TEST REPORT NO: RU1193/6637

COPY NO: 1

ISSUE NO: 1

FCC ID: NEO55-1549BDA

REPORT ON THE CERTIFICATION TESTING OF A
AERIAL FACILITIES LIMITED
BI-DIRECTION AMPLIFIER (800MHz/900MHz)
WITH RESPECT TO
THE FCC RULES CFR 47, PART 90 Subpart I
PRIVATE LAND MOBILE REPEATER.

TEST DATE: 1st September 2005 – 5th September 2005

TESTED BY: JOHN CHARTERS — Digitally signed by JOHN CHARTERS DN: CN = JOHN CHARTERS, C = US, O = TRL COMPLIANCE SERVICES Reason: I am the author of this document Date: 2005.11.11 13:47:03 Z — J CHARTERS

APPROVED BY: Peter Green — Digitally signed by Peter Green DN: CN = Peter Green, C = GB Reason: I am approving this document Date: 2005.11.11 13:49:14 Z — P GREEN PRODUCT MANAGER EMC

DATE: 11 November 2005

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1. Aerial Facilities Limited
2. TCB: TRL Compliance Limited
3. TRL EMC

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FS 21805

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Notes:

1. Component failure during test — YES [ ] NO [X]
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:	NEO55-1549BDA
PURPOSE OF TEST:	Certification
TEST SPECIFICATION:	FCC RULES CFR 47, Part 90 Subpart I
TEST RESULT:	Compliant to Specification
EQUIPMENT UNDER TEST:	BI-DIRECTION AMPLIFIER (800MHz/900MHz)
EQUIPMENT TYPE:	Private Land Mobile Repeater
MAXIMUM GAIN	Uplink 28.95dB Downlink 30.60dB
MAXIMUM INPUT	Uplink -12dBm Downlink +2dBm
MAXIMUM OUTPUT	Uplink +16.95dBm Downlink +32.60dBm
ANTENNA TYPE:	Not applicable
CHANNEL SPACING:	Not Applicable, wideband
NUMBER OF CHANNELS:	Not Applicable, wideband
FREQUENCY GENERATION:	N/A
MODULATION TYPE:	F3E
POWER SOURCE(s):	+110 Vac
TEST DATE(s):	1st September 2005 – 5th September 2005
ORDER No(s):	32001
APPLICANT:	Aerial Facilities Limited
ADDRESS:	Aerial House Asheridge Road Chesham Buckinghamshire HP5 1TU United Kingdom
TESTED BY:	JOHN CHARTERS Digitally signed by JOHN CHARTERS DN: CN = JOHN CHARTERS, C = US, O = TRL COMPLIANCE SERVICES Reason: I am the author of this document Date: 2005.11.11 13:47:21 Z J CHARTERS
APPROVED BY:	Peter Green Digitally signed by Peter Green DN: CN = Peter Green, C = GB Reason: I am approving this document Date: 2005.11.11 13:49:27 Z P GREEN PRODUCT MANAGER EMC

APPLICANT'S SUMMARY

EQUIPMENT UNDER TEST (EUT):	BI-DIRECTION AMPLIFIER (800MHz/900MHz)
EQUIPMENT TYPE:	Private Land Mobile Repeater
PURPOSE OF TEST:	Certification
TEST SPECIFICATION(s):	FCC RULES CFR 47, Part 90 Subpart I
TEST RESULT:	COMPLIANT Yes [X] No [ ]
APPLICANT'S CATEGORY:	MANUFACTURER [X] IMPORTER [ ] DISTRIBUTOR [ ] TEST HOUSE [ ] AGENT [ ]
APPLICANT'S ORDER No(s):	32001
APPLICANT'S CONTACT PERSON(s):	Mr Peter Bradfield
E-mail address:	Peterb@aerial.co.uk
APPLICANT:	Aerial Facilities Limited
ADDRESS:	Aerial House Asheridge Road Chesham Buckinghamshire HP5 1TU United Kingdom
TEL:	+44 (0)1494 777000
FAX:	+44 (0)1494 778456
MANUFACTURER:	Aerial Facilities Limited
EUT(s) COUNTRY OF ORIGIN:	United Kingdom
TEST LABORATORY:	TRL EMC
UKAS ACCREDITATION No:	0728
TEST DATE(s)	1st September 2005 – 5th September 2005
TEST REPORT No:	RU1193/6637

EQUIPMENT TEST / EXAMINATIONS REQUIRED

1.

TEST/EXAMINATION	RULE PART	APPLICABILITY	RESULT
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) 20^{o}C

5. Supply Voltages: Vnom +110 Vac

Note: Vnom voltages are as stated above unless otherwise shown on the test report page

6. Equipment Category:
   Single channel [ ]
   Two channel [ ]
   Multi-channel [X]

7. Channel spacing:
   Narrowband [ ]
   Wideband [X]

8. Test Location TRL Compliance Limited
   Up Holland [X]
   Long Green [ ]

9. Modifications made during test program No modifications were performed.

COMPLIANCE TESTS

AMPLIFIER GAIN – CONDUCTED – PART 2.1046 – UPLINK

Ambient temperature	=	20°C	Radio Laboratory
Relative humidity	=	77%	
Supply voltage	=	+110 Vac	
Channel number	=	See test results	

Frequency MHz	Signal Generator input level dBm	Cable & Attenuator loss dB	Level at Spectrum Analyser dBm	Gain dB	Gain after 10dB input level increase dBm
806.0 MHz	-12	27.10	-11.10	28.00	15.93
815.0 MHz	-12	27.10	-10.15	28.95	18.01
824.0 MHz	-12	27.10	-11.03	28.07	15.89

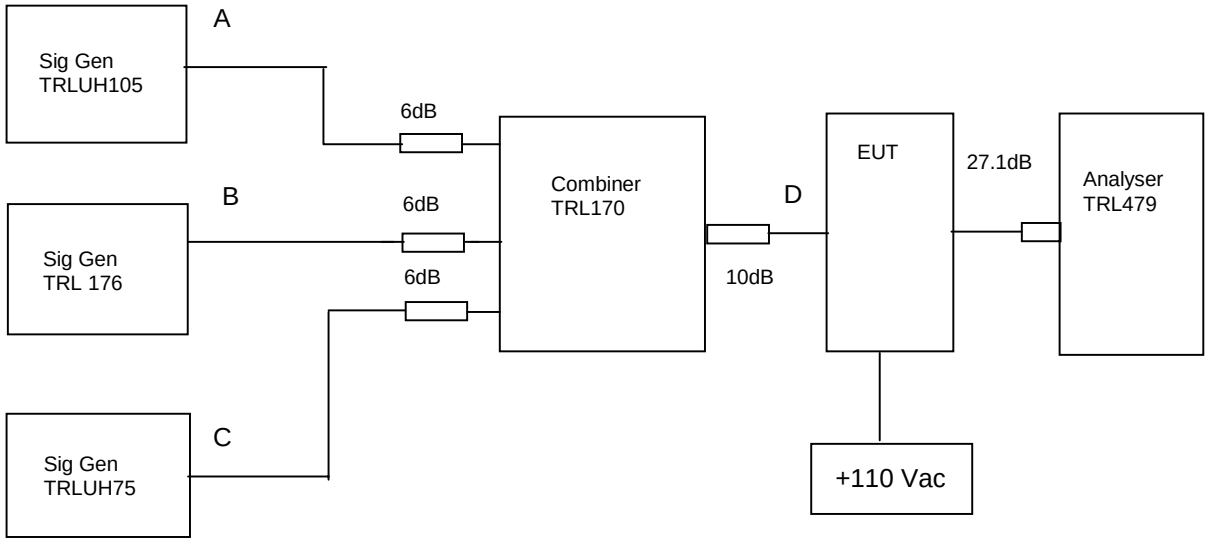
Notes:
1. The signal generator input was increased by 10dBs and the level of the output signal remeasured

TYPE OF EQUIPMENT	MAKER/ SUPPLIER	MODEL No	SERIAL No	TRL No	ACTUAL EQUIPMENT USED
SPECTRUM ANALYSER	ANRITSU	MS2665C	MT26089	479	**X**
ATTENUATOR	BIRD	8304-300-N	N/A	220	**X**
CABLE	ROSENBERGER	MICRO COAX	N/A	280	**X**
SIGNAL GENERATOR	MARCONI	2042	119388/080	176	**X**

AMPLIFIER INTERMODULATION SPURIOUS EMISSIONS – CONDUCTED – PART 2.1053– UPLINK

Ambient temperature = 23°C
Relative humidity = 68%
Supply voltage = +110 Vac

Radio Laboratory



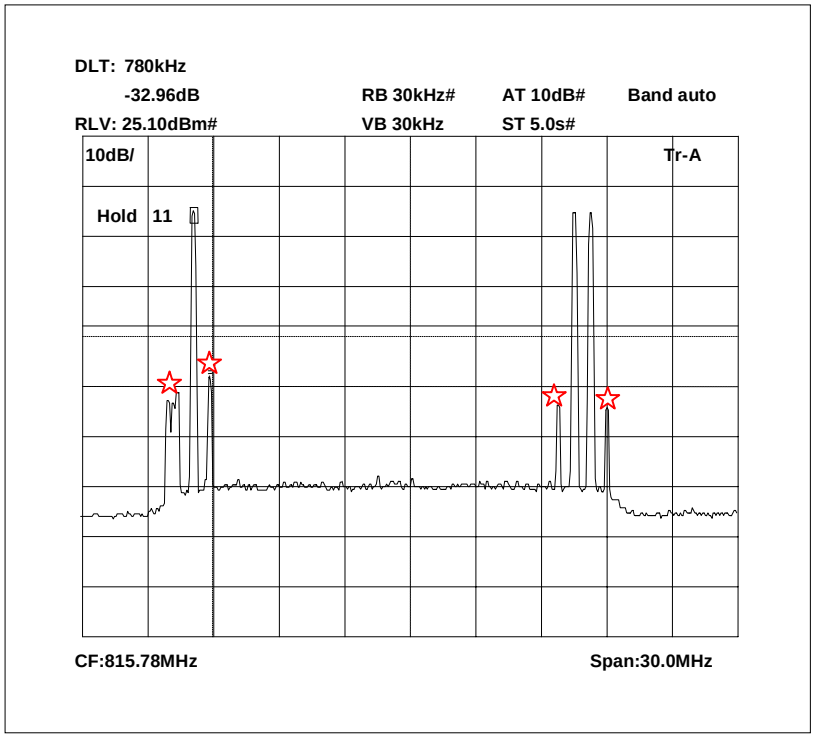
The Intermodulation and spurious products were measured with the amplifier operating at maximum gain. A three tone test was conducted using the equipment as above. The input power level was adjusted so the level at point D was 10dB above the maximum input of -12dBm.The cable and attenuator loss between the EUT and the spectrum analyser was 27.1dB. This test was performed on the frequencies listed in the table below. Sweep data is shown on the next page for scan with the highest intermodulation product:

RF Input Frequency (MHz)			Highest Intermodulation Product Level (dBm)	Limit (dBm)
806.000	823.250	824.00	-16.96dBm @ 806.780MHz	-13

Test equipment used for Intermodulation test

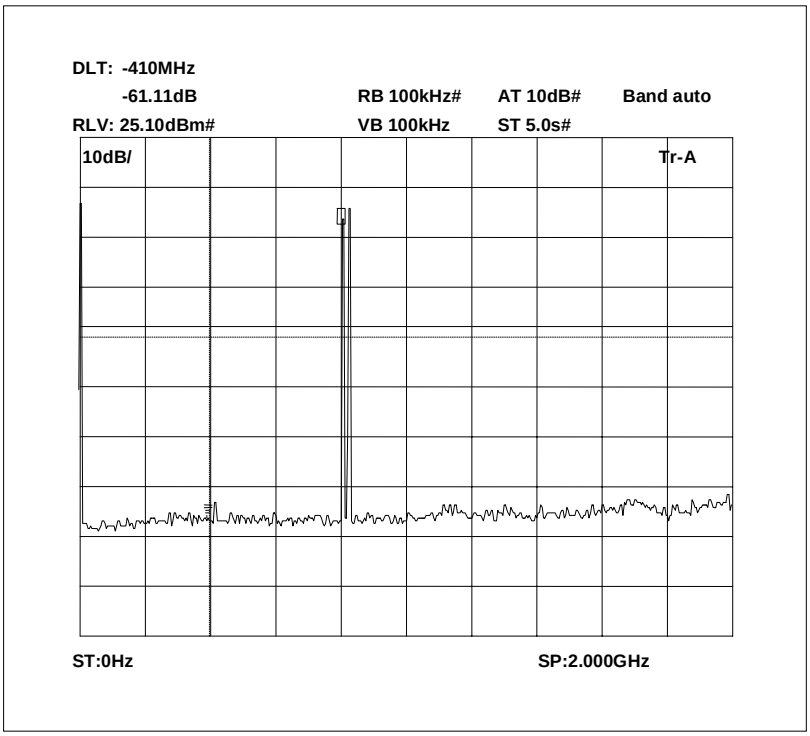
TYPE OF EQUIPMENT	MAKER/ SUPPLIER	MODEL No	SERIAL No	TRL No	ACTUAL EQUIPMENT USED
SPECTRUM ANALYSER	ANRITSU	MS2665C	MT26089	479	**X**
SIGNAL GENERATOR	MARCONI	2042	119388/080	176	**X**
SIGNAL GENERATOR	MARCONI	2023	112224/040	UH105	**X**
SIGNAL GENERATOR	MARCONI	2022D	119215/058	UH75	**X**
COMBINER	ELCOM	RC-4-50	N/A	170	**X**

Intermodulation Inband



The above plot shows that all products (designated by☆) are below the spurious limit.

Intermodulation Wideband

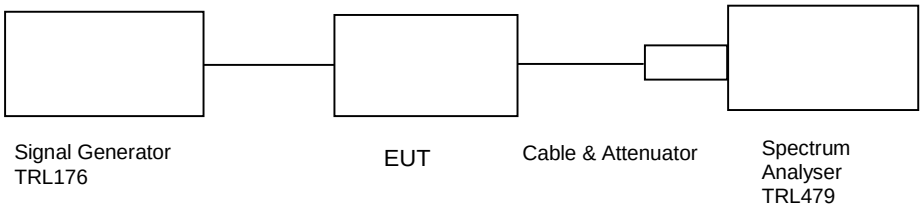


The above plot shows that there are no products outside the bands.

TRANSMITTER TESTS

AMPLIFIER MODULATED CHANNEL TEST – CONDUCTED – Part 2.1049– UPLINK

Ambient temperature	=	23^{o}C	Radio Laboratory
Relative humidity	=	68%	
Supply voltage	=	+110 Vac	
Channel number	=	See test results	



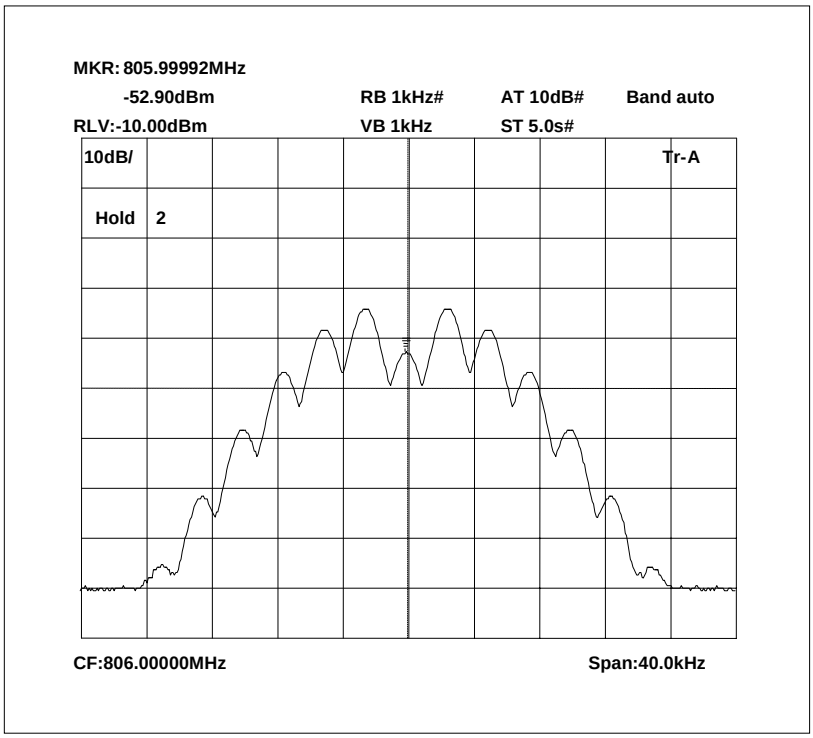
This test was performed to show that the amplifier does not alter the input signal in any way. The input signal was set to the maximum input level (-12dBm) and modulated with a 2500Hz tone. The plots show the signal measured at the signal generator and the signal measured at the output of the EUT.

Note: The cables and attenuators had the following losses.

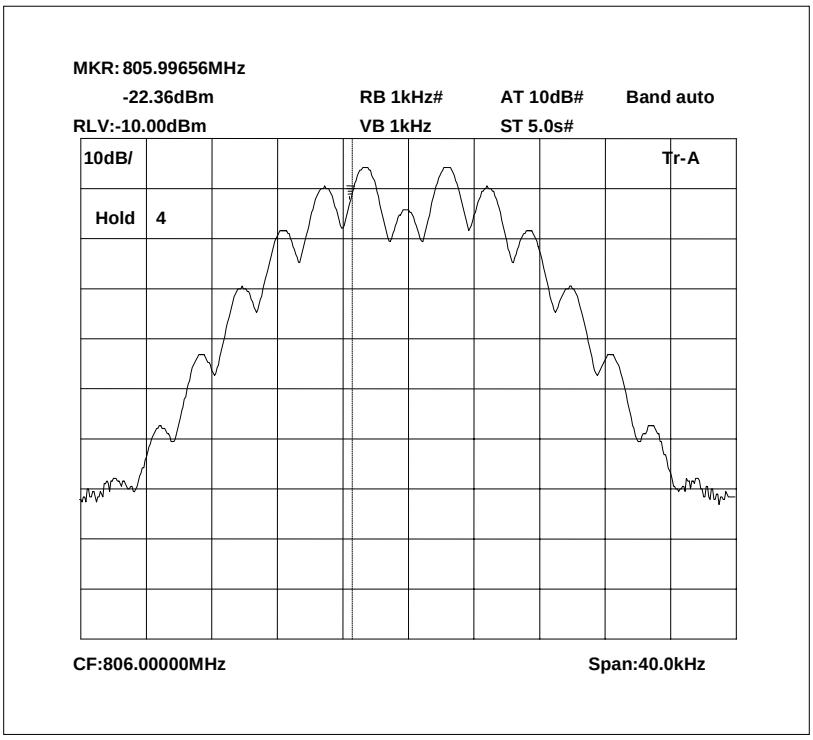
1. Cable and attenuator losses between EUT and spectrum analyser 27.01dB
2. Cable between signal generator and EUT 0.4dB

TYPE OF EQUIPMENT	MAKER/ SUPPLIER	MODEL No	SERIAL No	TRL No	ACTUAL EQUIPMENT USED
SPECTRUM ANALYSER	ANRITSU	MS2665C	MT26089	479	**X**
ATTENUATOR	BIRD	8304-300-N	N/A	220	**X**
CABLE	ROSENBERGER	MICRO COAX	N/A	280	**X**
SIGNAL GENERATOR	MARCONI	2042	119388/080	176	**X**

806.0 MHz Signal Generator deviation set to 5kHz

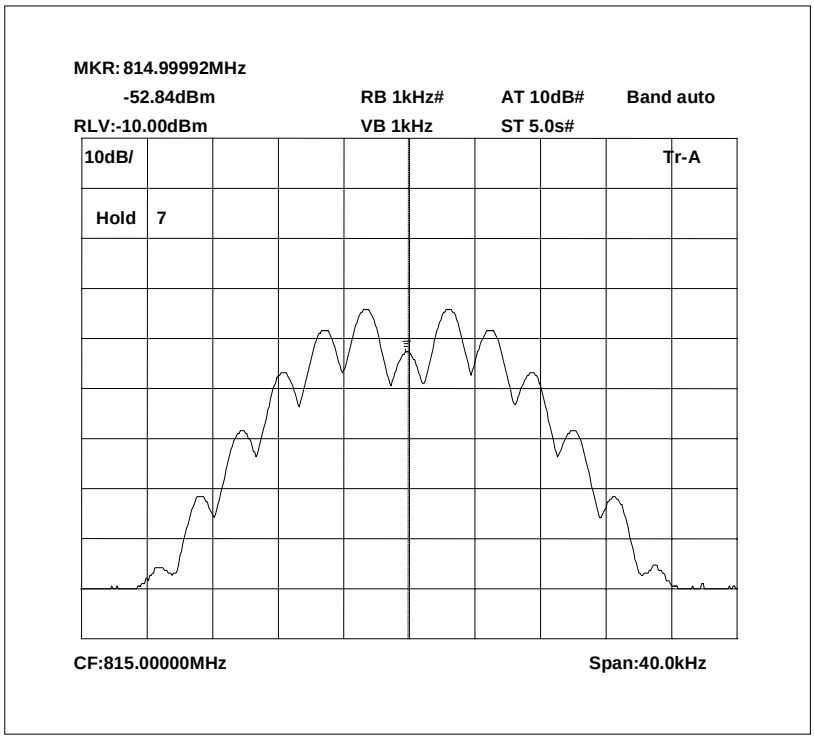


806.0 MHz Signal Generator and EUT deviation set to 5kHz

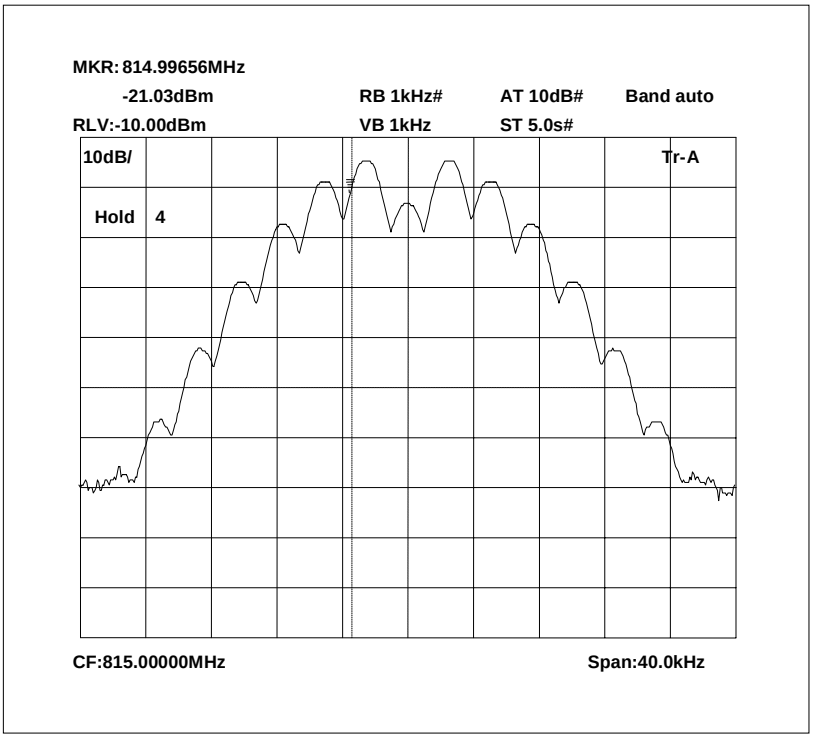


The above plots depicting the output waveshape show no measurable distortion visible when compared to the input signal.

815.0 MHz Signal Generator deviation set to 5kHz

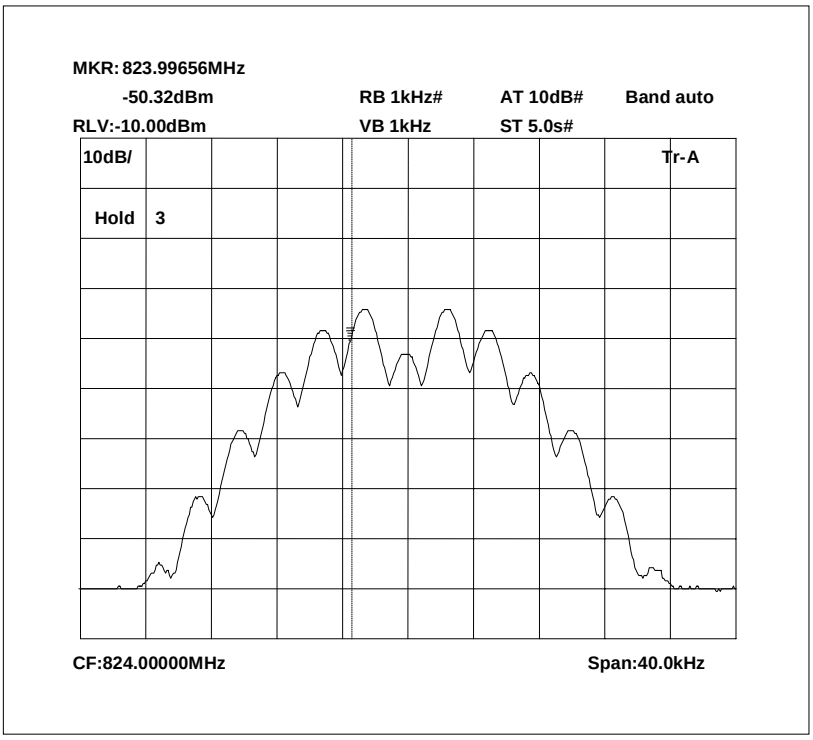


815.0 MHz Signal Generator and EUT deviation set to 5kHz

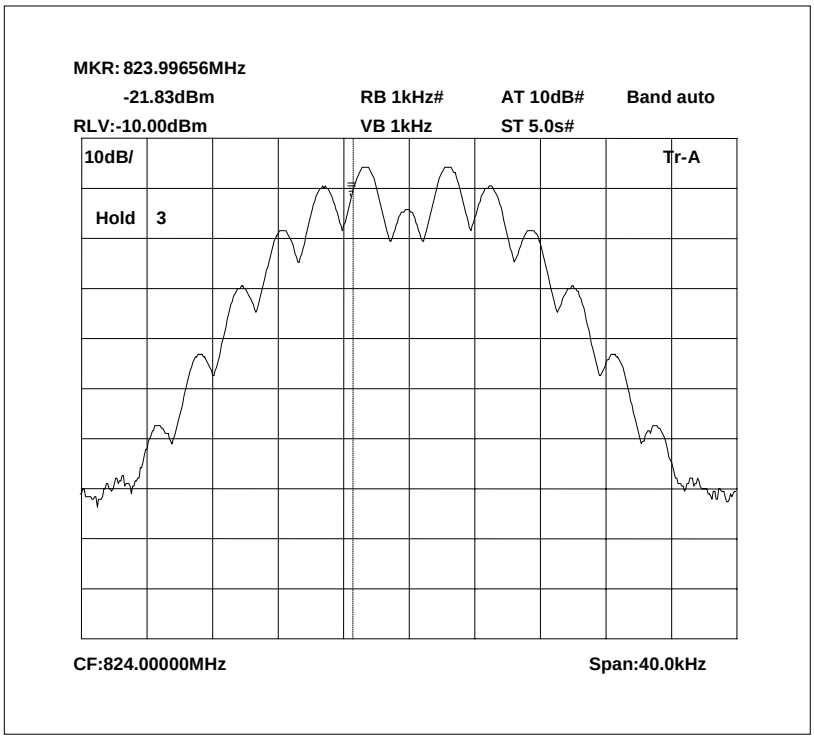


The above plots depicting the output waveshape show no measurable distortion visible when compared to the input signal.

