

Datasheet for #sbcw13585 DN

Recommendations:

Please read the User Manual and have a look at the FAQ at <http://www.alpeslasers.ch/?a=142>

WARNING: Operating the laser with higher current or voltage than specified in this document may cause damage and will result in loss of warranty, unless Alpes Lasers has permitted to do so!

WARNING: Beware of the polarity of the laser. This laser has to be powered with negative current on the laser contact (= bonding pad, corresponding to the label "laser" on the LLH) and the positive current on the base contact (= submount, corresponding to the label "base" on the LLH). To use with a power-supply ILX Lightwave LDX-3232 or equivalent.

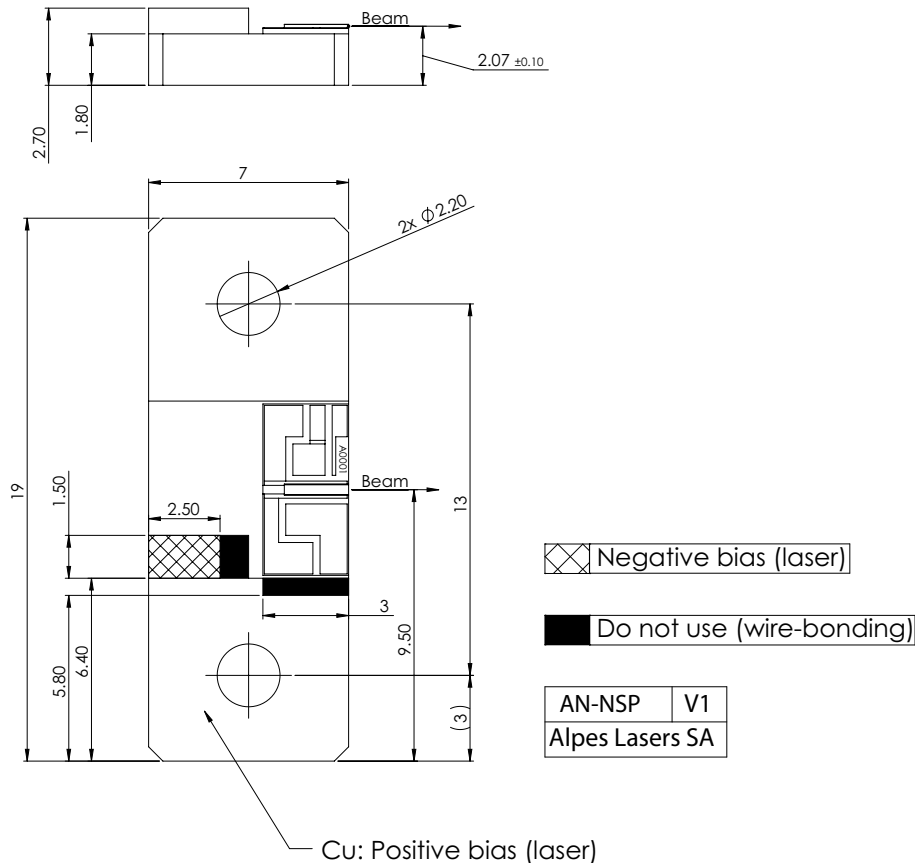


Figure 1: Mechanical and electrical interface for #sbcw13585 DN

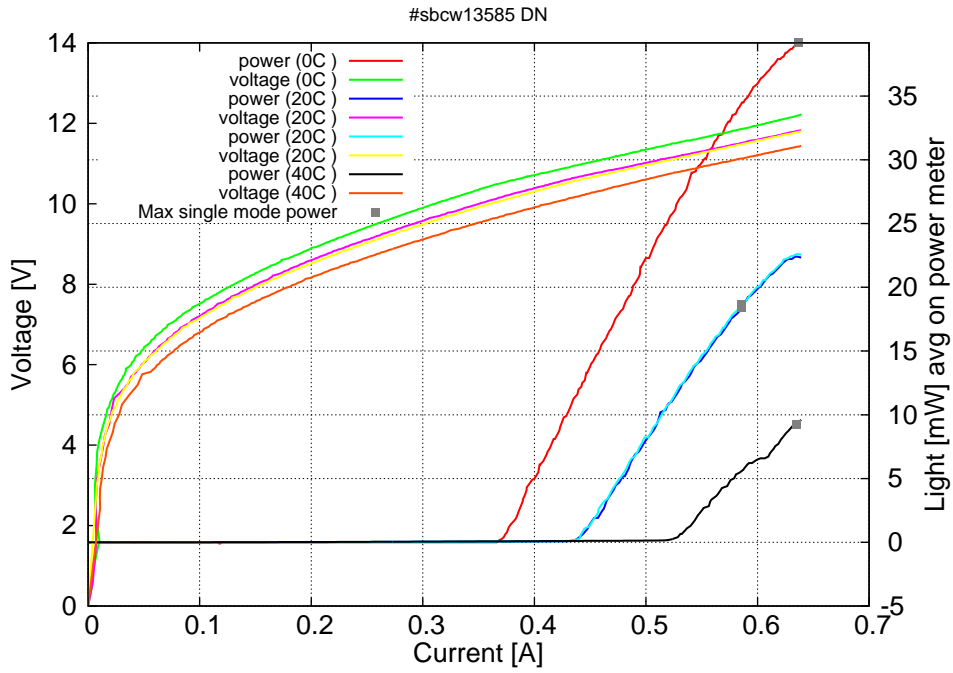


Figure 2: voltage and avg power vs current in continuous-wave operation (the solid squares indicate the maximum singlemode emitted power)

Note: at -30C: $I_{th}=0.37A$ / $V_{th}=10.5V$ (2-wires measurements). Maximum operation current: 0.64A for all temperatures.

