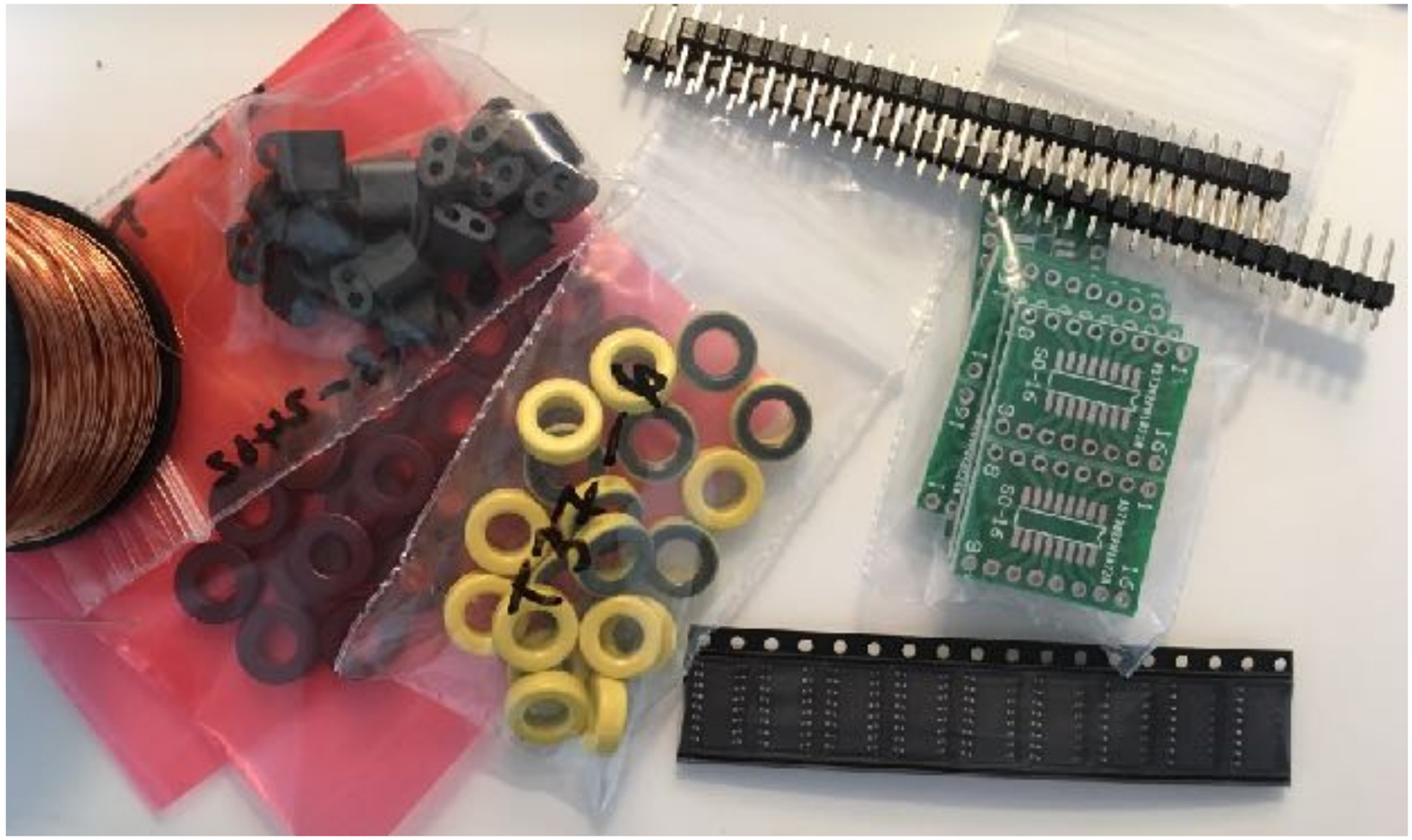
CONSTRUCTOR

Antony M0IFA

Constructor



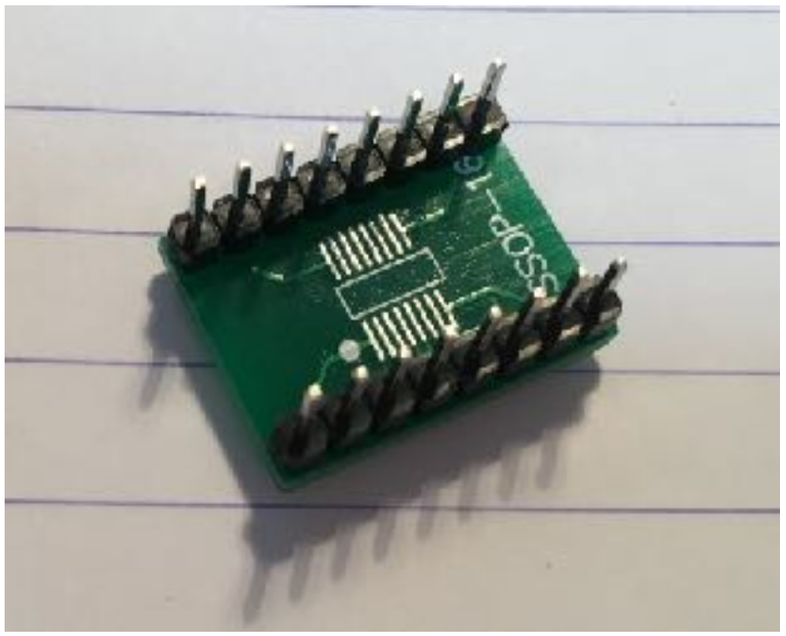
1. SMD device soldering: iron, solder, tweezers

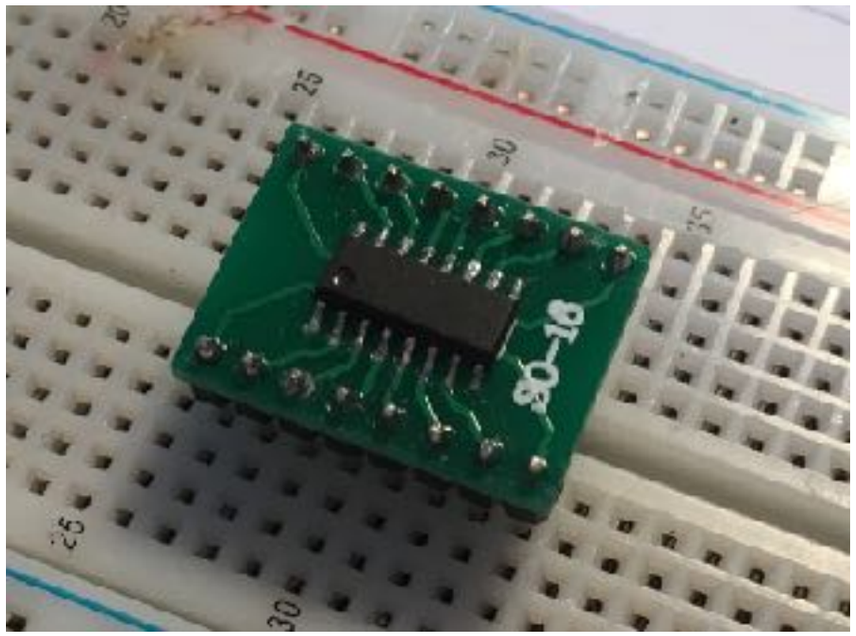
   - The SMD you have is an FST3253, CMOS multiplexer - used in SDR designs

