

# MTSU FSX-6S (12-bit) Spectrograph Step Calibration

23-Mar-2016 23:41 UTC

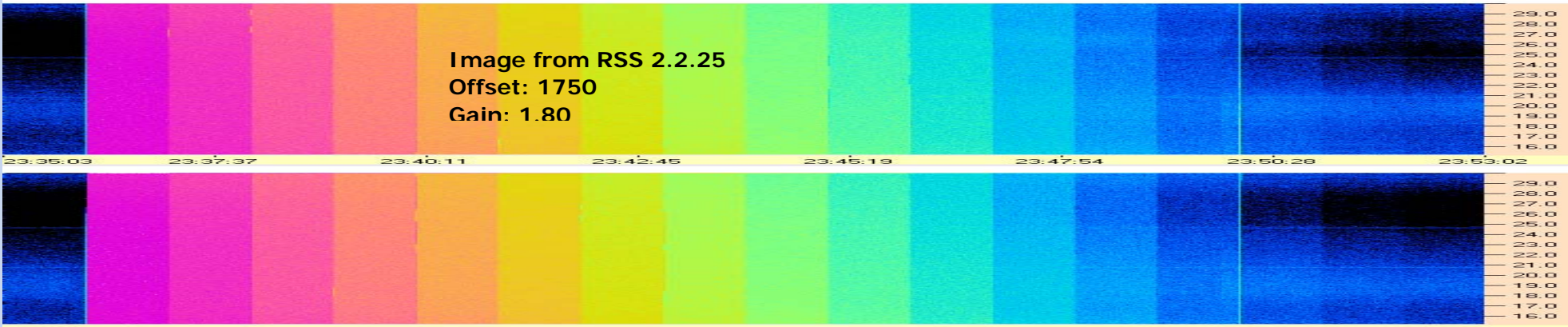
HP461A noise source + Kay 431D step attenuator + MCL Splitter

Calibration Plane: 90 Deg Hybrid Inputs

T0 (K)	290
Noise source temperature (MK)	35.7
Feed loss, cal plane to antenna (dB)	2.2
Receiver noise figure (dB)	6.0

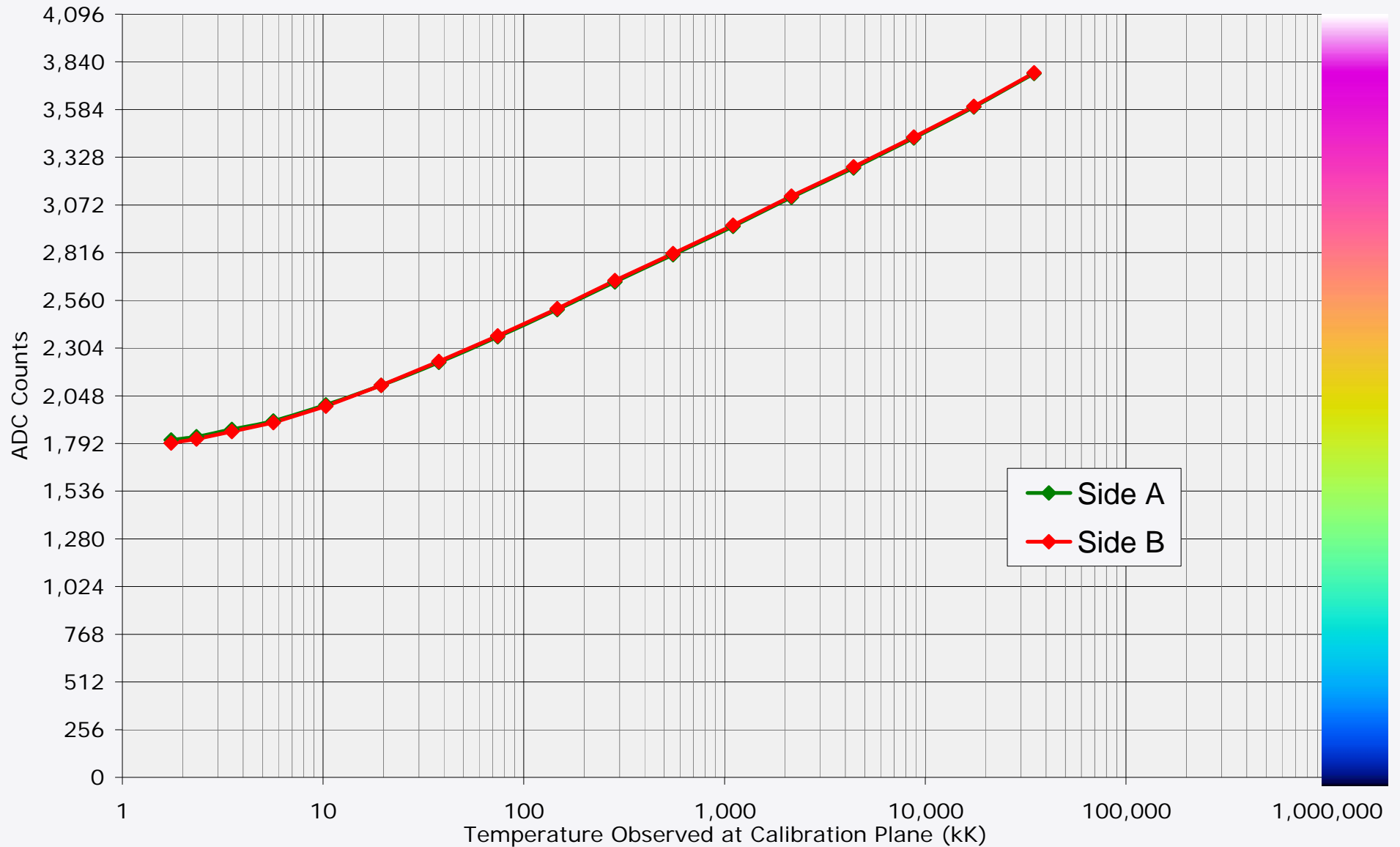
	Side A	Side B	Side A	Side B
RSS Color Offset:	1750	1750	1800	1800
RSS Color Gain:	1.80	1.80	2.50	2.50