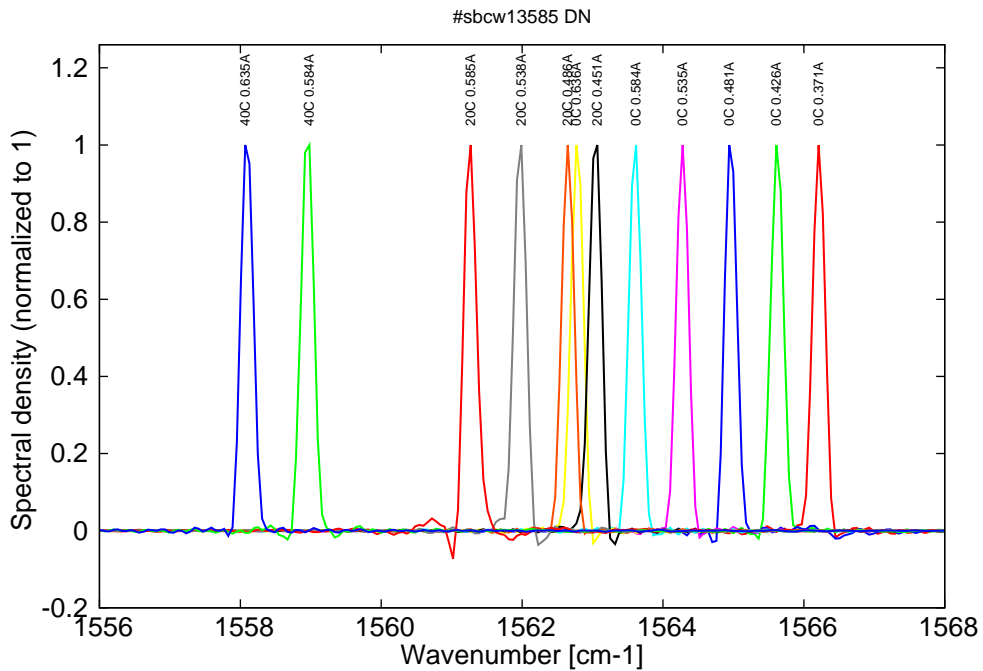


Figure 3: spectra at 0C, 20C and 40C in continuous-wave operation (front resistor current $I_F = 0A$ and back resistor current $I_B = 0A$)

Vernier characterization

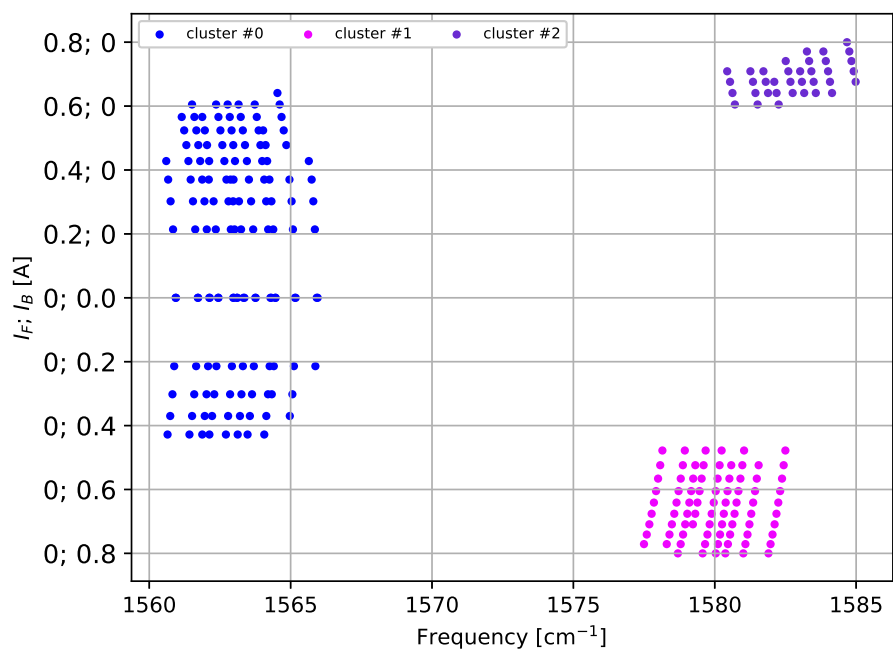


Figure 4: Emission frequency as a function of electrical current on the front resistor I_F or back resistor I_B . Either the back or the front resistors are heated, while no electrical current is flowing through the other resistor.

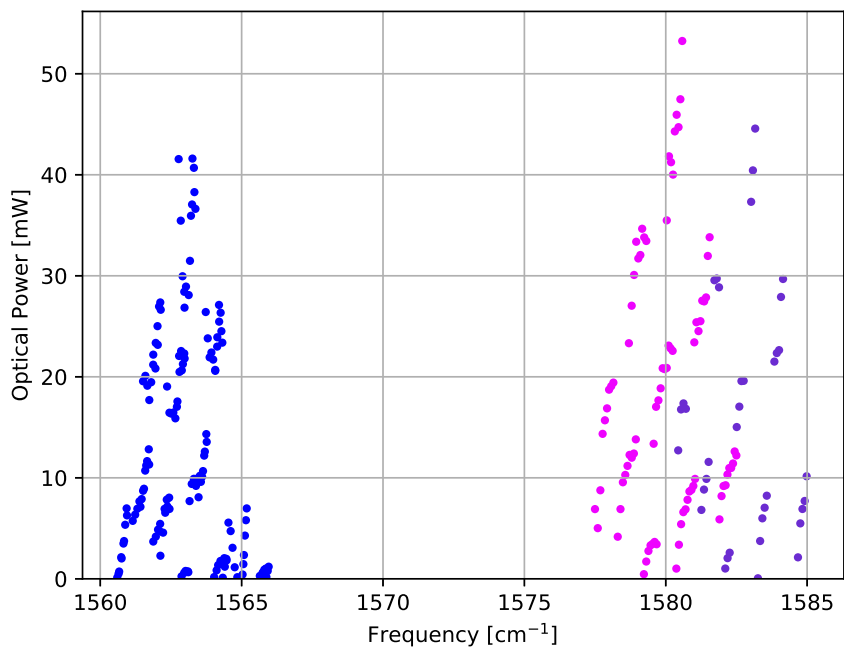


Figure 5: Optical power as a function of emission frequency.

