Frequency Stability

FCC ID: CM676A91341-600

Frequency Stability

Justification

The individuals and/or the organization requesting the test provided the modes, configurations and settings available to evaluate. While scanning the radiated emissions, all of the EUT parameters listed below were investigated. This includes, but may not be limited to, antennas, tuned transmit frequency ranges, operating modes, and data rates.

Channels in Specified Band Investigated:
Mid

Operating Modes Investigated:
Typical

Data Rates Investigated:
Maximum

Output Power Setting(s) Investigated:
Maximum

Power Input Settings Investigated:
Battery

Software\Firmware Applied During Test

Exercise software	Standard Production Software	Version	Unknown
Description			
The system was tested using standard operating production software to exercise the functions of the device during the testing.			

Equipment Modifications

No EMI suppression devices were added or modified. The EUT was tested as delivered.

EUT and Peripherals

Description	Manufacturer	Model/Part Number	Serial Number
EUT	SpaceLabs Medical	91341-05	PO16

Measurement Equipment

Description	Manufacturer	Model	Identifier	Last Cal	Interval
Spectrum Analyzer	Tektronix	2784	AAO	03/08/2001	24 mo
Near field probe	EMCO	7405	IPD	No cal required	N/A
Digital Multimeter	Tektronix	DMM912	MMH	06/20/2002	12 mo
DC Power Supply	Topward	TPS-2000	TPD	No cal required	N/A
Temperature / Humidity Chamber	Cincinnati Sub-Zero	ZH-32-2-2-H/AC	TBA	10/10/2001	12 mo

Test Description

Requirement: Per 47 CFR 2.1055, the frequency stability shall be measured with variation of ambient temperature and primary supply voltage. A spectrum analyzer or frequency counter can be used to measure the frequency stability. If using a spectrum analyzer, it must have a precision frequency reference that exceeds the stability requirement of the transmitter. A temperature / humidity chamber is required.

Configuration:

Variation of Supply Voltage

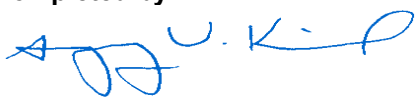
The primary supply voltage was varied from 85% to 115% of nominal. The EUT can only be battery operated, so a DC lab supply was used to vary the supply voltage up to 115% of 9V and down to the EUT's voltage end point.

Variation of Ambient Temperature

Using a temperature chamber, the transmit frequency was recorded at the extremes of the specified temperature range (-30° to +50° C) and at 10°C intervals.

Measurements were made at mid-band. The antenna is integral to the EUT, so a radiated measurement was made using a spectrum analyzer and a near field probe. The spectrum analyzer is equipped with a precision frequency reference that exceeds the stability requirement of the EUT.

Completed by:



NORTHWEST
EMC

EMISSIONS DATA SHEET

Rev BETA
01/30/01

EUT:	91341-05			Work Order:	SPAC0307
Serial Number:	PO16			Date:	09/05/02
Customer:	SpaceLabs Inc.			Temperature:	75 degrees F
Attendees:	N/A	Tested by:	Greg Kiemel	Humidity:	38% RH
Customer Ref. No.:	N/A	Power:	N/A	Job Site:	EV09

TEST SPECIFICATIONS

Specification:	47 CFR 2.1055	Year:	Most Current	Method:	TIA/EIA - 603	Year:	1993

SAMPLE CALCULATIONS

COMMENTS

EUT OPERATING MODES

Transmitting mid band

DEVIATIONS FROM TEST STANDARD

None

REQUIREMENTS

The frequency stability shall be measured with variation of ambient temperature and primary supply voltage.

RESULTS	MINIMUM FREQUENCY STABILITY
Pass	0.98 ppm

SIGNATURE

Tested By: A. U. Kiel

DESCRIPTION OF TEST

Frequency Stability

Frequency Stability with Variation of Ambient Temperature (Primary Supply = 9V Battery)

Temp (˚C)	Assigned Frequency (MHz)	Measured Frequency (MHz)	Tolerance (ppm)	Specification (ppm)
-30	611.012500	611.012530	0.05	n/a
-20	611.012500	611.012350	0.25	n/a
-10	611.012500	611.012210	0.47	n/a
0	611.012500	611.012110	0.64	n/a
10	611.012500	611.011900	0.98	n/a
20	611.012500	611.012170	0.54	n/a
30	611.012500	611.012400	0.16	n/a
40	611.012500	611.012410	0.15	n/a
50	611.012500	611.012500	0.00	n/a

Frequency Stability with Variation of Battery Voltage (Ambient Temperature = 25C)

Voltage (VDC)	Assigned Frequency (MHz)	Measured Frequency (MHz)	Tolerance (ppm)	Specification (ppm)
10.35 (115%)	611.012500	611.012200	0.49	n/a
9.9 (110%)	611.012500	611.012200	0.49	n/a
9.45 (105%)	611.012500	611.012150	0.57	n/a
9 (100%)	611.012500	611.012150	0.57	n/a
8.55 (95%)	611.012500	611.012150	0.57	n/a
8.1 (90%)	611.012500	611.012150	0.57	n/a
7.65 (85%)	611.012500	611.012150	0.57	n/a
5.5 (end point)	611.012500	611.012150	0.57	n/a