824.0 MHz Signal Generator deviation set to 5kHz



824.0 MHz Signal Generator and EUT deviation set to 5kHz



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

TRANSMITTER TESTS

AMPLIFIER SPURIOUS EMISSIONS – CONDUCTED – Part 2.10 – UPLINK

Ambient temperature	=	20°C	Radio Laboratory		
Relative humidity	=	77%	Test Signal	=	F3E
Supply voltage	=	+110 Vac			

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

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

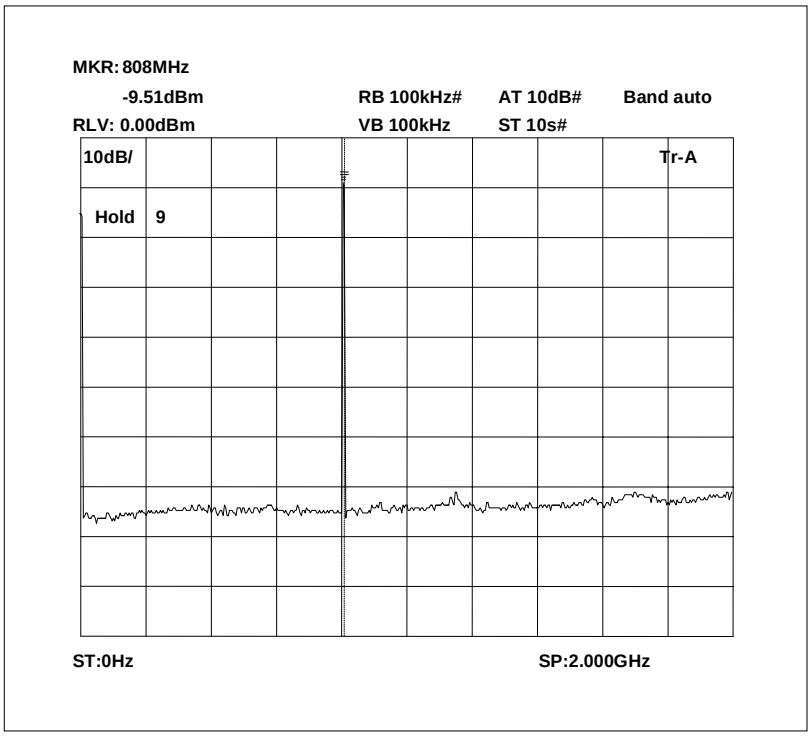
RESULTS

FREQUENCY RANGE	FREQ. (MHz)	MEASURED LEVEL (dBm)	ATTENUATOR & CABLE LOSSES (dB)	EMISSION LEVEL (dBm)	LIMIT (dBm)
0 Hz - 9.4GHz	No Significant emissions within 20 dB's of the limit				-13

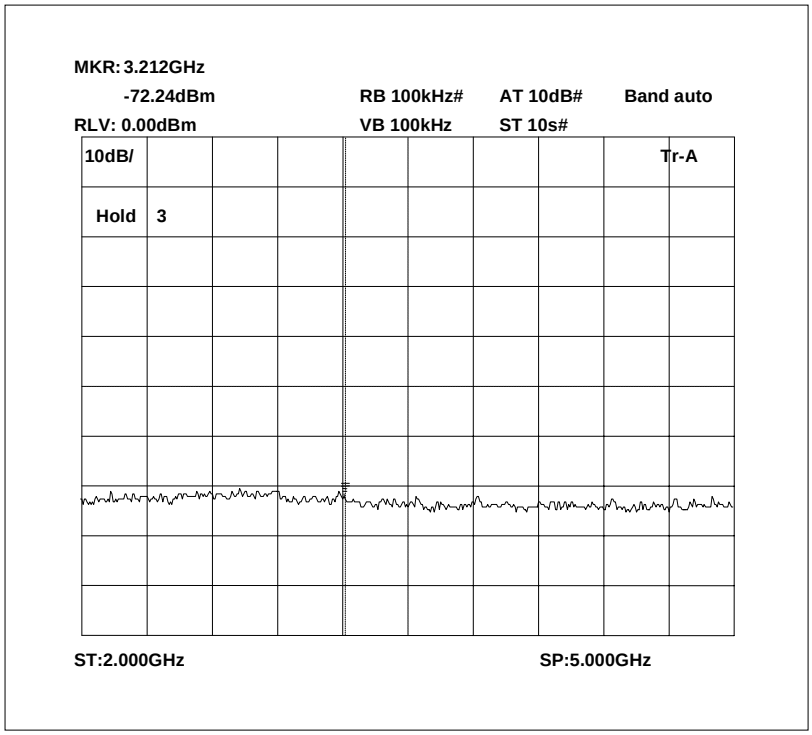
The test equipment used for the Transmitter Conducted Emissions:

TYPE OF EQUIPMENT	MAKER/ SUPPLIER	MODEL No	SERIAL No	TRL No	ACTUAL EQUIPMENT USED
SPECTRUM ANALYSER	ANRITSU	MS2665C	MT26089	479	**X**
ATTENUATOR	BIRD	8304-300-N	N/A	220	**X**
CABLE	ROSENBERGER	MICRO COAX	N/A	280	**X**
SIGNAL GENERATOR	MARCONI	2042	119388/080	176	**X**

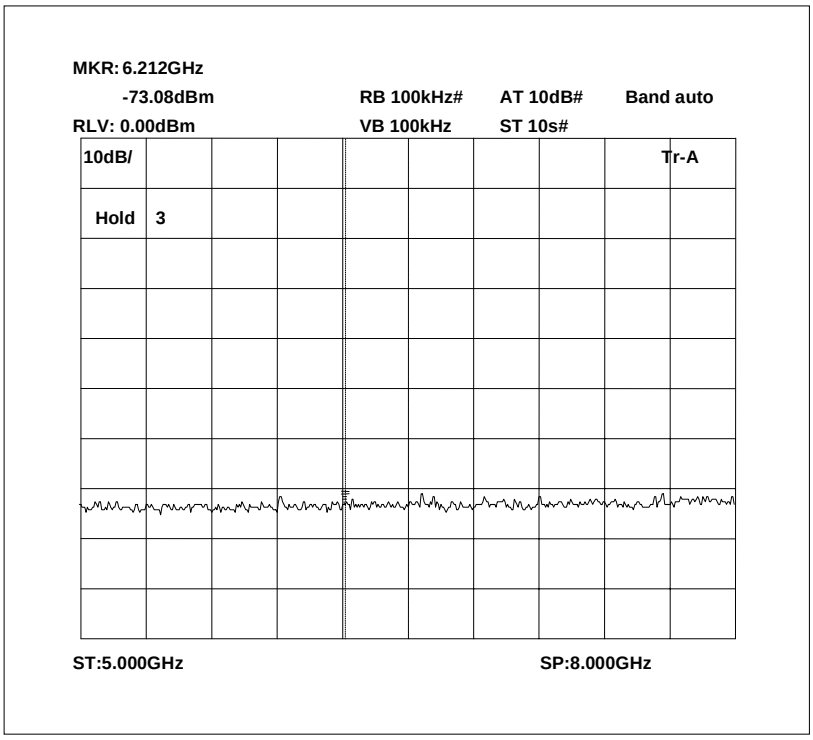
Conducted emissions 806.0 MHz 0 – 2GHz



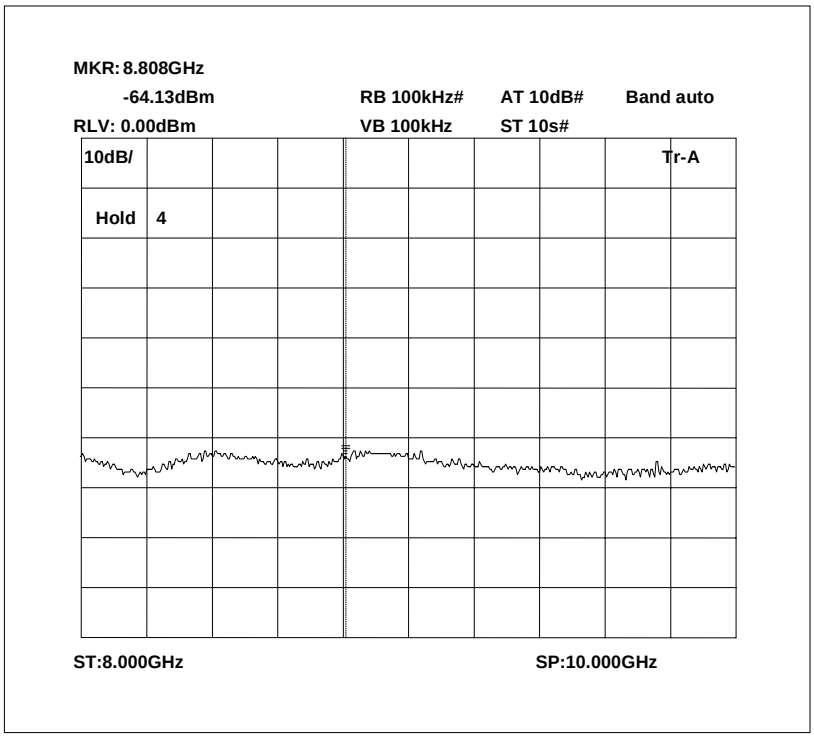
Conducted emissions 806.0 MHz 2 – 5GHz



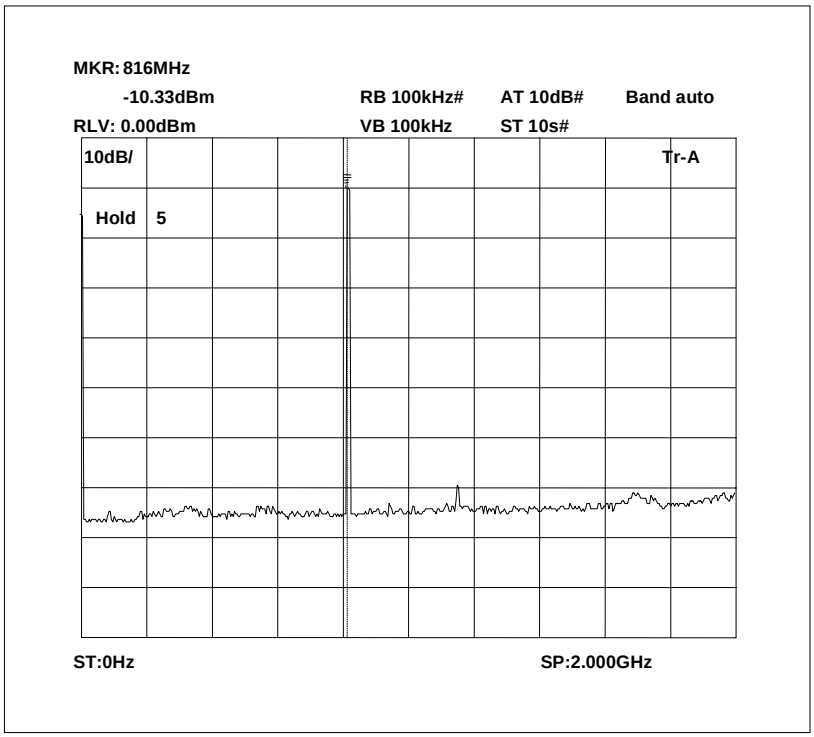
Conducted emissions 806.0 MHz 5 – 8GHz



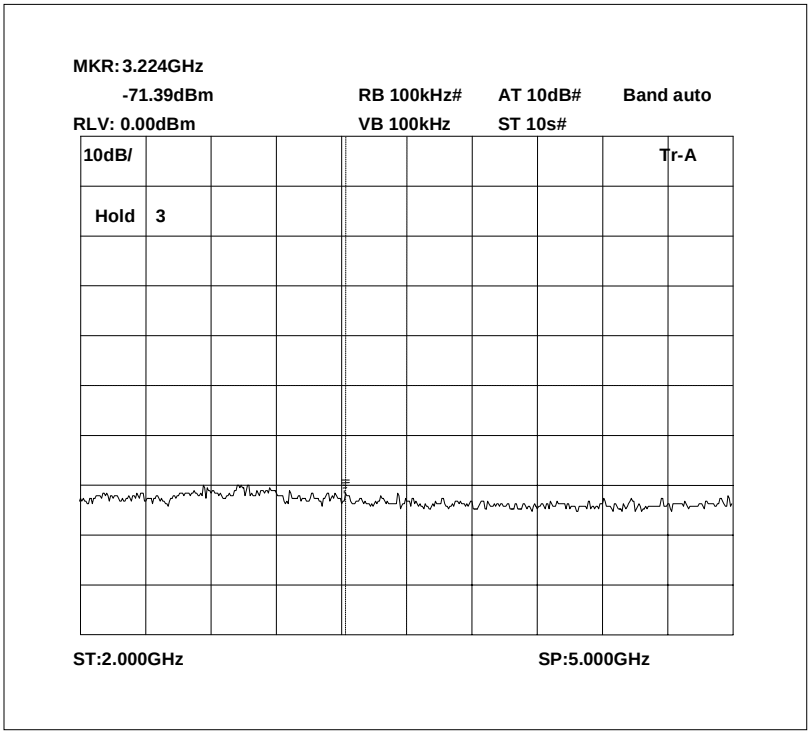
Conducted emissions 806.0 MHz 8 – 10GHz



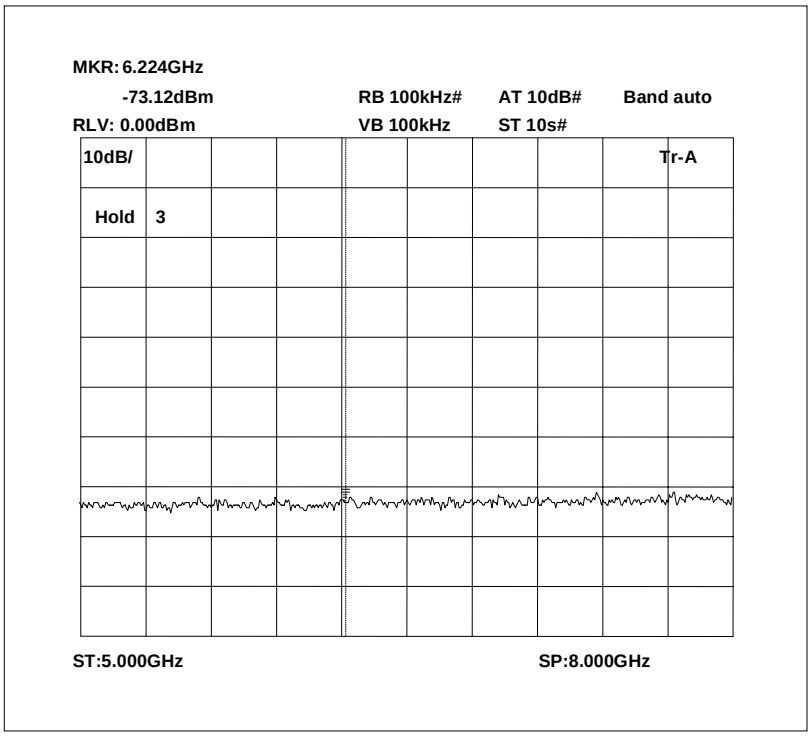
Conducted emissions 815.0 MHz 0 – 2GHz



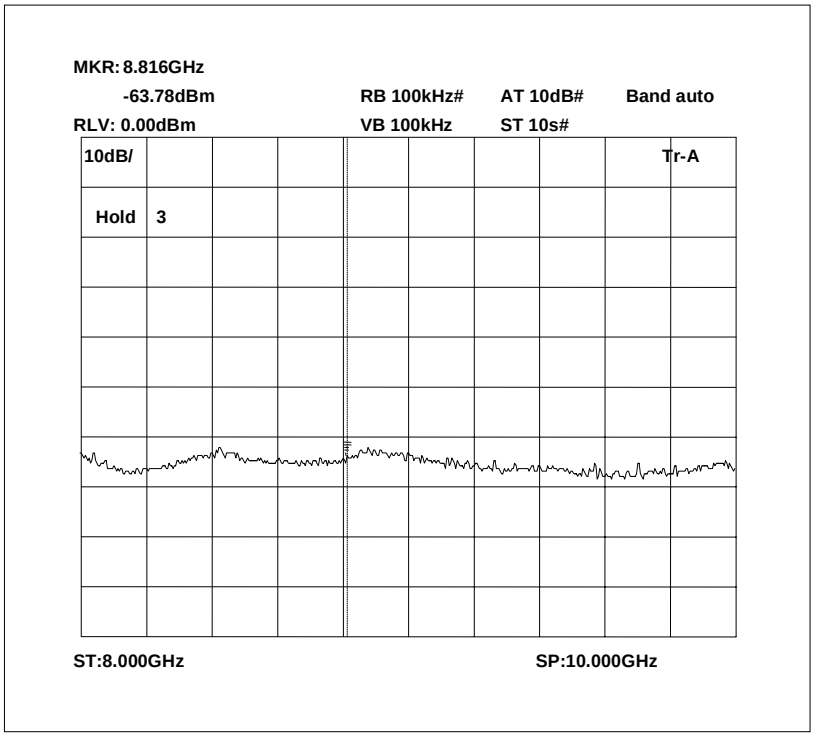
Conducted emissions 815.0 MHz 2 – 5GHz



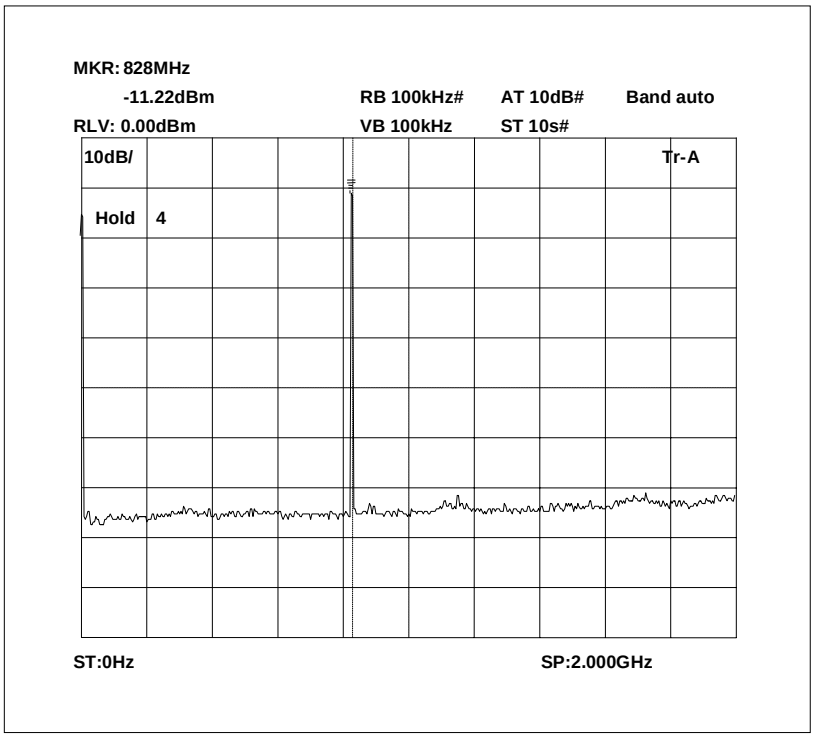
Conducted emissions 815.0 MHz 5 – 8GHz



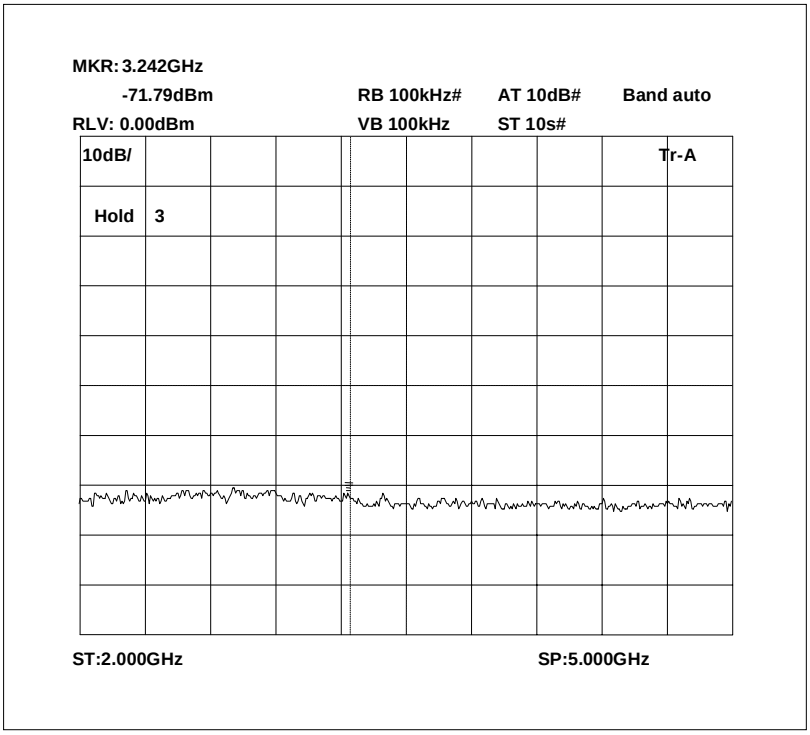
Conducted emissions 815.0 MHz 8 – 10GHz



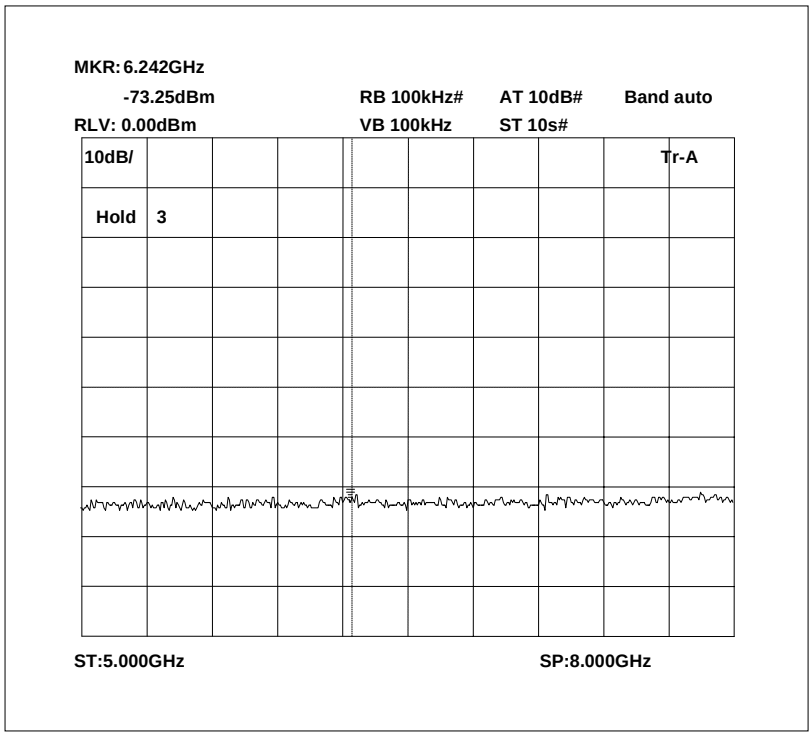
Conducted emissions 824.0 MHz 0 – 2GHz



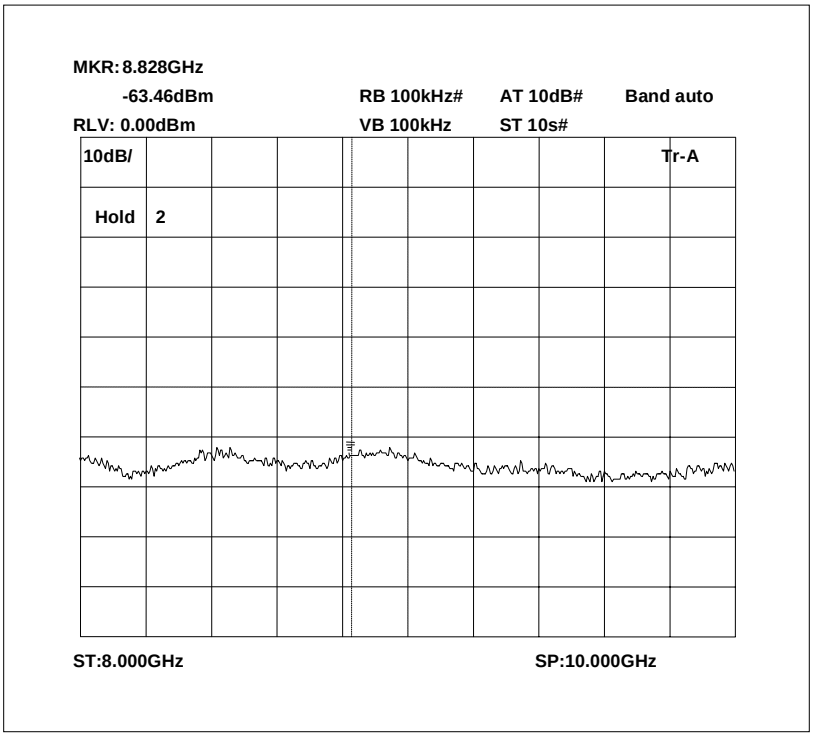
Conducted emissions 824.0 MHz 2 – 5GHz



Conducted emissions 824.0 MHz 5 – 8GHz



Conducted emissions 824.0 MHz 8 – 10GHz

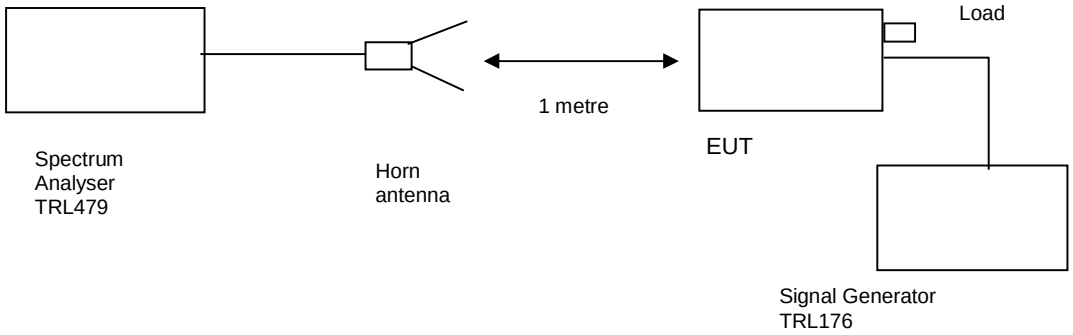


TRANSMITTER TESTS

AMPLIFIER SPURIOUS EMISSIONS – RADIATED – Part 2.1053– UPLINK

Ambient temperature = 20°C
Relative humidity = 80%
Conditions = OATS
Supply voltage = +110 Vac
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 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

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

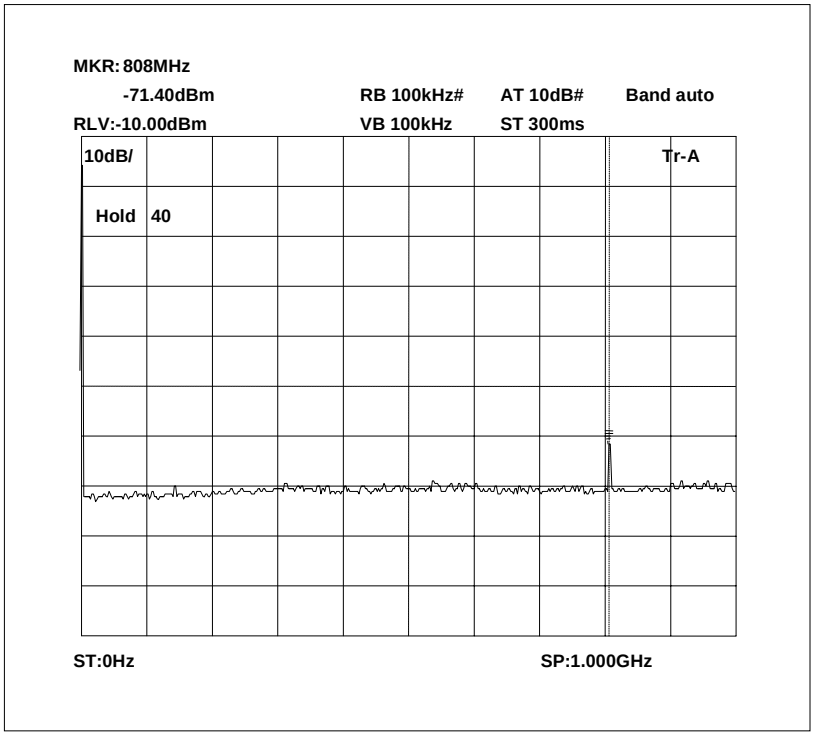
RESULTS

FREQUENCY RANGE	FREQ. (MHz)	MEAS. Rx. (dBµV)	CABLE LOSS (dB)	ANT FACTOR	FIELD STRENGTH (dBµV/m)	CALCULATED EIRP (dBm)	LIMIT (dBm)
0 Hz - 9.4GHz	No Significant emissions within 20 dB's of the limit						-13

