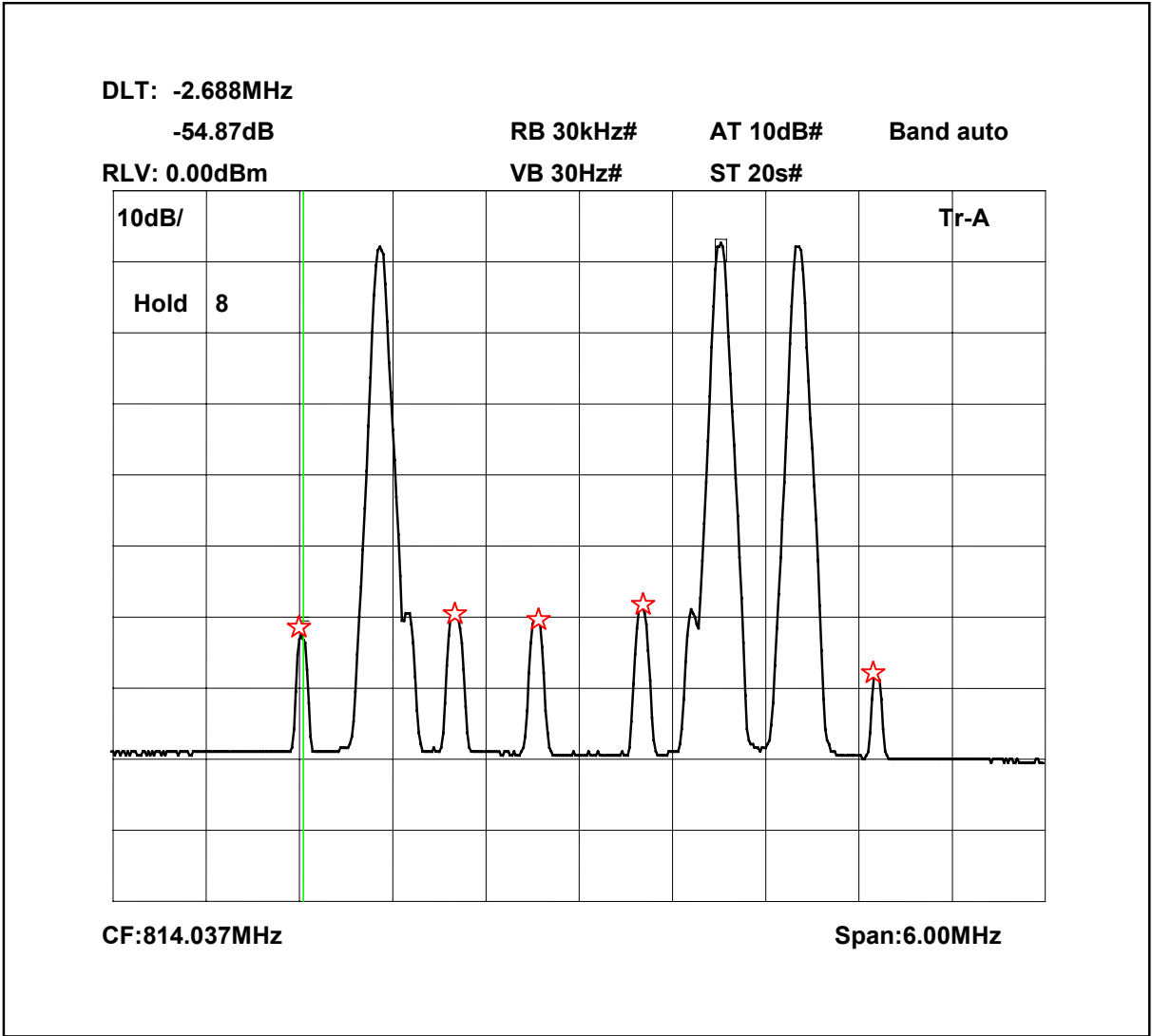
Radio Laboratory



The Intermodulation and spurious products were measured with the amplifier operating at maximum gain. A three tone test was conducted using the equipment as above. The input power level was adjusted so the level at point D was the maximum input of -77.3dBm. The cable and attenuator loss between the EUT and the spectrum analyser was 26.62dB.

Sweep data is shown on the next page:

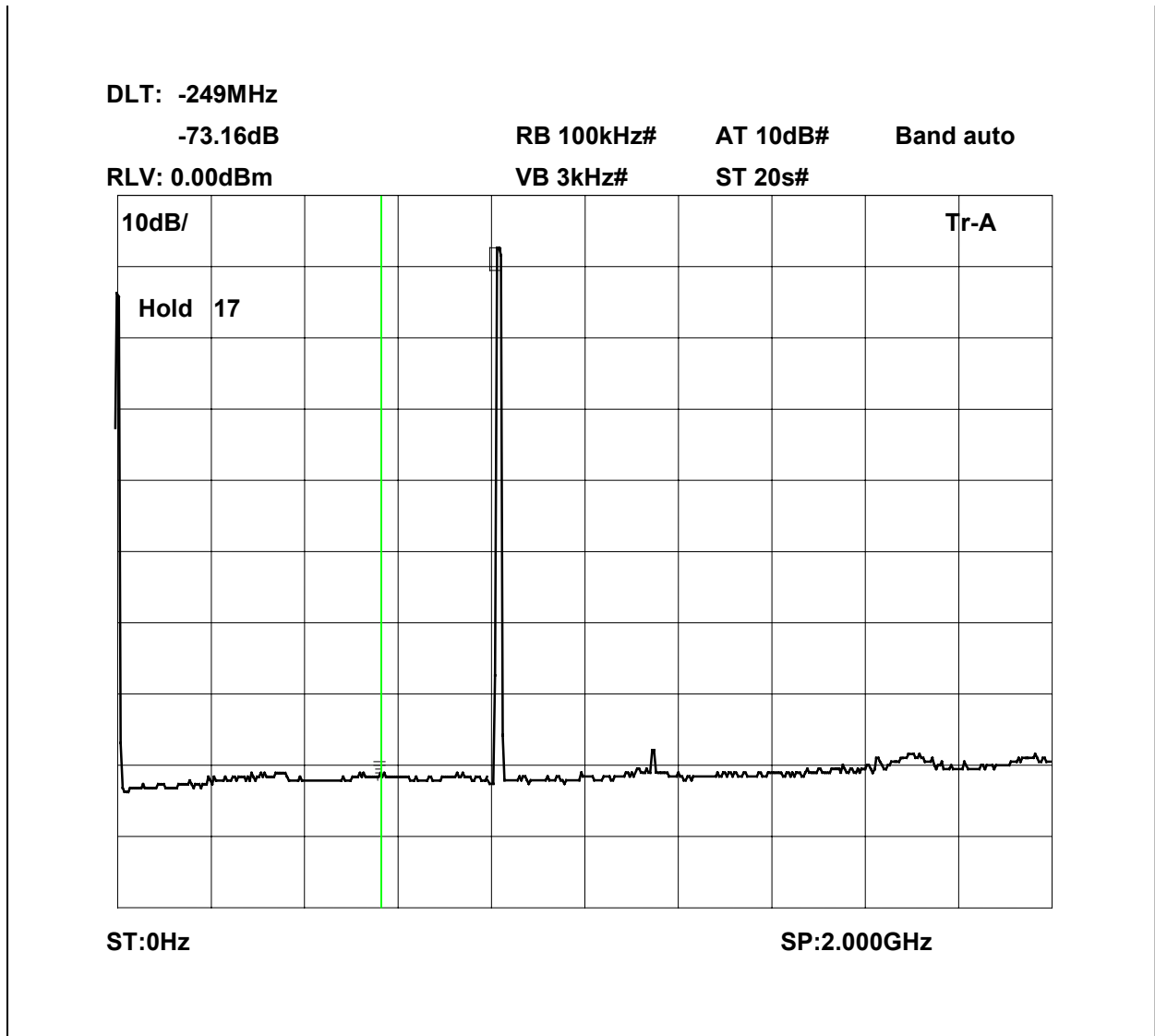
Intermodulaion Inband



The above plot shows that all products (designated by ☆) are at least 40dB below the fundamentals.



# Intermodulation Wideband



The above plot shows that there are no products outside the bands.

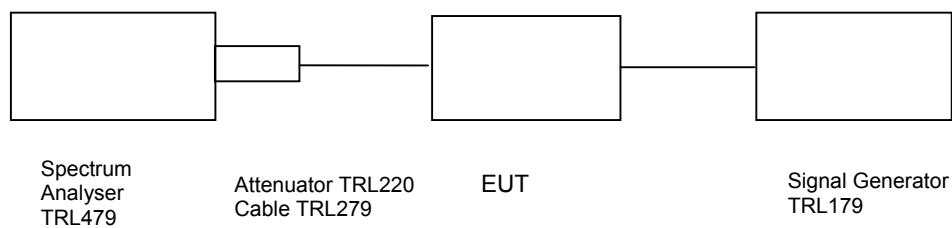
Test equipment used for intermodulation test

TYPE OF EQUIPMENT	MAKER/ SUPPLIER	MODEL No	SERIAL No	TRL No	ACTUAL EQUIPMENT USED
SPECTRUM ANALYSER	ANRITSU	MS2665C	MT26089	479	<b>X</b>
SIGNAL GENERATOR	MARCON	2042	119562/02	254	<b>X</b>
CMTA	ROHDE & SCHWARZ	CMTA52	894715/033	05	<b>X</b>
SIGNAL GENERATOR	MARCON	2042	119388/080	179	<b>X</b>
COMBINER	ELCOM	RC-4-50	N/A	170	<b>X</b>

## TRANSMITTER TESTS

### AMPLIFIER MODULATED CHANNEL TEST – CONDUCTED – Part 2.1049– UPLINK

Ambient temperature	=	24°C	Radio Laboratory
Relative humidity	=	45%	
Supply voltage	=	115V ac	
Channel number	=	See test results	



This test was performed to show that the amplifier does not alter the input signal in any way. The input signal was set to the maximum input level (-73.1dBm) and modulated with a 2500Hz tone. The plots show the signal measured at the signal generator and the signal measured at the output of the EUT.

Note: The cables and attenuators had the following losses.

1. Cable TRL279 and attenuator TRL220 26.62dB
2. Cable between signal generator and EUT 0.4dB

**MKR: 812.76240MHz**  
**-91.11dBm** **RB 1kHz#** **AT 0dB#** **Band auto**  
**RLV:-40.00dBm** **VB 1kHz#** **ST 5.0s#**

10dB/ Tr-A

Hold 4

**CF:812.76250MHz** **Span:50.0kHz**

**MKR: 812.77920MHz**  
**-62.91dBm** **RB 1kHz#** **AT 10dB#** **Band auto**  
**RLV: 0.00dBm** **VB 1kHz#** **ST 5.0s#**

10dB/ Tr-A

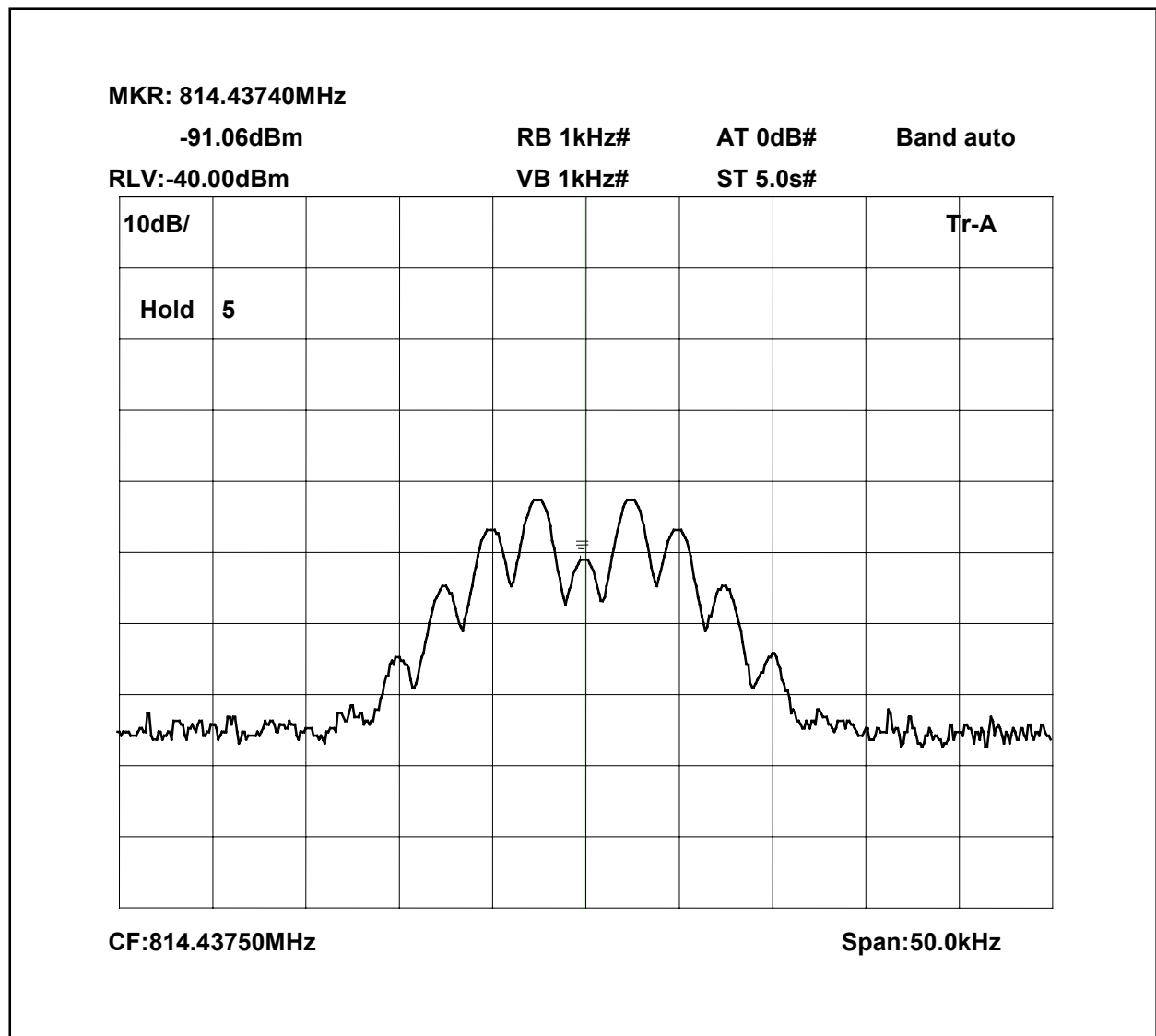
Hold 10

The figure is a spectrum analyzer display. It features a grid with 10 vertical divisions and 10 horizontal divisions. A vertical green line is positioned at the center of the grid, corresponding to the center frequency (CF) of 812.77920 MHz. The signal trace, labeled 'Tr-A', shows a noisy signal with a broad peak centered around the green line. The peak level is approximately -62.91 dBm. The resolution bandwidth (RB) is set to 1 kHz, and the video bandwidth (VB) is also 1 kHz. The sweep time (ST) is 5.0 seconds. The reference level (RLV) is 0.00 dBm. The span is 50.0 kHz. The display also shows the marker frequency (MKR) and the band is set to auto.

