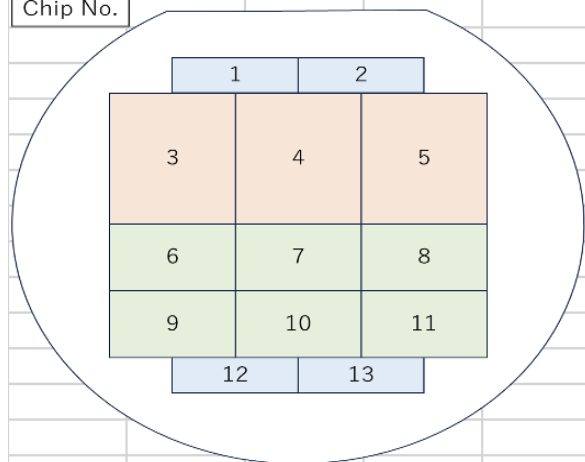




HPK ePIC S16694

HPK Sensors Received

Chip No.

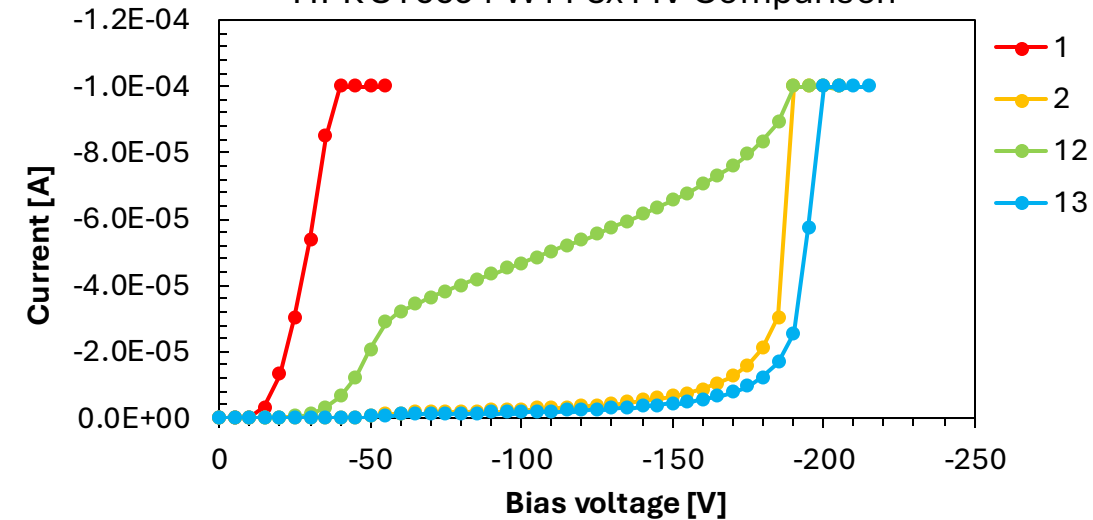


Type	50um											
W/No.	2			6			11			12		
Chip No.	VB (V)	ID@VB-35V (A)	OK or NG	VB (V)	ID@VB-35V (A)	OK or NG	VB (V)	ID@VB-35V (A)	OK or NG	VB (V)	ID@VB-35V (A)	OK or NG
1	195	3.79.E-07	OK	194	5.90.E-07	OK	40	-	NG	194	7.65.E-06	OK
2	193	1.02.E-06	OK	193	6.53.E-06	OK	192	7.54.E-06	OK	59	-	NG
3	50	-	NG	40	-	NG	53	-	NG	50	-	NG
4	40	-	NG	50	-	NG	183	1.91.E-05	NG	61	-	NG
5	67	-	NG	123	6.64.E-05	NG	116	6.68.E-05	NG	181	3.90.E-05	NG
6	30	-	NG	54	-	NG	51	-	NG	20	-	NG
7	80	-	NG	40	-	NG	183	2.54.E-05	NG	185	5.13.E-06	OK
8	160	5.96.E-05	NG	140	6.00.E-05	NG	40	-	NG	174	4.54.E-05	NG
9	10	-	NG	10	-	NG	10	-	NG	10	-	NG
10	54	-	NG	191	1.73.E-05	NG	192	8.57.E-06	OK	191	3.94.E-06	OK
11	50	-	NG	30	-	NG	50	-	NG	40	-	NG
12	199	3.63.E-06	OK	199	3.85.E-07	OK	198	5.72.E-06	OK	198	2.19.E-05	NG
13	198	3.57.E-06	OK	84	-	NG	191	6.84.E-05	NG	197	3.04.E-05	NG

