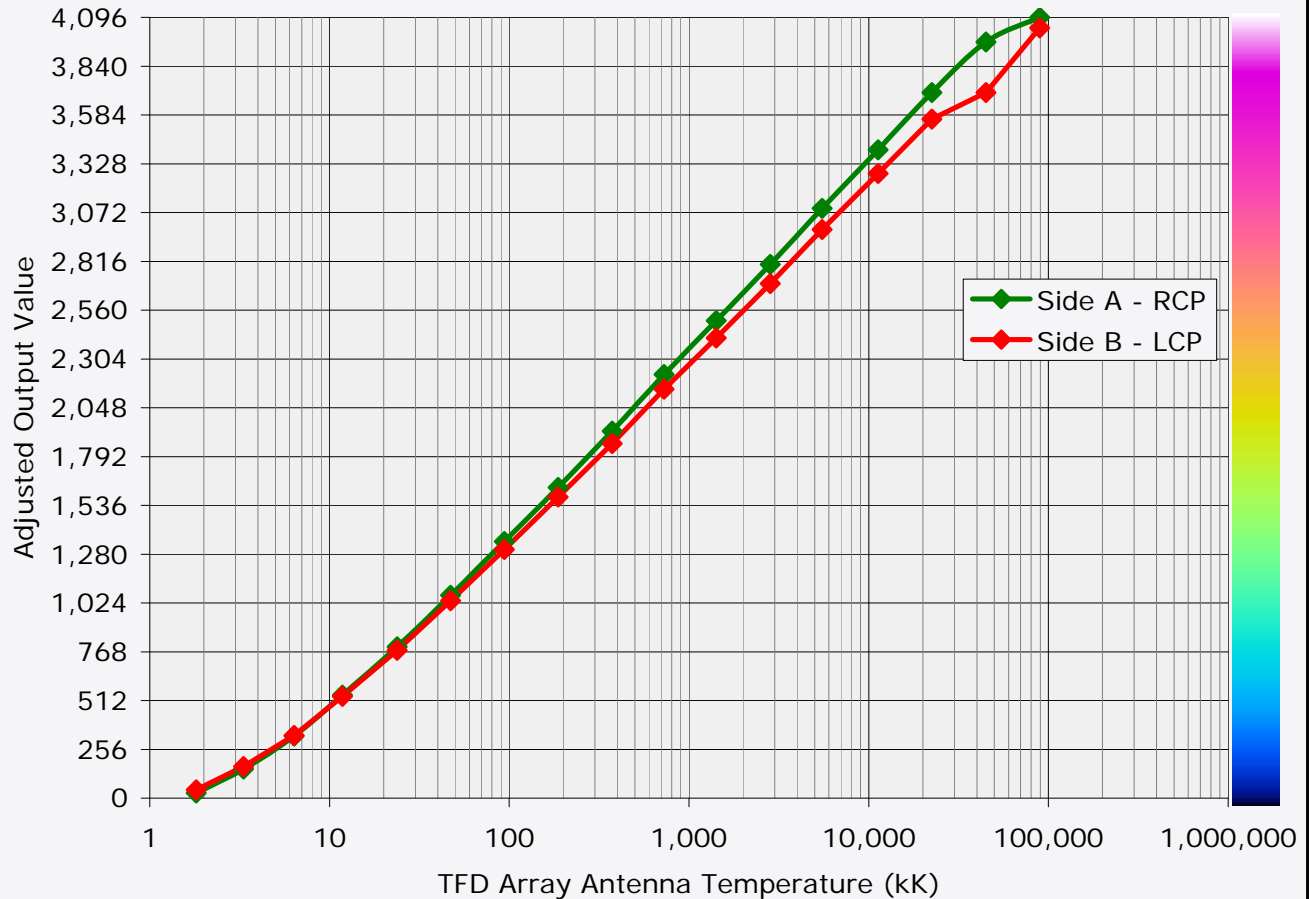


# AJ4CO DPS (12-bit) Spectrograph Step Calibration – 26-Jul-2015

Adjusted Output Value & Color vs Antenna Temperature for 4.3 dB Feed Loss

Color Bar Corresponds to RSS Color Offset = 1975, Color Gain = 1.95

$$\text{Adjusted Output Value} = (\text{Raw ADC Output Value} - \text{Color Offset}) * \text{Color Gain}$$



# AJ4CO DPS (12-bit) Spectrograph Step Calibration

26-Jul-2015 17:26 UTC

HP461A noise source + Kay 431D step attenuator + MCL Splitter

## 30 kHz IF Strips

Calibration Plane: 90 Deg Hybrid Inputs

T0 (K)	290
Noise source temperature (MK)	34.0
Feed loss, cal plane to antenna (dB)	4.3
Receiver noise figure (dB)	3.4