Att. dB	Source Temp (kK)	Equiv. Ant. Temp. (kK)	Side A ADC Counts	Side B ADC Counts	Solar		Jupiter	
					Adjusted Value	Adjusted Value	Adjusted Value	Adjusted Value
0.1	34,888	57,236	3778	3782	3650	3658	4096	4096
3.1	17,486	28,686	3598	3602	3326	3334	4096	4096
6.1	8,764	14,377	3431	3436	3026	3035	4078	4090
9.1	4,393	7,206	3271	3277	2738	2749	3678	3693
12.2	2,152	3,529	3113	3119	2453	2464	3283	3298
15.1	1,104	1,810	2957	2964	2173	2185	2893	2910
18.1	554	907	2805	2811	1899	1910	2513	2528
21.0	285	466	2659	2666	1636	1649	2148	2165
23.9	147	239	2511	2515	1370	1377	1778	1788
26.9	74	120	2365	2370	1107	1116	1413	1425
29.9	38	60	2227	2232	859	868	1068	1080
32.9	19	30	2104	2104	637	637	760	760
35.9	10.3	15	1999	1992	448	436	498	480
39.0	5.7	8	1913	1904	293	277	283	260
41.8	3.5	4.2	1867	1856	211	191	168	140
44.8	2.3	2.2	1828	1816	140	119	70	40
47.8	1.8	1.3	1811	1794	110	79	28	0



