

SIMRAD - NAVICO Ltd

A KONGSBERG Company

REPORT FORM FOR TESTING TO ETS 301 025

**RADIO EQUIPMENT AND SYSTEMS
RADIOTELEPHONE TRANSMITTERS AND RECEIVERS
FOR THE MARITIME MOBILE SERVICE OPERATING IN THE VHF BANDS
TECHNICAL CHARACTERISTICS AND METHODS OF MEASUREMENT**

Test Unit = RT1400 + DSC1400
Serial Number = AA11111:H:PA

Nominal Voltage = 12.0 Volts
Maximum Voltage = 15.6 Volts
Minimum Voltage = 10.8 Volts

Nominal Temperature = 20°C
Maximum Temperature = 55°C
Minimum Temperature = -15°C

Channel 16 = 156.800MHz
Upper Frequency = 162.975MHz
Lower Frequency = 155.025MHz
Second Receiver Frequency = 156.525MHz
Channel Spacing = 25.0kHz

First IF Main Rx = 21.4MHz
Second IF Main Rx = 455.0kHz
First IF 2nd Rx = 17.9MHz
Second IF 2nd Rx = 455.0kHz

Rated Audio Power = 6.0 Watts
Rated Audio Load = 4 Ohms

Testing carried out by KTL Arnhem between 10/7/98 and 1/10/98

This report is a copy of the results in report number 97406432.

The above report is not available in electronic form. The data contained within it has been transferred to this form.

David Sheekey

3/31/99

SUMMARY OF TEST RESULTSSerial No. **RT1400 + DSC1400 AA11111:H:PA**

6/25/99

Clause No.	Description	Complies?
8.1	Transmitter Frequency Error	Yes
8.2	Transmitter Output Power	Yes
8.3	Transmitter Frequency Deviation	Yes
8.4	Sensitivity of Modulator Including Microphone	No
8.5	Transmitter Audio Frequency Response	Yes
8.6	Transmitter Audio Frequency Distortion	Yes
8.7	Transmitter Adjacent Channel Power	Yes
8.8	Transmitter Conducted Spurious Emissions	Yes
!	Transmitter Radiated Spurious Emissions	Yes
8.9	Transmitter Transient Frequency Behaviour	Yes
8.10	Transmitter Residual Modulation	Yes
8.11	Frequency Error (demodulated DSC signal)	Yes
8.12	Modulation Index for DSC	Yes
8.13	Modulation Rate for DSC	Yes
8.14	Testing of generated call sequences	Yes
9.1	Receiver AF Harmonic Distortion	Yes
9.1	Receiver AF Output Power	Yes
9.2	Receiver Audio Frequency Response	Yes
9.3	Receiver Maximum Usable Sensitivity	Yes
9.4	Receiver Co-Channel Rejection	Yes
9.5	Receiver Adjacent Channel Selectivity	Yes
9.6	Receiver Spurious Response Rejection	Yes
9.7	Receiver Intermodulation Response	Yes
9.8	Receiver Blocking Response	Yes
	Receiver Spurious Emissions	Yes
9.9	Receiver Conducted Emissions	Yes
9.10	Receiver Hum And Noise	Yes
9.11	Receiver Squelch Operation	Yes
9.12	Receiver Squelch Hysteresis	Yes
9.13	Receiver Multiple Watch Characteristic	Yes
10.1	MUS for DSC receiver	Yes
10.2	Co-channel Rejection for DSC Receiver	Yes
10.3	Adjacent Channel Selectivity for DSC Receiver	Yes
10.4	Spurious Response/Blocking Immunity for DSC Receiver	Yes
10.5	Intermodulation Response for DSC Receiver	Yes
10.6	Dynamic Range for DSC Receiver	Yes
10.7	Conducted Spurious Emissions for DSC Receiver	Yes
10.8	Verification of Correct Decoding of DSC Calls	Yes

Notes.

Ambient Temperature =

TRANSMITTER FREQUENCY ERROR

Clause:- 8.1

High Power = 25.0W

Limit = 1.5kHz

TEST CONDITIONS		FREQUENCY ERROR (Hz)		
		155.025MHz	156.800MHz	162.975MHz
Tnom (20°C)	Vnom (12V)		7	
Tmax (55°C)	Vmin (10.8V)		287	
	Vmax(15.6V)		287	
Tmin (-15°C)	Vmin (10.8V)		1114	
	Vmax(15.6V)		1114	
Maximum Frequency Error		0	1114	0
Minimum Frequency Error		0	7	0
Pass/Fail			Pass	

Complies:- Yes

Ambient Temperature =

TRANSMITTER FREQUENCY ERROR

Clause:- 8.1

Low Power = 1.0W

Limit = 1.5kHz

TEST CONDITIONS		FREQUENCY ERROR (Hz)		
		155.025MHz	156.800MHz	162.975MHz
Tnom (20°C)	Vnom (12V)		7	
Tmax (55°C)	Vmin (10.8V)		287	
	Vmax(15.6V)		287	
Tmin (-15°C)	Vmin (10.8V)		1114	
	Vmax(15.6V)		1114	
Maximum Frequency Error		0	1114	0
Minimum Frequency Error		0	7	0
Pass/Fail			Pass	

Complies:- Yes

Ambient Temperature = 25°C

TRANSMITTER OUTPUT POWER

Clause:- 8.2

Upper Limit = 25.0 Watts

Lower Limit (Normal) = 17.7 Watts

Lower Limit (Extreme) = 12.5 Watts

TEST CONDITIONS		OUTPUT POWER (Watts)			Pass/Fail
		155.025MHz	156.800MHz	162.975MHz	
Tnom (20°C)	Vnom (12V)	22.2	22.2	22.3	Pass
Tmax (55°C)	Vmin (10.8V)		19.1		Pass
	Vmax(15.6V)		19.3		Pass
Tmin (-15°C)	Vmin (10.8V)		17.7		Pass
	Vmax(15.6V)		20.9		Pass