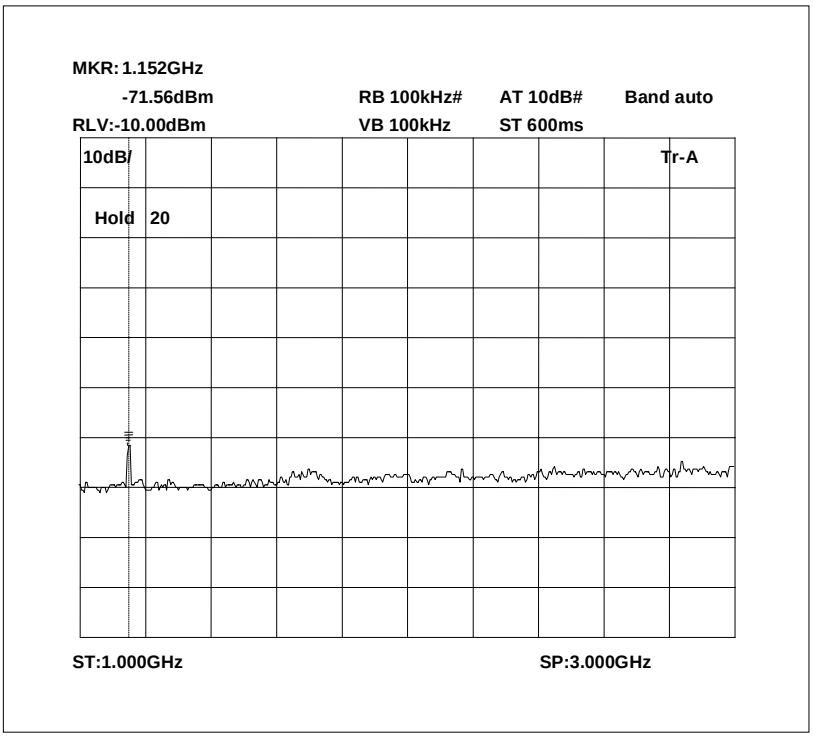
The test equipment used for the Transmitter Spurious Emissions:

TYPE OF EQUIPMENT	MAKER/ SUPPLIER	MODEL No	SERIAL No	TRL No	ACTUAL EQUIPMENT USED
SPECTRUM ANALYSER	ANRITSU	MS2665C	MT26089	479	**X**
HORN	EMCO	3115	9010-3581	139	**X**
ATTENUATOR	BIRD	8304-300-N	N/A	220	**X**
CABLE	ROSENBERGER	MICRO COAX	N/A	280	**X**
SIGNAL GENERATOR	MARCONI	2042	119388/080	176	**X**

Radiated emissions 806.0 MHz 0 – 1GHz

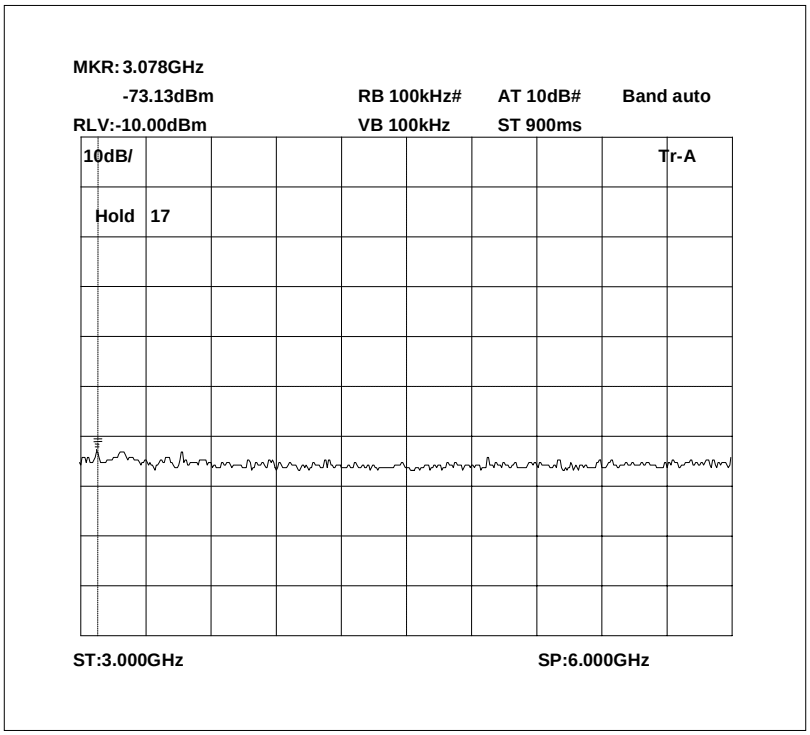


Radiated emissions 806.0 MHz 1 – 3GHz

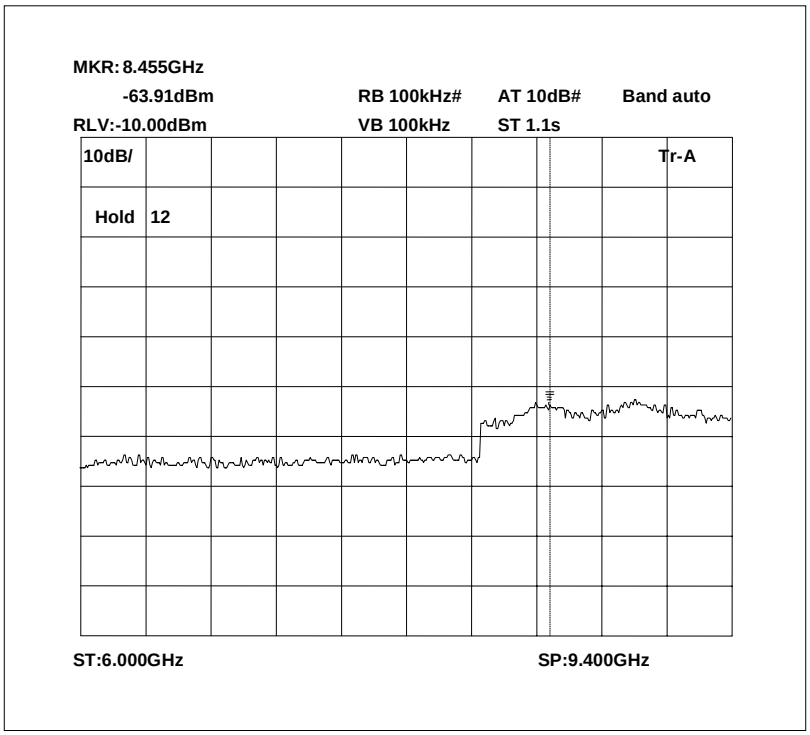


The above test results show that there were no emissions within 20dBs of the –13dBm limit.

Radiated emissions 806.0 MHz 3 – 6GHz

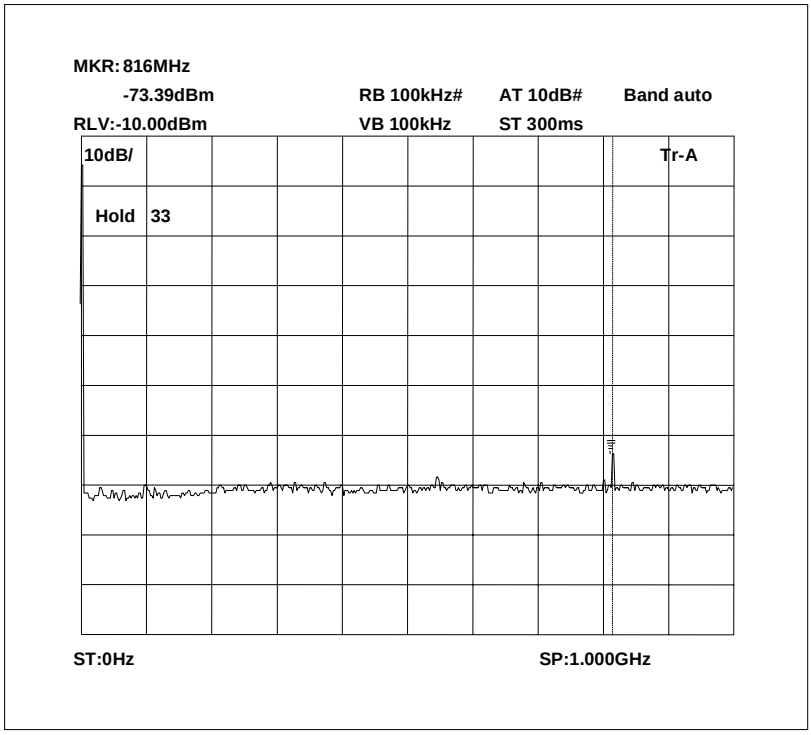


Radiated emissions 806.0 MHz 6 – 9.4GHz

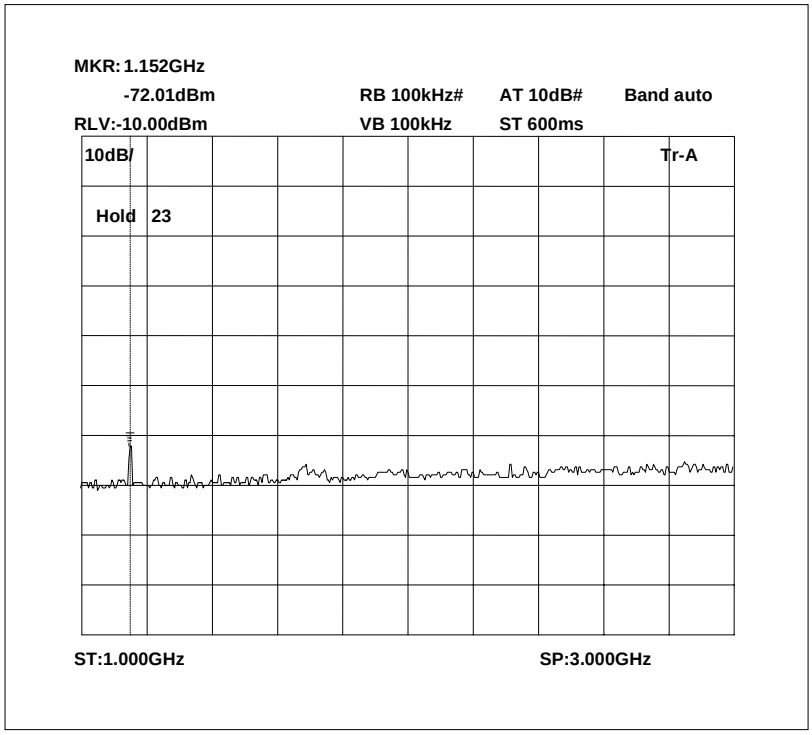


The above test results show that there were no emissions within 20dBs of the –13dBm limit.

Radiated emissions 815.0 MHz 0 – 1GHz

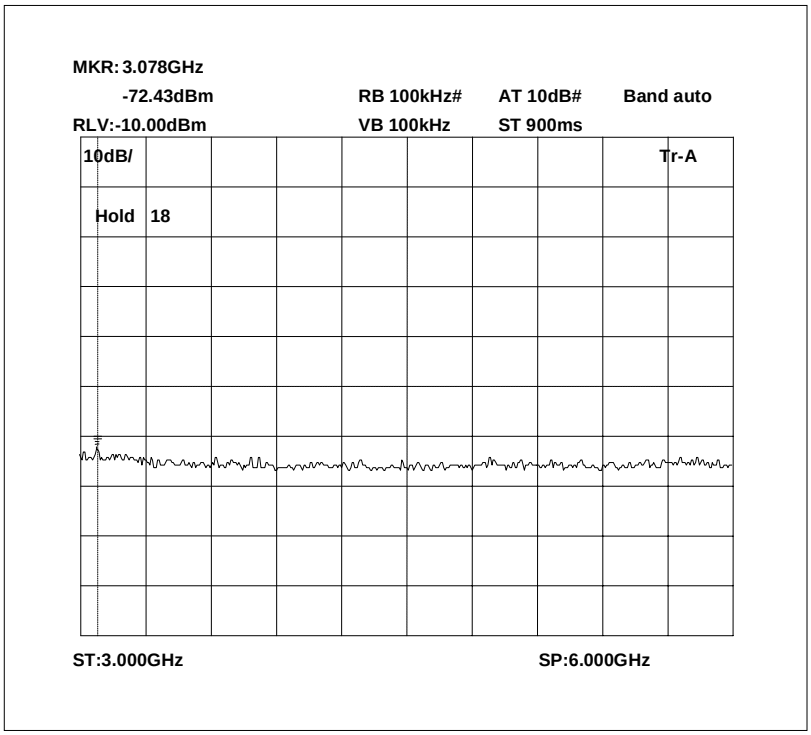


Radiated emissions 815.0 MHz 1 – 3GHz

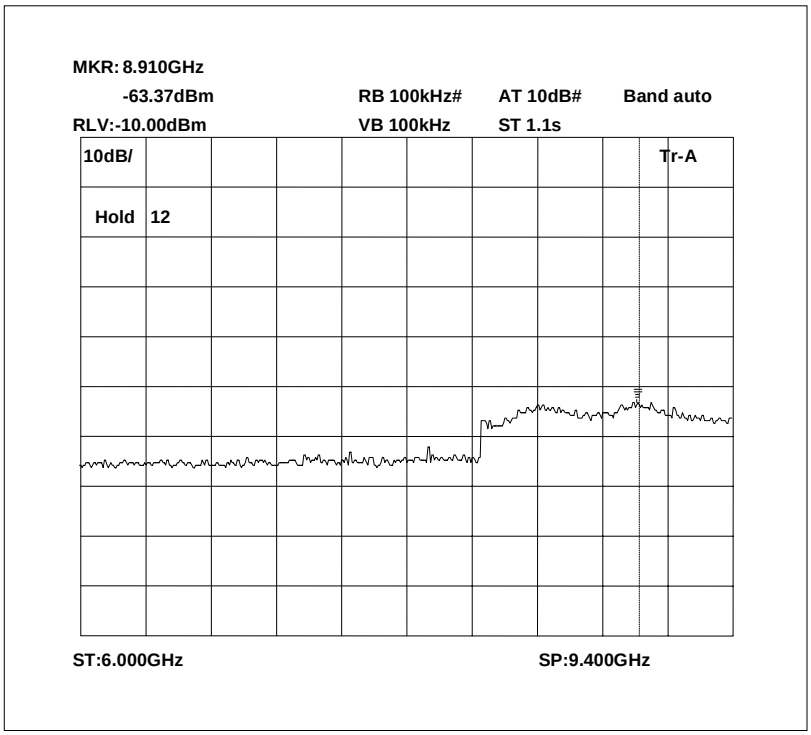


The above test results show that there were no emissions within 20dBs of the –13dBm limit.

Radiated emissions 815.0 MHz 3 – 6GHz

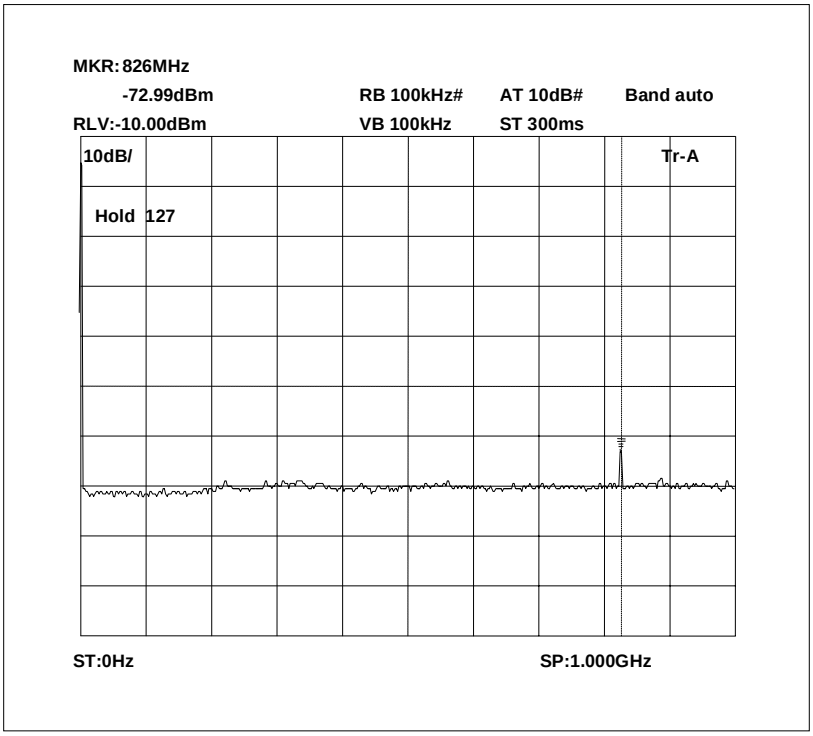


Radiated emissions 815.0 MHz 6 – 9.4GHz

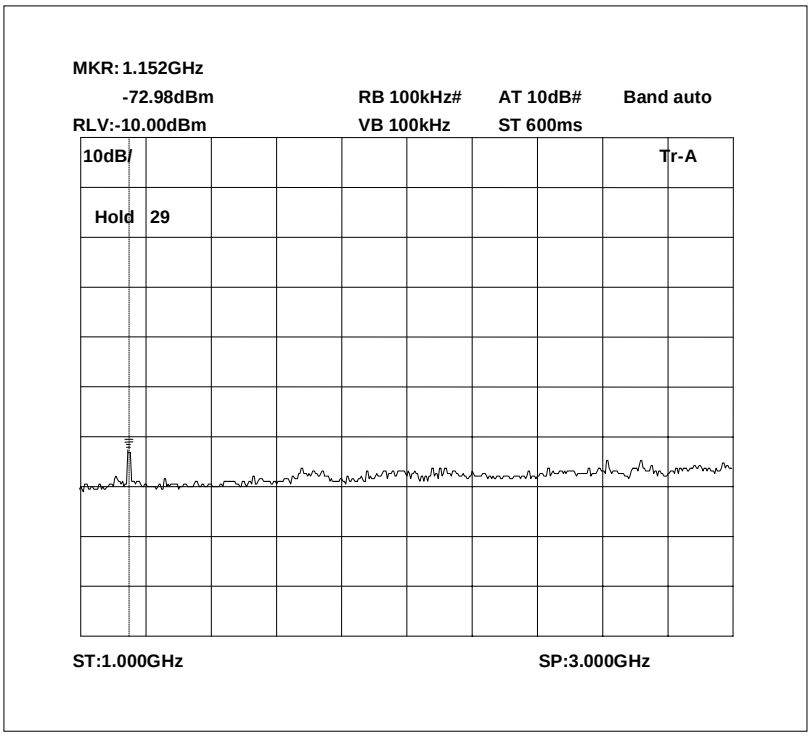


The above test results show that there were no emissions within 20dBs of the –13dBm limit.

Radiated emissions 824.0 MHz 0 – 1GHz

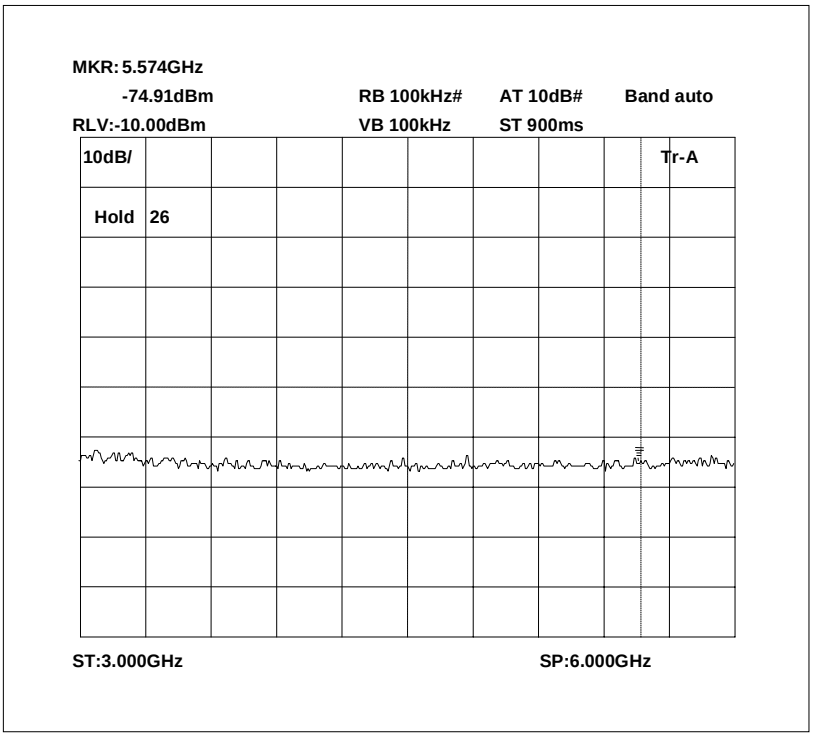


Radiated emissions 824.0 MHz 1 – 3GHz

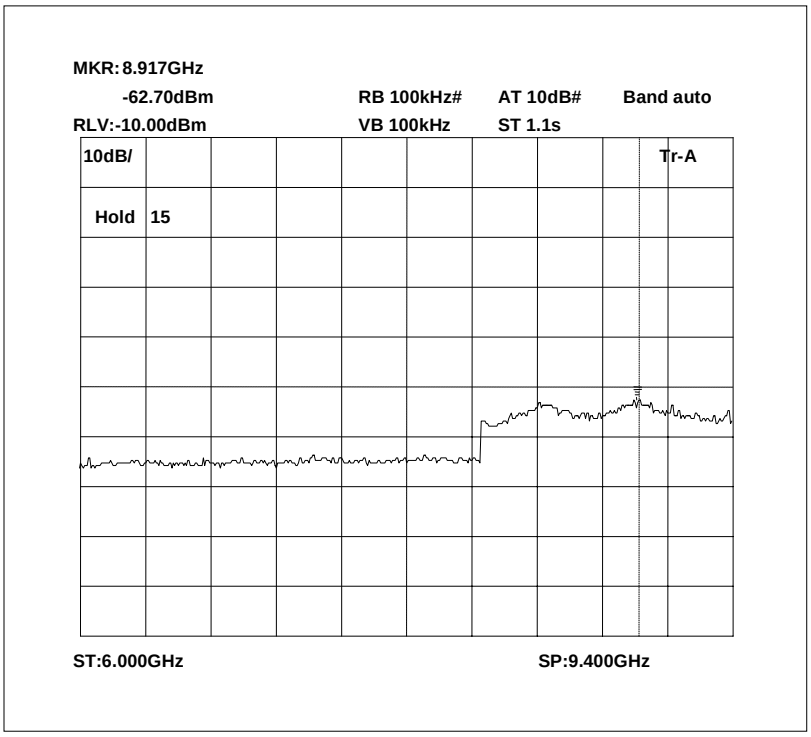


The above test results show that there were no emissions within 20dBs of the –13dBm limit.

Radiated emissions 824.0 MHz 3 – 6GHz

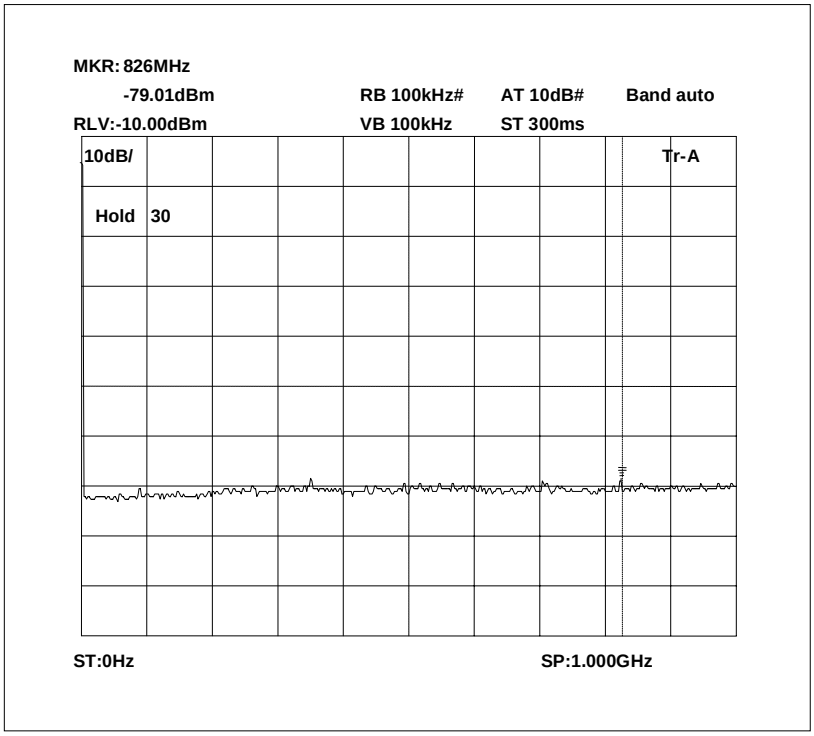


Radiated emissions 824.0 MHz 6 – 9.4GHz

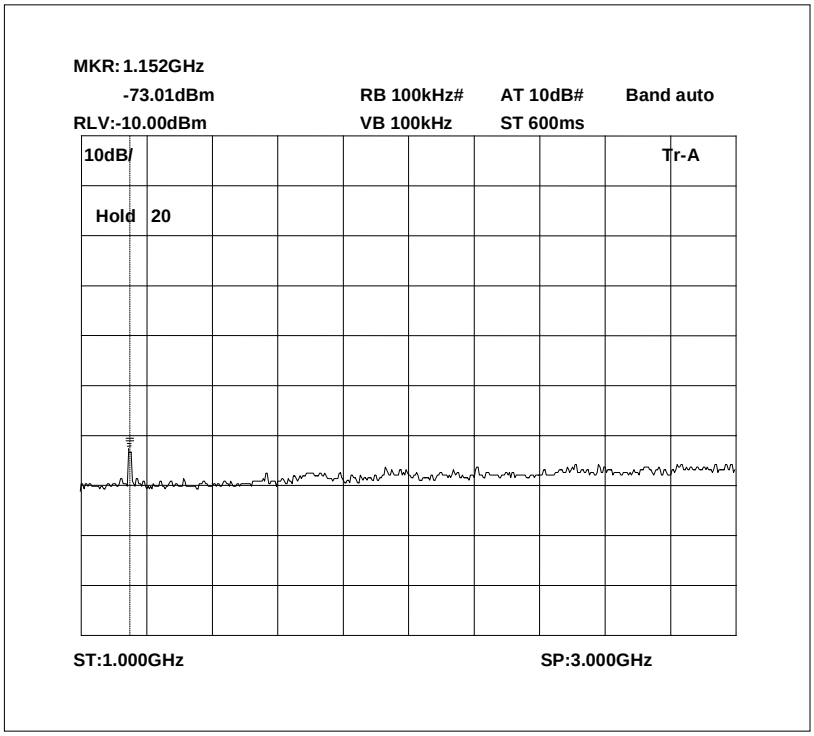


The above test results show that there were no emissions within 20dBs of the –13dBm limit.