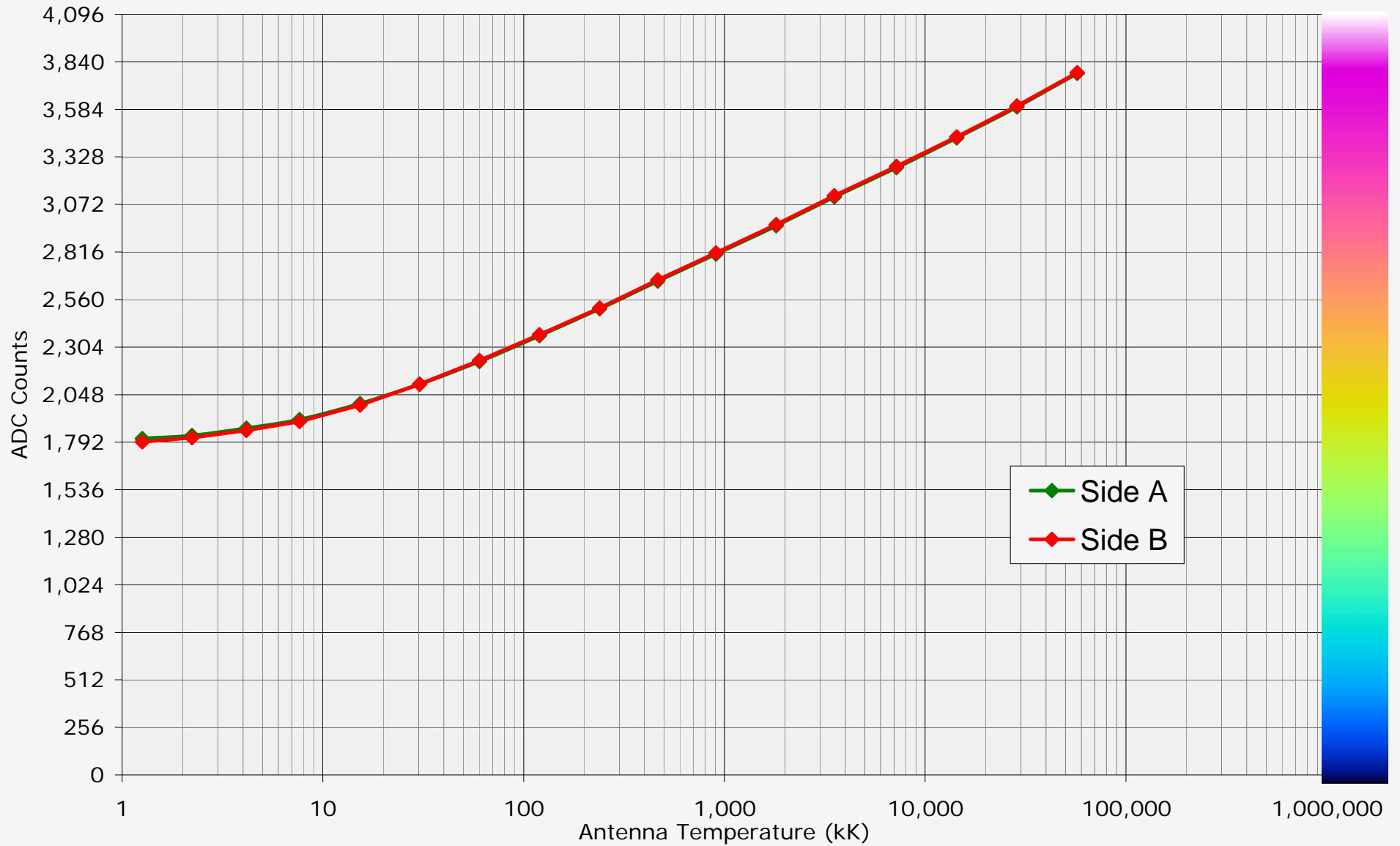
Raw ADC Output Value & Color vs Temperature Observed at 90 Deg Hybrid Inputs