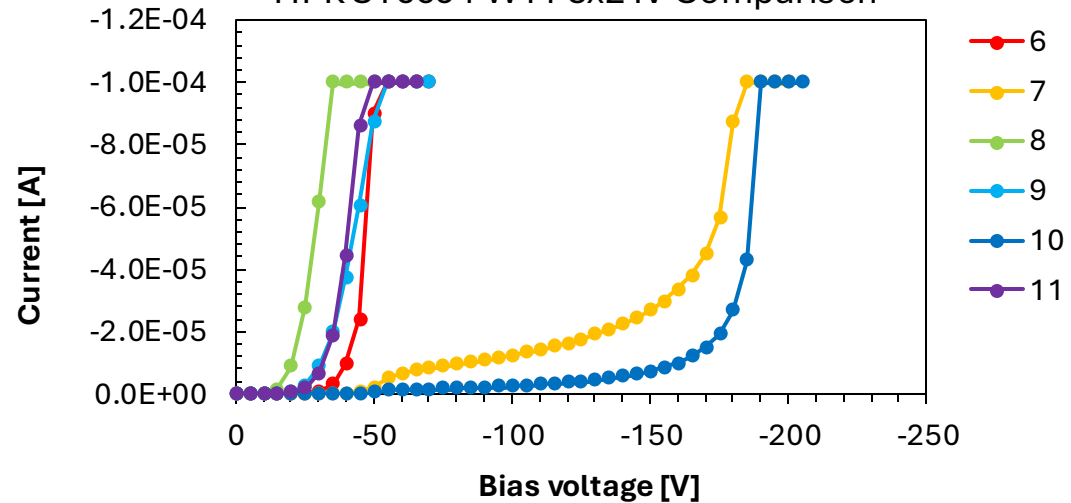
Type	30um											
W/No.	13			15			22			23		
Chip No.	VB (V)	ID@VB-35V (A)	OK or NG	VB (V)	ID@VB-35V (A)	OK or NG	VB (V)	ID@VB-35V (A)	OK or NG	VB (V)	ID@VB-35V (A)	OK or NG
1	188	9.57.E-09	OK	183	8.95.E-09	OK	186	8.65.E-09	OK	180	7.72.E-09	OK
2	188	1.00.E-08	OK	185	9.46.E-09	OK	182	7.71.E-09	OK	183	8.59.E-09	OK
3	40	-	NG	50	-	NG	58	-	NG	180	3.45.E-08	OK
4	185	3.56.E-08	OK	178	2.92.E-08	OK	156	3.70.E-05	NG	182	3.47.E-08	OK
5	182	2.91.E-08	OK	180	3.24.E-08	OK	177	2.93.E-08	OK	184	3.70.E-08	OK
6	185	1.96.E-08	OK	178	1.63.E-08	OK	183	1.83.E-08	OK	183	1.86.E-08	OK
7	186	1.93.E-08	OK	178	1.49.E-08	OK	181	1.55.E-08	OK	183	1.83.E-08	OK
8	183	1.86.E-08	NG	180	1.72.E-08	OK	177	1.45.E-08	OK	185	1.94.E-08	OK
9	10	-	NG	10	-	NG	20	-	NG	10	-	NG
10	188	1.90.E-08	OK	182	1.61.E-08	OK	183	1.58.E-08	OK	185	3.11.E-08	OK
11	185	1.87.E-08	OK	182	1.77.E-08	OK	179	1.44.E-08	OK	187	1.91.E-08	OK
12	190	1.05.E-08	OK	186	9.34.E-09	OK	186	8.52.E-09	OK	189	9.82.E-09	OK
13	124	2.55.E-09	NG	184	8.95.E-09	OK	182	7.53.E-09	OK	188	9.61.E-09	OK

