

Silicon avalanched photodiode



Description

0.196mm² circular active area chip, high speed, high gain APD with N-P- PP+ construction.

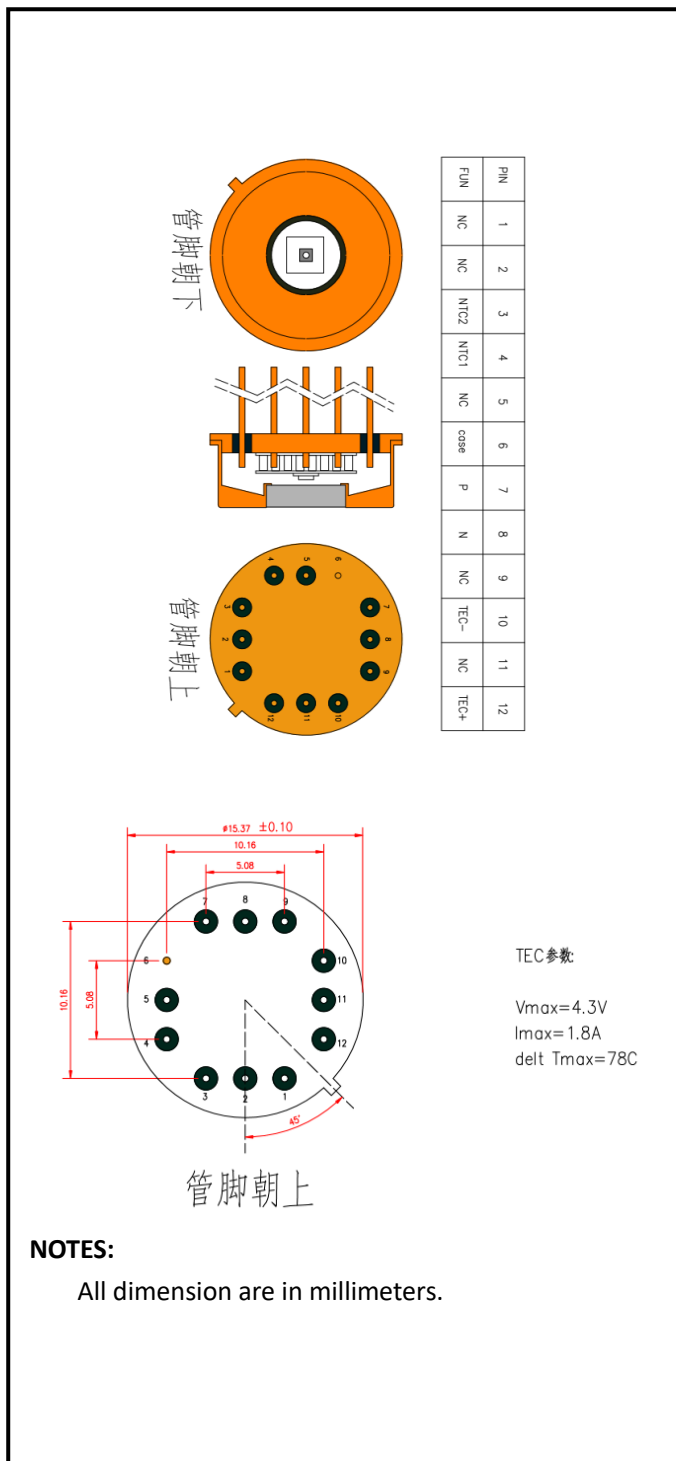
It's packaged in a TO8 package with thermoelectric Sub-mount, NTC temperature sensor, and class window.

Features

- * Top illumination planar APD
- * Φ 500um active area
- * High gain at low bias voltage
- * TEC submount

Applications

- * Laser range finder
- * High speed optical communications



Information in this technical datasheet is believed to be correct and reliable. However, no responsibility is assumed for possible inaccuracies or omission. Specifications are subject change without notice



