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TEST DATA TO BE SUPPLIED

Each of the parts relating to purchase order G122548 will be supplied with spectral test data. Barr Associates, however, is not able to test the narrowband filters (1644nm, 2124nm, 2168nm) to the letter of the specification, due to equipment capabilities. Following is an explanation of the data that will be supplied to show the parts do indeed meet spec.

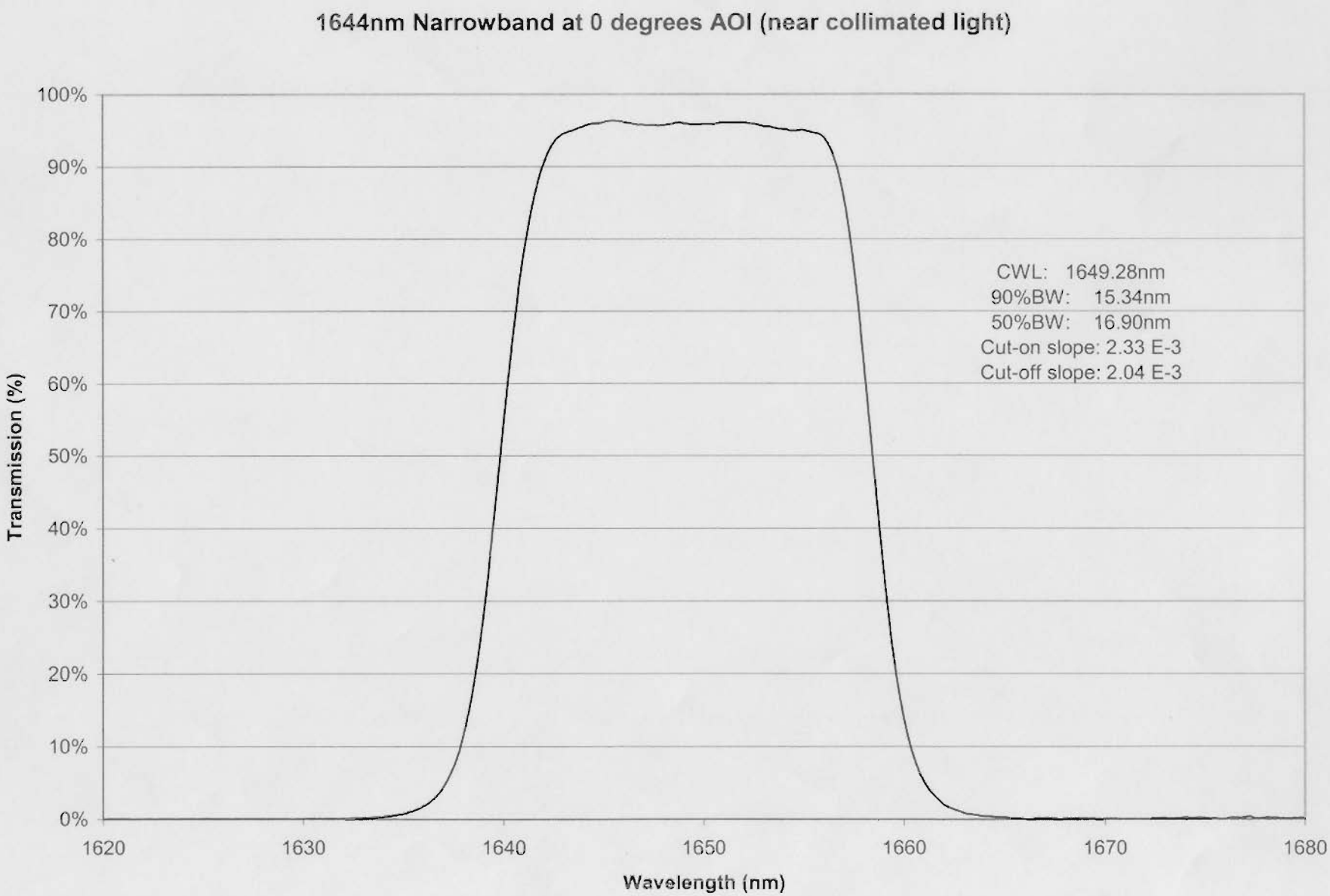
The specification in question is "Transmission ≥ 90% of peak over all angles 0° to 13.5° AOI". Since Barr does not have the capability to test in this wavelength range with a collimated light source, we will supply theoretical data as well as actual test data at f/8 (± 3.6°). When we tilt the part to 13.5°AOI, however, we would be basically seeing an average of about 10° to 17°. Because there is only about 1% transmission at 17° AOI for any of these filters, the data would be distorted and therefore meaningless. The parts will be tested at 0° and 10° AOI on a witness sample.