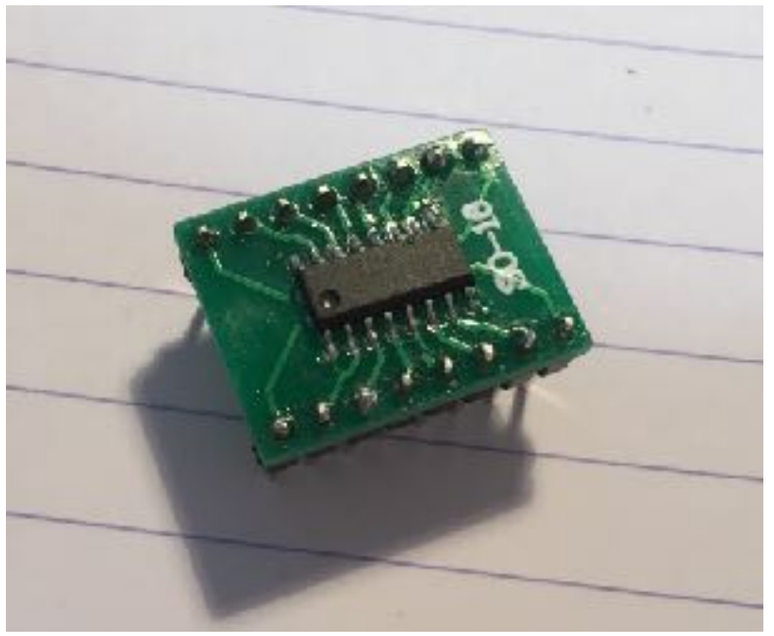
2. Toroids, and transformers

SMD

- Plug headers into Breadboard and solder







- Put a *SMALL* amount of solder on one pad
- Position SMD, and reflow the solder to fix
- Solder the other pads

Toroids

Come in many sizes and types

Two types of material

- Powdered iron
- Ferrite

- Both have permeability = Al
- Increases the inductance of coils
- Typical RF toroids

  - T37-6 Al = 3
  - FT37-43 Air = 350
  - BN-43-2402 Al = 1440

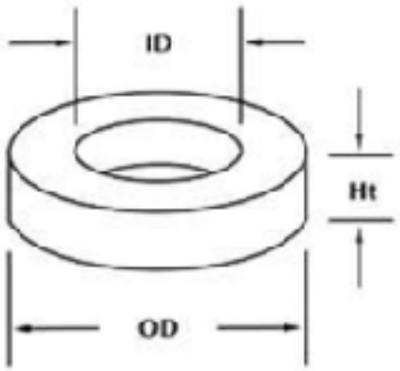
uH = (Al * turns^2) / 1000

Characteristics

T37-6

Physical Dimensions

COLOR CODE
- 1 Blue/Clear
- 2 Red/Clear
- 3 Gray/Clear
- 6 Yellow/Clear
- 7 White/Clear
- 10 Black/Clear
- 12 Green/White
- 15 Red/White
- 17 Blue/Yellow
- 0 Tan



TYPICAL PART NO.
T 25 - 10
OD in 100th Inches
Micrometals Mix No.
Letter Indicates Alternate Height

OD = .375 in / 9.53 mm +/- 0.015 in
ID = .205 in/ 5.21 mm +/- 0.015 in
Ht = .128 in / 3.25 mm +/- 0.02 in

A_L=3 +/- 5 % uH=(A_L*Turns^2)/1000

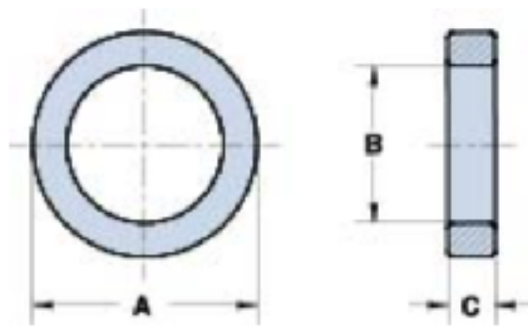
Temperature Stability (ppm /°C) = 35

Color Code = Yellow / Clear

Optimum Resonant Circuit Range
for highest Q and lowest core loss
3 MHz - 40 MHz

FT37-43

Physical Dimensions



OD(A) = 0.375 in / 9.5 mm +/- 0.25 mm
ID(B) = 0.187 in. / 4.75 mm +/- 0.10 mm
Ht(C) = 0.125 in. / 3.3 mm +/- 0.25 mm

A_L=350 +/- 20 % uH=(A_L*Turns^2)/1000
Actual measured AL using 10 turns #28 wire

Temperature Stability (ppm /°C) = 12500

Color Code = shiny black

Application Freq Range
Wideband Transformers 5 - 400 MHz
Power Transformers 0.5 - 30 MHz
RFI Suppression 5 - 500 MHz

NOTE: frequency range

toroids.info

Chose type

Enter
- uH to find turns
- turns to find uH

T25-2	FB-43-101
T25-6	FB-43-2401
T30-2	FB-73-2401
T30-6	FB-43-4852
T30-10	FB-43-7351
T37-0	FB-31-1020
T37-1	FT23-43
T37-2	FT37-43
T37-6	FT37-61
T37-7	FT37-67
T37-10	FT50-43
T44-2	FT50-61
T44-6	FT50-75
T50-1	FT50-J
T50-2	FT82-43
T50-3	FT82-61
T50-6	FT114-43
T50-7	FT114-61
T50-10	FT140-43
T68-1	FT140-61
T68-2	FT140-77
T68-6	FT240-31
T68-7	FT240-43
T68-10	FT240-52
T80-2	FT240-K
T80-6	FT240-61
T80-10	FT290-43
T80-17	XXX-XX
T94-2	BLN1728-8
T94-6	BN-43-2402
T94-10	BN-61-2402
T106-0	BN-43-1502
T106-2	BN-61-1502

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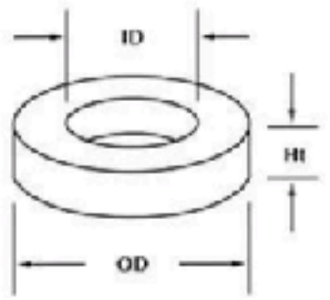

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Orders and Pricing
www.kitsandparts.com

Turns-Length Calculator for **T37-6**
Includes 1 inch / 2.5 cm pig-tails

MHz	uH	pF	ohms	turns	inches - cm		
0	0	0	0	0		Calc	Clear

Enter **uH** to Calc number of turns.
Enter number of turns to Calc uH.
Enter 2: MHz, uH, pF, ohms or turns to Calc all values.

Which to chose

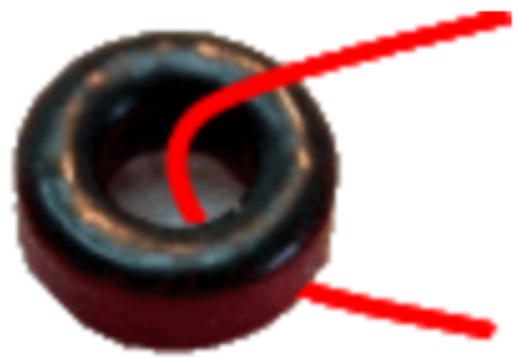
- For broadband transformers you need an inductance with XL 2-3x higher than in/out impedance at minimum frequency
  Chose FT… types with high AI