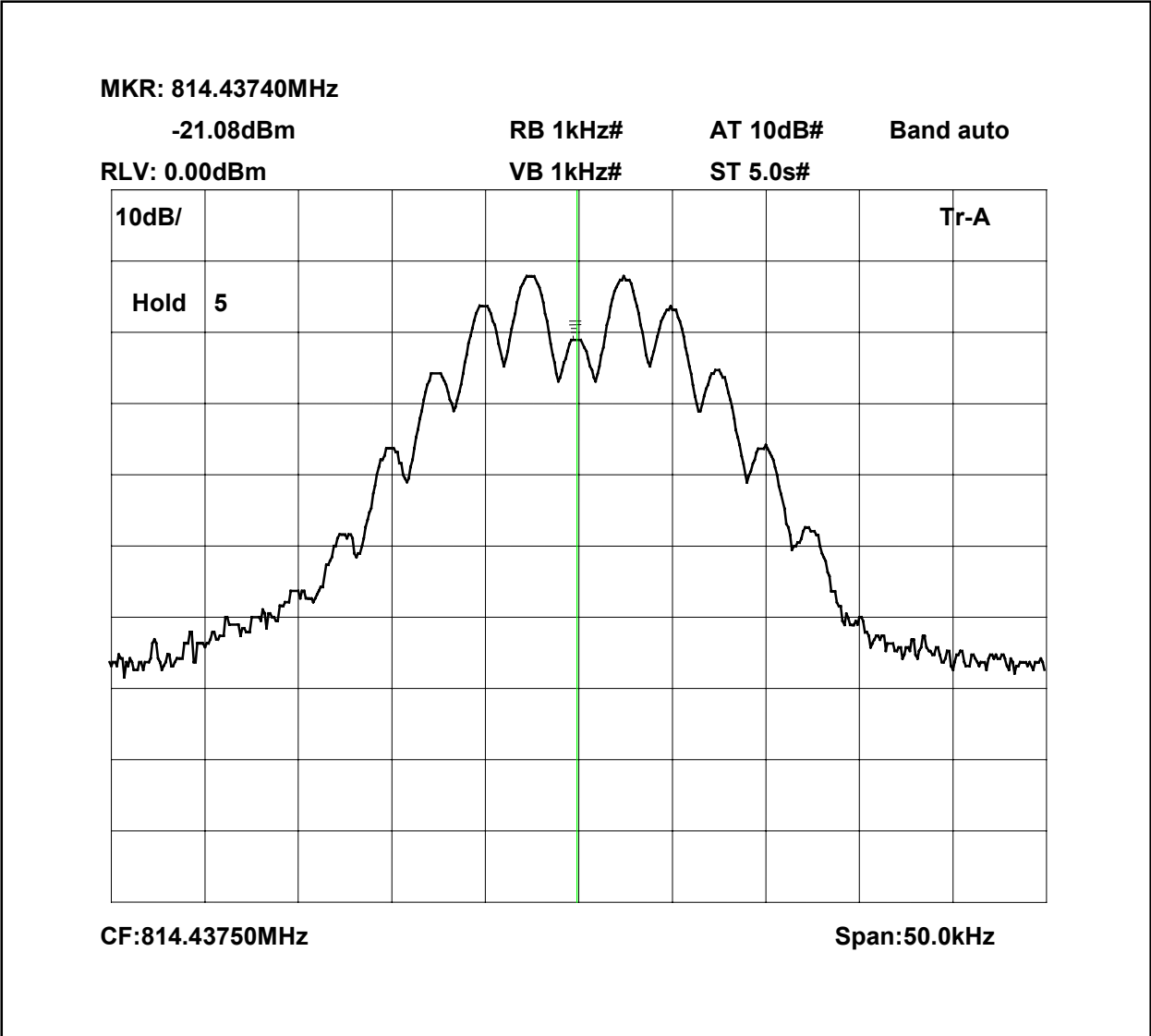
**CF:812.76250MHz** **Span:50.0kHz**

Page 13 of 71

814.4375MHz Signal Generator deviation set to 5kHz

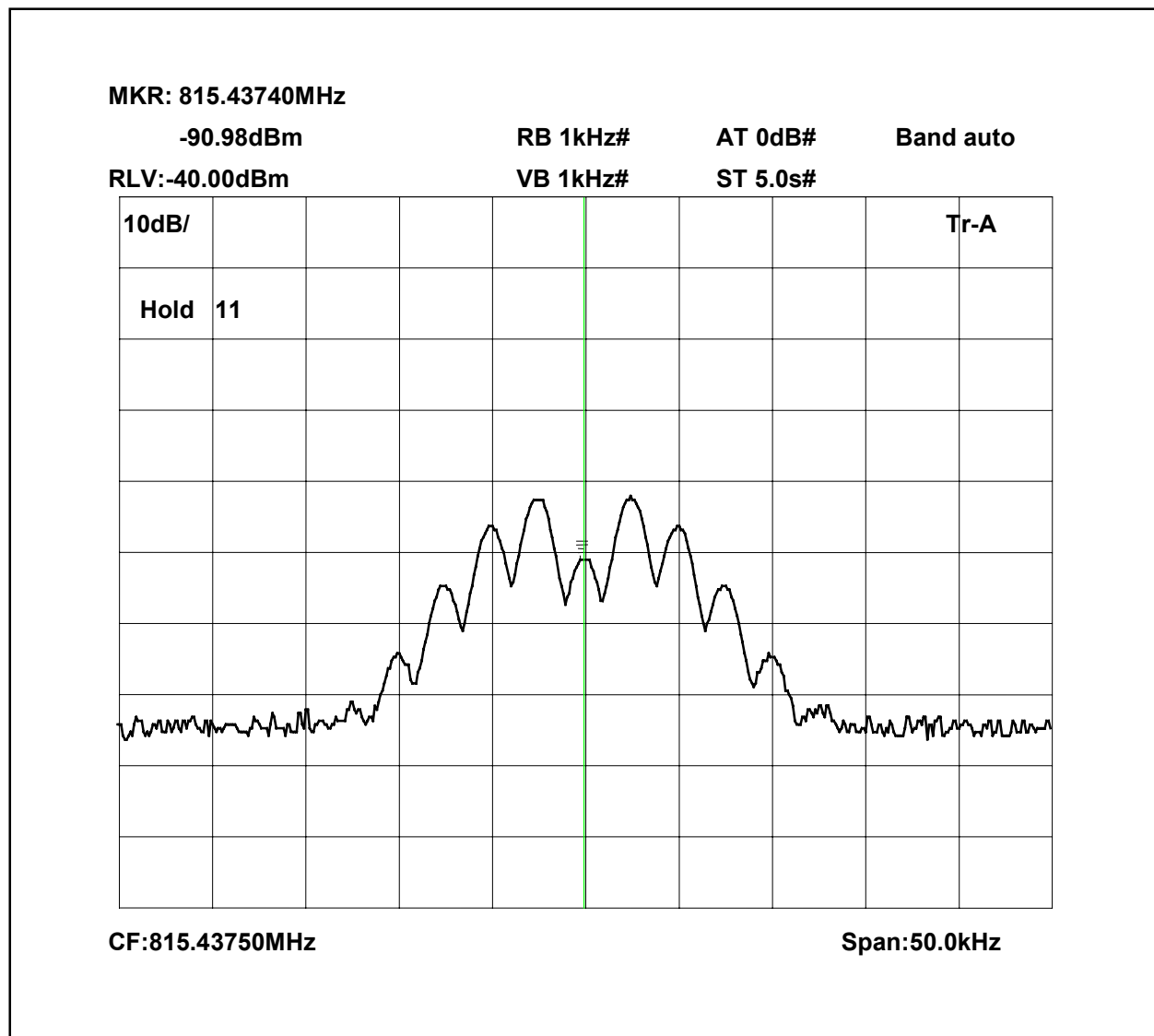


814.4375MHz Signal Generator and amplifier deviation set to 5kHz



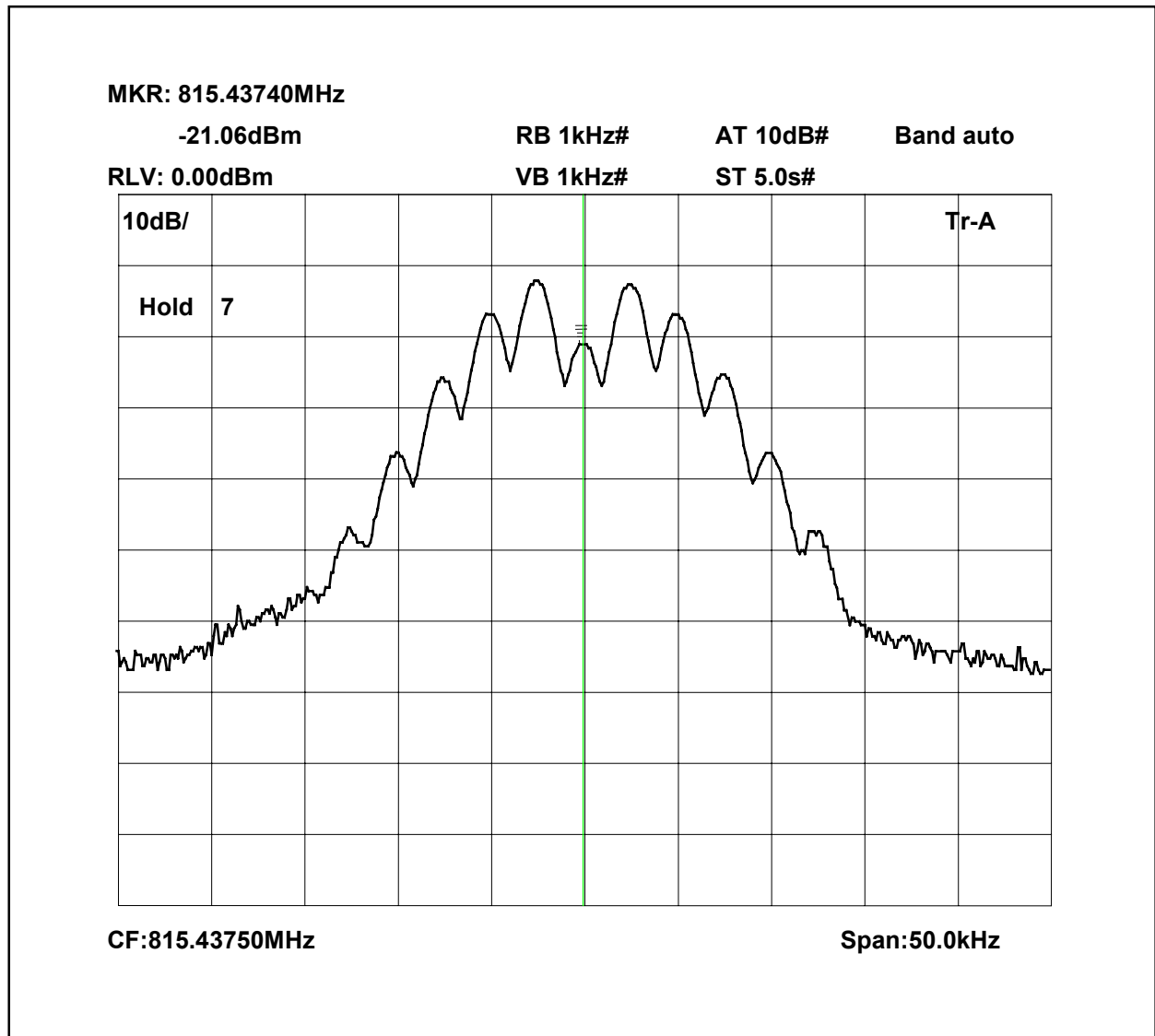
The above plots depicting the output waveshape show no measurable distortion visible when compared to the input signal.

815.4375MHz Signal Generator deviation set to 5kHz





815.4375MHz Signal Generator deviation set to 5kHz



The above plots depicting the output waveshape show no measurable distortion visible when compared to the input signal.

The test equipment used for the Transmitter Modulated Channel tests is shown overleaf:

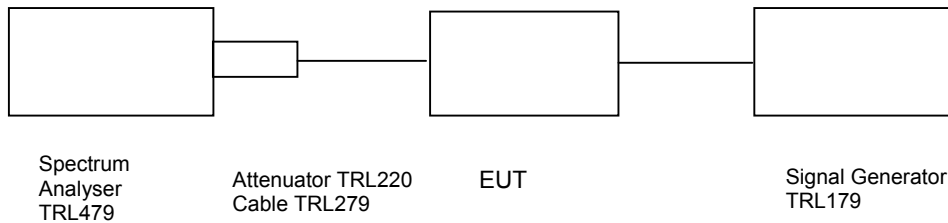
TYPE OF EQUIPMENT	MAKER/ SUPPLIER	MODEL No	SERIAL No	TRL No	ACTUAL EQUIPMENT USED
SPECTRUM ANALYSER	ANRITSU	MS2665C	MT26089	479	<b>X</b>
ATTENUATOR	BIRD	8304-300-N	N/A	220	<b>X</b>
CABLE	ROSENBERGER	MICRO COAX	N/A	279	<b>X</b>
SIGNAL GENERATOR	MARCON	2042	119388/080	179	<b>X</b>

## TRANSMITTER TESTS

### AMPLIFIER SPURIOUS EMISSIONS – CONDUCTED – Part 2.1051– UPLINK

Ambient temperature = 23°C  
 Relative humidity = 45%  
 Supply voltage = 115V ac

Radio Laboratory  
 Test Signal = F3E



The test was set up as per the diagram. The level at the input was adjusted to compensate for the loss of the interconnecting cable. The unit was tested operating at maximum power and on three test frequencies.

The Spurious limit was calculated as follows:

On any frequency removed from the assigned frequency by more than 250% of the authorised bandwidth

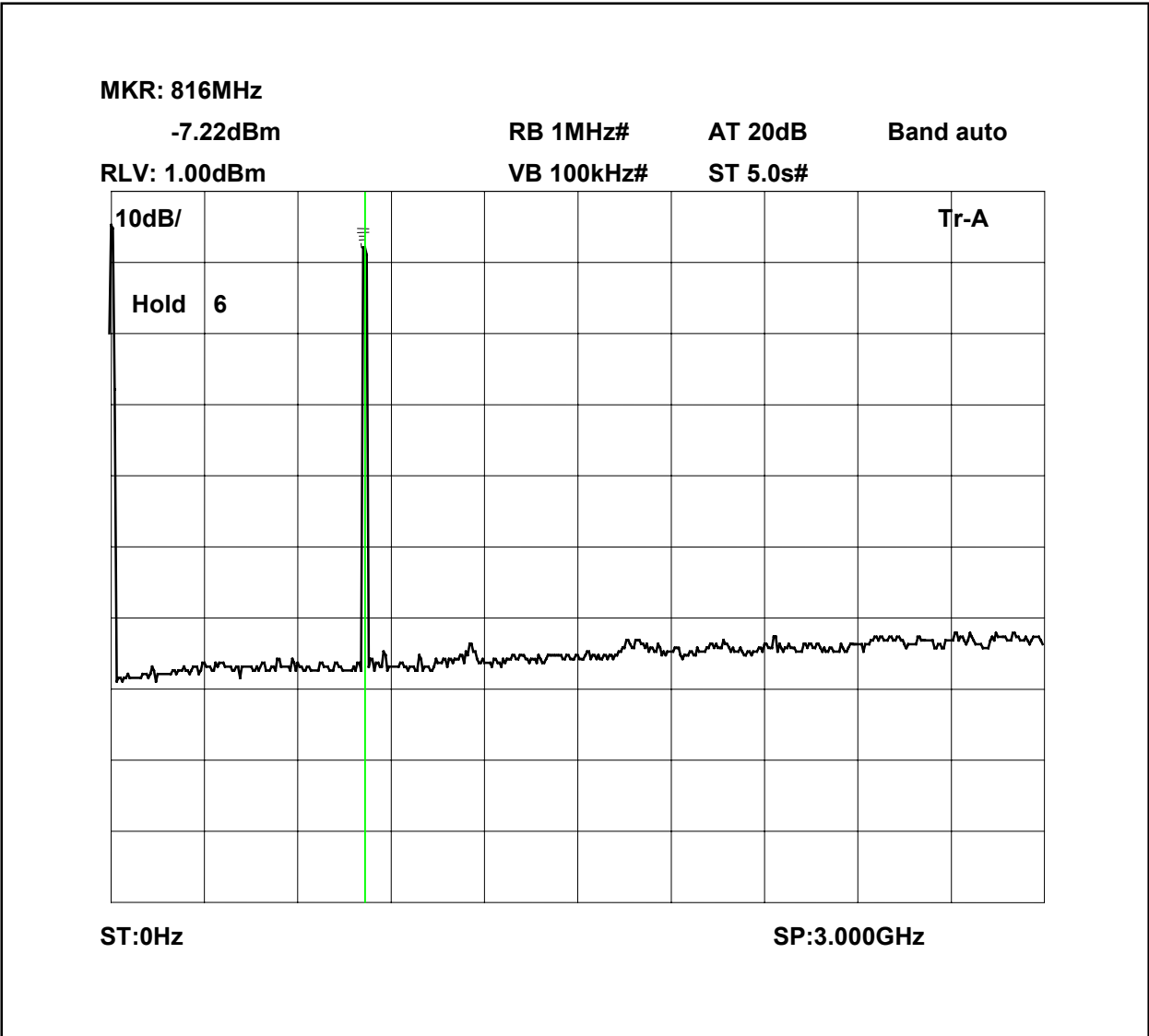
At least  $43 + 10 \log P_{dB}$

$$(10 \log P_{\text{watts}}) - (43 + 10 \log (P_{\text{watts}} * 1000)) = \text{LIMIT} = -13 \text{ dBm}$$

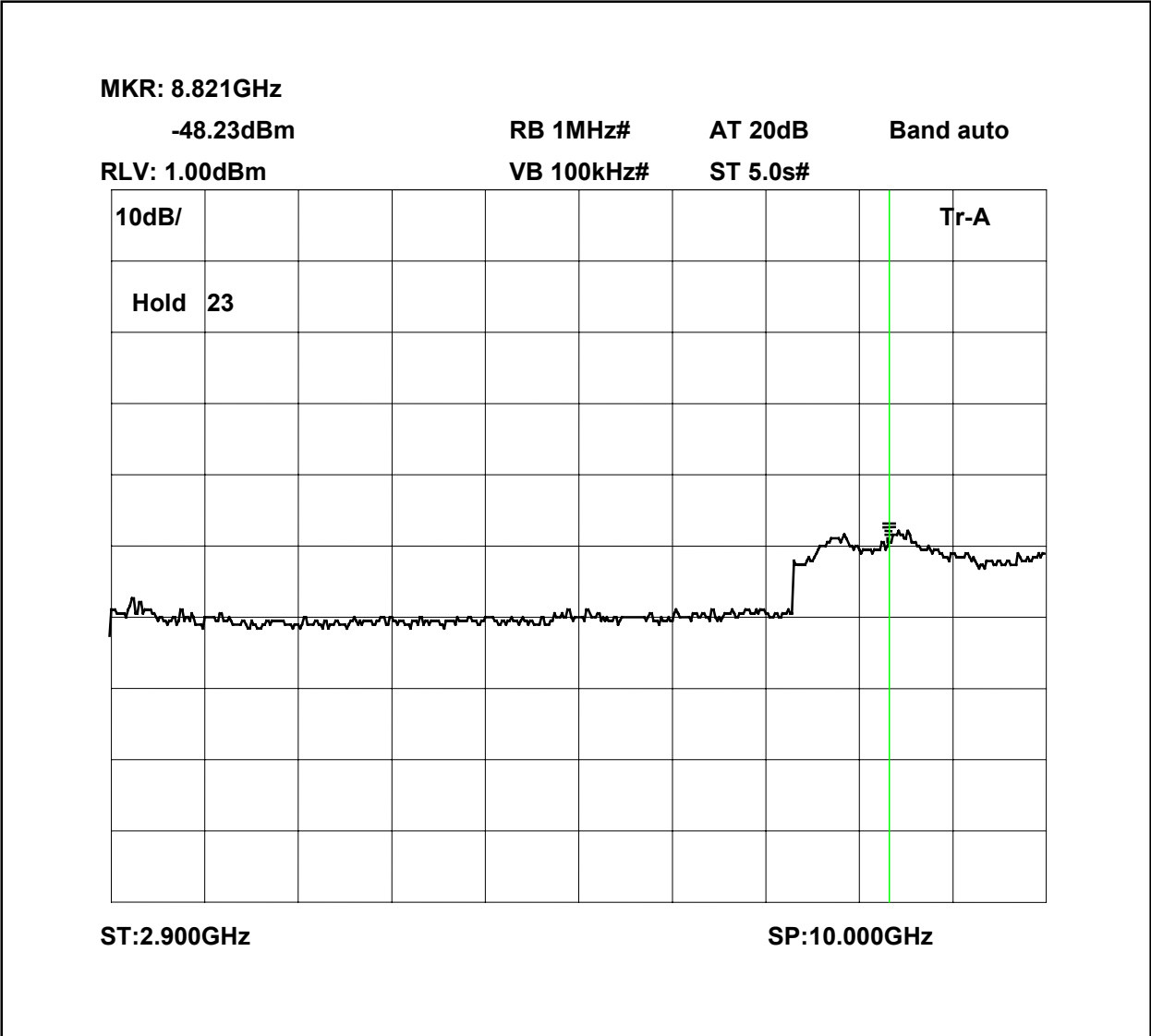
The test equipment used for the Transmitter Conducted Emissions:

TYPE OF EQUIPMENT	MAKER/SUPPLIER	MODEL No	SERIAL No	TRL No	ACTUAL EQUIPMENT USED
SPECTRUM ANALYSER	ANRITSU	MS2665C	MT26089	479	<b>X</b>
ATTENUATOR	BIRD	8304-300-N	N/A	220	<b>X</b>
CABLE	ROSENBERGER	MICRO COAX	N/A	279	<b>X</b>
SIGNAL GENERATOR	MARCON	2042	119388/080	179	<b>X</b>

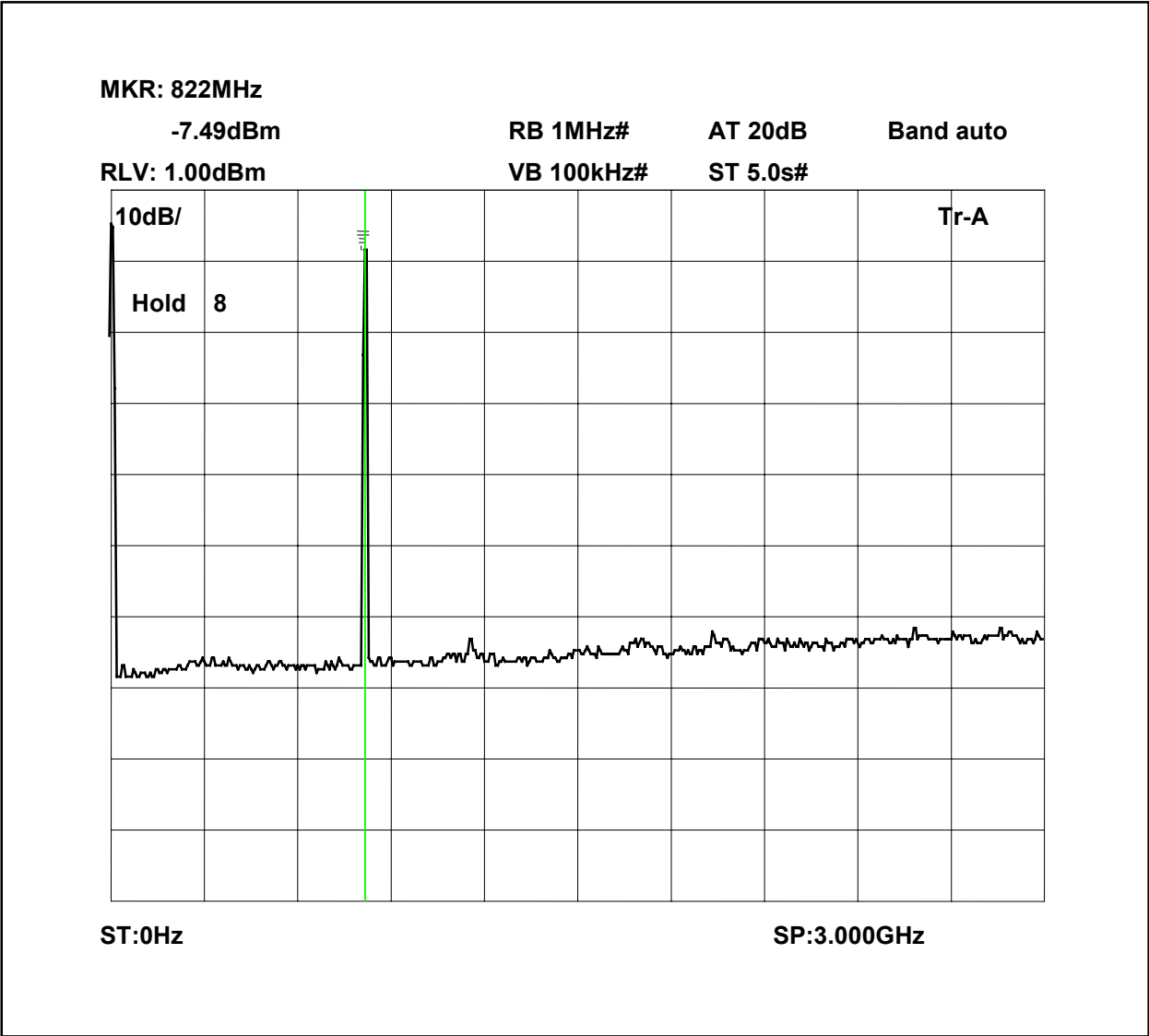
Conducted emissions 812.7625MHz 0 - 3GHz