RSS Color Offset: 1975  
 RSS Color Gain: 1.95

Side A	Side B	Side A	Side B
1975	1975	1975	1975
1.95	1.95	1.95	1.95

Solar

Jupiter

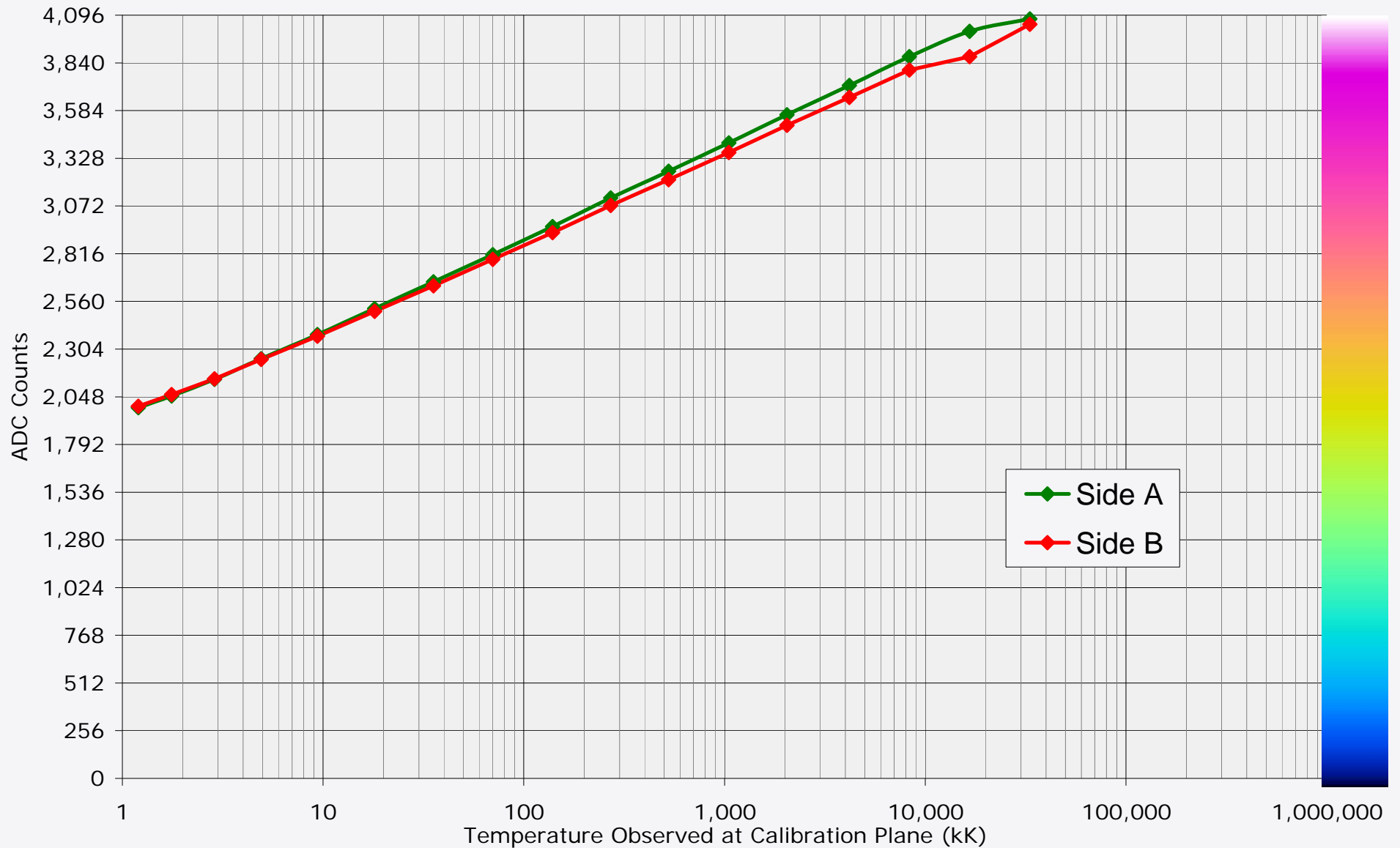
Att. dB	Source Temp (kK)	Equiv. Ant. Temp. (kK)	Side A ADC Counts	Side B ADC Counts
0.1	33,226	89,429	4076	4047
3.1	16,653	44,821	4009	3873
6.1	8,347	22,464	3873	3802
9.1	4,184	11,259	3719	3655
12.2	2,049	5,514	3562	3505
15.1	1,051	2,828	3411	3359
18.1	527	1,418	3259	3213
21.0	271	727	3115	3075
23.9	139	373	2962	2929
26.9	70	187	2811	2785
29.9	35	94	2665	2644
32.9	18	47	2521	2506
35.9	9.4	24	2382	2373
39.0	4.9	12	2252	2249
41.8	2.9	6.3	2142	2144
44.8	1.8	3.3	2053	2060
47.8	1.2	1.8	1989	1997