Complies:- Yes

Ambient Temperature = 25°C

TRANSMITTER OUTPUT POWER

Clause:- 8.2

Upper Limit = 1.0 Watts

Lower Limit (Normal) = .1 Watts

Lower Limit (Extreme) = .1 Watts

TEST CONDITIONS		OUTPUT POWER (Watts)			Pass/Fail
		155.025MHz	156.800MHz	162.975MHz	
Tnom (20°C)	Vnom (12V)	0.8	0.8	0.9	Pass
Tmax (55°C)	Vmin (10.8V)		0.5		Pass
	Vmax(15.6V)		0.5		Pass
Tmin (-15°C)	Vmin (10.8V)		0.9		Pass
	Vmax(15.6V)		0.9		Pass

Complies:- Yes

Ambient Temperature = °C

TRANSMITTER FREQUENCY DEVIATION

Clause:- 8.3

Supply voltage = 12.0 Volts

Output Power = 25.0 Watts

Modulation Frequency	Input Level	Limit	Maximum Deviation (kHz)			Pass/Fail
(Hz)			155.025MHz	156.800MHz	162.975MHz	
100	20db 3kHz	5.0kHz				
200	20db 3kHz	5.0kHz				
300	20db 3kHz	5.0kHz		4.6		Pass
450	20db 3kHz	5.0kHz		4.7		Pass
650	20db 3kHz	5.0kHz		4.7		Pass
1000	20db 3kHz	5.0kHz		4.7		Pass
2500	20db 3kHz	5.0kHz		4.4		Pass
3000	20db 3kHz	5.0kHz		4.0		Pass
3000	3kHz	Value @ 3kHz		3.60		Ref
3100	3kHz	Value @ 3kHz		3.10		Pass
4000	3kHz	Value @ 3kHz		2.40		Pass
5000	3kHz	Value @ 3kHz		1.50		Pass
6000	3kHz	1.5kHz		0.89		Pass
8000	3kHz	0.77		0.40		Pass
10000	3kHz	0.46		0.20		Pass
12000	3kHz	0.30		0.14		Pass
15000	3kHz	0.18		0.04		Pass
20000	3kHz	0.09		0.04		Pass
25000	3kHz	0.05		0.04		Pass

Notes:

Complies:- Yes

Ambient Temperature = °C

TRANSMITTER FREQUENCY DEVIATION

Clause:- 8.3

Supply voltage = 12.0 Volts

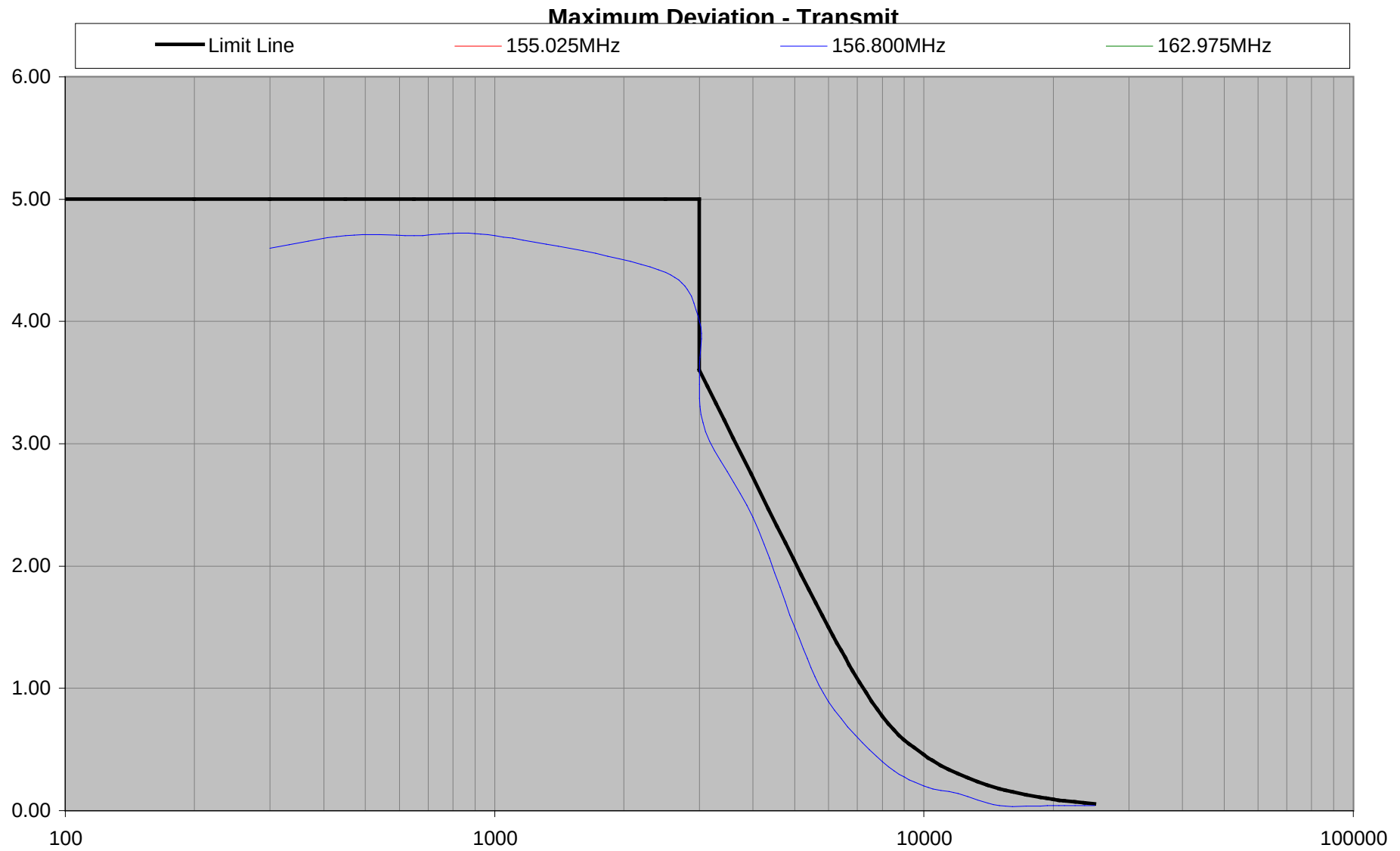
Output Power = 1.0 Watts

Limit = 5.0kHz

Modulation Frequency (Hz)	Input Level	Maximum Deviation (kHz)			Pass/Fail
		155.025MHz	156.800MHz	162.975MHz	
100	20dB 3kHz				
200	20dB 3kHz				
300	20dB 3kHz		4.6		Pass
450	20dB 3kHz		4.6		Pass
650	20dB 3kHz		4.6		Pass
1000	20dB 3kHz		4.6		Pass
2500	20dB 3kHz		4.6		Pass
3000	20dB 3kHz		4.6		Pass

