W-band Measurement Set up using the Jodrell Cryostat

# Turn On

### Cryostat

Turn on the compressor fractionally ahead of the drive unit. Best to have two people, count to 3 and turn on the compressor on at a count of 2.5 and the drive unit on a count of 3.

### VNA

Preset the VNA

Select the VNA receiver to use, on VNA select the button ‘measure’ and then ‘more’ – ‘receivers’, click activate and select R

Set power of the VNA to -25dB, on the VNA select ‘stimulus’ – ‘power’ – ‘power’. `

### Calibrate the output power of the VNA.

Connect the power meter to the VNA with the USB cable

Calibrate the power meter. Connect the power meter head to the calibration port. On power meter press Cal, then zero+Cal.

Connect the VNA ch 1 to the power meter.

On the VNA select ‘cal’ – ‘Power Cal’ – ‘source cal’ – check everything – ‘Take Cal Sweep’, , If it passes click OK

Check the power level of the VNA, VNA reads -23dBm and power meter reads -25dBm. Make sure of flat response.

## Setup the VNA

Set sweep type to CW, on the VNA select ‘stimulus’ – ‘sweep’ – ‘Sweep Type’ – ‘CW’, and set the frequency to 10GHz

## Setup the Spectrum Analyser

Preset the spectrum analyser

Set the centre Frequency to 75MHz and the span to 25MHz

Set a marker and then select ‘Marker’ – ‘Marker Function’ – ‘Band Power’, set the marker span to 24MHz

Set the bandwidth, select the ‘BW’ button and then set Res BW to 8MHz and the Video BW to 10Hz.

Turn on the low band preamplifier (3GHz) and set the attenuation to 0dBm. This is not included in the code so is important to do and to get right.

The power level should be around -90dBm

## Connect the System

Connect the input of the amplifier to the output of the mixer using a blue cable

Connect the output of the multiplier to the input of the mixer using a blue cable

Connect the output of amplifier to the spectrum analyser using the yellow cable

Connect the input of the multiplier to the VNA using the blue cable with the adaptor

Turn on the main power supply switch before connecting anything, make sure all of the output are turned off.

Connect the amplifier to the power supply, right hand connection on the heatsink. Set the voltage to 5.5V and ?A.

Connect the multiplier to the power supply, left hand connection on the heatsink. Set the voltage to 6V and ?A.

Turn on multiplier first, then turn on amplifier. Lights should come on and power on spectrum analyser should rise to around -81dB.

Turn on mixer

Increase power from VNA to 2dBm (2dBm is provided at the end of the cable, 1 or 2 dBm measured by the receiver in the VNA). Power level on spectrum analyser does not change yet.

Power level on spectrum analyser -69 dB

Set the switch the correct channel for the LNA to be measured

# Turn Off

Set the attenuator to 2.1 to turn the mixer off.

Set the VNA power to -25dBm.

Turn off the multiplier and then the amplifier. Then disconnect from the power supply.

Disconnect the RF cables from the VNA and the spectrum analyser.