Solar		Jupiter	
Adjusted Value	Adjusted Value	Adjusted Value	Adjusted Value
4096	4040	4096	4040
3966	3701	3966	3701
3701	3563	3701	3563
3401	3276	3401	3276
3095	2984	3095	2984
2800	2699	2800	2699
2504	2414	2504	2414
2223	2145	2223	2145
1925	1860	1925	1860
1630	1580	1630	1580
1346	1305	1346	1305
1065	1035	1065	1035
794	776	794	776
540	534	540	534
326	330	326	330
152	166	152	166
27	43	27	43



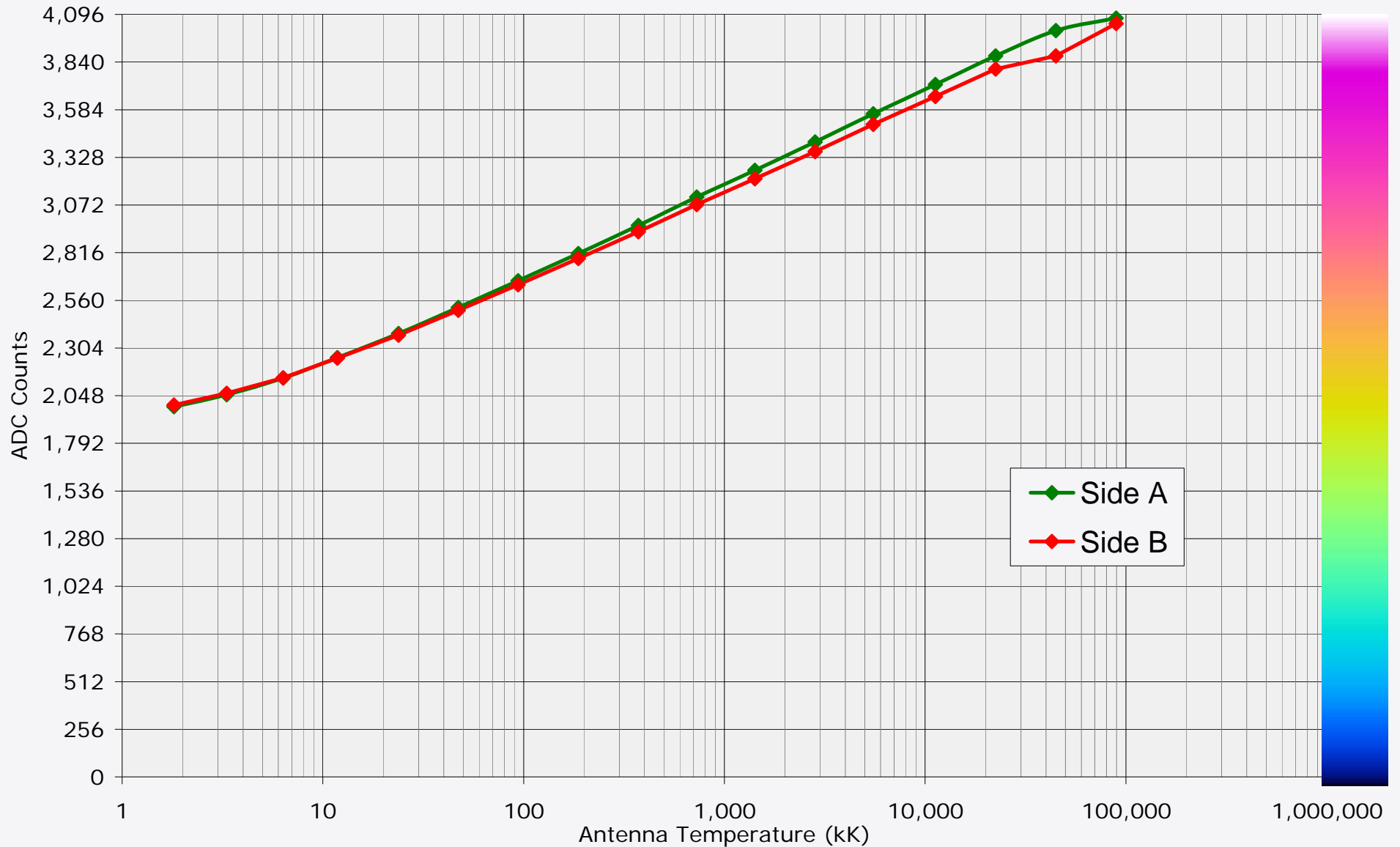
Raw ADC Output Value & Color vs Temperature Observed at 90 Deg Hybrid Inputs