Complies:- Yes

Frequency Deviation Chart



Modulation Sensitivity

Ambient Temperature = 20°C

Sensitivity of the modulator, including microphone

Upper Limit: 97.0dBA

Lower Limit: 91.0dBA

Power	155.025MHz	156.800MHz	162.975MHz	Pass / Fail
High		92.0dBA		Fail
Low		92.0dBA		Fail

Notes:

Complies:- No

Ambient Temperature = °C

TRANSMITTER AUDIO FREQUENCY RESPONSE

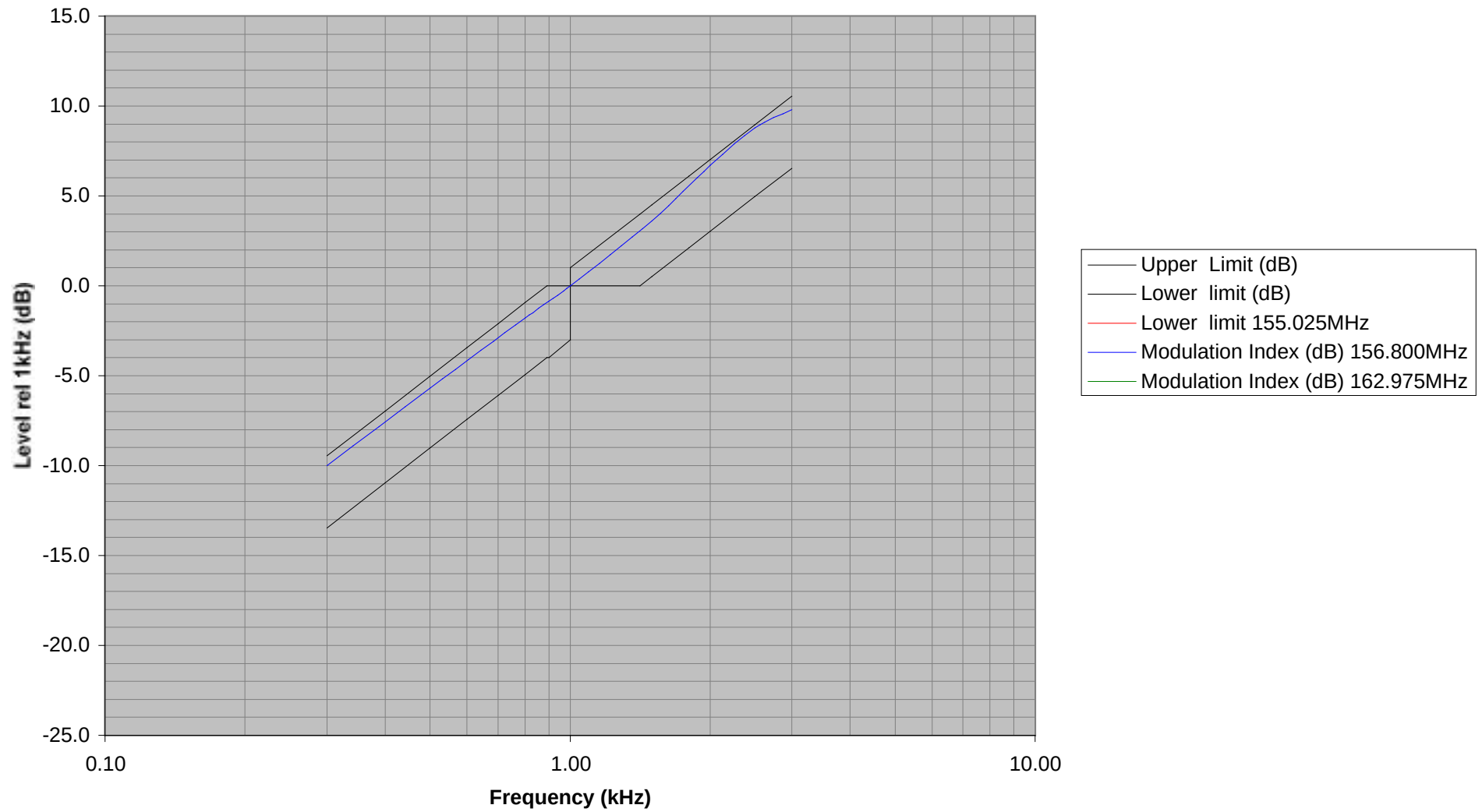
Clause:- 8.5

Supply Voltage = 12.0 Volts

Modulating Frequency (Hz)	Upper Limit (dB)	Lower limit (dB)	Modulation Index (dB)			Pass / Fail
			155.025MHz	156.800MHz	162.975MHz	
0.10						
0.20						
0.30	-9.5	-13.5		-10.0		Pass
0.40	-7.0	-11.0				
0.50	-5.0	-9.0		-5.7		Pass
0.60	-3.4	-7.4				
0.70	-2.1	-6.1				
0.80	-0.9	-4.9		-1.8		Pass
0.90		-4.0				
1.00	0.0	0.0		0.0		Pass
1.20						
1.50	4.5	0.5		3.6		Pass
1.80	6.1	2.1				
2.00	7.0	3.0		6.7		Pass
2.50	9.0	5.0		8.8		
3.00	10.5	6.5		9.8		Pass
4.00						
5.00						
6.00						
7.00						
8.00						
9.00						
10.00						