W11 IV Measurements

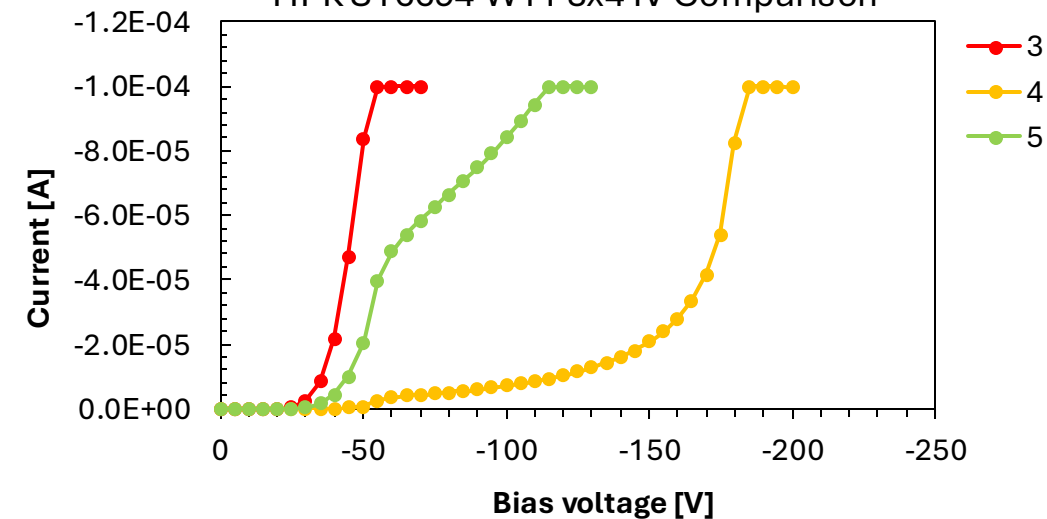
HPK S16694 W11 3x1 IV Comparison



HPK S16694 W11 3x2 IV Comparison



HPK S16694 W11 3x4 IV Comparison

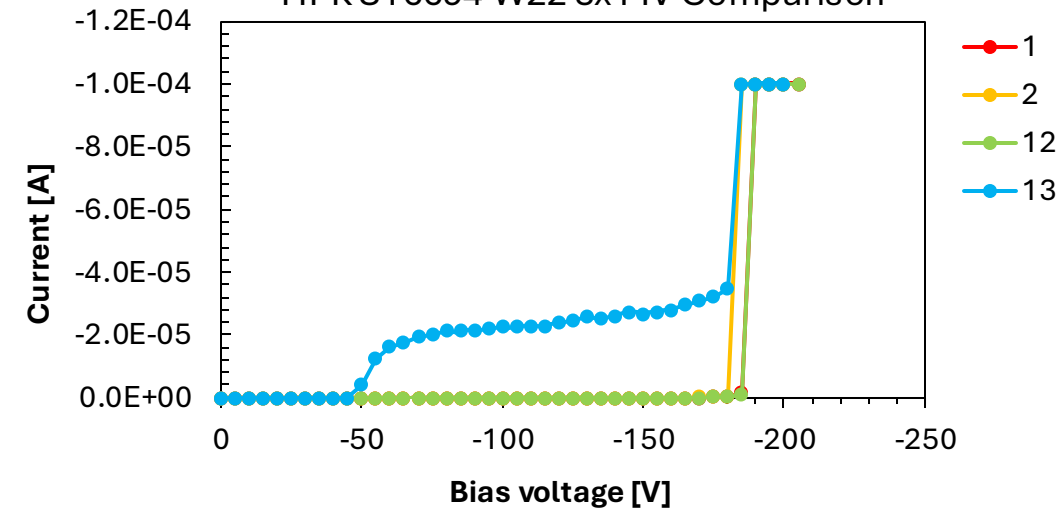


Type	50um		
W/No.	11		
Chip No.	VB (V)	ID@VB-35V (A)	OK or NG
1	40	-	NG
2	192	7.54.E-06	OK
3	53	-	NG
4	183	1.91.E-05	NG
5	116	6.68.E-05	NG
6	51	-	NG
7	183	2.54.E-05	NG
8	40	-	NG
9	10	-	NG
10	192	8.57.E-06	OK
11	50	-	NG
12	198	5.72.E-06	OK
13	191	6.84.E-05	NG