Color Bar Corresponds to RSS Color Offset = 0, Color Gain = 1



Raw ADC Output Value & Color vs Antenna Temperature for 4.3 dB Feed Loss

Color Bar Corresponds to RSS Color Offset = 0, Color Gain = 1

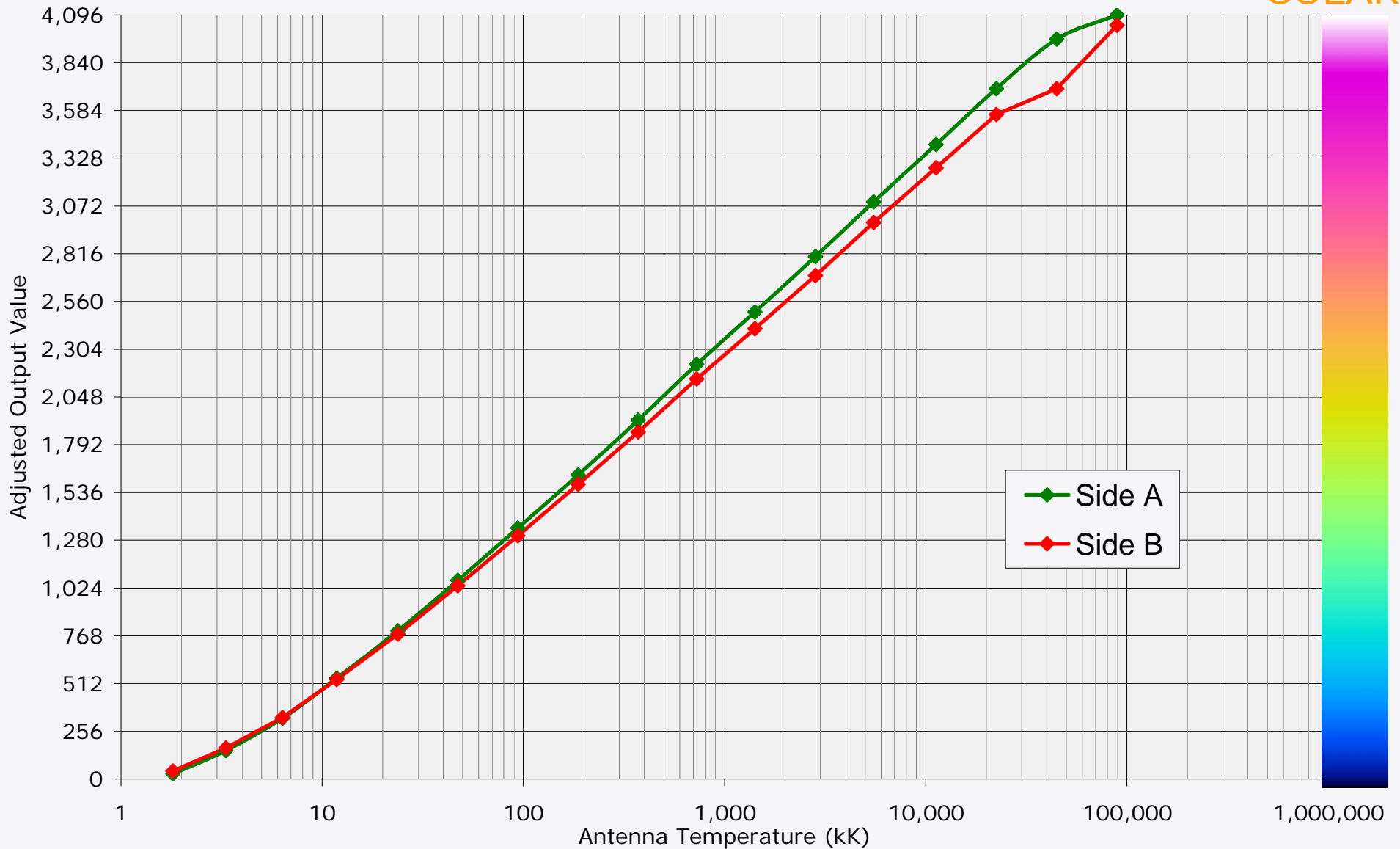


	<b>Side A</b>		<b>Side B</b>
Offset:	<b>1975</b>	Offset:	<b>1975</b>
Gain:	<b>1.95</b>	Gain:	<b>1.95</b>

