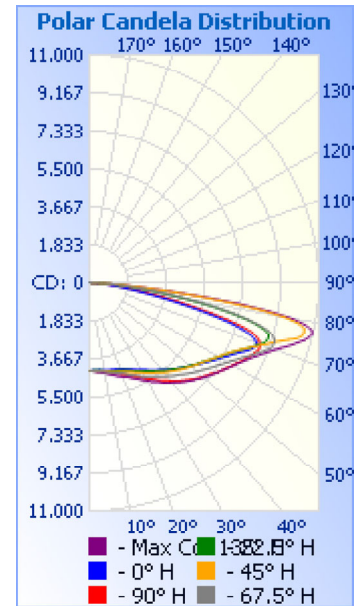


Photometrics Pro

Luminaire Photometric Report

Filename: Shoebox SB7 300W T5 - 480V
Manufacturer: SARIN Energy Inc
Luminaire: SES-SB7-4000-300-T5-480V
Lamp Output: 1 lamp, rated Lumens/lamp: 37947.9
Max Candela: 10,958.5 at Horizontal: 135°, Vertical: 77°
Input Wattage: 299.51
Luminous Opening: Point
Photometry : Type C
Nema Type: 7 X 7



Roadway Summary

Cutoff Classification:	NONCUTOFF
Distribution:	Type VS
Max Cd, 90 Deg Vert:	72.3
Max Cd, 80 to <90 Deg:	10,107.1
	Lumens % Lamp
Downward Street Side:	18,239.7 48.1%
Downward House Side:	19,566.4 51.6%
Downward Total:	37,806.1 99.6%
Upward Street Side:	70.1 0.2%
Upward House Side:	71.7 0.2%
Upward Total:	141.8 0.4%
Total Lumens:	37,947.9 100%

