



TEST REPORT NO: RU1181/6240
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ISSUE NO: 1
FCC ID: NEO50-1225Series

**REPORT ON THE CERTIFICATION TESTING OF A
AERIAL FACILITIES LIMITED
55-122501 CELL ENHANCER
WITH RESPECT TO
THE FCC RULES CFR 47, PART 90 Subpart I
PRIVATE LAND MOBILE REPEATER.**

TEST DATE: 12th April 2005 – 14th April 2005

TESTED BY: J CHARTERS
APPROVED BY: P GREEN
PRODUCT MANAGER
EMC
DATE: 5th January 2006.....

Distribution:

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

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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: NEO50-1225Series
PURPOSE OF TEST: Certification
TEST SPECIFICATION: FCC RULES CFR 47, Part 90 Subpart I
TEST RESULT: Compliant to Specification
EQUIPMENT UNDER TEST: 55-122501 Cell Enhancer
EQUIPMENT TYPE: Private Land Mobile Repeater
MAXIMUM GAIN: Uplink = 98.35 dB
Downlink = 98.90 dB
MAXIMUM INPUT: Uplink = -78.5 dBm
Downlink = -73.0 dBm
MAXIMUM OUTPUT: Uplink = 19.85 dBm
Downlink = 25.90 dBm (radiating cable system)
ANTENNA TYPE: Not applicable
CHANNEL SPACING: Uplink 12.5 kHz
Downlink 12.5 kHz
NUMBER OF CHANNELS: Uplink = 6
Downlink = 6
FREQUENCY GENERATION: N/A
MODULATION TYPE: F3E
POWER SOURCE(s): +110Vac
TEST DATE(s): 12th April 2005 – 14th April 2005
ORDER No(s): 30090
APPLICANT: Aerial Facilities Limited
ADDRESS: Aerial House
Asheridge Road
Chesham
Buckinghamshire
HP5 1TU
United Kingdom

TESTED BY: _____ J CHARTERS

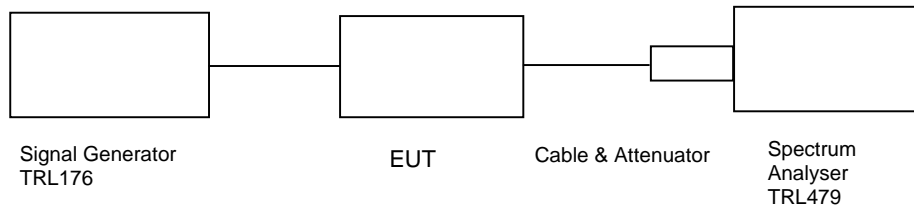
APPROVED BY: _____ P GREEN
PRODUCT
MANAGER EMC

COMPLIANCE TESTS

AMPLIFIER GAIN – CONDUCTED – PART 2.1046 – UPLINK

Ambient temperature = 25°C
 Relative humidity = 37%
 Supply voltage = +110Vac
 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 10dB input level increase dBm
162.0 MHz	-75.0	26.6	-6.25	95.35	85.56
163.5 MHz	-78.5	26.6	-6.75	98.35	89.81
165.0 MHz	-75.0	26.6	-6.39	95.21	85.57

Notes:

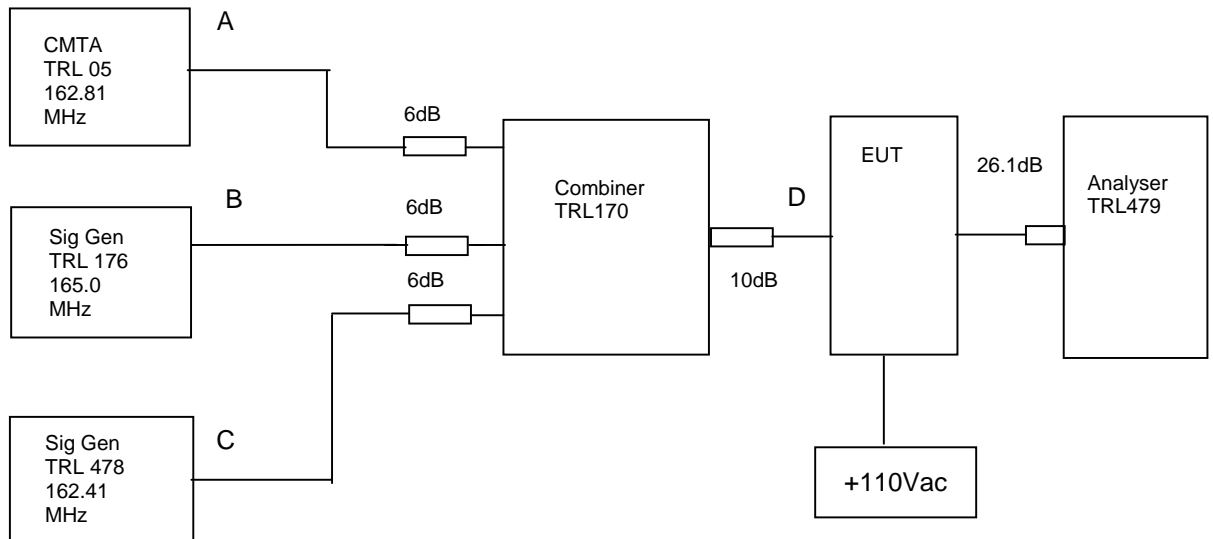
1. The level of the signal generator takes into consideration the loss from the cable.
2. The signal generator input was increased by 20dBs and the level of the output signal remeasured

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 = 20°C
 Relative humidity = 46%
 Supply voltage = +110Vac

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 10dBm above the maximum input of -75.0 dBm. The cable and attenuator loss between the EUT and the spectrum analyser was 26.1dB.

RF Input Frequency (MHz)			Highest Intermodulation Product Level (dBm)	Limit (dBm)
162.81	165.00	162.41	-27.67 dBm @ 164.600 MHz	-13
162.81	165.00	162.41	-18.14 dBm @ 163.200MHz (note 1)	-13

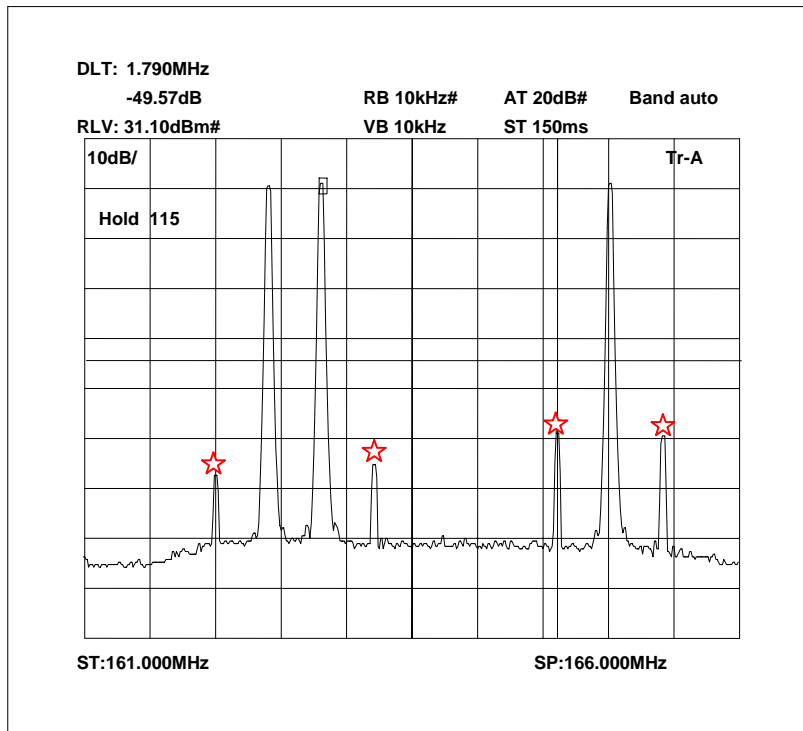
Note 1 6 active channels, 3 as above 3 channels set to frequencies where intermodulation products occur

Sweep data is shown on the next page:

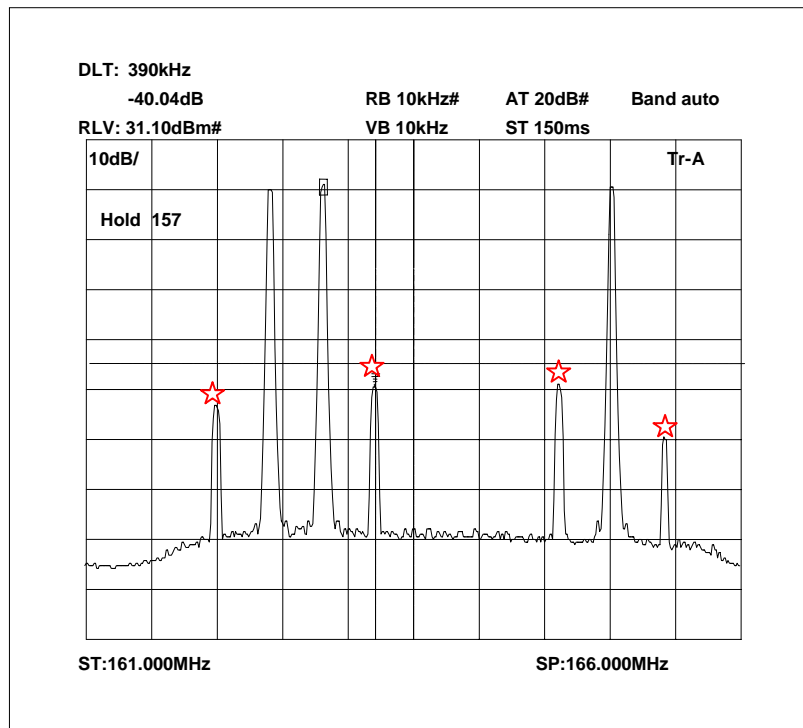
Test equipment used for intermodulation test

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	119562/02	254	X
CMTA	ROHDE & SCHWARZ	CMTA52	894715/033	05	X
SIGNAL GENERATOR	MARCONI	2042	119388/080	176	X
COMBINER	ELCOM	RC-4-50	N/A	170	X

Intermodulation Inband



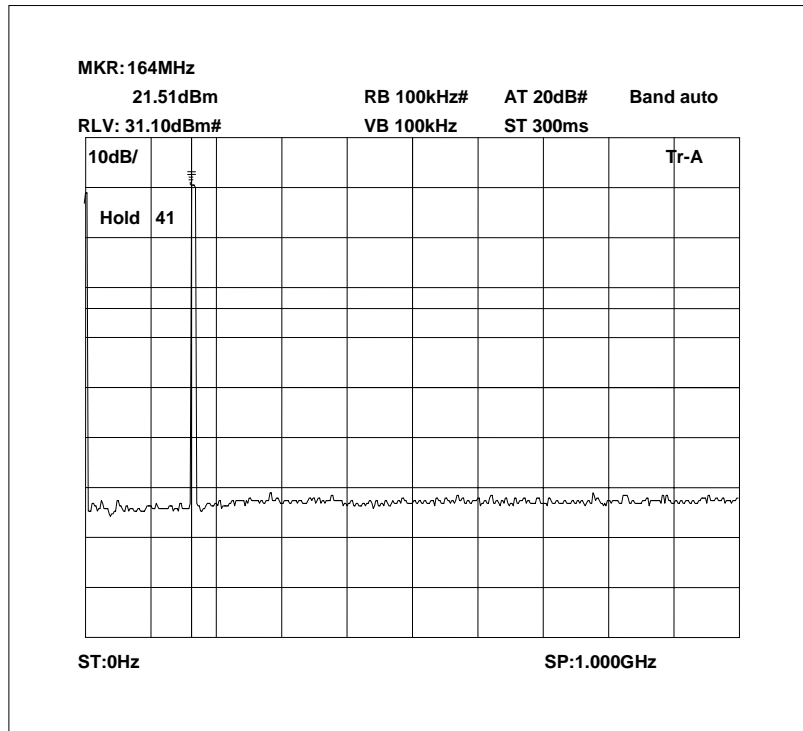
3 active channels, frequencies as per setup diagram above



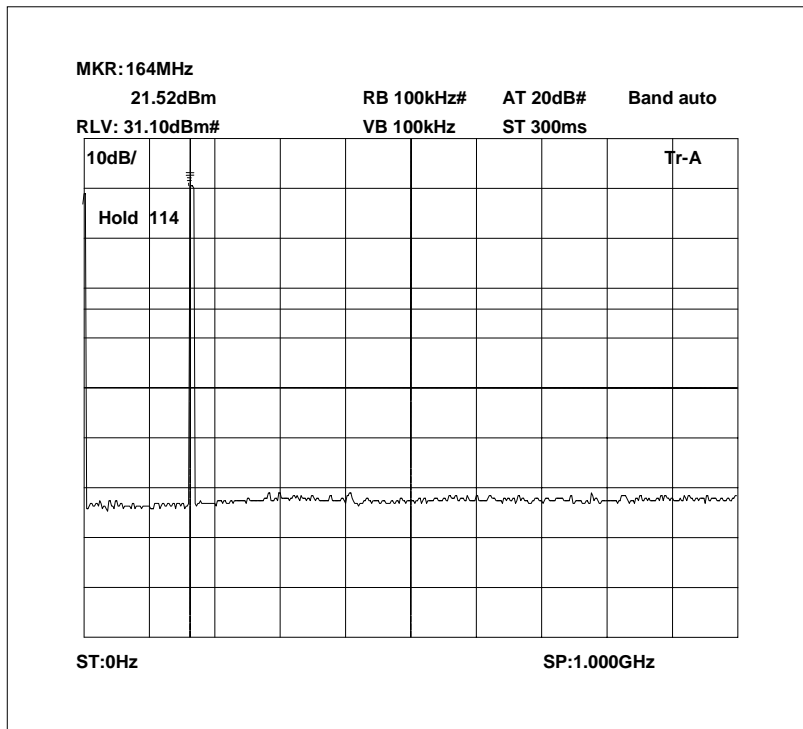
6 active channels, 3 as per above, 3 channels set to frequencies where intermodulation products occur

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

Intermodulation Wideband



3 active channels



6 active channels

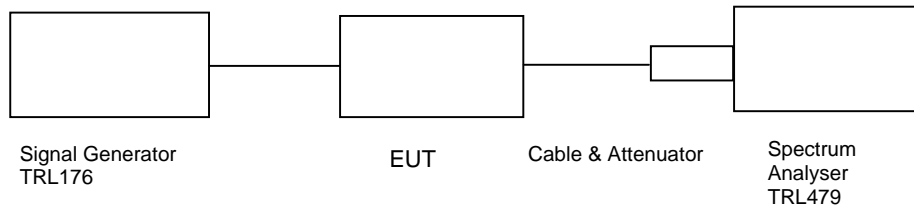
The above plots show that there are no products outside the bands.