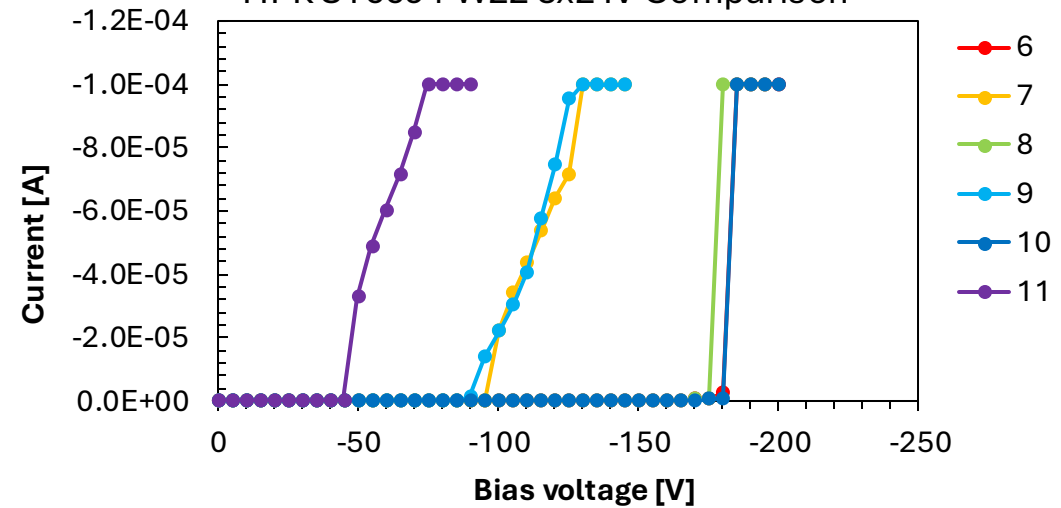
- Measurements generally matched the breakdown voltages listed from HPK, with the exceptions of chips 9, 12 and 13 (12 and 13 might be swapped)

W22 IV Measurements

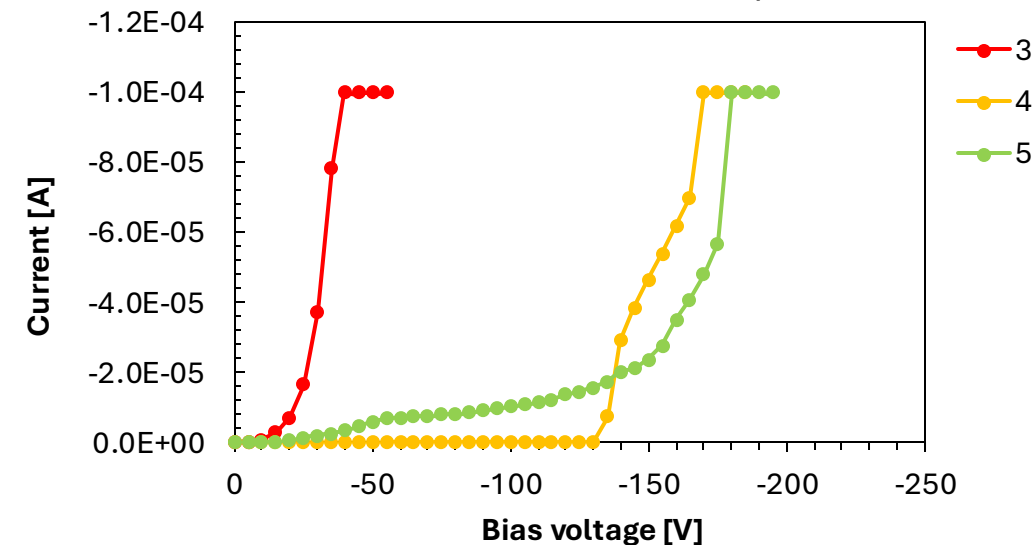
HPK S16694 W22 3x1 IV Comparison



HPK S16694 W22 3x2 IV Comparison



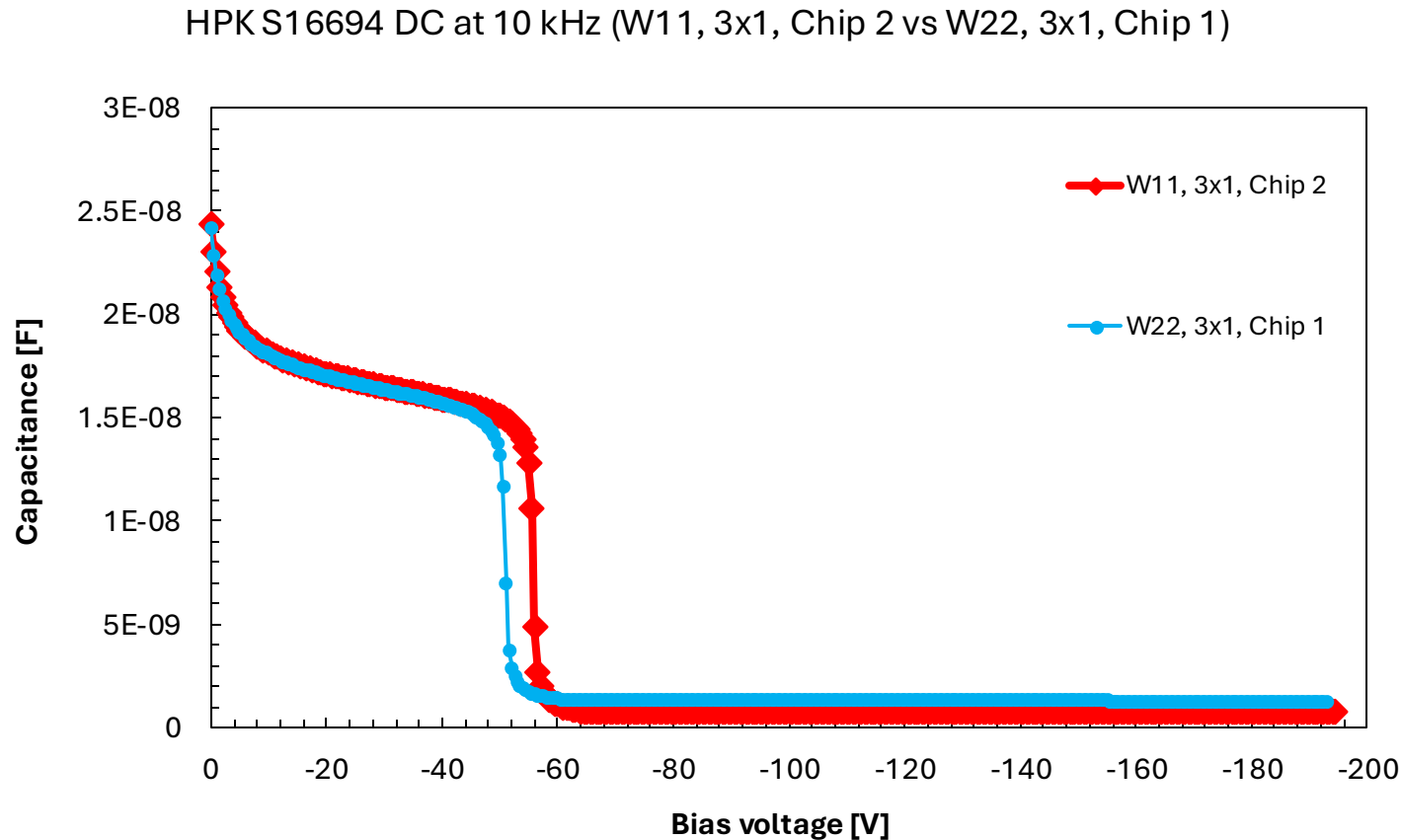
HPK S16694 W22 3x4 IV Comparison



Type	30um		
W/No.	22		
Chip No.	VB (V)	ID@VB-35V (A)	OK or NG
1	186	8.65.E-09	OK
2	182	7.71.E-09	OK
3	58	-	NG
4	156	3.70.E-05	NG
5	177	2.93.E-08	OK
6	183	1.83.E-08	OK
7	181	1.55.E-08	OK
8	177	1.45.E-08	OK
9	20	-	NG
10	183	1.58.E-08	OK
11	179	1.44.E-08	OK
12	186	8.52.E-09	OK
13	182	7.53.E-09	OK

- Measurements generally matched the breakdown voltages listed from HPK for the 3x1 and 3x4 sensors
- Chips 7, 9 and 11 in for the 3x2 sensors don't match the listed breakdown