Flood Summary

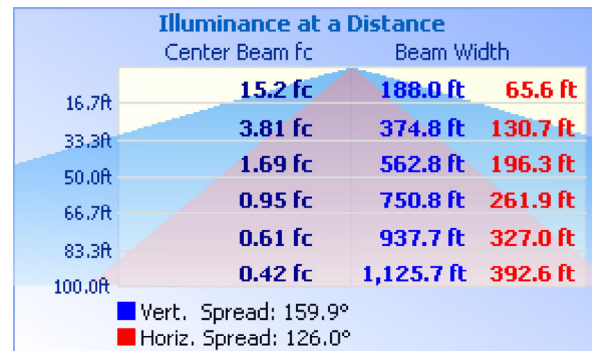
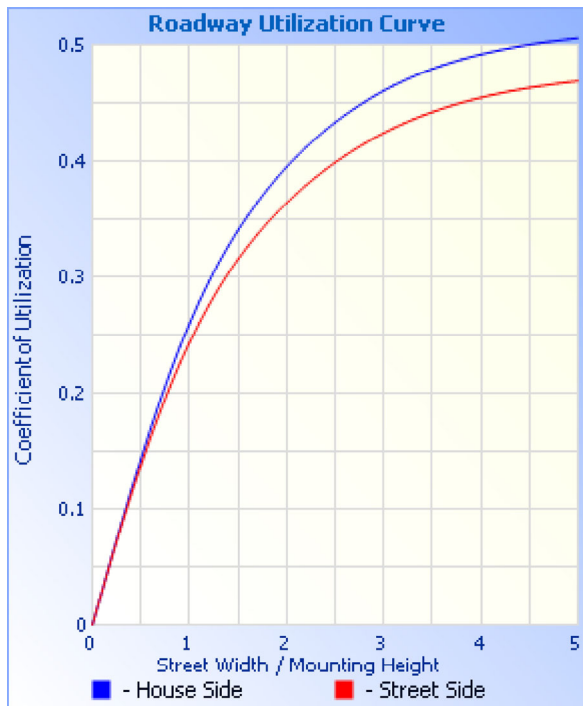
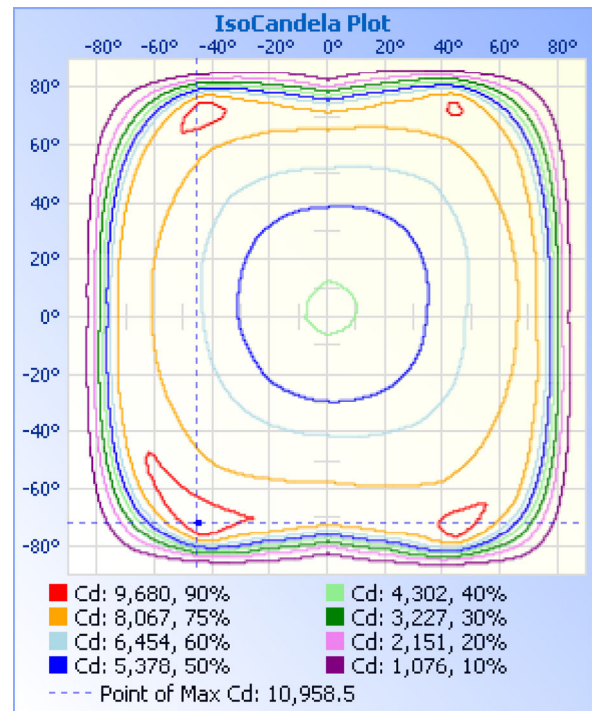
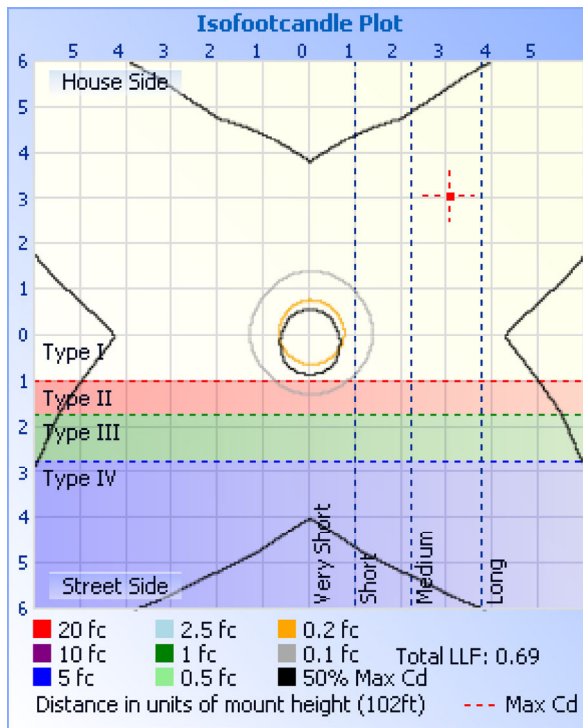
	Efficiency	Lumens	Horizontal Spread	Vertical Spread
Field (10%):	99.1%	37,589.3	154.1	169.9
Beam (50%):	80.7%	30,627.8	126	159.9
Total:	99.9%	37,909.2		

Zonal Lumen Summary

Zone	Lumens	% Lamp	% Luminaire
0-30	3,939.9	10.4%	10.4%
0-40	7,403.6	19.5%	19.5%
0-60	18,630.8	49.1%	49.1%
60-90	19,176.5	50.5%	50.5%
70-100	11,088.2	29.2%	29.2%
90-120	108.4	0.3%	0.3%
0-90	37,807.3	99.6%	99.6%
90-180	141.8	0.4%	0.4%
0-180	37,949.0	100%	100%