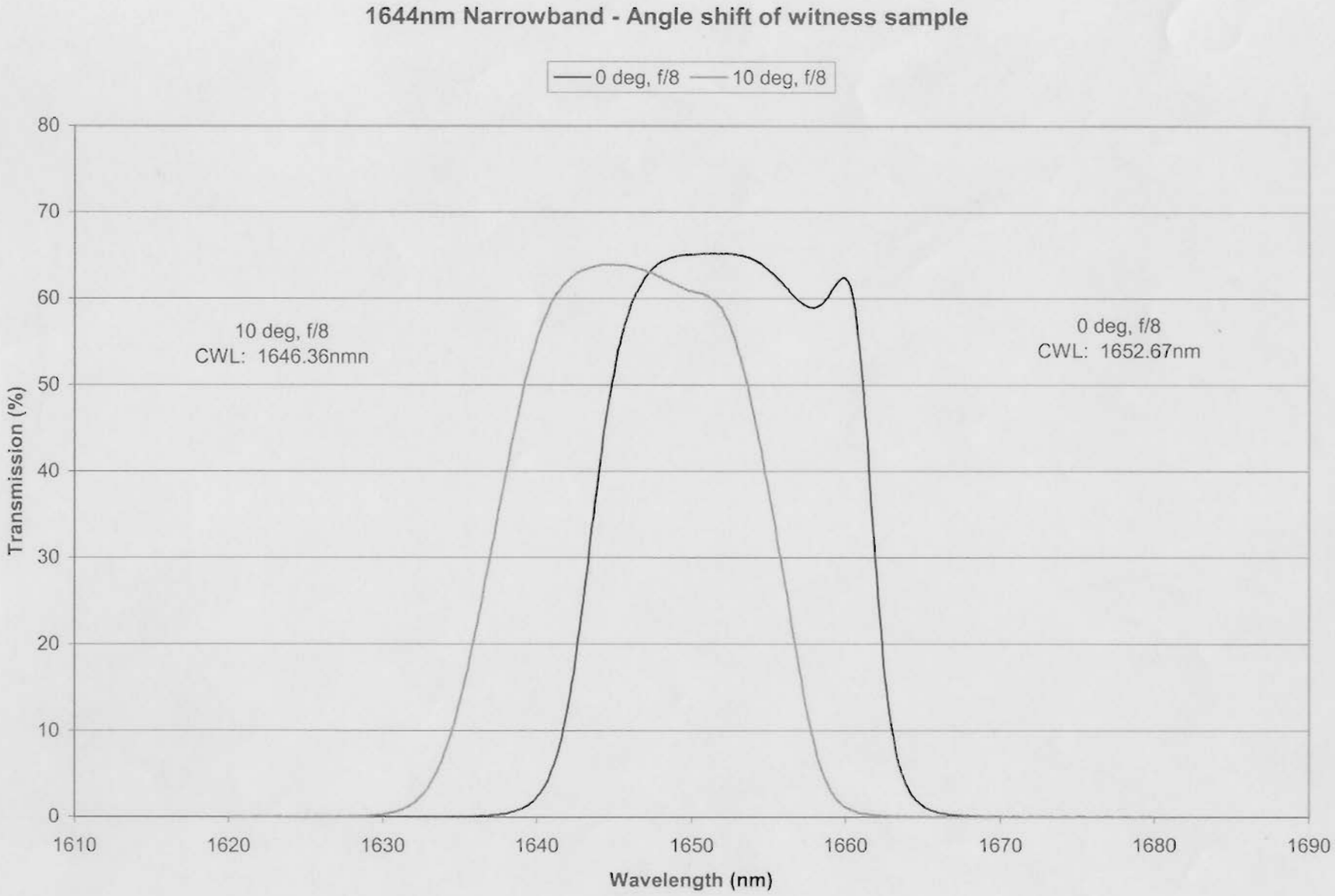
Data being supplied with the narrowband components:

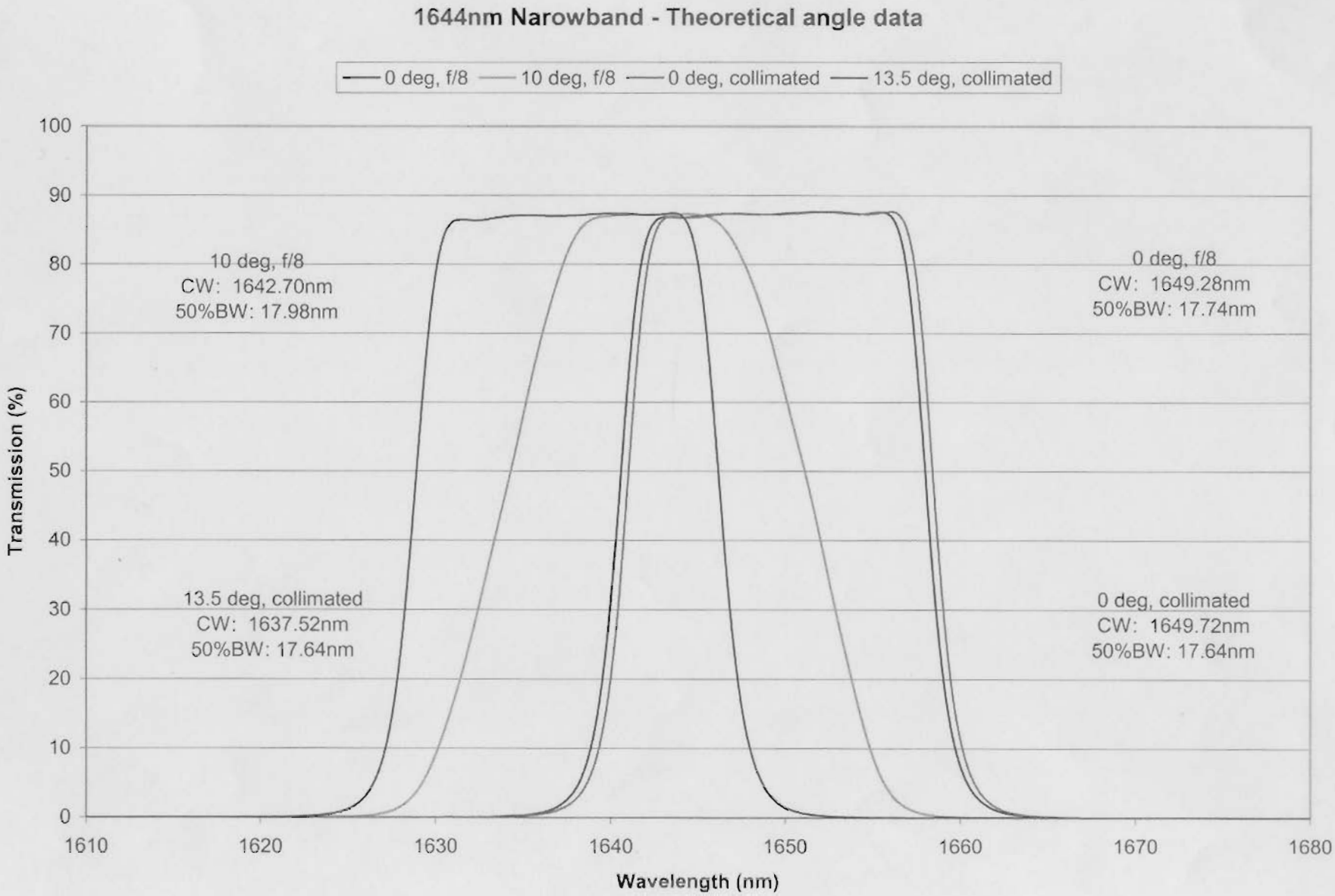
1. Actual test data of the actual part, performed at 0°, f/8.
2. Actual test data of a witness sample at 0° and 10°, f/8.
3. Theoretical data normalized to actual data (from item 1, above), including: 0°at f/8, 10° at f/8, 0° collimated and 13.5 degrees collimated.
4. Actual thermal test data at 0° AOI and 298°K and 77°K.
5. Near band blocking data at 0° AOI and 298°K.