Radiated emissions no input signal 0 – 1GHz

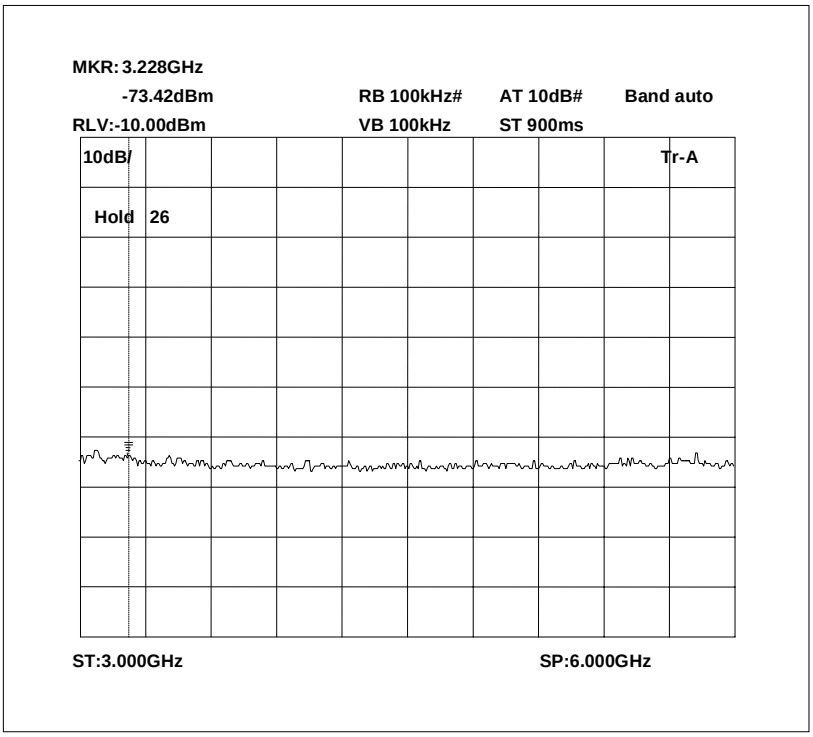


Radiated emissions no input signal 1 – 3GHz

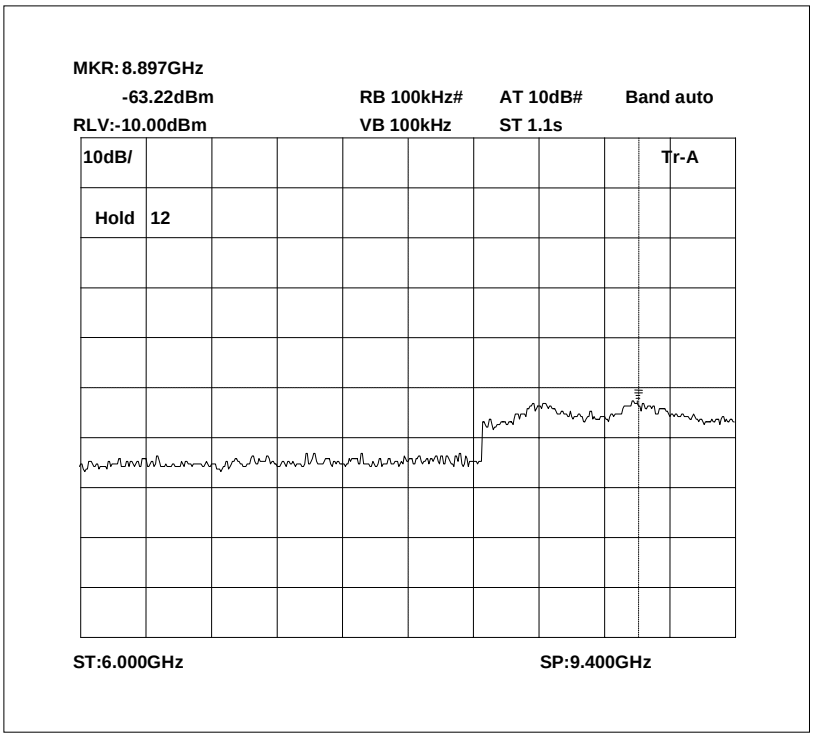


The above test results show that there were no emissions within 20dBs of the –13dBm limit.

Radiated emissions no input signal 3 – 6GHz



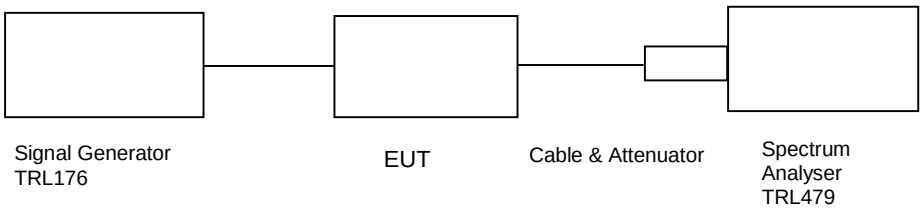
Radiated emissions no input signal 6 – 9.4GHz



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

AMPLIFIER GAIN – CONDUCTED – PART 2.1046 – DOWNLINK

Ambient temperature	=	25°C	Radio Laboratory
Relative humidity	=	54%	
Supply voltage	=	+110 Vac	
Channel number	=	See test results	



Frequency MHz	Signal Generator input level dBm	Cable & Attenuator loss dB	Level at Spectrum Analyser dBm	Gain dB	Gain after 10dB input level increase dBm
854.0 MHz	+2.0	27.1	5.02	30.12	21.64
861.5 MHz	+2.0	27.1	5.50	30.60	21.38
869.0 MHz	+2.0	27.1	5.04	30.14	21.80
929.0 MHz	-3.0	27.1	-4.00	26.10	19.30
929.5 MHz	-3.0	27.1	-3.64	26.46	18.62
930.0 MHz	-3.0	27.1	-3.66	26.44	18.28

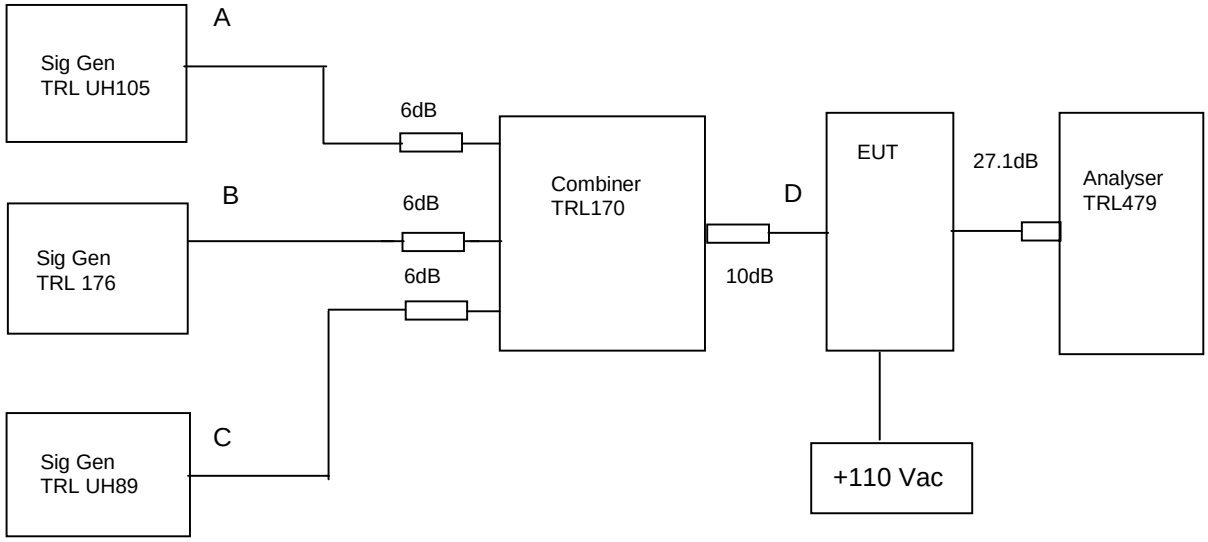
Notes:
1. The signal generator input was increased by 10dBs and the level of the output signal remeasured.
2. Antenna Port input split into 2 channelised amplifiers

TYPE OF EQUIPMENT	MAKER/ SUPPLIER	MODEL No	SERIAL No	TRL No	ACTUAL EQUIPMENT USED
SPECTRUM ANALYSER	ANRITSU	MS2665C	MT26089	479	**X**
ATTENUATOR	BIRD	8304-200	N/A	103	**X**
ATTENUATOR	BIRD	8304-300-N	N/A	220	**X**
CABLE	ROSENBERGER	MICRO COAX	N/A	280	**X**
SIGNAL GENERATOR	MARCONI	2042	119388/080	176	**X**

AMPLIFIER INTERMODULATION SPURIOUS EMISSIONS – CONDUCTED – PART 2.1053– DOWNLINK

Ambient temperature = 22°C
Relative humidity = 77%
Supply voltage = +110 Vac

Radio Laboratory



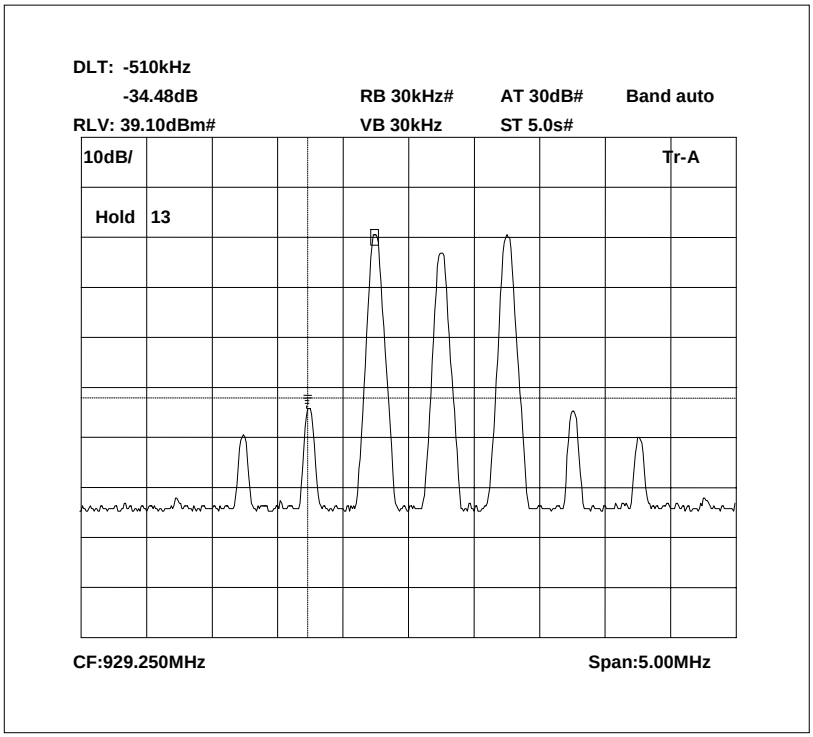
The Intermodulation and spurious products were measured with the amplifier operating at maximum gain. A three tone test was conducted using the equipment as above. The input power level was adjusted so the level at point D was 10 dB above the maximum input of +2dBm. The cable and attenuators loss between the EUT and the spectrum analyser was 27.1dB. This test was performed on the frequencies listed in the table below. Sweep data is shown on the next page for scan with the highest intermodulation product:

RF Input Frequency (MHz)			Highest Intermodulation Product Level (dBm)	Limit (dBm)
854.0000	855.5000	869.0000	-16.45 dBm @ 867.500MHz	-13
929.0000	929.7500	930.0000	-16.00 dBm @ 928.490MHz	-13
854.0000	868.5000	930.0000	-24.00 dBm @ 866.400MHz	-13

Test equipment used for Intermodulation test

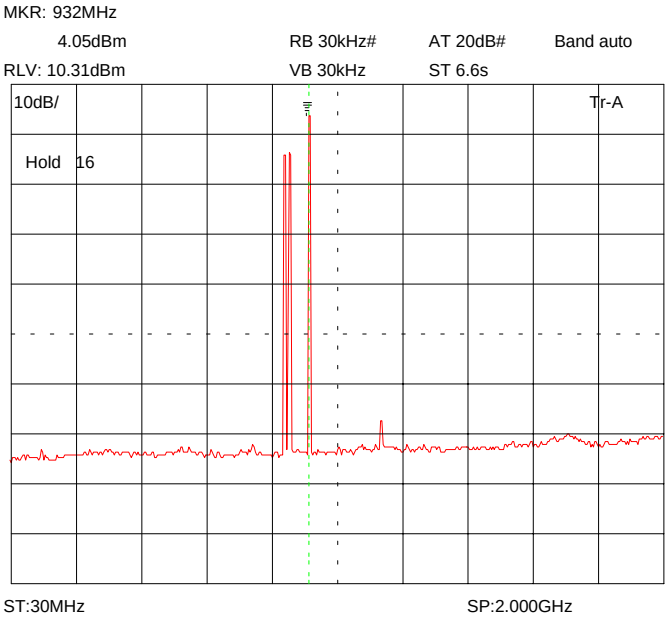
TYPE OF EQUIPMENT	MAKER/ SUPPLIER	MODEL No	SERIAL No	TRL No	ACTUAL EQUIPMENT USED
SPECTRUM ANALYSER	ANRITSU	MS2665C	MT26089	479	**X**
SIGNAL GENERATOR	MARCONI	2042	119388/080	176	**X**
SIGNAL GENERATOR	MARCONI	2023	112224/040	UH105	**X**
SIGNAL GENERATOR	MARCONI	2022D	119224/035	UH89	**X**
COMBINER	ELCOM	RC-4-50	N/A	170	**X**

Intermodulation Inband



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

Intermodulation Wideband

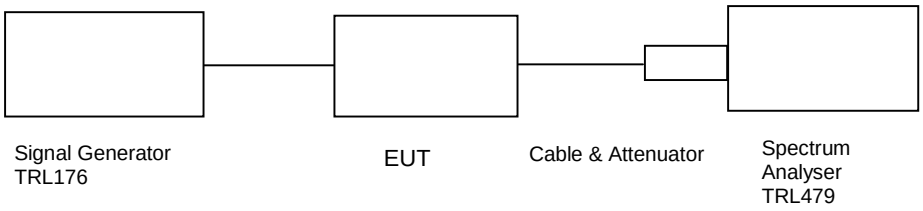


The above plot shows that there are no products outside the bands.

TRANSMITTER TESTS

AMPLIFIER MODULATED CHANNEL TEST – CONDUCTED – Part 2.1049– DOWNLINK

Ambient temperature	=	23°C	Radio Laboratory
Relative humidity	=	57%	
Supply voltage	=	+110 Vac	
Channel number	=	See test results	



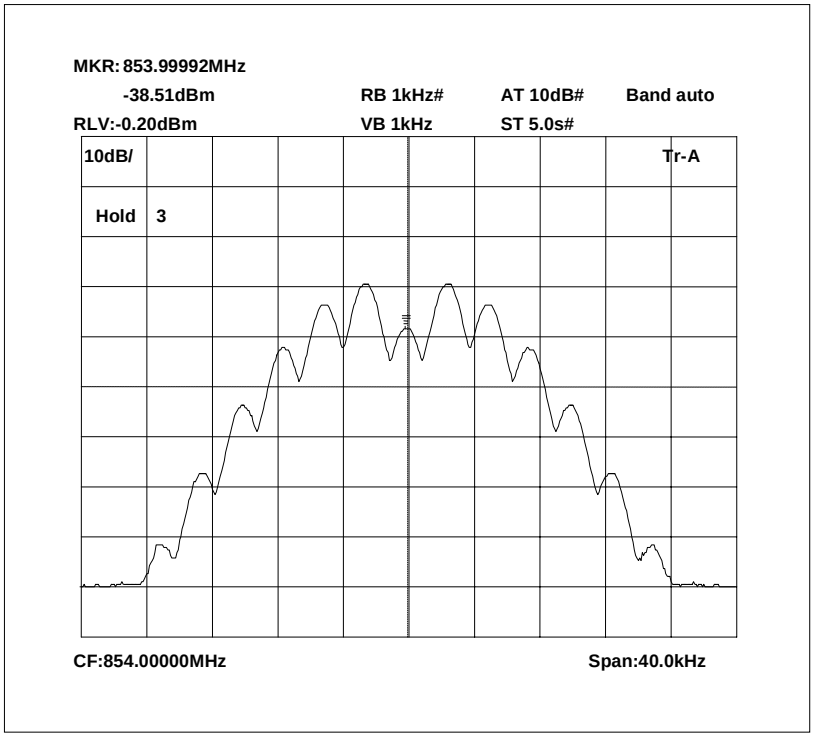
This test was performed to show that the amplifier does not alter the input signal in any way. The input signal was set to the maximum input level (+2 & -3dBm) and modulated with a 2500Hz tone. The plots show the signal measured at the signal generator and the signal measured at the output of the EUT.

Note: The cables and attenuators had the following losses.

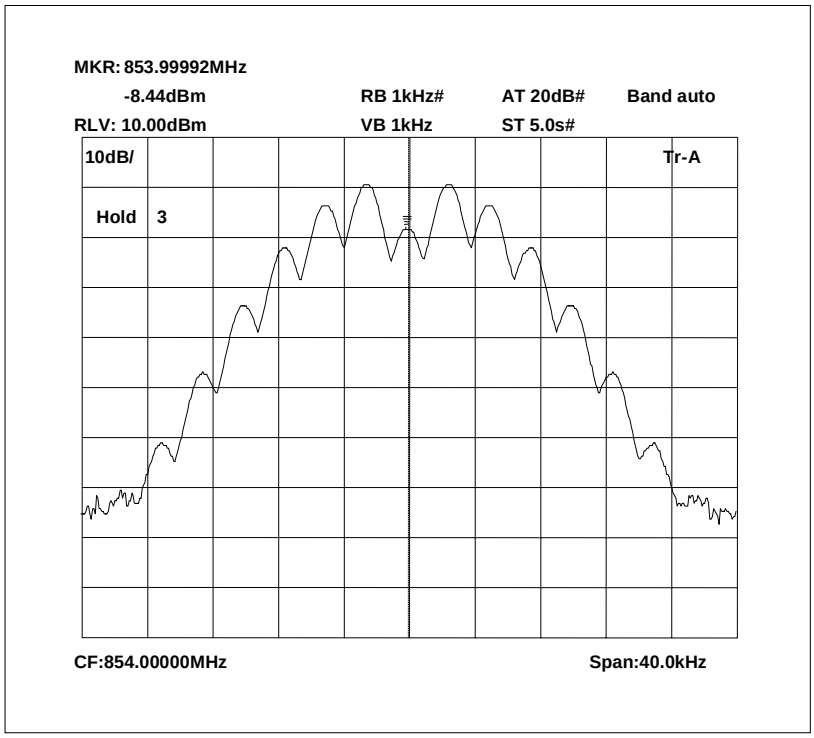
1. Cable and attenuator losses between EUT and spectrum analyser = 27.1dB
2. Cable between signal generator and EUT = 0.4dB

TYPE OF EQUIPMENT	MAKER/ SUPPLIER	MODEL No	SERIAL No	TRL No	ACTUAL EQUIPMENT USED
SPECTRUM ANALYSER	ANRITSU	MS2665C	MT26089	479	**X**
ATTENUATOR	BIRD	8304-200	N/A	103	
ATTENUATOR	BIRD	8304-300-N	N/A	220	**X**
CABLE	ROSENBERGER	MICRO COAX	N/A	280	**X**
SIGNAL GENERATOR	MARCONI	2042	119388/080	176	**X**

854.0MHz Signal Generator deviation set to 5kHz

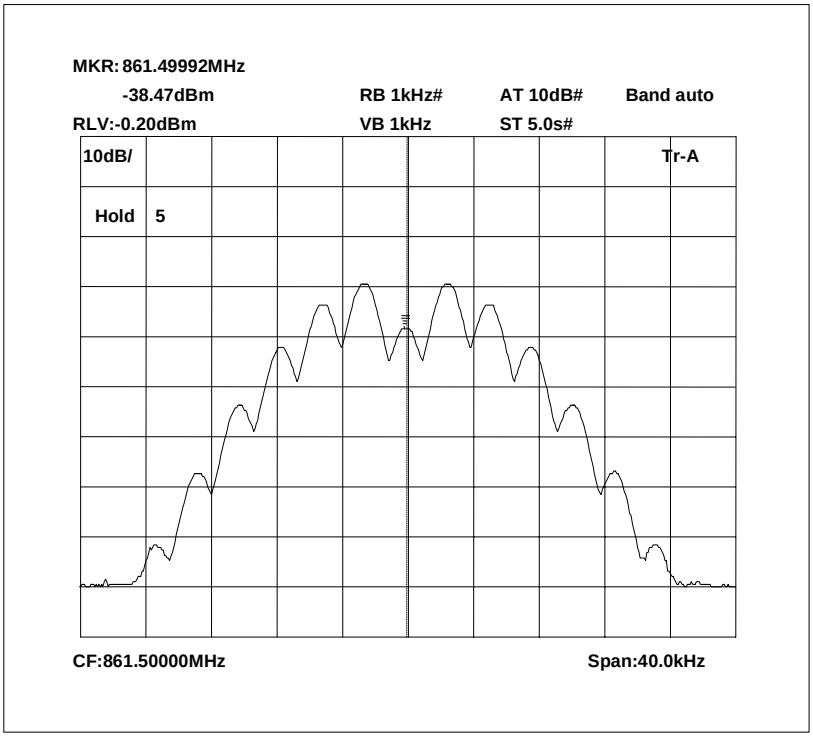


854.0MHz Signal Generator and EUT deviation set to 5kHz

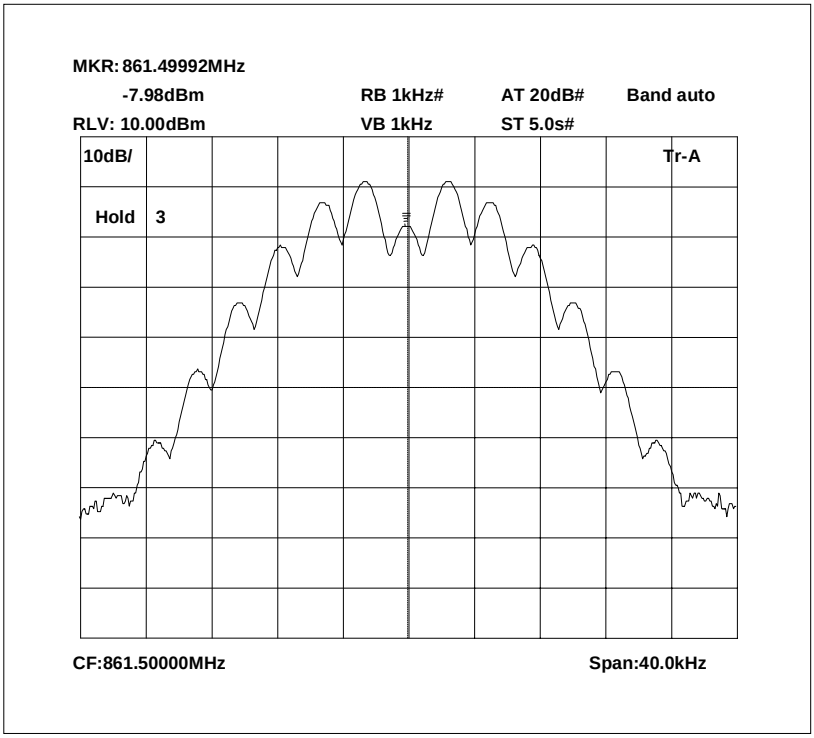


The above plots depicting the output waveshape show no measurable distortion visible when compared to the input signal.

861.5MHz Signal Generator deviation set to 5kHz

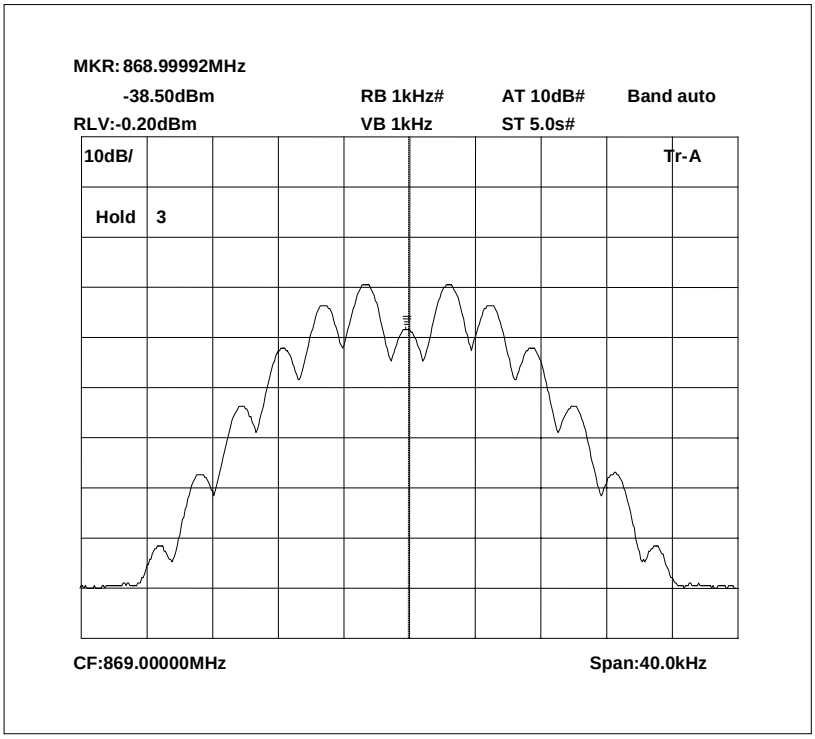


861.5MHz Signal Generator and EUT deviation set to 5kHz

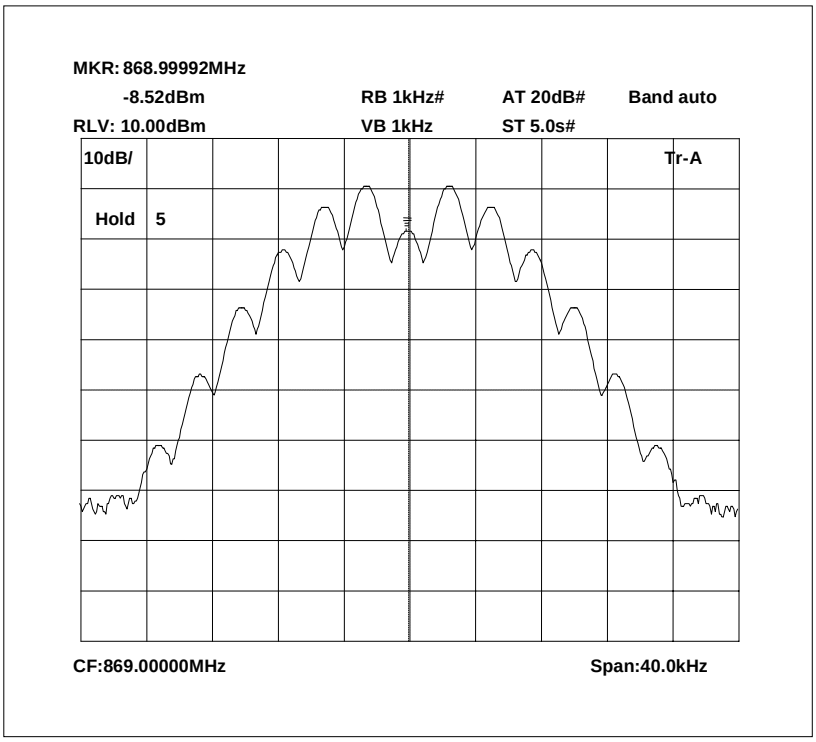


The above plots depicting the output waveshape show no measurable distortion visible when compared to the input signal.