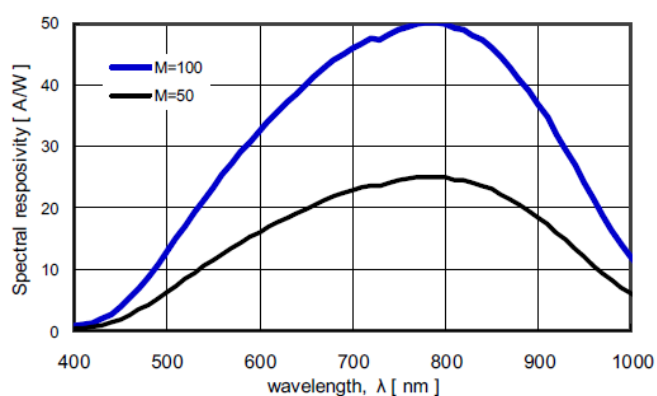
APD500-8TEC



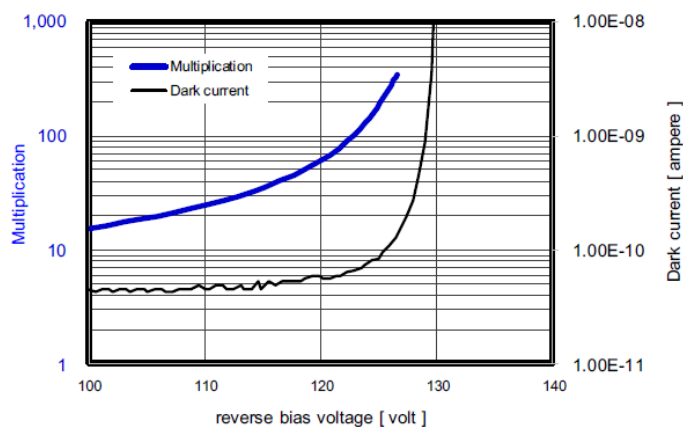
Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Wavelength range	λ		400-1100			nm
Active diameter	ϕ		500			μm
Dark current	I_D	M=100	0.05	0.10	3.0	nA
Junction Capacitance	C	M=100, f=1MHz		2.0		PF
Reverse breakdown voltage	V_{BR}	$I_D=10\mu\text{A}$	80		200	V
Operating voltage temperature coefficient	δ	$T_C=-40\sim+85^\circ\text{C}$	0.65			V/°C
Rise time	t_R	f=1MHz, $\lambda=800\text{nm}$, 50 Ω	-	0.3	-	ns
Maximum multiplication gain	M_{max}	$\lambda=800\text{nm}$, $\phi_e=1\mu\text{W}$		100		
Reponsivity	Re	$\lambda=800\text{nm}$, $\phi_e=1\mu\text{W}$, M=1	0.50	0.55		A/W

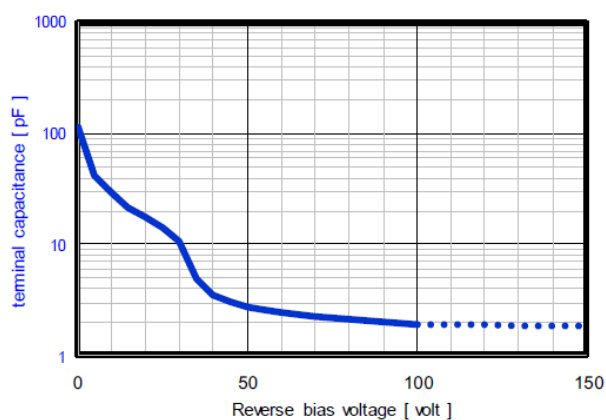
■ Spectral response with multiplication



■ Multiplication and Dark current vs Bias



■ Junction capacitance vs V_R





APD500-8TEC

Temperature Sensor (NTC)

T (°C)	R (KΩ)			Accuracy (%)	
	Rmin	Rnor	Rmax	-ΔR	ΔR
-50	548	576.5	606.3	-4.93%	5.18%
-49	512	538.2	565.7	-4.87%	5.11%
-48	478.6	502.8	528.1	-4.80%	5.04%
-47	447.6	469.9	493.2	-4.74%	4.96%
-46	418.9	439.4	460.9	-4.68%	4.89%
-45	392.1	411.1	430.9	-4.61%	4.82%
-44	367.2	384.7	403	-4.55%	4.75%
-43	344.1	360.3	377.2	-4.49%	4.69%
-42	322.6	337.5	353.1	-4.42%	4.62%
-41	302.6	316.4	330.7	-4.36%	4.55%
-40	283.9	296.6	309.9	-4.30%	4.48%
-39	266.5	278.3	290.6	-4.24%	4.42%
-38	250.3	261.2	272.6	-4.18%	4.35%
-37	235.2	245.3	255.8	-4.12%	4.28%
-36	221	230.4	240.1	-4.06%	4.22%
-35	207.9	216.5	225.5	-4.00%	4.15%
-34	195.6	203.6	211.9	-3.94%	4.09%
-33	184.1	191.5	199.2	-3.88%	4.03%
-32	173.3	180.2	187.3	-3.82%	3.96%
-31	163.2	169.6	176.2	-3.76%	3.90%
-30	153.8	159.8	165.9	-3.71%	3.84%
-29	145	150.5	156.2	-3.65%	3.78%
-28	136.8	141.9	147.1	-3.59%	3.71%
-27	129	133.8	138.7	-3.53%	3.65%
-26	121.8	126.2	130.7	-3.48%	3.59%
-25	115	119.1	123.3	-3.42%	3.53%
-24	108.6	112.4	116.3	-3.37%	3.47%
-23	102.7	106.2	109.8	-3.31%	3.41%
-22	97.05	100.3	103.7	-3.26%	3.36%
-21	91.78	94.81	97.94	-3.20%	3.30%
-20	86.82	89.65	92.55	-3.15%	3.24%
-19	82.18	84.8	87.5	-3.09%	3.18%
-18	77.81	80.25	82.76	-3.04%	3.13%
-17	73.7	75.96	78.3	-2.99%	3.07%
-16	69.82	71.94	74.1	-2.93%	3.01%
-15	66.18	68.14	70.16	-2.88%	2.96%
-14	62.75	64.57	66.45	-2.83%	2.90%
-13	59.51	61.21	62.95	-2.78%	2.85%
-12	56.46	58.04	59.66	-2.73%	2.79%

