

MDS 1710 Frequency Stability over Temperature (Below 1PPM)

GE MDS LLC. 10/18/07

To verify that the MDS 1710 output frequency did not shift by more than 1 PPM over the rated operating temperature, testing was done. The test was conducted in an environmental chamber with the temperature ranging from -30 c to 60 c. The radio was operational during the entire part of the test with control line, power line and antenna line coming out of the chamber. To be certain that the chamber temperature and the radio temperature were both equal a Fluke 80TK thermocouple module was used. The probe was tied directly into the screw holes of the chassis. The temperature was incremented by 10 c and once the thermocouple probe had reached the desired temperature the radio was soaked an additional 50 minutes at that temperature to be certain. Below are the results of the temperature testing.

Temp C	Radio: MDS 1710 (SER 1199554)	13.8vdc	10.5vdc	16vdc
	MDS 1710 Tx Freq (MHz)	Nominal Freq (Hz)	Freq (Hz)	Freq (Hz)
-30	173.899886	114	112	115
-20	173.900002	-2	-3	-4
-10	173.899979	21	24	26
0	173.899939	61	63	70
10	173.899948	52	55	62
20	173.899977	23	25	30
30	173.899943	57	60	65
40	173.899981	19	22	25
50	173.899989	11	15	17
60	173.899896	104	103	105

From the results it is clear that the MDS 1710 radio meets the 1PPM criteria. The set desired frequency being 173.9 MHz would indicate the frequency shift would have to be less than 174 hertz. From the collected data, the largest deviation is at -30 C@16vdc, which is 119 Hz, which is well inside the 174 Hz, +/-1ppm spec.