869.0 MHz Signal Generator deviation set to 5kHz

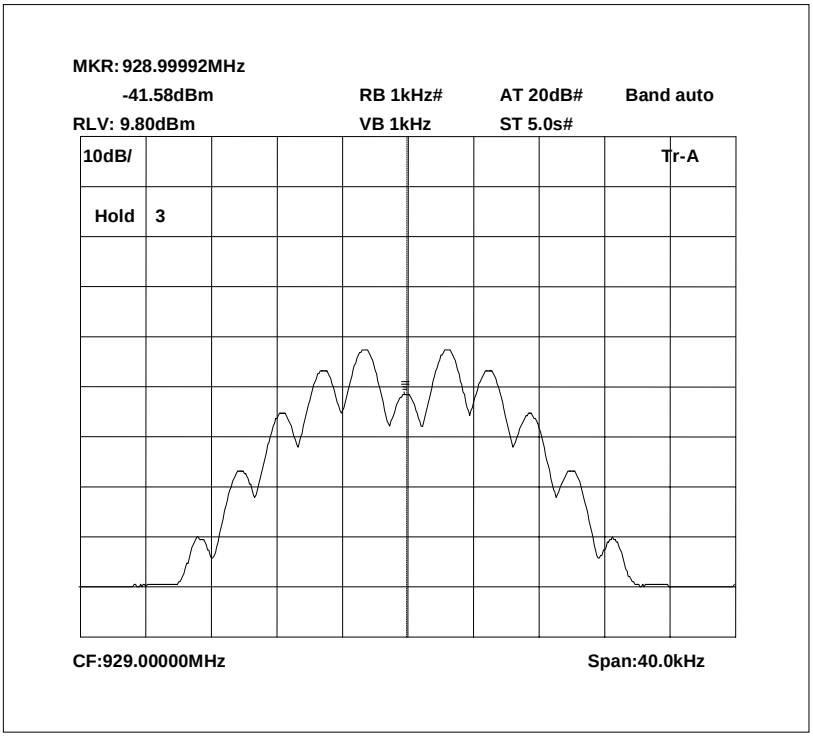


869.0 MHz Signal Generator and EUT deviation set to 5kHz

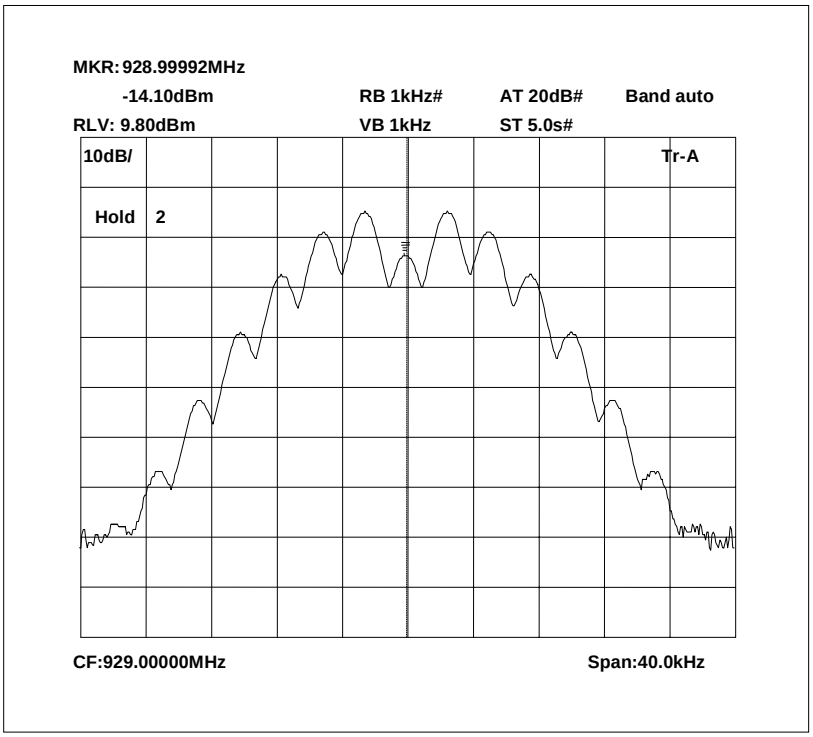


The above plots depicting the output waveshape show no measurable distortion visible when compared to the input signal.

929.0MHz Signal Generator deviation set to 5kHz

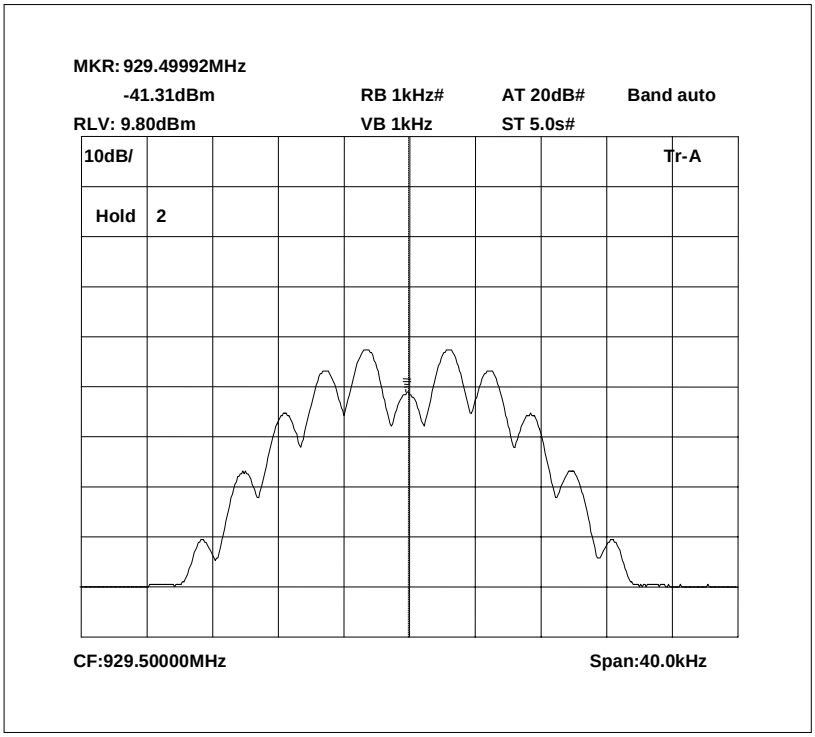


929.0MHz Signal Generator and EUT deviation set to 5kHz

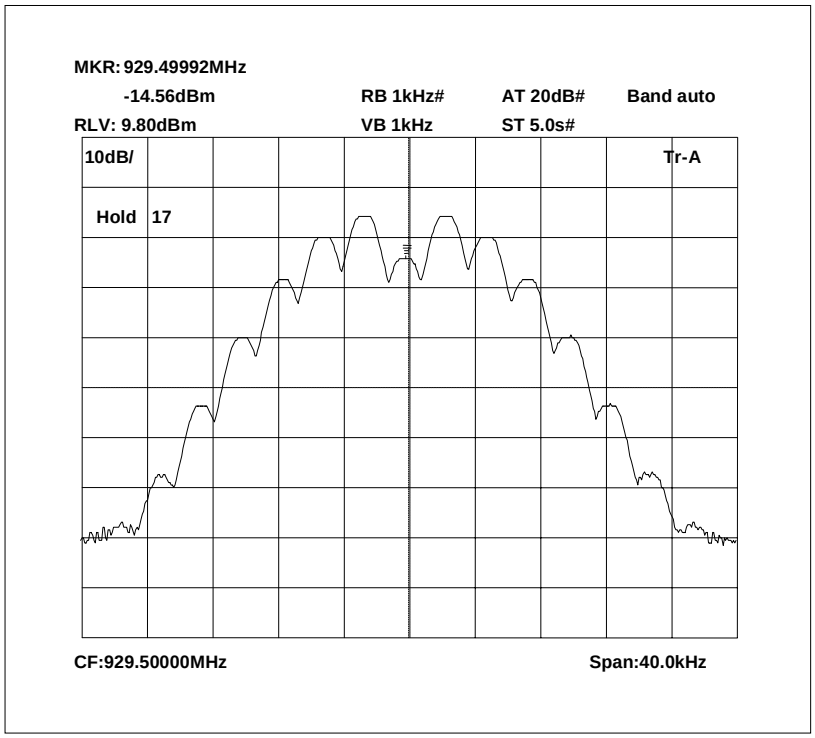


The above plots depicting the output waveshape show no measurable distortion visible when compared to the input signal.

929.5 MHz Signal Generator deviation set to 5kHz

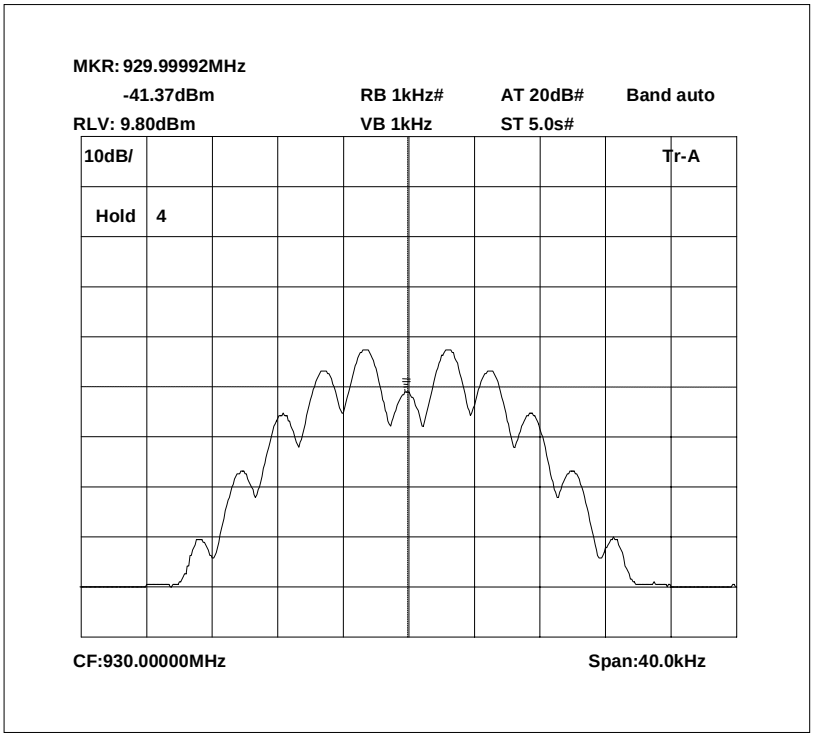


929.5 MHz Signal Generator and EUT deviation set to 5kHz

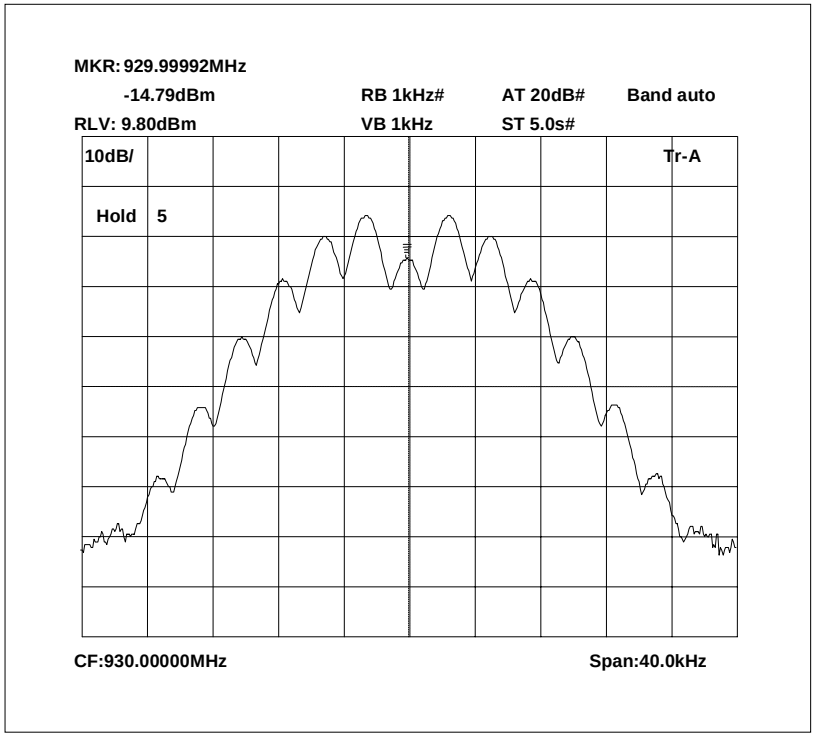


The above plots depicting the output waveshape show no measurable distortion visible when compared to the input signal.

930.0 MHz Signal Generator deviation set to 5kHz



930.0 MHz Signal Signal Generator and EUT deviation set to 5kHz



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

TRANSMITTER TESTS

AMPLIFIER SPURIOUS EMISSIONS – CONDUCTED – Part 2.10 – DOWNLINK

Ambient temperature	=	20°C	Radio Laboratory		
Relative humidity	=	77%	Test Signal	=	F3E
Supply voltage	=	+110 Vac			

Signal Generator TRL176 | EUT | Cable & Attenuator | Spectrum Analyser TRL479

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

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

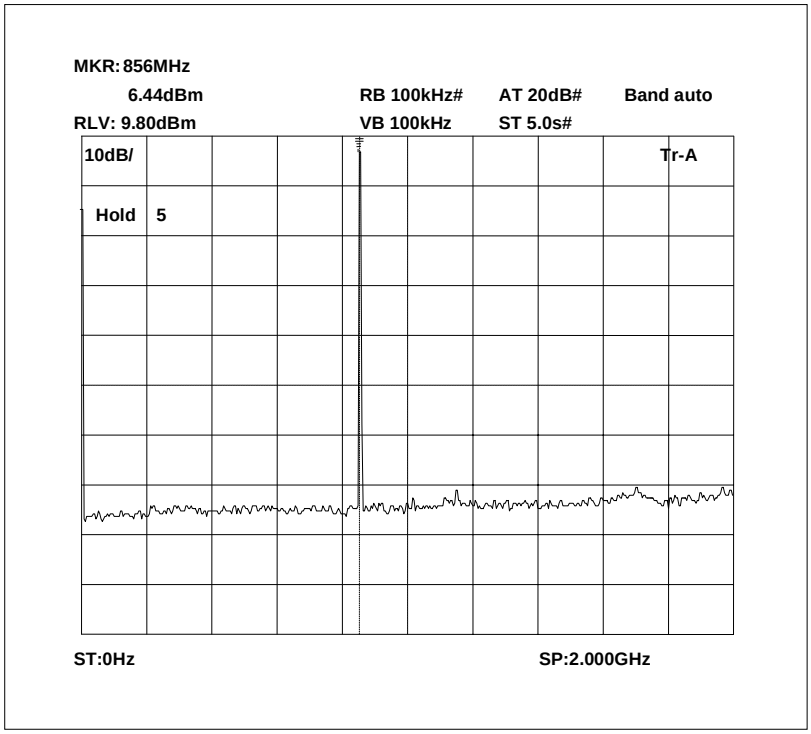
RESULTS

FREQUENCY RANGE	FREQ. (MHz)	MEASURED LEVEL (dBm)	ATTENUATOR & CABLE LOSSES (dB)	EMISSION LEVEL (dBm)	LIMIT (dBm)
0 Hz - 9.4GHz	No Significant emissions within 20 dB's of the limit				-13

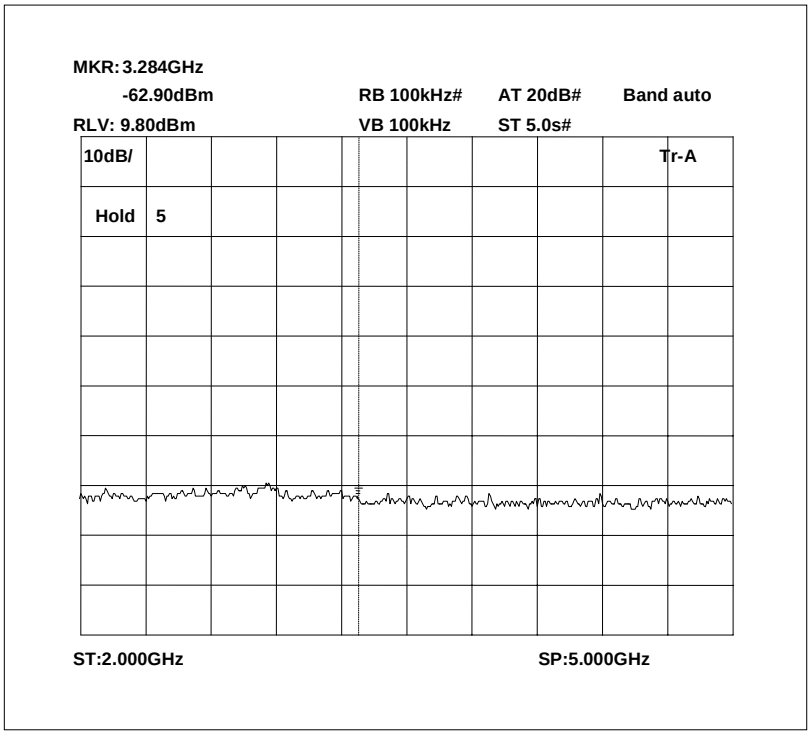
The test equipment used for the Transmitter Conducted Emissions:

TYPE OF EQUIPMENT	MAKER/ SUPPLIER	MODEL No	SERIAL No	TRL No	ACTUAL EQUIPMENT USED
SPECTRUM ANALYSER	ANRITSU	MS2665C	MT26089	479	**X**
ATTENUATOR	BIRD	8304-200	N/A	103	
ATTENUATOR	BIRD	8304-300-N	N/A	220	**X**
CABLE	ROSENBERGER	MICRO COAX	N/A	280	**X**
SIGNAL GENERATOR	MARCONI	2042	119388/080	176	**X**

