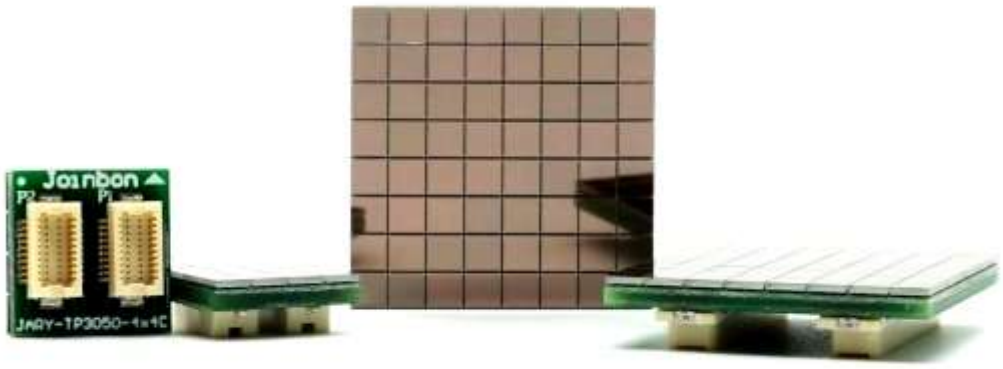
Joinbon
PASSION FOR LIGHT DETECTION

TP3050 SiPM Array

Compact, plug and play SiPM array



HIGHLIGHT FEATURES

- WLCSP package based on TSV technology
- Edge dead zone almost eliminated
- Excellent signal uniformity
- Excellent timing resolution
- Conducive to large area stitching
- High PDE up to 35%
- Single photon sensitivity

APPLICATIONS

- PET／small animal PET
- Spectral analysis
- Light detection and range
- Cosmic-ray detection
- Radiation measurement and analysis
- Fluorescence analysis
- High energy physics experiment

Inputs and Outputs (I／O)

Figure 1 shows the array schematic for a portion of an array. Each array has two connections: 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 TP Series datasheet.

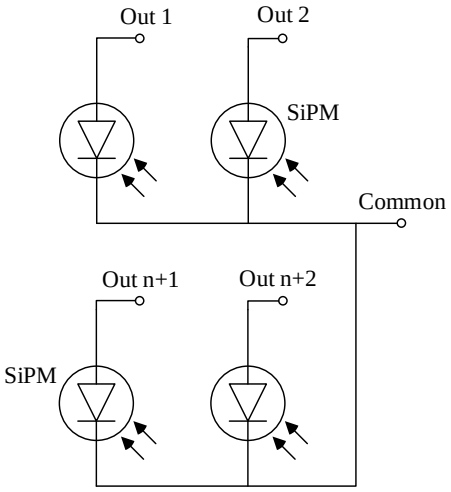


Fig.1 Signal connection of an SiPM array

Performance Parameter

Parameter		Value		Condition	Unit
		JARY-TP3050-4×4C	JARY-TP3050-8×8C		
Spectral Response Range		250-950		--	nm
Peak Sensitivity Wavelength		420		--	nm
Breakdown Voltage		25±0.2		@ 25℃	V
Overvoltage [1]		1 - 5		--	V
PDE @420nm [2]		35%		Vov=2V	--
Gain		2.5×10^6		Vov=2V	--
Rise Time		1		Vov=2V	ns
Recovery Time τ [3]		42		Vov=2V	ns
Dark Count Rate [4]	Typ.	120		Vov=2V	kHz/mm²
	Max.	270		Vov=2V	
Crosstalk Probability		3.1%		Vov=2V	--
Afterpulse Probability		3.9%		Vov=2V	--
Pixel Capacitance		169		Vov=2V	fF

1 Overvoltage (Vov) =Operating Voltage (Vop)-Breakdown Voltage (Vbr)

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℃

Conditions of Use

Parameter	JARY-TP3050-x××xC
Storage Temperature Range	-45℃~+100℃
Operating Temperature Range	-45℃~+85℃

