

## 7. APPENDIX G - FREQUENCY STABILITY

### 7.1 TEST RESULTS

#### 7.1.1 FREQUENCY ERROR VS. VOLTAGE

Frequency Error vs. Voltage								
Test Mode	Test Bandwidth [MHz]	Test Channel	Modulation	Test Temp.	Test Volt.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
TM1	5	LCH	QPSK	TN	VH	19.25	0.01	PASS
			QPSK	TN	VN	15.75	0.01	PASS
			QPSK	TN	VL	2.42	0	PASS
		MCH	QPSK	TN	VH	-8.34	0	PASS
			QPSK	TN	VN	-10.42	0	PASS
			QPSK	TN	VL	2.23	0	PASS
		HCH	QPSK	TN	VH	6.14	0	PASS
			QPSK	TN	VN	-0.70	0	PASS
			QPSK	TN	VL	6.66	0	PASS
	20	LCH	QPSK	TN	VH	0.09	0	PASS
			QPSK	TN	VN	0.18	0	PASS
			QPSK	TN	VL	4.84	0	PASS
		MCH	QPSK	TN	VH	-1.92	0	PASS
			QPSK	TN	VN	0	0	PASS
			QPSK	TN	VL	5.22	0	PASS
		HCH	QPSK	TN	VH	-0.94	0	PASS
			QPSK	TN	VN	0.87	0	PASS
			QPSK	TN	VL	-5.90	0	PASS
TM2	5	LCH	16QAM	TN	VH	13.42	0.01	PASS
			16QAM	TN	VN	-6.51	0	PASS
			16QAM	TN	VL	-4.87	0	PASS
		MCH	16QAM	TN	VH	3.97	0	PASS
			16QAM	TN	VN	-11.92	0	PASS
			16QAM	TN	VL	-1.52	0	PASS
		HCH	16QAM	TN	VH	2.95	0	PASS
			16QAM	TN	VN	-2.44	0	PASS
			16QAM	TN	VL	19.15	0.01	PASS
	20	LCH	16QAM	TN	VH	-5.60	0	PASS
			16QAM	TN	VN	1.60	0	PASS
			16QAM	TN	VL	-3.79	0	PASS
		MCH	16QAM	TN	VH	-3.05	0	PASS
			16QAM	TN	VN	-1.53	0	PASS
			16QAM	TN	VL	-2.42	0	PASS
		HCH	16QAM	TN	VH	1.98	0	PASS
			16QAM	TN	VN	-4.39	0	PASS
			16QAM	TN	VL	4.88	0	PASS

**7.1.2 FREQUENCY ERROR VS. TEMPERATURE**

Frequency Error vs. Temperature								
Test Mode	Test Bandwidth [MHz]	Test Channel	Modulation	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
TM1	5	LCH	QPSK	VN	-30	4.26	0	PASS
			QPSK	VN	-20	11.04	0	PASS
			QPSK	VN	-10	-2.25	0	PASS
			QPSK	VN	0	9.39	0	PASS
			QPSK	VN	10	-8.17	0	PASS
			QPSK	VN	20	2.87	0	PASS
			QPSK	VN	30	8.08	0	PASS
			QPSK	VN	40	-7.89	0	PASS
			QPSK	VN	50	-0.80	0	PASS
		MCH	QPSK	VN	-30	-5.86	0	PASS
			QPSK	VN	-20	-0.36	0	PASS
			QPSK	VN	-10	10.63	0	PASS
			QPSK	VN	0	-21.51	-0.01	PASS
			QPSK	VN	10	-2.10	0	PASS
			QPSK	VN	20	0.22	0	PASS
			QPSK	VN	30	4.68	0	PASS
			QPSK	VN	40	8.30	0	PASS
			QPSK	VN	50	-7.93	0	PASS
		HCH	QPSK	VN	-30	18.18	0.01	PASS
			QPSK	VN	-20	-5.45	0	PASS
			QPSK	VN	-10	-3.53	0	PASS
			QPSK	VN	0	12.89	0	PASS
			QPSK	VN	10	0.34	0	PASS
			QPSK	VN	20	9.97	0	PASS
			QPSK	VN	30	10.04	0	PASS
			QPSK	VN	40	-0.85	0	PASS
			QPSK	VN	50	5.72	0	PASS
			QPSK	VN	50	-7.79	0	PASS