## Adjusted Output Value & Color vs Antenna Temperature for 4.3 dB Feed Loss

Color Bar Corresponds to RSS Color Offset = 1975, Color Gain = 1.95

SOLAR



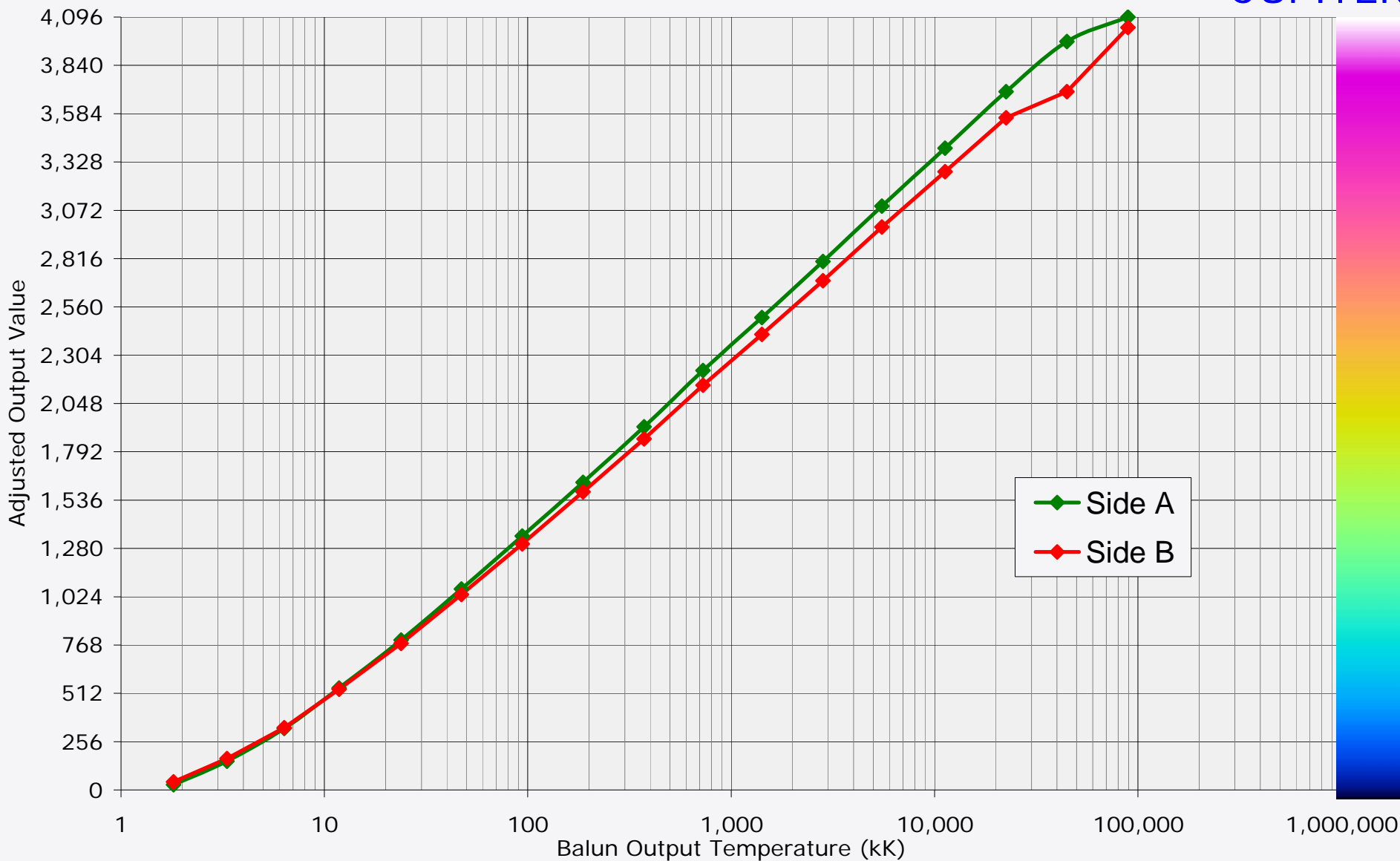
Side A  
 Offset: 1975  
 Gain: 1.95

Side B  
 Offset: 1975  
 Gain: 1.95

Adjusted Output Value & Color vs Antenna Temperature for 4.3 dB Feed Loss

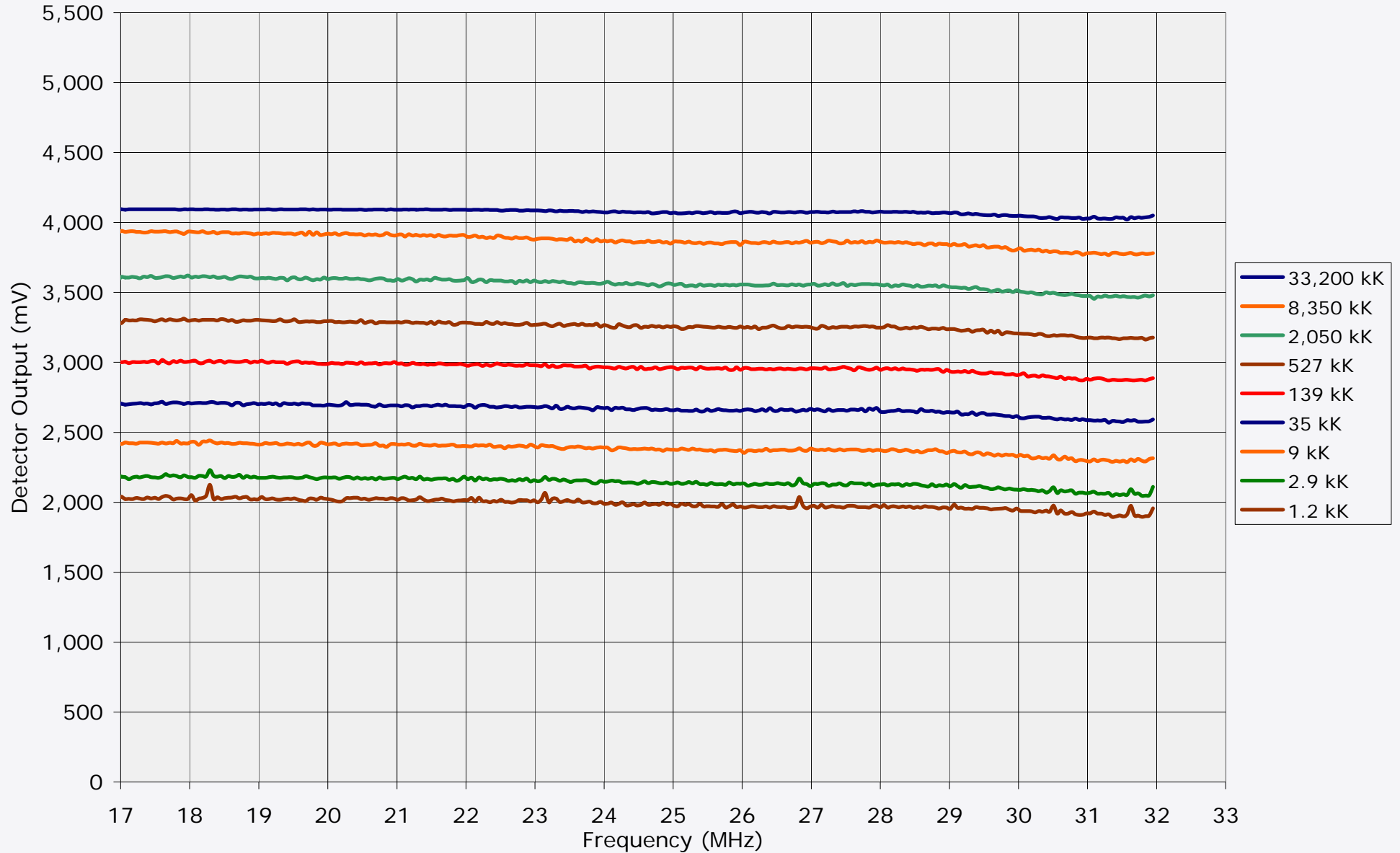
Color Bar Corresponds to RSS Color Offset = 1975, Color Gain = 1.95

JUPITER



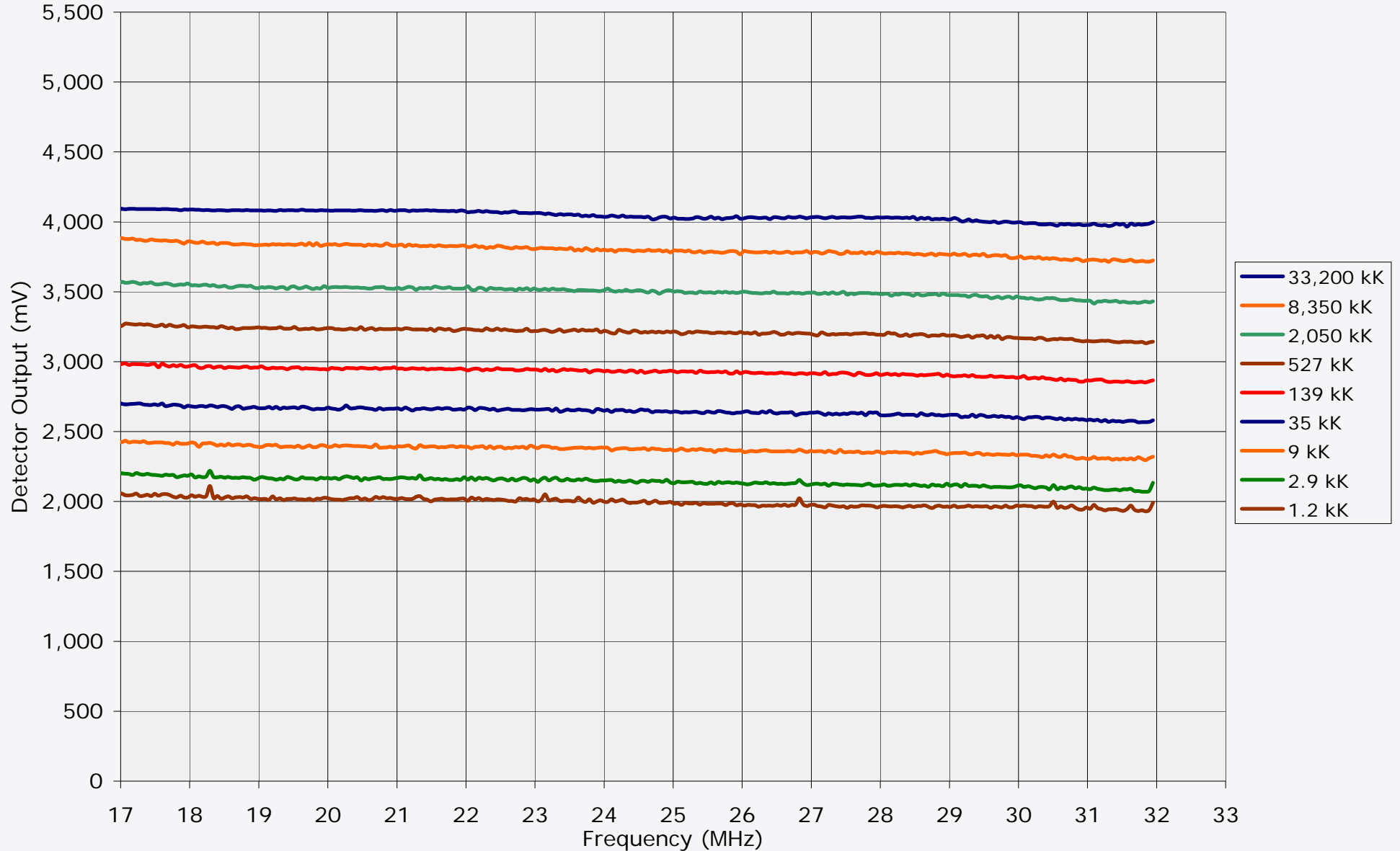
## Side A Detector Output vs Frequency vs Temperature Observed at 90 Deg Hybrid Inputs