Lumens Per Zone

Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	409.1	1.1%	90-100	47.3	0.1%
10-20	1,271.6	3.4%	100-110	35.2	0.1%
20-30	2,259.3	6.0%	110-120	25.9	0.1%
30-40	3,463.7	9.1%	120-130	14.2	0%
40-50	4,857.2	12.8%	130-140	8.2	0%
50-60	6,370.0	16.8%	140-150	5.3	0%
60-70	8,135.5	21.4%	150-160	3.3	0%
70-80	8,636.1	22.8%	160-170	1.9	0%
80-90	2,404.8	6.3%	170-180	0.5	0%



Coefficients Of Utilization - Zonal Cavity Method

Effective Floor Cavity Reflectance: 20%

RCC %:	80				70				50			30			10			0
RW %:	70	50	30	0	70	50	30	0	50	30	20	50	30	20	50	30	20	0
RCR: 0	1.19	1.19	1.19	1.19	1.16	1.16	1.16	1.00	1.11	1.11	1.11	1.06	1.06	1.06	1.02	1.02	1.02	1.00
1	1.03	.96	.89	.83	1.00	.93	.87	.73	.89	.84	.79	.84	.80	.77	.81	.77	.74	.72
2	.90	.78	.68	.60	.87	.76	.67	.54	.72	.64	.58	.68	.62	.56	.65	.60	.55	.52
3	.79	.65	.54	.45	.76	.63	.53	.41	.60	.51	.44	.57	.49	.43	.54	.47	.42	.39

4	.71	.55	.44	.35	.68	.54	.43	.33	.51	.42	.34	.48	.40	.34	.46	.39	.33	.30
5	.64	.48	.37	.29	.62	.47	.36	.27	.45	.35	.28	.42	.34	.28	.40	.33	.27	.24
6	.59	.42	.32	.24	.56	.41	.31	.22	.39	.30	.23	.37	.29	.23	.36	.28	.23	.20
7	.54	.38	.27	.20	.52	.37	.27	.19	.35	.26	.20	.34	.26	.19	.32	.25	.19	.17
8	.50	.34	.24	.17	.48	.33	.24	.17	.32	.23	.17	.30	.23	.17	.29	.22	.17	.14
9	.46	.31	.22	.15	.45	.30	.21	.15	.29	.21	.15	.28	.20	.15	.27	.20	.15	.12
10	.43	.28	.19	.13	.42	.28	.19	.13	.27	.19	.13	.26	.18	.13	.25	.18	.13	.11