TRANSMITTER TESTS

AMPLIFIER MODULATED CHANNEL TEST – CONDUCTED – Part 2.1049– UPLINK

Ambient temperature = 24°C
 Relative humidity = 37%
 Supply voltage = +110Vac
 Channel number = See test results

Radio Laboratory



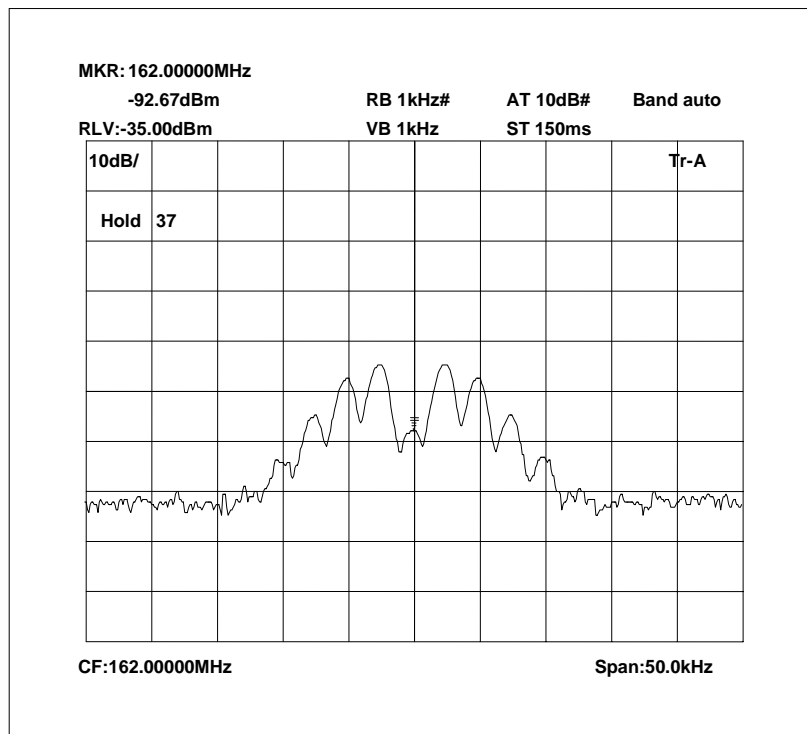
This test was performed to show that the amplifier does not alter the input signal in any way. The input signal was set to the maximum input level (-75dBm) and modulated with a 2500Hz tone. The plots show the signal measured at the signal generator and the signal measured at the output of the EUT.

Note: The cables and attenuators had the following losses.

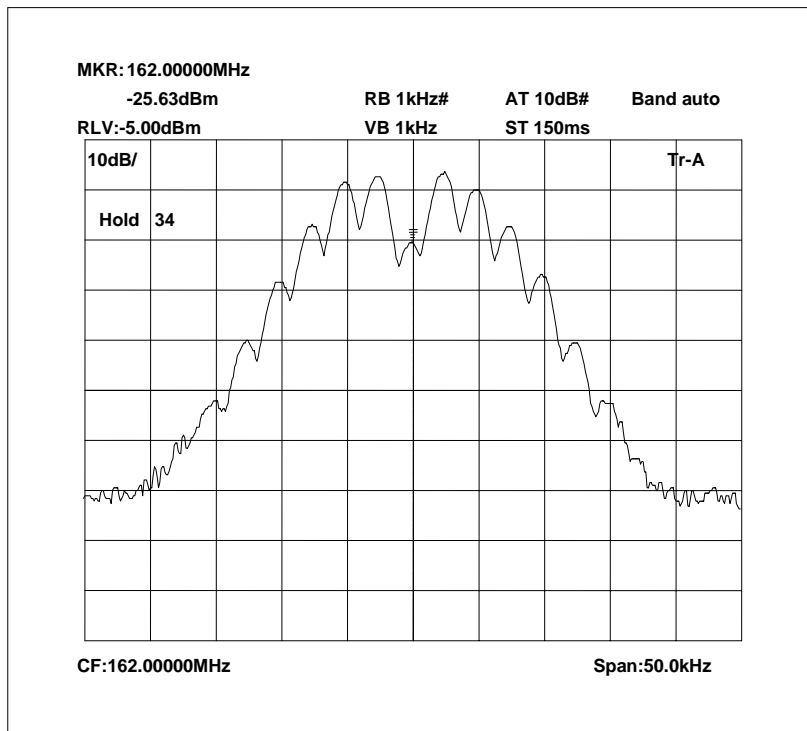
1. Cable and attenuator between EUT and spectrum analyser 26.1dB
2. Cable between signal generator and EUT 0.5dB

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

162.0 MHz Signal Generator, deviation set to 5kHz

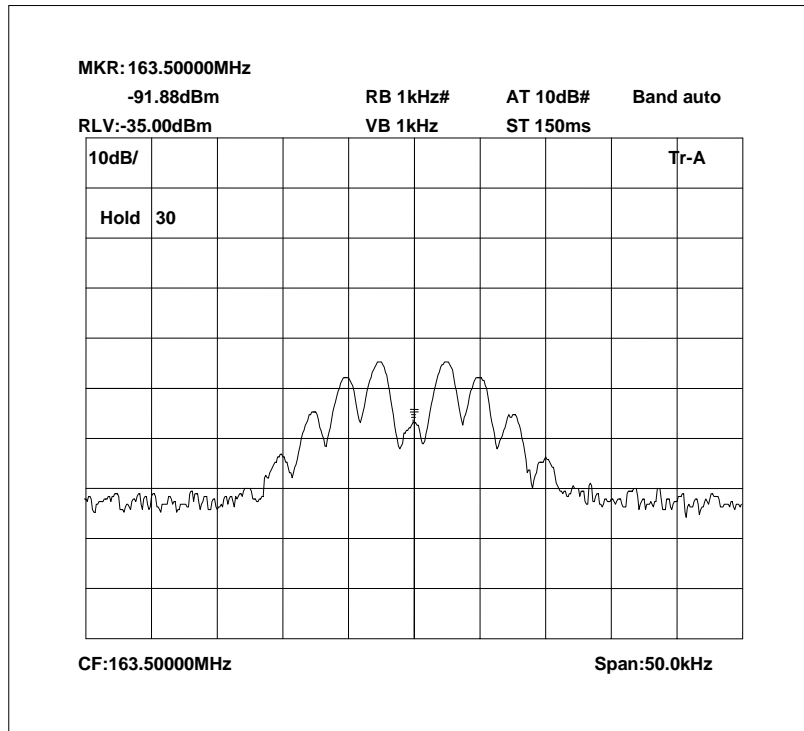


172.0 MHz Signal Generator and EUT, deviation set to 5kHz

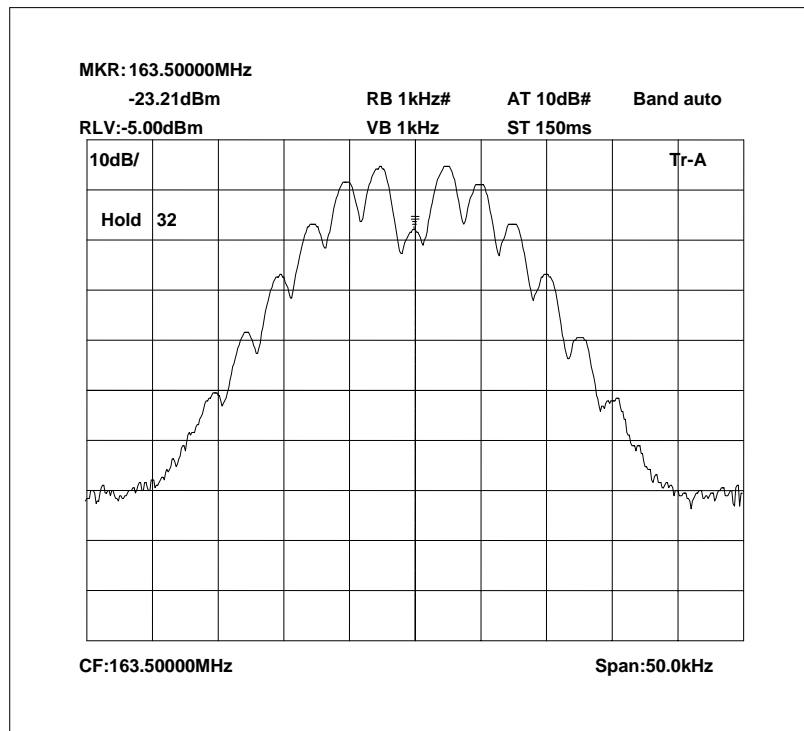


The above plots depicting the output waveshape show no measurable distortion visible when compared to the input signal.

163.5 MHz Signal Generator, deviation set to 5kHz

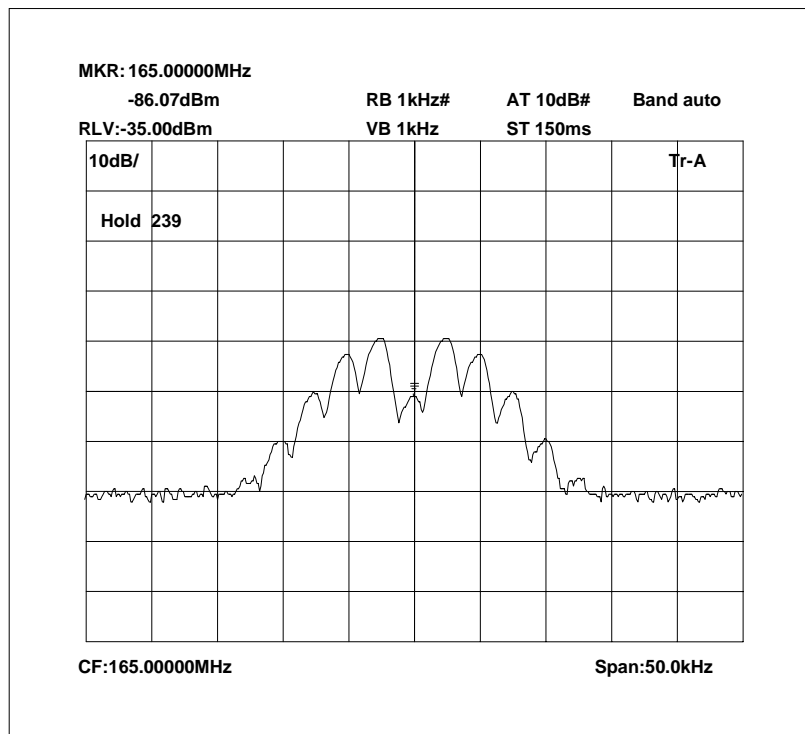


163.5 MHz Signal Generator and EUT, deviation set to 5kHz

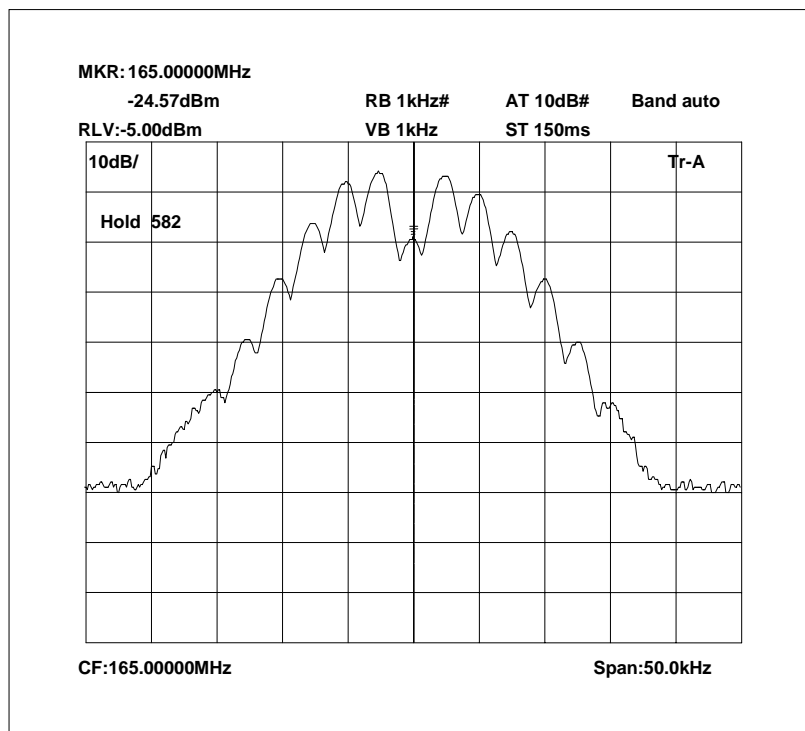


The above plots depicting the output waveshape show no measurable distortion visible when compared to the input signal.

165.0 MHz Signal Generator, deviation set to 5kHz



165.0 MHz Signal Generator deviation and EUT, set to 5kHz



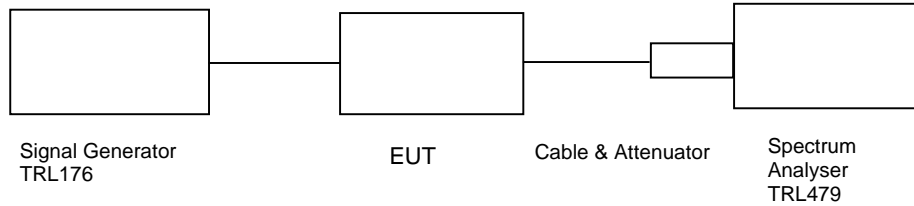
The above plots depicting the output waveshape show no measurable distortion visible when compared to the input signal.

