# HF Low Pass filter

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | | | Design parameters:  7 pole Chebychev, 0.1dB ripple  Corner frequency = 1.4FMax | | |
| Band | 160M | -3dB point | | 2.75MHz |
| L1/L3= | 4.79 | uH | | 29 Turns T68-2 22SWG |
| L2= | 5.48 | uH | | 31 Turns T68-2 22SWG |
| C1, C4= | 1200 | pF | | Silver Mica 250V |
| C2, C3= | 2400 | pF | | Silver Mica 250V |
| Passband loss | 0.37dB | measured | |  |
| 2nd Harmonic level | -32dB | @F=3.6MHz | |  |
| 3rd harmonic level | -55dB | @F=5.4MHz | |  |

|  |  |  |  |
| --- | --- | --- | --- |
| Band | 80M | -3dB point | 5.16MHz |
| L1/L3= | 2.28 | uH | 20 Turns T68-2 22SWG |
| L2= | 2.51 | uH | 21 Turns T68-222SWG |
| C1, C4= | 820 | pF | Silver Mica 250V |
| C2, C3= | 1500 | pF | Silver Mica 250V |
| Passband loss | 0.27dB | measured |  |
| 2nd Harmonic level | -36dB | @F=7MHz |  |
| 3rd harmonic level | -69dB | @F=10.5MHz |  |

|  |  |  |  |
| --- | --- | --- | --- |
| Band | 40M | -3dB point | 9.3MHz |
| L1/L3= | 1.25 | uH | 16 Turns T50-222SWG |
| L2= | 1.42 | uH | 17 Turns T50-222SWG |
| C1, C4= | 390 | pF | Silver Mica 250V |
| C2, C3= | 680 | pF | Silver Mica 250V |
| Passband loss | 0.22dB | measured |  |
| 2nd Harmonic level | -43dB | @F=14MHz |  |
| 3rd harmonic level | -80dB | @F=21MHz |  |

|  |  |  |  |
| --- | --- | --- | --- |
| Band | 30, 20M | -3dB point | 19.5MHz |
| L1/L3= | 0.576 | uH | 12 Turns T50-6 22SWG |
| L2= | 0.676 | uH | 13 Turns T50-6 22SWG |
| C1, C4= | 180 | pF | Silver Mica 250V |
| C2, C3= | 330 | pF | Silver Mica 250V |
| Passband loss | 0.22dB | measured |  |
| 2nd Harmonic level | -39dB | @F=28MHz |  |
| 3rd harmonic level | -74dB | @F=42MHz |  |
| 3rd harmonic, 30m | -50dB | @31.5MHz |  |

|  |  |  |  |
| --- | --- | --- | --- |
| Band | 17, 15M | -3dB point | 25.8MHz |
| L1/L3= | 0.38 | uH | 11 Turns T50-10 22SWG |
| L2= | 0.45 | uH | 12 Turns T50-10 22SWG |
| C1, C4= | 150 | pF | Silver Mica 250V |
| C2, C3= | 270 | pF | Silver Mica 250V |
| Passband loss | 0.22dB | measured |  |
| 2nd Harmonic level | -54dB | @F=42MHz |  |
| 3rd harmonic level | -63dB | @F=63MHz |  |
| 3rd harmonic, 17m | -69dB | @F=54MHz |  |

|  |  |  |  |
| --- | --- | --- | --- |
| Band | 12, 10M | -3dB point | 35.7MHz |
| L1/L3= | 250 | nH | 9 Turns T50-10 22SWG |
| L2= | 310 | nH | 10 Turns T50-10 22SWG |
| C1, C4= | 100 | pF | Silver Mica 250V |
| C2, C3= | 180 | pF | Silver Mica 250V |
| Passband loss | 0.35dB | measured |  |
| 2nd Harmonic level | -51dB | @F=56MHz |  |
| 3rd harmonic level | -61dB | @F=84MHz |  |
| 3rd harmonic, 12m | -63dB | @F=72MHz |  |

|  |  |  |  |
| --- | --- | --- | --- |
| Band | 6M | -3dB point | 56.7MHz |
| L1/L3= | 166 | nH | 7 Turns Dia=6.3mm L=9mm 22SWG |
| L2= | 195 | nH | 8 Turns Dia 6.3mm L=10mm 22SWG |
| C1, C4= | 62 | pF | Silver Mica 250V |
| C2, C3= | 110 | pF | Silver Mica 250V |
| Passband loss | 0.5dB | measured |  |
| 2nd Harmonic level | -56dB | @F=100MHz |  |
| 3rd harmonic level | -69dB | @F=150MHz |  |

Keydown test – nothing warms up after 20s @ 100W CW

## Control signals

Each filter activated by applying +12v to its control pin

|  |  |  |  |
| --- | --- | --- | --- |
| 1 | LPF7 (50MHz) | 2 | GND |
| 3 | LPF6 (28 MHz) | 4 | GND |
| 5 | LPF5 (21 MHz) | 6 | GND |
| 7 | LPF4 (14 MHz) | 8 | GND |
| 9 | LPF3 (7MHz) | 10 | GND |
| 11 | LPF2 (3.5MHz) | 12 | GND |
| 13 | LPF1 (1.8MHz) | 14 | GND |
| 15 | +12V | 16 | +12V |