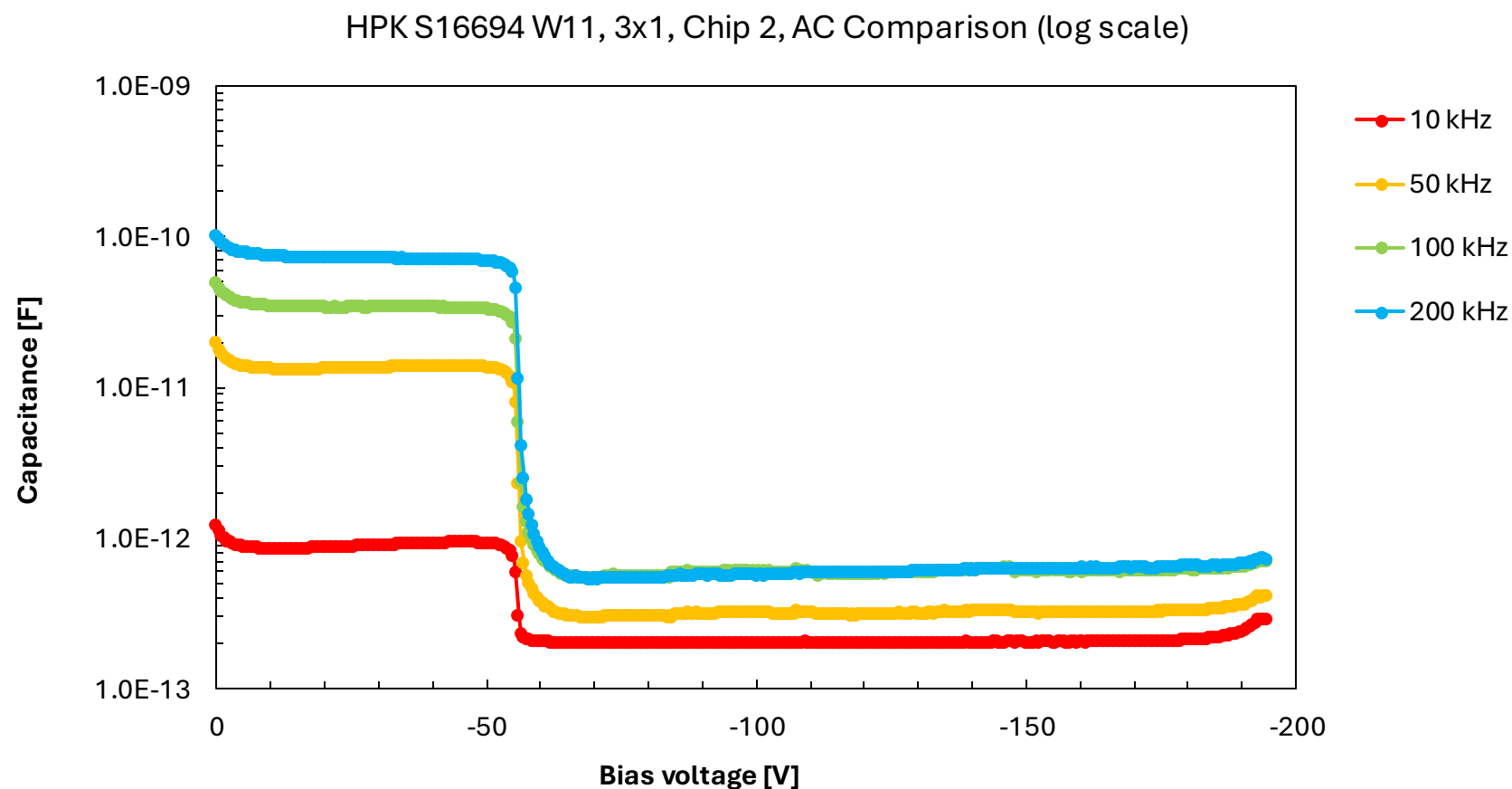
W11 and W22 CV Comparison



- CV on the N+ connector (full sensor) at 10 kHz
- Final capacitance:
 - W11: 0.725 nF
 - W22: 1.24 nF
- W22 appears to have an earlier depletion than W11, but will have to measure more sensors to confirm