Complies:- Yes

Audio Frequency Response - Transmit



Ambient Temperature = 25°C

TRANSMITTER AUDIO FREQUENCY DISTORTION

Clause:- 8.6

Output Power = 25.0 Watts

Limit = 10%

		Modulation Frequencies (Hz)	AF Distortion (%)		
			155.025MHz	156.800MHz	162.975MHz
Tnom (20°C)	Vnom (12V)	300		2.1	
		500		2.2	
		1000		2.3	
Tmax (55°C)	Vmin (10.8V)	1000		2.1	
	Vmax(15.6V)			2.1	
Tmin (-15°C)	Vmin (10.8V)	1000		2.8	
	Vmax(15.6V)			2.5	
Pass/Fail				Pass	

Complies:- Yes

Ambient Temperature = 25°C

TRANSMITTER AUDIO FREQUENCY DISTORTION

Clause:- 8.7

Output Power = 1.0 Watts

Limit = 10%

		Modulation Frequencies (Hz)	AF Distortion (%)		
			155.025MHz	156.800MHz	162.975MHz
Tnom (20°C)	Vnom (12V)	300		2.1	
		500		2.2	
		1000		2.3	
Tmax (55°C)	Vmin (10.8V)	1000		1.9	
	Vmax(15.6V)			1.9	
Tmin (-15°C)	Vmin (10.8V)	1000		2.7	
	Vmax(15.6V)			2.6	
Pass/Fail				Pass	

Complies:- Yes

Ambient Temperature = °C

RESIDUAL MODULATION OF THE TRANSMITTER

8.10

Output Power = 25.0 Watts

Limit = -40.0dB

Residual Modulation (dB)	155.025MHz	156.800MHz	162.975MHz	Pass/Fail
		-40		Pass

Complies:- Yes

Ambient Temperature = 20°C

TRANSMITTER ADJACENT CHANNEL POWER

8.7

Output Power = 25.0 Watts

Limit = -70.0dB

But not less than 0.2uW

Measurement Offset	Adjacent Channel Power (dBc)			Pass / Fail
	155.025MHz	156.800MHz	162.975MHz	
Fn + 25kHz		-79.1		Pass
Fn - 25kHz		-79.0		Pass

Complies:- Yes

Ambient Temperature = 20°C

TRANSMITTER ADJACENT CHANNEL POWER

8.7

Output Power = 1.0 Watts

Limit = -70.0dB

But not less than 0.2uW

Measurement Offset	Adjacent Channel Power (dBc)			Pass / Fail
	155.025MHz	156.800MHz	162.975MHz	
Fn + 25kHz		-77.0		Pass
Fn - 25kHz		-73.6		Pass

Complies:- Yes

Ambient Temperature = 20°C

**TRANSMITTER CONDUCTED SPURIOUS EMISSIONS INTO
THE ANTENNA**

8.8

Output Power = 25.0 Watts

Limit = 0.25uW

Frequency of Spurious Emissions (MHz)	Spurious Emission Level (uW)			Pass / Fail
	155.025MHz	156.800MHz	162.975MHz	
310.050				
465.075				
620.100				
775.125				
930.150				
1085.175				
1240.200				
313.600		0.06		Pass
470.400		0.03		Pass
627.200				
784.000				
940.800				
1097.600				
1254.400				
325.950				
488.925				
651.900				
814.875				
977.850				
1140.825				
1303.800				

Notes:

Complies:- Yes

Ambient Temperature = 20°C

**TRANSMITTER CONDUCTED SPURIOUS EMISSIONS INTO
THE ANTENNA**

8.8

Output Power = 1.0 Watts

Limit = 0.25uW

Frequency of Spurious Emissions (MHz)	Spurious Emission Level (uW)			Pass / Fail
	155.025MHz	156.800MHz	162.975MHz	
310.050				
465.075				
620.100				
775.125				
930.150				
1085.175				
1240.200				
313.600		0.03		Pass
470.400		0.01		Pass
627.200				
784.000				
940.800				
1097.600				
1254.400				
325.950				
488.925				
651.900				
814.875				
977.850				
1140.825				
1303.800				

Complies:- Yes

Ambient Temperature = 20°C

TRANSMITTER RADIATED SPURIOUS EMISSIONS

!

Output Power = 25.0 Watts

Limit = 0.25uW

Frequency of Spurious Emissions (MHz)	Spurious Emission Level (uW)			Pass / Fail
	155.025MHz	156.800MHz	162.975MHz	
310.500	0.20			Pass
313.600		0.17		Pass

Notes: Remaining spurii at least 10dB below limit

Complies:- Yes

Ambient Temperature = 20°C

TRANSMITTER RADIATED SPURIOUS EMISSIONS

!

Output Power = 1.0 Watts

Limit = 0.25uW

Frequency of Spurious Emissions (MHz)	Spurious Emission Level (uW)			Pass / Fail
	155.025MHz	156.800MHz	162.975MHz	

Notes: All spuri at least 10dB below limit

Complies:- Yes

Ambient Temperature = 20°C

TRANSMITTER TRANSIENT FREQUENCY BEHAVIOUR

Clause:- 8.90

Output Power = 25.0 Watts

Limit Period t1 (5ms) = 25.0kHz

Limit Period t2 (20ms) = 12.5kHz

Limit Period >t2 = 1.5kHz

Limit Period t3 (5ms) = 25.0kHz

Transient Period	Frequency Error (kHz)			Pass/Fail
	155.025MHz	156.800MHz	162.975MHz	
t1		13.00		Pass
t2		8.00		Pass
>t2		1.00		Pass
t3		2.00		Pass

Complies:- Yes

Ambient Temperature = 20°C

Additional Tests for DSC Transmit

		Wanted	Tolerance	Value	Error	
Frequency Error	B-state	2100	10Hz	2099.6	0Hz	Pass
	Y-state	1300	10Hz	1300.7	-1Hz	Pass
Modulation Index	B-state	2	10%	2.07	3%	Pass
	Y-state	2	10%	1.83	9%	Pass
Modulation Rate		600	30ppm	600.003	-4	Pass