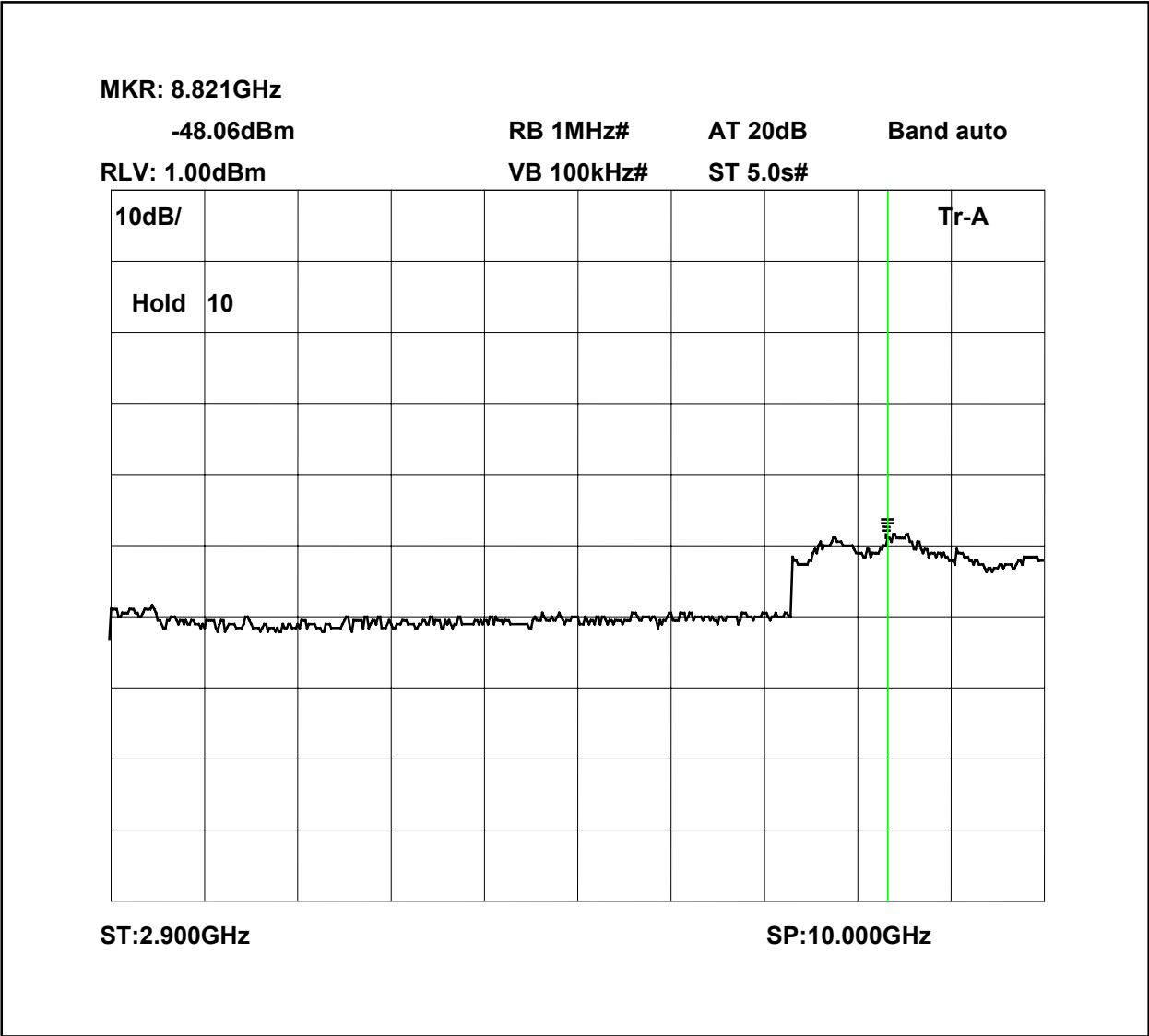
Conducted emissions 812.7625MHz 2.9 - 10GHz



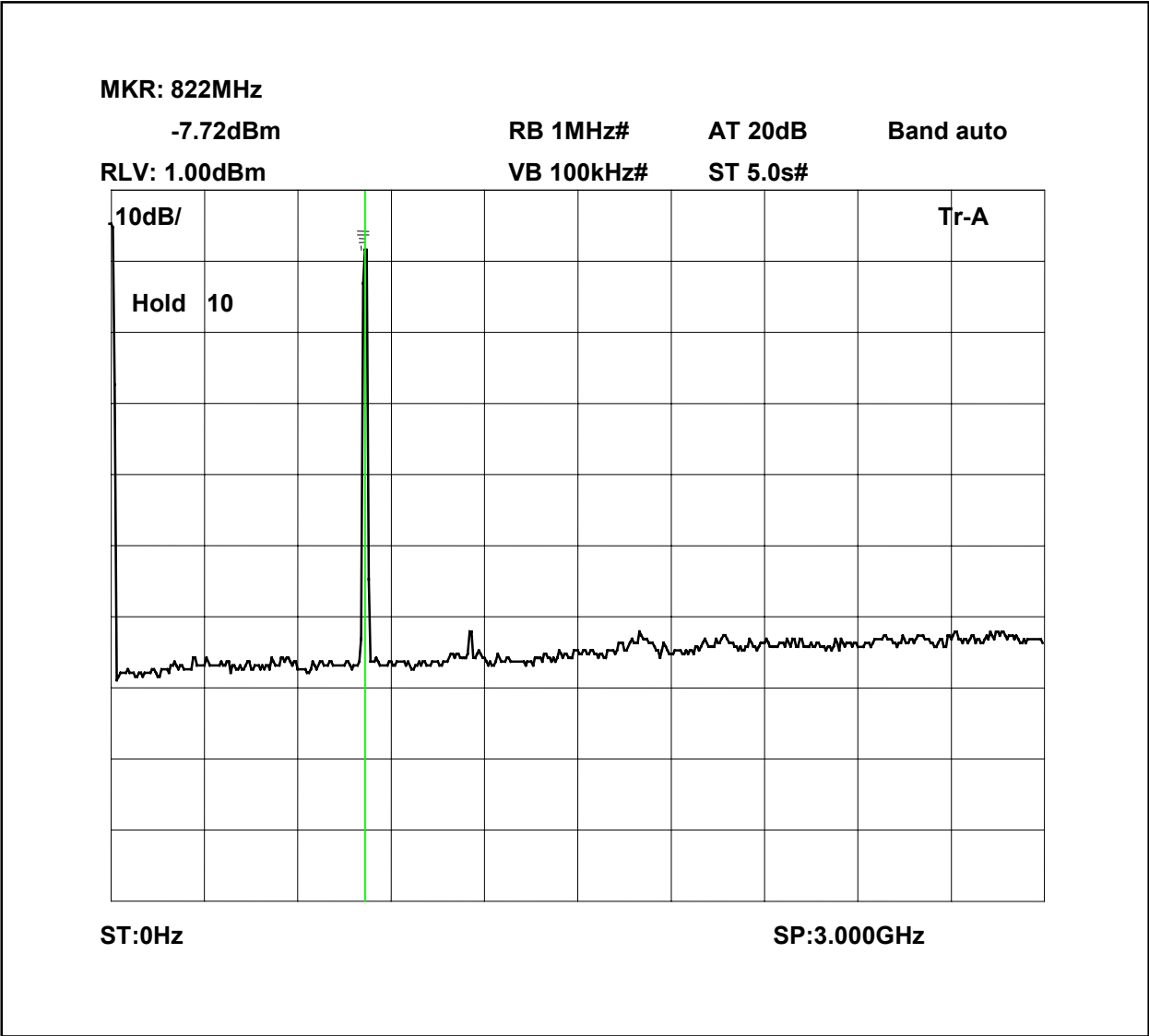
Conducted emissions 814.4375MHz 0 - 3GHz



Conducted emissions 814.4375MHz 2.9 - 10GHz



Conducted emissions 815.4375MHz 0 - 3GHz





MR: 8.821GHz  
-47.64dBm  
RB 1MHz#  
AT 20dB  
Band auto  
RLV: 1.00dBm  
VB 100kHz#  
ST 5.0s#

10dB/

Hold 10

Tr-A

ST:2.900GHz

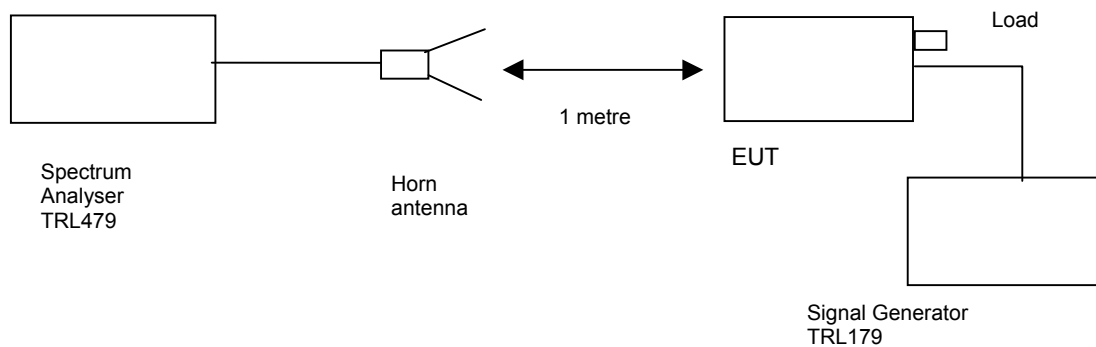
SP:10.000GHz

## TRANSMITTER TESTS

### AMPLIFIER SPURIOUS EMISSIONS – RADIATED – Part 2.1053– UPLINK

Ambient temperature = 16°C  
Relative humidity = 60%  
Conditions = OATS  
Supply voltage = 115V ac  
Supply Frequency = N/A

Test Signal = F3E



The test was set up as per the diagram. The level at the input was adjusted to compensate for the loss of the interconnecting cable. The unit was tested operating maximum power on three test frequencies with a 50 ohm load on the output. The unit was also tested with the signal generator replaced by another 50ohm load.

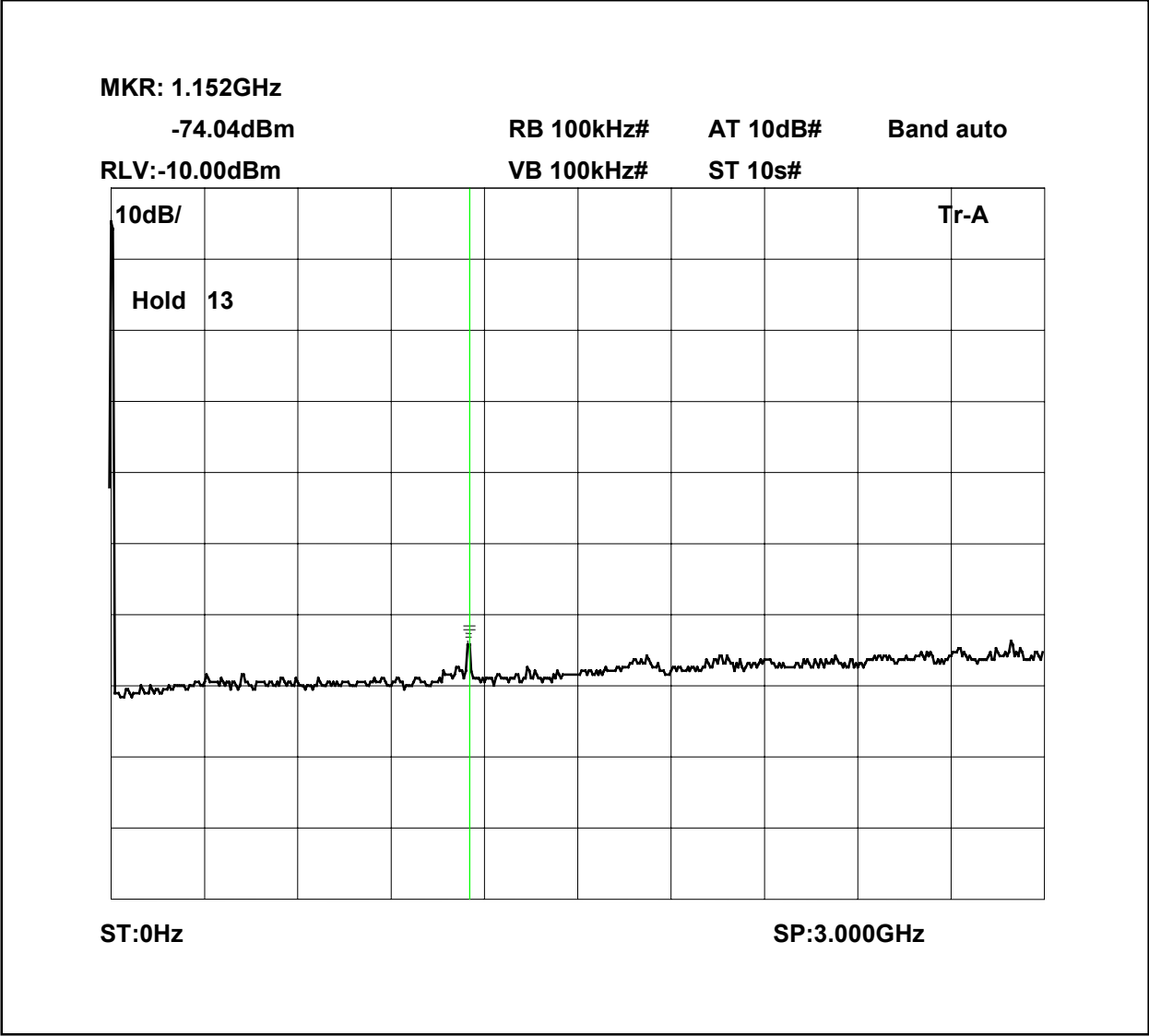
The Spurious limit was calculated as follows:

On any frequency removed from the assigned frequency by more that 250% of the authorised bandwidth

At least  $43 + 10 \log \text{PdB}$

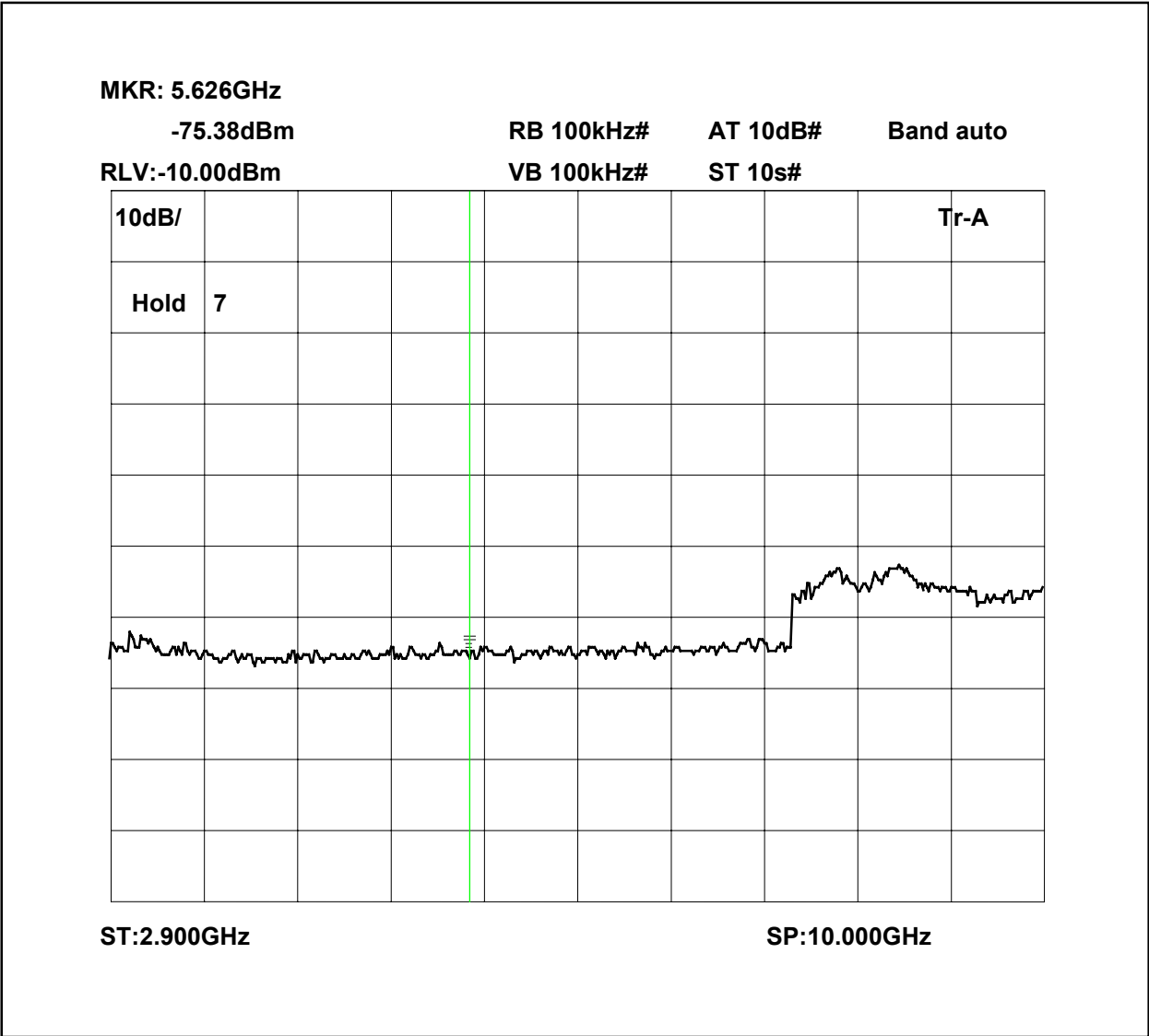
$$(10\log P_{\text{watts}}) - (43 + 10\log (P_{\text{watts}} * 1000)) = \text{LIMIT} = -13 \text{ dBm}$$

Radiated emissions 812.7625MHz 0-3GHz



The above test results show that there were no emissions within 20dBs of the –13dBm limit.

Radiated emissions 812.7625MHz 2.9-10GHz



The above test results show that there were no emissions within 20dBs of the –13dBm limit.