TRANSMITTER TESTS

AMPLIFIER SPURIOUS EMISSIONS – CONDUCTED – Part 2.1053 – UPLINK

Ambient temperature = 24°C
 Relative humidity = 36%
 Supply voltage = +110Vac

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 $43 + 10 \log P_{dB}$

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

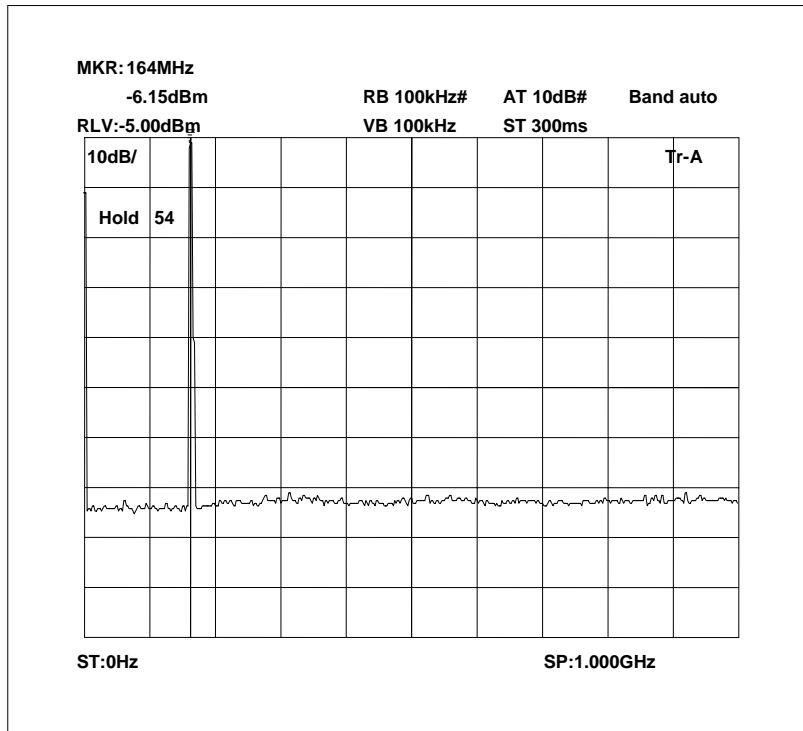
RESULTS

FREQUENCY RANGE	FREQ. (MHz)	MEASURED LEVEL (dBm)	ATTENUATOR & CABLE LOSSES (dB)	EMISSION LEVEL (dBm)	LIMIT (dBm)
0 – 2GHz	No Significant Emissions				-13

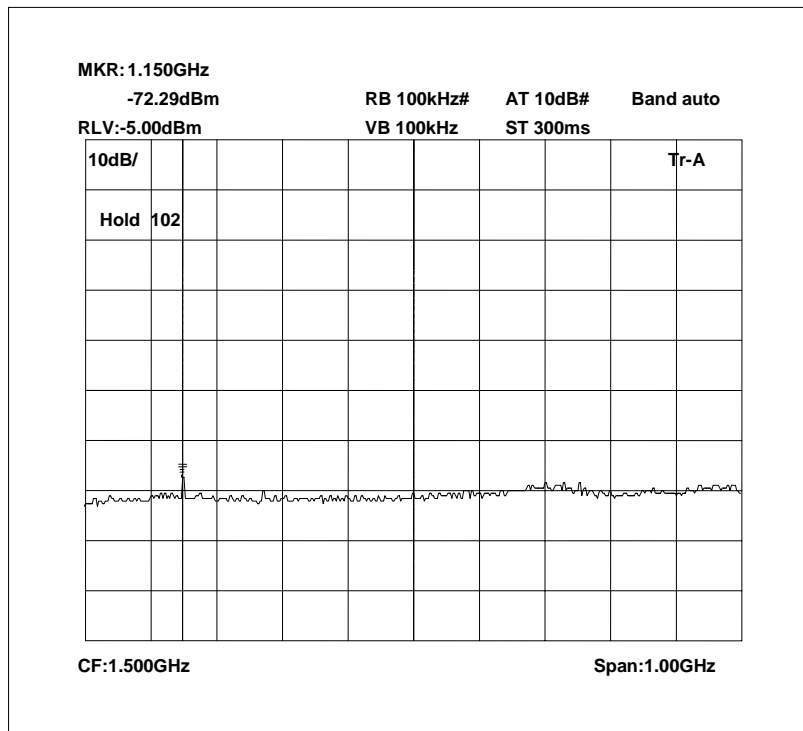
The test equipment used for the Transmitter Conducted Emissions:

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

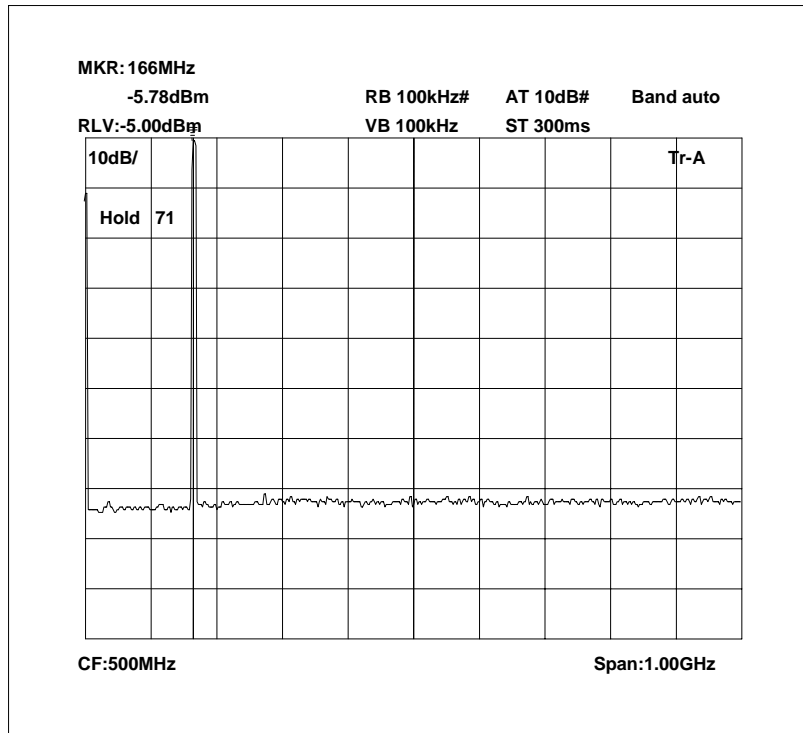
Conducted emissions 162.0 MHz 0 – 1GHz



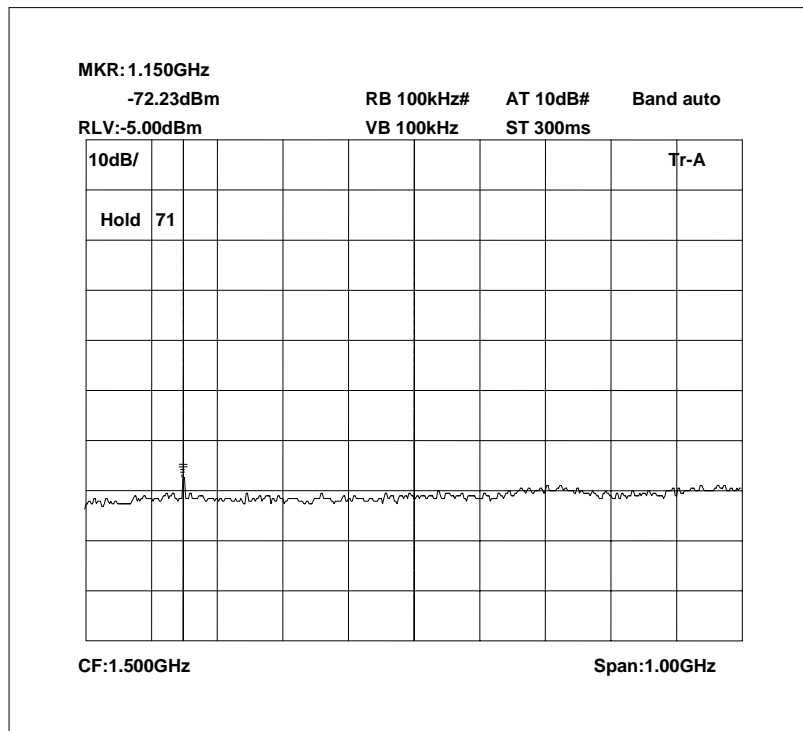
Conducted emissions 162.0 MHz 1 – 2GHz



Conducted emissions 165.0 MHz 0 – 1GHz



Conducted emissions 165.0 MHz 1 – 2GHz

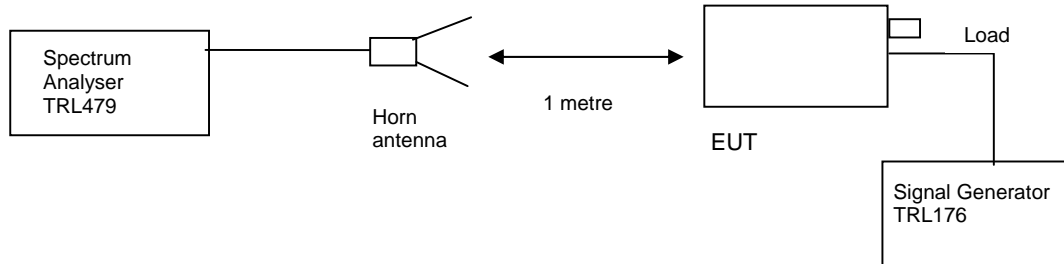


TRANSMITTER TESTS

AMPLIFIER SPURIOUS EMISSIONS – RADIATED – Part 2.1053– UPLINK

Ambient temperature = 17°C
 Relative humidity = 49%
 Conditions = OATS
 Supply voltage = +110Vac
 Supply Frequency = 60Hz

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 $43 + 10 \log P_{dB}$

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

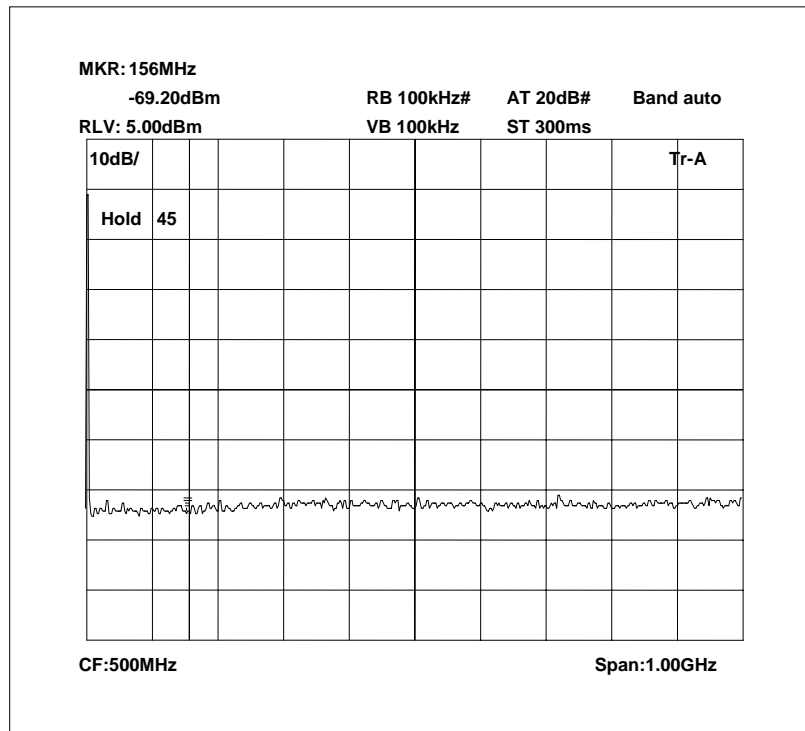
RESULTS

FREQUENCY RANGE	FREQ. (MHz)	MEAS. Rx. (dBµV)	CABLE LOSS (dB)	ANT FACTOR	FIELD STRENGTH (dBµV/m)	CALCULATED EIRP (dBm)	LIMIT (dBm)
0 – 2 GHz	No Significant Emissions						-13

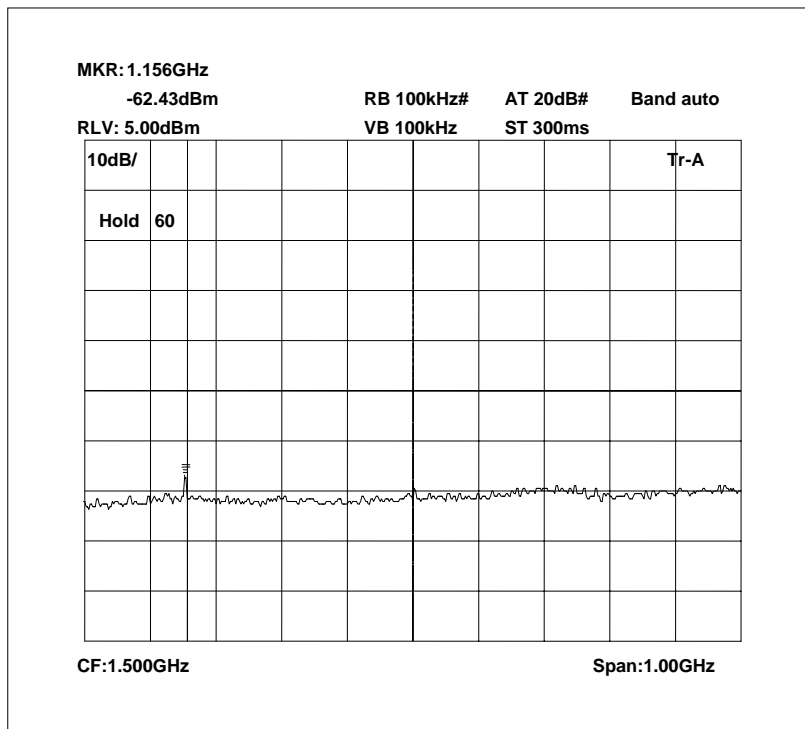
The test equipment used for the Transmitter Spurious Emissions:

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 162.0 MHz 0 – 1GHz

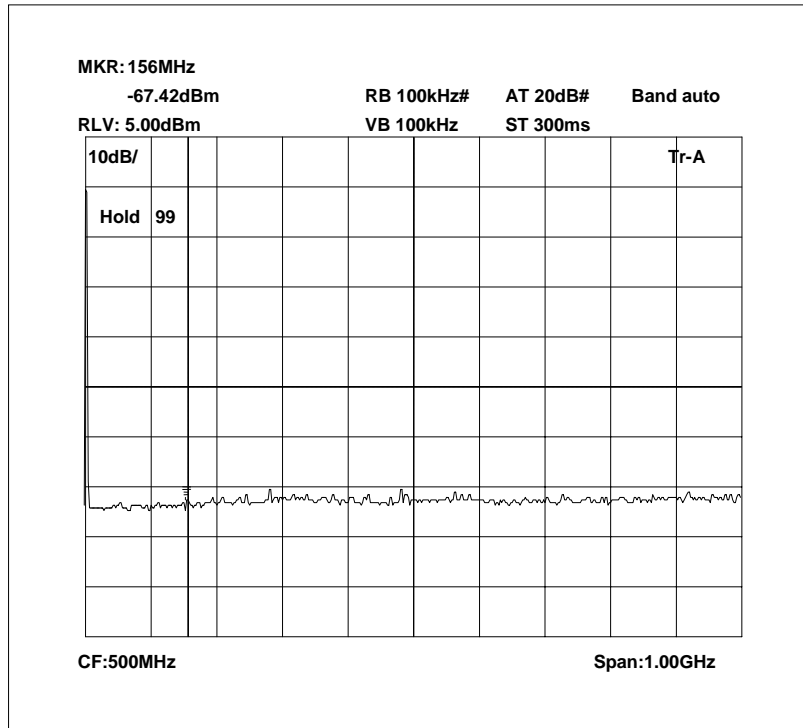


Radiated emissions 162.0 MHz 1 – 2GHz

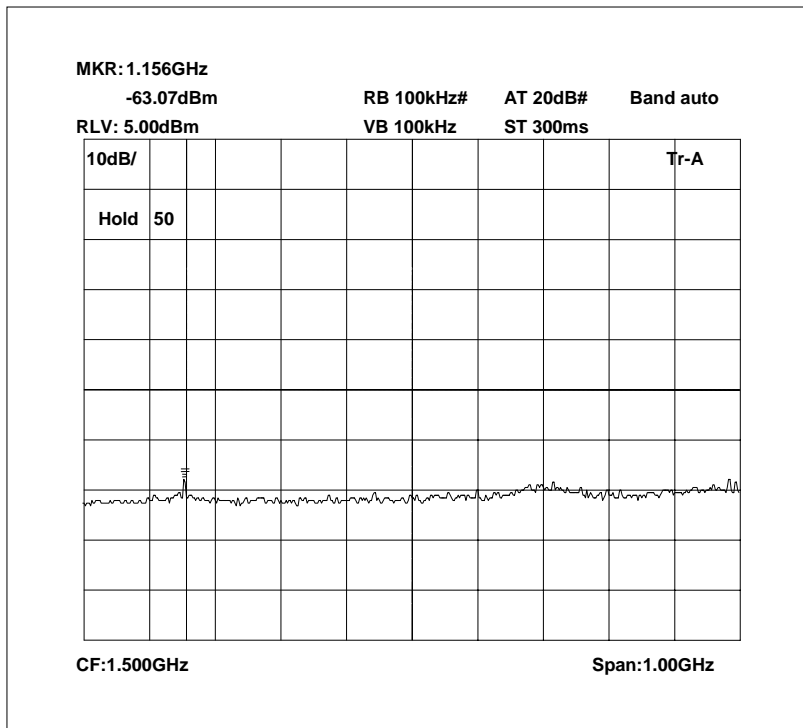


The above test results show that there were no emissions within 20dBs of the -13dBm limit.

Radiated emissions 163.5 MHz 0 – 1GHz

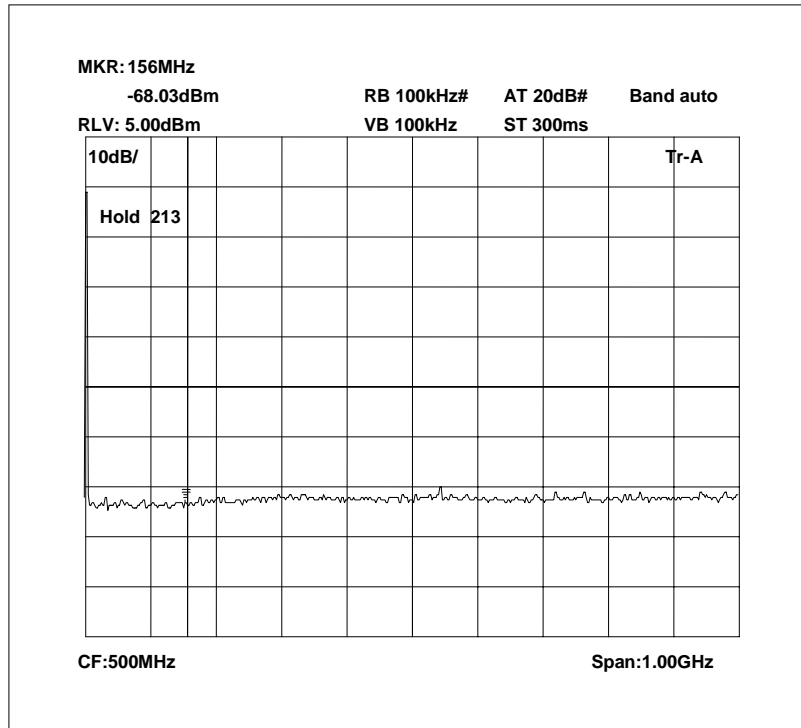


Radiated emissions 163.5 MHz 1 – 2GHz

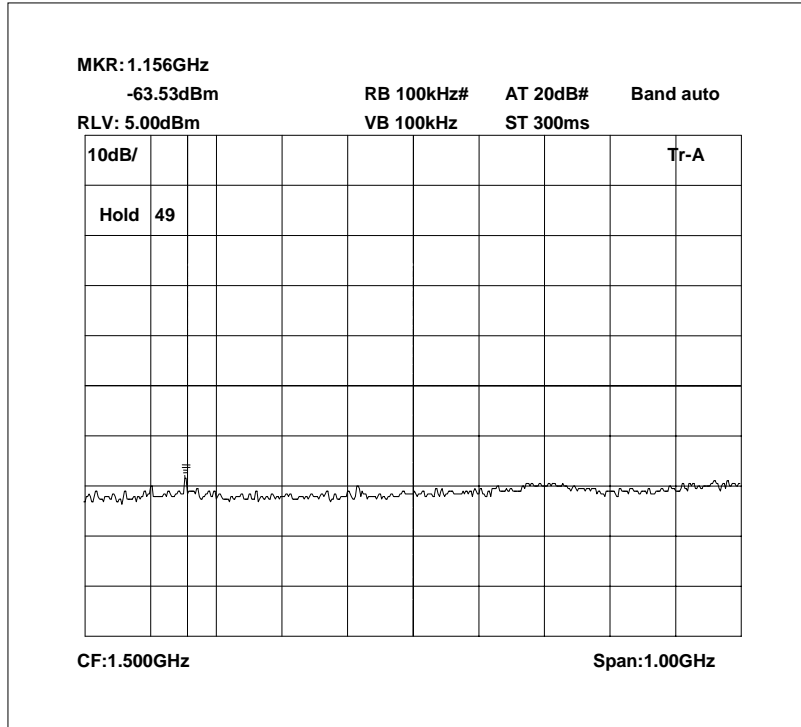


The above test results show that there were no emissions within 20dBs of the -13dBm limit.

Radiated emissions 165.0 MHz 0 – 1GHz

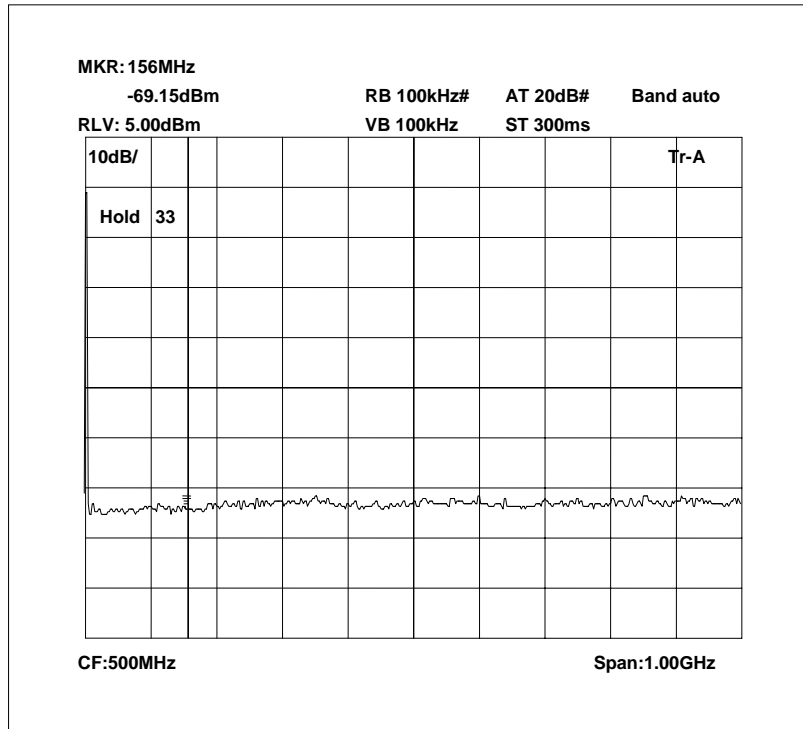


Radiated emissions 165.0 MHz 1 – 2GHz

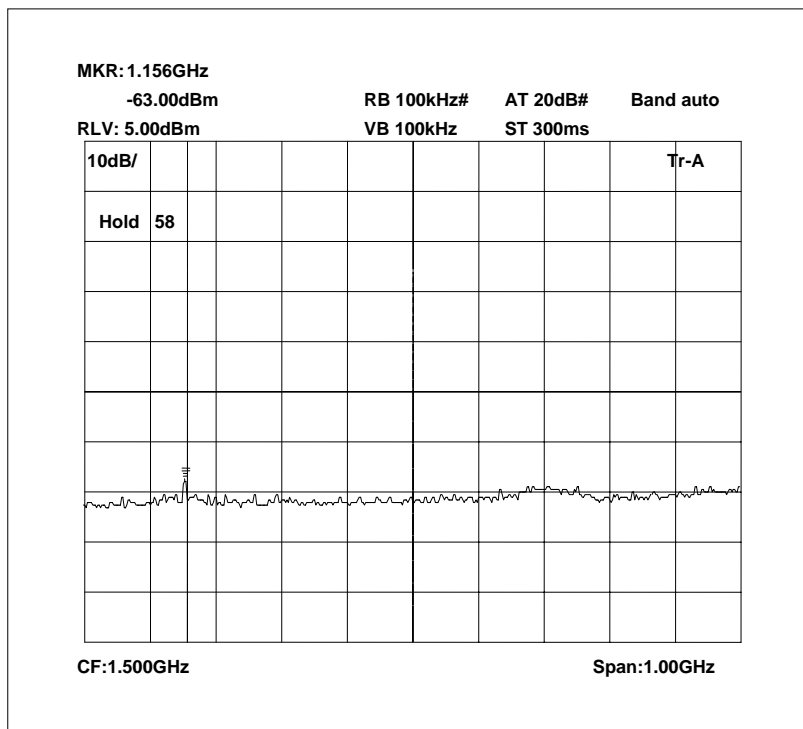


The above test results show that there were no emissions within 20dBs of the -13dBm limit.

Radiated emissions no input signal 0 – 1GHz



Radiated emissions no input signal 1 – 2GHz

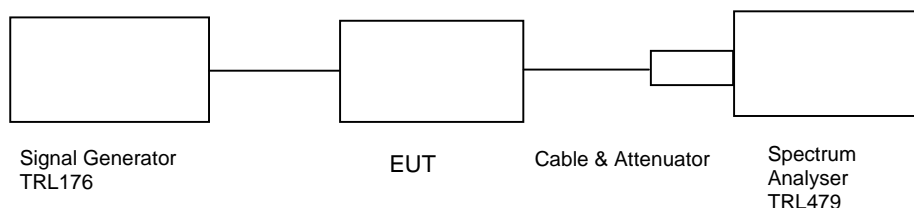


The above test results show that there were no emissions within 20dBs of the -13dBm limit.

AMPLIFIER GAIN – CONDUCTED – PART 2.1046 – DOWNLINK

Ambient temperature = 25°C
 Relative humidity = 37%
 Supply voltage = +110Vac
 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 10dB input level increase dBm
167.0	-70	26.6	-3.02	93.58	83.72
169.5	-73	26.6	-0.07	99.53	89.12
172.0	-71	26.6	-0.98	96.62	86.83

Notes:

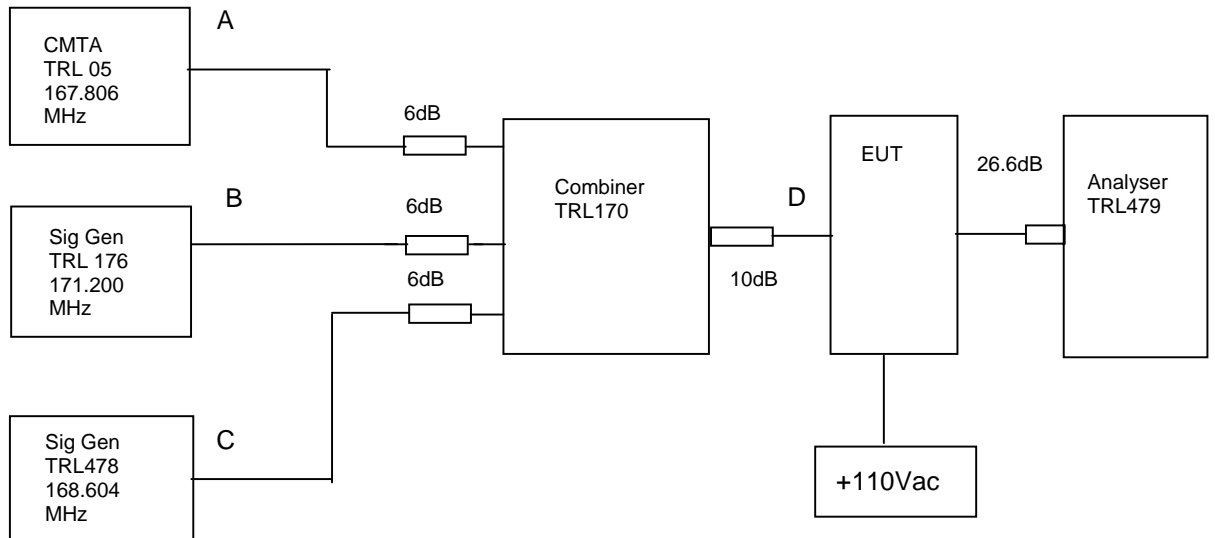
1. The level of the signal generator takes into consideration the loss from the cable.
2. The signal generator input was increased by 20dBs and the level of the output signal remeasured.