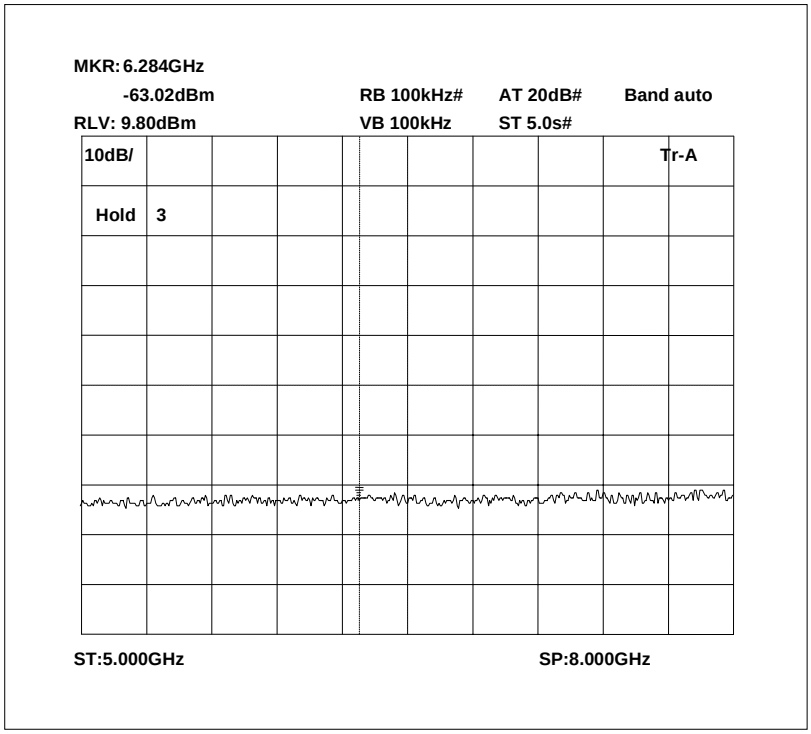
Conducted emissions 854.0MHz 0 – 1GHz



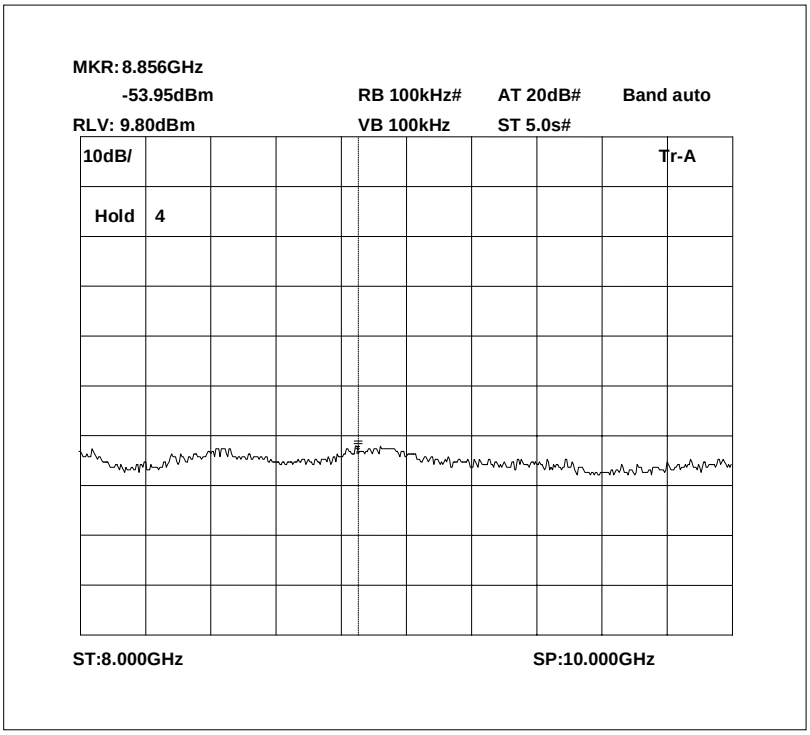
Conducted emissions 854.0MHz 2 – 5GHz



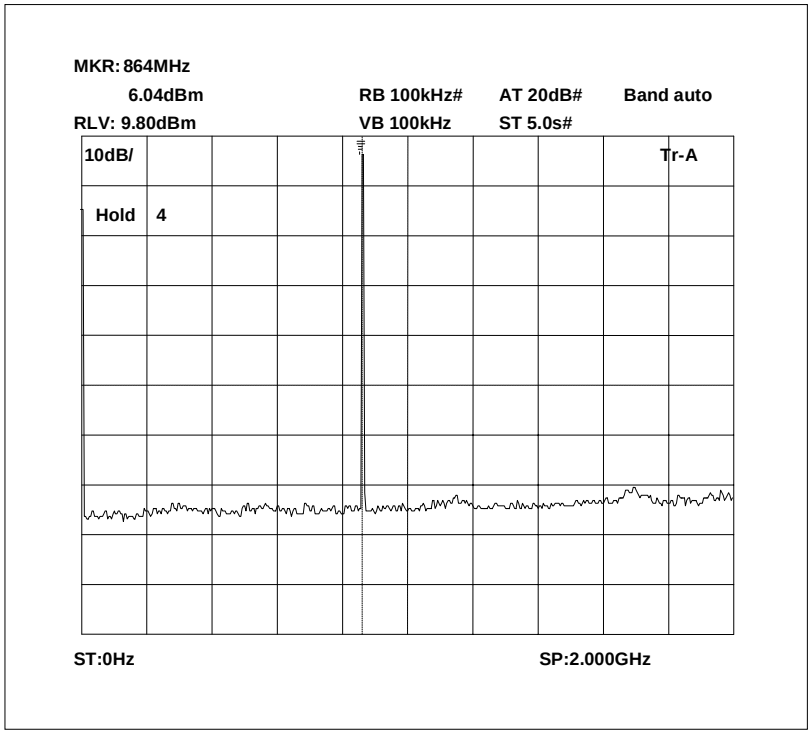
Conducted emissions 854.0MHz 5 – 8GHz



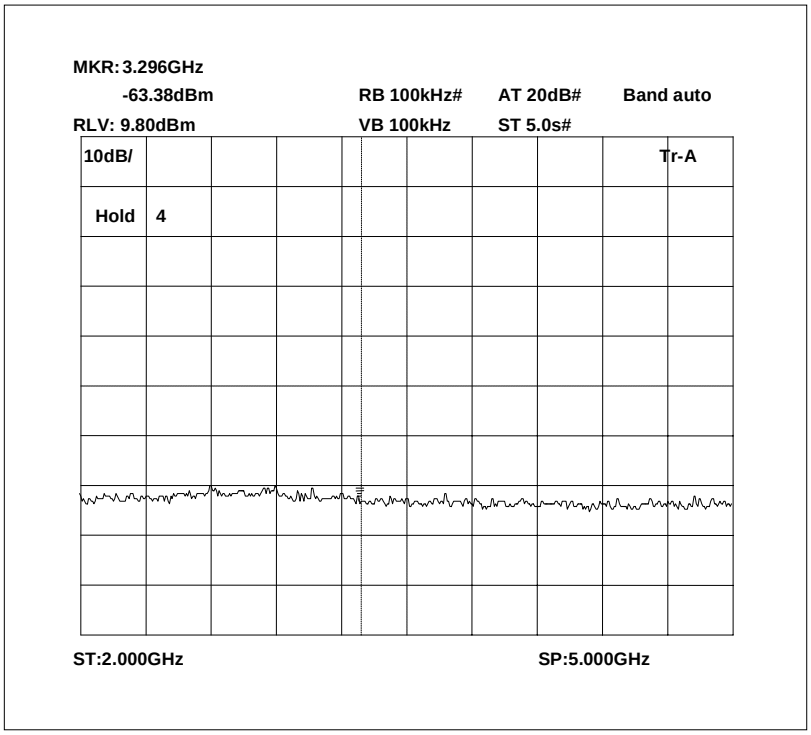
Conducted emissions 854.0MHz 8 – 10GHz



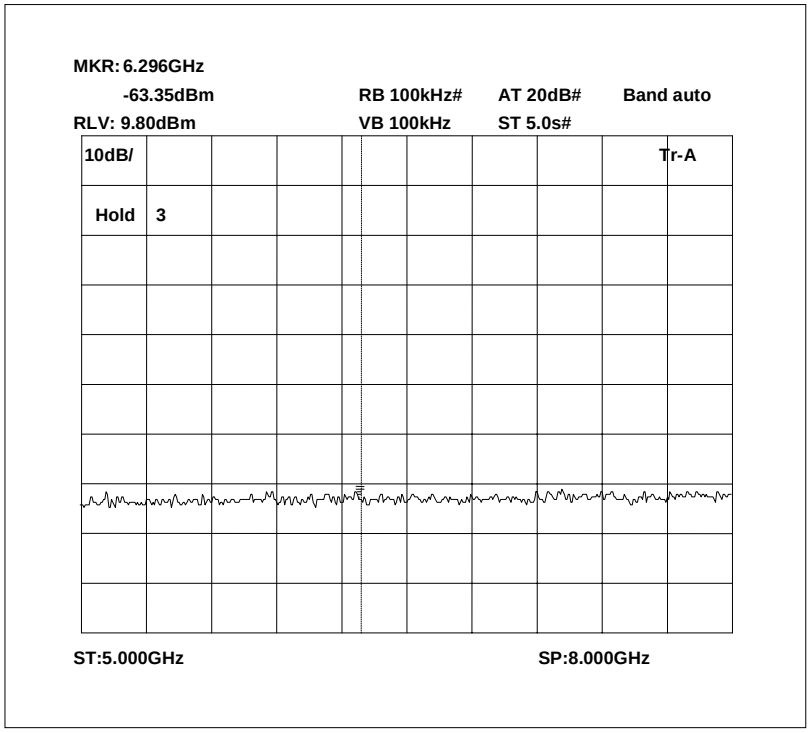
Conducted emissions 861.5MHz 0 – 2GHz



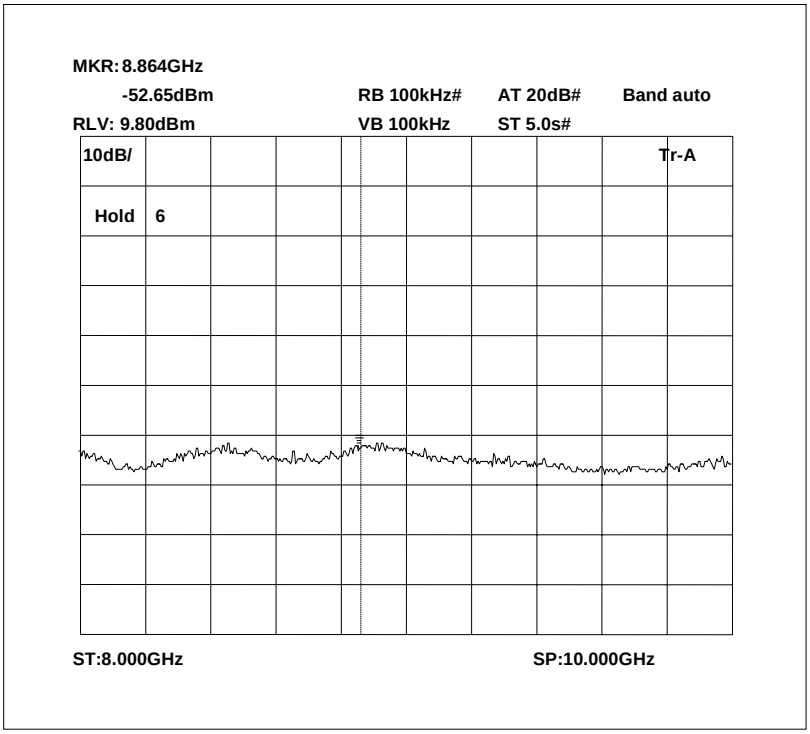
Conducted emissions 861.5MHz 2 – 5GHz



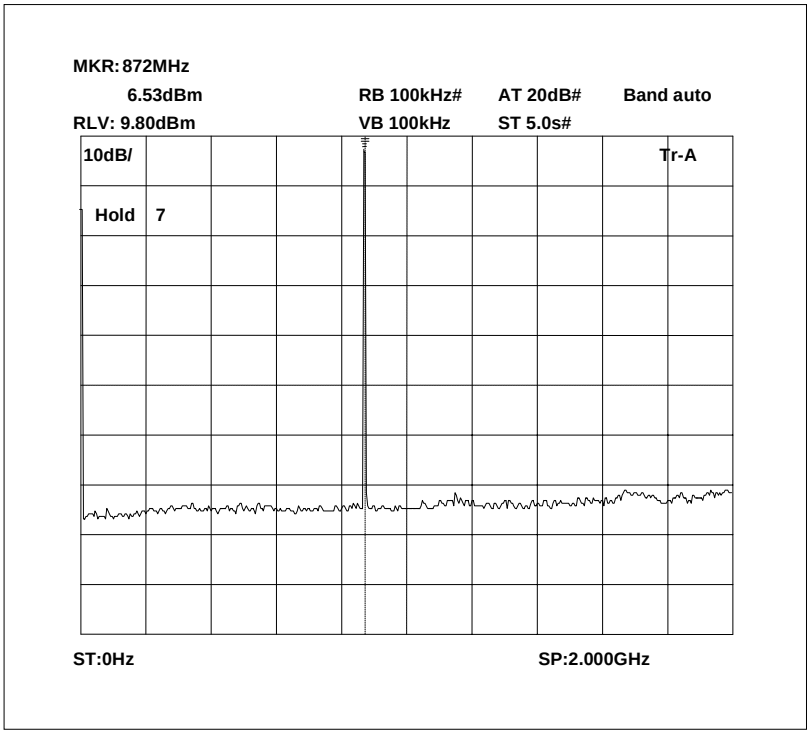
Conducted emissions 861.5MHz 5 – 8GHz



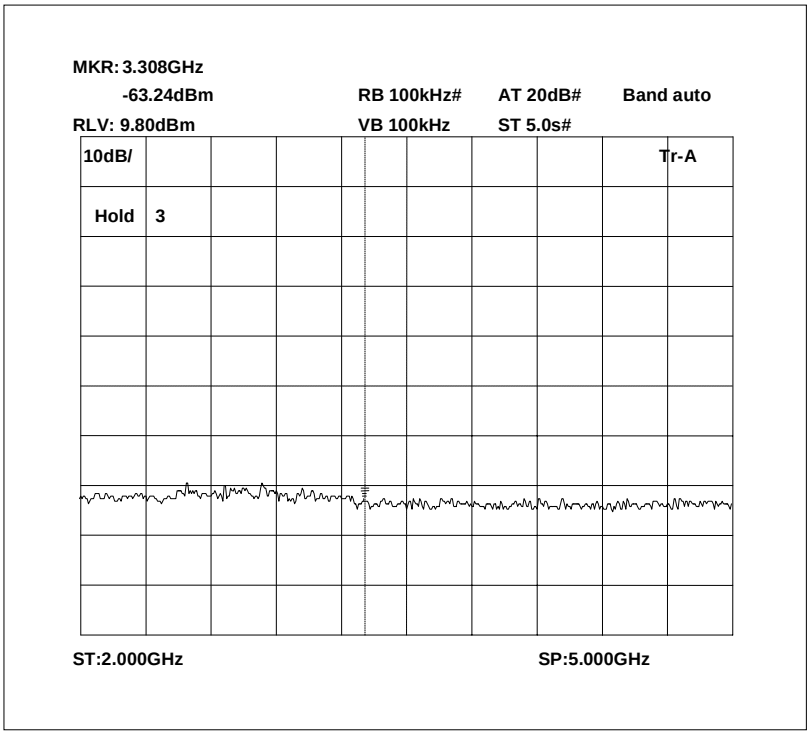
Conducted emissions 861.5MHz 8 – 10GHz



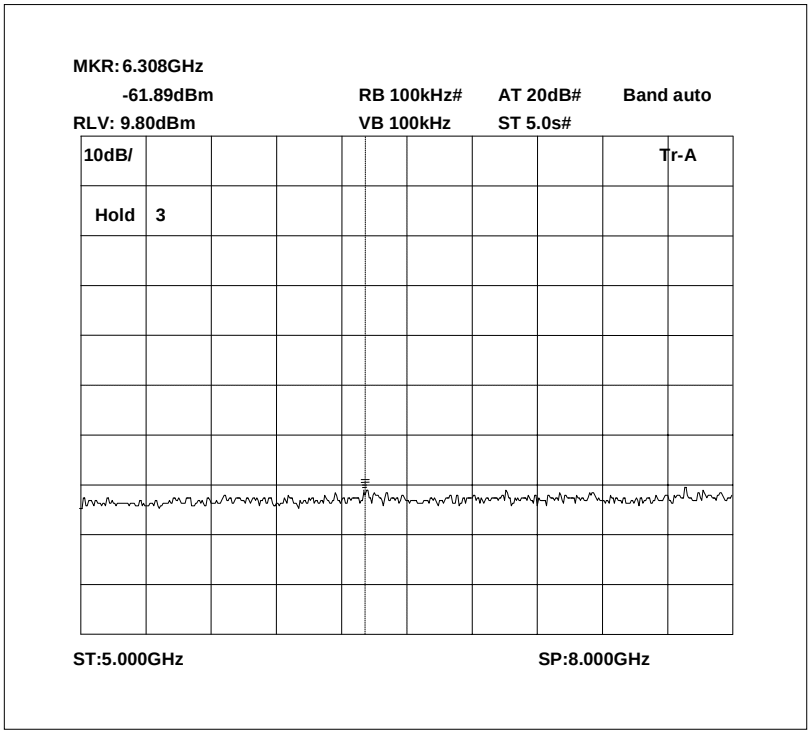
Conducted emissions 869.0 MHz 0 – 2GHz



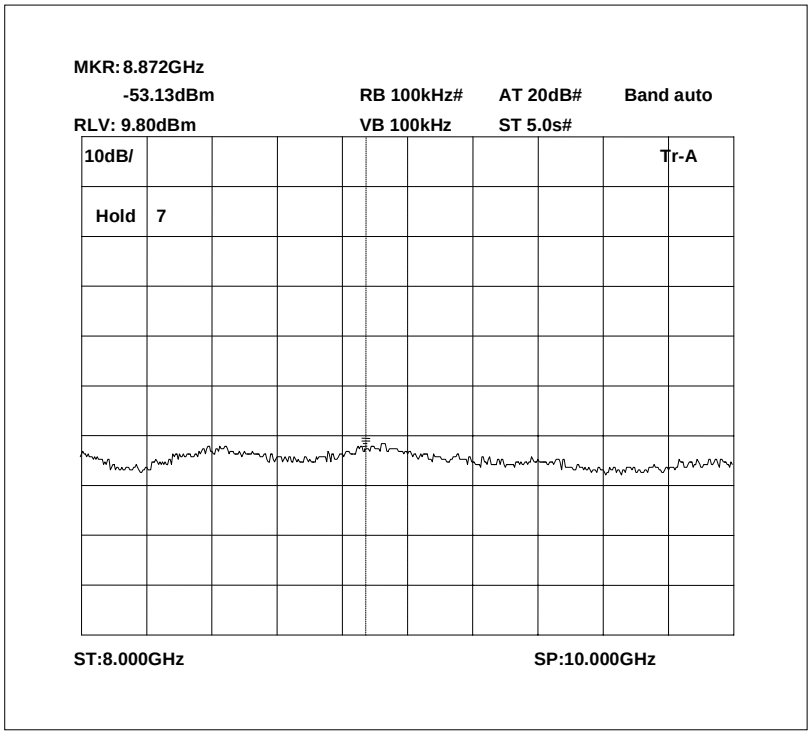
Conducted emissions 869.0 MHz 2 – 5GHz



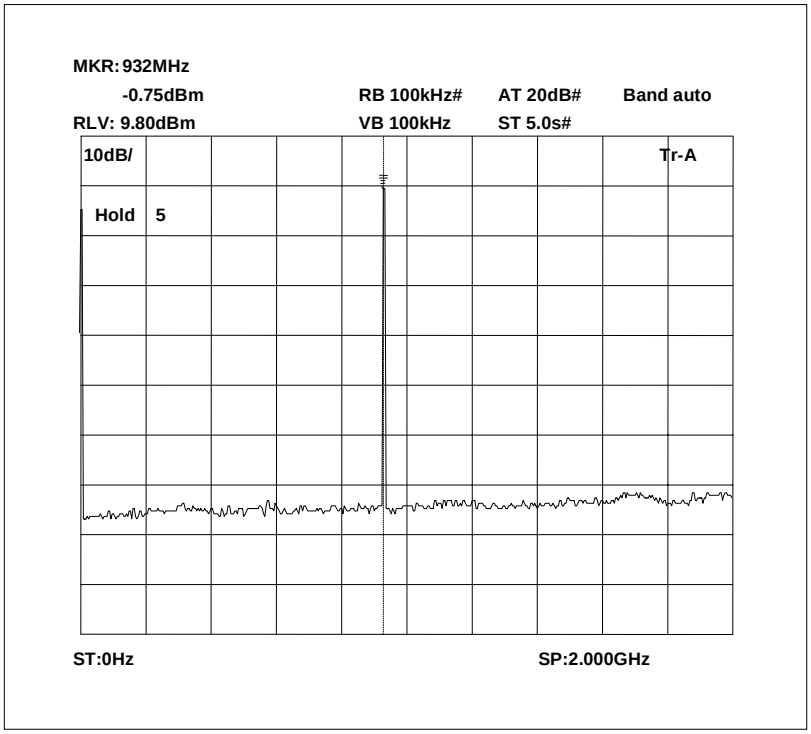
Conducted emissions 869.0 MHz 5 – 8GHz



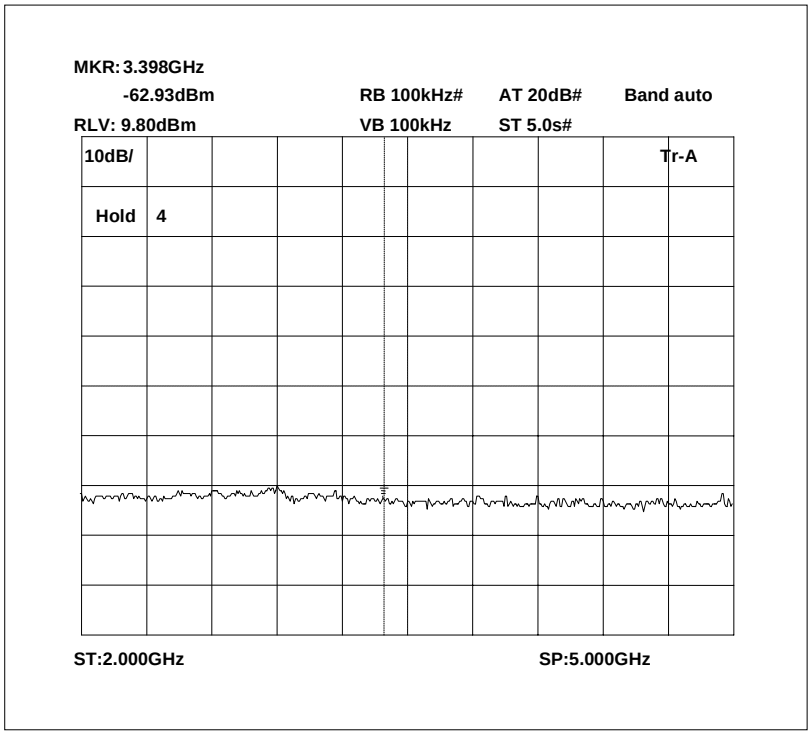
Conducted emissions 869.0 MHz 8 –10GHz



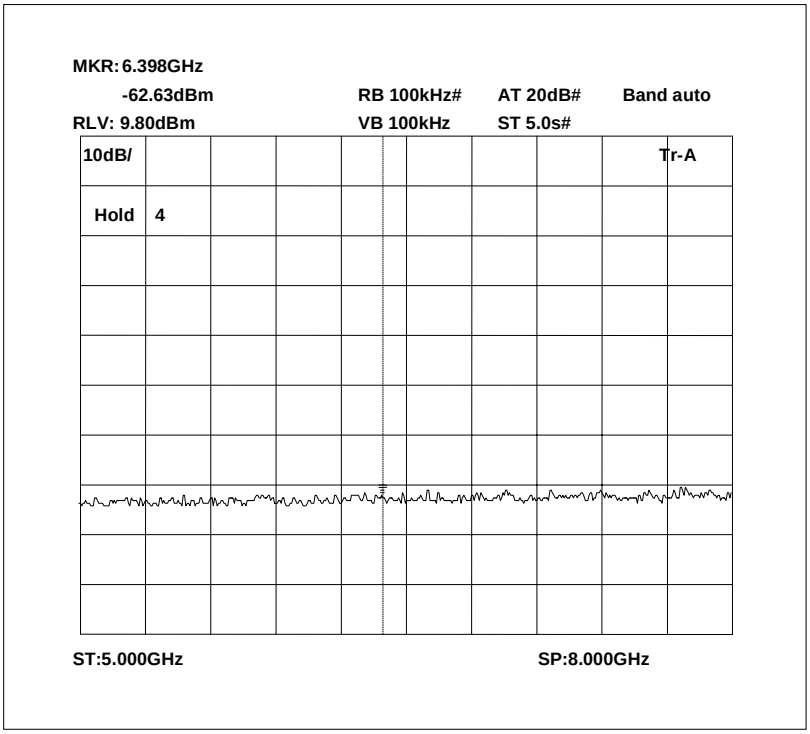
Conducted emissions 929.0MHz 0 – 2GHz



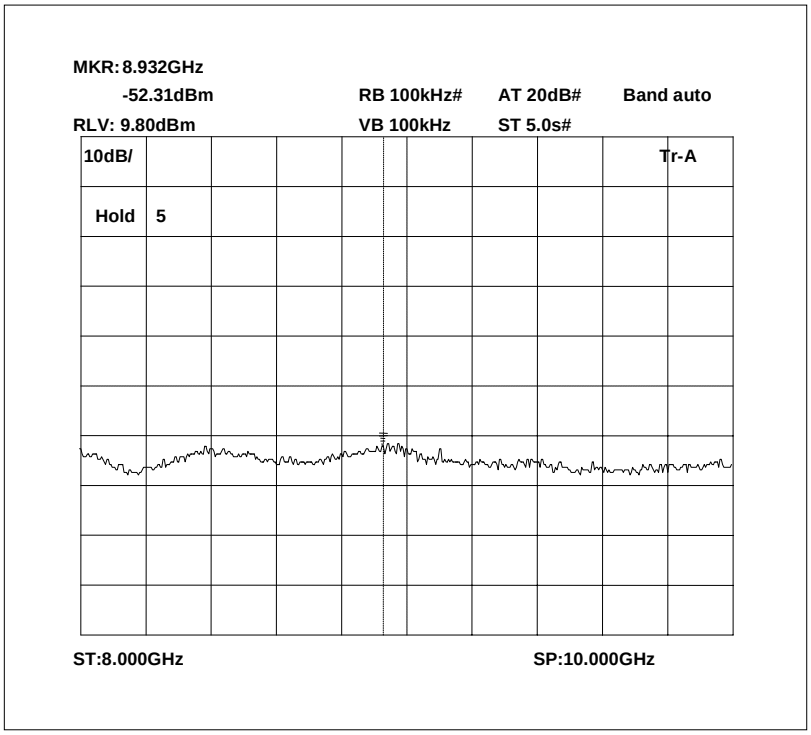
Conducted emissions 929.0MHz 2 – 5GHz



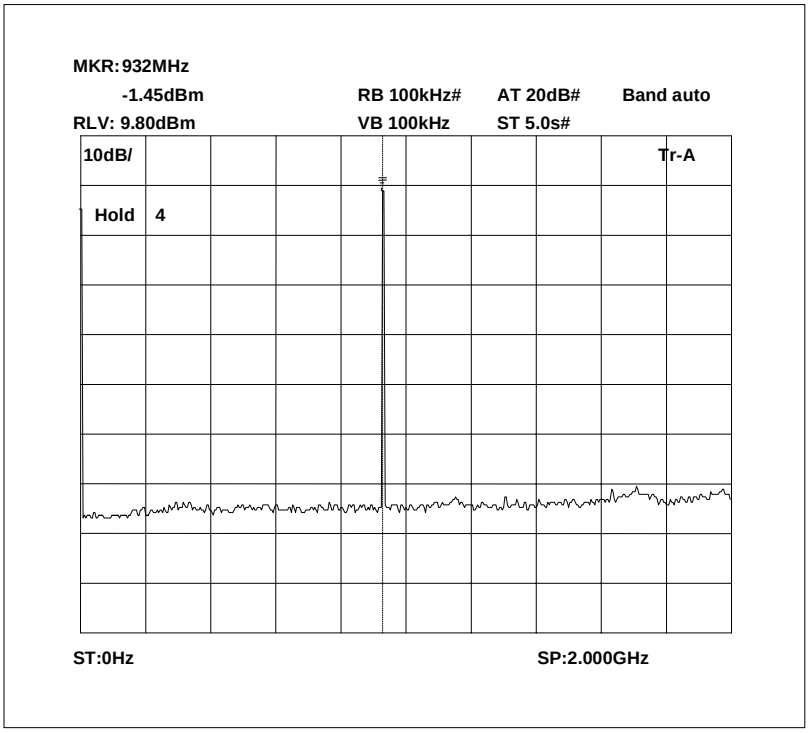
Conducted emissions 929.0MHz 5 – 8GHz



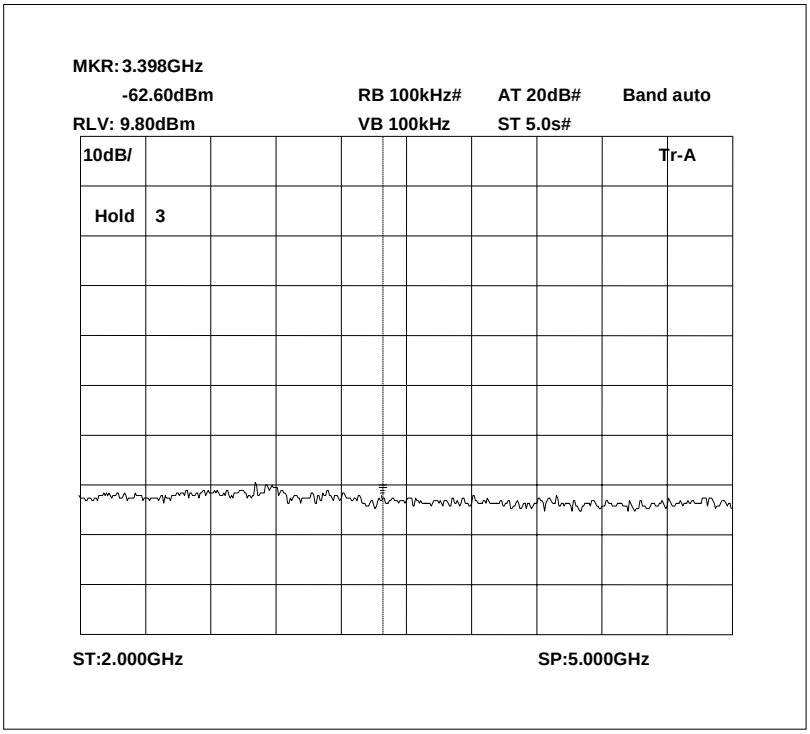
Conducted emissions 929.0MHz 8 – 10GHz



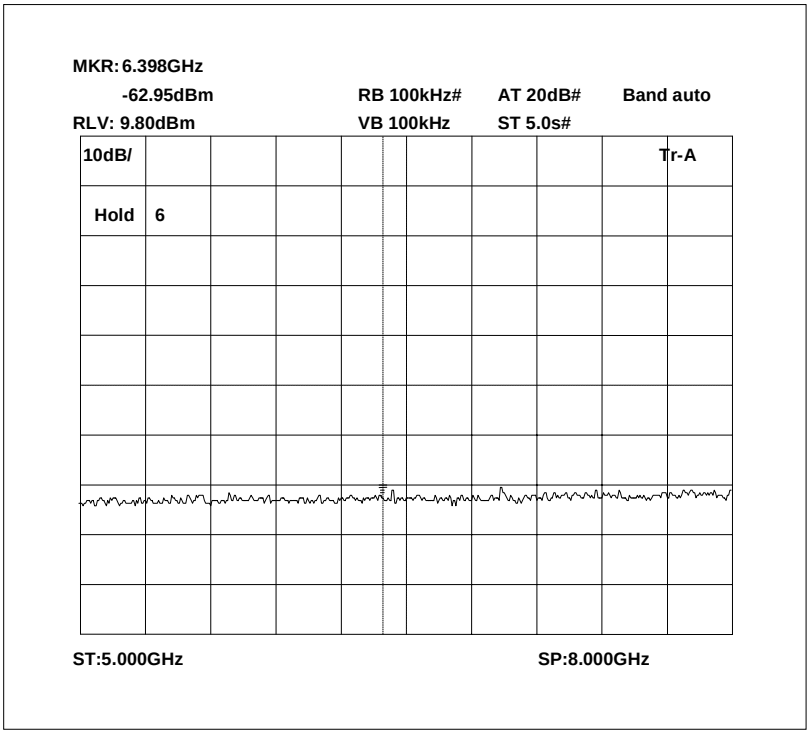
Conducted emissions 929.5 MHz 0 – 2GHz



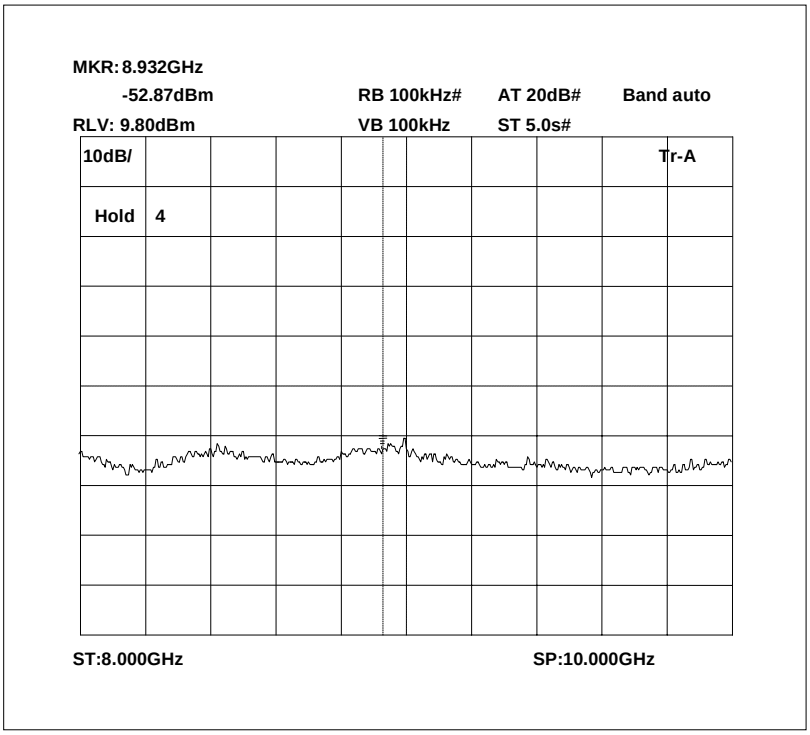
Conducted emissions 929.5 MHz 2 – 5GHz



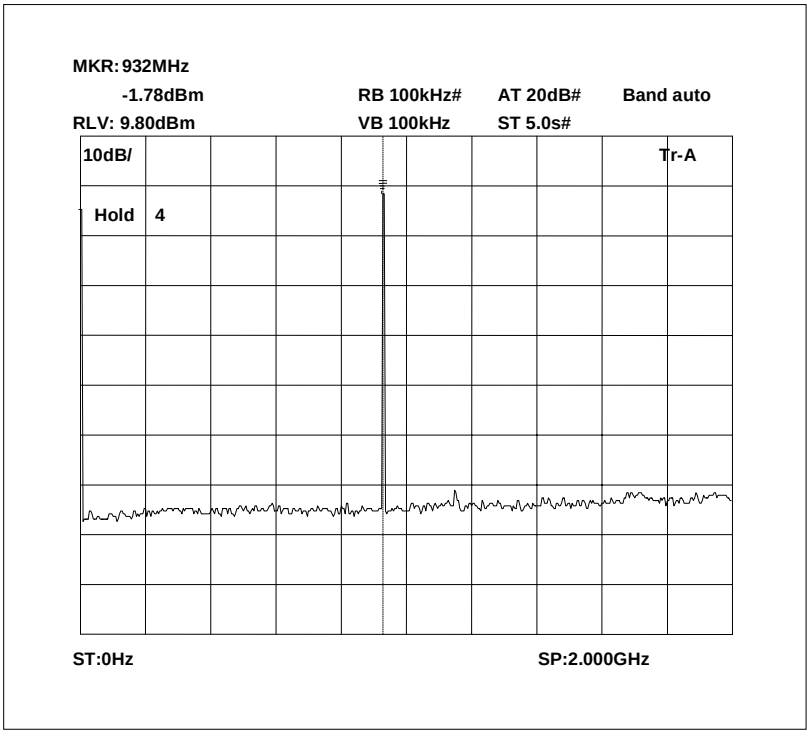
Conducted emissions 929.5 MHz 5 – 8GHz



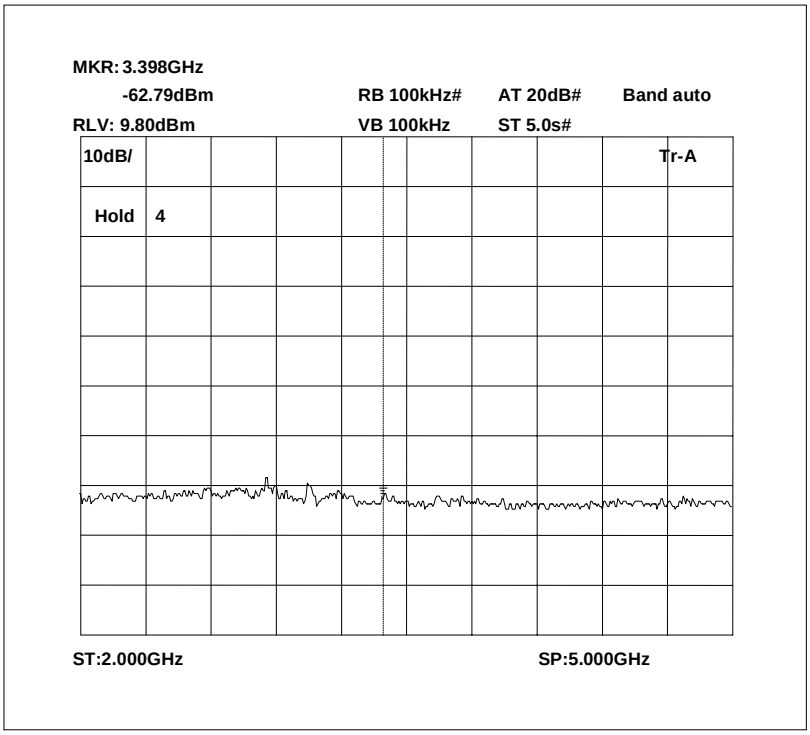
Conducted emissions 929.5 MHz 8 – 10GHz



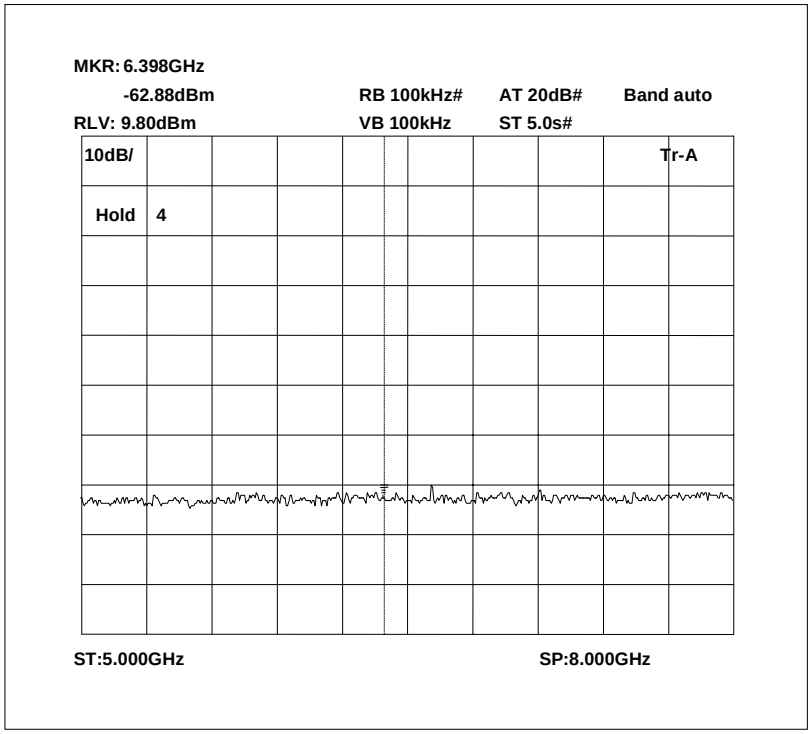
Conducted emissions 930.0 MHz 0 – 2GHz



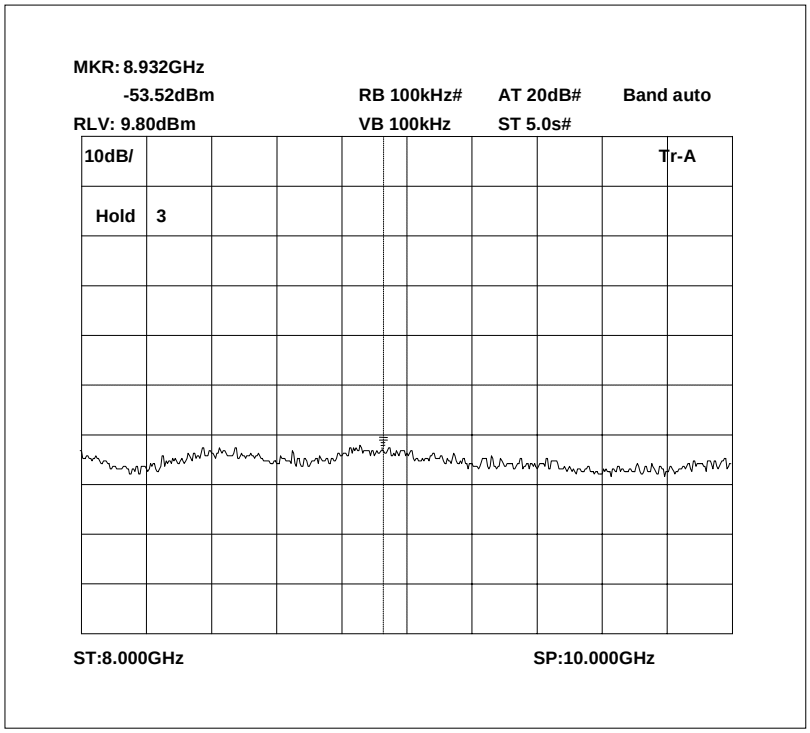
Conducted emissions 930.0 MHz 2 – 5GHz



Conducted emissions 930.0 MHz 5 – 8GHz



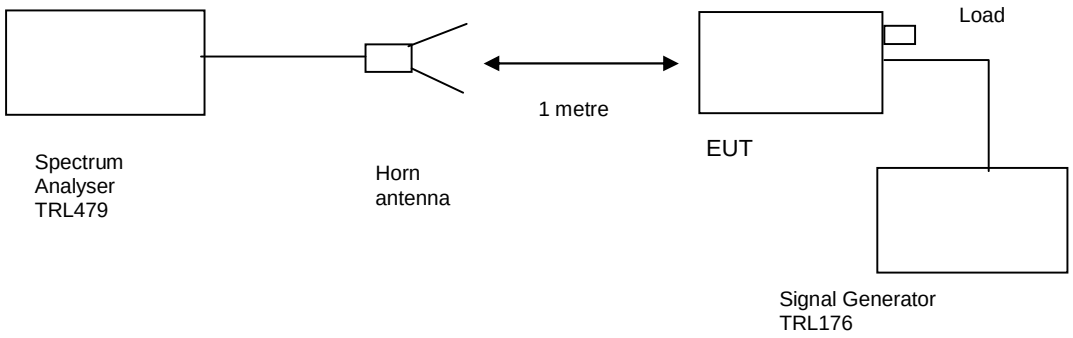
Conducted emissions 930.0 MHz 8 – 10GHz



TRANSMITTER TESTS

AMPLIFIER SPURIOUS EMISSIONS – RADIATED – Part 2.1053 – DOWNLINK

Ambient temperature	=	20°C	Test Signal	=	F3E
Relative humidity	=	80%			
Conditions	=	OATS			
Supply voltage	=	+110 Vac			
Supply Frequency	=	N/A			