MR: 1.152GHz  
-74.04dBm  
RB 100kHz#  
AT 10dB#  
Band auto  
RLV:-10.00dBm  
VB 100kHz#  
ST 10s#

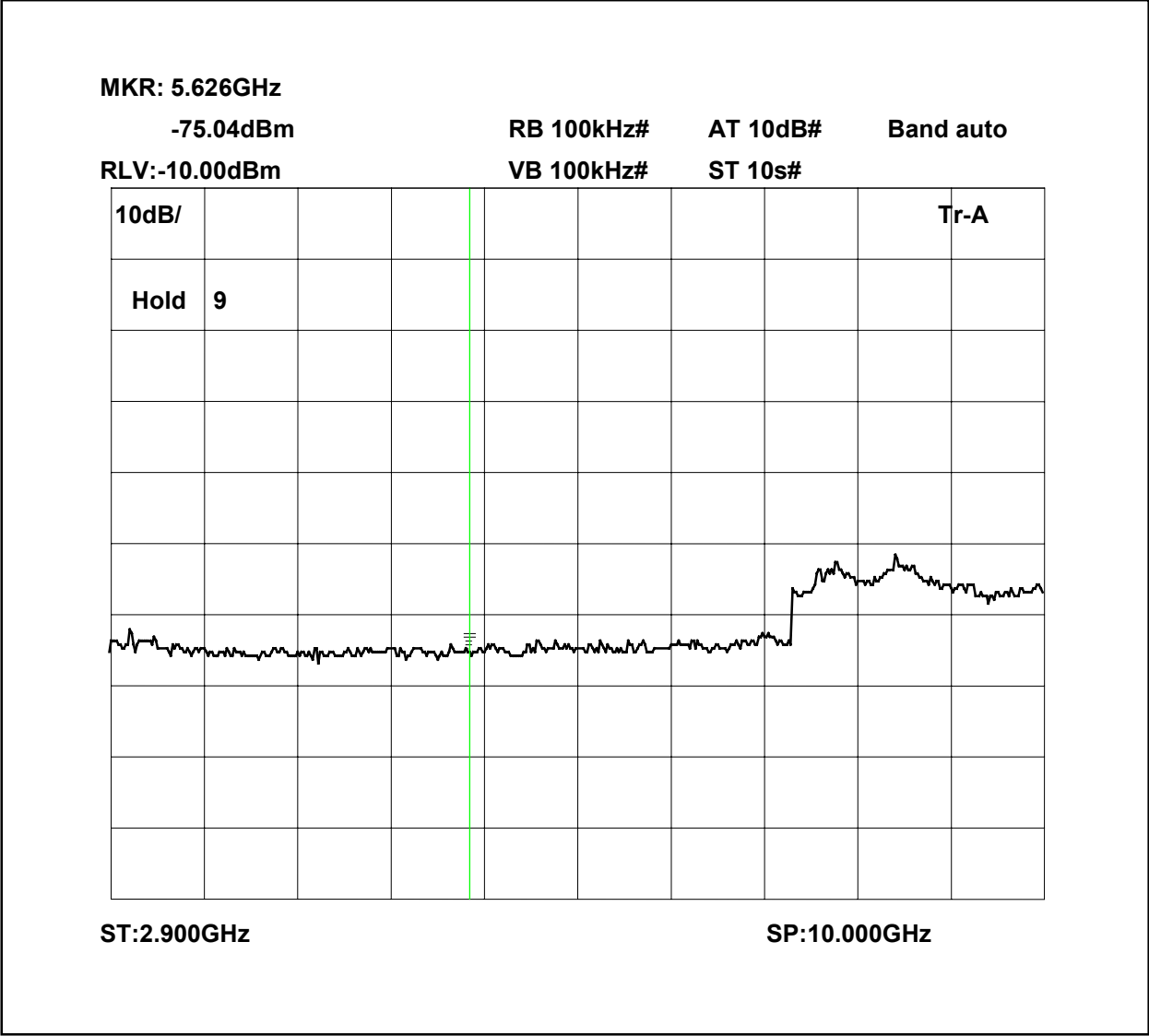
10dB/  
Hold 5

Tr-A

ST:0Hz  
SP:3.000GHz

Page 29 of 71

Radiated emissions 814.4375MHz 2.9-10GHz



The above test results show that there were no emissions within 20dBs of the –13dBm limit.

MKR: 1.152GHz  
-73.99dBm  
RB 100kHz#  
AT 10dB#  
Band auto

RLV:-10.00dBm  
VB 100kHz#  
ST 10s#

10dB/  
Hold 9  
Tr-A

ST:0Hz  
SP:3.000GHz

Detailed description: The image shows a spectrum analyzer interface. At the top, the center frequency is set to 1.152 GHz. The power level is -73.99 dBm. The resolution bandwidth (RB) is 100 kHz, and the video bandwidth (VB) is 100 kHz. The sweep time (ST) is 10 seconds. The span is 3.000 GHz. The reference level (RLV) is -10.00 dBm. The trace shows a signal at 1.152 GHz with a power level of -73.99 dBm. The trace is labeled 'Tr-A'. The display includes a grid and a 'Hold' button.

RF335 iss02

MR: 5.626GHz  
-74.85dBm  
RB 100kHz#  
AT 10dB#  
Band auto

RLV:-10.00dBm  
VB 100kHz#  
ST 10s#

10dB/

Hold 5

Tr-A

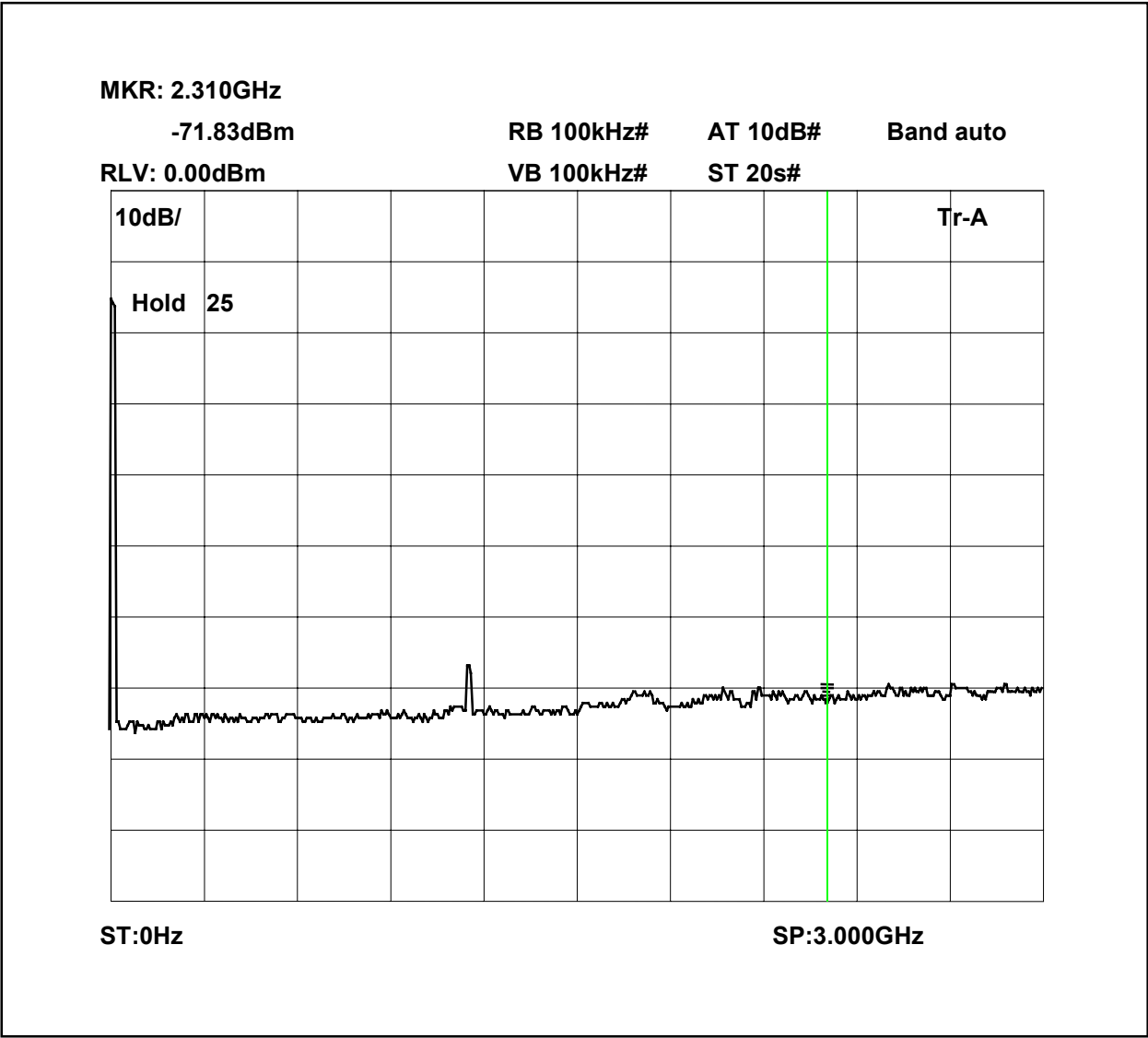
ST:2.900GHz

SP:10.000GHz

RF335 iss02

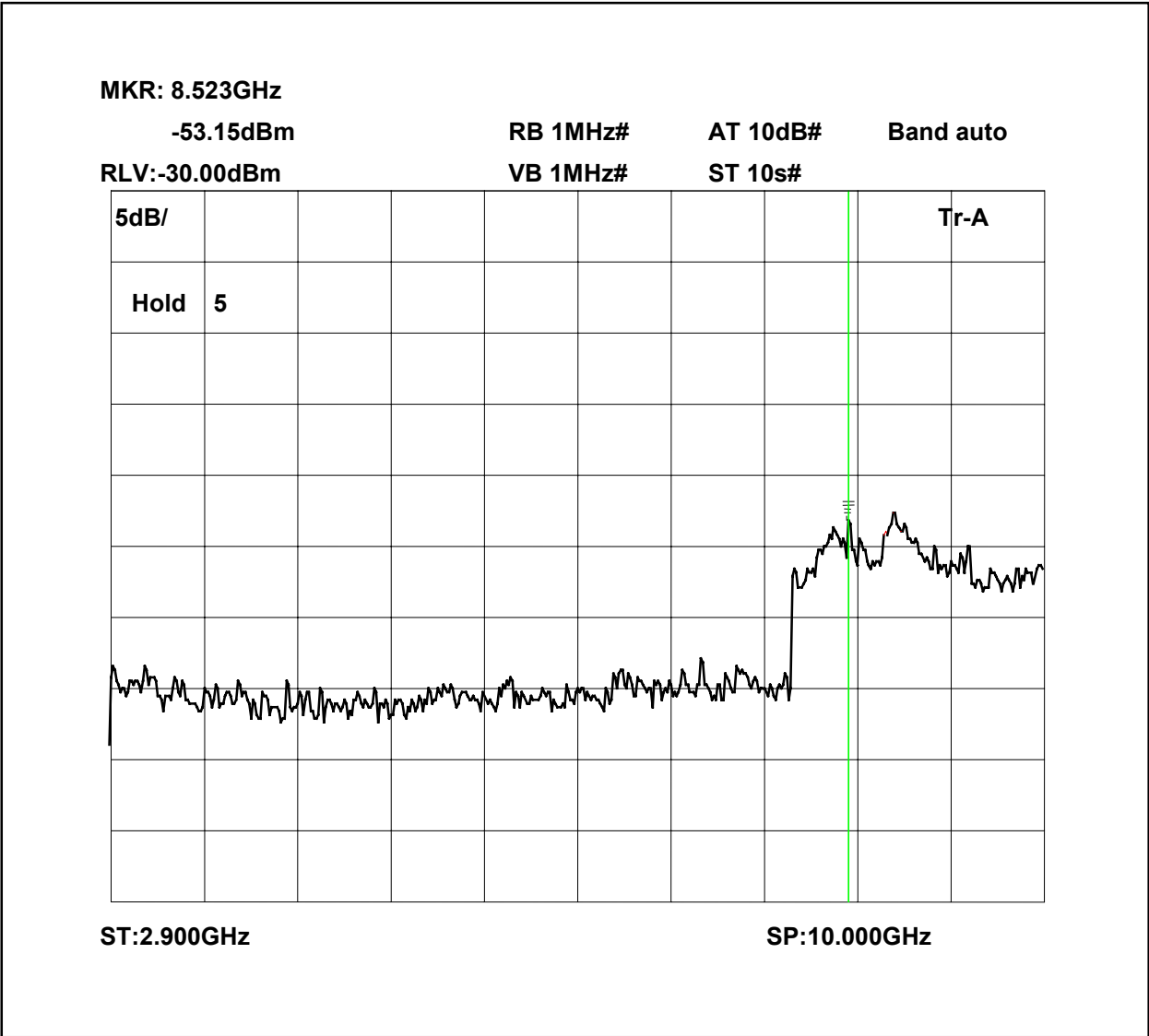


Radiated emissions no input signal 0-3GHz



The above test results show that there were no emissions within 20dBs of the –13dBm limit.

Radiated emissions no input signal 2.9-10GHz



The above test results show that there were no emissions within 20dBs of the –13dBm limit.

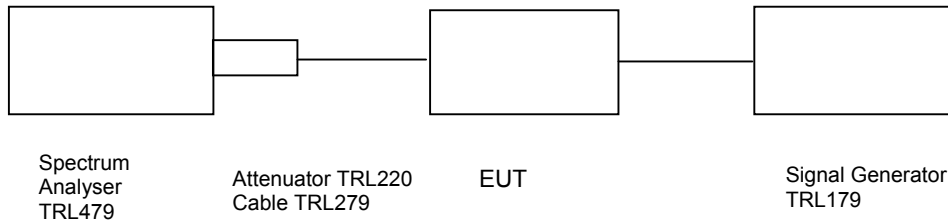
The test equipment used for the Transmitter Spurious Emissions:

TYPE OF EQUIPMENT	MAKER/ SUPPLIER	MODEL No	SERIAL No	TRL No	ACTUAL EQUIPMENT USED
SPECTRUM ANALYSER	ANRITSU	MS2665C	MT26089	479	<b>X</b>
HORN	EMCO	3115	9010-3581	139	<b>X</b>
ATTENUATOR	BIRD	8304-300-N	N/A	220	<b>X</b>
CABLE	ROSENBERGER	MICRO COAX	N/A	279	<b>X</b>
SIGNAL GENERATOR	MARCON	2042	119388/080	179	<b>X</b>

## AMPLIFIER GAIN – CONDUCTED – PART 2.1046 – DOWNLINK

Ambient temperature = 21°C  
 Relative humidity = 61%  
 Supply voltage = 115V ac  
 Channel number = See test results

Radio Laboratory



Frequency MHz	Signal Generator input level dBm	Cable & Attenuator loss dB	Level at Spectrum Analyser dBm	Gain dB	Gain after 20dB input level increase dBm
857.7625MHz	-77.79	26.57	-7.36	96.7	96.7
859.4375MHz	-77.4	26.57	-6.9	97.07	97.07
860.4375MHz	-77.4	26.57	-7.36	96.61	96.61

### Notes:

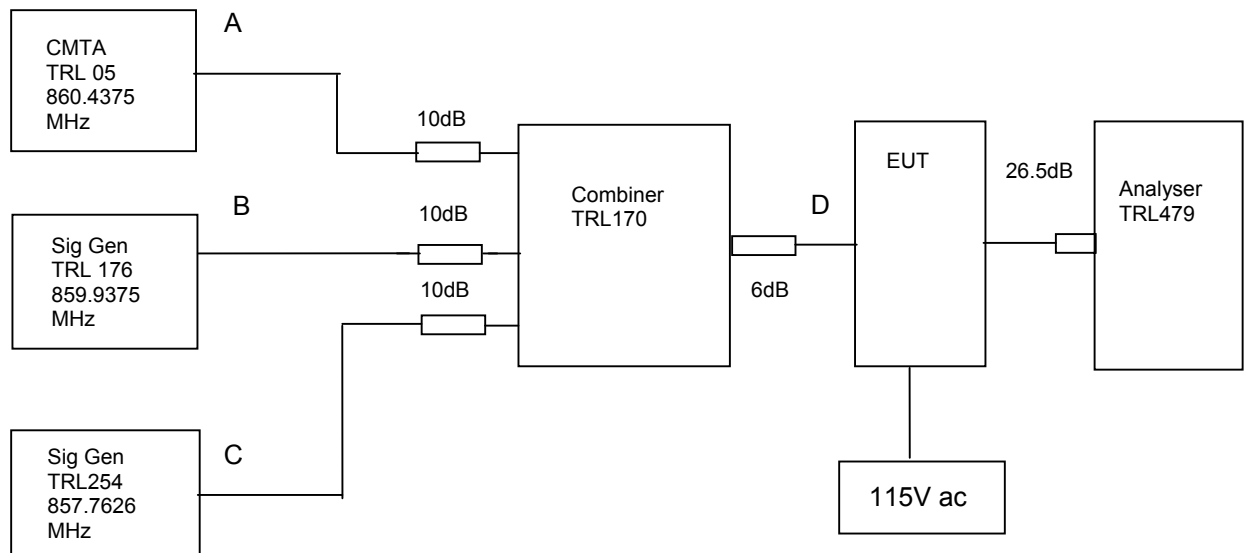
- The level of the signal generator takes into consideration the loss from the cable.
- The signal generator input was increased by 20dBs and the level of the output signal re-measured

TYPE OF EQUIPMENT	MAKER/ SUPPLIER	MODEL No	SERIAL No	TRL No	ACTUAL EQUIPMENT USED
SPECTRUM ANALYSER	ANRITSU	MS2665C	MT26089	479	<b>X</b>
ATTENUATOR	BIRD	8304-200	N/A	103	<b>X</b>
ATTENUATOR	BIRD	8304-300-N	N/A	220	<b>X</b>
CABLE	ROSENBERGER	MICRO COAX	N/A	279	<b>X</b>
SIGNAL GENERATOR	MARCON	2042	119388/080	179	<b>X</b>

## AMPLIFIER INTERMODULATION SPURIOUS EMISSIONS – CONDUCTED – PART 2.1053– DOWNLINK

Ambient temperature = 21°C  
 Relative humidity = 61%  
 Supply voltage = 115V ac

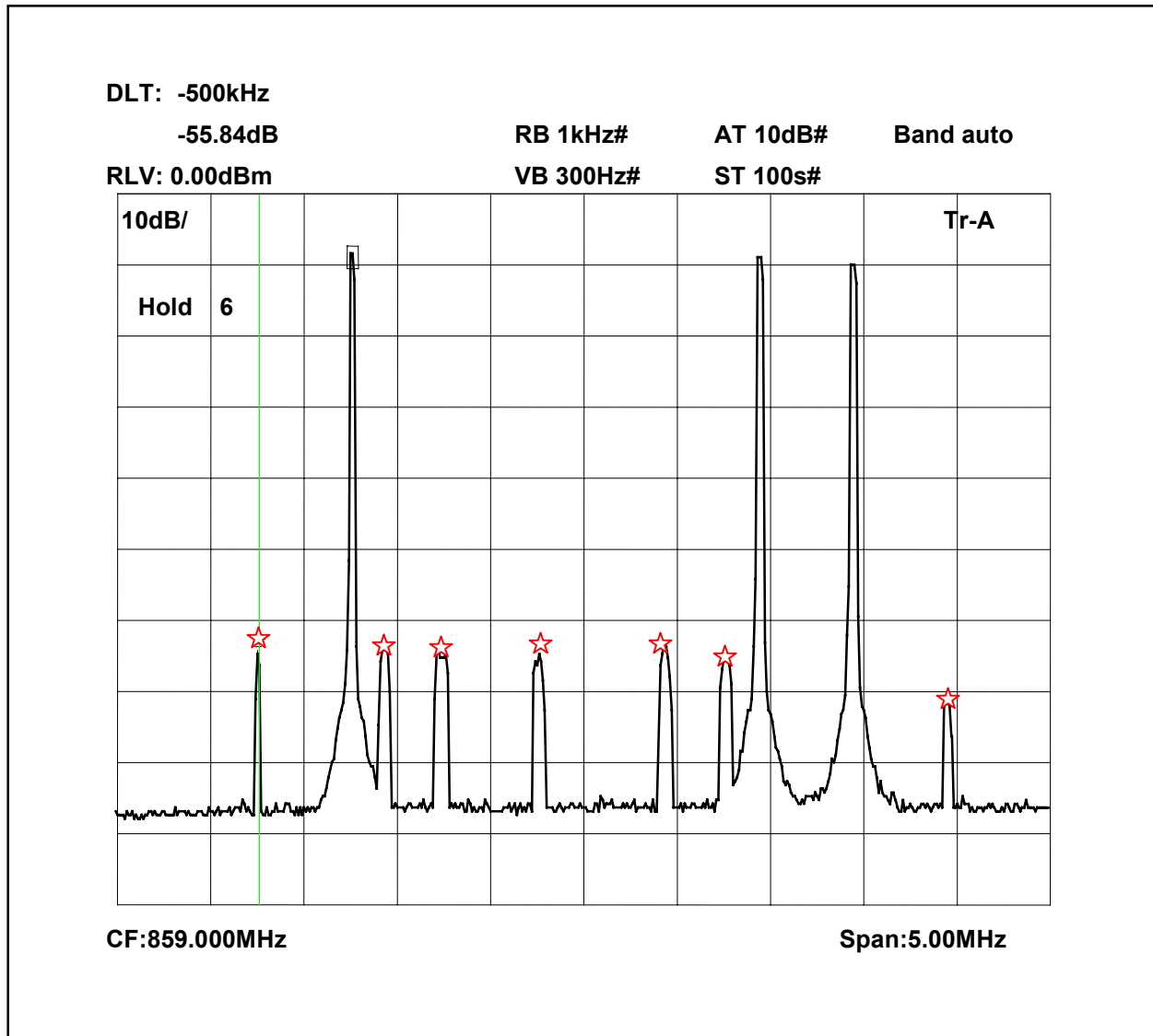
Radio Laboratory



The Intermodulation and spurious products were measured with the amplifier operating at maximum gain. A three tone test was conducted using the equipment as above. The input power level was adjusted so the level at point D was the maximum input of  $-77.4\text{dBm}$ . The cable and attenuator loss between the EUT and the spectrum analyser was  $26.57\text{dB}$ .

