

TEMPERATURE COMPENSATION INFORMATION FOR GE 5ppm CRYSTAL
MODULE USED IN THE CUSTOM MVP AND EXECUTIVE II RADIOS.

There is a three digit number on the top of the crystal can. It indicates the direction of drift from +30 degrees C to -3.5 degrees C, and the extent of drift.

Code 132 = + 3.2 PPM

Code 005 = - 0.5 PPM

Codes will always be between +4.0 and -2 PPM

C2 is selected from chart

+4.0 to +3.5	43 pF @ -750 PPM/°C	19A116656P43J7
+3.4 to +2.8	43 pF @ -470 PPM/°C	19A116656P43J4
+2.7 to +2.1	43 pF @ -220 PPM/°C	19A116656P43J2
+2.0 to +1.8	43 pF Si MICA	7489162P18
+1.7 to +1.4	47 pF Si MICA	7489162P19
+1.3 to +1.0	51 pF Si MICA	7489162P20
+0.9 to +0.5	56 pF Si MICA	7489162P21
+0.4 to 0.0	62 pF Si MICA	7489162P22
-0.1 to -0.5	68 pF Si MICA	7489162P23
-0.6 to -1.0 *	75 pF Si MICA	7489162P24
-1.1 to -1.5 *	82 pF Si MICA	7489162P25
-1.6 to -2.0 *	91 pF Si MICA	7489162P26

* If value of C2 is 75 pF or greater, then C4 (4.7 pF) must be removed

The crystal is cut/ground/plated to be on frequency in a specific test fixture at 30° C. It is then measured again in the same fixture at -3.5° C. The difference is the drift error. If the crystal drifts 467 HZ high at -3.5° C, reference to 146.000 MHz at 30° C, then the drift is 3.2 PPM. (146 Hz drift @ 146 MHz = 1 PPM) The code on the crystal is 132 and the cap should be 43 pf with a negative 470 temp coefficient.

The C2 capacitor has to be in the circuit to oscillate, so I don't know what the "test" fixture used. However, I'm thinking that an NPO capacitor could possibly be substituted to take the drift readings. Not sure of values, but several could be tried. If this were done using a "stock" GE crystal already installed in a module, one could reverse engineer (trial and error) until the correct value was discovered.