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



Raw ADC Output Value & Color vs Antenna Temperature for 2.2 dB Feed Loss

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

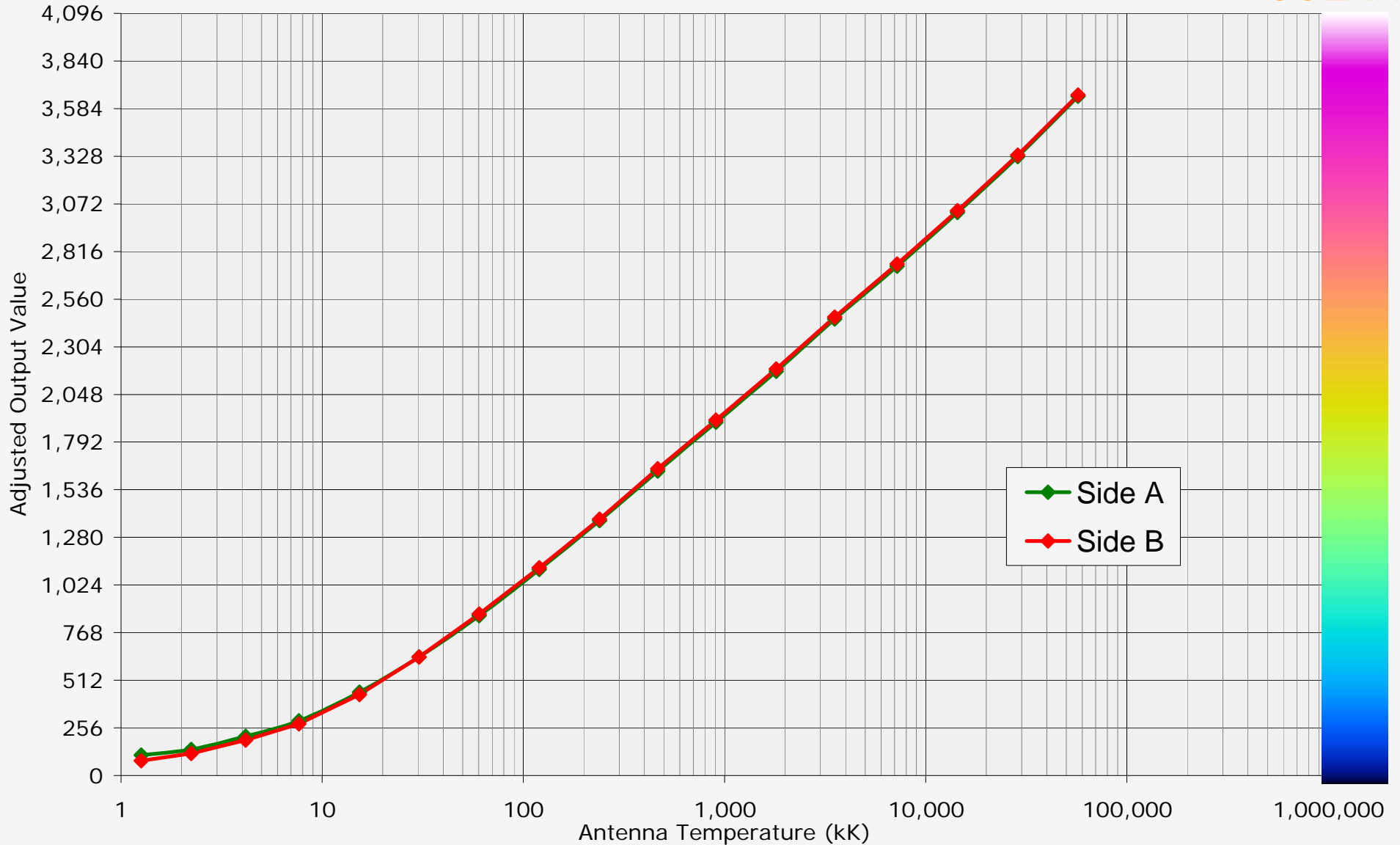


	Side A	Side B
Offset:	1750	1750
Gain:	1.80	1.80

Adjusted Output Value & Color vs Antenna Temperature for 2.2 dB Feed Loss

Color Bar Corresponds to RSS Color Offset = 1750, Color Gain = 1.80