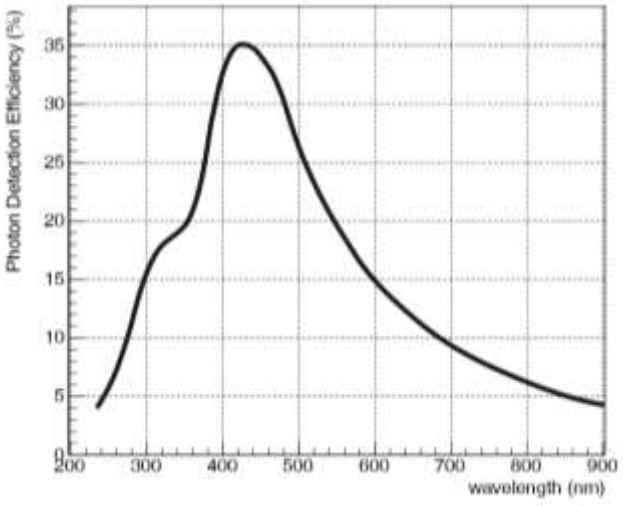
Structure

Parameter	JARY-TP3050-4×4C	JARY-TP3050-8×8C	Unit
Number of Channels	16 (4×4)	64 (8×8)	-
Active Area	3×3		mm
Pixel Pitch	50		μm
Number of Pixels Per SiPM	3364		-
Package Type	With Connector [5]		-

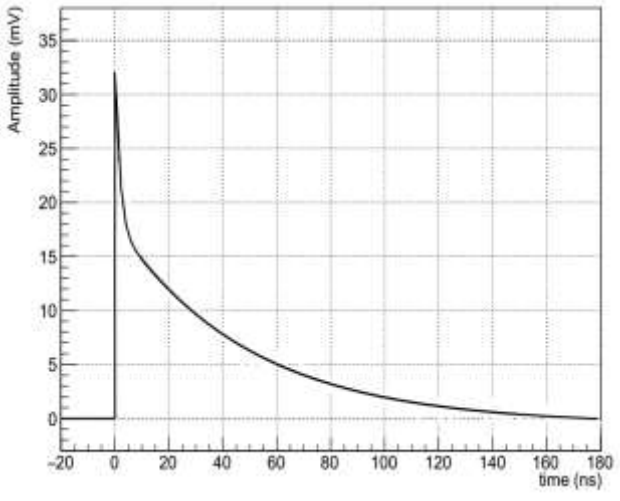
*5 A connector (DF12B (5.0)-20DP-0.5V (86)) made by HIROSE is mounted on the back side of the board.
This connector mates with a HIROSE receptacle (DF12B-20DS-0.5V (86)).