W11 3x1 Chip 2, CV Measurements

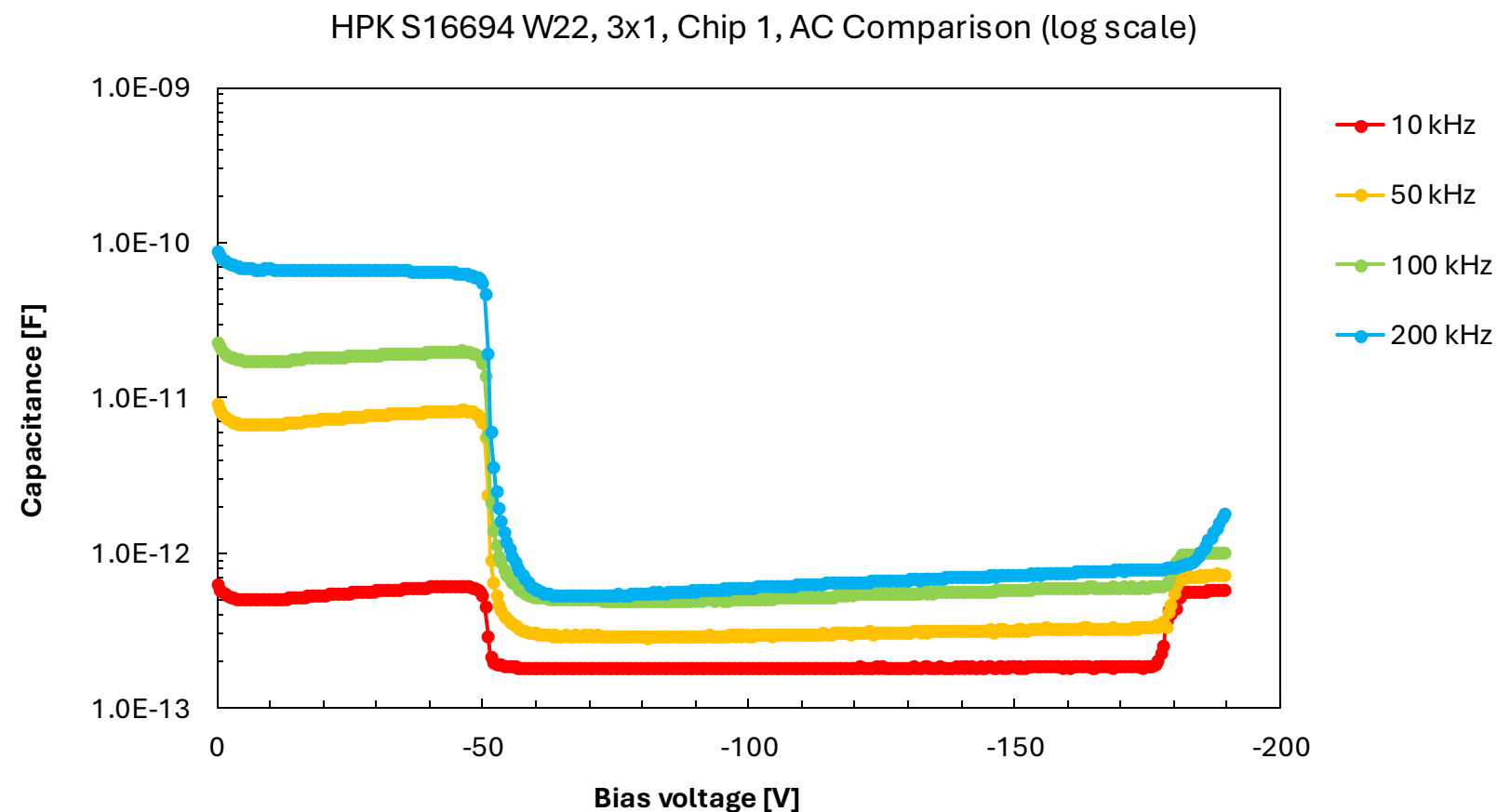
- CV on strip at the edge, with N+ grounded at varying frequencies
- Capacitance after depletion is nearly identical for 100 kHz and 200 kHz



Frequency (kHz)	Final Strip Capacitance (pF)
10	0.28
50	0.41
100	0.69
200	0.72

W22 3x1 Chip 1, CV Measurements

- CV on strip at the edge, with N+ grounded at varying frequencies
- Capacitance increases and flattens out towards the end



Frequency (kHz)	Final Strip Capacitance (pF)
10	0.58
50	0.72
100	0.99
200	3.09

Next Up

- Will be taking CV measurements on some of the other sensors from this batch to compare the behavior between W11 and W22
- Will also be testing DC-LGAD and PiN devices from both wafers