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 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

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

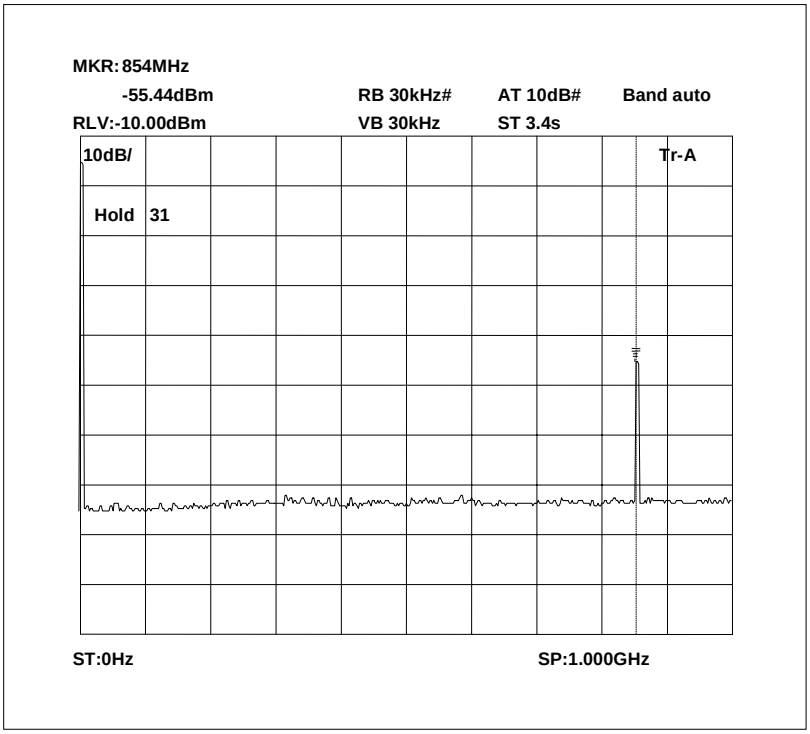
RESULTS

FREQUENCY RANGE	FREQ. (MHz)	MEAS. Rx. (dBµV)	CABLE LOSS (dB)	ANT FACTOR	FIELD STRENGTH (dBµV/m)	CALCULATED EIRP (dBm)	LIMIT (dBm)
0 Hz - 9.4GHz	No Significant emissions within 20 dB's of the limit						-13

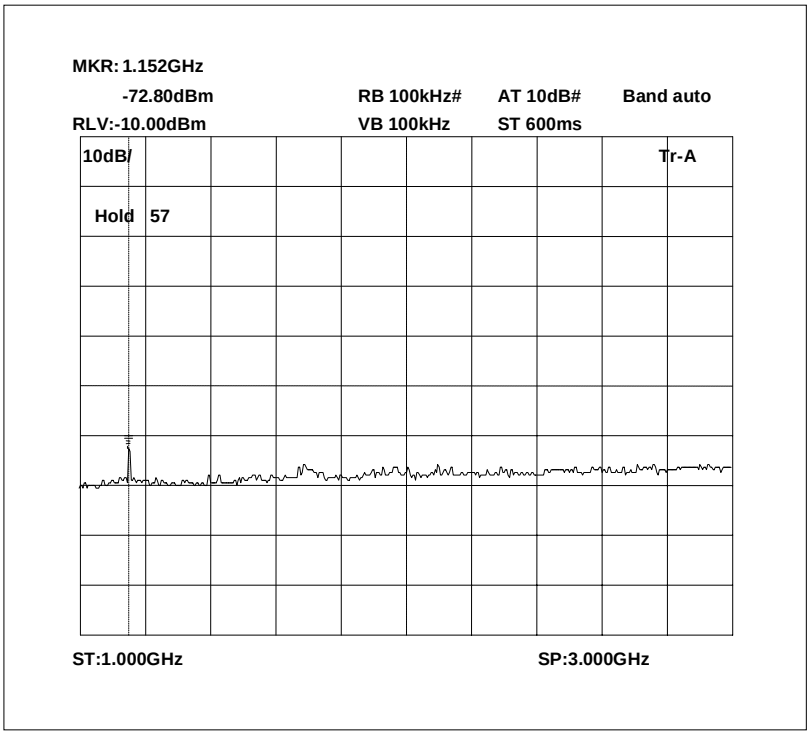
The test equipment used for the Transmitter Spurious Emissions:

TYPE OF EQUIPMENT	MAKER/ SUPPLIER	MODEL No	SERIAL No	TRL No	ACTUAL EQUIPMENT USED
SPECTRUM ANALYSER	ANRITSU	MS2665C	MT26089	479	**X**
HORN	EMCO	3115	9010-3581	139	**X**
CABLE	ROSENBERGER	MICRO COAX	N/A	280	**X**
SIGNAL GENERATOR	MARCONI	2042	119388/080	176	**X**

Radiated emissions 854.0MHz 0 – 1GHz

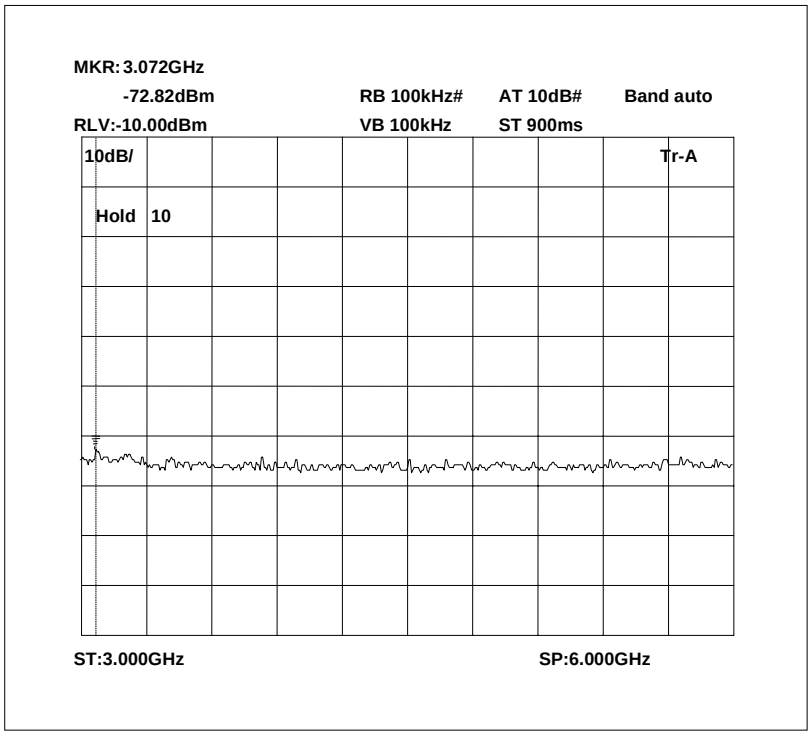


Radiated emissions 854.0MHz 1 – 3GHz

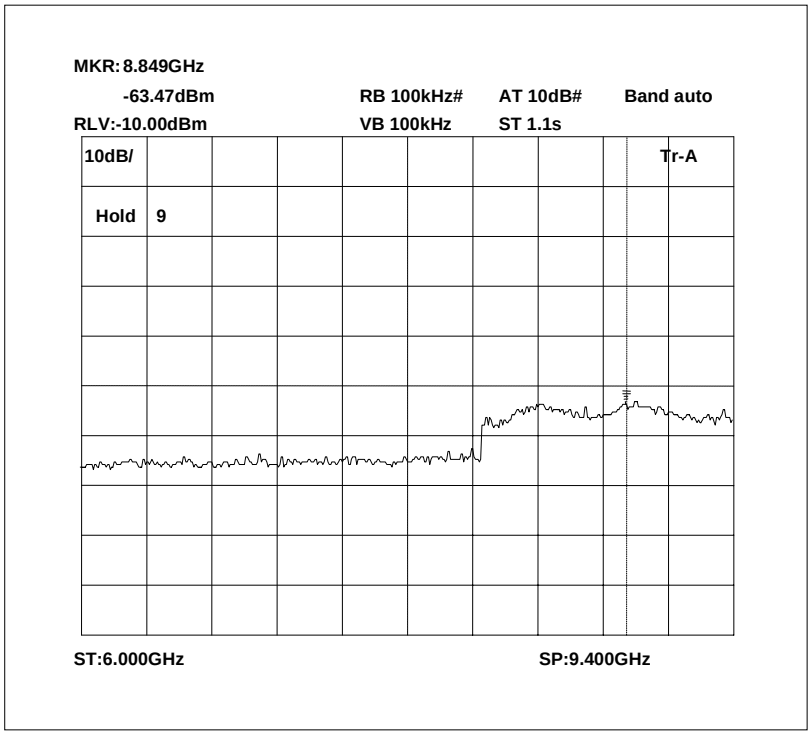


The above test results show that there were no emissions within 20dBs of the –13dBm limit.

Radiated emissions 854.0MHz 3 – 6GHz

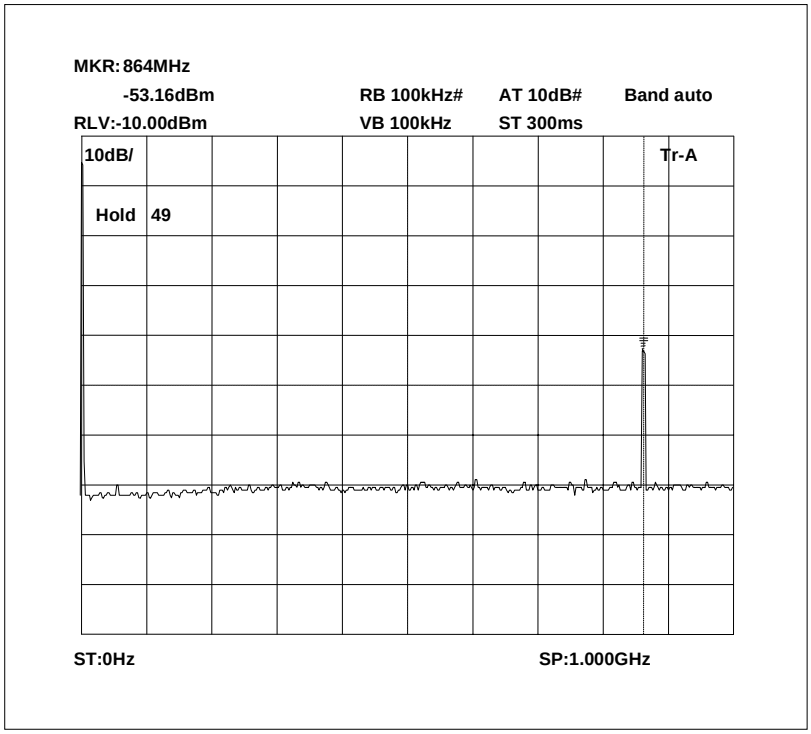


Radiated emissions 854.0MHz 6 – 9.4GHz

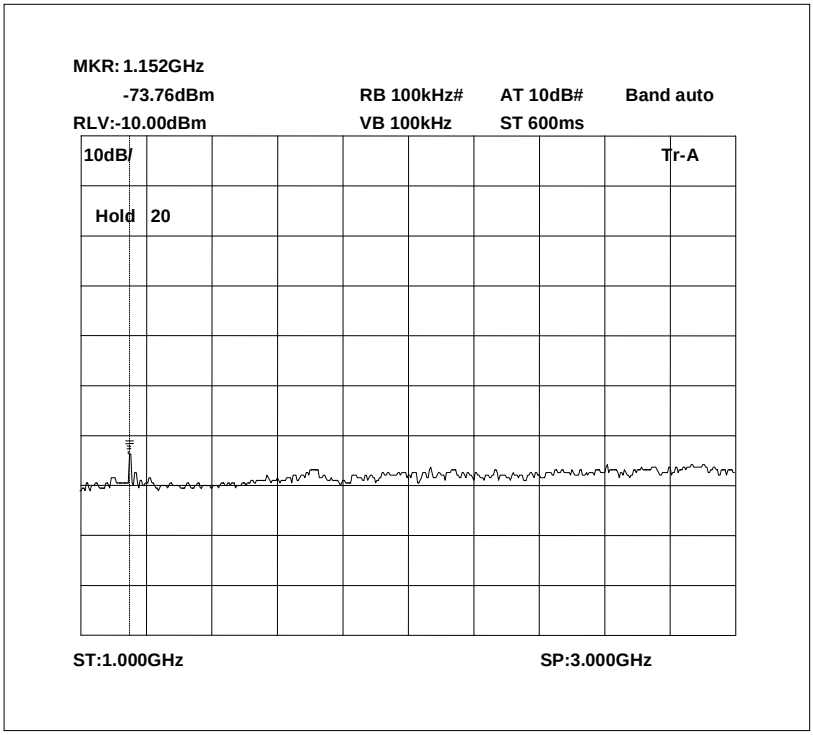


The above test results show that there were no emissions within 20dBs of the –13dBm limit.

Radiated emissions 861.5MHz 0 – 3GHz

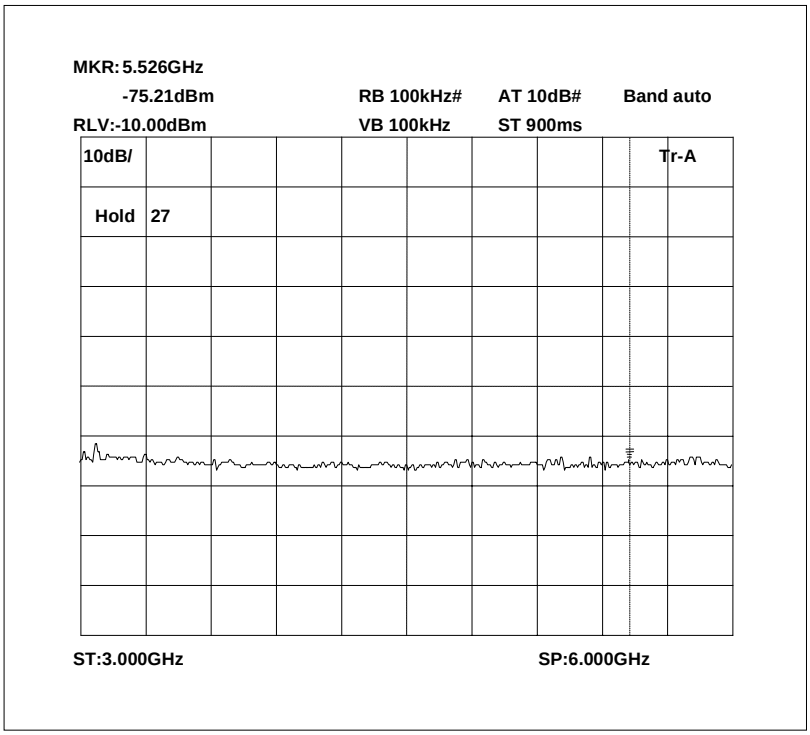


Radiated emissions 861.5MHz 1 – 3GHz

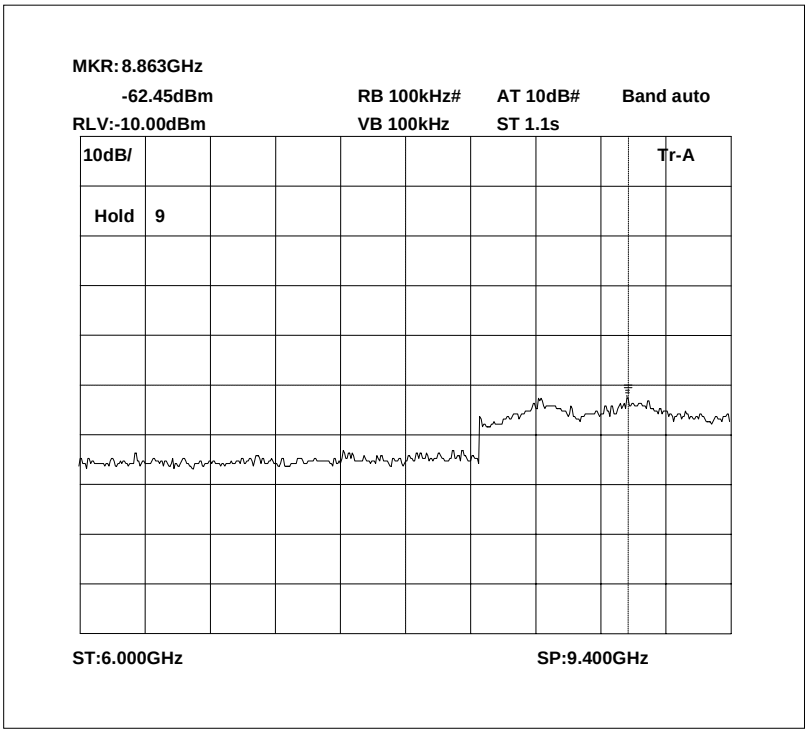


The above test results show that there were no emissions within 20dBs of the –13dBm limit.

Radiated emissions 861.5MHz 3 – 6GHz

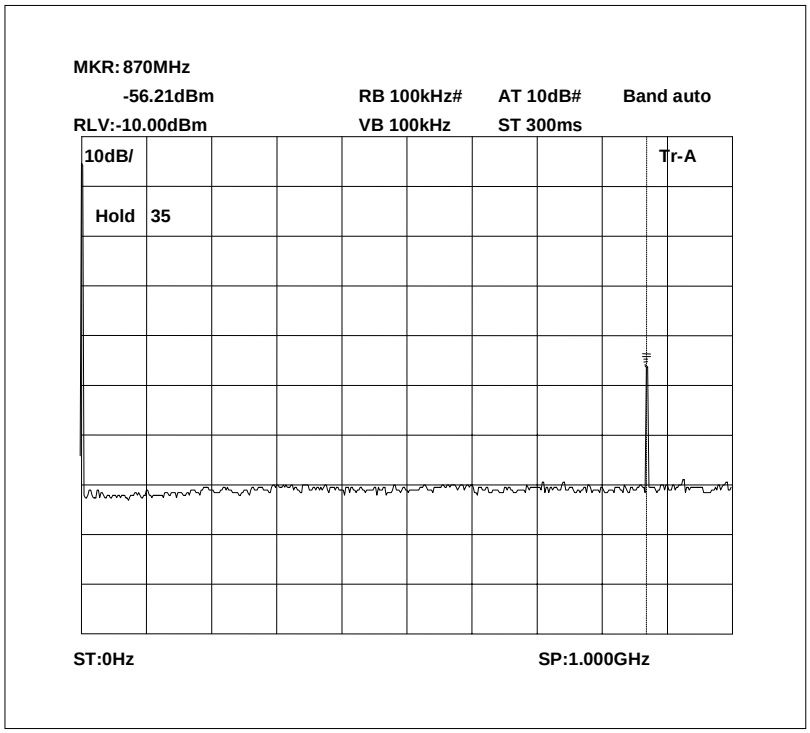


Radiated emissions 861.5MHz 6 – 9.4GHz

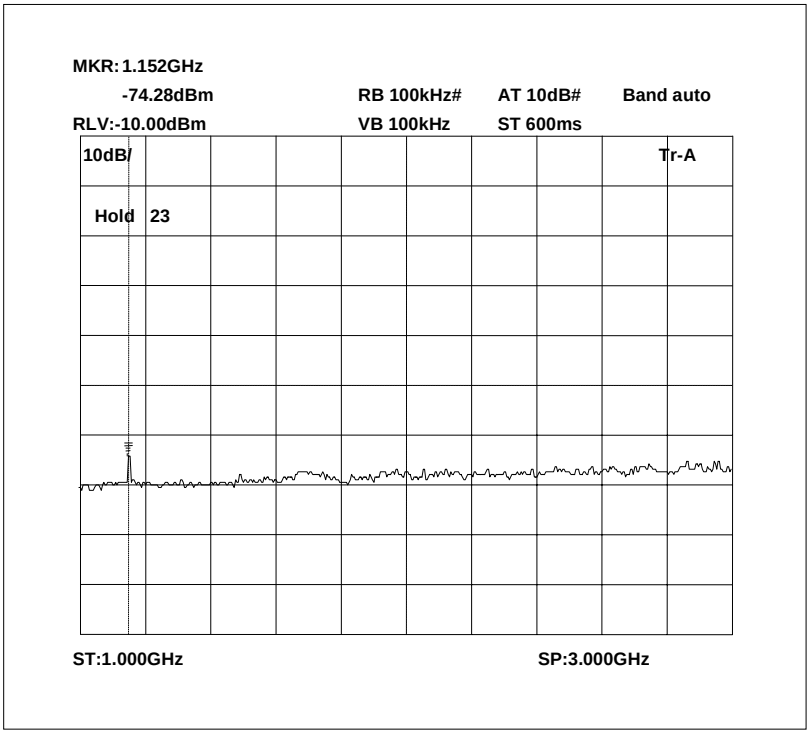


The above test results show that there were no emissions within 20dBs of the –13dBm limit.

Radiated emissions 869.0 MHz 0 – 1GHz

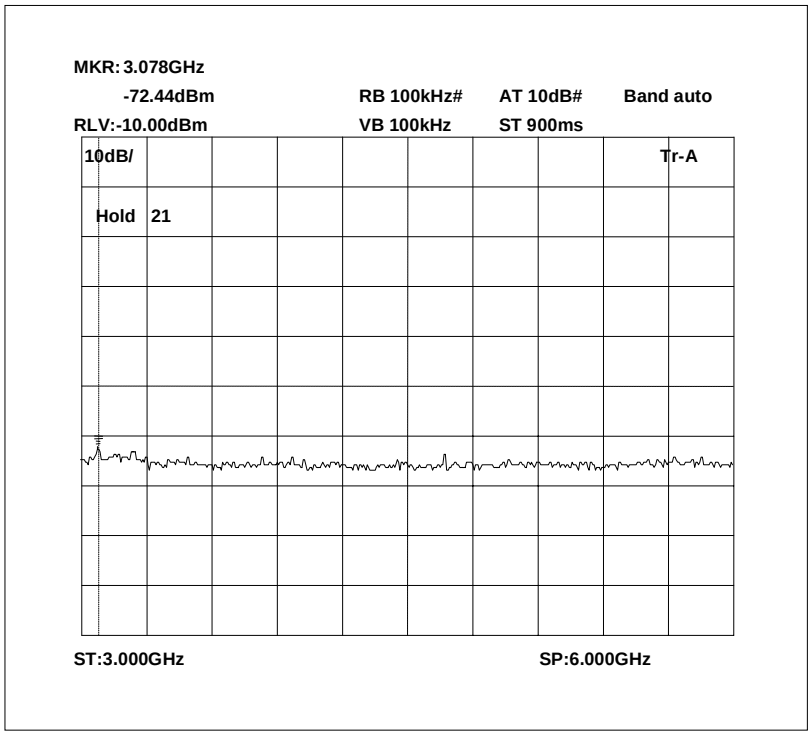


Radiated emissions 869.0 MHz 1 – 3GHz

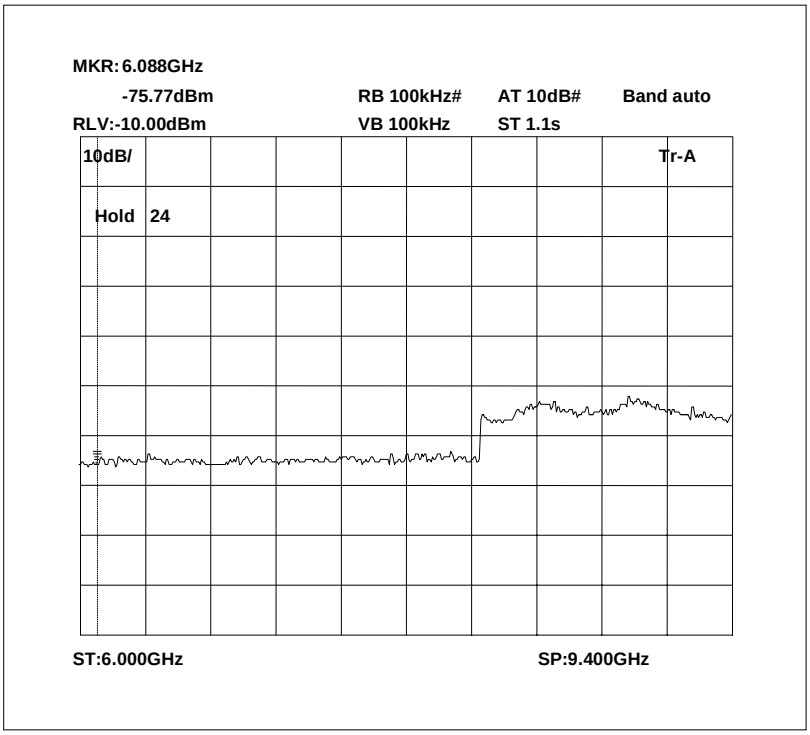


The above test results show that there were no emissions within 20dBs of the –13dBm limit.