Candela Table - Type C

	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5	360
0	4230	4230	4230	4230	4230	4230	4230	4230	4230	4230	4230	4230	4230	4230	4230	4230	4230
1	4218	4228	4222	4233	4240	4240	4235	4235	4226	4233	4233	4240	4230	4227	4226	4223	4218
2	4211	4217	4228	4238	4244	4237	4240	4249	4235	4241	4245	4241	4221	4225	4224	4220	4211
3	4214	4218	4228	4253	4246	4255	4253	4260	4253	4256	4252	4247	4230	4227	4213	4216	4214
4	4217	4212	4229	4259	4254	4262	4271	4274	4267	4269	4264	4249	4234	4231	4222	4215	4217
5	4214	4221	4240	4265	4267	4277	4289	4292	4285	4293	4276	4269	4245	4235	4225	4217	4214
6	4218	4232	4244	4280	4270	4298	4303	4312	4314	4312	4298	4276	4257	4236	4225	4226	4218
7	4228	4242	4261	4292	4288	4307	4324	4339	4328	4333	4310	4287	4267	4246	4239	4223	4228
8	4242	4256	4275	4307	4303	4336	4357	4365	4357	4350	4335	4311	4286	4260	4253	4245	4242
9	4255	4272	4294	4321	4325	4359	4388	4392	4387	4376	4356	4327	4306	4262	4257	4252	4255
10	4264	4294	4309	4338	4346	4384	4404	4422	4419	4416	4382	4348	4316	4284	4267	4279	4264
11	4285	4313	4325	4364	4372	4411	4442	4461	4452	4447	4409	4369	4342	4303	4289	4288	4285
12	4294	4331	4355	4389	4388	4440	4478	4497	4484	4480	4437	4395	4358	4326	4312	4309	4294
13	4304	4347	4384	4412	4414	4477	4516	4530	4512	4504	4463	4415	4380	4345	4334	4322	4304
14	4313	4366	4413	4436	4441	4505	4556	4561	4541	4535	4504	4437	4389	4361	4356	4336	4313
15	4328	4374	4432	4463	4463	4534	4599	4586	4566	4563	4543	4461	4414	4384	4376	4346	4328
16	4339	4397	4463	4489	4495	4584	4632	4620	4600	4594	4570	4501	4442	4405	4401	4358	4339
17	4355	4410	4487	4519	4536	4630	4685	4648	4624	4630	4606	4514	4479	4429	4421	4364	4355
18	4371	4421	4513	4566	4570	4659	4712	4694	4669	4661	4639	4559	4505	4448	4442	4387	4371
19	4387	4443	4533	4585	4618	4707	4757	4735	4711	4699	4673	4601	4542	4480	4464	4404	4387
20	4417	4468	4553	4624	4665	4763	4802	4789	4767	4739	4705	4644	4577	4521	4476	4422	4417
21	4437	4493	4579	4672	4714	4820	4841	4844	4811	4788	4737	4684	4608	4561	4501	4454	4437
22	4476	4529	4615	4727	4765	4876	4882	4906	4873	4838	4778	4739	4656	4602	4516	4474	4476