Data supplied with the blocker components:

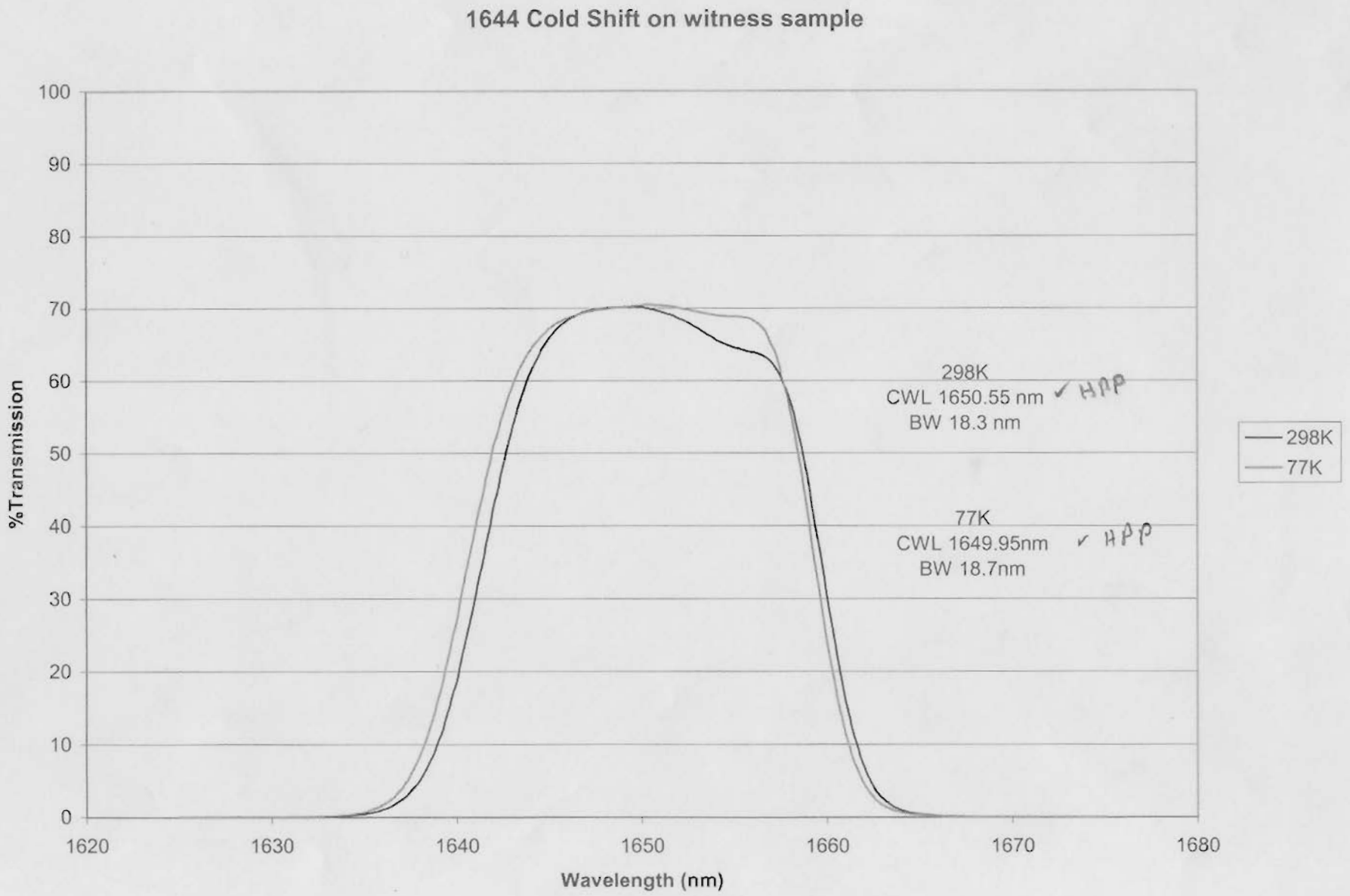
1. Actual test data of the actual part, performed at 0°, f/8.
2. Actual thermal test data at 0° AOI and 298°K and 77°K.
3. Blocking data 300-4000nm.

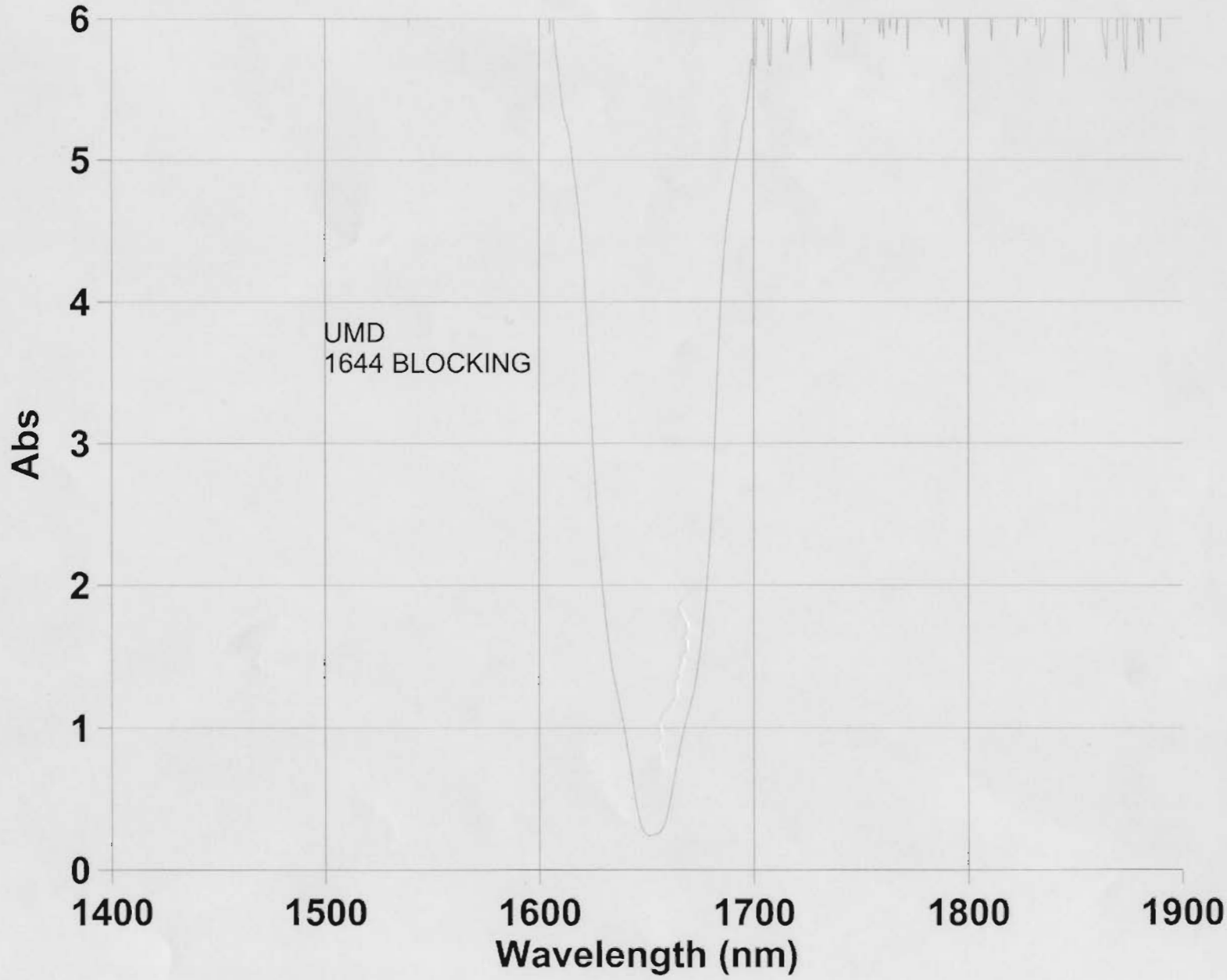

1644nm Narrowband at 0 degrees AOI (near collimated light)
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Transmission (%)
1620
1630
1640
1650
1660
1670
1680
Wavelength (nm)
CWL: 1649.28nm
90%BW: 15.34nm
50%BW: 16.90nm
Cut-on slope: 2.33 E-3
Cut-off slope: 2.04 E-3


1644nm Narrowband - Angle shift of witness sample
0 deg, f/8
10 deg, f/8
10 deg, f/8
CWL: 1646.36nmn
0 deg, f/8
CWL: 1652.67nm
Transmission (%)
Wavelength (nm)
0
10
20
30
40
50
60
70
80
1610
1620
1630
1640
1650
1660
1670
1680
1690


1644nm Narowband - Theoretical angle data
0 deg, f/8
10 deg, f/8
0 deg, collimated
13.5 deg, collimated
Transmission (%)
100
90
80
70
60
50
40
30
20
10
0
1610
1620
1630
1640
1650
1660
1670
1680
Wavelength (nm)
10 deg, f/8
CW: 1642.70nm
50%BW: 17.98nm
0 deg, f/8
CW: 1649.28nm
50%BW: 17.74nm
13.5 deg, collimated
CW: 1637.52nm
50%BW: 17.64nm
0 deg, collimated
CW: 1649.72nm
50%BW: 17.64nm

Do not use for absolute λ of actual filter




6
5
4
3
2
1
0
Abs
UMD
1644 BLOCKING
1400
1500
1600
1700
1800
1900
Wavelength (nm)