Cluster	I_B [A]	V_B [V]	I_F [A]	V_F [V]	I_L [A]	V_L [V]	Freq [cm ⁻¹]	T [C]	P_{opt} [mW]
#0-Back	0.00 - 0.43	0.0 - 1.8	0	0	0.39 - 0.61	10.6 - 12.7	1560.6 - 1566.0	0 - 20	42
#0-Front	0	0	0.00 - 0.64	0.0 - 2.4	0.39 - 0.61	10.4 - 12.7	1560.6 - 1566.0	0 - 20	42
#1-Back	0.48 - 0.80	1.8 - 3.2	0	0	0.46 - 0.61	10.7 - 11.9	1577.5 - 1582.5	0 - 20	53
#2-Front	0	0	0.60 - 0.80	2.3 - 3.0	0.46 - 0.61	10.6 - 11.8	1580.4 - 1585.0	0 - 20	45

Table 1: Overview of the clusters.

Details of cluster #0-Back

I_F	V_F	I_B	V_B	P_{elR}	I_L	V_L	P_L	P_{tot}	P_{opt}	T	freq
[A]	[V]	[A]	[V]	[W]	[A]	[V]	[W]	[W]	[mW]	[C]	[cm ⁻¹]
0.0	0.0	0.428	1.772	0.76	0.599	11.99	7.18	7.94	28	0	1563.13
0.0	0.0	0.37	1.575	0.58	0.599	12.01	7.19	7.77	36	0	1563.21
0.0	0.0	0.302	1.323	0.40	0.599	12.06	7.23	7.62	42	0	1563.26
0.0	0.0	0.214	0.97	0.21	0.599	12.13	7.27	7.47	41	0	1563.31
0.0	0.0	0.0	0.0	0.00	0.599	12.66	7.59	7.59	38	0	1563.33
0.0	0.0	0.0	0.0	0.00	0.599	12.35	7.40	7.40	37	0	1563.37
0.0	0.0	0.428	1.772	0.76	0.528	11.50	6.07	6.83	21	0	1564.07
0.0	0.0	0.37	1.575	0.58	0.528	11.53	6.09	6.67	24	0	1564.14
0.0	0.0	0.302	1.323	0.40	0.528	11.58	6.11	6.51	27	0	1564.20
0.0	0.0	0.214	0.97	0.21	0.528	11.64	6.15	6.36	26	0	1564.26
0.0	0.0	0.0	0.0	0.00	0.528	12.18	6.43	6.43	25	0	1564.28
0.0	0.0	0.0	0.0	0.00	0.528	11.94	6.30	6.30	23	0	1564.32
0.0	0.0	0.37	1.575	0.58	0.456	11.03	5.03	5.61	0	0	1564.97
0.0	0.0	0.302	1.323	0.40	0.456	11.08	5.05	5.45	1	0	1565.06
0.0	0.0	0.214	0.97	0.21	0.456	11.14	5.08	5.29	4	0	1565.12
0.0	0.0	0.0	0.0	0.00	0.456	11.65	5.31	5.31	6	0	1565.15
0.0	0.0	0.0	0.0	0.00	0.456	11.45	5.22	5.22	7	0	1565.18
0.0	0.0	0.214	0.97	0.21	0.385	10.64	4.10	4.30	0	0	1565.88
0.0	0.0	0.0	0.0	0.00	0.385	11.19	4.31	4.31	1	0	1565.92
0.0	0.0	0.0	0.0	0.00	0.385	10.88	4.19	4.19	1	0	1565.96
0.0	0.0	0.428	1.632	0.70	0.609	11.87	7.23	7.93	22	10	1561.87
0.0	0.0	0.37	1.39	0.51	0.609	11.91	7.26	7.77	23	10	1561.96
0.0	0.0	0.302	1.108	0.33	0.609	11.96	7.29	7.62	25	10	1562.03
0.0	0.0	0.214	0.741	0.16	0.609	12.03	7.33	7.48	27	10	1562.08
0.0	0.0	0.0	0.0	0.00	0.609	12.20	7.43	7.43	27	10	1562.12
0.0	0.0	0.0	0.0	0.00	0.609	12.33	7.51	7.51	27	10	1562.14
0.0	0.0	0.428	1.632	0.70	0.548	11.45	6.28	6.97	17	10	1562.71
0.0	0.0	0.37	1.39	0.51	0.548	11.49	6.30	6.81	22	10	1562.79
0.0	0.0	0.302	1.108	0.33	0.548	11.54	6.33	6.66	23	10	1562.86
0.0	0.0	0.214	0.741	0.16	0.548	11.61	6.36	6.52	21	10	1562.92
0.0	0.0	0.0	0.0	0.00	0.548	11.76	6.44	6.44	22	10	1562.97
0.0	0.0	0.0	0.0	0.00	0.548	11.91	6.53	6.53	22	10	1562.98
0.0	0.0	0.428	1.632	0.70	0.486	11.03	5.36	6.06	8	10	1563.48
0.0	0.0	0.37	1.39	0.51	0.486	11.07	5.38	5.89	10	10	1563.56
0.0	0.0	0.302	1.108	0.33	0.486	11.12	5.40	5.74	11	10	1563.63
0.0	0.0	0.214	0.741	0.16	0.486	11.18	5.43	5.59	13	10	1563.70
0.0	0.0	0.0	0.0	0.00	0.486	11.32	5.50	5.50	14	10	1563.75
0.0	0.0	0.0	0.0	0.00	0.486	11.52	5.60	5.60	14	10	1563.77
0.0	0.0	0.302	1.108	0.33	0.425	10.69	4.54	4.88	0	10	1564.33
0.0	0.0	0.214	0.741	0.16	0.425	10.75	4.57	4.73	1	10	1564.41
0.0	0.0	0.0	0.0	0.00	0.425	10.90	4.63	4.63	2	10	1564.46
0.0	0.0	0.0	0.0	0.00	0.425	11.04	4.69	4.69	2	10	1564.47
0.0	0.0	0.428	1.612	0.69	0.615	11.74	7.22	7.91	1	20	1560.65
0.0	0.0	0.37	1.37	0.51	0.615	11.78	7.24	7.75	2	20	1560.74
0.0	0.0	0.302	1.088	0.33	0.615	11.83	7.27	7.60	3	20	1560.82
0.0	0.0	0.214	0.722	0.15	0.615	11.89	7.31	7.47	5	20	1560.88