Testing of generated call sequences

Format Specifier	Category	Received OK?	Required Return Channel	OK?
Distress		Yes	16	Yes
All Ships	Urgency	Yes	Working	Yes
All Ships	Safety	Yes	Working	Yes
Individual	Routine	Yes	Working	Yes
Group	Routine	Yes	Working	Yes

Calls Transmitted Correctly? Yes

Ambient Temperature = 20°C

RECEIVER HARMONIC DISTORTION AND RATED AUDIO FREQUENCY OUTPUT POWER

LOUDSPEAKER

Rated load = 4 Ohms

Harmonic distortion Limit = 10%

Rated Power = 6.0 Watts

Required AF Voltage = 4.9 Volts

Fn = 156.800MHz				Harmonic Distortion (%)			
TEST CONDITIONS		TEST SIGNAL LEVEL (dBuV)	Fmod (Hz)	Fn	Fn(-1.5kHz)	Fn(+1.5kHz)	Pass/Fail
Tnom (20°C)	Vnom (12V)	60	300	1.9			Pass
			500	3.4			Pass
			1000	6.6			Pass
		100	300	1.8			Pass
			500	3.6			Pass
			1000	7.0			Pass
Tmax (55°C)	Vmin (10.8V) Vmax(15.6V)	60	1000				
	Vmin (10.8V) Vmax(15.6V)	100					
Tmin (-15°C)	Vmin (10.8V) Vmax(15.6V)	60	1000				
	Vmin (10.8V) Vmax(15.6V)	100					

Complies:- Yes

Ambient Temperature = 20°C

RECEIVER HARMONIC DISTORTION AND RATED AUDIO FREQUENCY OUTPUT POWER

HEADPHONE

Rated load = 300 Ohms

Harmonic distortion Limit = 10%

Fn = 155.025MHz				Harmonic Distortion (%)			
TEST CONDITIONS		TEST SIGNAL LEVEL (dBuV)	Fmod (Hz)	Fn	Fn(-1.5kHz)	Fn(+1.5kHz)	Pass/Fail
Tnom (20°C)	Vnom (12V)	60	300	1.6			Pass
			500	1.9			Pass
			1000	6.9			Pass
		100	300	1.6			Pass
			500	1.9			Pass
			1000	6.7			Pass
Tmax (55°C)	Vmin (10.8V) Vmax(15.6V)	60	1000				
	Vmin (10.8V) Vmax(15.6V)	100					
Tmin (-15°C)	Vmin (10.8V) Vmax(15.6V)	60	1000				
	Vmin (10.8V) Vmax(15.6V)	100					

Complies:- Yes

Ambient Temperature 20°C

RECEIVER HARMONIC DISTORTION AND RATED AUDIO FREQUENCY OUTPUT POWER**LOUDSPEAKER**

Rated load = 4 Ohms

Limit = 2.0 Watts

Fn = 156.800MHz				Output Power (W)			
TEST CONDITIONS		TEST SIGNAL LEVEL (dBuV)	Fmod (Hz)	Fn	Fn (1.5kHz)	Fn (+1.5kHz)	Pass/Fail
Tnom (20°C)	Vnom (12V)	60	300	6.0			Pass
			500	6.0			Pass
			1000	6.0			Pass
		100	300	6.0			Pass
			500	4.0			Pass
			1000	4.0			Pass
Tmax (55°C)	Vmin (10.8V) Vmax(15.6V)	60	1000				
	Vmin (10.8V) Vmax(15.6V)	100					
Tmin (-15°C)	Vmin (10.8V) Vmax(15.6V)	60	1000				
	Vmin (10.8V) Vmax(15.6V)	100					

Complies:- Yes

SUPPLEMENTARY TABLE FOR ENTRY OF RMS VOLTAGES.

Tnom (20°C)	Vnom (12V)	60	300	5.1		
			500	5.0		
			1000	5.0		
		100	300	5.0		
			500	5.1		
			1000	5.1		
Tmax (55°C)	Vmin (10.8V) Vmax(15.6V)	60	1000	5.5	5.6	5.4
				5.7	5.9	5.4
	Vmin (10.8V) Vmax(15.6V)	100		5.5	5.5	5.4
				5.6	5.7	5.5
Tmin (-15°C)	Vmin (10.8V) Vmax(15.6V)	60	1000	5.2	5.6	4.9
				5.6	5.7	5.5
	Vmin (10.8V) Vmax(15.6V)	100		5.5	5.7	5.1
				5.5	5.9	5.1

Ambient Temperature 20°C

RECEIVER HARMONIC DISTORTION AND RATED AUDIO FREQUENCY OUTPUT POWER**HEADPHONE**

Rated load = 300 Ohms

Limit = 1.0mW

Fn = 156.800MHz				Output Power (mW)			Pass/Fail
TEST CONDITIONS		TEST SIGNAL LEVEL (dBuV)	Fmod (Hz)	Fn	Fn (1.5kHz)	Fn (+1.5kHz)	
Tnom (20°C)	Vnom (12V)	60	300	6.6			Pass
			500	13.0			Pass
			1000	17.0			Pass
		100	300	6.6			Pass
			500	13.0			Pass
			1000	17.0			Pass
Tmax (55°C)	Vmin (10.8V) Vmax(15.6V)	60	1000				
	Vmin (10.8V) Vmax(15.6V)	100					
Tmin (-15°C)	Vmin (10.8V) Vmax(15.6V)	60	1000				
	Vmin (10.8V) Vmax(15.6V)	100					