Frequency Error vs. Temperature								
Test Mode	Test Bandwidth [MHz]	Test Channel	Modulation	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
TM1	20	LCH	QPSK	VN	-30	-5.74	0	PASS
			QPSK	VN	-20	3.77	0	PASS
			QPSK	VN	-10	2.58	0	PASS
			QPSK	VN	0	2.48	0	PASS
			QPSK	VN	10	-1.87	0	PASS
			QPSK	VN	20	-2.17	0	PASS
			QPSK	VN	30	-0.59	0	PASS
			QPSK	VN	40	-0.10	0	PASS
		MCH	QPSK	VN	50	-1.76	0	PASS
			QPSK	VN	-30	-2.99	0	PASS
			QPSK	VN	-20	-0.86	0	PASS
			QPSK	VN	-10	-3.32	0	PASS
			QPSK	VN	0	-2.53	0	PASS
			QPSK	VN	10	-6.12	0	PASS
			QPSK	VN	20	-1.34	0	PASS
			QPSK	VN	30	-9.32	0	PASS
		HCH	QPSK	VN	40	-1.43	0	PASS
			QPSK	VN	50	-2.59	0	PASS
			QPSK	VN	-30	-2.12	0	PASS
			QPSK	VN	-20	1.31	0	PASS
			QPSK	VN	-10	-4.20	0	PASS
			QPSK	VN	0	1.73	0	PASS
			QPSK	VN	10	-1.59	0	PASS
			QPSK	VN	20	2.79	0	PASS
		QPSK	VN	30	0.33	0	PASS	
		QPSK	VN	40	4.93	0	PASS	
		QPSK	VN	50	-5.42	0	PASS	

Frequency Error vs. Temperature								
Test Mode	Test Bandwidth [MHz]	Test Channel	Modulation	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
TM2	5	LCH	16QAM	VN	-30	-1.96	0	PASS
			16QAM	VN	-20	-13.29	-0.01	PASS
			16QAM	VN	-10	-2.73	0	PASS
			16QAM	VN	0	2.16	0	PASS
			16QAM	VN	10	-7.49	0	PASS
			16QAM	VN	20	-1.54	0	PASS
			16QAM	VN	30	-16.74	-0.01	PASS
			16QAM	VN	40	-9.71	0	PASS
		MCH	16QAM	VN	50	8.28	0	PASS
			16QAM	VN	-30	-4.03	0	PASS
			16QAM	VN	-20	-11.56	0	PASS
			16QAM	VN	-10	9.74	0	PASS
			16QAM	VN	0	8.12	0	PASS
			16QAM	VN	10	12.95	0	PASS
			16QAM	VN	20	0.50	0	PASS
			16QAM	VN	30	-13.33	-0.01	PASS
		HCH	16QAM	VN	40	3.87	0	PASS
			16QAM	VN	50	-7.83	0	PASS
			16QAM	VN	-30	5.36	0	PASS
			16QAM	VN	-20	5.13	0	PASS
			16QAM	VN	-10	8.40	0	PASS
			16QAM	VN	0	2.53	0	PASS
			16QAM	VN	10	1.49	0	PASS
			16QAM	VN	20	6.15	0	PASS
16QAM	VN	30	0.01	0	PASS			
16QAM	VN	40	-5.17	0	PASS			
16QAM	VN	50	-1.53	0	PASS			

Frequency Error vs. Temperature								
Test Mode	Test Bandwidth [MHz]	Test Channel	Modulation	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
TM2	20	LCH	16QAM	VN	-30	-4.90	0	PASS
			16QAM	VN	-20	-4.49	0	PASS
			16QAM	VN	-10	1.75	0	PASS
			16QAM	VN	0	-3.28	0	PASS
			16QAM	VN	10	-1.94	0	PASS
			16QAM	VN	20	-1.45	0	PASS
			16QAM	VN	30	-2.66	0	PASS
			16QAM	VN	40	2.58	0	PASS
		MCH	16QAM	VN	50	-6.91	0	PASS
			16QAM	VN	-30	2.77	0	PASS
			16QAM	VN	-20	-2.49	0	PASS
			16QAM	VN	-10	-4.92	0	PASS
			16QAM	VN	0	1.71	0	PASS
			16QAM	VN	10	4.08	0	PASS
			16QAM	VN	20	3.75	0	PASS
			16QAM	VN	30	4.98	0	PASS
		HCH	16QAM	VN	40	-3.22	0	PASS
			16QAM	VN	50	-2.23	0	PASS
			16QAM	VN	-30	4.19	0	PASS
			16QAM	VN	-20	-1.18	0	PASS
			16QAM	VN	-10	-3.47	0	PASS
			16QAM	VN	0	-3.35	0	PASS
			16QAM	VN	10	1.96	0	PASS
			16QAM	VN	20	-2.09	0	PASS
16QAM	VN	30	0.73	0	PASS			
16QAM	VN	40	1.39	0	PASS			
16QAM	VN	50	-3.11	0	PASS			

End of Test Report