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I_F	V_F	I_B	V_B	P_{elR}	I_L	V_L	P_L	P_{tot}	P_{opt}	T	freq
[A]	[V]	[A]	[V]	[W]	[A]	[V]	[W]	[W]	[mW]	[C]	[cm ⁻¹]
0.0	0.0	0.0	0.0	0.00	0.615	12.10	7.44	7.44	7	20	1560.93
0.0	0.0	0.0	0.0	0.00	0.615	12.15	7.47	7.47	6	20	1560.95
0.0	0.0	0.428	1.612	0.69	0.56	11.37	6.37	7.06	7	20	1561.42
0.0	0.0	0.37	1.37	0.51	0.56	11.40	6.39	6.89	9	20	1561.51
0.0	0.0	0.302	1.088	0.33	0.56	11.45	6.41	6.74	11	20	1561.59
0.0	0.0	0.214	0.722	0.15	0.56	11.52	6.45	6.61	12	20	1561.66
0.0	0.0	0.0	0.0	0.00	0.56	11.79	6.61	6.61	13	20	1561.72
0.0	0.0	0.0	0.0	0.00	0.56	11.76	6.58	6.58	11	20	1561.73
0.0	0.0	0.428	1.612	0.69	0.505	10.99	5.55	6.24	2	20	1562.13
0.0	0.0	0.37	1.37	0.51	0.505	11.03	5.57	6.08	5	20	1562.22
0.0	0.0	0.302	1.088	0.33	0.505	11.08	5.60	5.92	7	20	1562.30
0.0	0.0	0.214	0.722	0.15	0.505	11.15	5.63	5.79	7	20	1562.37
0.0	0.0	0.0	0.0	0.00	0.505	11.44	5.78	5.78	8	20	1562.44
0.0	0.0	0.0	0.0	0.00	0.505	11.29	5.70	5.70	7	20	1562.45
0.0	0.0	0.0	0.0	0.00	0.45	10.97	4.94	4.94	1	20	1563.10
0.0	0.0	0.0	0.0	0.00	0.45	10.91	4.91	4.91	1	20	1563.12

Table 2:

Details of cluster #0-Front

I_F	V_F	I_B	V_B	P_{elR}	I_L	V_L	P_L	P_{tot}	P_{opt}	T	freq
[A]	[V]	[A]	[V]	[W]	[A]	[V]	[W]	[W]	[mW]	[C]	[cm ⁻¹]
0.605	2.271	0.0	0.0	1.37	0.599	11.83	7.09	8.46	42	0	1562.77
0.566	2.169	0.0	0.0	1.23	0.599	11.85	7.10	8.32	35	0	1562.85
0.524	1.998	0.0	0.0	1.05	0.599	11.88	7.11	8.16	30	0	1562.91
0.478	1.855	0.0	0.0	0.89	0.599	11.91	7.13	8.02	28	0	1562.97
0.37	1.541	0.0	0.0	0.57	0.599	12.00	7.19	7.76	27	0	1562.98
0.428	1.718	0.0	0.0	0.74	0.599	11.95	7.16	7.89	29	0	1563.03
0.302	1.304	0.0	0.0	0.39	0.599	12.06	7.22	7.62	31	0	1563.17
0.214	1.068	0.0	0.0	0.23	0.599	12.13	7.26	7.49	37	0	1563.25
0.0	0.0	0.0	0.0	0.00	0.599	12.66	7.59	7.59	38	0	1563.33
0.0	0.0	0.0	0.0	0.00	0.599	12.35	7.40	7.40	37	0	1563.37
0.605	2.271	0.0	0.0	1.37	0.528	11.32	5.98	7.35	26	0	1563.73
0.566	2.169	0.0	0.0	1.23	0.528	11.35	5.99	7.22	24	0	1563.80
0.524	1.998	0.0	0.0	1.05	0.528	11.38	6.01	7.06	22	0	1563.87
0.478	1.855	0.0	0.0	0.89	0.528	11.41	6.03	6.91	22	0	1563.93
0.428	1.718	0.0	0.0	0.74	0.528	11.46	6.05	6.78	22	0	1563.99
0.37	1.541	0.0	0.0	0.57	0.528	11.49	6.07	6.64	21	0	1564.07
0.302	1.304	0.0	0.0	0.39	0.528	11.57	6.11	6.50	23	0	1564.13
0.214	1.068	0.0	0.0	0.23	0.528	11.64	6.15	6.37	25	0	1564.20
0.0	0.0	0.0	0.0	0.00	0.528	12.18	6.43	6.43	25	0	1564.28
0.0	0.0	0.0	0.0	0.00	0.528	11.94	6.30	6.30	23	0	1564.32
0.641	2.395	0.0	0.0	1.54	0.456	10.80	4.92	6.46	6	0	1564.53
0.605	2.271	0.0	0.0	1.37	0.456	10.82	4.93	6.31	5	0	1564.61
0.566	2.169	0.0	0.0	1.23	0.456	10.85	4.95	6.18	3	0	1564.68
0.524	1.998	0.0	0.0	1.05	0.456	10.88	4.96	6.01	1	0	1564.75
0.478	1.855	0.0	0.0	0.89	0.456	10.91	4.98	5.86	0	0	1564.85
0.37	1.541	0.0	0.0	0.57	0.456	11.01	5.02	5.59	0	0	1564.96
0.302	1.304	0.0	0.0	0.39	0.456	11.06	5.05	5.44	0	0	1565.03
0.214	1.068	0.0	0.0	0.23	0.456	11.14	5.08	5.31	2	0	1565.08
0.0	0.0	0.0	0.0	0.00	0.456	11.65	5.31	5.31	6	0	1565.15
0.0	0.0	0.0	0.0	0.00	0.456	11.45	5.22	5.22	7	0	1565.18
0.428	1.718	0.0	0.0	0.74	0.385	10.45	4.02	4.76	0	0	1565.64
0.37	1.541	0.0	0.0	0.57	0.385	10.50	4.04	4.61	1	0	1565.74
0.302	1.304	0.0	0.0	0.39	0.385	10.55	4.06	4.46	1	0	1565.80
0.214	1.068	0.0	0.0	0.23	0.385	10.62	4.09	4.32	1	0	1565.86
0.0	0.0	0.0	0.0	0.00	0.385	11.19	4.31	4.31	1	0	1565.92
0.0	0.0	0.0	0.0	0.00	0.385	10.88	4.19	4.19	1	0	1565.96
0.605	2.333	0.0	0.0	1.41	0.609	11.70	7.13	8.54	20	10	1561.51
0.566	2.244	0.0	0.0	1.27	0.609	11.74	7.15	8.42	20	10	1561.60
0.524	2.042	0.0	0.0	1.07	0.609	11.78	7.18	8.25	19	10	1561.67
0.478	1.947	0.0	0.0	0.93	0.609	11.85	7.21	8.14	18	10	1561.73
0.428	1.803	0.0	0.0	0.77	0.609	11.89	7.24	8.01	19	10	1561.80
0.37	1.424	0.0	0.0	0.53	0.609	11.94	7.27	7.80	21	10	1561.87
0.302	1.127	0.0	0.0	0.34	0.609	12.06	7.34	7.68	21	10	1561.95
0.214	0.733	0.0	0.0	0.16	0.609	12.12	7.38	7.54	23	10	1562.03
0.0	0.0	0.0	0.0	0.00	0.609	12.20	7.43	7.43	27	10	1562.12
0.0	0.0	0.0	0.0	0.00	0.609	12.33	7.51	7.51	27	10	1562.14