Radiated emissions 869.0 MHz 3 – 6GHz

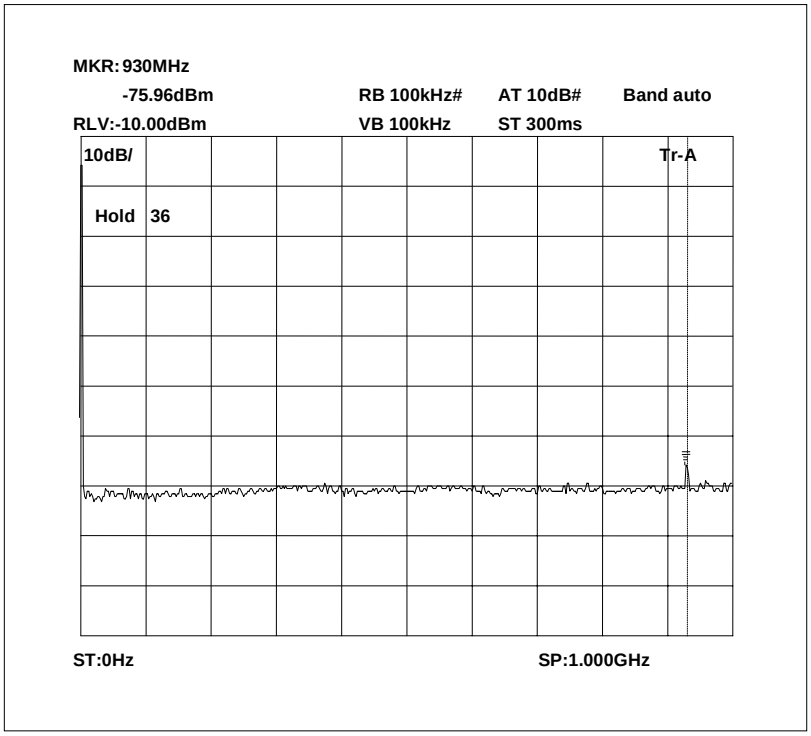


Radiated emissions 869.0 MHz 6 – 9.4GHz

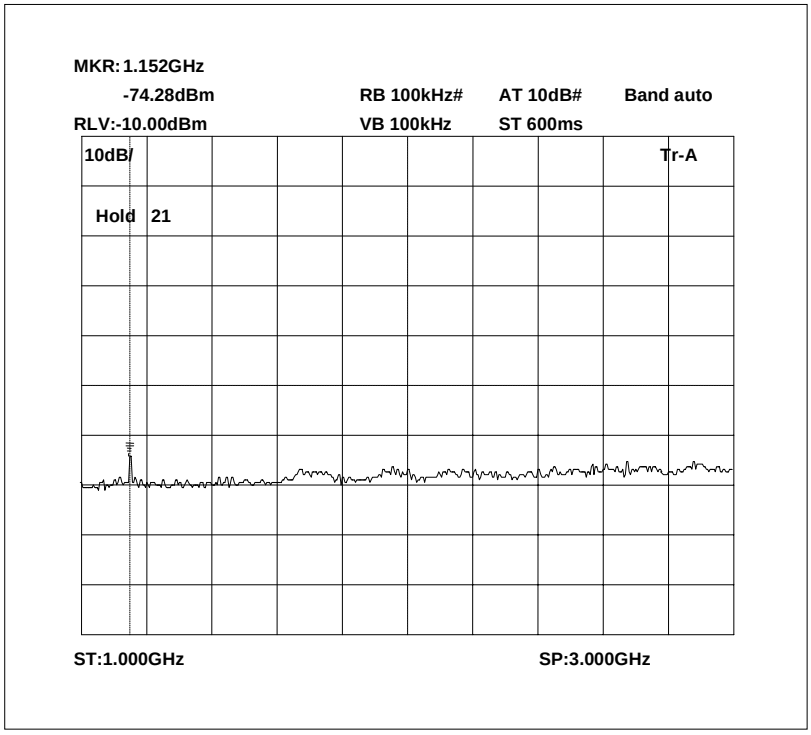


The above test results show that there were no emissions within 20dBs of the –13dBm limit.

Radiated emissions 929.0MHz 0 – 1GHz

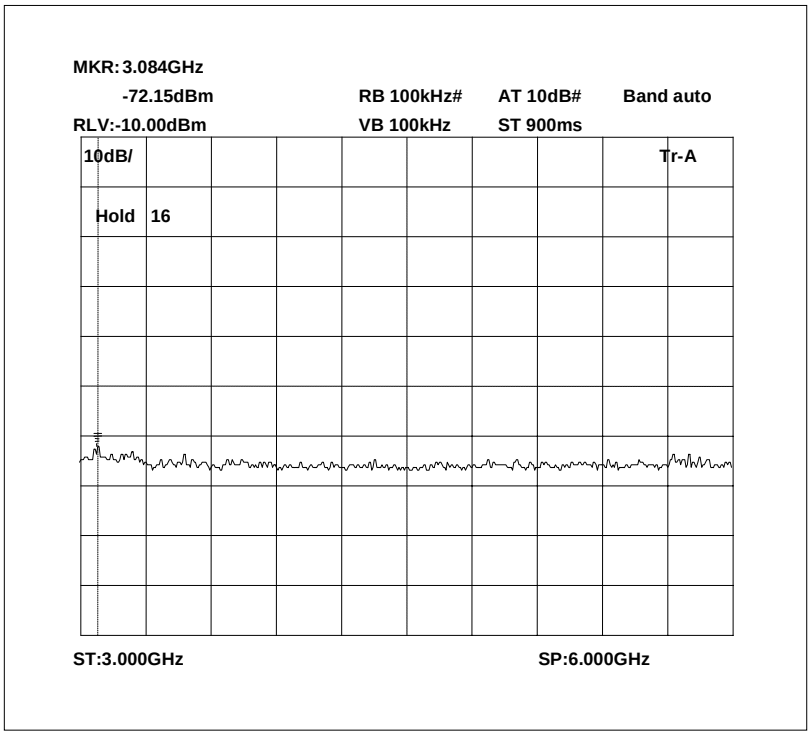


Radiated emissions 929.0MHz 1 – 3GHz

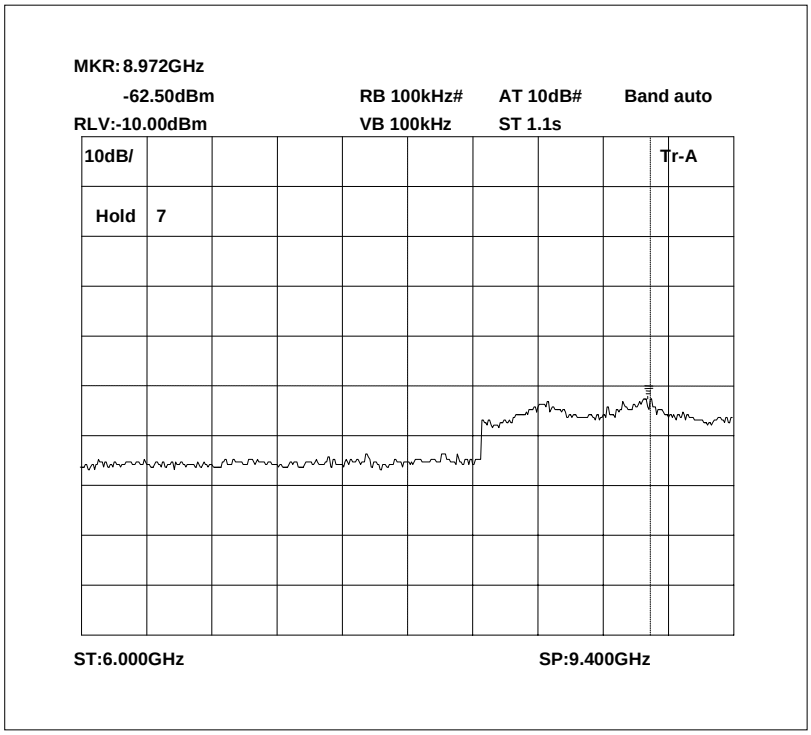


The above test results show that there were no emissions within 20dBs of the –13dBm limit.

Radiated emissions 929.0MHz 3 – 6GHz

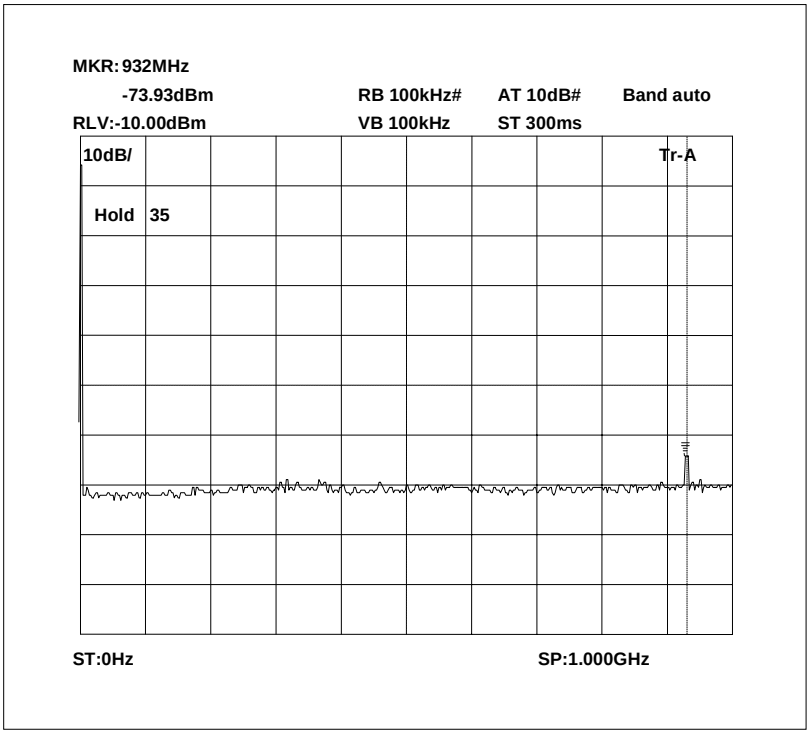


Radiated emissions 929.0MHz 6 – 9.4GHz

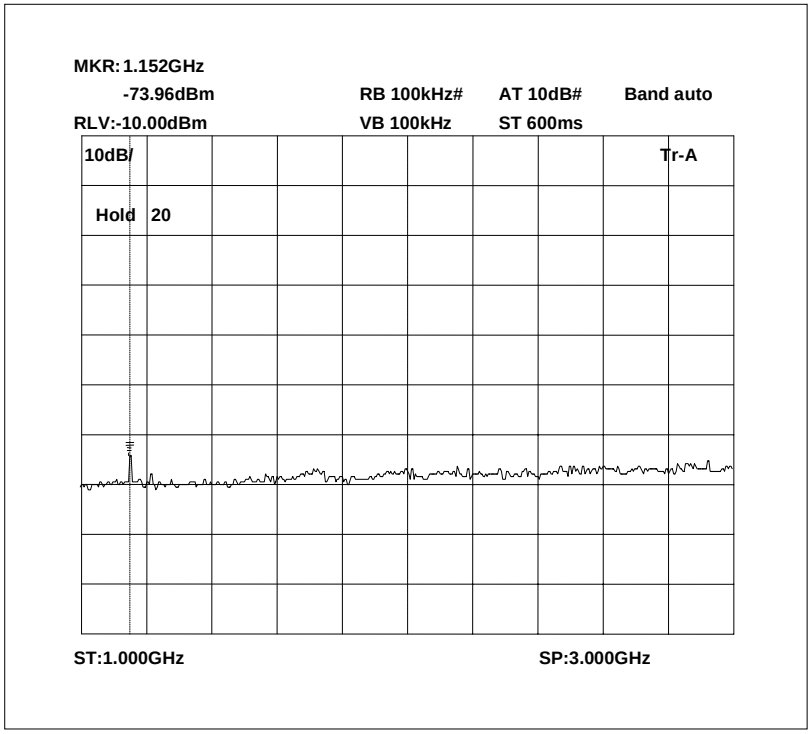


The above test results show that there were no emissions within 20dBs of the –13dBm limit.

Radiated emissions 929.5 MHz 0 – 1GHz

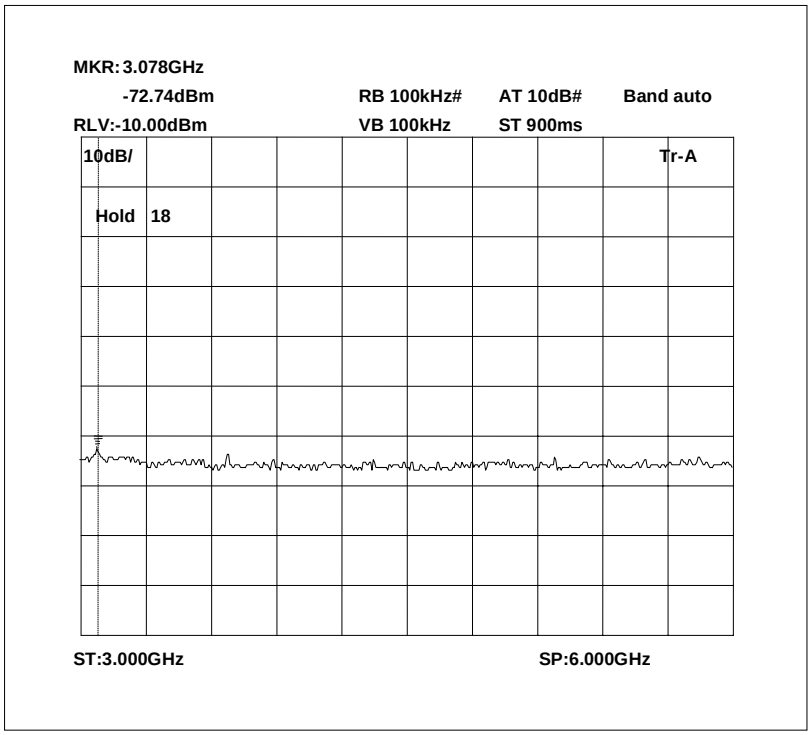


Radiated emissions 929.5 MHz 1 – 3GHz

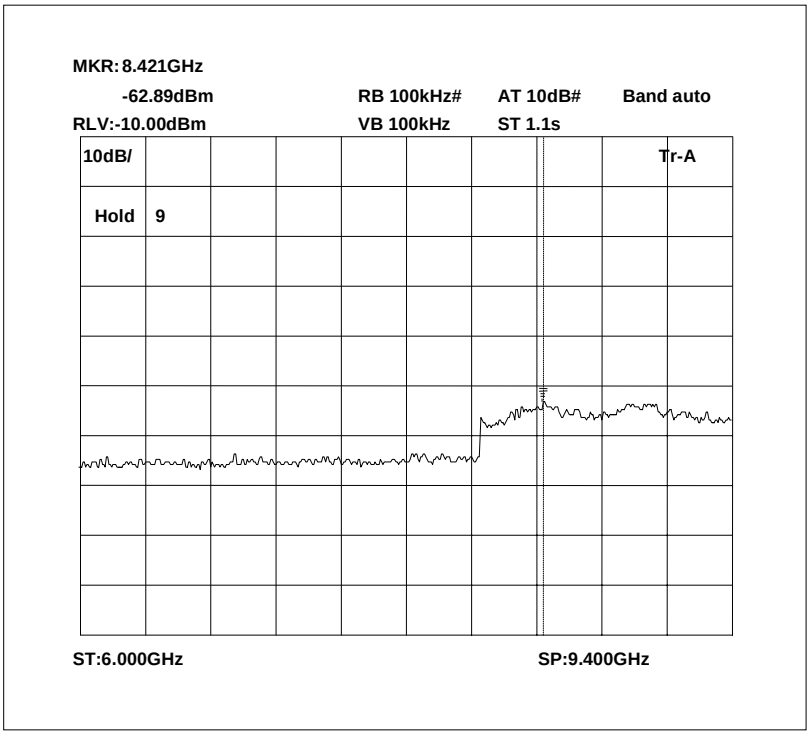


The above test results show that there were no emissions within 20dBs of the –13dBm limit.

Radiated emissions 929.5 MHz 3 – 6GHz

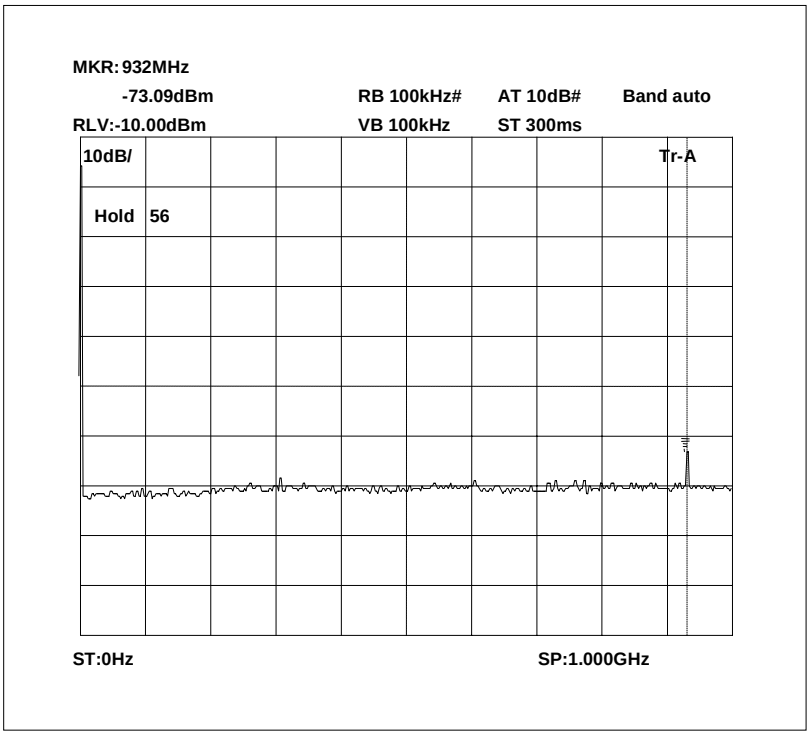


Radiated emissions 929.5 MHz 6 – 9.4GHz

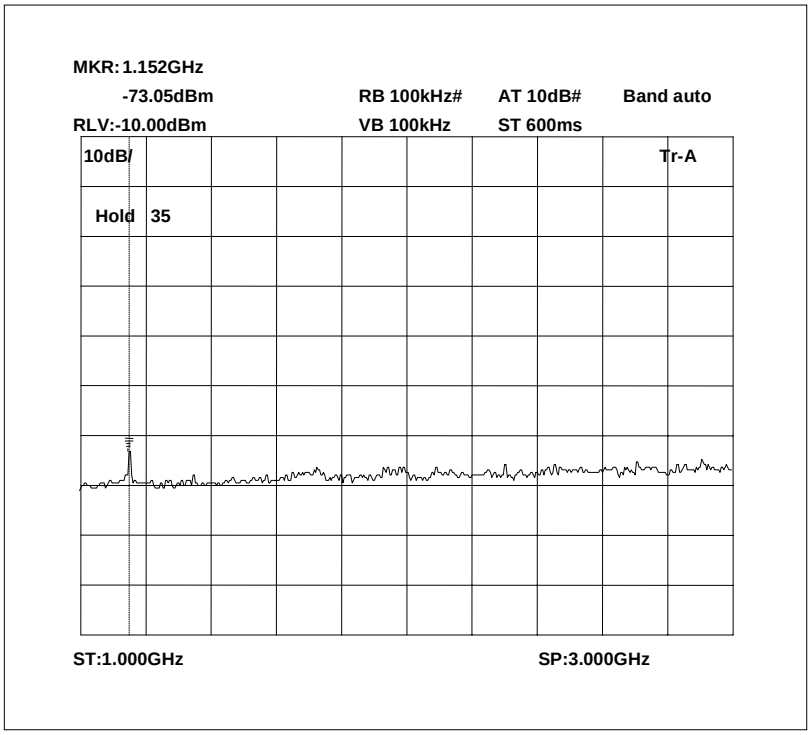


The above test results show that there were no emissions within 20dBs of the –13dBm limit.

Radiated emissions 930.0 MHz 0 – 1GHz

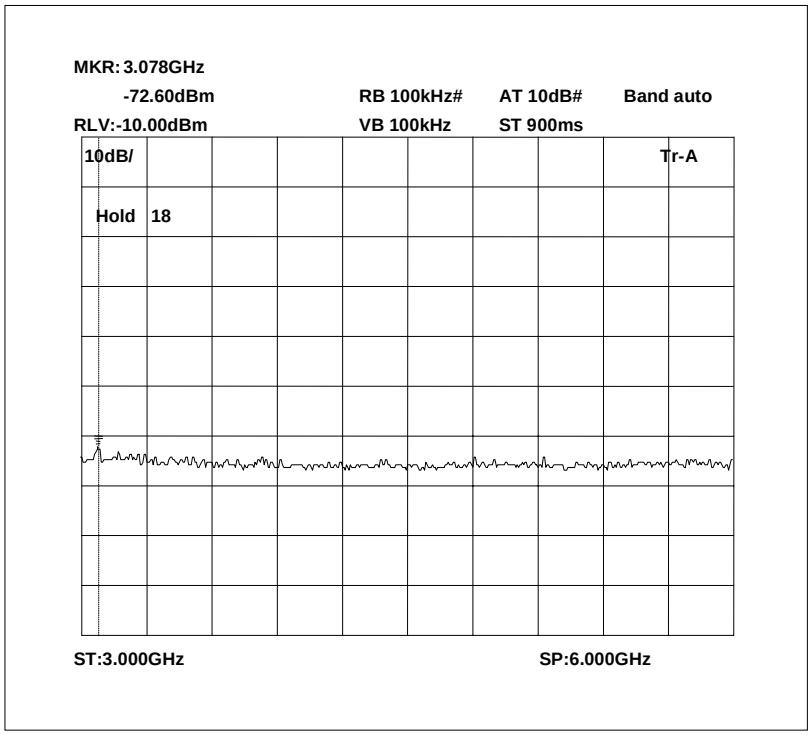


Radiated emissions 930.0 MHz 1 – 3GHz

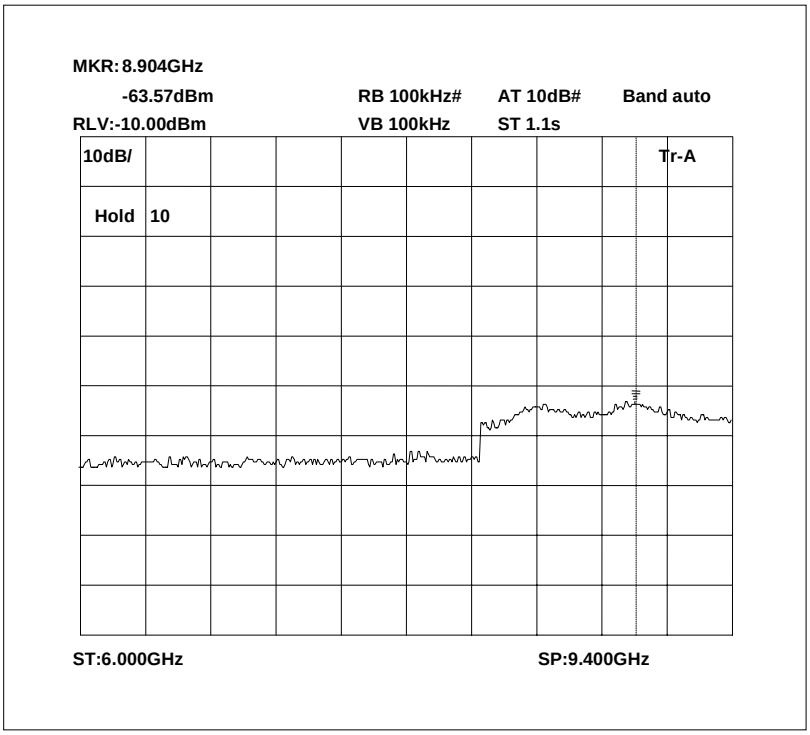


The above test results show that there were no emissions within 20dBs of the –13dBm limit.

Radiated emissions 930.0 MHz 3 – 6GHz



Radiated emissions 930.0 MHz 6 – 9.4GHz



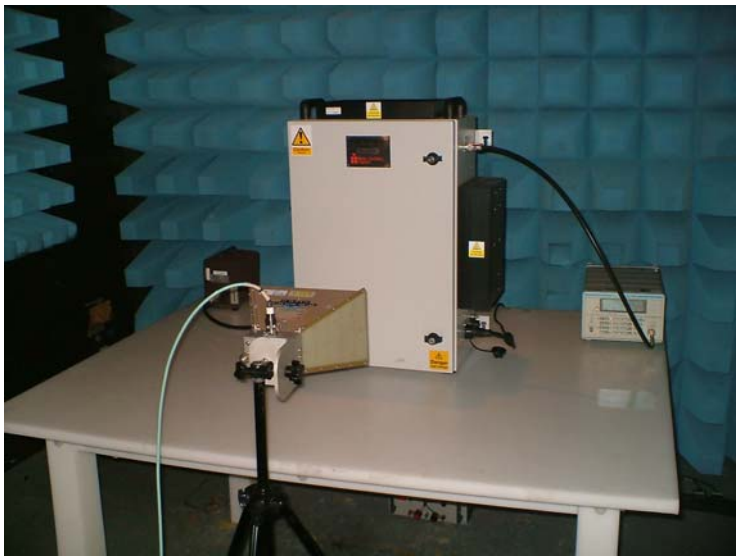
The above test results show that there were no emissions within 20dBs of the –13dBm limit

ANNEX A

PHOTOGRAPHS

PHOTOGRAPH No. 1 **TEST SETUP**

PHOTOGRAPH No. 2 **TEST SETUP**



ANNEX B

APPLICANT'S SUBMISSION OF DOCUMENTATION LIST

APPLICANT'S SUBMISSION OF DOCUMENTATION LIST

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

ANNEX C

EQUIPMENT CALIBRATION

EQUIPMENT CALIBRATION

UH006	3m Range ERP CAL	TRL	01/03/05	12	01/03/06
UH028	Log Periodic Ant	Schwarbeck	28/04/05	24	28/04/07
UH029	Bicone Antenna	Schwarbeck	27/04/05	24	27/04/07
UH041	Multimeter	AVOmeter	14/12/04	12	14/12/05
UH120	Spectrum Analyser	Marconi	15/03/05	12	15/03/06
UH122	Oscilloscope	Tektronix	07/06/05	24	07/06/07
UH162	ERP Cable Cal	TRL	23/05/05	12	23/05/06
UH179	Power Sensor	Marconi	14/12/04	12	14/12/05
UH228	Power Sensor	Marconi	17/01/05	12	17/01/06
UH253	1m Cable N type	TRL	10/01/05	12	10/01/06
UH254	1m Cable N type	TRL	10/01/05	12	10/01/06
UH265	Notch filer	Telonic	24/06/05	12	24/06/06
L005	CMTA	R&S	22/10/04	12	22/10/05
L007	Loop Antenna	R&S	29/03/05	24	29/03/07
L138	1-18GHz Horn	EMCO	15/04/05	24	15/04/07
L139	1-18GHz Horn	EMCO	03/05/05	24	03/05/07
L176	Signal Generator	Marconi	31/01/05	12	31/01/06
L193	Bicone Antenna	Chase	12/10/03	24	12/10/05
L203	Log Periodic Ant	Chase	21/10/03	24	21/10/05
L254	Signal Generator	Marconi	13/12/04	12	13/12/05
L280	18GHz Cable	Rosenberger	10/01/05	12	10/01/06
L343	CCIR Noise Filter	TRL	07/06/05	12	07/06/06
L426	Temperature Indicator	Fluke	14/12/04	12	14/12/05
L479	Analyser	Anritsu	05/10/04	12	05/10/05
L552	Signal Generator	Agilent	25/04/05	12	25/04/06