

TF0105 Digitally Tunable LC Filters

200MHz – 400MHz – typical performance



I. General & Electrical Requirements

- Tuned Center Frequency Range (F_{COM}) ^{Note 1}:
 $F_{MIN} = 200\text{MHz}$ to $F_{MAX} = 400\text{MHz}$ in 250-steps, $F_{STEP} = 800\text{kHz}$
- Passband @ 3dB: $F_{SIG} \pm 2.5\text{MHz}$
- Passband Insertion Loss: $\leq 3.2\text{dB}$
- Passband Variation (peak-valley): $\leq 0.3\text{dB}$
- Input/Output VSWR (within the F_{SIG} Bandwidth into 50Ω): $< 2.0:1$
- Absolute Stop Band Attenuation:
 $F_{SIG} \pm 10\%$: 16dB minimum
 $F_{SIG} \pm 15\%$: 22dB minimum
 $F_{SIG} \pm 20\%$: 27dB minimum

30.0MHz to $\frac{1}{2} F_{TUNE}$: 40dB minimum
 $2x F_{SIG}$ to $< 750\text{MHz}$: 35dB minimum
750MHz to 1.2GHz: 25dB minimum
1.2GHz to 2.0GHz: 15dB minimum
- In-Band IIP3: +45dBm minimum
- In Band RF Power Handling: $\leq 1.25\text{-watts}$ (+31dBm) CW
- Out of Band RF Power Handling: 5-watts (+37dBm) CW, $\geq \pm 10\%$ from F_{TUNE}
- Z_{IN}/Z_{OUT} : 50Ω nominal
- Tuning Method:
Digital Control: 250-steps, 8-bit parallel
Tuning Speed: $< 15\mu\text{sec}$
- DC Power:
 V_1 : $+5V_{DC} \pm 5\%$
 I_1 : $< 275\text{mA}$
 V_2 : $100V_{DC} \pm 5\%$ ^{Note 2}
 I_2 : 1.5mA typical

Note 1:

F_{SIG} = Frequency of the signal,

Where; F_{COM} is the target command frequency that the filter will be directed to.

$$F_{COM} = \text{Integer}((F_{SIG} - F_{MIN}) / F_{STEP}) * F_{STEP} + F_{MIN}$$

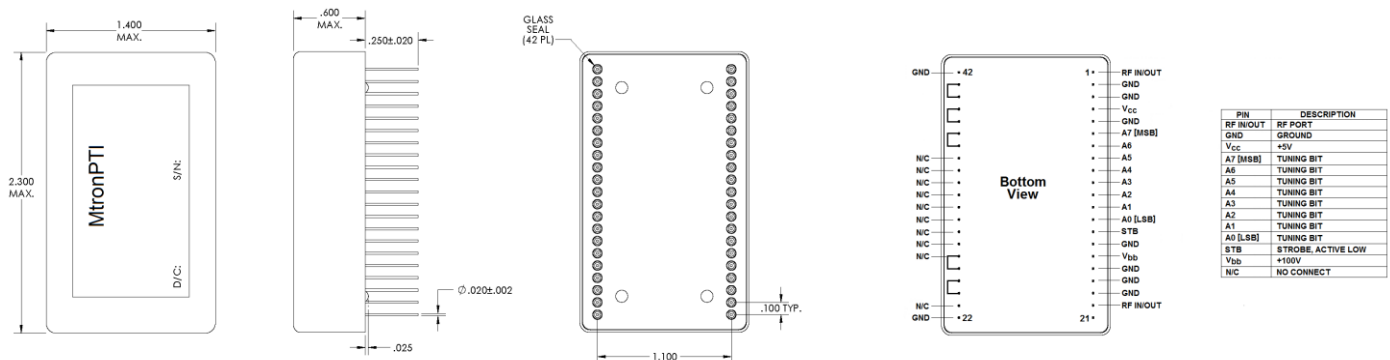
Note 2:

$V_2 = 100\text{V}$, the filter command and tune frequencies are set up with 100V applied and the filter is fully compliant to these specification.

For $V_2 = 50\text{V}$ ($I_2 = 1.5\text{mA}$), the filter will be functional but the filter command frequency may have greater error. Power handling and linearity will be degraded.

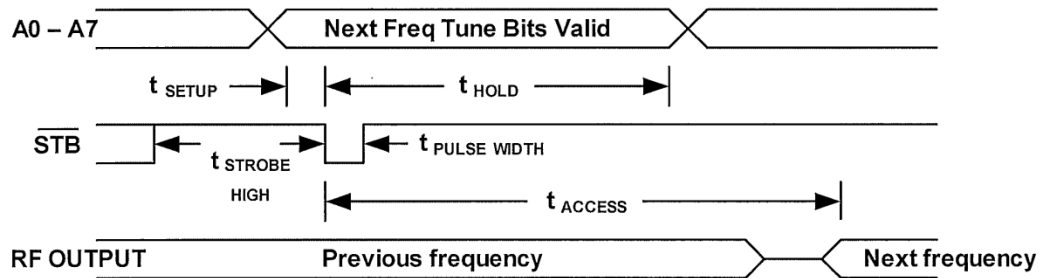
II. Environmental & Physical Requirements

- Temperature Range:
Operating: -40°C to $+85^\circ\text{C}$
Storage: -45°C to $+90^\circ\text{C}$
- Package
Size: 2.300" (L) x 1.400" (W) x 0.600" (H)
Style: 42-pin thru-hole



III. Interface Timing:

Input Control Timing



$t_{\text{SETUP}} = 200 \text{ ns (min)}$

$t_{\text{HOLD}} = 6 \mu\text{S (min)}$

$t_{\text{STROBE HIGH}} = 25 \mu\text{S (min)}$

$t_{\text{PULSE WIDTH}} = 20 \text{ ns (min)}$

$t_{\text{ACCESS}} = 15 \mu\text{S (max)}$

DC Control Interface Characteristics

Symbol	Parameter	Condition	Min	Max	Units
V_{IL}	Input Low Voltage	Control signals except A0 - A7	0.0	0.2 Vcc	V
V_{IH}	Input High Voltage	Control signals except A0 - A7	0.7 Vcc	Vcc	V
V_{IL}	Input Low Voltage	A0 - A7	0.0	0.15 Vcc	V
V_{IH}	Input High Voltage	A0 - A7	0.7 Vcc	Vcc	V

IV. Data Sheet Revision:

Date	Rev.	Author	Details of Revision
08/27/13	A	BRM	Corrected a typographical error in the package width and removed the preliminary status designation.
06/25/13	-	BRM	Original Draft.