TYPE OF EQUIPMENT	MAKER/SUPPLIER	MODEL No	SERIAL No	TRL No	ACTUAL EQUIPMENT USED
SPECTRUM ANALYSER	ANRITSU	MS2665C	MT26089	479	X
ATTENUATOR	BIRD	8304-200	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 = 20°C
 Relative humidity = 46%
 Supply voltage = +110Vac

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 10dBm above the maximum input of -70.0dBm. The cable and attenuators loss between the EUT and the spectrum analyser was 26.6 dB.

RF Input Frequency (MHz)			Highest Intermodulation Product Level (dBm)	Limit (dBm)
167.806	168.604	171.200	-26.3 dBm @ 170.402MHz	-13
167.806	168.604	171.200	-20.87 dBm @ 169.380 MHz (note1)	-13

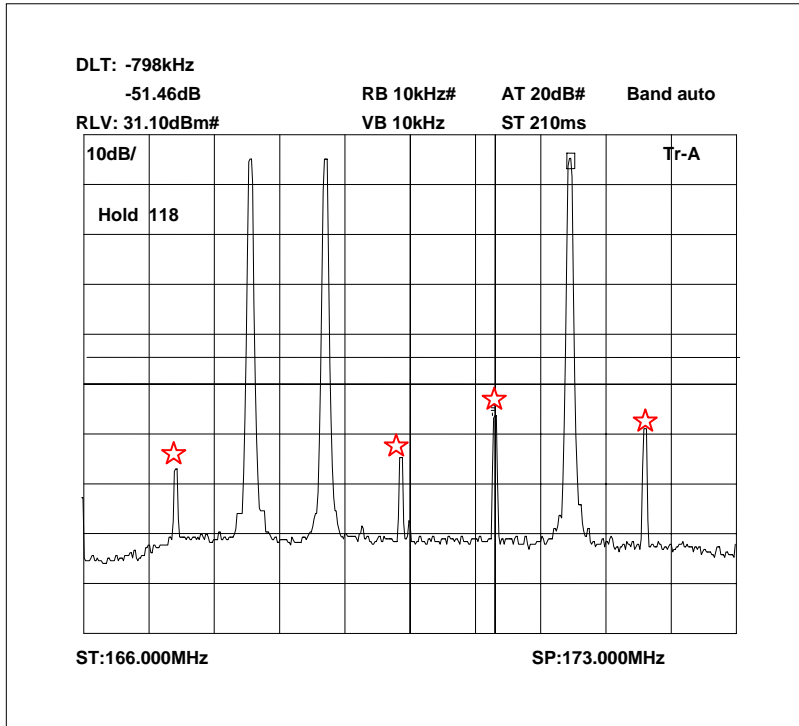
Note 1 6 active channels, 3 as above 3 channels set to frequencies where intermodulation products occur

Sweep data is shown on the next page:

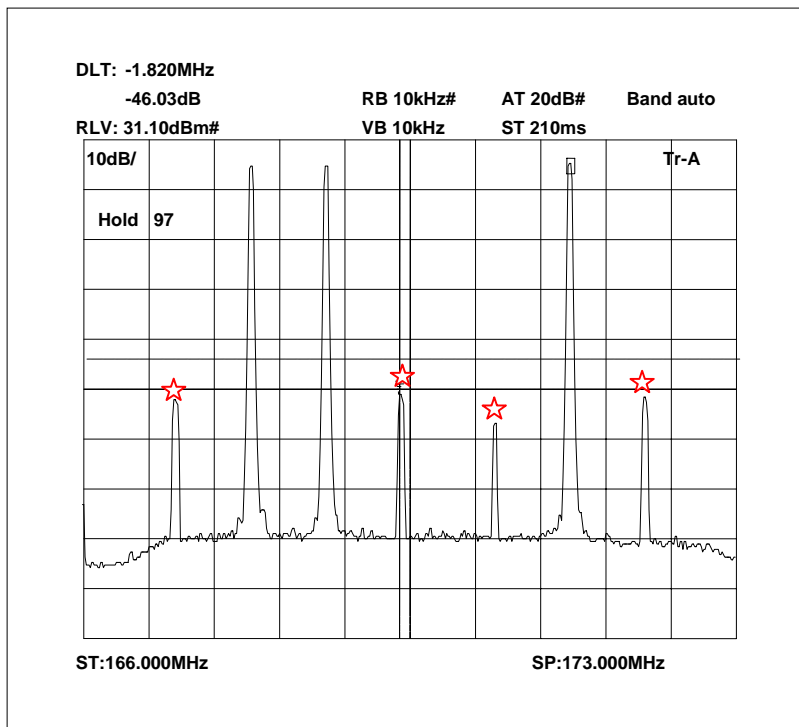
Test equipment used for intermodulation test

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	119562/02	254	X
CMTA	ROHDE & SCHWARZ	CMTA52	894715/033	05	X
SIGNAL GENERATOR	MARCONI	2042	119388/080	176	X
COMBINER	ELCOM	RC-4-50	N/A	170	X

Intermodulation Inband



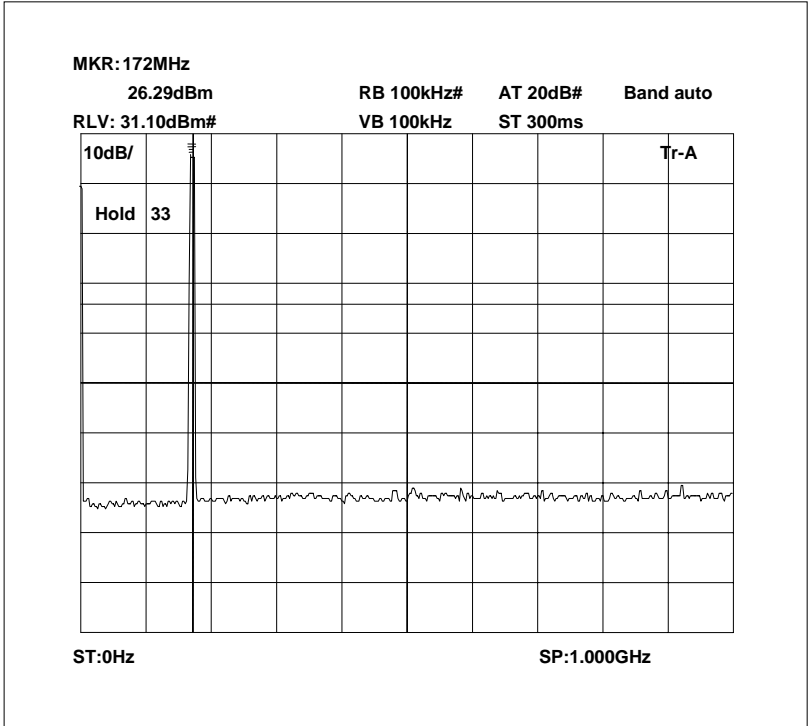
3 active channels, frequencies as per setup diagram above



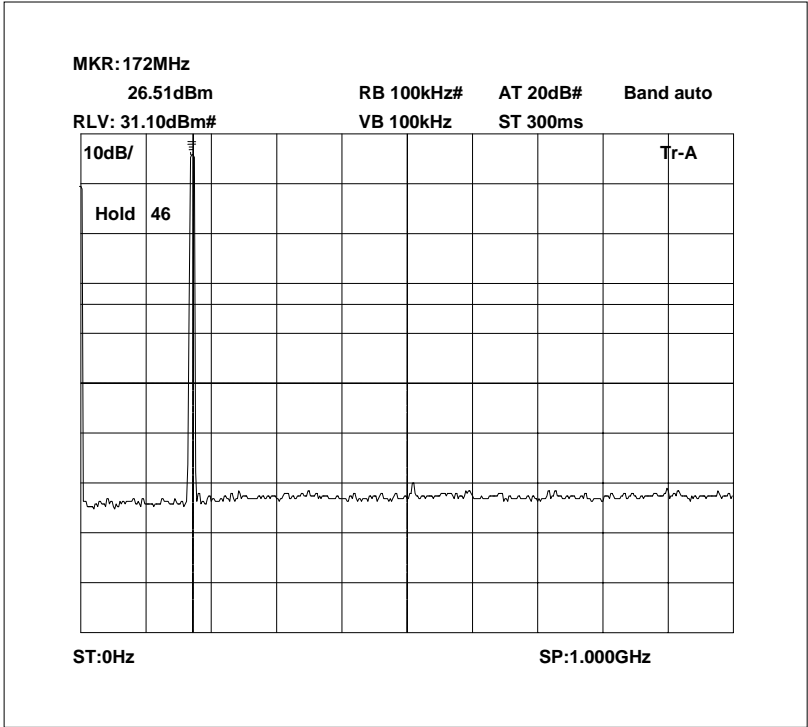
6 active channels, 3 as per above, 3 channels set to frequencies where intermodulation products occur

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

Intermodulation Wideband



3 active channels



6 active channels

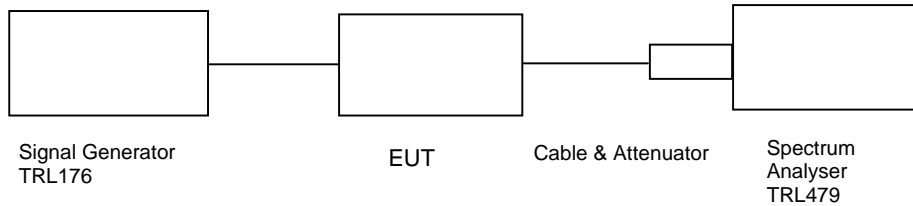
The above plots show that there are no products outside the bands.

TRANSMITTER TESTS

AMPLIFIER MODULATED CHANNEL TEST – CONDUCTED – Part 2.1049– DOWNLINK

Ambient temperature = 24°C
 Relative humidity = 37%
 Supply voltage = +110Vac
 Channel number = See test results

Radio Laboratory



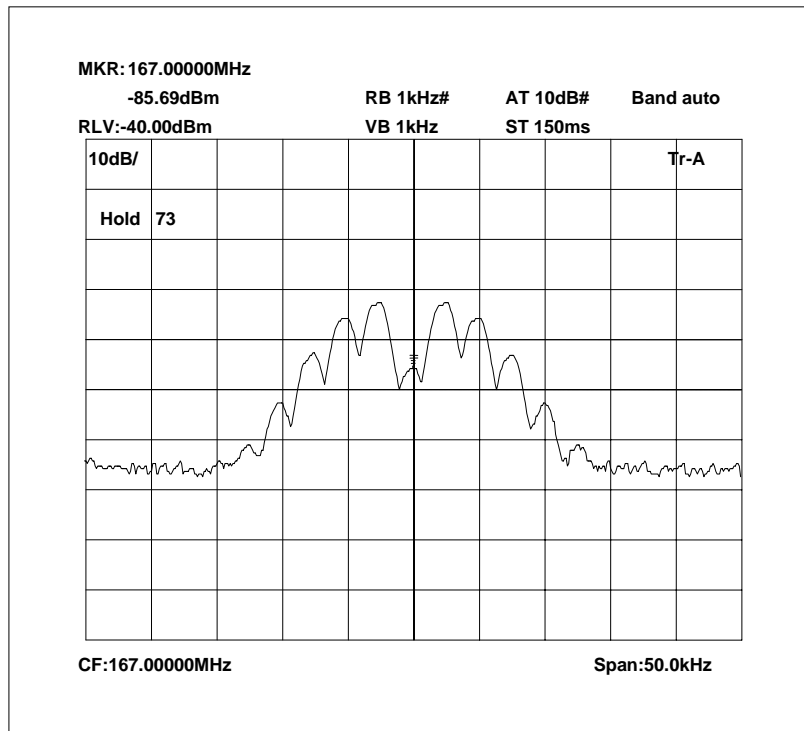
This test was performed to show that the amplifier does not alter the input signal in any way. The input signal was set to the maximum input level (-70dBm) and modulated with a 2500Hz tone. The plots show the signal measured at the signal generator and the signal measured at the output of the EUT.

Note: The cables and attenuators had the following losses.

