

Samples for evaluation purposes only



Features

- 200 MHz bandwidth
- 74 k Ω transimpedance
- 64:16 Mux
- Low noise

Description

Compact TIA evaluation board for 32 and 64 channel APD arrays including high bandwidth, amplification and temperature compensated power control.

Application

- LIDAR applications
- Shape recognition
- Collision warning

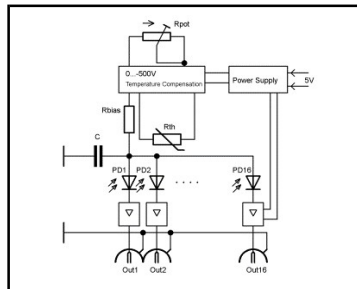
RoHS

2011/65/EU

Absolute maximum ratings

Symbol	Parameter	Min	Max	Unit
T _{STG}	Storage temp	-40	125	°C
T _{OP}	Operating temp	-25	70	°C

Schematic

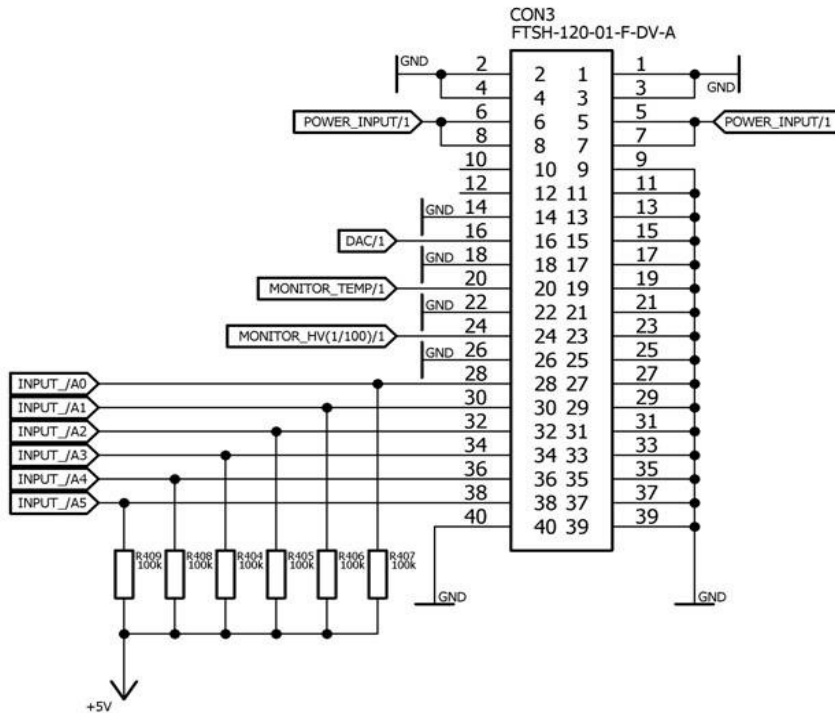


Characteristics of TIA evaluation board @ 23 °C

Part	Characteristic	Test Condition	Min	Typ	Max	Unit
Measurement characteristics						
Amplifier	Photoelectric sensitivity incl. APD	M = 25; λ = 905 nm; 10 kHz		1.11x10 ⁶		V/W
Amplifier	Noise equivalent power	M = 25; λ = 905 nm; 10 kHz		t.b.d		W/Hz ^{1/2}
Amplifier	Transimpedance gain			74		k Ω
Amplifier	Rise time	200mVP-P,OUT and CIN,TOT = 2pF		1.6		ns
Amplifier	Bandwidth (Cut-off frequency)	-3db		200		MHz
Amplifier	Coupling			AC		
Amplifier	Output impedance			50		Ω
Amplifier	Output voltage	50 Ω load			1.0	V
Amplifier	Voltage noise	f = 100MHz, CIN,TOT = 2pF		t.b.d.		nV/ \sqrt Hz
Amplifier	Current noise	f = 100MHz, CIN,TOT = 2pF		4.3		pA/ \sqrt Hz
Power Supply						
Power Sup.	Module Supply voltage		5.5	6.5	7	V
Power Sup.	HV adjustable	DC	-60	-150	-500	V
Power Sup.	Supply current for TIA module				800	mA
Power Sup.	Temperature compensated APD bias			yes		
Power Sup.	Gain stability	25 °C \pm 10 °C; M = 25		\pm 5		%

Connector (Power supply and Signal)					
Connector	Maker: Samtec (www.samtec.com) Power, Mux, Monitor	Type	1 x FTSH-120-01-F-DV-A		
		Number	2 x 20		
Connector	Maker: Molex Signal outputs	Type	SMA coaxial		
		Number	16		
Connector	Maker: Samtec (www.samtec.com) APD board connection	Type	2 x CLP-120-02-F-D-A		
		Number	2 x 20 per connector		
Mechanical characteristics					
Module	Dimensional outline - width			t.b.d.	mm
Module	Dimensional outline - length			t.b.d.	mm
Module	Dimensional outline - height			t.b.d.	mm