SOLAR

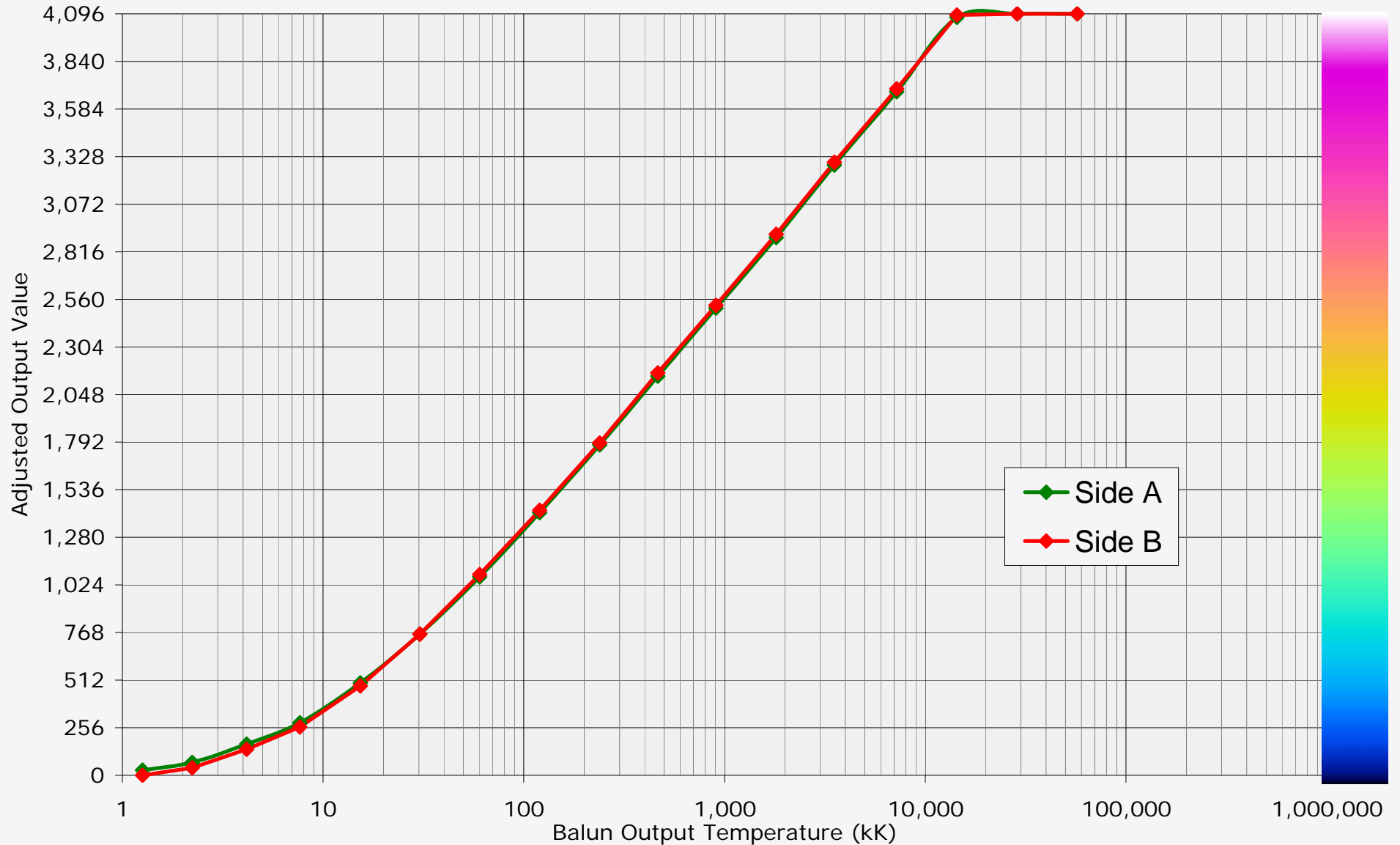


	<b>Side A</b>		<b>Side B</b>
<b>Offset:</b>	<b>1800</b>	<b>Offset:</b>	<b>1800</b>
<b>Gain:</b>	<b>2.50</b>	<b>Gain:</b>	<b>2.50</b>

## Adjusted Output Value & Color vs Antenna Temperature for 2.2 dB Feed Loss

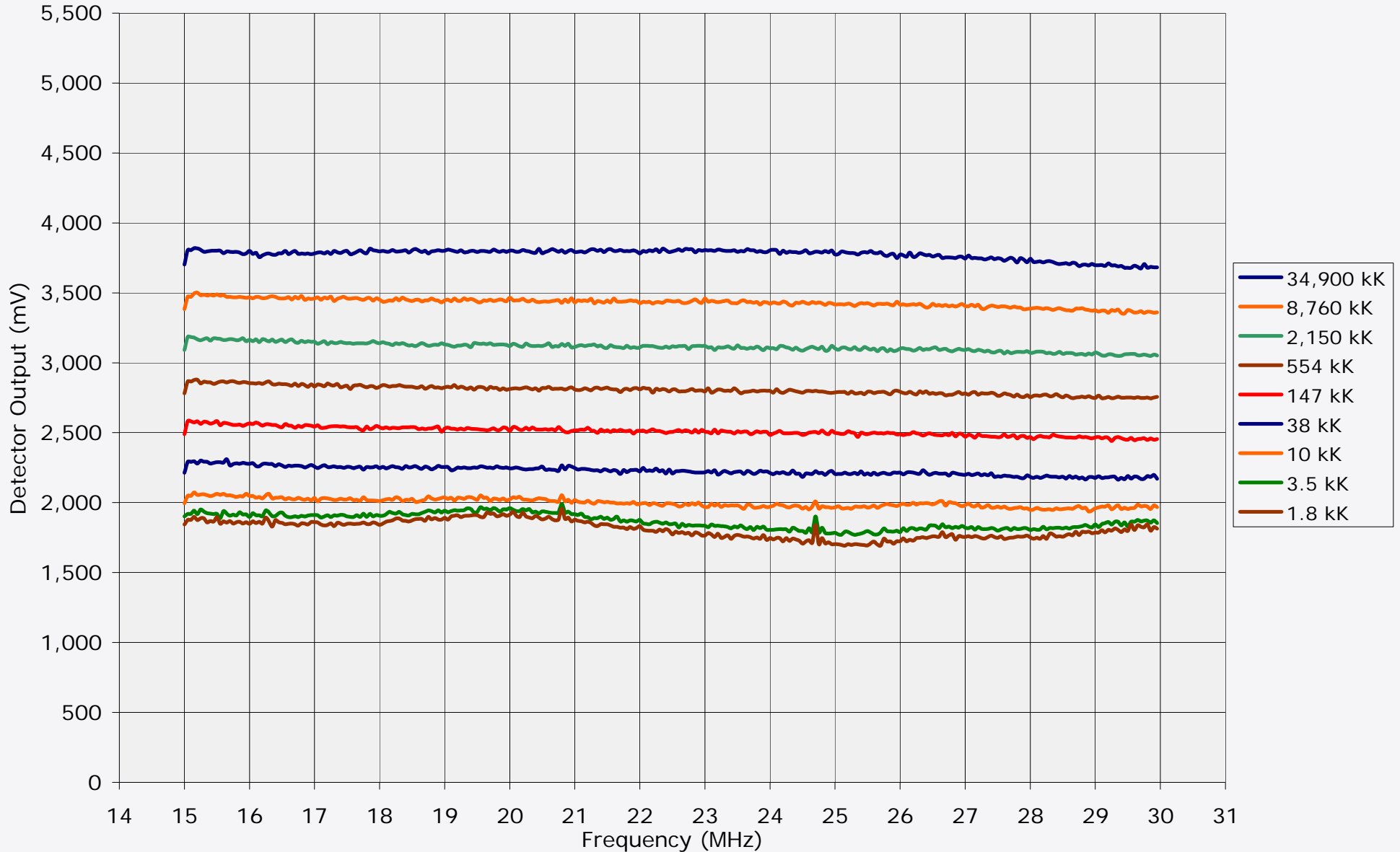
Color Bar Corresponds to RSS Color Offset = 1800, Color Gain = 2.50