23	4509	4568	4645	4783	4820	4942	4939	4969	4931	4909	4822	4797	4703	4643	4535	4507	4509
24	4553	4604	4683	4844	4879	4997	5000	5036	4996	4960	4865	4834	4744	4686	4574	4548	4553
25	4599	4655	4721	4897	4938	5069	5059	5096	5070	5025	4916	4890	4789	4724	4604	4582	4599
26	4640	4691	4770	4949	4994	5145	5131	5167	5138	5097	4981	4947	4841	4778	4639	4618	4640
27	4686	4744	4823	5003	5062	5216	5200	5245	5208	5163	5040	5001	4899	4821	4676	4661	4686
28	4736	4793	4867	5067	5129	5290	5274	5325	5294	5233	5105	5057	4964	4864	4717	4700	4736
29	4793	4847	4917	5134	5203	5366	5347	5408	5372	5306	5178	5115	5017	4924	4767	4740	4793
30	4839	4892	4974	5200	5286	5433	5424	5483	5452	5386	5242	5175	5089	4964	4820	4793	4839
31	4882	4933	5037	5255	5361	5503	5508	5568	5540	5466	5314	5229	5156	5013	4869	4842	4882
32	4936	4984	5094	5308	5445	5585	5604	5649	5637	5541	5385	5288	5222	5067	4920	4887	4936
33	4996	5046	5154	5360	5519	5659	5673	5735	5723	5617	5457	5352	5296	5127	4965	4940	4996
34	5065	5108	5207	5424	5607	5735	5746	5832	5813	5701	5530	5413	5367	5192	5024	4992	5065
35	5127	5163	5276	5499	5712	5805	5822	5921	5916	5774	5608	5481	5444	5246	5084	5060	5127
36	5198	5229	5337	5569	5794	5888	5931	5999	5999	5847	5686	5550	5507	5296	5136	5108	5198
37	5266	5289	5397	5636	5878	5973	6014	6079	6088	5934	5761	5614	5594	5353	5198	5163	5266
38	5324	5351	5467	5707	5953	6052	6097	6171	6181	6013	5836	5686	5673	5417	5252	5234	5324
39	5388	5423	5530	5780	6052	6147	6180	6270	6277	6098	5916	5757	5763	5475	5307	5294	5388
40	5462	5488	5606	5846	6160	6216	6257	6355	6381	6203	5978	5827	5857	5537	5371	5369	5462
41	5533	5563	5667	5943	6265	6309	6335	6448	6466	6266	6047	5899	5935	5589	5426	5442	5533
42	5621	5633	5735	6013	6336	6407	6434	6541	6574	6370	6127	5983	6009	5665	5499	5497	5621
43	5702	5701	5802	6085	6431	6493	6520	6641	6653	6440	6198	6050	6088	5720	5549	5558	5702
44	5768	5765	5869	6139	6526	6578	6603	6730	6759	6549	6284	6128	6167	5787	5603	5618	5768
45	5841	5855	5934	6223	6594	6658	6683	6819	6849	6638	6351	6202	6241	5855	5668	5708	5841
46	5922	5925	6010	6320	6696	6746	6761	6903	6941	6748	6415	6287	6315	5941	5726	5785	5922