Complies:- Yes**SUPPLEMENTARY TABLE FOR ENTRY OF RMS VOLTAGES.**

Tnom (20°C)	Vnom (12V)	60	300	1.4		
			500	1.8		
			1000	2.2		
		100	300	1.4		
			500	1.9		
			1000	2.2		
Tmax (55°C)	Vmin (10.8V) Vmax(15.6V)	60	1000	2.9	2.9	2.8
				2.9	2.9	2.8
	Vmin (10.8V) Vmax(15.6V)	100		2.9	3.0	2.8
				2.9	2.9	2.8
Tmin (-15°C)	Vmin (10.8V) Vmax(15.6V)	60	1000	2.1	2.2	1.9
				2.0	2.1	1.8
	Vmin (10.8V) Vmax(15.6V)	100		2.1	2.3	2.0
				2.1	2.2	1.9

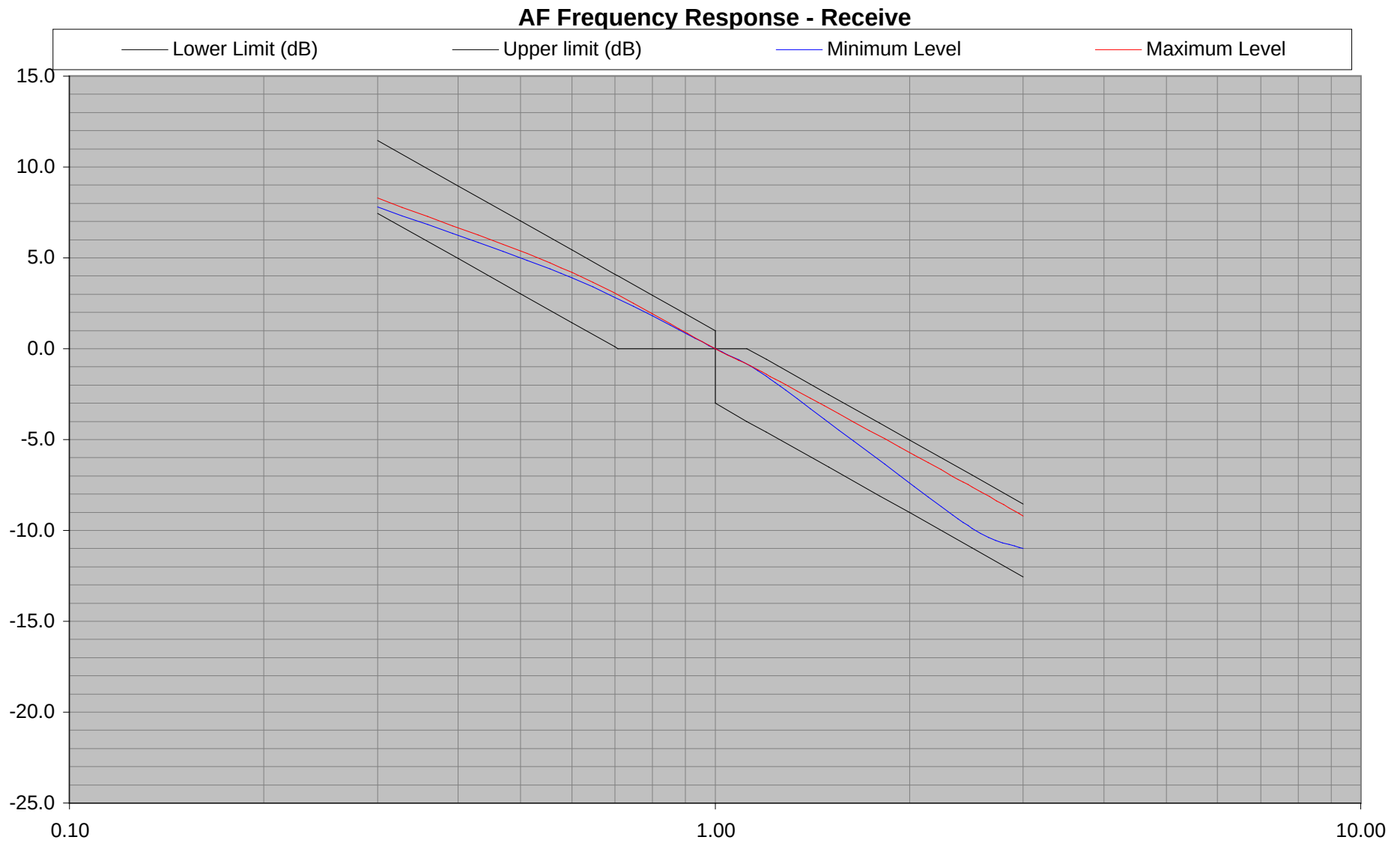
Ambient Temperature = 20°C

RECEIVER AUDIO FREQUENCY RESPONSE

Supply Voltage = 12.0 Volts

Modulating Frequency (Hz)	Lower Limit (dB)	Upper limit (dB)	Relative Audio Power									Pass / Fail
			155.025MHz			156.800MHz			162.975MHz			
			F _n	F _n -1.5	F _n +1.5	F _n	F _n -1.5	F _n +1.5	F _n	F _n -1.5	F _n +1.5	
0.10												
0.11												
0.12												
0.13												
0.15												
0.17												
0.20												
0.30	11.5	7.5				8.1	8.3	7.8				Pass
0.40	9.0	5.0										
0.50	7.0	3.0										
0.60	5.4	1.4				3.9	4.0	4.2				Pass
0.70	4.1	0.1										
0.71	4.0	0.0										
0.80	2.9											
0.90	1.9											
1.00	1.0											
1.00	0.0	0.0				0.0	0.0	0.0				Pass
1.00		-3.0				0.0	0.0	0.0				Pass
1.12	0.0	-4.0				0.0	0.0	0.0				Pass
1.20	-0.6	-4.6				-1.5	-1.5	-1.4				Pass
1.50	-2.5	-6.5										
1.80	-4.1	-8.1										
2.00	-5.0	-9.0										
2.50	-7.0	-11.0				-7.6	-7.9	-9.9				Pass
3.00	-8.5	-12.5				-9.2	-9.7	-11.0				Pass
4.00												
5.00												
6.00												
7.00												
8.00												
9.00												
10.00												