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-12	56.46	58.04	59.66	-2.73%	2.79%
-11	53.59	55.06	56.57	-2.67%	2.74%
-10	50.87	52.24	53.65	-2.62%	2.68%
-9	48.31	49.59	50.9	-2.57%	2.63%
-8	45.9	47.09	48.3	-2.52%	2.58%
-7	43.62	44.72	45.85	-2.47%	2.52%
-6	41.46	42.49	43.54	-2.42%	2.47%
-5	39.43	40.39	41.36	-2.37%	2.42%
-4	37.5	38.4	39.3	-2.32%	2.37%
-3	35.68	36.51	37.36	-2.27%	2.32%
-2	33.96	34.74	35.52	-2.23%	2.27%
-1	32.34	33.05	33.79	-2.18%	2.21%
0	30.79	31.46	32.15	-2.13%	2.16%
1	29.34	29.97	30.6	-2.08%	2.11%
2	27.97	28.55	29.14	-2.03%	2.07%
3	26.66	27.2	27.75	-1.99%	2.02%
4	25.43	25.93	26.44	-1.94%	1.97%
5	24.25	24.72	25.2	-1.89%	1.92%
6	23.14	23.57	24.02	-1.85%	1.87%
7	22.08	22.49	22.9	-1.80%	1.82%
8	21.08	21.45	21.83	-1.75%	1.77%
9	20.12	20.47	20.83	-1.71%	1.73%
10	19.22	19.54	19.87	-1.66%	1.68%
11	18.36	18.66	18.96	-1.62%	1.63%
12	17.54	17.82	18.1	-1.57%	1.59%
13	16.76	17.02	17.28	-1.53%	1.54%
14	16.02	16.26	16.51	-1.48%	1.49%
15	15.32	15.54	15.77	-1.44%	1.45%
16	14.65	14.86	15.06	-1.39%	1.40%
17	14.01	14.2	14.4	-1.35%	1.36%
18	13.41	13.58	13.76	-1.30%	1.31%
19	12.83	12.99	13.16	-1.26%	1.26%
20	12.28	12.43	12.58	-1.22%	1.22%
21	11.76	11.9	12.04	-1.17%	1.18%
22	11.26	11.39	11.52	-1.13%	1.13%
23	10.78	10.9	11.02	-1.09%	1.09%
24	10.33	10.44	10.55	-1.04%	1.04%
25	9.9	10	10.1	-1.00%	1.00%
26	9.475	9.575	9.675	-1.04%	1.04%
27	9.071	9.17	9.27	-1.09%	1.09%
28	8.685	8.784	8.883	-1.13%	1.13%