47	6005	5990	6079	6404	6782	6831	6844	7001	7045	6811	6478	6364	6393	6011	5784	5860	6005
48	6080	6079	6144	6487	6874	6918	6913	7094	7153	6902	6547	6434	6479	6099	5850	5926	6080
49	6173	6150	6210	6580	6961	7010	7001	7180	7258	6977	6662	6513	6534	6160	5902	6008	6173
50	6250	6225	6290	6646	7043	7093	7085	7279	7358	7064	6718	6587	6614	6233	5977	6084	6250
51	6331	6315	6357	6742	7114	7177	7167	7369	7456	7174	6787	6674	6690	6303	6045	6163	6331
52	6422	6396	6429	6817	7195	7270	7250	7460	7564	7274	6863	6749	6782	6385	6116	6237	6422
53	6507	6477	6503	6922	7268	7362	7337	7566	7651	7360	6929	6826	6866	6464	6173	6325	6507
54	6609	6562	6577	7010	7383	7447	7414	7662	7744	7438	7010	6903	6946	6544	6246	6411	6609
55	6707	6631	6646	7114	7487	7547	7514	7751	7846	7532	7057	7000	7025	6618	6297	6494	6707
56	6807	6747	6732	7207	7573	7640	7569	7844	7951	7629	7169	7105	7101	6711	6374	6586	6807
57	6914	6829	6822	7303	7648	7738	7668	7939	8043	7737	7258	7186	7191	6815	6466	6667	6914
58	7020	6936	6923	7420	7735	7843	7772	8029	8177	7817	7330	7289	7278	6909	6551	6767	7020
59	7148	7021	7020	7533	7838	7959	7860	8146	8257	7956	7417	7382	7416	7003	6627	6845	7148
60	7238	7140	7120	7658	7939	8077	7967	8251	8355	8027	7507	7485	7474	7109	6700	6947	7238
61	7366	7254	7227	7760	8012	8204	8055	8351	8482	8141	7585	7600	7568	7202	6818	7060	7366
62	7511	7368	7330	7915	8131	8333	8182	8453	8585	8219	7678	7725	7676	7336	6894	7164	7511
63	7637	7490	7470	8048	8234	8483	8299	8584	8710	8352	7803	7840	7755	7440	7037	7294	7637
64	7778	7617	7599	8198	8327	8625	8420	8688	8815	8456	7906	7982	7861	7590	7125	7423	7778
65	7934	7782	7750	8365	8443	8783	8556	8846	8932	8588	8034	8125	7995	7738	7257	7550	7934
66	8115	7954	7913	8548	8535	8919	8716	8959	9066	8728	8148	8266	8049	7892	7386	7699	8115
67	8296	8102	8112	8715	8607	9103	8881	9100	9112	8833	8279	8431	8174	8054	7526	7878	8296
68	8442	8311	8305	8890	8699	9314	9060	9239	9134	8964	8452	8594	8256	8221	7714	8065	8442
69	8523	8488	8525	9049	8735	9470	9248	9375	9186	9063	8612	8793	8320	8377	7887	8237	8523
70	8543	8675	8755	9224	8710	9612	9435	9500	9042	9193	8799	8963	8304	8562	8111	8414	8543
71	8399	8862	9019	9291	8608	9741	9662	9599	8710	9305	8968	9124	8255	8767	8356	8609	8399
72	8125	8943	9260	9328	8436	9826	9927	9618	8273	9351	9205	9284	8138	8863	8572	8769	8125
73	7698	8975	9581	9270	8143	9827	10178	9515	7627	9310	9411	9401	7938	8881	8848	8831	7698
74	7094	8932	9928	9145	7615	9727	10407	9234	6775	9127	9672	9401	7557	8878	9165	8788	7094
75	6282	8676	10307	8878	6868	9516	10654	8767	5818	8746	9928	9398	6890	8821	9479	8643	6282
76	5441	8264	10504	8389	6022	9198	10840	8140	4928	8227	10121	9344	6161	8628	9702	8366	5441
77	4559	7678	10559	7826	5139	8756	10958	7335	4017	7520	10314	9101	5320	8288	9925	7854	4559
78	3758	6892	10529	7070	4317	8085	10899	6333	3219	6516	10404	8705	4500	7797	9999	7159	3758
79	3006	6034	10187	6289	3568	7328	10521	5264	2539	5522	10372	8174	3708	7173	9962	6333	3006
80	2405	5120	9505	5305	2816	6466	9867	4360	1973	4640	10107	7523	3008	6389	9781	5475	2405
81	1853	4156	8314	4421	2239	5419	8725	3481	1517	3673	9552	6593	2323	5449	9025	4508	1853
82	1412	3367	6661	3544	1731	4569	7225	2773	1180	2988	8420	5754	1792	4606	7764	3704	1412
83	1077	2675	5042	2815	1315	3606	5446	2092	827	2270	7034	4657	1344	3707	6294	2924	1077
84	810	2068	3640	2139	967	2792	3869	1571	604	1689	5178	3670	964	2939	4751	2340	810
85	570	1594	2367	1525	674	2094	2436	1135	418	1235	3502	2822	683	2209	3447	1783	570
86	383	1086	1383	1018	461	1378	1434	751	267	801	2190	2005	443	1602	2168	1320	383
87	229	623	606	548	295	830	684	402	165	470	1189	1301	279	981	1222	849	229
88	112	215	144	145	167	356	226	216	101	240	513	738	138	529	534	424	112
89	60	57	67	55	80	60	77	57	55	120	170	333	68	155	106	81	60
90	55	46	54	50	59	59	68	54	49	43	66	72	52	46	52	58	55
91	51	43	59	48	57	54	51	48	50	42	51	59	48	44	56	51	51
92	44	29	51	37	55	51	49	51	46	41	59	51	40	42	47	51	44
93	41	40	44	45	44	51	43	43	44	48	62	51	42	43	42	45	41
94	43	39	43	37	50	29	42	45	47	44	59	46	47	36	43	43	43
95	43	27	41	37	46	38	46	45	39	45	48	51	35	35	48	39	43

96	36	36	42	35	49	34	52	47	44	33	50	45	40	35	36	41	36
97	44	28	36	32	51	40	49	49	39	35	46	41	44	35	37	39	44
98	40	33	40	29	49	31	49	52	47	29	49	47	36	31	31	43	40
99	45	33	41	30	50	30	41	50	33	34	42	44	37	32	29	42	45
100	39	24	39	31	37	32	42	52	42	36	41	42	40	37	24	32	39
101	37	20	33	32	40	36	42	45	33	35	48	39	36	26	40	39	37
102	35	30	37	27	43	34	29	44	34	36	38	45	35	27	34	42	35
103	38	20	38	33	43	33	41	39	35	34	41	36	35	31	38	30	38
104	39	22	38	31	47	36	28	42	32	23	36	33	31	27	29	41	39
105	40	26	36	33	44	29	33	39	35	24	33	42	31	31	30	35	40
106	42	28	29	28	44	32	35	31	39	28	29	32	34	23	23	34	42
107	40	27	25	26	32	34	34	34	40	22	28	34	33	24	29	31	40
108	41	26	34	25	40	30	34	37	38	15	25	31	40	26	26	41	41
109	46	21	26	29	40	28	26	33	43	30	35	26	20	15	24	39	46
110	51	19	26	26	42	25	28	34	38	22	34	30	28	22	21	31	51
111	59	24	28	20	37	23	24	35	54	7	33	25	28	25	25	30	59
112	56	16	20	25	37	29	26	32	60	24	28	29	25	19	25	33	56
113	66	14	21	22	29	20	25	29	75	19	28	25	26	20	23	32	66
114	70	15	17	16	33	20	20	36	69	20	21	27	22	20	22	28	70
115	64	18	21	12	33	21	10	22	66	18	14	22	27	12	21	27	64
116	54	23	17	7	33	21	22	31	71	11	20	26	18	13	18	22	54
117	52	14	16	14	26	17	16	23	62	8	20	16	18	19	21	26	52
118	48	15	9	7	32	15	17	27	58	9	20	17	20	10	20	22	48
119	42	15	7	11	29	20	16	28	55	12	17	17	29	21	21	24	42
120	25	10	15	8	27	14	11	21	44	7	9	18	20	19	15	23	25
121	40	17	8	10	22	16	5	14	37	9	12	13	13	20	8	22	40
122	41	10	14	11	20	9	20	24	39	14	10	11	20	12	14	17	41
123	35	11	18	9	18	12	14	13	31	12	15	6	19	21	13	10	35
124	37	16	11	12	16	9	14	20	32	10	8	5	22	12	14	19	37
125	33	12	18	14	25	7	10	18	32	0	17	14	11	13	19	23	33
126	28	14	14	8	18	8	9	20	29	10	9	15	20	12	13	22	28
127	37	7	11	13	18	4	7	18	27	10	14	11	27	6	18	19	37
128	28	7	17	6	26	7	10	19	30	10	15	11	20	12	13	16	28
129	35	13	9	3	15	4	4	15	27	4	10	14	10	13	13	16	35
130	28	9	13	6	21	3	11	13	20	7	6	10	12	15	17	22	28
131	23	7	8	8	22	5	3	20	21	5	10	9	18	7	10	10	23
132	28	2	12	0	11	0	7	12	23	8	8	9	16	4	13	17	28
133	30	7	6	4	21	3	6	9	24	5	4	8	11	8	10	22	30
134	29	5	12	6	10	5	7	10	17	1	7	6	13	6	10	16	29
135	23	7	12	10	20	0	5	11	16	4	1	6	7	17	12	15	23
136	30	5	4	8	11	7	3	12	18	4	2	5	12	12	8	16	30
137	30	7	5	6	19	0	7	11	22	0	6	8	12	10	18	12	30
138	30	10	0	5	14	4	8	10	21	0	3	5	10	11	9	18	30
139	26	9	0	11	13	0	5	11	22	5	8	7	6	6	11	15	26
140	29	7	11	1	13	0	1	8	18	4	6	6	6	10	11	13	29
141	25	10	12	4	14	5	1	13	12	9	4	10	15	6	11	17	25
142	24	0	5	5	12	2	1	18	17	4	0	1	10	4	12	14	24
143	32	9	9	2	16	1	8	10	26	4	3	0	17	4	6	12	32
144	20	7	9	7	14	3	5	7	22	3	2	7	7	8	6	15	20