JUPITER



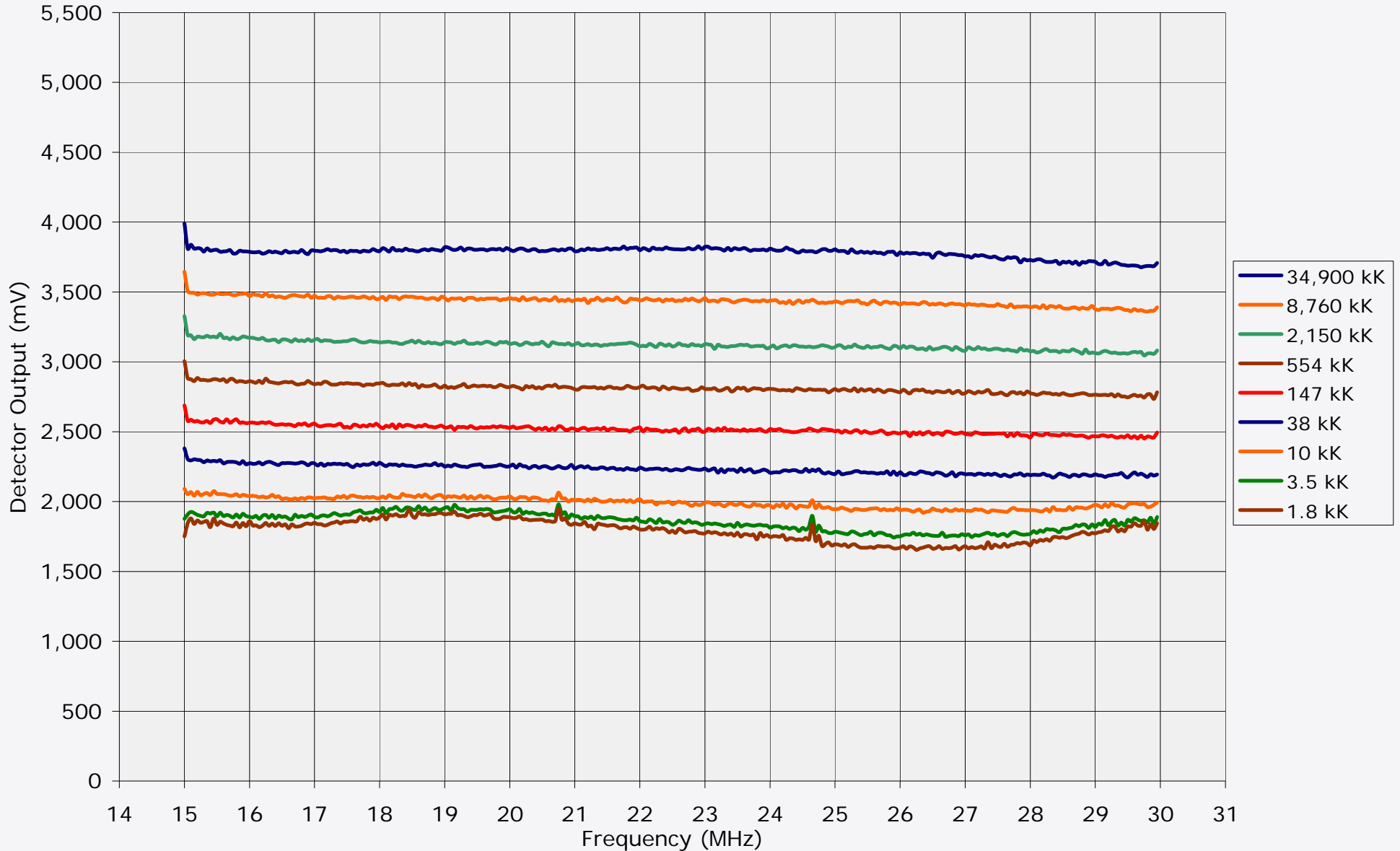
Side A Detector Output vs Frequency vs Temperature Observed at 90 Deg Hybrid Inputs