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I_F	V_F	I_B	V_B	P_{elR}	I_L	V_L	P_L	P_{tot}	P_{opt}	T	freq
[A]	[V]	[A]	[V]	[W]	[A]	[V]	[W]	[W]	[mW]	[C]	[cm ⁻¹]
0.605	2.333	0.0	0.0	1.41	0.548	11.26	6.17	7.58	19	10	1562.36
0.566	2.244	0.0	0.0	1.27	0.548	11.30	6.19	7.46	16	10	1562.45
0.524	2.042	0.0	0.0	1.07	0.548	11.34	6.22	7.29	16	10	1562.52
0.478	1.947	0.0	0.0	0.93	0.548	11.40	6.25	7.18	16	10	1562.58
0.428	1.803	0.0	0.0	0.77	0.548	11.45	6.27	7.05	16	10	1562.66
0.37	1.424	0.0	0.0	0.53	0.548	11.51	6.31	6.83	18	10	1562.73
0.302	1.127	0.0	0.0	0.34	0.548	11.63	6.38	6.72	20	10	1562.80
0.214	0.733	0.0	0.0	0.16	0.548	11.59	6.35	6.51	21	10	1562.88
0.0	0.0	0.0	0.0	0.00	0.548	11.76	6.44	6.44	22	10	1562.97
0.0	0.0	0.0	0.0	0.00	0.548	11.91	6.53	6.53	22	10	1562.98
0.605	2.333	0.0	0.0	1.41	0.486	10.81	5.25	6.67	8	10	1563.16
0.566	2.244	0.0	0.0	1.27	0.486	10.86	5.28	6.55	9	10	1563.24
0.524	2.042	0.0	0.0	1.07	0.486	10.90	5.30	6.37	10	10	1563.31
0.478	1.947	0.0	0.0	0.93	0.486	10.95	5.32	6.25	9	10	1563.39
0.428	1.803	0.0	0.0	0.77	0.486	11.01	5.35	6.12	10	10	1563.45
0.37	1.424	0.0	0.0	0.53	0.486	11.06	5.38	5.90	10	10	1563.53
0.302	1.127	0.0	0.0	0.34	0.486	11.15	5.42	5.76	10	10	1563.60
0.214	0.733	0.0	0.0	0.16	0.486	11.16	5.43	5.58	12	10	1563.68
0.0	0.0	0.0	0.0	0.00	0.486	11.32	5.50	5.50	14	10	1563.75
0.0	0.0	0.0	0.0	0.00	0.486	11.52	5.60	5.60	14	10	1563.77
0.524	2.042	0.0	0.0	1.07	0.425	10.46	4.44	5.51	0	10	1564.03
0.478	1.947	0.0	0.0	0.93	0.425	10.50	4.46	5.39	1	10	1564.11
0.428	1.803	0.0	0.0	0.77	0.425	10.56	4.49	5.26	1	10	1564.17
0.37	1.424	0.0	0.0	0.53	0.425	10.62	4.51	5.04	2	10	1564.25
0.302	1.127	0.0	0.0	0.34	0.425	10.70	4.55	4.89	2	10	1564.32
0.214	0.733	0.0	0.0	0.16	0.425	10.73	4.56	4.72	2	10	1564.39
0.0	0.0	0.0	0.0	0.00	0.425	10.90	4.63	4.63	2	10	1564.46
0.0	0.0	0.0	0.0	0.00	0.425	11.04	4.69	4.69	2	10	1564.47
0.428	1.585	0.0	0.0	0.68	0.615	11.72	7.21	7.89	0	20	1560.60
0.37	1.342	0.0	0.0	0.50	0.615	11.77	7.24	7.74	1	20	1560.67
0.302	1.065	0.0	0.0	0.32	0.615	11.83	7.28	7.60	2	20	1560.75
0.214	0.706	0.0	0.0	0.15	0.615	11.90	7.32	7.47	4	20	1560.84
0.0	0.0	0.0	0.0	0.00	0.615	12.10	7.44	7.44	7	20	1560.93
0.0	0.0	0.0	0.0	0.00	0.615	12.15	7.47	7.47	6	20	1560.95
0.566	2.144	0.0	0.0	1.21	0.56	11.22	6.29	7.50	6	20	1561.15
0.524	1.979	0.0	0.0	1.04	0.56	11.25	6.30	7.34	6	20	1561.23
0.478	1.791	0.0	0.0	0.86	0.56	11.29	6.32	7.18	7	20	1561.31
0.428	1.585	0.0	0.0	0.68	0.56	11.34	6.35	7.03	8	20	1561.39
0.37	1.342	0.0	0.0	0.50	0.56	11.39	6.38	6.88	8	20	1561.46
0.302	1.065	0.0	0.0	0.32	0.56	11.45	6.41	6.73	9	20	1561.55
0.214	0.706	0.0	0.0	0.15	0.56	11.53	6.46	6.61	11	20	1561.63
0.0	0.0	0.0	0.0	0.00	0.56	11.79	6.61	6.61	13	20	1561.72
0.0	0.0	0.0	0.0	0.00	0.56	11.76	6.58	6.58	11	20	1561.73
0.566	2.144	0.0	0.0	1.21	0.505	10.85	5.48	6.69	4	20	1561.87
0.524	1.979	0.0	0.0	1.04	0.505	10.88	5.49	6.53	4	20	1561.97
0.478	1.791	0.0	0.0	0.86	0.505	10.92	5.51	6.37	5	20	1562.04
0.37	1.342	0.0	0.0	0.50	0.505	11.02	5.56	6.06	5	20	1562.11
0.428	1.585	0.0	0.0	0.68	0.505	10.96	5.54	6.21	5	20	1562.12