Connector pinning FTSH-120-01-F-DV-A

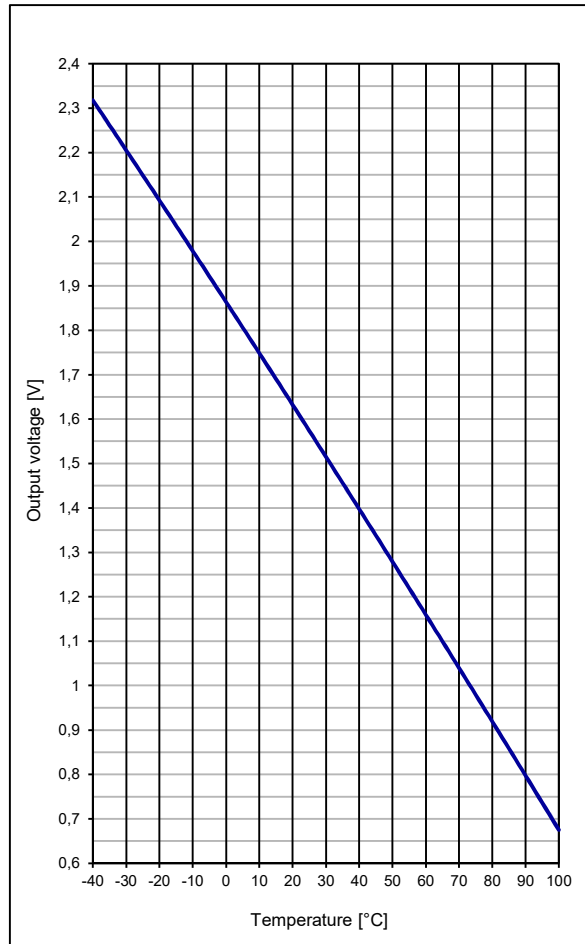


Switching matrix
 t.b.d.

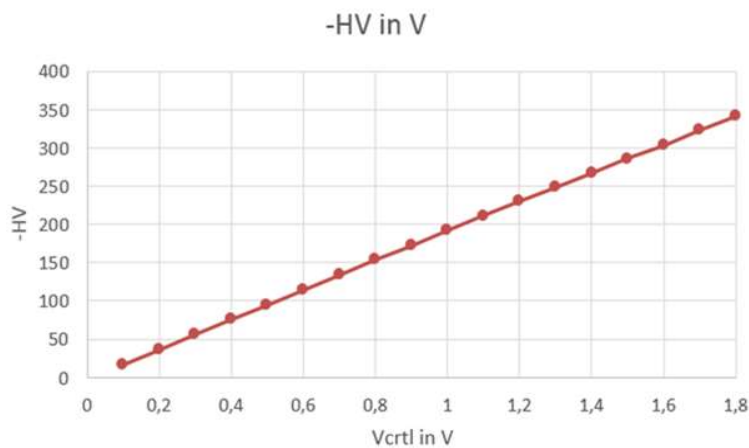
Characteristic curve of LM20 temp sensor

T [°C]	Voltage [V]	T [°C]	Voltage [V]	T [°C]	Voltage [V]
-40	2,32	14	1,70	68	1,06
-38	2,30	16	1,68	70	1,04
-36	2,27	18	1,66	72	1,02
-34	2,25	20	1,63	74	0,99
-32	2,23	22	1,61	76	0,97
-30	2,21	24	1,59	78	0,94
-28	2,18	26	1,56	80	0,92
-26	2,16	28	1,54	82	0,89
-24	2,14	30	1,52	84	0,87
-22	2,12	32	1,49	86	0,85
-20	2,09	34	1,47	88	0,82
-18	2,07	36	1,44	90	0,80
-16	2,05	38	1,42	92	0,77
-14	2,02	40	1,40	94	0,75
-12	2,00	42	1,37	96	0,72
-10	1,98	44	1,35	98	0,70
-8	1,96	46	1,33	100	0,68
-6	1,93	48	1,30	102	0,65
-4	1,91	50	1,28	104	0,63
-2	1,89	52	1,26	106	0,60
0	1,86	54	1,23	108	0,58
2	1,84	56	1,21	110	0,55
4	1,82	58	1,18	112	0,53
6	1,79	60	1,16	114	0,50
8	1,77	62	1,14	116	0,48
10	1,75	64	1,11	118	0,45
12	1,73	66	1,09	120	0,43

Characteristic curve of LM20 temp sensor



HV source



Fitting Products

Product	Gap; Pitch	Active Area	Order Number
32AA1.2-9 w/PCB	40 μ m; 380 μ m	0.34 x 3.6 mm	3005816
32AA0.68-9 w/PCB	40 μ m; 380 μ m	0.34 x 2 mm	3005510
64AA0.06-9 w/PCB	64 μ m; 300 μ m	0.236 x 0.236 mm	3005826
64AA0.25-9 w/PCB	40 μ m; 140 μ m	0.1 x 2.5 mm	3005817
64AA0.375-9 w/PCB	40 μ m; 190 μ m	0.15 x 2.5 mm	3005500
64AA0.475-9 w/PCB	40 μ m; 230 μ m	0.19 x 2.5 mm	3005508

Quick start procedure

1.) Connect X1...X16 to an oscilloscope that is 50 Ohm terminated.



2.) Connect a 6.5V low-noise analog power supply.



3.) Apply -70V to -240V at RT to set the gain of the desired APD gain. A Jumper has to be set to choose between option a.) or b.).

- a.) Potentiometer to adjust HV
- b.) DAC input (Pin 16) to adjust HV

Pin 24 HV/100 in V can be used to monitor the setted HV.



4.) Select the corresponding channel by applying high and low signals to Pin 28 to 38 (see switching matrix).

Temperature compensated APD:

APD-PCBs allow the option to measure temperature using the LM20. At 25°C the LM20 provides 1.57 V output and has a scale factor of 11.77 mV/°C. This feature is useful to temperature compensate the APD bias if a DAC is used to set the HV by a μ Controller.