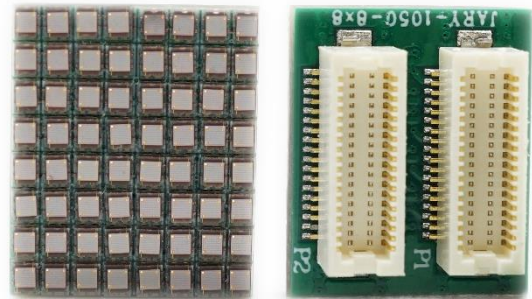


# Array with TN1050 SiPM

Compact SiPM array module

## Introduction

JARY-TN1050-8x8C is a compact SiPM array based on TN1050 SiPM, it contains 64 SiPMs that tightly mounted on the PCB substrate with 0.2mm spacing, and each channel has independent output within two connectors. It is designed for low light imaging applications such as light detection and range, gamma camera, high energy physics experiment, security inspection and other applications that require high channel density, position sensitivity and high photon sensitivity.



## Inputs and Outputs (I/O)

Figure 1 shows the array schematic for a portion of an Array. Each array has two connectors: output and common. The cathode of all sensors are summed together to the common pin. The anode of each sensor has individual output pin. The performance of SiPM in the array can be found in the TN Series datasheet.

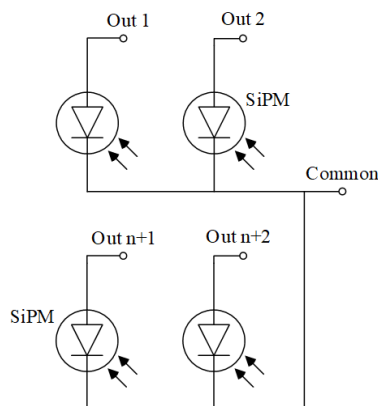


Fig.1 Signal connection of an SiPM array

## Electrical and Optical Characteristics

Parameter	Value		Condition	Unit
	JARY-TN1050-8×8C			
Spectral Response Range	250-950		--	nm
Peak Sensitivity Wavelength	420		--	nm
Breakdown Voltage	25 ±0.2		@ 25°C	V
Overvoltage <sup>1</sup>	1-5		--	V
PDE @420nm <sup>2</sup>	35%		V <sub>ov</sub> =2V	--
Gain	2.7 ×10 <sup>6</sup>		V <sub>ov</sub> =2V	--
Rise Time	1.3		V <sub>ov</sub> =2V	ns
Recovery Time τ <sup>3</sup>	45		V <sub>ov</sub> =2V	ns
Dark Count Rate <sup>4</sup>	Typ.	124	V <sub>ov</sub> =2V	kHz/mm <sup>2</sup>
	Max.	288	V <sub>ov</sub> =2V	
Dark Current	Typ.	714	V <sub>ov</sub> =2V	nA
	Max.	1600	V <sub>ov</sub> =2V	
Temperature Dependency of V <sub>br</sub>	35.2		--	mV/°C
Crosstalk Probability	3.0%		V <sub>ov</sub> =2V	--
Afterpulse Probability	2.7%		V <sub>ov</sub> =2V	--
Pixel Capacitance	165		V <sub>ov</sub> =2V	fF

\*1 Overvoltage (V<sub>ov</sub>) =Operating Voltage (V<sub>op</sub>)-Breakdown Voltage (V<sub>br</sub>)

\*2 Photon detection efficiency does not include crosstalk and afterpulse

\*3 RC charging time of the pixel

\*4 Threshold=0.5 p.e at 25°C

## Structures

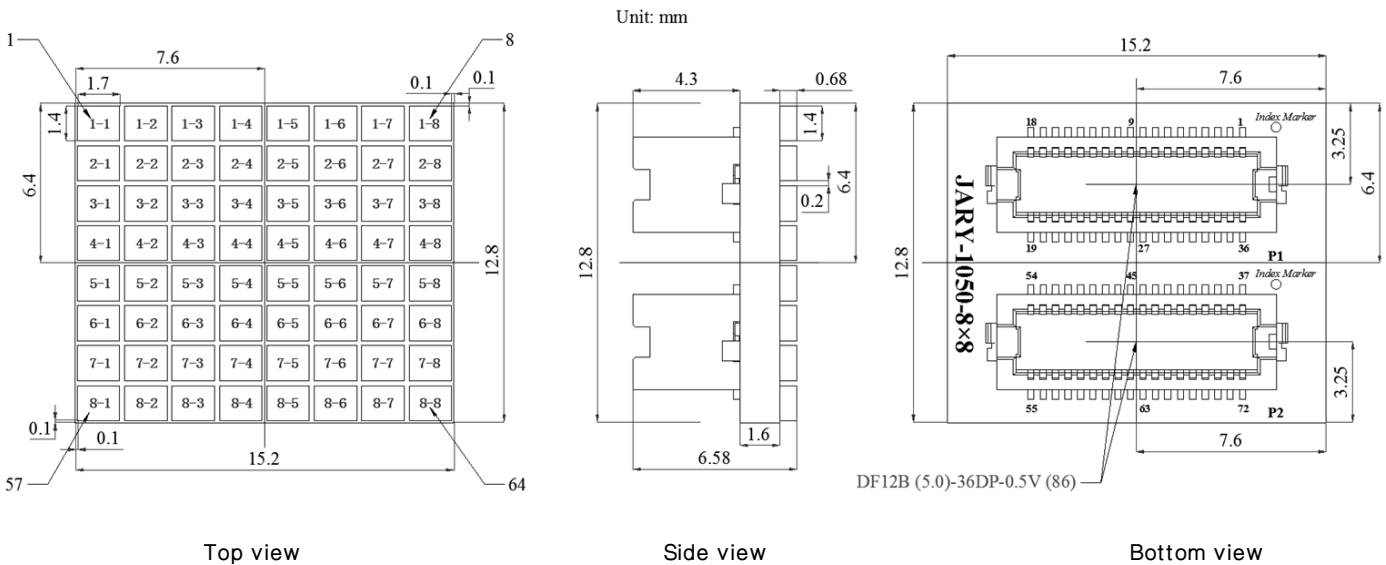
Parameter	JARY-TN1050-8x8C	Unit
Number of Channels	64(8x8)	-
Active Area	1×1	mm <sup>2</sup>
Pixel Pitch	50	μm
Array Dimension	15.2×12.8×2.73	mm
Package Type	Connector	-