145	21	0	3	8	17	1	5	10	21	5	7	0	0	8	10	14	21
146	15	6	12	10	10	1	3	15	13	7	0	8	4	2	4	8	15
147	25	5	7	0	9	1	3	17	16	2	6	0	0	7	6	10	25
148	29	8	4	4	11	0	5	20	15	0	0	2	11	4	10	21	29
149	15	7	4	10	12	2	6	11	16	0	5	4	6	6	1	12	15
150	19	4	6	7	12	0	4	1	12	5	6	4	10	6	5	13	19
151	25	1	9	0	12	0	8	9	16	7	4	8	12	0	2	15	25
152	16	5	3	3	15	1	5	10	19	6	0	6	12	4	4	13	16
153	19	4	8	1	11	8	0	14	9	1	4	5	12	1	2	14	19
154	18	1	14	11	16	0	0	10	19	1	5	6	11	7	0	10	18
155	16	1	1	10	7	0	7	10	14	1	3	8	4	0	9	13	16
156	22	3	7	6	10	0	6	10	14	2	0	5	8	0	4	13	22
157	24	6	3	0	16	1	3	10	6	1	0	0	3	8	7	13	24
158	17	4	5	4	8	0	7	10	13	0	0	0	3	0	10	10	17
159	23	5	14	2	12	4	0	12	12	0	5	0	12	1	0	10	23
160	20	6	6	7	14	1	2	12	11	3	2	7	3	3	4	6	20
161	12	0	7	0	17	0	0	13	14	7	5	6	8	0	5	11	12
162	19	6	6	0	12	1	1	8	11	3	0	6	6	3	6	13	19
163	13	1	7	7	16	2	8	18	10	0	9	4	12	1	8	10	13
164	11	0	8	2	12	6	4	13	11	1	5	5	12	0	3	16	11
165	12	0	7	3	13	6	2	6	8	2	4	5	11	2	8	11	12
166	12	4	12	6	10	0	2	13	15	4	0	2	1	6	7	12	12
167	17	0	6	6	12	3	3	12	18	3	0	4	10	0	3	10	17
168	14	1	4	4	12	0	9	11	10	0	1	9	2	8	3	10	14
169	20	0	5	4	13	6	5	9	10	2	7	0	6	5	7	14	20
170	19	0	0	1	6	2	1	15	15	1	4	3	1	4	4	14	19
171	13	0	9	4	8	0	6	9	13	3	0	8	6	0	1	9	13
172	14	0	7	2	12	0	7	8	11	0	7	1	9	5	0	13	14
173	11	0	9	3	15	1	5	4	12	0	7	6	5	2	8	3	11
174	10	1	11	1	12	0	2	11	10	0	5	0	6	0	6	10	10
175	12	0	0	4	12	0	8	12	10	3	3	3	10	3	3	8	12
176	11	4	6	7	10	3	2	6	13	3	0	2	8	0	3	15	11
177	17	1	10	0	12	0	6	15	9	0	0	0	8	1	0	8	17
178	10	3	2	3	10	1	0	5	2	0	0	4	8	0	0	5	10
179	11	0	8	2	11	3	2	12	9	0	7	1	4	0	2	5	11
180	11	0	7	4	12	8	3	0	11	3	4	0	7	0	2	9	11

Luminaire Report Summary

IESNA:LM-63-2002
[TEST]
[TESTLAB]
[ISSUEDATE] 2018-2-7 15:03
[MANUFAC] SARIN Energy Inc
[LUMINAIRE] SES-SB7-4000-300-T5-480V
[_TOTALLUMINAIRELUMENS] 37949
[VOLTAGE] 480 V
[CURRENT] 1.101 A
[POWERFACTOR] 0.948
[TESTINST] GPM-3000
[TESTDIST] 17.398 M
[TESTTEMPERATURE] 15.3 'C
[TESTHUMIDITY]
[TESTOPERATOR]
FILE: CANDELA MULTIPLIER: 1
FILE: VERTICAL ANGLES: 181, HORIZONTAL ANGLES: 17
FILE: COORDINATE SYSTEM: TYPE C
FILE: UNIT OF MEASURE: METRIC
FILE: BALLAST FACTOR: 1

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Reported data calculated from manufacturer's data file, based on IES recommended methods.