ADC Voltage Reference = 4.096 V Receiver Noise Figure = 3.4 dB



Side B Detector Output vs Frequency vs Temperature Observed at 90 Deg Hybrid Inputs

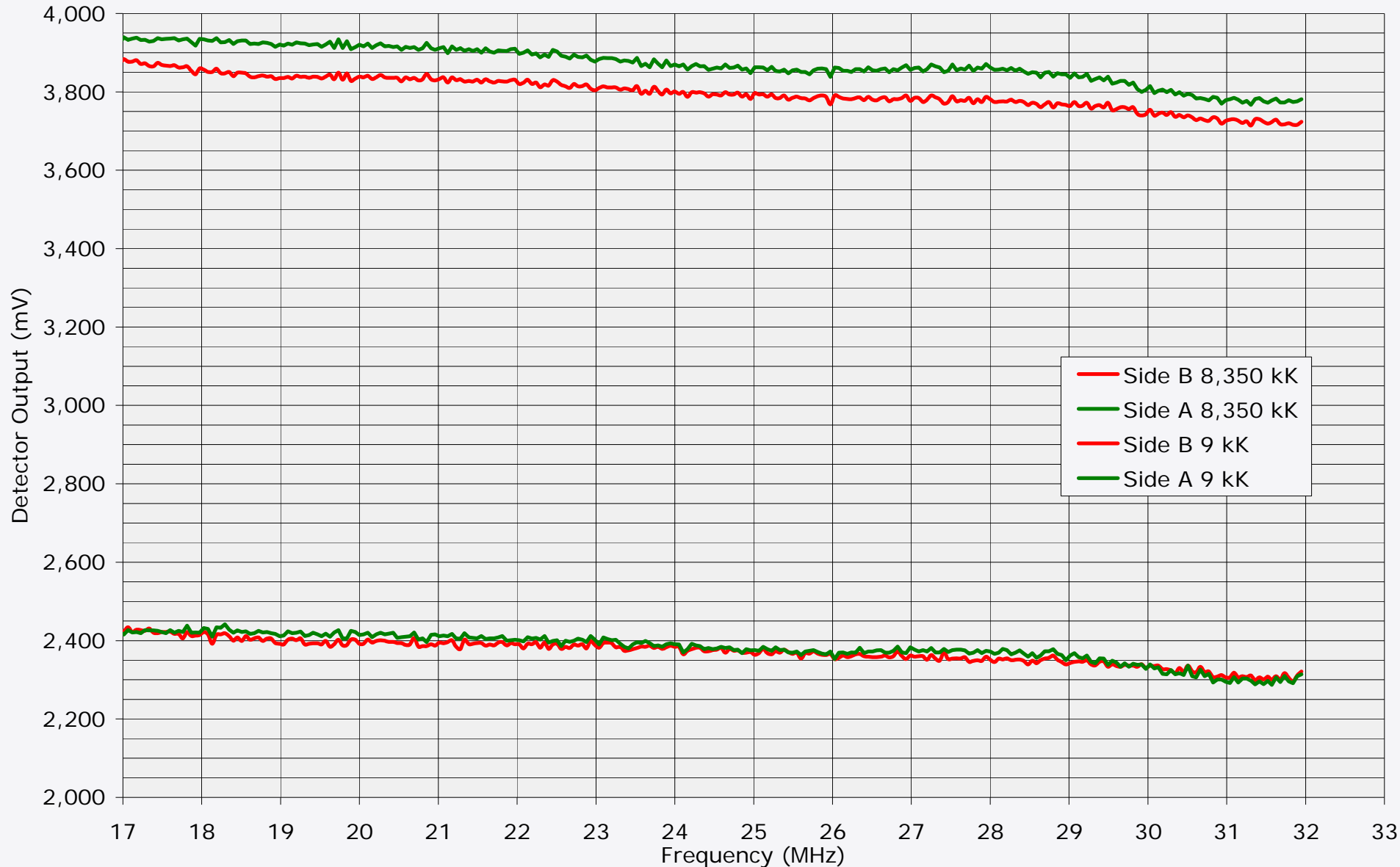
ADC Voltage Reference = 4.096 V Receiver Noise Figure = 3.4 dB