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28	8.685	8.784	8.883	-1.13%	1.13%
29	8.318	8.416	8.515	-1.17%	1.17%
30	7.967	8.065	8.163	-1.21%	1.22%
31	7.634	7.731	7.828	-1.25%	1.26%
32	7.315	7.411	7.508	-1.30%	1.30%
33	7.012	7.107	7.202	-1.34%	1.35%
34	6.722	6.816	6.911	-1.38%	1.39%
35	6.446	6.539	6.632	-1.42%	1.43%
36	6.182	6.274	6.366	-1.46%	1.47%
37	5.93	6.021	6.112	-1.50%	1.51%
38	5.69	5.779	5.869	-1.54%	1.56%
39	5.46	5.548	5.637	-1.58%	1.60%
40	5.241	5.328	5.415	-1.62%	1.64%
41	5.032	5.117	5.203	-1.66%	1.68%
42	4.832	4.915	5	-1.70%	1.72%
43	4.64	4.722	4.806	-1.74%	1.76%
44	4.457	4.538	4.62	-1.78%	1.80%
45	4.283	4.362	4.442	-1.82%	1.84%
46	4.115	4.193	4.272	-1.86%	1.88%
47	3.956	4.032	4.109	-1.90%	1.92%
48	3.803	3.878	3.954	-1.93%	1.96%
49	3.656	3.73	3.804	-1.97%	2.00%
50	3.516	3.588	3.661	-2.01%	2.04%
51	3.382	3.453	3.525	-2.05%	2.08%
52	3.254	3.324	3.394	-2.08%	2.12%
53	3.132	3.2	3.269	-2.12%	2.16%
54	3.015	3.081	3.149	-2.16%	2.20%
55	2.902	2.967	3.034	-2.20%	2.23%
56	2.795	2.858	2.923	-2.23%	2.27%
57	2.691	2.754	2.818	-2.27%	2.31%
58	2.593	2.654	2.716	-2.30%	2.35%
59	2.498	2.558	2.619	-2.34%	2.39%
60	2.407	2.466	2.526	-2.38%	2.42%
61	2.32	2.377	2.436	-2.41%	2.46%
62	2.237	2.293	2.35	-2.45%	2.50%
63	2.157	2.211	2.268	-2.48%	2.54%
64	2.08	2.133	2.188	-2.52%	2.57%
65	2.006	2.059	2.112	-2.55%	2.61%
66	1.935	1.987	2.039	-2.59%	2.65%
67	1.867	1.918	1.969	-2.62%	2.68%
68	1.802	1.851	1.902	-2.66%	2.72%

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68	1.802	1.851	1.902	-2.66%	2.72%
69	1.739	1.788	1.837	-2.69%	2.75%
70	1.679	1.726	1.774	-2.72%	2.79%
71	1.621	1.667	1.715	-2.76%	2.83%
72	1.566	1.611	1.657	-2.79%	2.86%
73	1.513	1.556	1.602	-2.82%	2.90%
74	1.461	1.504	1.548	-2.86%	2.93%
75	1.412	1.454	1.497	-2.89%	2.97%
76	1.364	1.406	1.448	-2.92%	3.00%
77	1.319	1.359	1.4	-2.96%	3.04%
78	1.275	1.314	1.355	-2.99%	3.07%
79	1.233	1.271	1.311	-3.02%	3.10%
80	1.192	1.23	1.268	-3.05%	3.14%
81	1.153	1.19	1.228	-3.09%	3.17%
82	1.116	1.151	1.188	-3.12%	3.21%
83	1.079	1.114	1.151	-3.15%	3.24%
84	1.045	1.079	1.114	-3.18%	3.27%
85	1.011	1.045	1.079	-3.21%	3.31%
86	0.9787	1.011	1.045	-3.24%	3.34%
87	0.9476	0.9796	1.013	-3.27%	3.37%
88	0.9176	0.9489	0.9813	-3.30%	3.41%
89	0.8887	0.9194	0.951	-3.33%	3.44%
90	0.8608	0.8908	0.9218	-3.37%	3.47%
91	0.834	0.8633	0.8936	-3.40%	3.50%
92	0.8081	0.8368	0.8664	-3.43%	3.54%
93	0.7831	0.8112	0.8401	-3.46%	3.57%
94	0.7591	0.7865	0.8148	-3.49%	3.60%
95	0.7358	0.7626	0.7904	-3.52%	3.63%
96	0.7134	0.7396	0.7668	-3.54%	3.66%
97	0.6918	0.7174	0.744	-3.57%	3.70%
98	0.6709	0.696	0.722	-3.60%	3.73%
99	0.6508	0.6753	0.7007	-3.63%	3.76%
100	0.6313	0.6553	0.6802	-3.66%	3.79%
101	0.6125	0.636	0.6603	-3.69%	3.82%
102	0.5944	0.6174	0.6412	-3.72%	3.85%
103	0.5769	0.5994	0.6226	-3.75%	3.88%
104	0.56	0.5819	0.6047	-3.78%	3.91%
105	0.5436	0.5651	0.5874	-3.80%	3.94%
106	0.5278	0.5488	0.5707	-3.83%	3.97%
107	0.5125	0.5331	0.5545	-3.86%	4.00%
108	0.4978	0.5179	0.5388	-3.89%	4.03%

