Cheap & Simple Transverters

and

Microwave Multiband

Paul Wade W1GHZ
902 MHz to 10 GHz
Cheap and Simple Transverters

• Design Philosophy – *Gain is Cheap*
• Cheap MMICs for gain
• Ordinary capacitors and resistors
• Ordinary PC board material (FR4)
• Cheap SMA connectors from China (ebay)
• Cheap gain makes up for losses

• Printed Filters – Magic is in PC Board
• Pipe-cap Filters – cheap and readily available

• Modular – one band at a time
  – Goal: > $100 per band
• Add bits for higher performance
Transverter Updates

• New MMICs –
  – Higher gain and power
  – Lower Noise Figure
  – New footprint – SOT-89 package

• Synthesizer for LO
  – No multipliers, except 5.7 & 10 GHz
  – Frequency accuracy

• Soldermask – protect filters, ease assembly
1296 – soldermask, new MMICs
Hairpin Filter with Soldermask

1296 Transverter Hairpin Filter
Blue - 2016d (No Soldermask)
Green - 2018d (with Soldermask)

Freq [GHz]

Y1

1.10 1.15 1.20 1.25 1.30 1.35 1.40
2304 & 3456 MHz TRANSVERTER

W1GHZ 2019
2304 or 3456 MHz
Pipe-cap Filters
5760 Transverter
10 GHz Transverter
Six identical amplifiers
Local Oscillator

• Synthesizer
  – Flexible frequency for Multiband
• Cheap ones go to 4 GHz
  – ADF4350, ADF4351
  – Need Multiplier for 5 & 10 GHz
• DigiLO – to 6 GHz
• ADF5355 – to 13 GHz
• DB6NT - $$
LO – Cheap Chinese Synthesizer
ADF4350 Board+ 137Mhz-4.4G RF source Sweep Phase Locked Loop Board+12864 Display

Signal source
10 GHz/ 24 GHz

$65.25

- 1, measuring power range -45 ~ -5 dBm (external RF attenuator can be extended to 80dBm)
- 2, the measurement resolution of 0.1 dBm power
- 3, measurement frequency range 1 MHz - 5GHz
- 4, the measured power 1nW ~ 2W
- 5, the working voltage of 5VDC (direct selection MICRO-USB powered)
- 6, the working current <50 mA
- 7, the working temperature of -40 °C ~ 65 °C degrees Celsius
- 8, storage temperature -40 °C ~ 65 °C degrees Celsius
- 9, size 50 * 50 * 25 mm length X
3456 MHZ Lunch Box Transverter
ADF4350 Phase Locked Loop 137M-4.4GHz RF Signal Source Frequency Synthesizer

Condition: New
Quantity: 1
Price: US $22.25
Best Offer:

Limited quantity remaining: More than 56% sold  60-day returns

Shipping: $2.96 Standard SpeedPAK from China/Hong Kong/Taiwan | See details

You'll earn $0.22 in eBay Bucks. See conditions.
Better ADF4351

SV1AFN.com

ADF4351 PLL Synthesizer Module

Price: 28,23€ [VAT excluded]  35,00€

Quantity: 1

ADD TO CART

Downloads:
- ADF4351_SCH.PDF
- ADF4351_BASICPLLDEBUG.PDF
- ADF4351_CHEATSHEET.PDF

Secure payments by:
- PayPal
- VISA
- MasterCard
- American Express
Local Oscillator - digiLO
SDMG Group Transverter

- Control ADF4350 with Arduino
- Multiple transverter boards
- Select band and LO frequency with Arduino
- Group build
- Add bands as desired
Synthesizer on Arduino, 10 GHZ Multiplier, by Drew, N7DA
Sequencer + IF interface
IF interface – PIN diode switch

RF on the PCB backside
What else could Arduino do?

- Load Synthesizer Frequency
- Inhibit Transceiver output
- VSWR monitor and shutdown
  - analog inputs
- Monitor voltage
- Temperature monitor (external sensor)
- TR relay auxiliary contacts
- Latching relay driver
- Multiband transmit protection (Rover)
Coax Relay

- **ON**
  - High Power
  - High Isolation

- **SWITCHING**
  - Low Power
  - Low Isolation
  - Easily damaged
Waveguide Switches

- High Power and Isolation
- but **NOT** while switching
Solid-state switch
Switch for Multiband LO

HMC252

HMC252 DC to 3GHz Non-reflective Single Pole Six Throw SP6T RF Switch 3V-5V New

Condition: New
Quantity: 1
More than 10 available

Buy It Now
View Cart
Make Offer
Add to Watchlist

Free shipping
60-day returns
Longtime member

You'll earn $0.22 in eBay Bucks. See conditions

Shipping: FREE. Standard SpeedPAK from China/Hong Kong/Taiwan.
See details.
International shipment of items may be subject to customs processing and additional charges.
Item location: Shenzhen, China.
Ships to: Worldwide. See details.

Delivery: Estimated between Tue, Jun. 9 and Thu, Jul. 2.
This item has an extended handling time and a delivery estimate greater than 11 business days.
Please allow additional time if international delivery is subject to customs processing.

Payments: PayPal, VISA, Mastercard, American Express, Discover
FT-817 with Panadapter
SDR

- Several wideband SDR available
- Good receiver
- Clean transmit a problem

- Simple matter of software…

- Better as test equipment?  satsagen
Get it on the air!
More Details

• www.w1ghz.org

• Arduino sketches (software)
• Pictures, schematic, parts list, etc.

• Boards are available