Complies:- Yes



Ambient Temperature = 20°C

RECEIVER MAXIMUM USEABLE SENSITIVITY

Limit under normal conditions = 6 dBuV

Limit under extreme conditions = 12 dBuV

TEST CONDITIONS		Receiver Sensitivity (dBm / dbuV)						Pass/Fail
		155.025MHz		156.800MHz		162.975MHz		
Tnom (20°C)	Vnom (12V)			-119.0	-6.0			Pass
Tmax (55°C)	Vmin (10.8V)			-114.5	-1.5			Pass
	Vmax(15.6V)			-114.5	-1.5			Pass
Tmin (-15°C)	Vmin (10.8V)			-114.0	-1.0			Pass
	Vmax(15.6V)			-114.0	-1.0			Pass

Complies:- Yes

Ambient Temperature = 20°C

RECEIVER CO - CHANNEL REJECTION RATIO

Limit (upper) = 0.0dB

Limit (lower) = -10.0dB

Frequency of Unwanted Signal	Rejection Ratio (dB)			Pass/Fail
	155.025MHz	156.800MHz	162.975MHz	
Fn + 3kHz		-9.0		Pass
Fn + 1.5kHz		-9.0		Pass
Fn		-9.0		Pass
Fn - 1.5kHz		-9.0		Pass
Fn - 3kHz		-9.0		Pass

Complies:- Yes

Ambient Temperature = 20°C

RECEIVER ADJACENT CHANNEL SELECTIVITY

Limit under normal conditions = 70.0dB

Limit under extreme conditions = 60.0dB

Test Conditions		Ratio of Unwanted to Wanted Signal (dB)						Pass/Fail
		155.025MHz		156.800MHz		162.975MHz		
		Fn + 25kHz	Fn - 25kHz	Fn + 25kHz	Fn - 25kHz	Fn + 25kHz	Fn - 25kHz	
Tnom (20°C)	Vnom (12V)			78.5	78.0			Pass
Tmin (-15°C)	Vmax(15.6V)			77.0	76.5			Pass
	Vmin (10.8V)			77.0	76.5			Pass
Tmax (55°C)	Vmax(15.6V)			76.0	76.0			Pass
	Vmin (10.8V)			76.0	76.0			Pass

Complies:- Yes

Ambient Temperature = 20°C

RECEIVER SPURIOUS RESPONSE REJECTION RATIO

Supply Voltage = 12.0 Volts

Limit = 70.0dB

Frequency of Spurious Responses (MHz)	Relationship	Ratio (dB)			Pass / Fail
		155.025MHz	156.800MHz	162.975MHz	
21.4	IF				
112.225	Image				
144.325	"Half IF"				
160.025	2nd Rx LO				
114.000	Image		-		Pass
146.100	"Half IF"		-		Pass
160.025	2nd Rx LO		-		Pass
563.000			74		Pass
120.175	Image				
152.275	"Half IF"				
160.025	2nd Rx LO				
2nd Receiver - informative only					
17.9	IF				
138.625	Image				
147.575	"Half IF"				
153.300	1st Rx LO				

Notes:

Complies:- Yes

Ambient Temperature = 20°C

RECEIVER INTERMODULATION RESPONSE

Supply Voltage = 12.0 Volts

Limit (upper) = 68.0dB

Frequency of Unwanted Signal	Rejection Ratio (dB)			Pass/Fail
	155.025MHz	156.800MHz	162.975MHz	
Upper Side		69.0		Pass
Lower side		69.0		Pass

Complies:- Yes

Ambient Temperature = 20°C

RECEIVER BLOCKING OR DESENSITISATION

Supply Voltage = 12.0 Volts

Limit = 90 dBuV

Frequency of Unwanted Signal	Rejection Ratio (dB)			Pass/Fail
	155.025MHz	156.800MHz	162.975MHz	
Fn + 10MHz		97		Pass
Fn + 5MHz		97		Pass
Fn + 2MHz		94		Pass
Fn + 1 MHz		93		Pass
Fn - 1MHz		93		Pass
Fn - 2MHz		94		Pass
Fn - 5MHz		94		Pass
Fn - 10Mhz		95		Pass

Complies:- Yes

Ambient Temperature = 20°C

RECEIVER RADIATED SPURIOUS EMISSIONS

Supply Voltage = 12.0 Volts

Limit = 2.0nW

Frequency of Spurious Emissions (MHz)	Spurious Emission Level (nW)			Pass / Fail
	155.025MHz	156.800MHz	162.975MHz	
135.400MHz		0.2		Pass
270.800MHz				
406.200MHz				
541.600MHz				
677.000MHz				
812.400MHz				

Notes: All spuri >10db below limit

Complies:- Yes

Ambient Temperature = 20°C

RECEIVER CONDUCTED SPURIOUS EMISSIONS

Supply Voltage = 12.0 Volts

Limit = 2.0nW

Frequency of Spurious Emissions	Spurious Emission Level (nW)			Pass / Fail
(MHz)	155.025MHz	156.800MHz	162.975MHz	
133.625				
267.25				
400.875				
534.5				
668.125				
801.75				
935.375				
135.4		0.60		Pass
270.8		0.20		Pass
406.2				
541.6				
677				
812.4				
947.8				
141.575				
283.15				
424.725				
566.3				
707.875				
849.45				
991.025				

Notes:

Complies:- Yes

Ambient Temperature = 20°C

RECEIVER HUM AND NOISE

Supply Voltage = 12.0 Volts

Limit = 40.0dB

	155.025MHz	156.800MHz	162.975MHz	Pass/Fail
Hum and Noise level(dB)		43.0		Pass

Complies:- Yes

Ambient Temperature = 20°C

RRECEIVER SQUELCH OPERATION

Supply Voltage = 12.0 Volts

Relative Output Power Limit = -40.0dB

Input Level Limit = 6 dBuV

SINAD Limit = 20.0dB

Frequency of Unwanted Signal	Channel			Pass/Fail
	155.025MHz	156.800MHz	162.975MHz	
Relative Output Power (dB)		-46.00		Pass
SINAD (dB)		25.00		Pass
Input Level (dBuV)		4.50		Pass