ADC Voltage Reference = 4.096 V Receiver Noise Figure = 6 dB



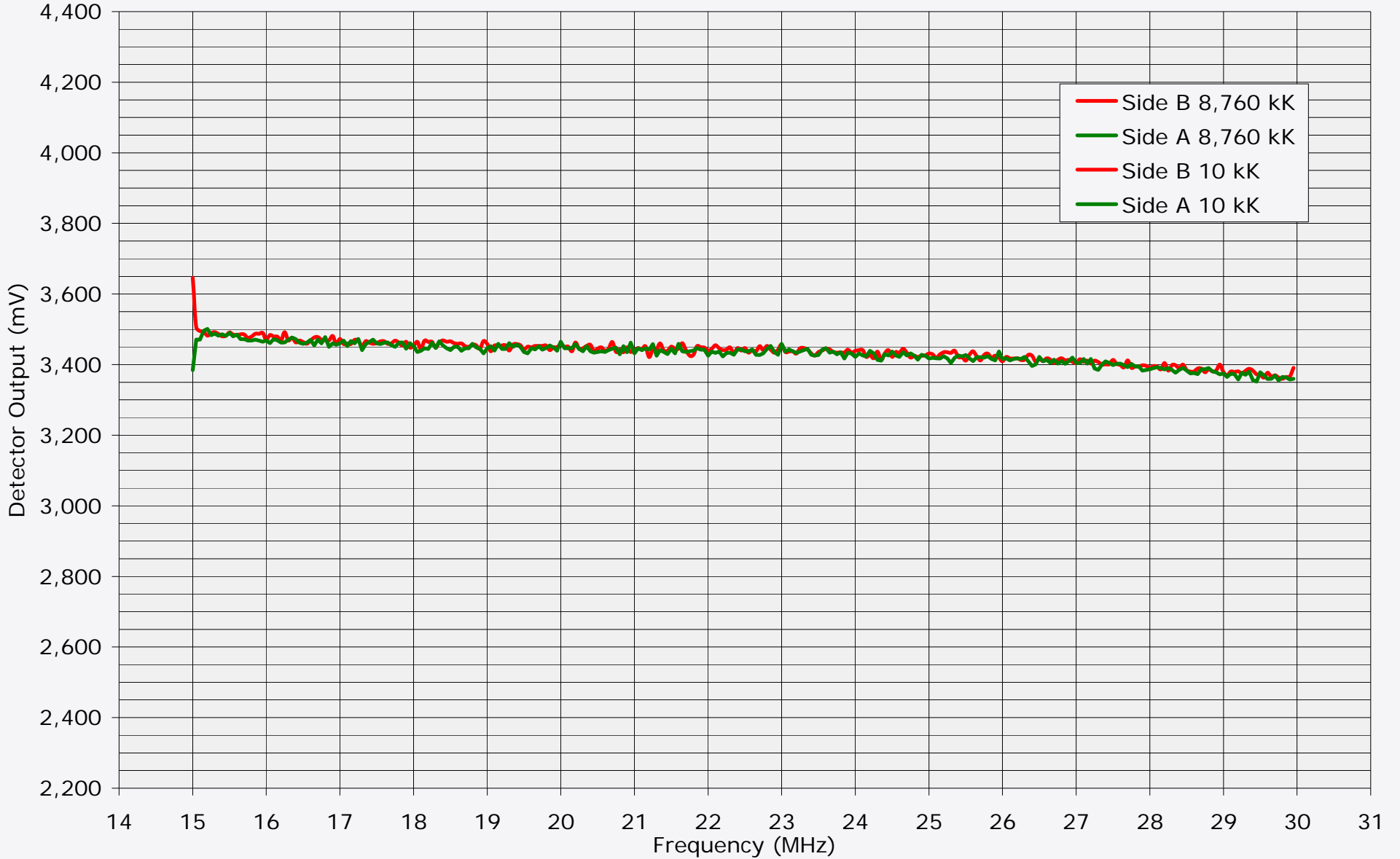
Side B Detector Output vs Frequency vs Temperature Observed at 90 Deg Hybrid Inputs