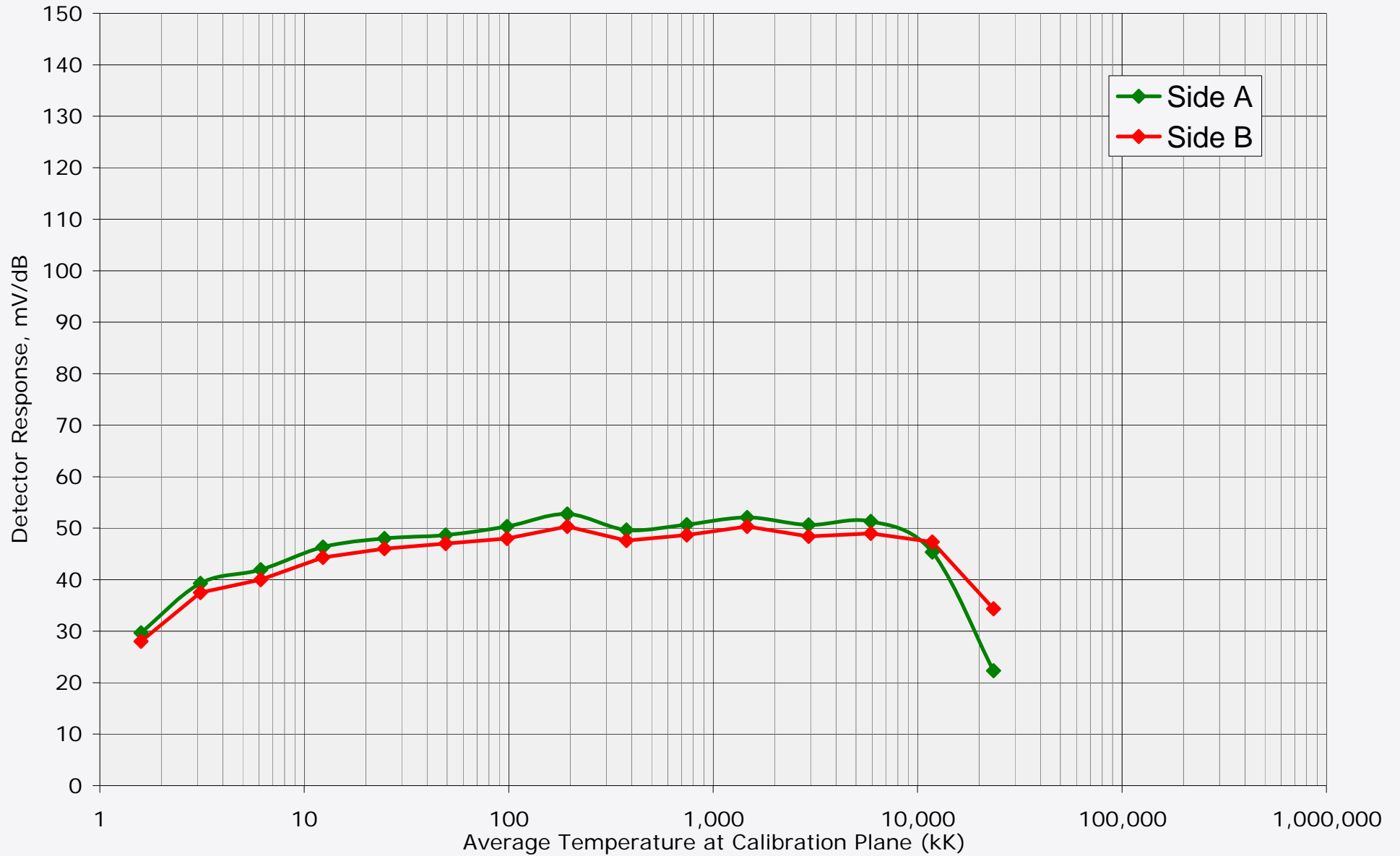


Side A & B Detector Output vs Frequency vs Temperature Observed at 90 Deg Hybrid Inputs

ADC Voltage Reference = 4.096 V Receiver Noise Figure = 3.4 dB



Detector Response Averaged Over Adjacent 3 dB Calibration Steps



Side B – Side A Response Mismatch