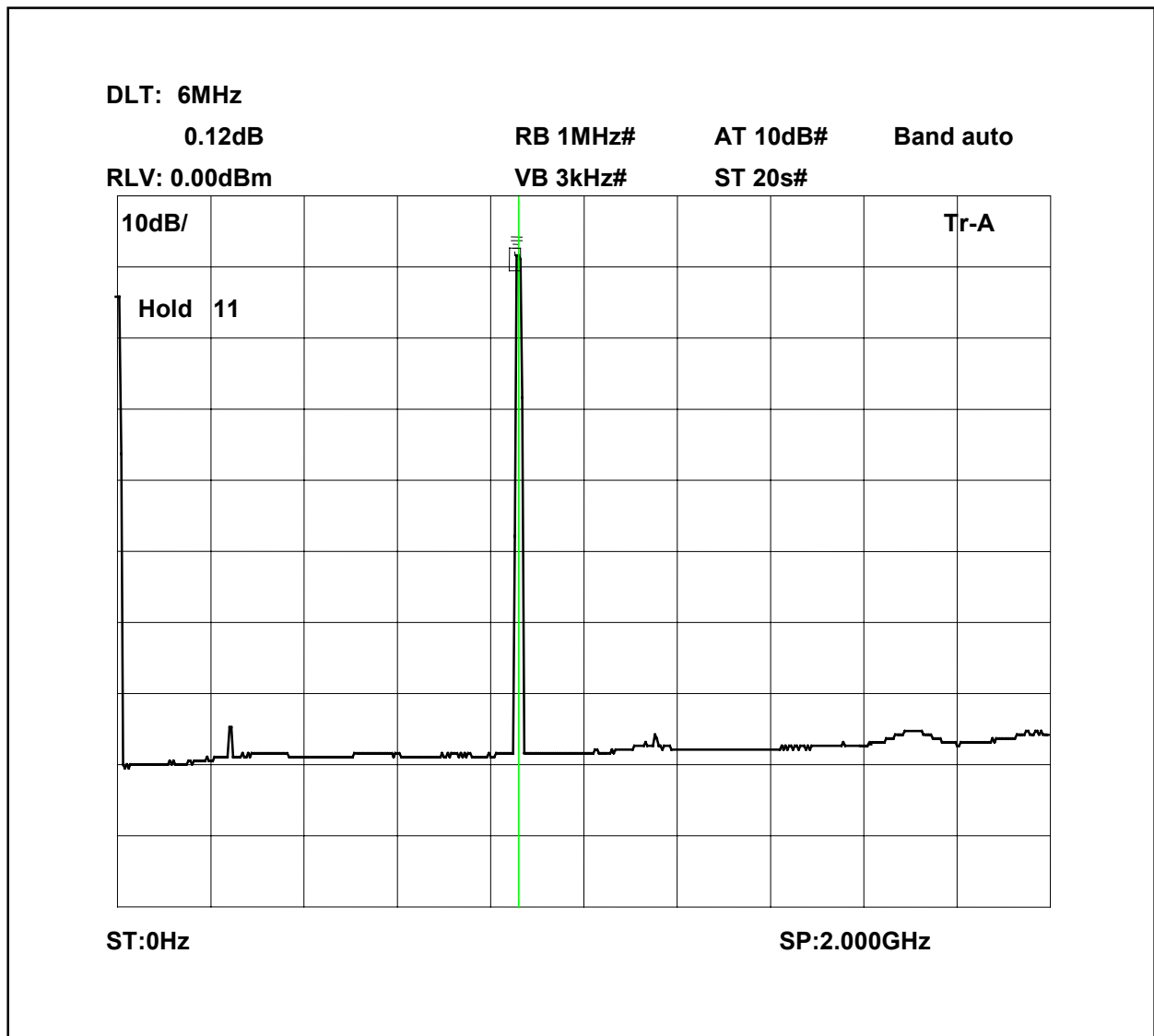
Sweep data is shown on the next page:

# Intermodulaion Inband



The above plot shows that all products (designated by ☆) are at least 50dB below the fundamentals.

# Intermodulation Wideband



The above plot shows that there are no products outside the bands.

Test equipment used for intermodulation test

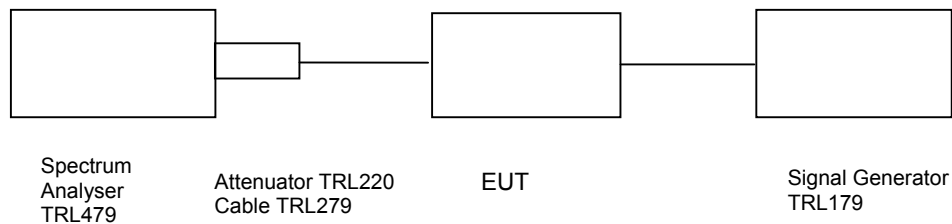
TYPE OF EQUIPMENT	MAKER/ SUPPLIER	MODEL No	SERIAL No	TRL No	ACTUAL EQUIPMENT USED
SPECTRUM ANALYSER	ANRITSU	MS2665C	MT26089	479	<b>X</b>
SIGNAL GENERATOR	MARCON	2042	119562/02	254	<b>X</b>
CMTA	ROHDE & SCHWARZ	CMTA52	894715/033	05	<b>X</b>
SIGNAL GENERATOR	MARCON	2042	119388/080	179	<b>X</b>
COMBINER	ELCOM	RC-4-50	N/A	170	<b>x</b>



## TRANSMITTER TESTS

### AMPLIFIER MODULATED CHANNEL TEST – CONDUCTED – Part 2.1049– DOWNLINK

Ambient temperature	=	21°C	Radio Laboratory
Relative humidity	=	61%	
Supply voltage	=	115V ac	
Channel number	=	See test results	

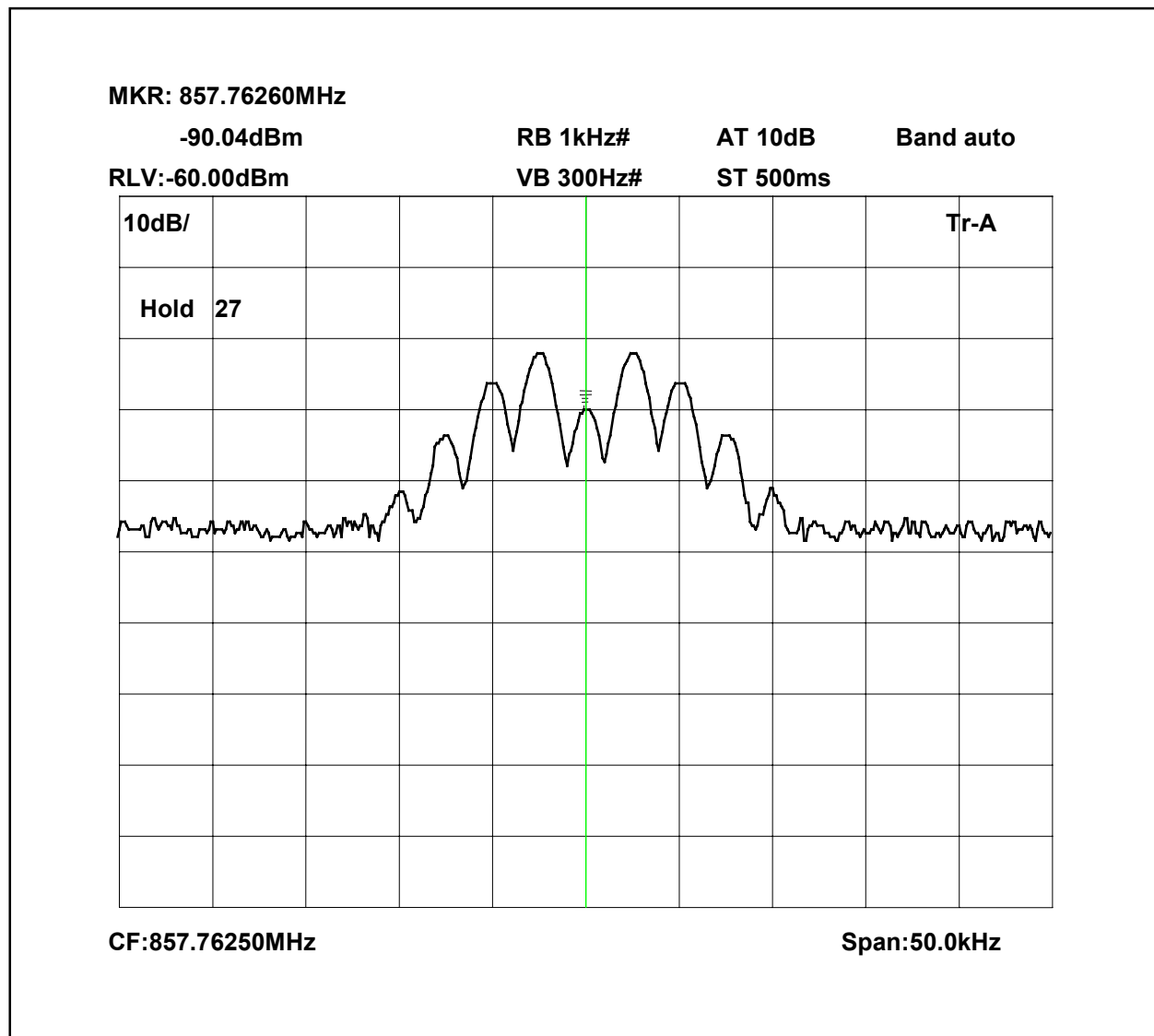


This test was performed to show that the amplifier does not alter the input signal in any way. The input signal was set to the maximum input level (-77.4dBm) and modulated with a 2500Hz tone. The plots show the signal measured at the signal generator and the signal measured at the output of the EUT.

Note: The cables and attenuators had the following losses.

