Design of VHF Sine Wave Sources

50.125 MHz VXO for microT2 exciter

Quartz Crystal
Capacitor
Transistor
Transformer
Inductor

Solder to ground
Resistor

8.354 MHz crystal

10k
10k
180
180
8.354 MHz crystal

All 3 transistors 2N3904 or equivalent
T1 4t trifilar on FT25-43
L1 and associated 180pF capacitors
X=100 ohms at crystal freq.

Gray circuitry is part of microT2
L2 18t T25-2 resonant at 3x crystal freq.
T2 18t:3t T25-2 resonant at 3x crystal freq.

0 dBm output drives microT2 buffer amp
C1 3/4" long twisted #28 gimmick
C2 3/8" long twisted #28 gimmick
41 and 58 MHz spurs -45 dBC

TP reads ~0.4 volts when properly tuned
T3,T4 16t:2t T25-6 resonant at 6x crystal freq.
MCL T4:1 may be replaced by trifilar transformer like T1
0 dBm output 50 MHz all spurs < 50 dBC
Block Diagram:

Oscillator Multiplier Isolating Amplifier

![Block Diagram](image-url)
High Stability Quartz Resonator Oscillator
DC and RF Design Illustration
Frequency Multipliers

- transistor
- balanced diode
- passive diode with diplexer
- phase locked loop
- ...and many others
Transistor Frequency Multiplier
Interstage Considerations and Test Points
Isolation Amplifier on Output

S11 S21 S12 S22
Complete Schematic of 144 MHz Sine Wave Source

Note: Electromagnetics Not Shown
Passive Diode Doubler
Complete Schematic of 222 MHz Sine Wave Source

Complete Schematic of 222 MHz Sine Wave Source