Performance Plots

PDE versus Wavelength
JSP-TP3050-SMT

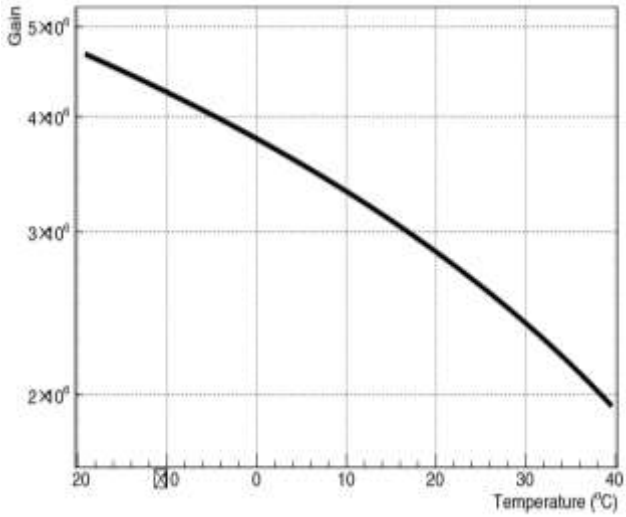


Typical Impulse Response
JSP-TP3050-SMT



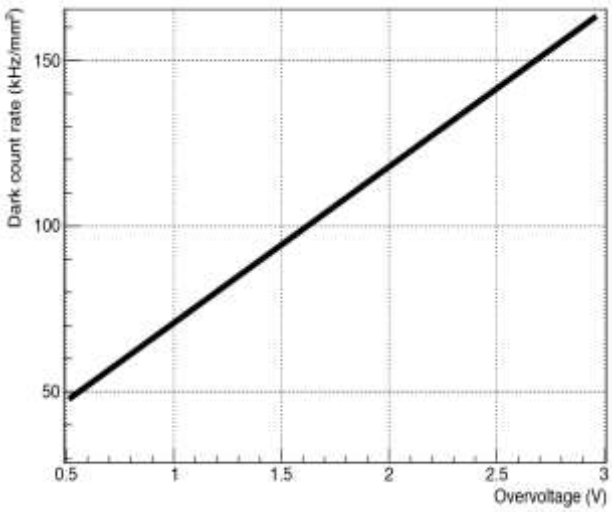
Gain versus Temperature*

JSP-TP3050-SMT



Dark Count Rate versus Overvoltage

JSP-TP3050-SMT

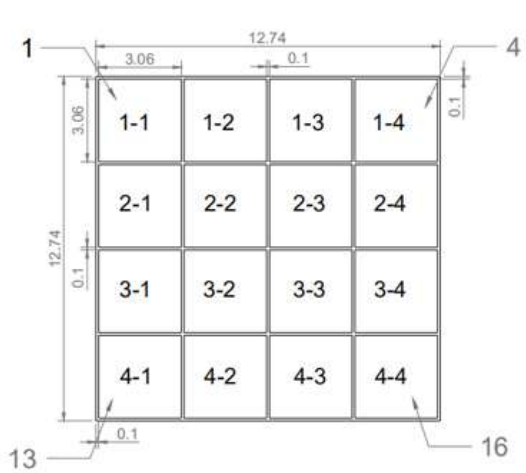


* All the measurement are made at voltage of Vov=2V unless otherwise noted.,

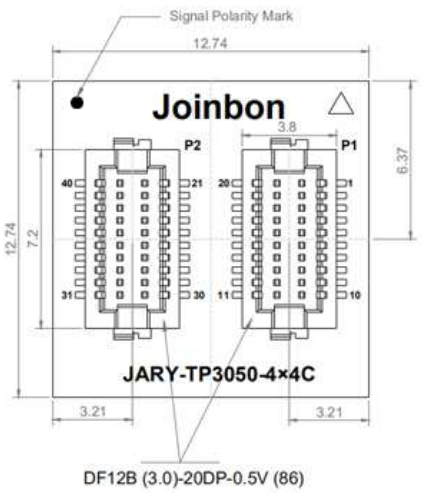
Dimensional Outlines and Connector Pin–Outs

JARY–TP3050–4×4C DIMENSIONAL OUTLINES

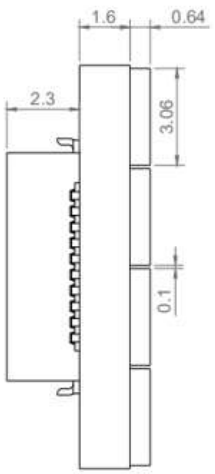
unit: mm



Top View



Bottom View



Side View

The connector might be changed without notice, please contact our sales before ordering.

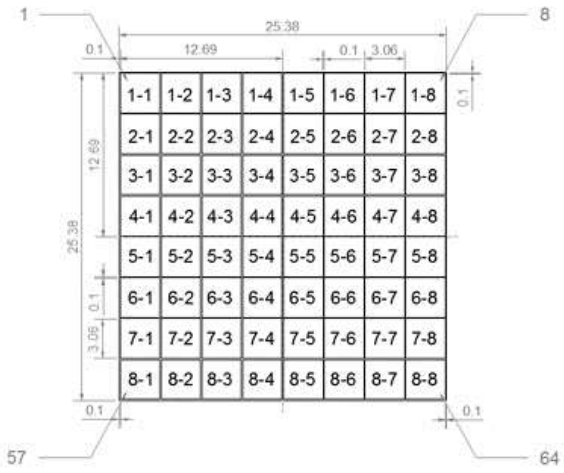
Connector Pin–Outs for JARY–TP3050–4×4C

Pin	Connection	Signal	Pin	Connection	Signal
1	A(1-1)	Out1	21	A(1-3)	Out3
2	N.C.	-	22	N.C.	-