1. Cable TRL279 and attenuators TRL220 = 26.62dB
2. Cable between signal generator and EUT = 0.4B

857.7625MHz Signal Generator deviation set to 5kHz



MR: 857.76250MHz

-21.15dBm RB 1kHz# AT 10dB# Band auto

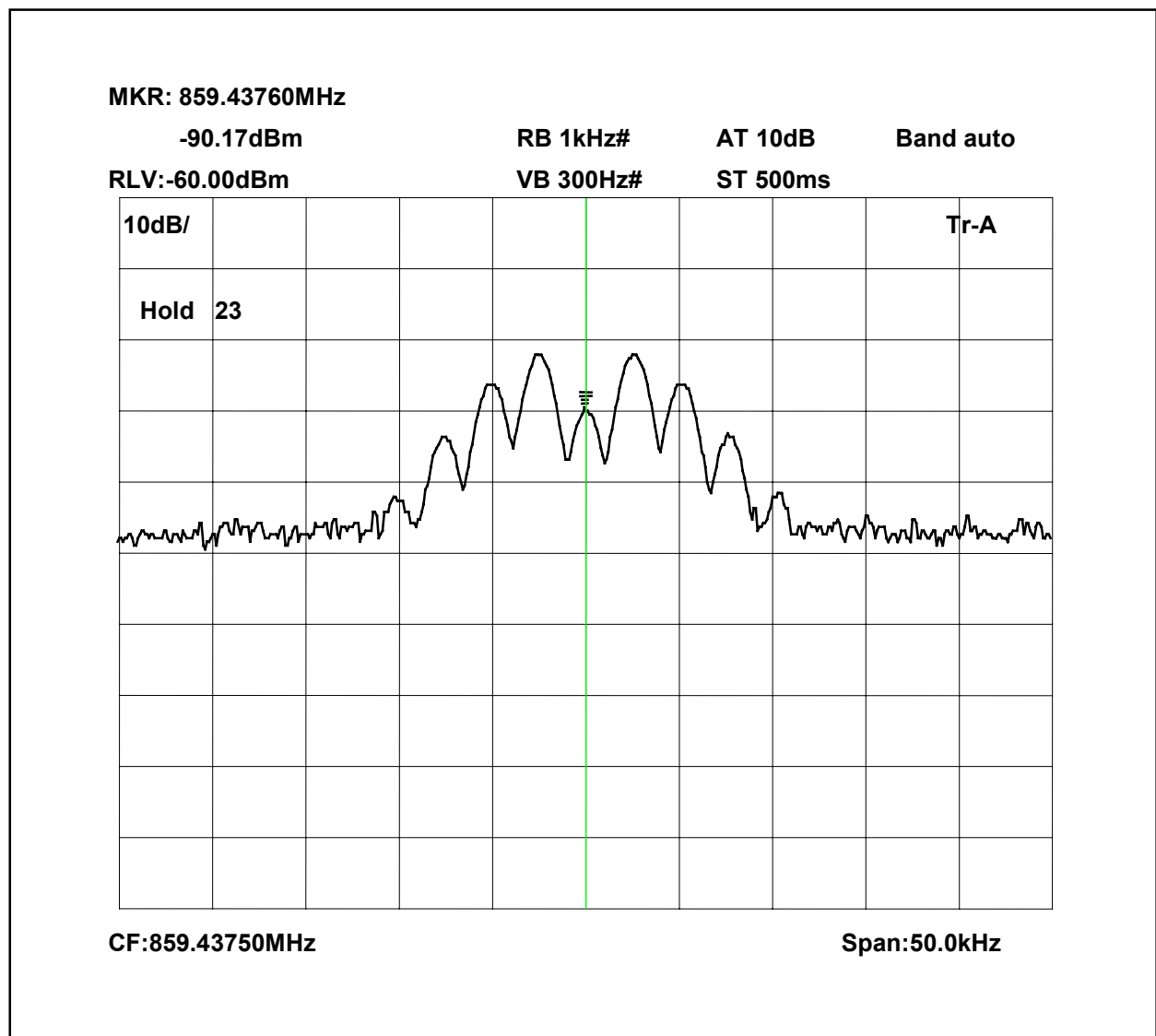
RLV: 0.00dBm VB 1kHz# ST 2.0s#

10dB/ Hold 12 Tr-A

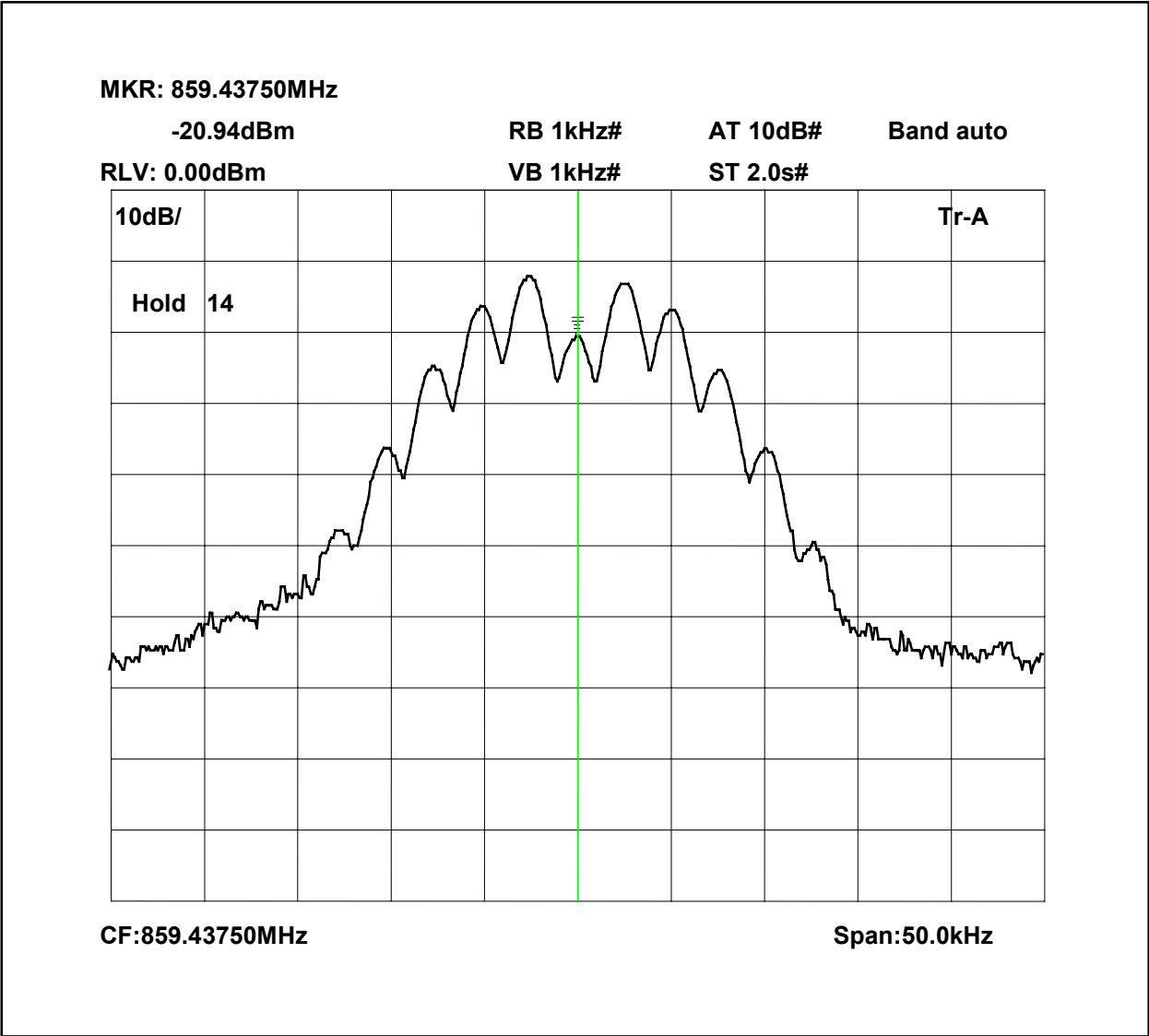
CF: 857.76250MHz Span: 50.0kHz

Page 43 of 71

859.4375MHz Signal Generator deviation set to 5kHz

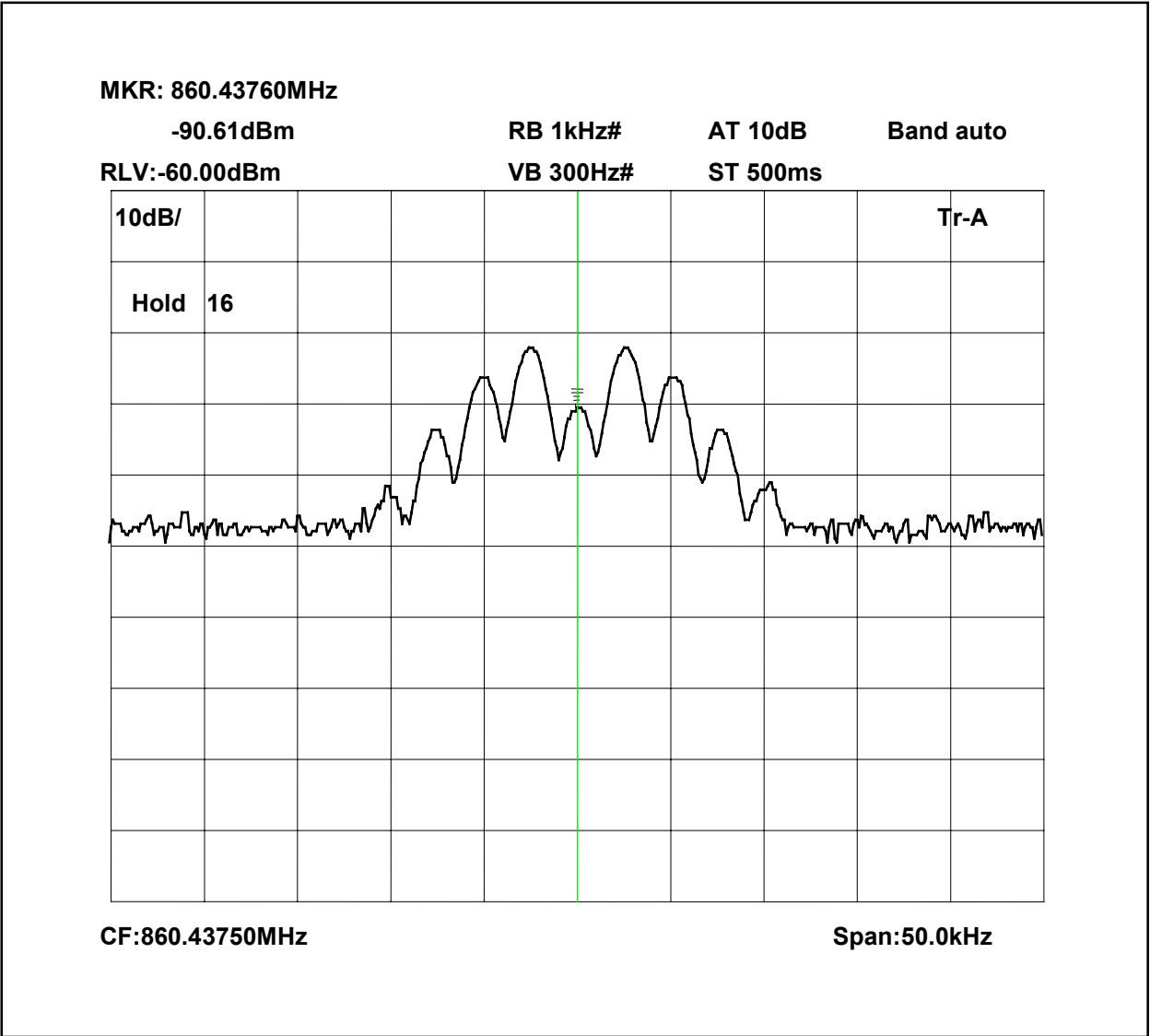


859.4375MHz Signal Generator and amplifier deviation set to 5kHz

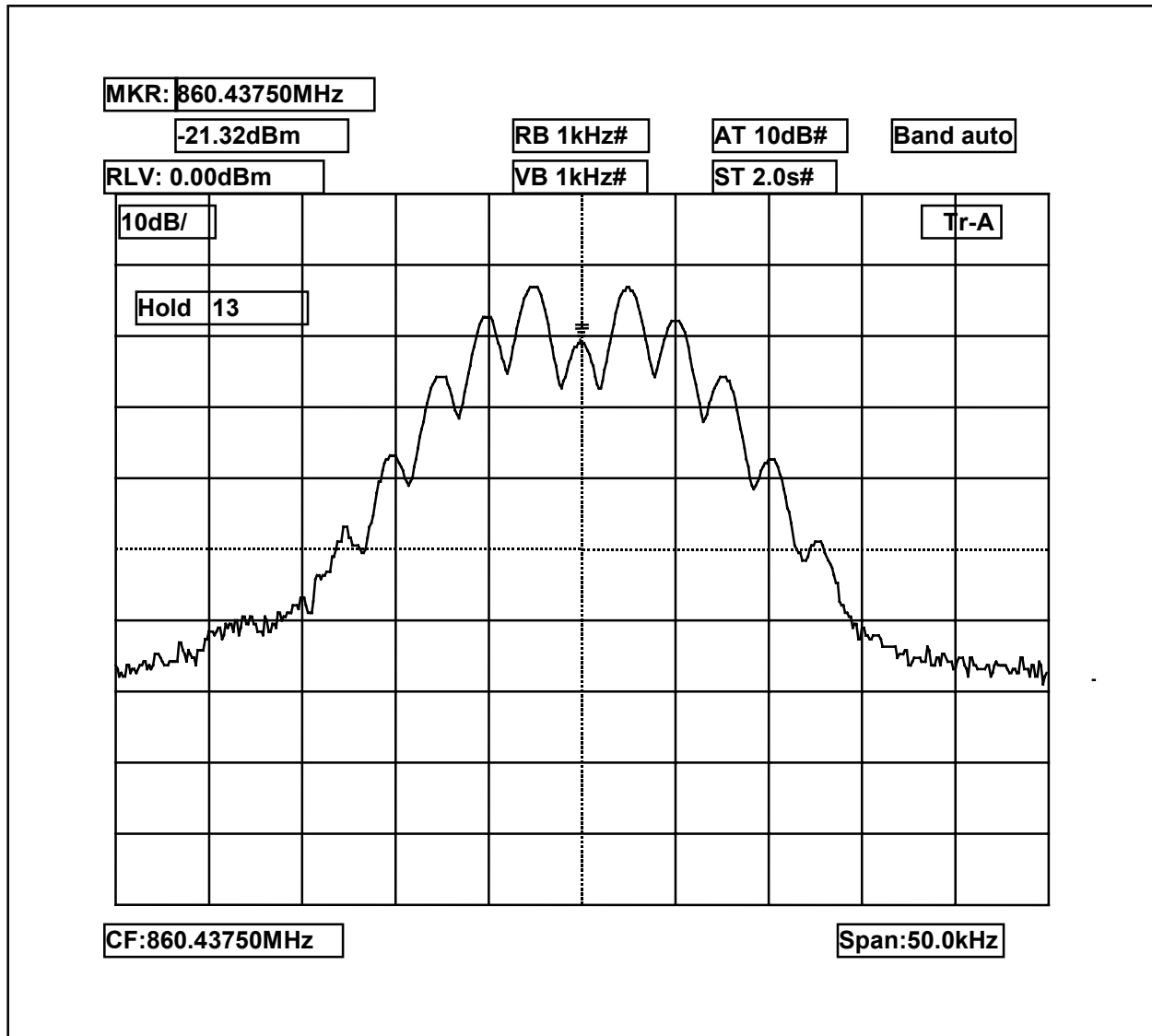


The above plots depicting the output wave shape show no measurable distortion visible. When compared to the input signal.

860.4375MHz Signal Generator deviation set to 5kHz



860.4375MHz Signal Generator deviation set to 5kHz



The above plots depicting the output wave shape show no measurable distortion visible. When compared to the input signal.

The test equipment used for the Transmitter Modulated Channel tests is shown overleaf:

TYPE OF EQUIPMENT	MAKER/ SUPPLIER	MODEL No	SERIAL No	TRL No	ACTUAL EQUIPMENT USED
SPECTRUM ANALYSER	ANRITSU	MS2665C	MT26089	479	<b>X</b>
ATTENUATOR	BIRD	8304-200	N/A	103	
ATTENUATOR	BIRD	8304-300-N	N/A	220	<b>X</b>
CABLE	ROSENBERGER	MICRO COAX	N/A	279	<b>X</b>
SIGNAL GENERATOR	MARCON	2042	119388/080	179	<b>X</b>

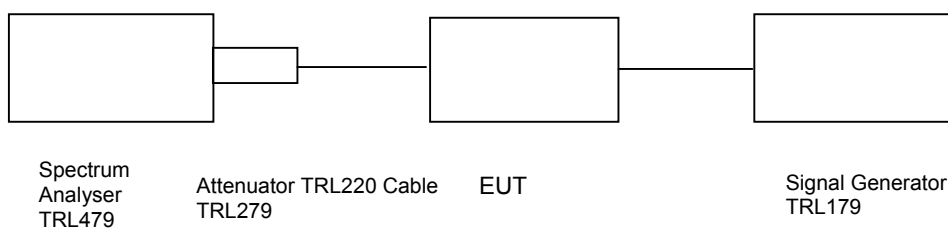


## TRANSMITTER TESTS

### AMPLIFIER SPURIOUS EMISSIONS – CONDUCTED – Part 2.1051– DOWNLINK

Ambient temperature = 21°C  
 Relative humidity = 61%  
 Supply voltage = 115V ac

Radio Laboratory  
 Test Signal = F3E



The test was set up as per the diagram. The level at the input was adjusted to compensate for the loss of the interconnecting cable. The unit was tested operating at maximum power and on three test frequencies.

The Spurious limit was calculated as follows:

On any frequency removed from the assigned frequency by more that 250% of the authorised bandwidth

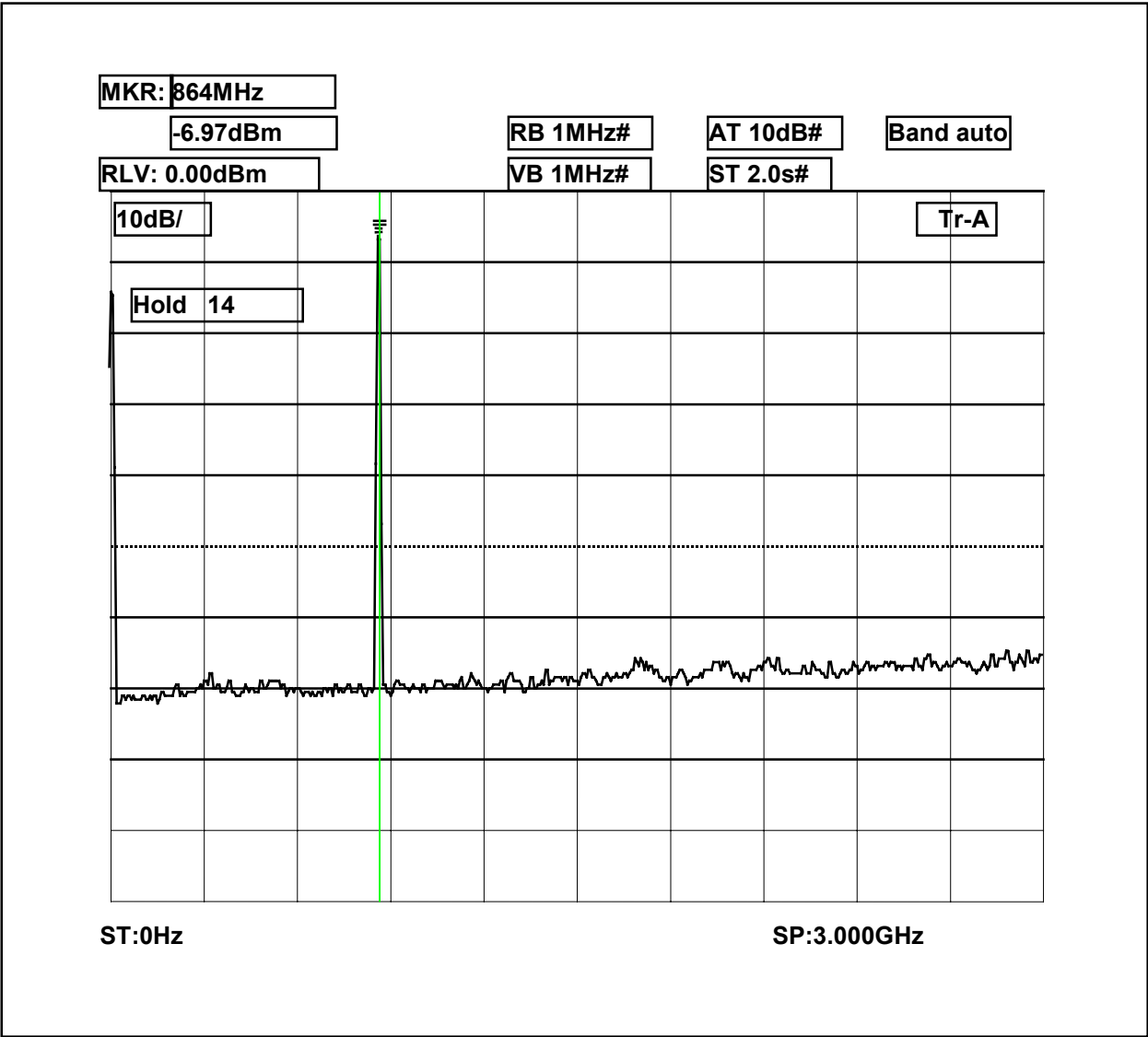
At least 43 + 10 log PdB

$$(10\log P_{\text{watts}}) - (43 + 10\log (P_{\text{watts}} * 1000)) = \text{LIMIT} = -13 \text{ dBm}$$

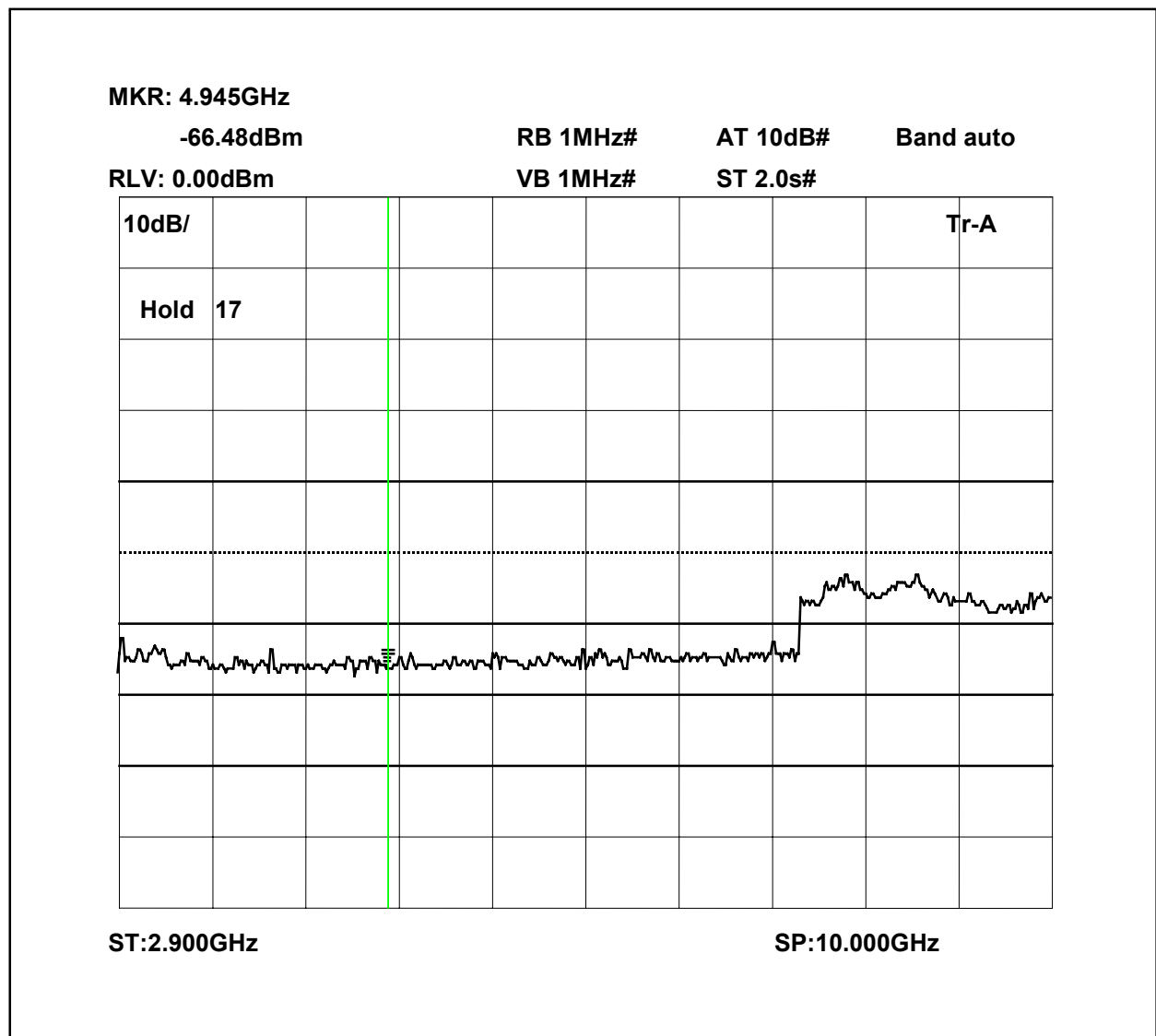
The test equipment used for the Transmitter Conducted Emissions:

TYPE OF EQUIPMENT	MAKER/ SUPPLIER	MODEL No	SERIAL No	TRL No	ACTUAL EQUIPMENT USED
SPECTRUM ANALYSER	ANRITSU	MS2665C	MT26089	479	<b>X</b>
ATTENUATOR	BIRD	8304-200	N/A	103	
ATTENUATOR	BIRD	8304-300-N	N/A	220	<b>X</b>
CABLE	ROSENBERGER	MICRO COAX	N/A	279	<b>X</b>
SIGNAL GENERATOR	MARCON	2042	119388/080	179	<b>X</b>

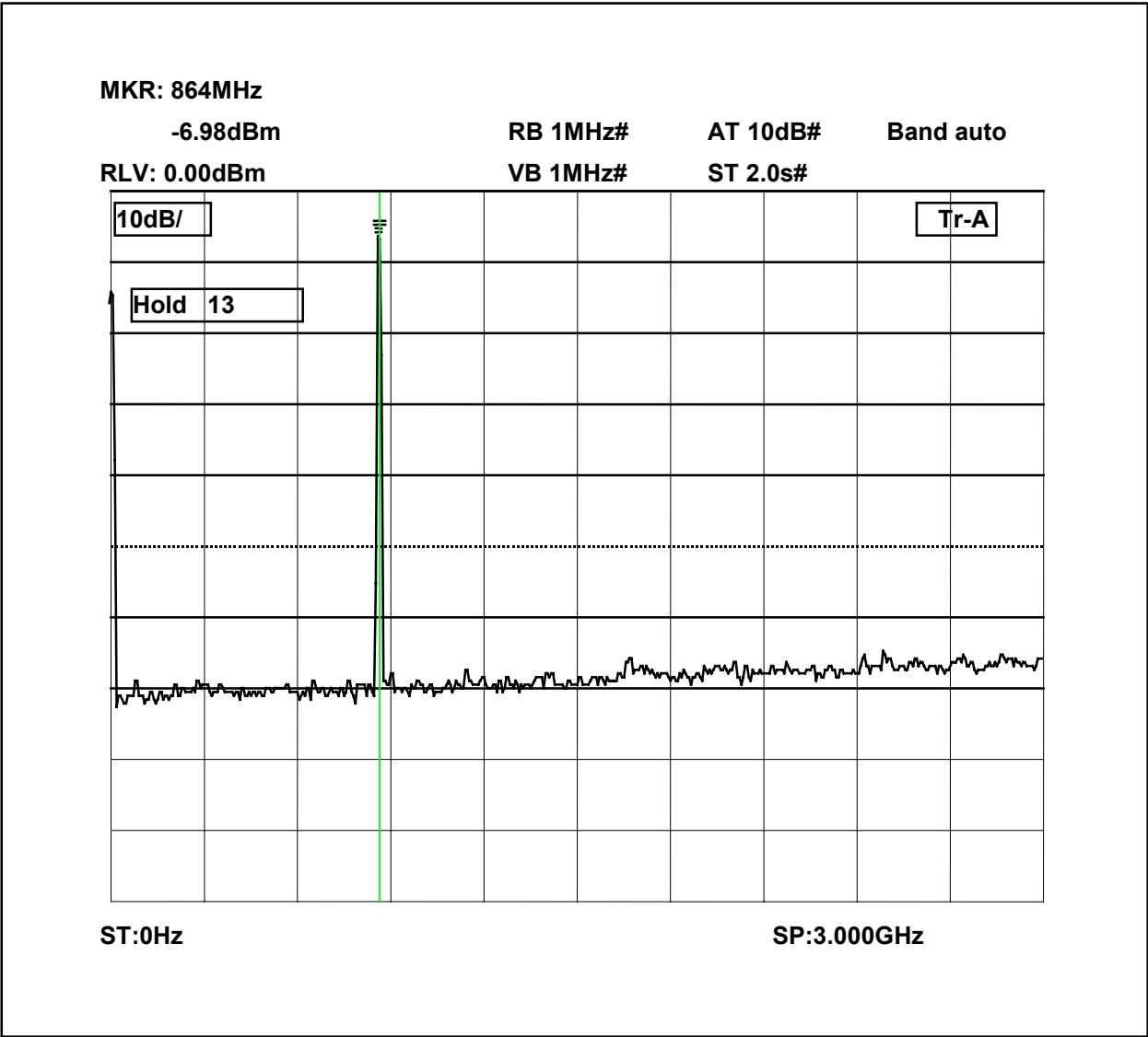
Conducted emissions 857.7625MHz 0-3GHz



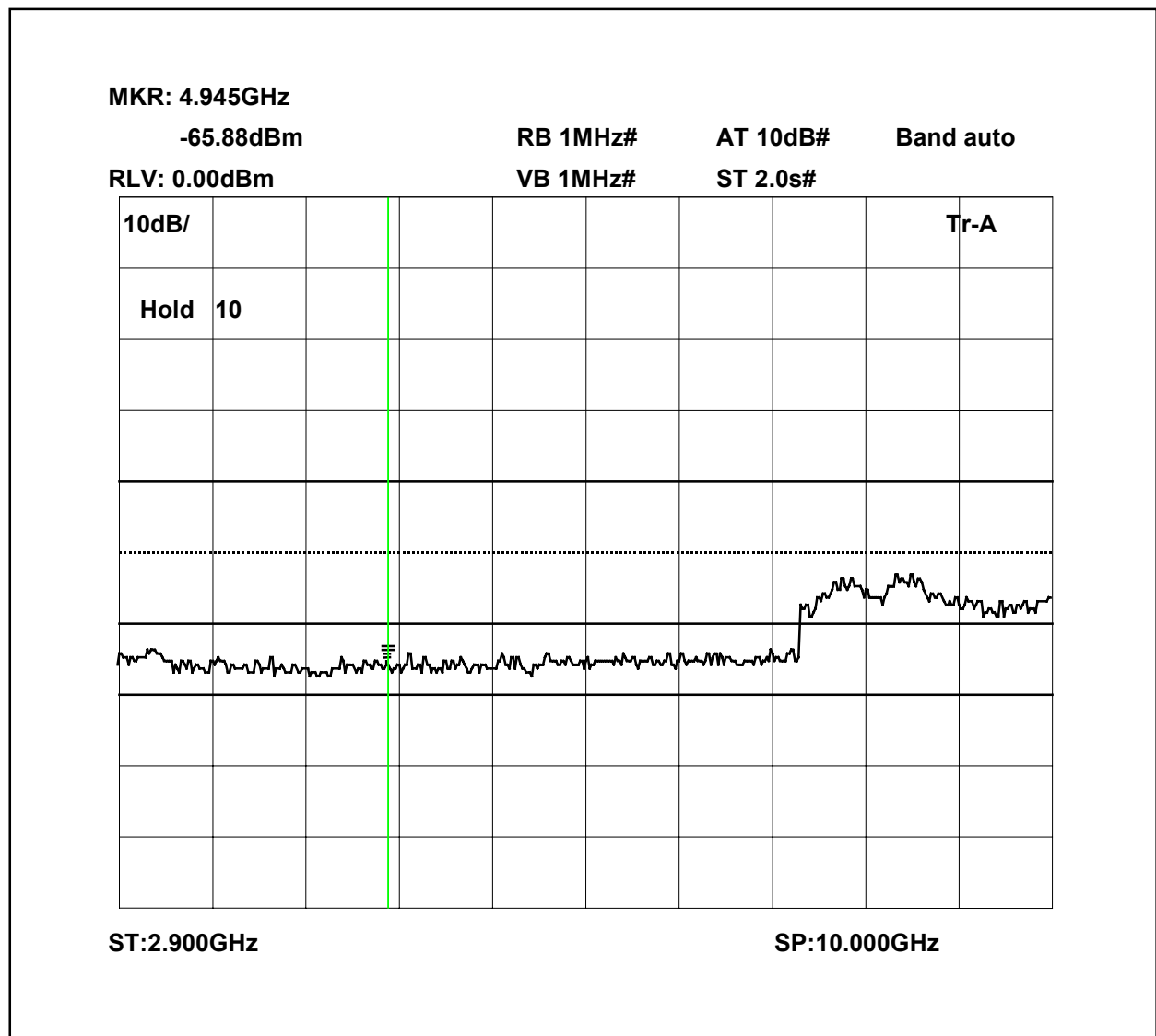
Conducted emissions 857.7625MHz 2.9-10GHz



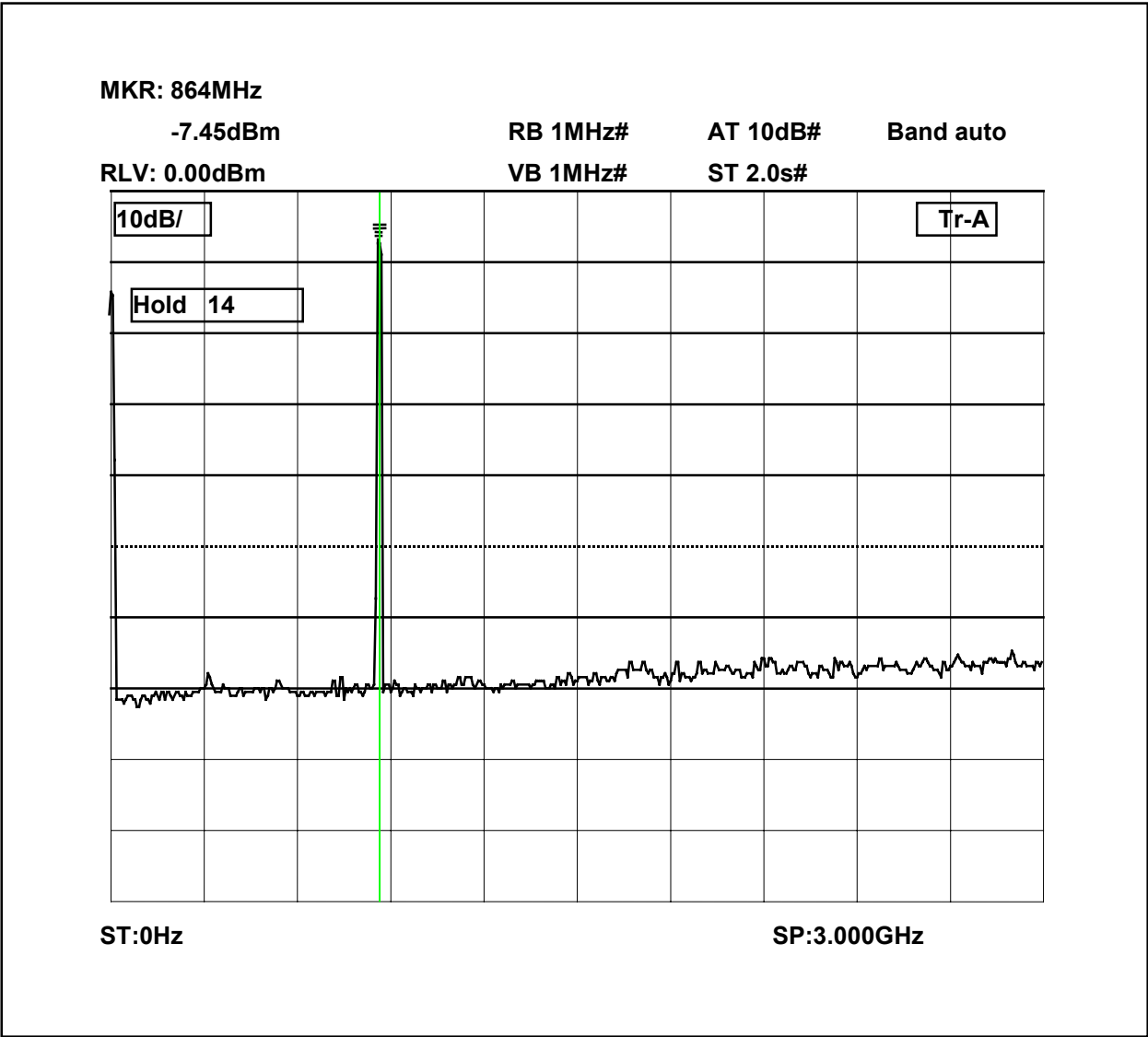
Conducted emissions 859.4375MHz 0-3GHz



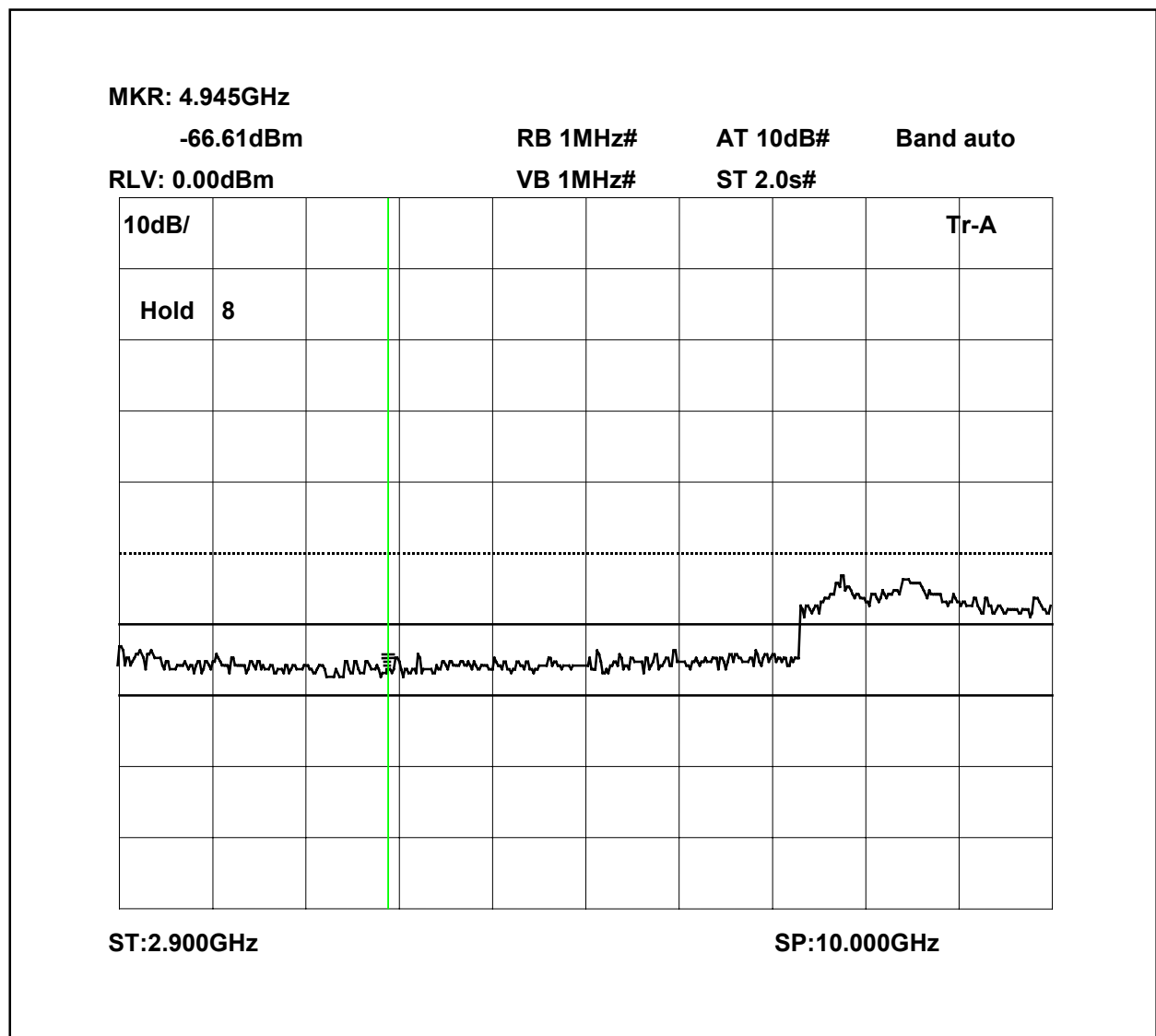
Conducted emissions 859.4375MHz 2.9-10GHz



Conducted emissions 860.4375MHz 0-3GHz



Conducted emissions 860.4375MHz 2.9-10GHz

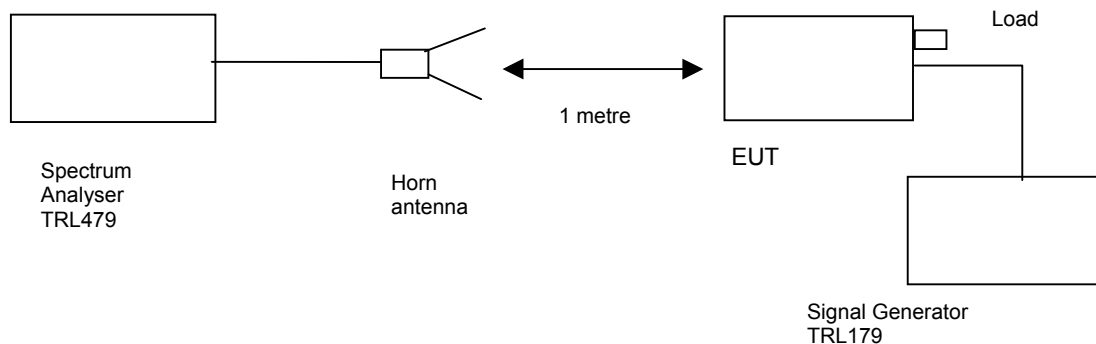


## TRANSMITTER TESTS

### AMPLIFIER SPURIOUS EMISSIONS – RADIATED – Part 2.1053– DOWNLINK

Ambient temperature = 18°C  
Relative humidity = 60%  
Conditions = OATS  
Supply voltage = 115V ac  
Supply Frequency = N/A

Test Signal = F3E



The test was set up as per the diagram. The level at the input was adjusted to compensate for the loss of the interconnecting cable. The unit was tested operating maximum power on three test frequencies with a 50 ohm load on the output. The unit was also tested with the signal generator replaced by another 50ohm load.

The Spurious limit was calculated as follows:

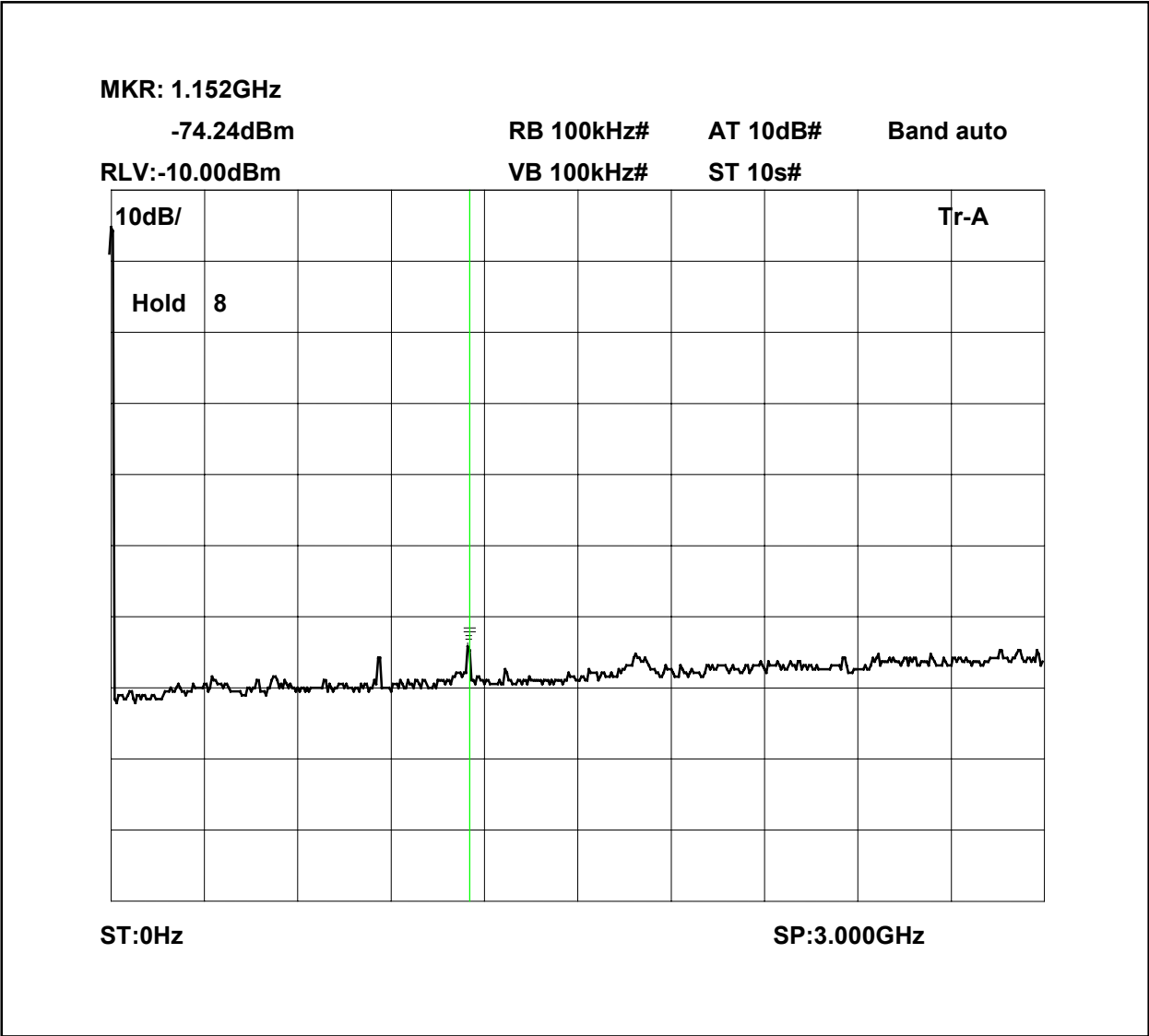
On any frequency removed from the assigned frequency by more that 250% of the authorised bandwidth

At least  $43 + 10 \log P_{dB}$

$$(10\log P_{\text{watts}}) - (43 + 10\log (P_{\text{watts}} * 1000)) = \text{LIMIT} = -13 \text{ dBm}$$



Radiated emissions 857.7625MHz 0-3GHz



The above test results show that there were no emissions within 20dBs of the –13dBm limit.