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I_F	V_F	I_B	V_B	P_{elR}	I_L	V_L	P_L	P_{tot}	P_{opt}	T	freq
[A]	[V]	[A]	[V]	[W]	[A]	[V]	[W]	[W]	[mW]	[C]	[cm ⁻¹]
0.302	1.065	0.0	0.0	0.32	0.505	11.07	5.59	5.91	7	20	1562.28
0.214	0.706	0.0	0.0	0.15	0.505	11.15	5.63	5.78	8	20	1562.35
0.0	0.0	0.0	0.0	0.00	0.505	11.44	5.78	5.78	8	20	1562.44
0.0	0.0	0.0	0.0	0.00	0.505	11.29	5.70	5.70	7	20	1562.45
0.37	1.342	0.0	0.0	0.50	0.45	10.63	4.78	5.28	0	20	1562.87
0.302	1.065	0.0	0.0	0.32	0.45	10.69	4.81	5.13	1	20	1562.97
0.214	0.706	0.0	0.0	0.15	0.45	10.77	4.85	5.00	1	20	1563.02
0.0	0.0	0.0	0.0	0.00	0.45	10.97	4.94	4.94	1	20	1563.10
0.0	0.0	0.0	0.0	0.00	0.45	10.91	4.91	4.91	1	20	1563.12

Table 3:

Details of cluster #1-Back

I_F	V_F	I_B	V_B	P_{elR}	I_L	V_L	P_L	P_{tot}	P_{opt}	T	freq
[A]	[V]	[A]	[V]	[W]	[A]	[V]	[W]	[W]	[mW]	[C]	[cm ⁻¹]
0.0	0.0	0.8	3.055	2.44	0.599	11.65	6.98	9.42	35	0	1580.04
0.0	0.0	0.771	2.964	2.29	0.599	11.68	6.99	9.28	42	0	1580.11
0.0	0.0	0.741	2.859	2.12	0.599	11.71	7.01	9.13	41	0	1580.19
0.0	0.0	0.709	2.673	1.90	0.599	11.73	7.03	8.92	40	0	1580.26
0.0	0.0	0.676	2.541	1.72	0.599	11.75	7.04	8.76	44	0	1580.32
0.0	0.0	0.641	2.434	1.56	0.599	11.78	7.06	8.62	46	0	1580.39
0.0	0.0	0.605	2.311	1.40	0.599	11.82	7.08	8.48	45	0	1580.45
0.0	0.0	0.566	2.168	1.23	0.599	11.86	7.11	8.33	47	0	1580.52
0.0	0.0	0.524	2.033	1.07	0.599	11.91	7.13	8.20	53	0	1580.58
0.0	0.0	0.8	3.055	2.44	0.528	11.16	5.89	8.34	23	0	1581.01
0.0	0.0	0.771	2.964	2.29	0.528	11.19	5.91	8.20	25	0	1581.08
0.0	0.0	0.741	2.859	2.12	0.528	11.22	5.93	8.04	25	0	1581.16
0.0	0.0	0.709	2.673	1.90	0.528	11.24	5.94	7.83	26	0	1581.23
0.0	0.0	0.676	2.541	1.72	0.528	11.27	5.95	7.67	28	0	1581.29
0.0	0.0	0.641	2.434	1.56	0.528	11.30	5.96	7.52	27	0	1581.36
0.0	0.0	0.605	2.311	1.40	0.528	11.33	5.98	7.38	28	0	1581.42
0.0	0.0	0.566	2.168	1.23	0.528	11.38	6.01	7.23	32	0	1581.49
0.0	0.0	0.524	2.033	1.07	0.528	11.42	6.03	7.09	34	0	1581.55
0.0	0.0	0.8	3.055	2.44	0.456	10.67	4.87	7.31	6	0	1581.90
0.0	0.0	0.771	2.964	2.29	0.456	10.70	4.88	7.16	8	0	1581.97
0.0	0.0	0.741	2.859	2.12	0.456	10.73	4.89	7.01	9	0	1582.04
0.0	0.0	0.709	2.673	1.90	0.456	10.75	4.90	6.80	9	0	1582.12
0.0	0.0	0.676	2.541	1.72	0.456	10.77	4.91	6.63	10	0	1582.18
0.0	0.0	0.641	2.434	1.56	0.456	10.80	4.93	6.49	11	0	1582.25
0.0	0.0	0.605	2.311	1.40	0.456	10.84	4.94	6.34	11	0	1582.31
0.0	0.0	0.566	2.168	1.23	0.456	10.88	4.96	6.19	11	0	1582.38
0.0	0.0	0.524	2.033	1.07	0.456	10.92	4.98	6.04	13	0	1582.44
0.0	0.0	0.478	1.926	0.92	0.456	10.96	5.00	5.92	12	0	1582.50
0.0	0.0	0.8	3.185	2.55	0.609	11.51	7.01	9.56	23	10	1578.70
0.0	0.0	0.771	3.056	2.36	0.609	11.53	7.02	9.38	27	10	1578.79
0.0	0.0	0.741	2.913	2.16	0.609	11.56	7.04	9.20	30	10	1578.88
0.0	0.0	0.709	2.774	1.97	0.609	11.59	7.06	9.03	33	10	1578.95
0.0	0.0	0.676	2.733	1.85	0.609	11.62	7.08	8.92	32	10	1579.03
0.0	0.0	0.641	2.517	1.61	0.609	11.68	7.11	8.72	32	10	1579.10
0.0	0.0	0.605	2.366	1.43	0.609	11.70	7.12	8.55	35	10	1579.17
0.0	0.0	0.566	2.22	1.26	0.609	11.73	7.14	8.40	34	10	1579.24
0.0	0.0	0.524	2.031	1.06	0.609	11.78	7.17	8.24	33	10	1579.31
0.0	0.0	0.8	3.185	2.55	0.548	11.09	6.08	8.62	13	10	1579.57
0.0	0.0	0.771	3.056	2.36	0.548	11.11	6.09	8.45	17	10	1579.66
0.0	0.0	0.741	2.913	2.16	0.548	11.14	6.10	8.26	18	10	1579.74
0.0	0.0	0.709	2.774	1.97	0.548	11.17	6.12	8.09	19	10	1579.82
0.0	0.0	0.676	2.733	1.85	0.548	11.20	6.14	7.99	21	10	1579.89
0.0	0.0	0.641	2.517	1.61	0.548	11.25	6.16	7.78	21	10	1579.96
0.0	0.0	0.605	2.366	1.43	0.548	11.28	6.18	7.61	21	10	1580.03
0.0	0.0	0.566	2.22	1.26	0.548	11.31	6.20	7.46	23	10	1580.10
0.0	0.0	0.524	2.031	1.06	0.548	11.36	6.22	7.29	23	10	1580.17

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I_F	V_F	I_B	V_B	P_{elR}	I_L	V_L	P_L	P_{tot}	P_{opt}	T	freq
[A]	[V]	[A]	[V]	[W]	[A]	[V]	[W]	[W]	[mW]	[C]	[cm ⁻¹]
0.0	0.0	0.478	1.839	0.88	0.548	11.41	6.25	7.13	23	10	1580.24
0.0	0.0	0.8	3.185	2.55	0.486	10.66	5.18	7.73	1	10	1580.37
0.0	0.0	0.771	3.056	2.36	0.486	10.69	5.19	7.55	3	10	1580.47
0.0	0.0	0.741	2.913	2.16	0.486	10.72	5.21	7.37	5	10	1580.54
0.0	0.0	0.709	2.774	1.97	0.486	10.75	5.22	7.19	7	10	1580.62
0.0	0.0	0.676	2.733	1.85	0.486	10.78	5.24	7.08	7	10	1580.70
0.0	0.0	0.641	2.517	1.61	0.486	10.82	5.26	6.87	8	10	1580.77
0.0	0.0	0.605	2.366	1.43	0.486	10.86	5.28	6.71	9	10	1580.84
0.0	0.0	0.566	2.22	1.26	0.486	10.89	5.29	6.55	9	10	1580.91
0.0	0.0	0.524	2.031	1.06	0.486	10.93	5.31	6.38	9	10	1580.98
0.0	0.0	0.478	1.839	0.88	0.486	10.98	5.34	6.21	10	10	1581.04
0.0	0.0	0.771	3.062	2.36	0.615	11.43	7.03	9.39	7	20	1577.50
0.0	0.0	0.741	2.93	2.17	0.615	11.45	7.04	9.21	5	20	1577.60
0.0	0.0	0.709	2.798	1.98	0.615	11.48	7.06	9.04	9	20	1577.69
0.0	0.0	0.676	2.672	1.81	0.615	11.51	7.08	8.88	14	20	1577.77
0.0	0.0	0.641	2.521	1.62	0.615	11.54	7.09	8.71	16	20	1577.85
0.0	0.0	0.605	2.369	1.43	0.615	11.57	7.12	8.55	17	20	1577.92
0.0	0.0	0.566	2.197	1.24	0.615	11.61	7.14	8.38	19	20	1578.00
0.0	0.0	0.524	2.019	1.06	0.615	11.65	7.16	8.22	19	20	1578.07
0.0	0.0	0.478	1.825	0.87	0.615	11.70	7.19	8.07	19	20	1578.15
0.0	0.0	0.771	3.062	2.36	0.56	11.06	6.19	8.55	4	20	1578.30
0.0	0.0	0.741	2.93	2.17	0.56	11.08	6.21	8.38	7	20	1578.40
0.0	0.0	0.709	2.798	1.98	0.56	11.11	6.22	8.20	10	20	1578.48
0.0	0.0	0.676	2.672	1.81	0.56	11.13	6.24	8.04	10	20	1578.57
0.0	0.0	0.641	2.521	1.62	0.56	11.16	6.25	7.87	11	20	1578.65
0.0	0.0	0.605	2.369	1.43	0.56	11.20	6.27	7.71	12	20	1578.72
0.0	0.0	0.566	2.197	1.24	0.56	11.24	6.29	7.54	12	20	1578.80
0.0	0.0	0.524	2.019	1.06	0.56	11.28	6.31	7.37	12	20	1578.87
0.0	0.0	0.478	1.825	0.87	0.56	11.32	6.34	7.21	14	20	1578.94
0.0	0.0	0.709	2.798	1.98	0.505	10.74	5.42	7.41	0	20	1579.23
0.0	0.0	0.676	2.672	1.81	0.505	10.76	5.44	7.24	2	20	1579.31
0.0	0.0	0.641	2.521	1.62	0.505	10.79	5.45	7.07	3	20	1579.39
0.0	0.0	0.605	2.369	1.43	0.505	10.83	5.47	6.90	3	20	1579.46
0.0	0.0	0.566	2.197	1.24	0.505	10.86	5.49	6.73	3	20	1579.54
0.0	0.0	0.524	2.019	1.06	0.505	10.90	5.51	6.56	4	20	1579.61
0.0	0.0	0.478	1.825	0.87	0.505	10.95	5.53	6.40	3	20	1579.68