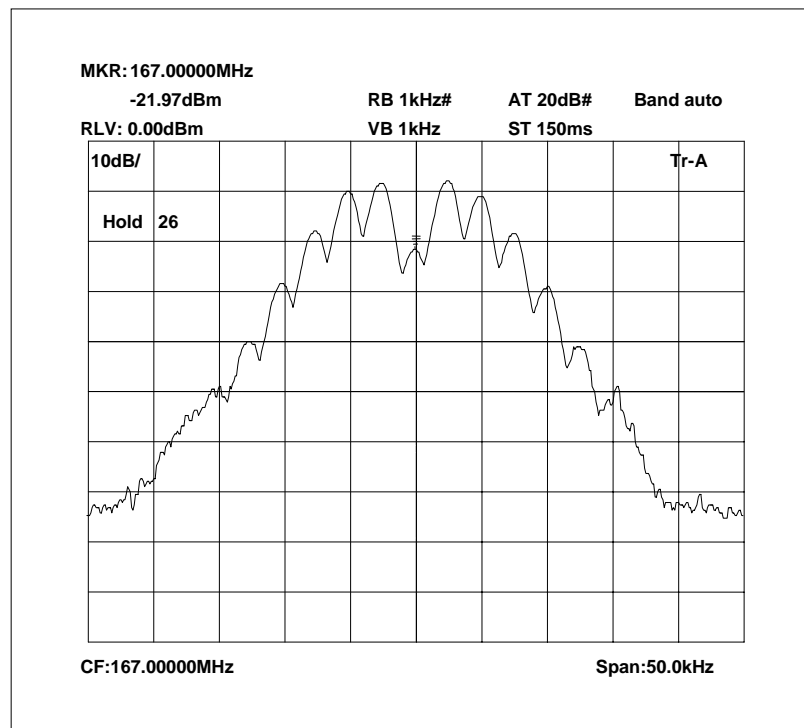
1. Cable and attenuator between EUT and spectrum analyser = 26.1dB
2. Cable between signal generator and EUT = 0.5dB

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

167.0 MHz Signal Generator, deviation set to 5kHz

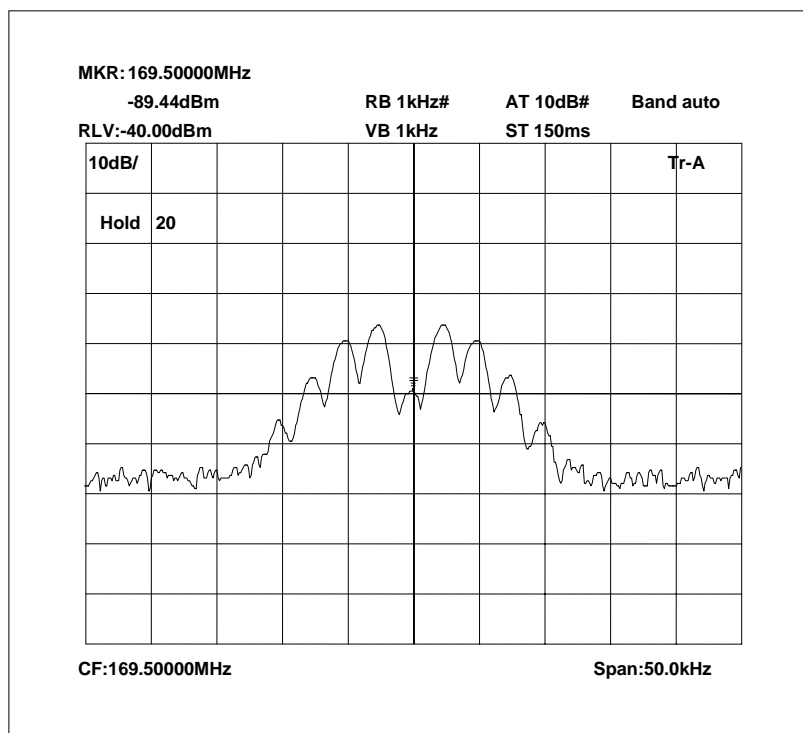


167.0 MHz Signal Generator and EUT, deviation set to 5kHz

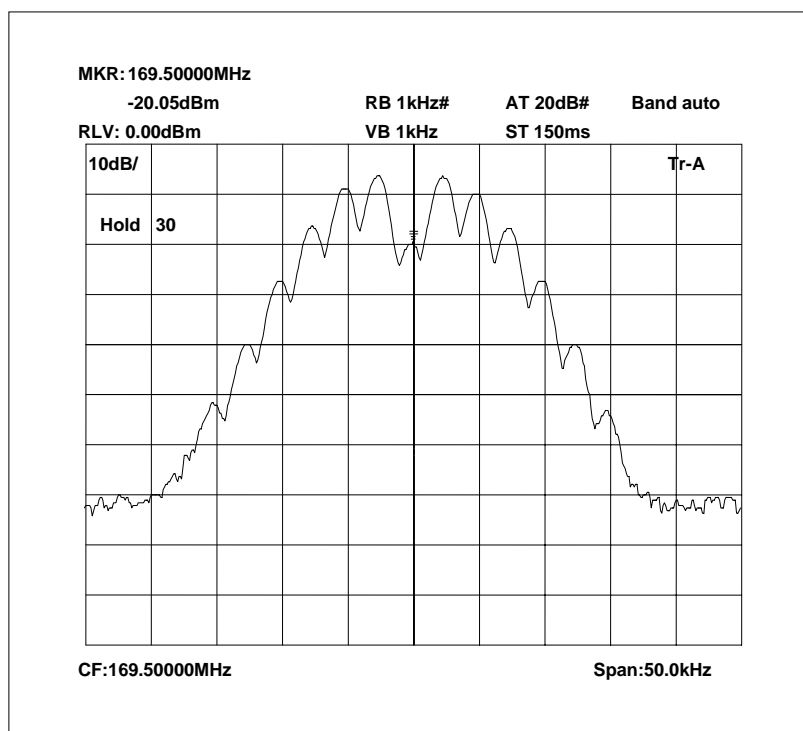


The above plots depicting the output waveshape show no measurable distortion visible when compared to the input signal.

169.5 MHz Signal Generator, deviation set to 5kHz

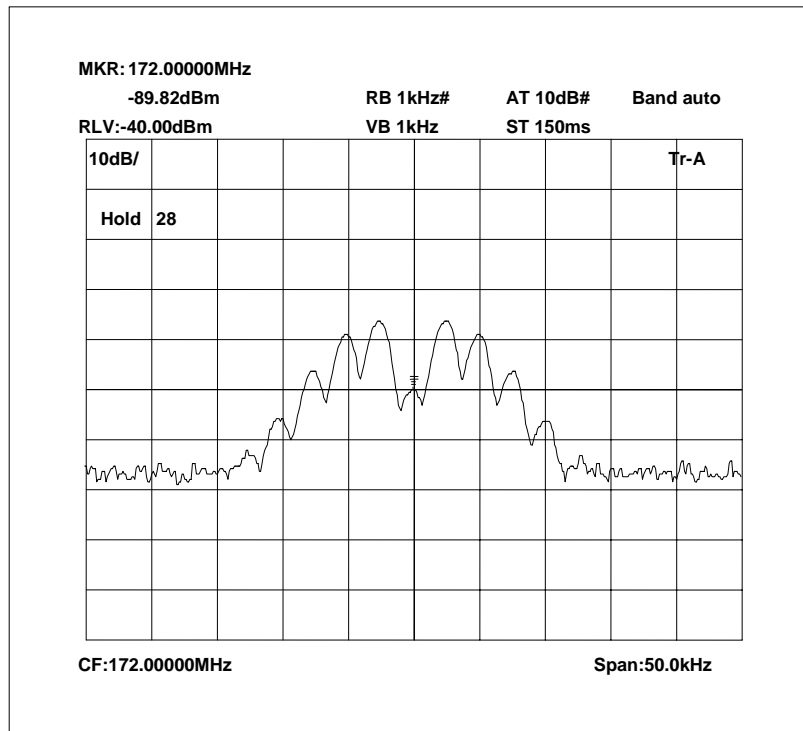


169.5 MHz Signal Generator and EUT, deviation set to 5kHz

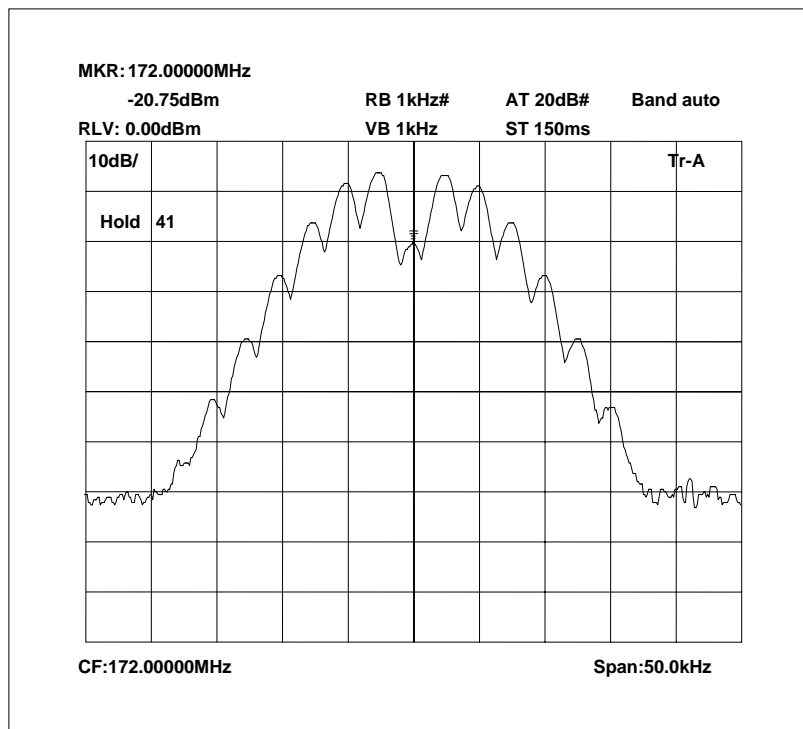


The above plots depicting the output waveshape show no measurable distortion visible when compared to the input signal.

172.0 MHz Signal Generator, deviation set to 5kHz



172.0 MHz Signal Generator and EUT, deviation set to 5kHz



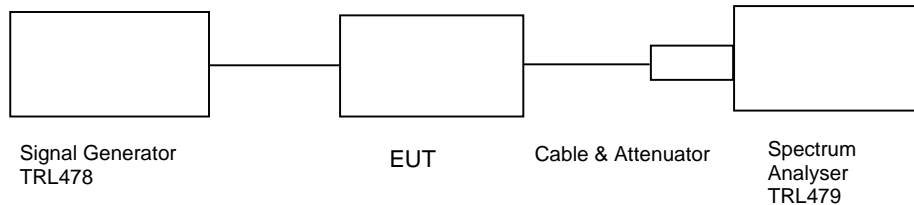
The above plots depicting the output waveshape show no measurable distortion visible when compared to the input signal.

TRANSMITTER TESTS

AMPLIFIER SPURIOUS EMISSIONS – CONDUCTED – Part 2.1053 – DOWNLINK

Ambient temperature = 24°C
 Relative humidity = 37%
 Supply voltage = +110Vac

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 $43 + 10 \log P_{dB}$

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

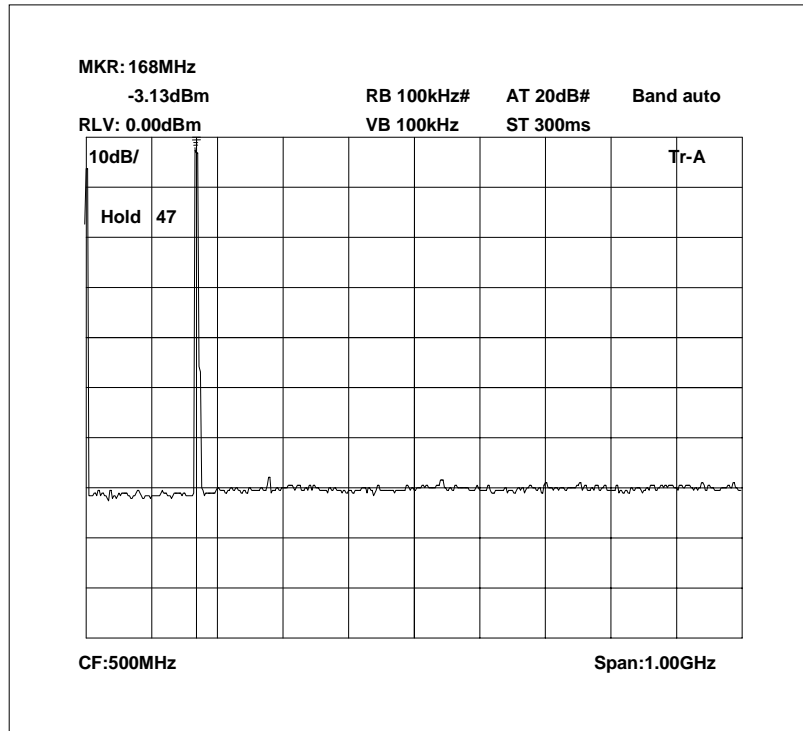
RESULTS

FREQUENCY RANGE	FREQ. (MHz)	MEASURED LEVEL (dBm)	ATTENUATOR & CABLE LOSSES (dB)	EMISSION LEVEL (dBm)	LIMIT (dBm)
0 – 2 GHz	No Significant Emissions				-13

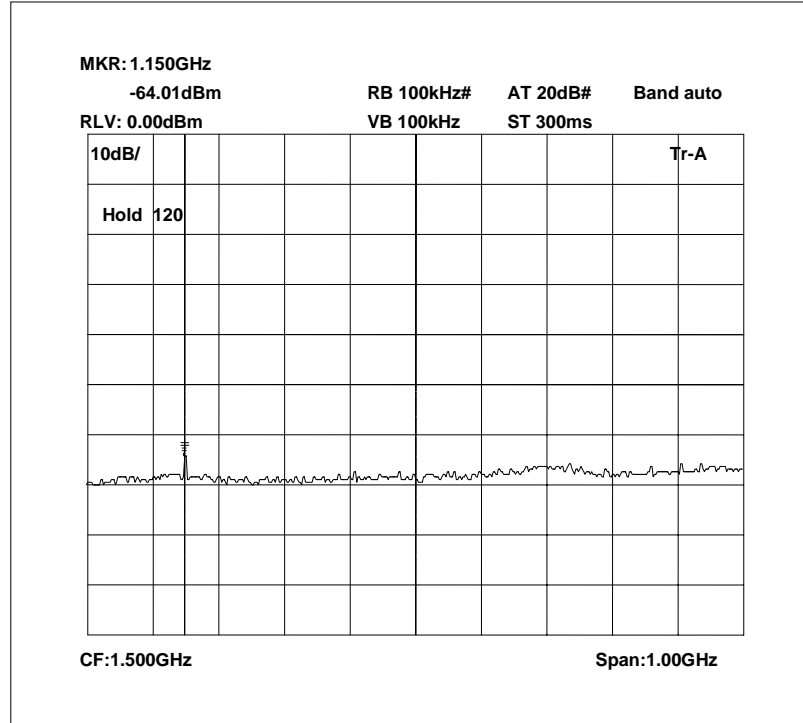
The test equipment used for the Transmitter Conducted Emissions:

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	RHODE & SCHWARZ	SMR 20	834671/003	478	X

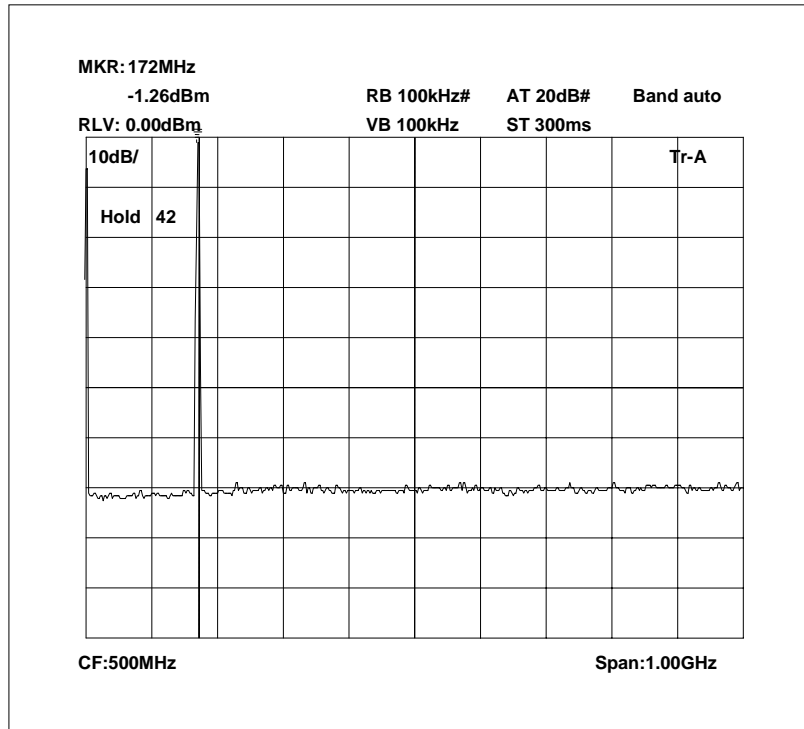
Conducted emissions 167.0 MHz 0 – 1GHz



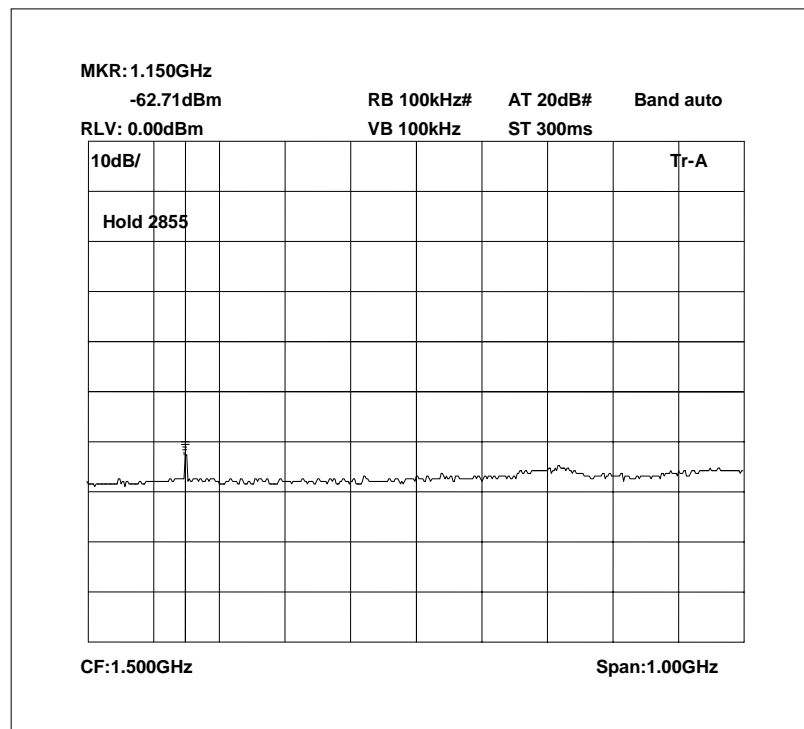
Conducted emissions 167.0 MHz 1 – 2GHz



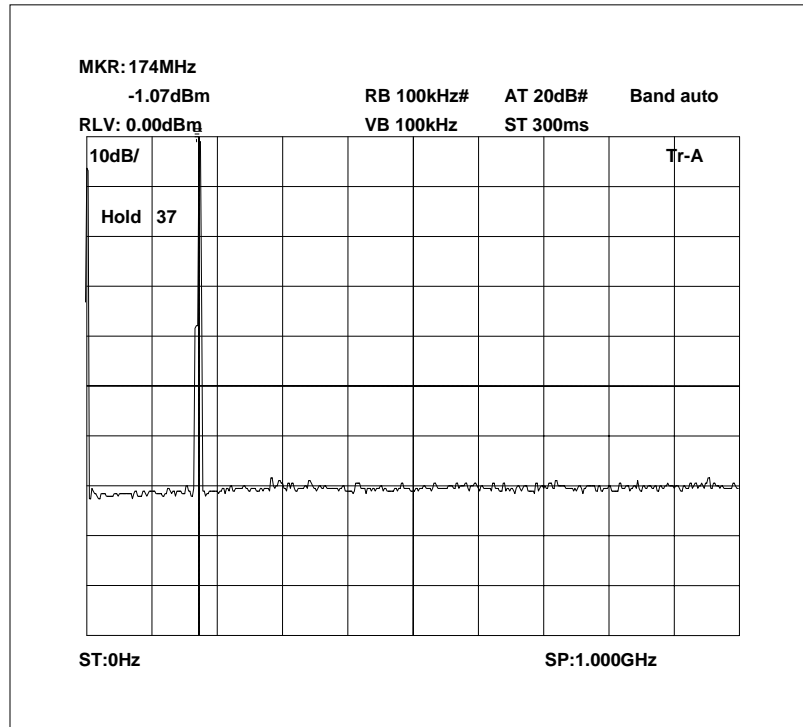
Conducted emissions 169.5 MHz 0 – 1GHz



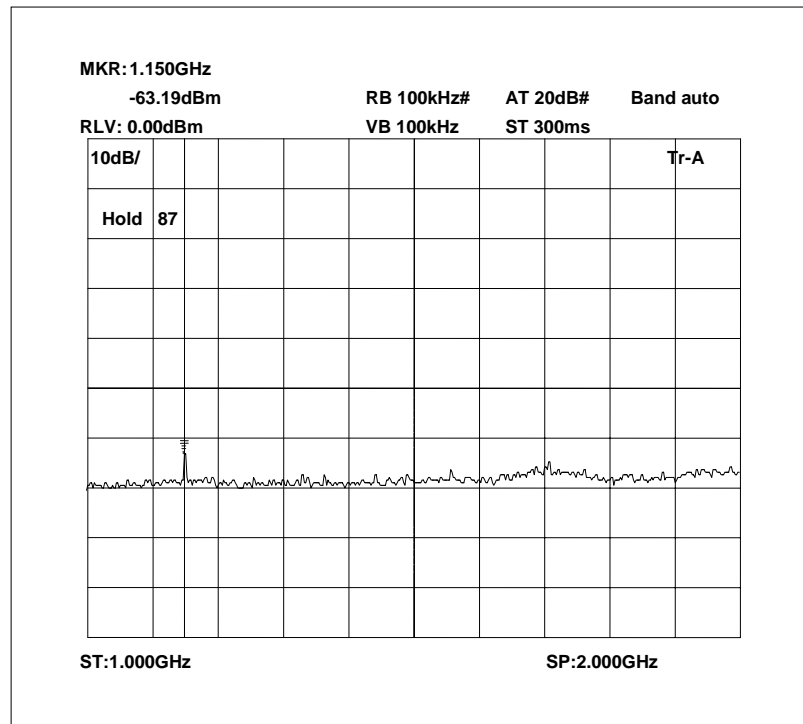
Conducted emissions 169.5 MHz 1 – 2GHz



Conducted emissions 172.0 MHz 0 – 1GHz



Conducted emissions 172.0 MHz 1 – 2GHz

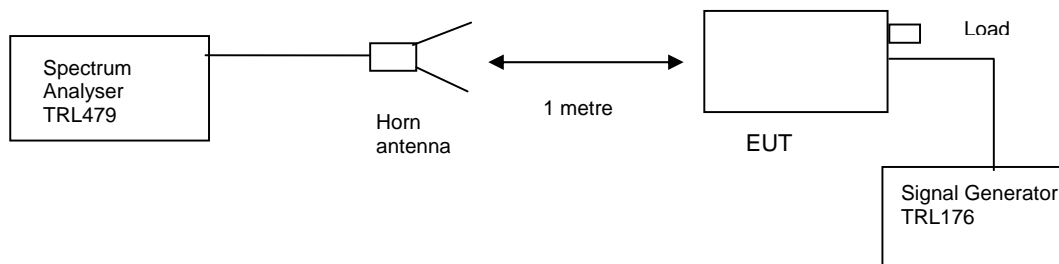


TRANSMITTER TESTS

AMPLIFIER SPURIOUS EMISSIONS – RADIATED – Part 2.1053– DOWNLINK

Ambient temperature = 17°C
 Relative humidity = 49%
 Conditions = OATS
 Supply voltage = +110Vac
 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 $43 + 10 \log \text{PdB}$

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

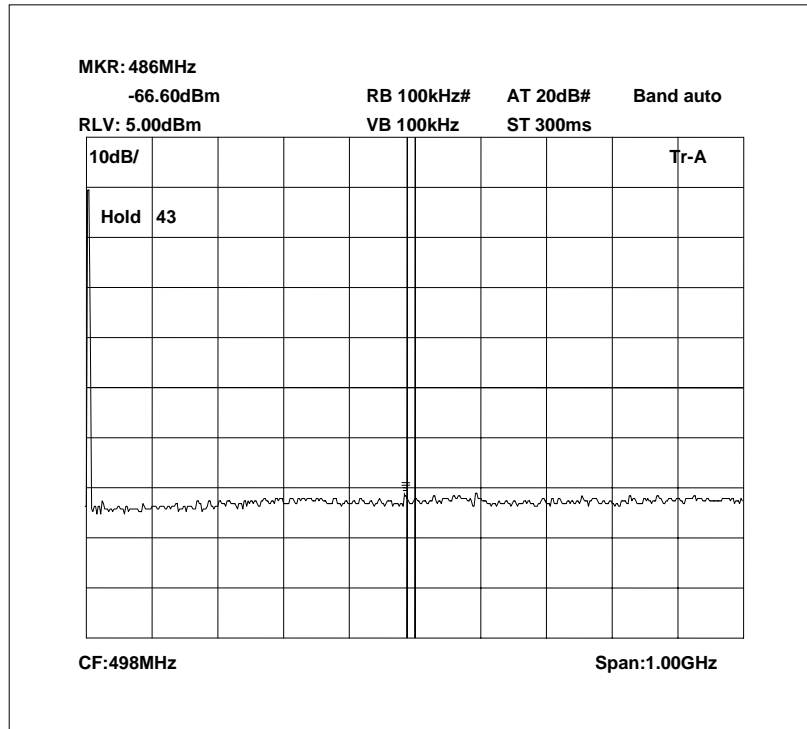
RESULTS

FREQUENCY RANGE	FREQ. (MHz)	MEAS. Rx. (dBµV)	CABLE LOSS (dB)	ANT FACTOR	FIELD STRENGTH (dBµV/m)	CALCULATED EIRP (dBm)	LIMIT (dBm)
0 – 2GHz	No Significant Emissions within						

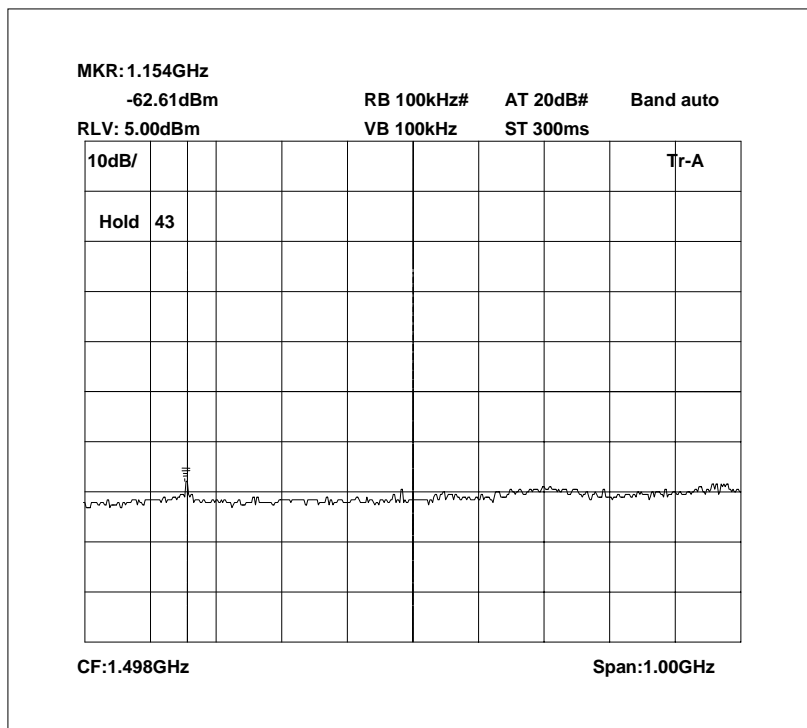
The test equipment used for the Transmitter Spurious Emissions:

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	
ATTENUATOR	BIRD	8308-100	N/A	112	
CABLE	ROSENBERGER	MICRO COAX	N/A	280	X
SIGNAL GENERATOR	MARCONI	2042	119388/080	176	X