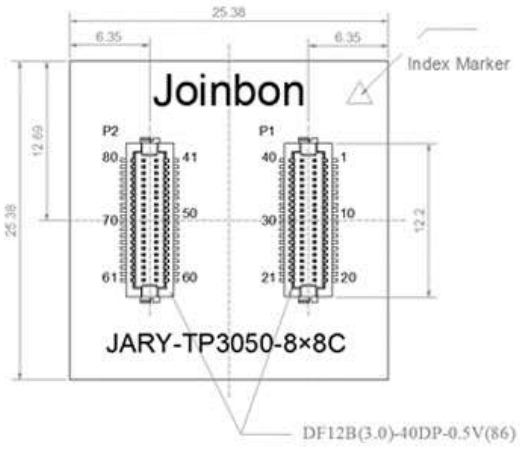
3	A(2-1)	Out5	23	A(2-3)	Out7
4	C(1-1, 2-1, 1-2, 2-2)	V1	24	C(1-3, 2-3, 1-4, 2-4)	V3
5	N.C.	-	25	N.C.	-
6	N.C.	-	26	N.C.	-
7	N.C.	-	27	N.C.	-
8	A(3-1)	Out9	28	A(3-3)	Out11
9	C(3-1, 3-2, 4-1, 4-2)	V2	29	C(3-3, 4-3, 3-4, 4-4)	V4
10	A(4-1)	Out13	30	A(4-3)	Out15
11	A(4-2)	Out14	31	A(4-4)	Out16
12	C(3-1, 3-2, 4-1, 4-2)	V2	32	C(3-3, 4-3, 3-4, 4-4)	V4
13	A(3-2)	Out10	33	A(3-4)	Out12
14	N.C.	-	34	N.C.	-
15	N.C.	-	35	N.C.	-
16	N.C.	-	36	N.C.	-
17	C(1-1, 2-1, 1-2, 2-2)	V1	37	C(1-3, 2-3, 1-4, 2-4)	V3
18	A(2-2)	Out6	38	A(2-4)	Out8
19	N.C.	-	39	N.C.	-
20	A(1-2)	Out2	40	A(1-4)	Out4

JARY-TP3050-8×8C DIMENSIONAL OUTLINES

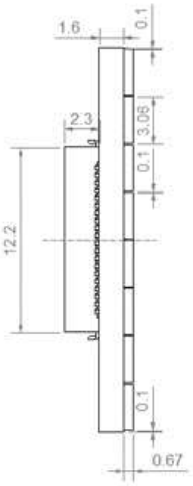
unit: mm



Top view



Bottom view



Side view

The connector might be changed without notice, please contact our sales before ordering.

Connector Pin-Outs for JARY-TP3050-8×8C

Pin	Connection	Signal	Pin	Connection	Signal
1	A(2-2)	Out10	41	A(2-6)	Out14
2	A(3-2)	Out18	42	A(3-6)	Out22
3	A(4-2)	Out26	43	C(1-5, 1-6, 1-7, 1-8,	V2

				2-5, 2-6, 2-7, 2-8, 3-5, 3-6, 3-7, 3-8, 4-5, 4-6, 4-7, 4-8)	
4	A(1-2)	Out2	44	N.C.	-
5	A(1-1)	Out1	45	A(4-6)	Out30
6	A(3-1)	Out17	46	A(1-6)	Out6
7	A(2-1)	Out9	47	A(3-5)	Out21
8	A(4-1)	Out25	48	A(4-5)	Out29
9	N.C.	-	49	A(2-5)	Out13
10	N.C.	-	50	A(1-5)	Out5
11	A(5-2)	Out34	51	N.C.	-
12	A(5-3)	Out35	52	N.C.	-
13	A(5-1)	Out33	53	A(5-5)	Out37
14	A(7-1)	Out49	54	A(7-5)	Out53
15	A(6-1)	Out41	55	A(6-5)	Out45
16	A(8-1)	Out57	56	A(6-6)	Out46
17	A(8-2)	Out58	57	N.C.	-
18	A(6-2)	Out42	58	A(8-5)	Out61
19	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)	V1	59	A(8-6)	Out62
20	A(7-2)	Out50	60	A(7-6)	Out54
21	A(7-3)	Out51	61	A(7-7)	Out55
22	A(8-3)	Out59	62	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)	V4
23	A(8-4)	Out60	63	A(6-7)	Out47
24	N.C.	-	64	A(8-7)	Out63
25	A(6-3)	Out43	65	A(8-8)	Out64
26	A(6-4)	Out44	66	A(6-8)	Out48
27	A(7-4)	Out52	67	A(7-8)	Out56
28	A(5-4)	Out36	68	A(5-8)	Out40
29	N.C.	-	69	A(5-6)	Out38
30	N.C.	-	70	A(5-7)	Out39
31	A(1-4)	Out4	71	N.C.	-
32	A(2-4)	Out12	72	N.C.	-
33	A(4-4)	Out28	73	A(4-8)	Out32
34	A(3-4)	Out20	74	A(2-8)	Out16
35	A(1-3)	Out3	75	A(3-8)	Out24
36	A(4-3)	Out27	76	A(1-8)	Out8
37	N.C.	-	77	A(1-7)	Out7

38	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)	V3	78	A(4-7)	Out31
39	A(3-3)	Out19	79	A(3-7)	Out23
40	A(2-3)	Out11	80	A(2-7)	Out15

Note: 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
Site: www.joinbon.com