- For tuned circuits, needing lower inductances
  Chose T… types with lower AI

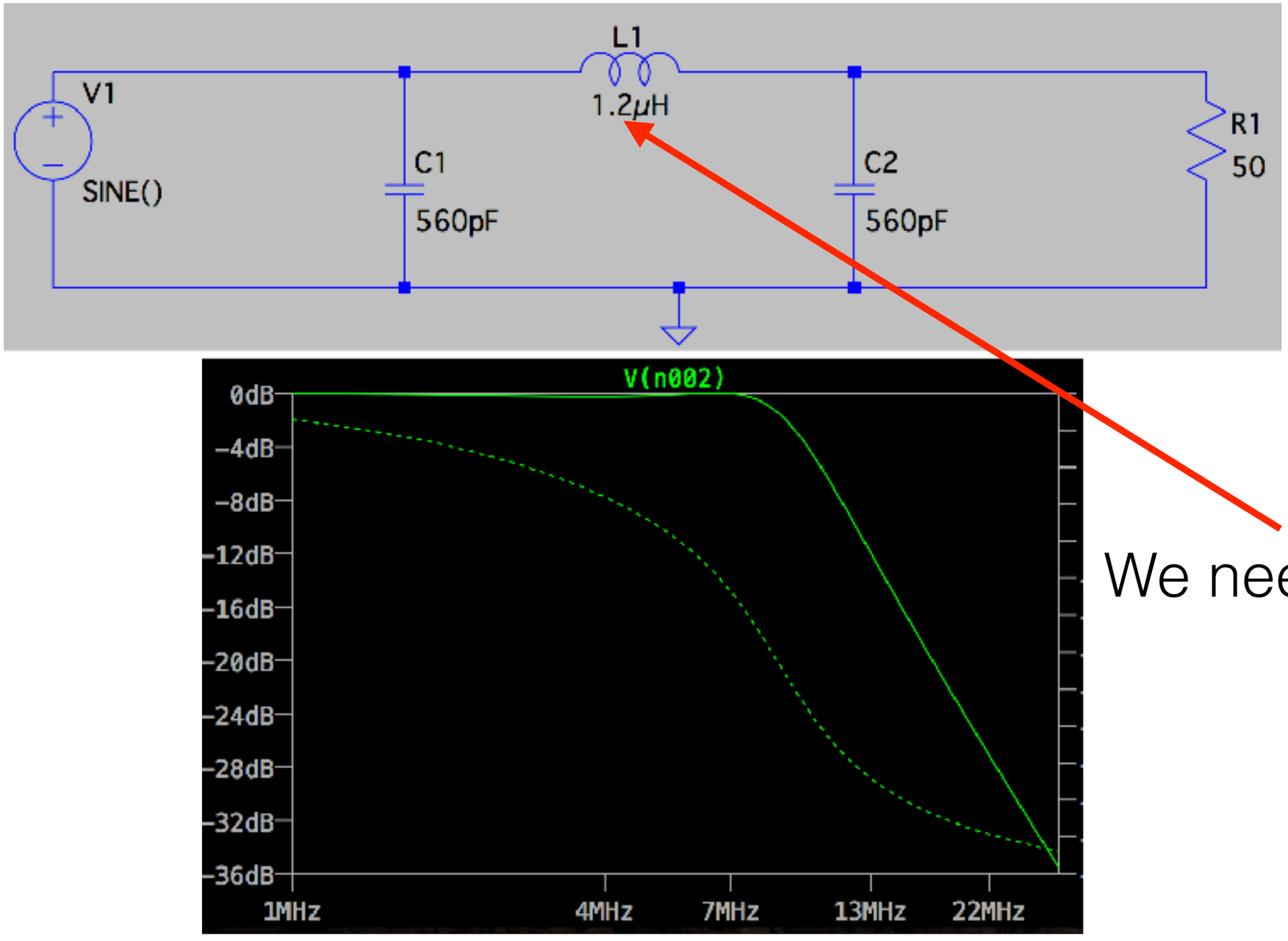
Count the turns

BN-43-2402

FT37-43
T37-6



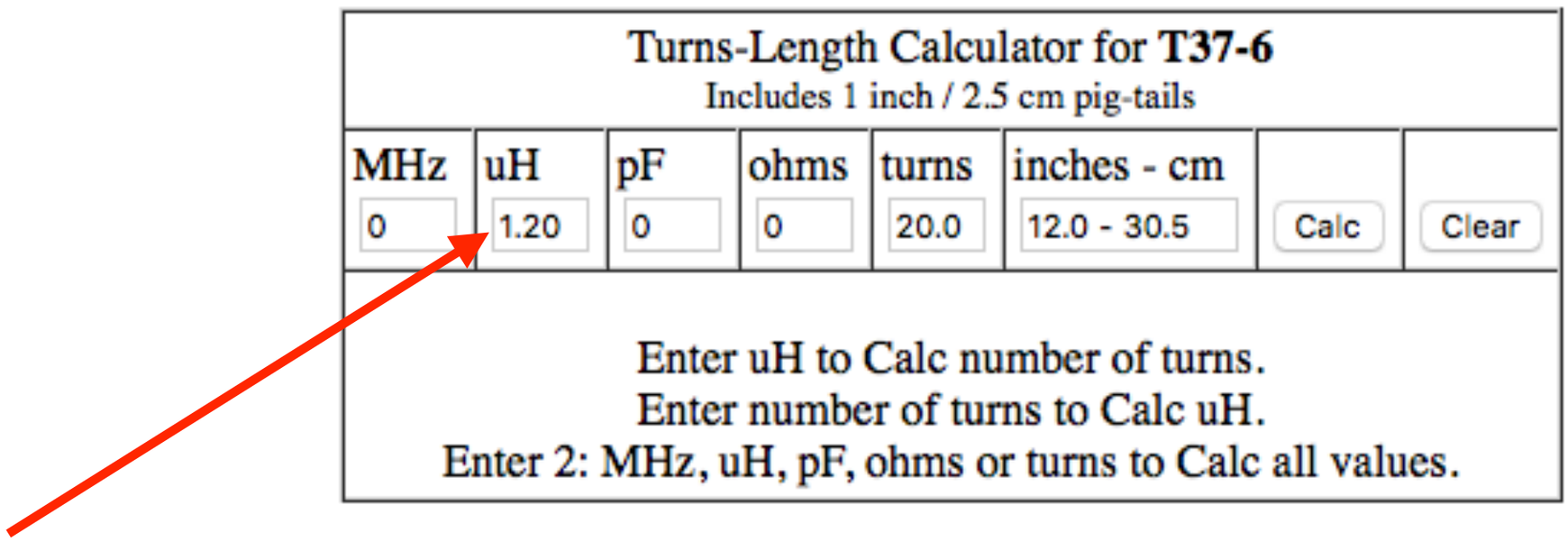
Simple 40m LPF



We need this

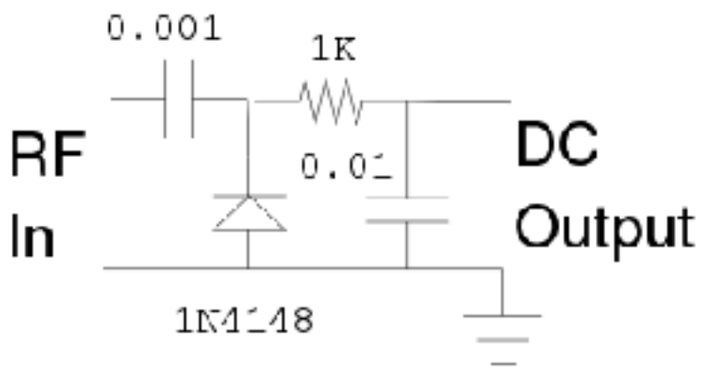