Radiated emissions 167.0 MHz 0 – 1GHz

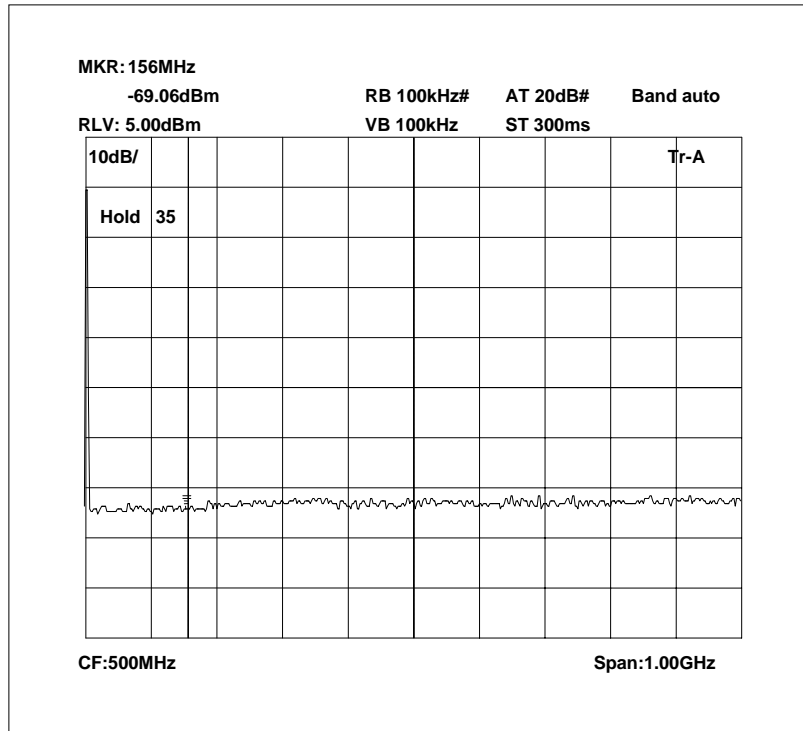


Radiated emissions 167.0 MHz 1 – 2GHz

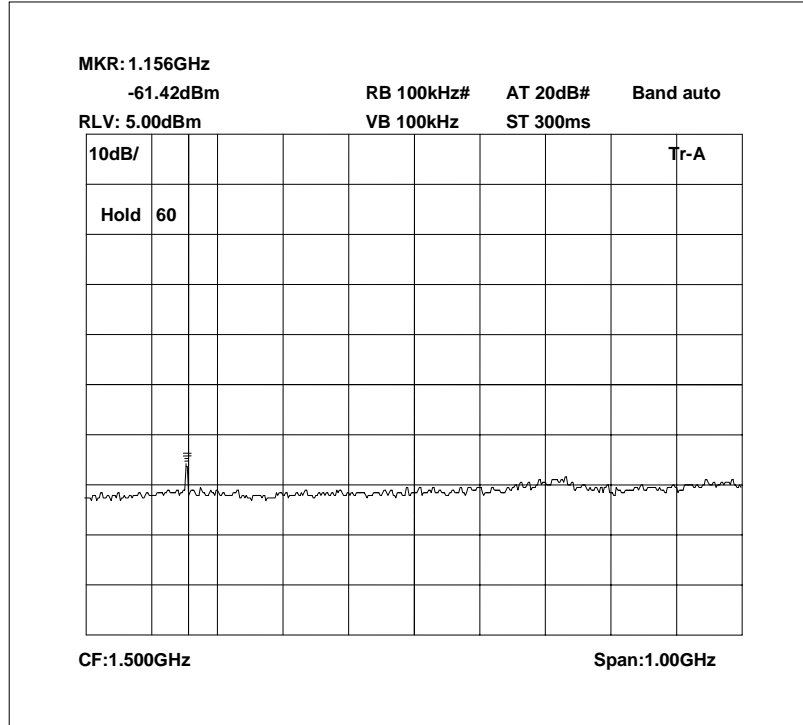


The above test results show that there were no emissions within 20dBs of the -13dBm limit.

Radiated emissions 172.0 MHz 0 – 1GHz

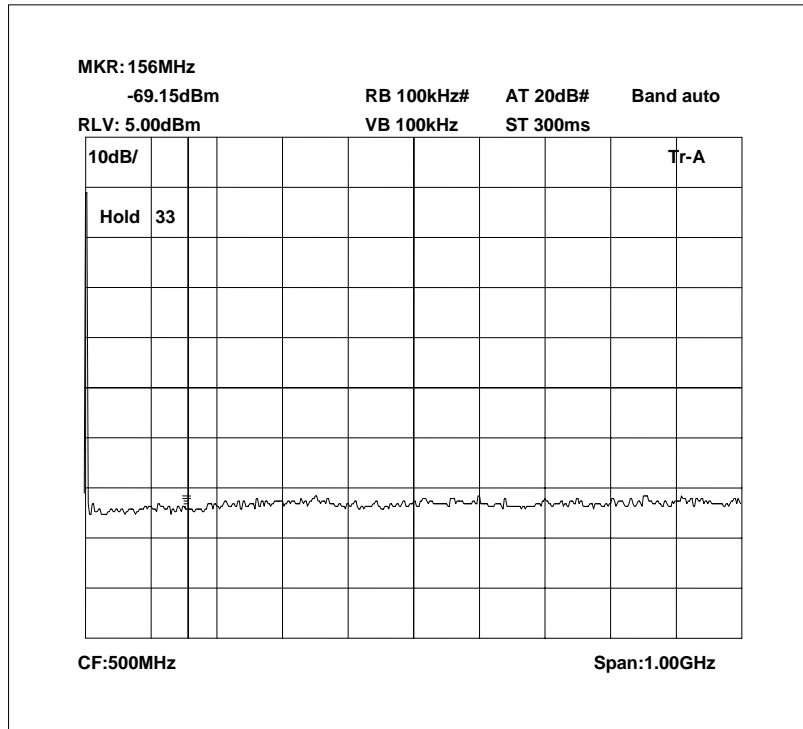


Radiated emissions 172.0 MHz 1 – 2GHz

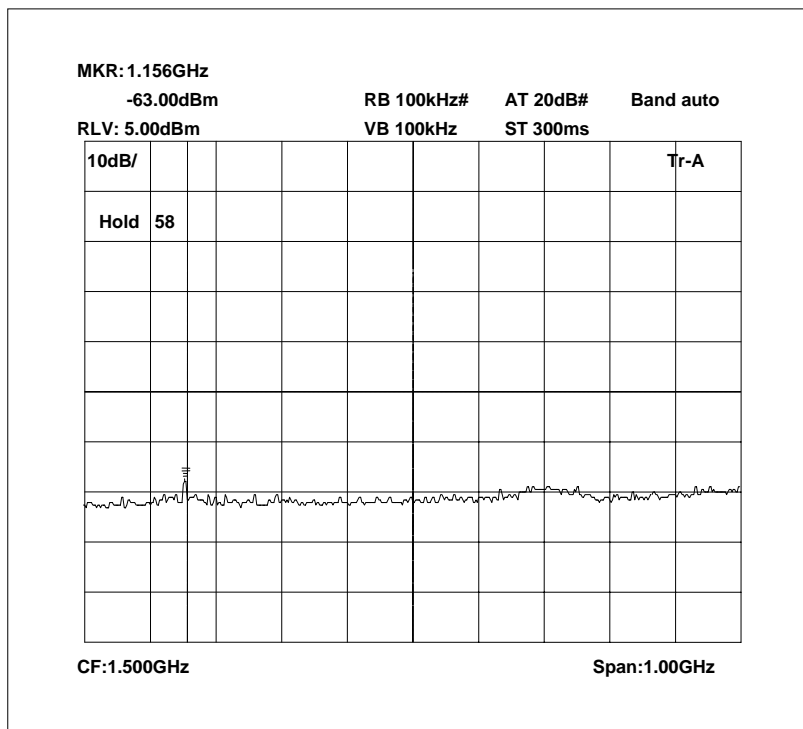


The above test results show that there were no emissions within 20dBs of the -13dBm limit.

Radiated emissions no input signal 0 – 1GHz



Radiated emissions no input signal 1 – 2GHz



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

ANNEX A
PHOTOGRAPHS

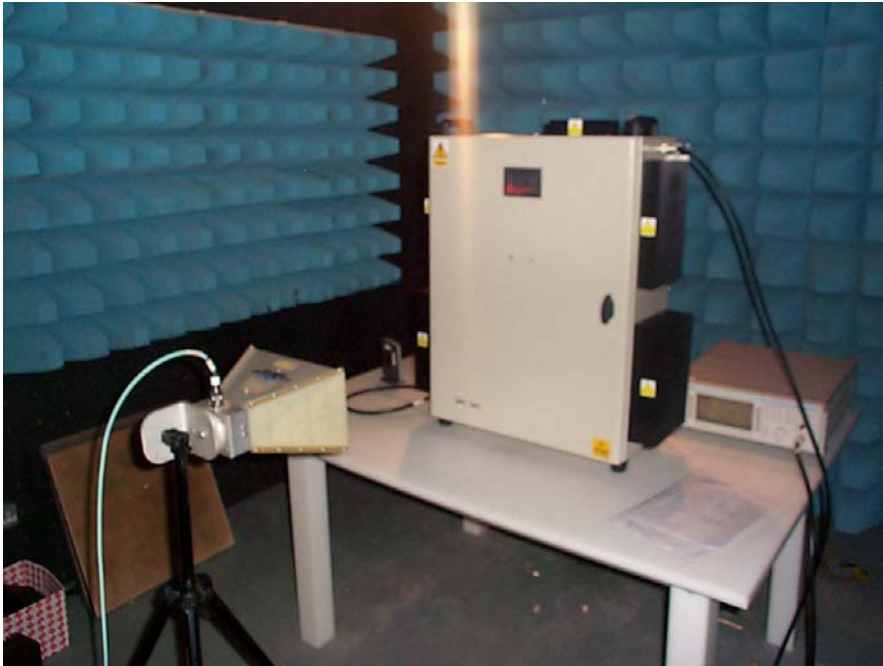
PHOTOGRAPH No. 1

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

TRL Number	Equipment Type	Manufacturer	Last Cal Calibration	Calibration Period	Due For Calibration
UH006	3m Range ERP CAL	TRL	01/03/2005	12	01/03/2006
UH028	Log Periodic Ant	Schwarbeck	28/04/2005	24	28/04/2007
UH029	Bicone Antenna	Schwarbeck	27/04/2005	24	27/04/2007
UH041	Multimeter	AVOmeter	14/12/2004	12	14/12/2005
UH120	Spectrum Analyser	Marconi	15/03/2005	12	15/03/2006
UH122	Oscilloscope	Tektronix	07/06/2005	24	07/06/2007
UH132	Power meter	Marconi	15/12/2004	12	15/12/2005
UH162	ERP Cable Cal	TRL	23/05/2005	12	23/05/2006
UH253	1m Cable N type	TRL	10/01/2005	12	10/01/2006
UH254	1m Cable N type	TRL	10/01/2005	12	10/01/2006
UH265	Notch filer	Telonic	24/06/2005	12	24/06/2006
L005	CMTA	R&S	05/12/2005	12	05/12/2006
L007	Loop Antenna	R&S	29/03/2005	24	29/03/2007
L103	Attenuator	Bird		Calibrate in use	
L112	Attenuator	Bird		Calibrate in use	
L138	1-18GHz Horn	EMCO	15/04/2005	24	15/04/2007
L139	1-18GHz Horn	EMCO	03/05/2005	24	03/05/2007
L176	Signal Generator	Marconi	31/01/2005	12	31/01/2006
L254	Signal Generator	Marconi	13/12/2004	12	13/12/2005
L280	18GHz Cable	Rosenberger	10/01/2005	12	10/01/2006
L343	CCIR Noise Filter	TRL	07/06/2005	12	07/06/2006
L426	Temperature Indicator	Fluke	14/12/2004	12	14/12/2005
L479	Analyser	Anritsu	18/11/2005	12	18/11/2006
L552	Signal Generator	Agilent	25/04/2005	12	25/04/2006

ANNEX D
MEASUREMENT UNCERTAINTY

Radio Testing – General Uncertainty Schedule

All statements of uncertainty are expanded standard uncertainty using a coverage factor of 1.96 to give a 95% confidence where no required test level exists.

[1] Adjacent Channel Power

Uncertainty in test result = **1.86dB**

[2] Carrier Power

Uncertainty in test result (Equipment - TRLUH120) = **2.18dB**

Uncertainty in test result (Equipment – TRL05) = **1.08dB**

Uncertainty in test result (Equipment – TRL479) = **2.48dB**

[3] Effective Radiated Power

Uncertainty in test result = **4.71dB**

[4] Spurious Emissions

Uncertainty in test result = **4.75dB**

[5] Maximum frequency error

Uncertainty in test result (Equipment - TRLUH120) = **119ppm**

Uncertainty in test result (Equipment – TRL05) = **0.113ppm**

Uncertainty in test result (Equipment – TRL479) = **0.265ppm**

[6] Radiated Emissions, field strength OATS 14kHz-18GHz Electric Field

Uncertainty in test result (14kHz – 30MHz) = **4.8dB**, Uncertainty in test result (30MHz – 1GHz) = **4.6dB**, Uncertainty in test result (1GHz-18GHz) = **4.7dB**

[7] Frequency deviation

Uncertainty in test result = **3.2%**

[8] Magnetic Field Emissions

Uncertainty in test result = **2.3dB**

[9] Conducted Spurious

Uncertainty in test result (Equipment TRL479) Up to 8.1GHz = **3.31dB**

Uncertainty in test result (Equipment TRL479) 8.1GHz – 15.3GHz = **4.43dB**

Uncertainty in test result (Equipment TRL479) 15.3GHz – 21GHz = **5.34dB**

Uncertainty in test result (Equipment TRLUH120) Up to 26GHz = **3.14dB**

[10] Channel Bandwidth

Uncertainty in test result = **15.5%**

[11] Amplitude and Time Measurement – Oscilloscope

Uncertainty in overall test level = **2.1dB**, Uncertainty in time measurement = **0.59%**, Uncertainty in Amplitude measurement = **0.82%**

[11] Power Line Conduction

Uncertainty in test result = **3.4dB**