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108	0.4978	0.5179	0.5388	-3.89%	4.03%
109	0.4835	0.5032	0.5237	-3.92%	4.06%
110	0.4697	0.489	0.509	-3.94%	4.09%
111	0.4564	0.4752	0.4948	-3.97%	4.12%
112	0.4435	0.4619	0.4811	-4.00%	4.15%
113	0.431	0.4491	0.4679	-4.02%	4.18%
114	0.4189	0.4366	0.455	-4.05%	4.21%
115	0.4072	0.4245	0.4426	-4.08%	4.24%
116	0.3959	0.4129	0.4305	-4.11%	4.27%
117	0.385	0.4016	0.4188	-4.13%	4.30%
118	0.3744	0.3906	0.4075	-4.16%	4.33%
119	0.3641	0.38	0.3966	-4.19%	4.36%
120	0.3542	0.3698	0.386	-4.21%	4.39%
121	0.3446	0.3598	0.3757	-4.24%	4.41%
122	0.3353	0.3502	0.3658	-4.26%	4.44%
123	0.3263	0.3409	0.3561	-4.29%	4.47%
124	0.3175	0.3318	0.3468	-4.31%	4.50%
125	0.3091	0.3231	0.3377	-4.34%	4.53%
126	0.3008	0.3146	0.3289	-4.37%	4.55%
127	0.2929	0.3063	0.3204	-4.39%	4.58%
128	0.2852	0.2984	0.3121	-4.42%	4.61%
129	0.2777	0.2906	0.3041	-4.44%	4.64%
130	0.2705	0.2831	0.2963	-4.47%	4.67%
131	0.2635	0.2758	0.2888	-4.49%	4.69%
132	0.2566	0.2688	0.2815	-4.52%	4.72%
133	0.25	0.2619	0.2744	-4.54%	4.75%
134	0.2436	0.2553	0.2675	-4.57%	4.77%
135	0.2374	0.2488	0.2608	-4.59%	4.80%
136	0.2314	0.2426	0.2543	-4.61%	4.83%
137	0.2255	0.2365	0.248	-4.64%	4.85%
138	0.2198	0.2306	0.2418	-4.66%	4.88%
139	0.2143	0.2249	0.2359	-4.69%	4.91%
140	0.209	0.2193	0.2301	-4.71%	4.93%
141	0.2038	0.2139	0.2245	-4.73%	4.96%
142	0.1987	0.2087	0.2191	-4.76%	4.98%
143	0.1938	0.2036	0.2138	-4.78%	5.01%
144	0.1891	0.1986	0.2086	-4.80%	5.04%
145	0.1845	0.1938	0.2036	-4.83%	5.06%
146	0.18	0.1891	0.1988	-4.85%	5.09%
147	0.1756	0.1846	0.194	-4.87%	5.11%
148	0.1714	0.1802	0.1895	-4.90%	5.14%

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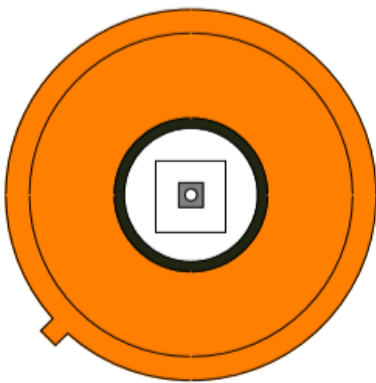
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148	0.1714	0.1802	0.1895	-4.90%	5.14%
149	0.1672	0.1759	0.185	-4.92%	5.16%
150	0.1632	0.1717	0.1806	-4.94%	5.19%

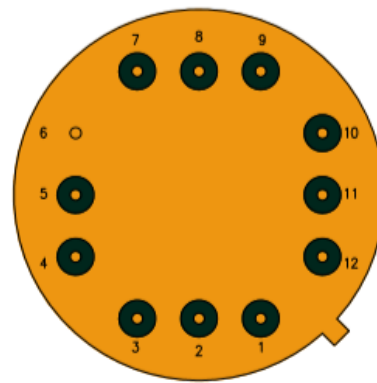
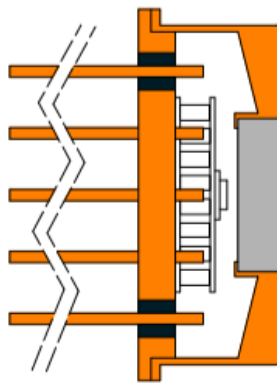
$$T = \frac{B \cdot T_N}{B + \ln\left(\frac{R_L}{R_N}\right) \cdot T_N}$$

OUTLINE DRAWING:

PIN	1	2	3	4	5	6	7	8	9	10	11	12
FUN	NC	NC	NTC2	NTC1	NC	case	P	N	NC	TEC-	NC	TEC+



管脚朝下



管脚朝上