Complies:- Yes

Ambient Temperature = 20°C

RRECEIVER SQUELCH OPERATION

Supply Voltage = 12.0 Volts

Upper Limit = 6.0dB

Lower Limit = 3.0dB

	Input Level (dBuV)			Pass/Fail
	155.025MHz	156.800MHz	162.975MHz	
Squelch Open		-5.5		
Squelch Closed		-10.5		
Difference (dB)		5		Pass

Complies:- Yes

Ambient Temperature = 20°C

RECEIVER MULTIPLE WATCH CHARACTERISTIC

Limit of dwell period (Fp) = 150.0mS

Limit of scan period = 2000.0mS

Limit of dwell time (Fa) = 850.0mS

Test Conditions		Scan Period	Dwell Time Fp	Dwell Time Fa	Pass/Fail
Tnom (20°C)	Vnom (12V)	1320.00	140	1180.00	Pass
Tmin (-15°C)	Vmax(15.6V)	1320.00	140	1180.00	Pass
	Vmin (10.8V)	1320.00	140	1180.00	Pass
Tmax (55°C)	Vmax(15.6V)	1320.00	140	1180.00	Pass
	Vmin (10.8V)	1320.00	140	1180.00	Pass

Complies:- Yes

Ambient Temperature = 20°C

2nd Receiver Performance

Test		Temp		Input Level	BER	Measured	Pass / Fail
MUS		20	fn	0 dBuV	1.0%	0.0%	Pass
			fn + 1.5kHz	0 dBuV	1.0%	0.0%	Pass
			fn - 1.5kHz	0 dBuV	1.0%	0.0%	Pass
	10.8	-15		6 dBuV	1.0%	0.0%	Pass
	15.6			6 dBuV	1.0%	0.0%	Pass
	10.8	55		6 dBuV	1.0%	0.0%	Pass
	15.6			6 dBuV	1.0%	0.0%	Pass
CoChannel			fn - 3.0kHz	+3/-5dBuV	1.0%	0.0%	Pass
			fn - 1.5kHz		1.0%	0.0%	Pass
			fn		1.0%	0.0%	Pass
			fn + 1.5kHz		1.0%	0.0%	Pass
			fn + 3.0kHz		1.0%	0.0%	Pass
Adjacent Channel		20	fn + 25kHz		1.0%	0.0%	Pass
			fn - 25kHz		1.0%	0.0%	Pass
	10.8	-15	fn + 25kHz		1.0%	0.0%	Pass
			fn - 25kHz		1.0%	0.0%	Pass
	15.6		fn + 25kHz		1.0%	0.0%	Pass
			fn - 25kHz		1.0%	0.0%	Pass
	10.8	55	fn + 25kHz		1.0%	0.0%	Pass
			fn - 25kHz		1.0%	0.0%	Pass
	15.6		fn + 25kHz		1.0%	0.0%	Pass
			fn - 25kHz		1.0%	0.0%	Pass
Spurious Responses					See Separate Sheet		Pass
IMD			fn+50,+100kHz		1.0%	0.0%	Pass
			fn-50,-100kHz		1.0%	0.0%	Pass
Dynamic Range					1.0%	0.0%	Pass

Ambient Temp = 20

Spurious response and blocking immunity

Frequency of Spurious Responses	Relationship	Unwanted Level	BER Limit	BER Measured	Pass / Fail
	Spurii				
17.900MHz	First IF	73 dBuV	1.0%	0.0%	Pass
120.725MHz	Image	73 dBuV	1.0%	0.0%	Pass
147.575MHz	"1/2 IF"	73 dBuV	1.0%	0.0%	Pass
153.300MHz	First Rx LO	73 dBuV	1.0%	0.0%	Pass
157.435MHz	2nd Image	73 dBuV	1.0%	0.0%	Pass
	Blocking				
166.525MHz		93 dBuV	1.0%	0.0%	Pass
161.525MHz		93 dBuV	1.0%	0.0%	Pass
158.525MHz		93 dBuV	1.0%	0.0%	Pass
157.525MHz		93 dBuV	1.0%	0.0%	Pass
155.525MHz		93 dBuV	1.0%	0.0%	Pass
154.525MHz		93 dBuV	1.0%	0.0%	Pass
151.525MHz		93 dBuV	1.0%	0.0%	Pass
146.525MHz		93 dBuV	1.0%	0.0%	Pass

Complies? Yes

Spurious Frequency	Limit nW	Level nW	Pass / Fail
138.625MHz	2.00	0.20	Pass
277.250MHz	2.00		Test
415.875MHz	2.00		Test
554.500MHz	2.00		Test
693.125MHz	2.00		Test
831.750MHz	2.00		Test
970.375MHz	2.00		Test
1109.000MHz	2.00		Test
1247.625MHz	2.00		Test
1386.250MHz	2.00		Test
1524.875MHz	2.00		Test
1663.500MHz	2.00		Test
1802.125MHz	2.00		Test
1940.750MHz	2.00		Test

Notes: All spuriuos emissions >10db below limit
Complies? Yes

Verification of correct decoding of various types of DSC calls

Format Specifier	Category	Type	Requested Channel	Received OK?	Set to Channel	Pass / Fail
Distress		F3E/G3E	16	Yes	16	Pass
All Ships	Distress	Distress Ack	-	Yes	-	Pass
All Ships	Distress	Distress Relay	-	Yes	-	Pass
All Ships	Urgency	F3E/G3E	16	Yes	16	Pass
All Ships	Safety	F3E/G3E	06	Yes	06	Pass
Individual	Urgency	F3E/G3E	16	Yes	16	Pass
Individual	Safety	F3E/G3E	08	Yes	08	Pass
Individual	Routine	F3E/G3E	08	Yes	08	Pass
Group	Routine	F3E/G3E	06	Yes	06	Pass

Complies? Yes