

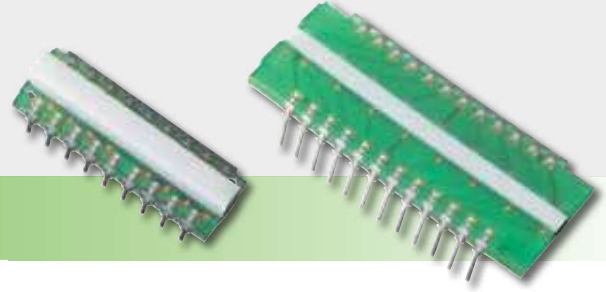
Photodiode Arrays

For X-ray Security Applications

SILICON PHOTODIODE ARRAYS ■

Left: 16 Element, 1.6 mm Pitch Photodiode Array With Segmented Csi Scintillator.

Right: 16 Element, 2.5 mm Pitch Photodiode Array With GOS Low Energy Screen Scintillator.



Photodiode Arrays – VTA Series

Applications

- Luggage scanning
- Cargo & container scanning
- Food inspection
- Non-destructive testing

Features and Benefits

- Various crystal types available (Csl, GOS, etc.)
- Custom chip geometry & pitch
- Single or dual-sided assemblies
- High responsivity and low capacitance
- Onboard electronics available on a custom basis
- Multiple photodiode rows

Product Description

These photodiode arrays are used to generate an X-ray image by scanning an object line by line. The X-rays are converted into light through the attached scintillator crystal. The light intensity is then measured by the photodiodes. The boards are employing chip-on-board technology with optically adapted scintillator crystals. The listed designs can be ordered as a standard part, but can also be customized to meet the needs of a wide variety of applications. Excelitas custom photodiode arrays give customers the option to choose the:

- active photodiode area
- total number of elements
- overall PCB and photodiode chip dimensions
- photodiode chip geometry and orientation
- electro-optical specifications
- single sided vs. double sided PCB
- alternative substrate materials (e.g. ceramic)
- electrical interface (e.g. connector)

First stage amplification electronics can also be added to the custom board design to convert the current generated by the photodiode into an easy to measure voltage.

Product Table

Photodiode Arrays • VTA Series

Symbol	Substrate		Active Area	Photodiode Chip Dimensions		Pitch	Number of Elements	Scintillator Crystal Type	Light Current Uniformity @ 540 nm, 30 nW/cm ²	Dark Current @ H=0, VR=10 mV		Junction Capacitance @ H=0, VR=0V		Radiometric Sensitivity @ 540 nm
	Material	Dimensions		Design	Design					typ	max	typ	max	min
		mm	mm ²			mm	mm	I _b						
Unit								%	pA	pA	pF	pF	A/W	
VTA2164H-D-NC-00-0	FR4	43.2x67.7	1.41	1.40x3.50	2.1	64	Custom	±5	<10	90	<100	200	0.30	
VTA1616H-H-SC-01-0	FR4	8.0x25.4	2.58	1.51x3.25	1.6	16	Csl	±5	-	50	-	350	0.30	
VTA1616H-L-SC-02-0	FR4	16.0x25.4	2.58	1.51x3.25	1.6	16	GOS	±5	-	50	-	350	0.30	
VTA2516H-H-SC-01-0	FR4	8.0x40.0	5.20	2.45x3.15	2.5	16	Csl	±5	-	50	-	600	0.30	
VTA2516H-L-SC-02-0	FR4	16.0x40.0	5.20	2.45x3.15	2.5	16	GOS	±5	-	50	-	600	0.30	
VTA1216H-H-NC-00-0	FR4	10.2x19.0	3.44	2.30x4.95 (dual cell)	1.2	16	Custom	±5	-	100	-	300	0.30	
VTA1216H-L-NC-00-0	FR4	17.8x19.0	3.44	2.30x4.95 (dual cell)	1.2	16	Custom	±5	-	100	-	300	0.30	
VTA0832H-H-NC-00-0	FR4	17.8x25.4	0.50	1.59x2.34 (dual cell)	0.8	32	Custom	±5	-	100	-	100	0.30	