Let’s wind it

Chose your type, e.g. T37-6
Chose your inductance
e.g. 1.2uH
Goto toroids.info and find turns required
Wind it



Measuring RF

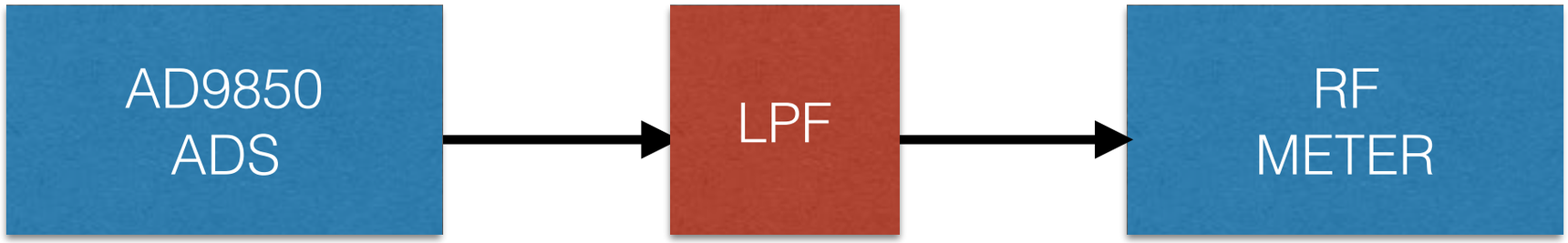
- There is a pretty simple way to measure RF volts
- Use a cap + diode detector