ADC Voltage Reference = 4.096 V Receiver Noise Figure = 6 dB



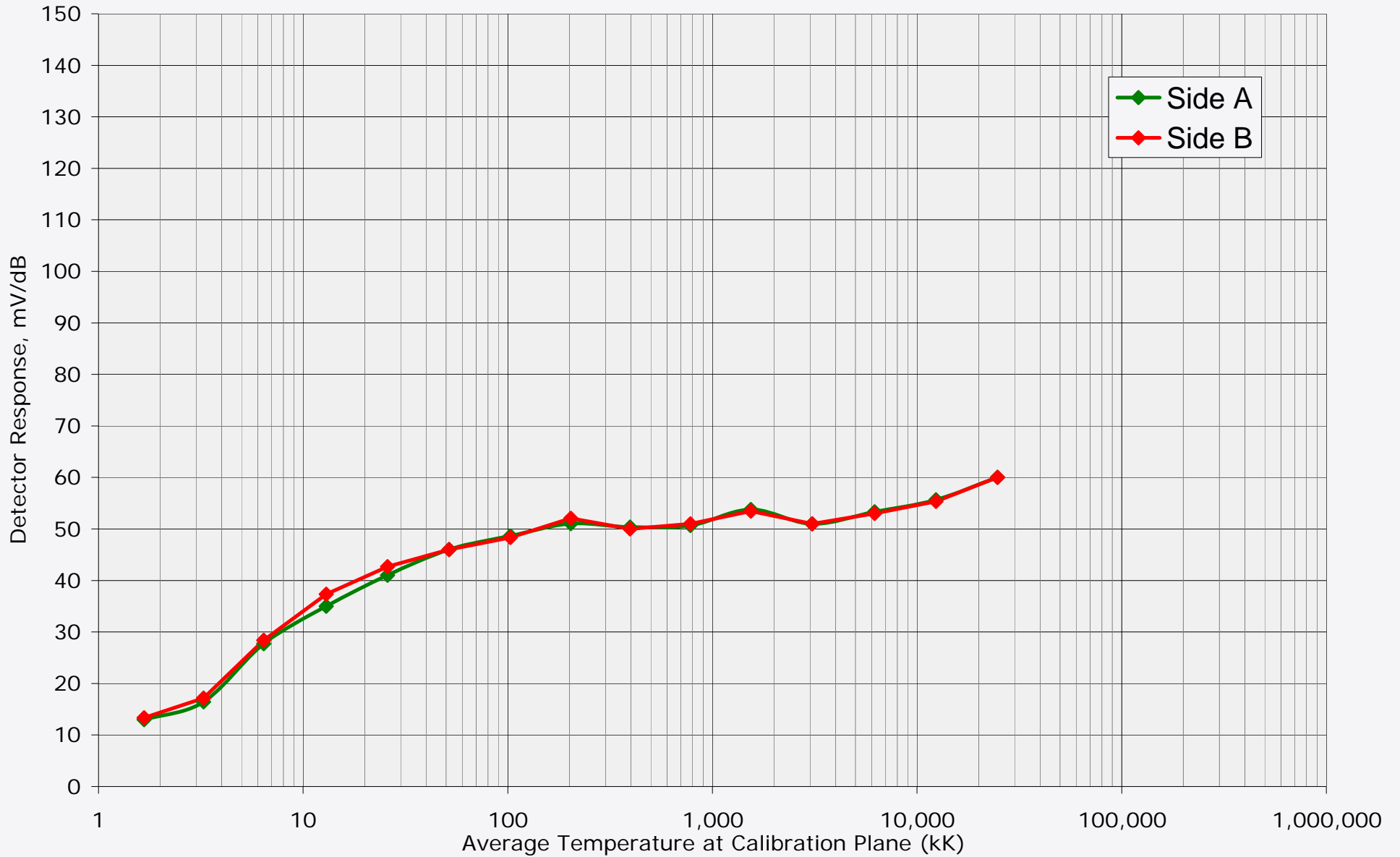
Side A & B Detector Output vs Frequency vs Temperature Observed at 90 Deg Hybrid Inputs

ADC Voltage Reference = 4.096 V Receiver Noise Figure = 6 dB





Detector Response Averaged Over Adjacent 3 dB Calibration Steps



Side B – Side A Response Mismatch