Electrical characteristics at T_{Ambient} = 25 °C

Figure 1

Side 1 Detail VTA2164H-D

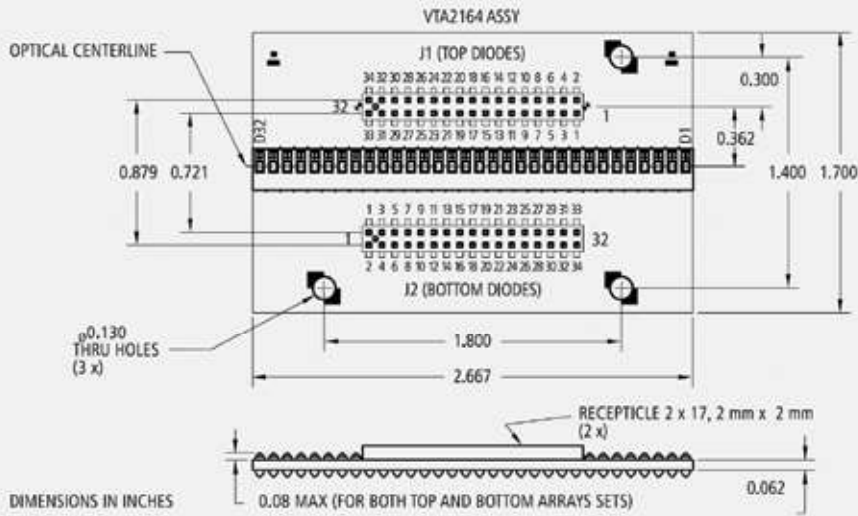


Figure 2

Side 2 Detail VTA2164H-D

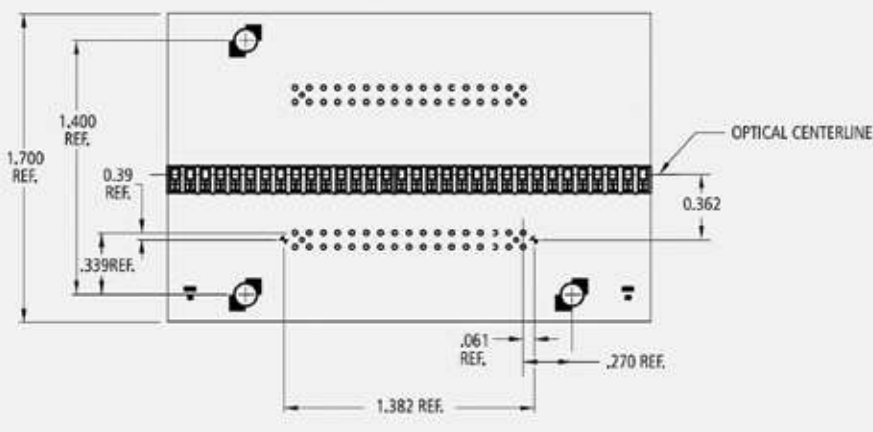
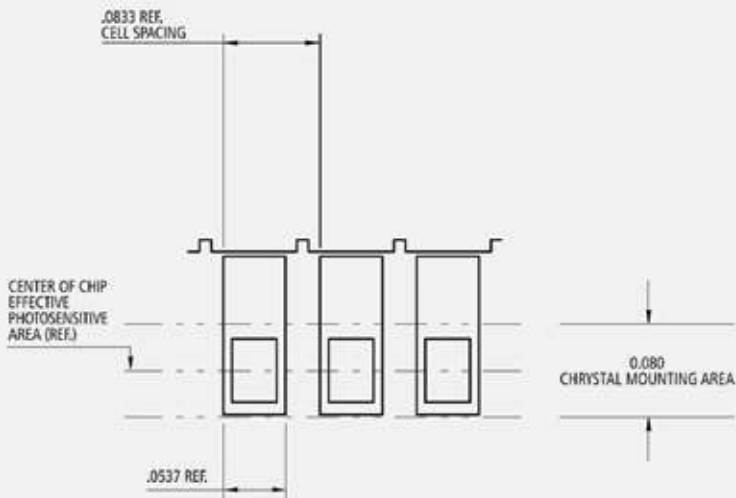


Figure 3

Chip Spacing Details, Side 1 (Typ.) VTA2164H-D

Photosensitive Area 0.0545" x 0.0385 (Typ.) or 0.0021 SQ. IN.



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Pin Out VTA2164H-D

Connector J1 (Top Diodes)		Connector J2 (Bottom Diodes)	
Pin	Connection	Pin	Connection
1	D1	1	D1
2	D2	2	D2
3	D3	3	D3
4	D4	4	D4
5	D5	5	D5
6	D6	6	D6
7	D7	7	D7
8	D8	8	D8
9	D9	9	D9
10	D10	10	D10
11	D11	11	D11
12	D12	12	D12
13	D13	13	D13
14	D14	14	D14
15	D15	15	D15
16	D16	16	D16
17	D17	17	D17
18	D18	18	D18
19	D19	19	D19
20	D20	20	D20
21	D21	21	D21
22	D22	22	D22
23	D23	23	D23
24	D24	24	D24
25	D25	25	D25
26	D26	26	D26
27	D27	27	D27
28	D28	28	D28
29	D29	29	D29
30	D30	30	D30
31	D31	31	D31
32	D32	32	D32
33	N/C	33	N/C
34	Common	34	Common

Figure 4

Pos. of Top Diodes Rel. to Bottom Diodes VTA2164H-D

(Optical Center Line to Optical Center Line)