## Absolute Maximum Ratings

Parameter	JARY-TN1050-8×8C
Storage Temperature Range	-45℃~+100℃
Operating Temperature Range	-45℃~+85℃

## Dimensional Outlines and Connector Pins

### JARY-TN1050-8×8BGA Dimensional Outlines



### Connector Pin-Outs for JARY-TN1050-8×8BGA

Pin	Connection	Signal	Pin	Connection	Signal
1	A(1-2)	Out2	37	A(6-2)	Out42
2	A(2-2)	Out10	38	A(5-2)	Out34
3	A(1-3)	Out3	39	A(5-3)	Out35
4	A(2-3)	Out11	40	A(6-3)	Out43
5	A(1-1)	Out1	41	A(6-1)	Out41

6	A(2-1)	Out9	42	A(5-1)	Out33
7	A(1-4)	Out4	43	A(5-4)	Out36
8	A(2-4)	Out12	44	A(6-4)	Out44
9	C(1-1,1-2, 1-3, 1-4, 2-1,2-2, 2-3, 2-4, 3-1,3-2, 3-3, 3-4, 4-1,4-2, 4-3, 4-4)	Bias1	45	C(5-1,5-2, 5-3, 5-4, 6-1,6-2, 6-3, 6-4, 7-1,7-2, 7-3, 7-4, 8-1,8-2, 8-3, 8-4)	Bias3
10	C(1-5,1-6, 1-7, 1-8, 2-5,2-6, 2-7, 2-8, 3-5,3-6, 3-7, 3-8, 4-5,4-6, 4-7, 4-8)	Bias2	46	C(5-5,5-6, 5-7, 5-8, 6-5,6-6, 6-7, 6-8, 7-5,7-6, 7-7, 7-8, 8-5,8-6, 8-7, 8-8)	Bias4
11	A(1-5)	Out5	47	A(5-5)	Out37
12	A(2-5)	Out13	48	A(6-5)	Out45
13	A(1-8)	Out8	49	A(6-8)	Out48
14	A(2-8)	Out16	50	A(5-8)	Out40
15	A(1-6)	Out6	51	A(6-6)	Out46
16	A(2-6)	Out14	52	A(5-6)	Out38
17	A(1-7)	Out7	53	A(6-7)	Out47
18	A(2-7)	Out15	54	A(5-7)	Out39
19	A(3-7)	Out23	55	A(8-7)	Out63
20	A(4-7)	Out31	56	A(7-7)	Out55
21	A(4-6)	Out30	57	A(8-6)	Out62
22	A(3-6)	Out22	58	A(7-6)	Out54
23	A(4-8)	Out32	59	A(8-8)	Out64
24	A(3-8)	Out24	60	A(7-8)	Out56
25	A(3-5)	Out21	61	A(8-5)	Out61
26	A(4-5)	Out29	62	A(7-5)	Out53
27	C(1-5,1-6, 1-7, 1-8, 2-5,2-6, 2-7, 2-8, 3-5,3-6, 3-7, 3-8, 4-5,4-6, 4-7, 4-8)	Bias2	63	C(5-5,5-6, 5-7, 5-8, 6-5,6-6, 6-7, 6-8, 7-5,7-6, 7-7, 7-8, 8-5,8-6, 8-7, 8-8)	Bias4
28	C(1-1,1-2, 1-3, 1-4, 2-1,2-2, 2-3, 2-4, 3-1,3-2, 3-3, 3-4, 4-1,4-2, 4-3, 4-4)	Bias1	64	C(5-1,5-2, 5-3, 5-4, 6-1,6-2, 6-3, 6-4, 7-1,7-2, 7-3, 7-4, 8-1,8-2, 8-3, 8-4)	Bias3
29	A(3-4)	Out20	65	A(8-4)	Out60
30	A(4-4)	Out28	66	A(7-4)	Out52
31	A(4-1)	Out25	67	A(8-1)	Out57
32	A(3-1)	Out17	68	A(7-1)	Out49
33	A(3-3)	Out19	69	A(8-3)	Out59
34	A(4-3)	Out27	70	A(7-3)	Out51
35	A(4-2)	Out26	71	A(8-2)	Out58
36	A(3-2)	Out18	72	A(7-2)	Out50

Note: In the "Connection" column, A= Anode, C= Cathode.



■ All specifications are subject to change without notice

## Joinbon Technology Co., Ltd. (Hubei)



Building A03, East Lake Hi-Tech Innovation City, No.9 Phoenix Avenue, Phoenix Lake, Ezhou, Hubei, P.R.China.

Postcode: 436060

Tel: 027-5937 0337

Fax: 027-5937 0337

Email: [info@joinbon.com](mailto:info@joinbon.com)

Site: [www.joinbon.com](http://www.joinbon.com)