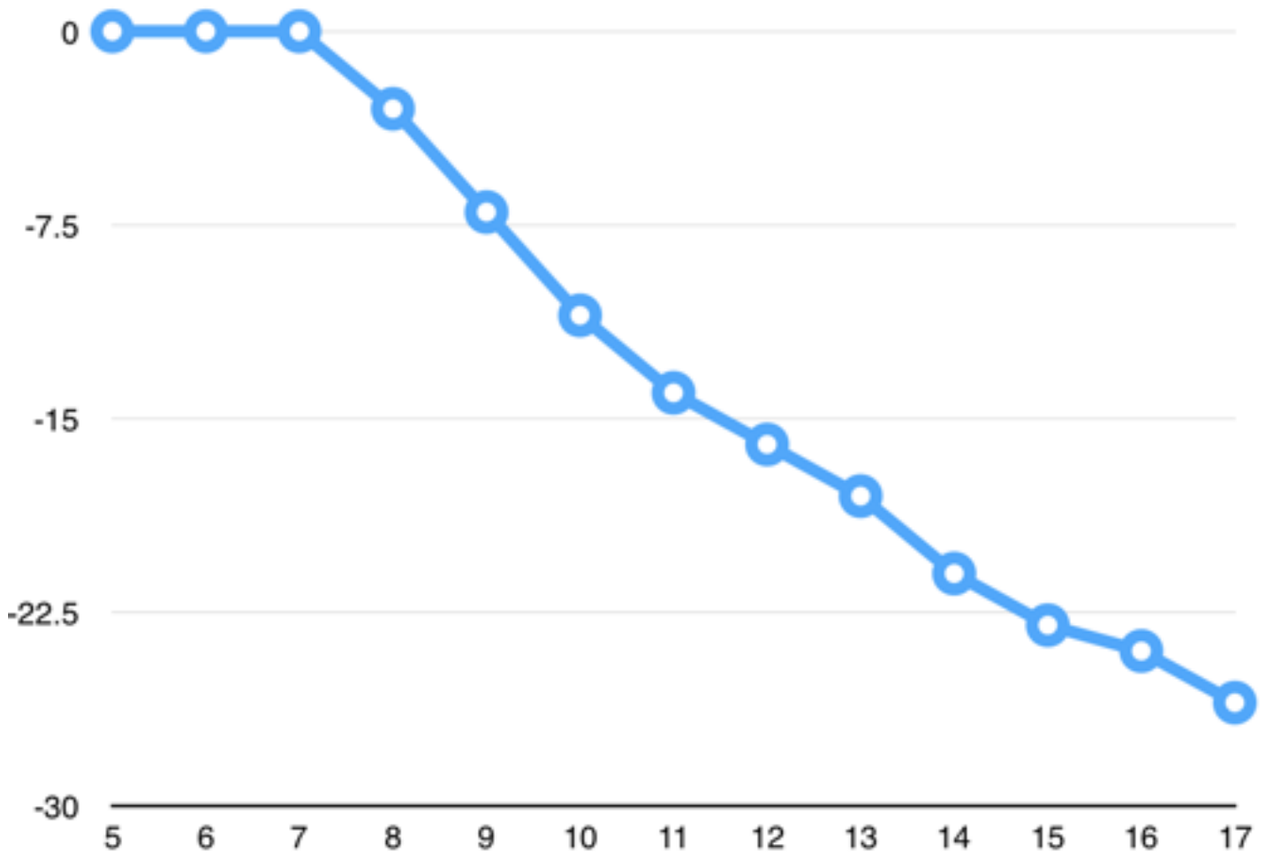


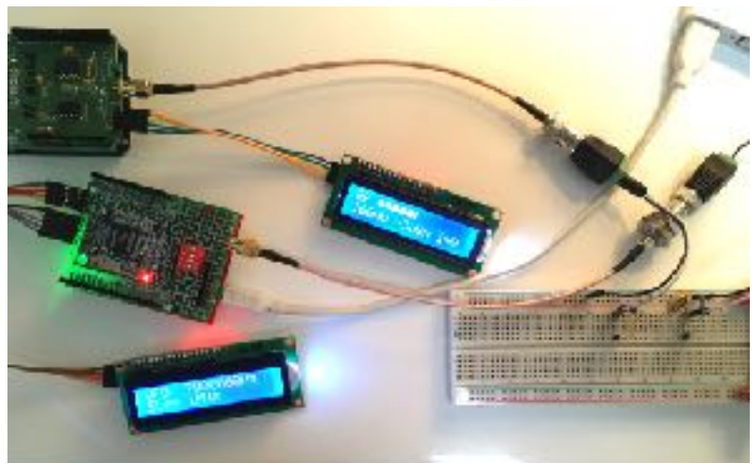
- And an Arduino + LCD
- Sketch LCD_VOLTS
- Input on A0

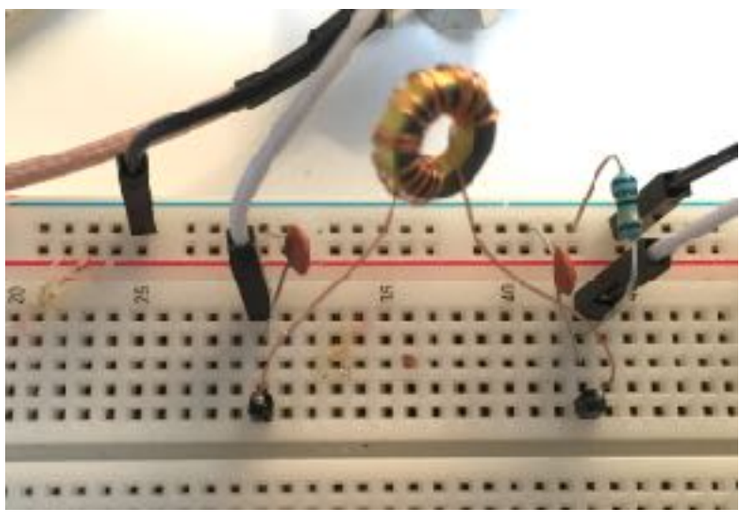
Better solution is to build the Arduino RF_METER!

Measure the response









Why not make a Return Loss bridge?

- Return Loss is another way of measuring SWR

- 1:1 Balun, converts balanced bridge output to un-balanced input the RF METER

- Use FT37-43 toroid for high inductance
  wind 10t + 10T or more, bifilar (twisted pair)