MKR: 5.626GHz  
-75.25dBm  
RB 100kHz#  
AT 10dB#  
Band auto  
RLV:-10.00dBm  
VB 100kHz#  
ST 10s#

10dB/

Hold 7

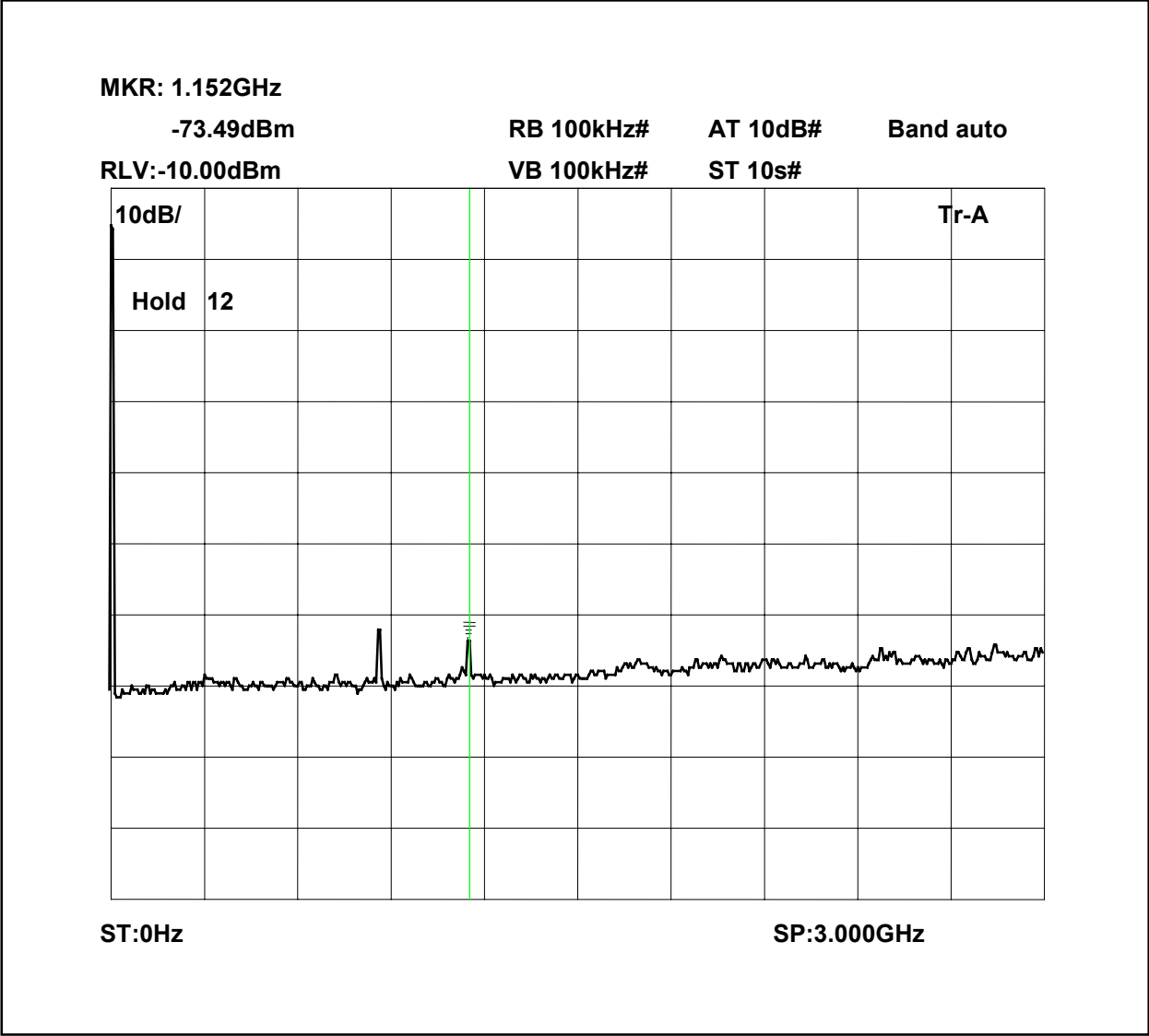
Tr-A

ST:2.900GHz

SP:10.000GHz

RF335 iss02

Radiated emissions 859.4375MHz 0-3GHz



The above test results show that there were no emissions within 20dBs of the –13dBm limit.

MR: 5.626GHz  
-75.25dBm  
RB 100kHz#  
AT 10dB#  
Band auto

RLV:-10.00dBm  
VB 100kHz#  
ST 10s#

10dB/

Hold 7

Tr-A

ST:2.900GHz

SP:10.000GHz

Page 60 of 71

MR: 1.152GHz  
-73.39dBm  
RB 100kHz#  
AT 10dB#  
Band auto

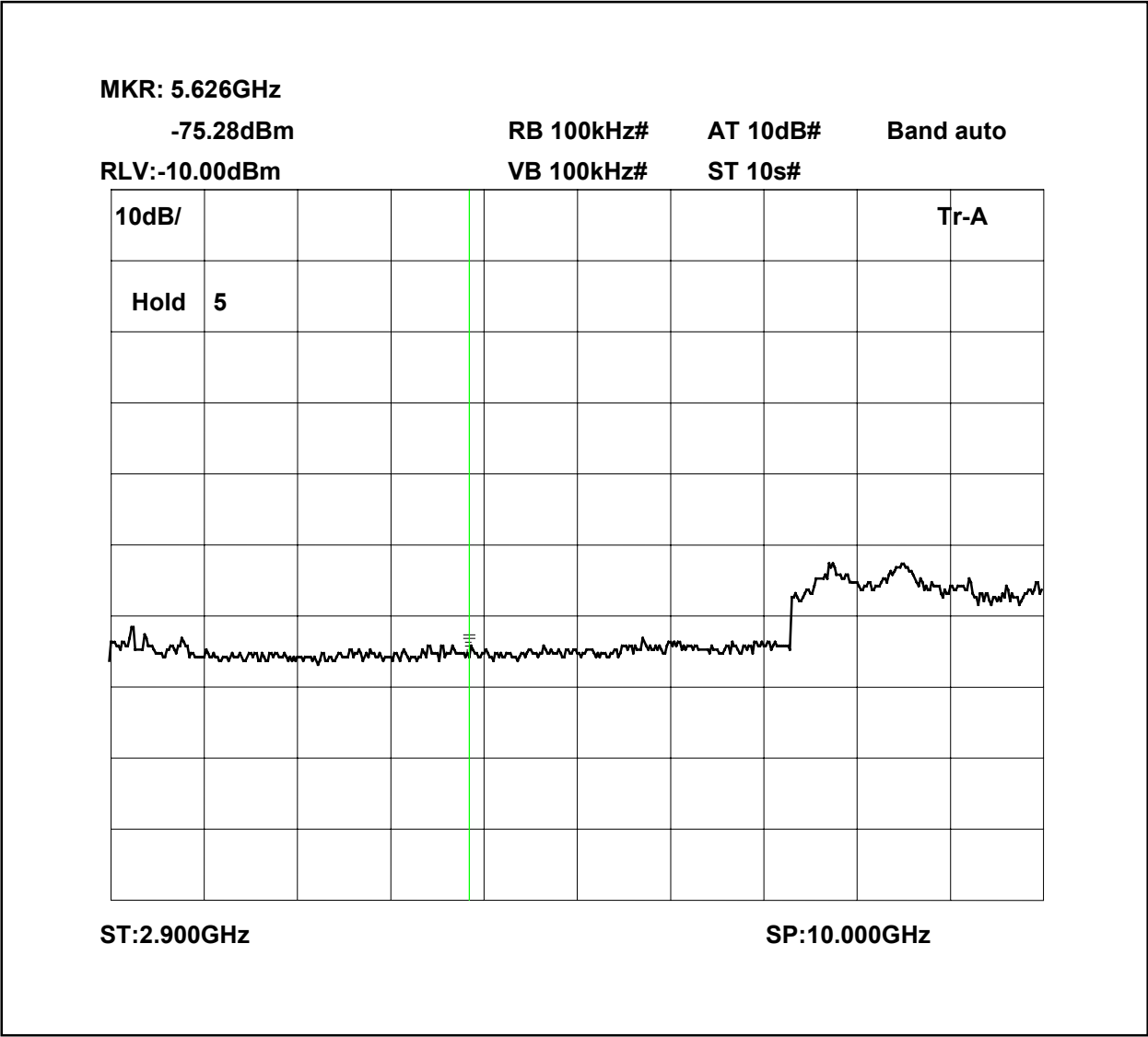
RLV:-10.00dBm  
VB 100kHz#  
ST 10s#

10dB/  
Hold 7  
Tr-A

ST:0Hz  
SP:3.000GHz

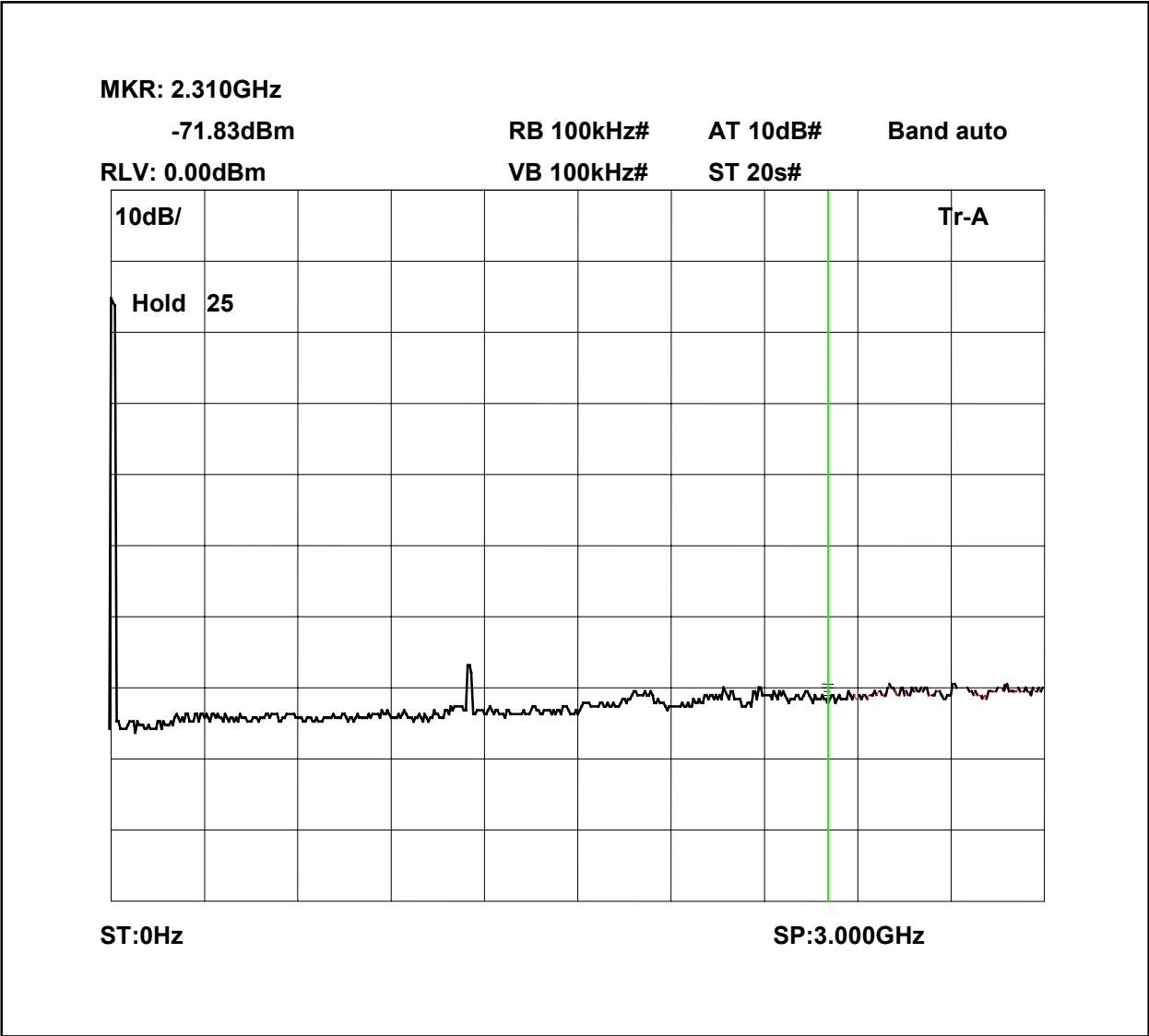
RF335 iss02

Radiated emissions 860.4375MHz 2.9-10GHz



The above test results show that there were no emissions within 20dBs of the –13dBm limit.

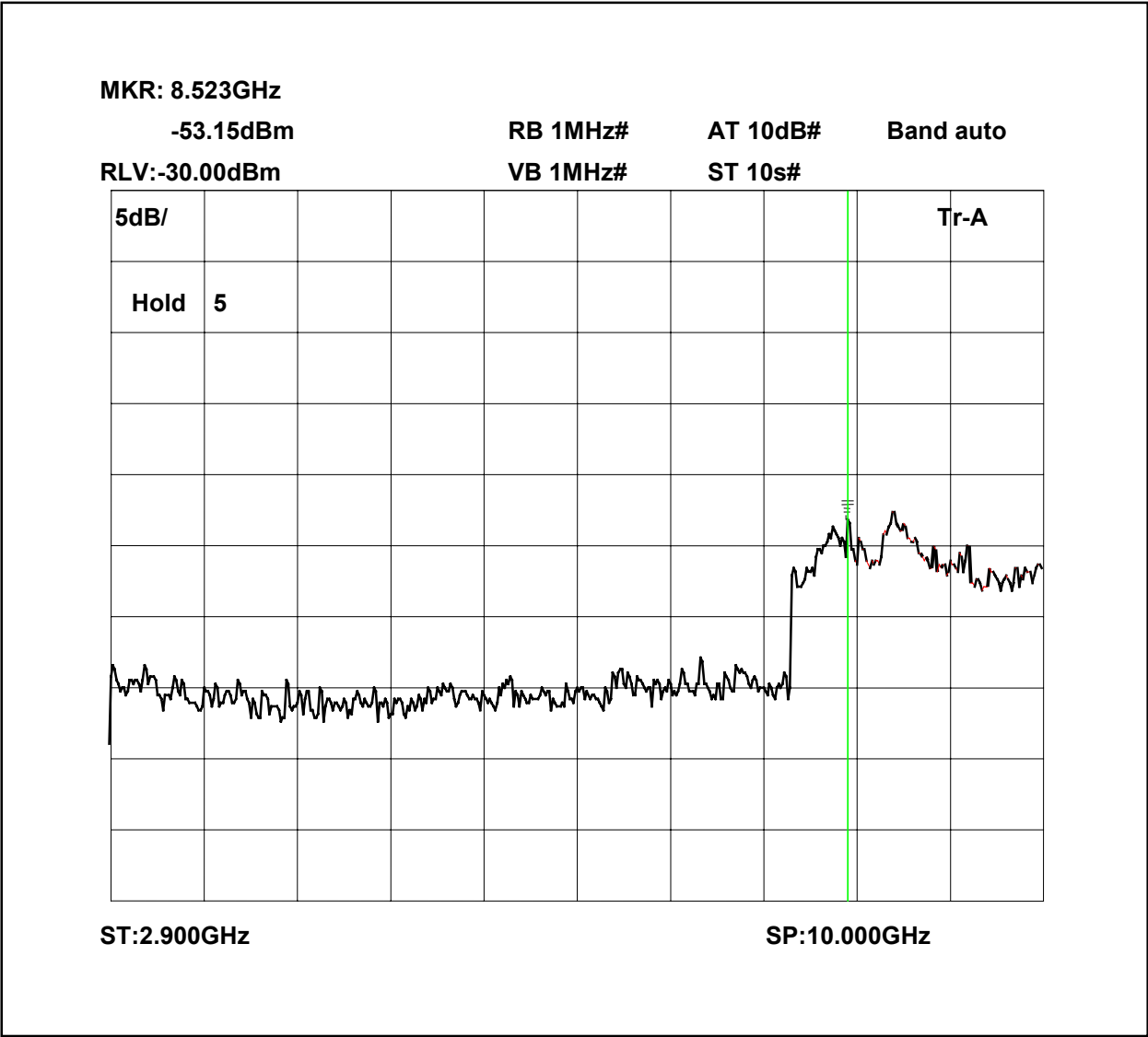
Radiated emissions no input signal 0-3GHz



The above test results show that there were no emissions within 20dBs of the –13dBm limit.



Radiated emissions no input signal 2.9-10GHz



The above test results show that there were no emissions within 20dBs of the –13dBm limit.

The test equipment used for the Transmitter Spurious Emissions:

TYPE OF EQUIPMENT	MAKER/ SUPPLIER	MODEL No	SERIAL No	TRL No	ACTUAL EQUIPMENT USED
SPECTRUM ANALYSER	ANRITSU	MS2665C	MT26089	479	<b>X</b>
HORN	EMCO	3115	9010-3581	139	<b>X</b>
ATTENUATOR	BIRD	8304-300-N	N/A	220	<b>X</b>
ATTENUATOR	BIRD	8308-100	N/A	112	<b>X</b>
CABLE	ROSENBERGER	MICRO COAX	N/A	279	<b>X</b>
SIGNAL GENERATOR	MARCON	2042	119388/080	179	<b>X</b>

**ANNEX A**  
**PHOTOGRAPHS**





**ANNEX B**

**APPLICANT'S SUBMISSION OF DOCUMENTATION LIST**

## APPLICANT'S SUBMISSION OF DOCUMENTATION LIST

a.	TCB	-	APPLICATION	<input checked="" type="checkbox"/>
		-	FEE	<input checked="" type="checkbox"/>
b.	AGENT'S LETTER OF AUTHORISATION	-		<input checked="" type="checkbox"/>
c.	MODEL(s) vs IDENTITY	-		<input type="checkbox"/>
d.	ALTERNATIVE TRADE NAME DECLARATION(s)	-		<input type="checkbox"/>
e.	LABELLING	-	PHOTOGRAPHS	<input type="checkbox"/>
		-	DECLARATION	<input type="checkbox"/>
		-	DRAWINGS	<input type="checkbox"/>
f.	TECHNICAL DESCRIPTION	-		<input checked="" type="checkbox"/>
g.	BLOCK DIAGRAMS	-	Tx	<input checked="" type="checkbox"/>
		-	Rx	<input type="checkbox"/>
		-	PSU	<input type="checkbox"/>
		-	AUX	<input type="checkbox"/>
h.	CIRCUIT DIAGRAMS	-	Tx	<input type="checkbox"/>
		-	Rx	<input type="checkbox"/>
		-	PSU	<input type="checkbox"/>
		-	AUX	<input type="checkbox"/>
i.	COMPONENT LOCATION	-	Tx	<input type="checkbox"/>
		-	Rx	<input type="checkbox"/>
		-	PSU	<input type="checkbox"/>
		-	AUX	<input type="checkbox"/>
j.	PCB TRACK LAYOUT	-	Tx	<input type="checkbox"/>
		-	Rx	<input type="checkbox"/>
		-	PSU	<input type="checkbox"/>
		-	AUX	<input type="checkbox"/>
k.	BILL OF MATERIALS	-	Tx	<input type="checkbox"/>
		-	Rx	<input type="checkbox"/>
		-	PSU	<input type="checkbox"/>
		-	AUX	<input type="checkbox"/>
l.	USER INSTALLATION / OPERATING INSTRUCTIONS	-		<input checked="" type="checkbox"/>

Intentionally blank