Table 4:

Details of cluster #2-Front

I_F	V_F	I_B	V_B	P_{elR}	I_L	V_L	P_L	P_{tot}	P_{opt}	T	freq
[A]	[V]	[A]	[V]	[W]	[A]	[V]	[W]	[W]	[mW]	[C]	[cm ⁻¹]
0.709	2.681	0.0	0.0	1.90	0.599	11.74	7.03	8.94	37	0	1583.02
0.676	2.54	0.0	0.0	1.72	0.599	11.78	7.05	8.77	40	0	1583.08
0.641	2.395	0.0	0.0	1.54	0.599	11.79	7.06	8.60	45	0	1583.16
0.771	2.891	0.0	0.0	2.23	0.528	11.20	5.91	8.14	22	0	1583.84
0.741	2.72	0.0	0.0	2.02	0.528	11.20	5.92	7.93	22	0	1583.93
0.709	2.681	0.0	0.0	1.90	0.528	11.24	5.93	7.84	23	0	1584.01
0.676	2.54	0.0	0.0	1.72	0.528	11.28	5.95	7.67	28	0	1584.08
0.641	2.395	0.0	0.0	1.54	0.528	11.30	5.97	7.50	30	0	1584.15
0.8	2.987	0.0	0.0	2.39	0.456	10.62	4.84	7.23	2	0	1584.68
0.771	2.891	0.0	0.0	2.23	0.456	10.67	4.87	7.10	5	0	1584.76
0.741	2.72	0.0	0.0	2.02	0.456	10.69	4.88	6.89	7	0	1584.83
0.709	2.681	0.0	0.0	1.90	0.456	10.73	4.89	6.80	8	0	1584.91
0.676	2.54	0.0	0.0	1.72	0.456	10.77	4.91	6.63	10	0	1584.98
0.709	2.763	0.0	0.0	1.96	0.609	11.59	7.06	9.02	30	10	1581.72
0.676	2.659	0.0	0.0	1.80	0.609	11.61	7.07	8.87	30	10	1581.80
0.641	2.511	0.0	0.0	1.61	0.609	11.65	7.10	8.71	29	10	1581.88
0.741	2.864	0.0	0.0	2.12	0.548	11.11	6.09	8.21	15	10	1582.51
0.709	2.763	0.0	0.0	1.96	0.548	11.14	6.11	8.06	17	10	1582.60
0.676	2.659	0.0	0.0	1.80	0.548	11.18	6.12	7.92	20	10	1582.68
0.641	2.511	0.0	0.0	1.61	0.548	11.22	6.15	7.76	20	10	1582.76
0.771	2.998	0.0	0.0	2.31	0.486	10.67	5.19	7.50	0	10	1583.26
0.741	2.864	0.0	0.0	2.12	0.486	10.65	5.17	7.30	4	10	1583.34
0.709	2.763	0.0	0.0	1.96	0.486	10.69	5.20	7.16	6	10	1583.42
0.676	2.659	0.0	0.0	1.80	0.486	10.73	5.22	7.01	7	10	1583.50
0.641	2.511	0.0	0.0	1.61	0.486	10.78	5.24	6.85	8	10	1583.57
0.709	2.728	0.0	0.0	1.93	0.615	11.50	7.07	9.00	13	20	1580.44
0.676	2.597	0.0	0.0	1.76	0.615	11.51	7.08	8.84	17	20	1580.54
0.641	2.457	0.0	0.0	1.57	0.615	11.54	7.10	8.67	17	20	1580.63
0.605	2.313	0.0	0.0	1.40	0.615	11.57	7.12	8.51	17	20	1580.71
0.709	2.728	0.0	0.0	1.93	0.56	11.11	6.22	8.16	7	20	1581.26
0.676	2.597	0.0	0.0	1.76	0.56	11.13	6.24	7.99	9	20	1581.35
0.641	2.457	0.0	0.0	1.57	0.56	11.16	6.25	7.83	10	20	1581.44
0.605	2.313	0.0	0.0	1.40	0.56	11.20	6.27	7.67	12	20	1581.52
0.676	2.597	0.0	0.0	1.76	0.505	10.76	5.43	7.19	1	20	1582.10
0.641	2.457	0.0	0.0	1.57	0.505	10.79	5.45	7.02	2	20	1582.19
0.605	2.313	0.0	0.0	1.40	0.505	10.82	5.46	6.86	3	20	1582.26

Table 5: