InGaAs APD Receiver with Amplifier



Description

This Series includes a InGaAs avalanche photodiode (APD) with a hybrid preamplifier, in the same hermetically-sealed TO-8 package, to allow for ultra-low noise operation. Our InGaAs APD, optimized at 1550 nm.

Features

- Fast response speed
- High detect sensitivity
- High reliability

E/O Characteristics

The Opto-electronic Characteristics(Tc=22± 3℃,VCC/VEE=±5V, AC Rl=50Ω)

Parameters	Symbol	Test conditions	Min	Typ	Max	Unit
Response Spectrum	λ	—	1000～1700			nm
Active Diameter	D	—	500			μm
Reverse breakdown voltage	VBR	DC ID=100μA,Optical Power φe=0	30		70	V
Operating voltage	VR	Avalanche Gain M=10	0.90×VR			V
Responsivity	RV	M=10,λ=1.55μm,pulse width TW=100ns，Output pulse inversion	300			kV/W
Dynamic range	DY	M=10,λ=1.55μm	25			dB
-3dB bandwidth	BW	M=10,λ=1.55μm,pulse width TW=100ns		40		MHz
Rise/Fall time	tr	M=10,λ=1.55μm,pulse width TW=100ns		7		ns

Noise Equivalent Power	NEP	M=10,f=100kHz,△f=1.0Hz	—	0.16	1	pW/ √Hz
Output impedance	RO	VCC/VEE=±5V	—		50	Ω
Output Voltage Swing	VO	-	0.7			V
Offset Voltage	Voffset	-		0		V
Positive Supply Current	ICC	VCC/VEE=±5V	—		30	mA
Negative Supply Current	IEE		—		10	mA
Temperature coefficient	σ	-55℃~+85℃		0.12		V/℃
Concentricity	△D	-			50	μm

The Absolute Values

Parameter	Symbol	Rating	Unit
APD voltage supply	VR	VBR	V
Operating temperature	TC	-45～+85	℃
Storage temperature	TSTG	-55～+100	℃
Maximum optical input power	Pin	100	mW
Module mains voltage	Vcc/VEE	±6	V
Power dissipation	Pw	250	mW
Soldering temperature(time)	-	300（10s）	℃

Block Diagram

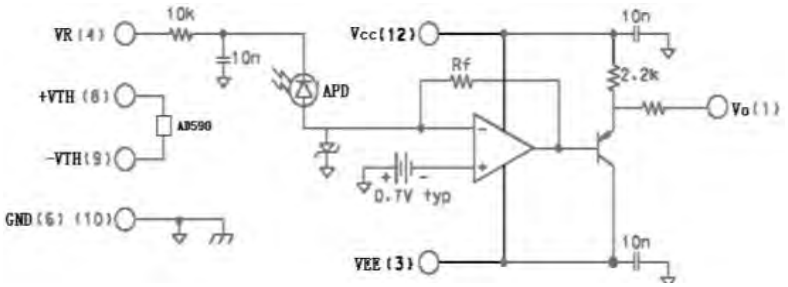


Figure1 Modle Circuit Drawing

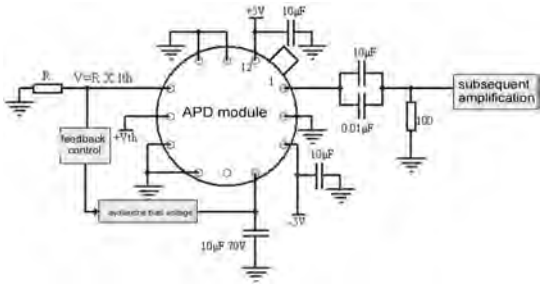


Figure2 Modle optical Drawing

Typical Performance Curves（Tc=22± 3℃,VCC/VEE=±5V, AC Rl=50Ω)

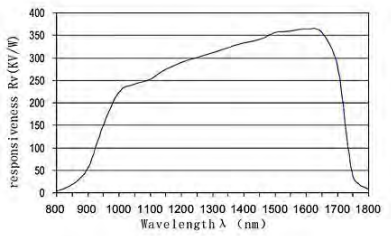


Figure3 Responsivity vs. Wavelength

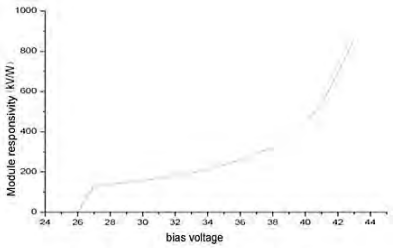


Figure4 Photo Current vs. Reverse Voltage

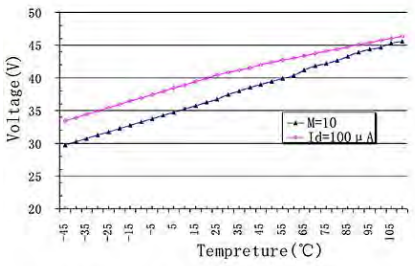


Figure5 Operating Voltage vs. Temperature

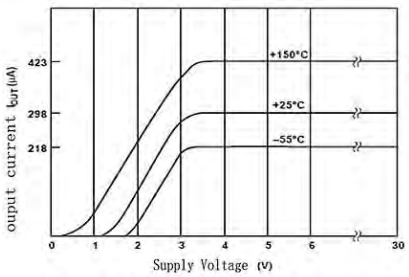


Figure6 AD590 Temperature transducer V-I Curver

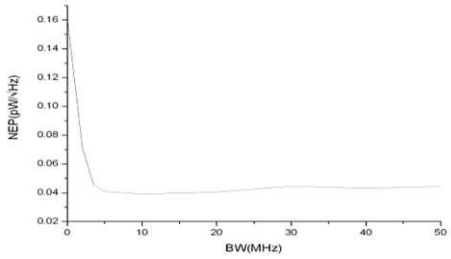
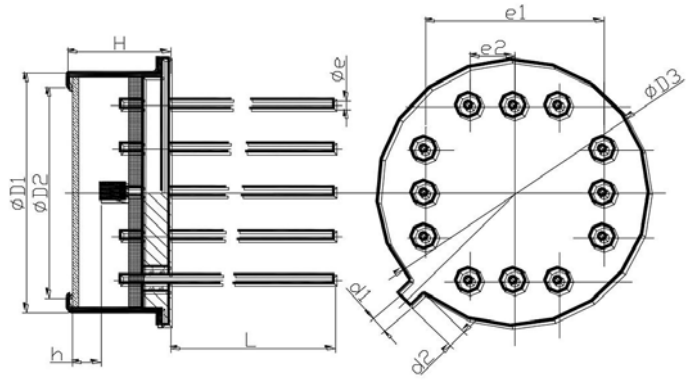


Figure7 Noise Equivalent Power vs. Bandwidth

Dimension

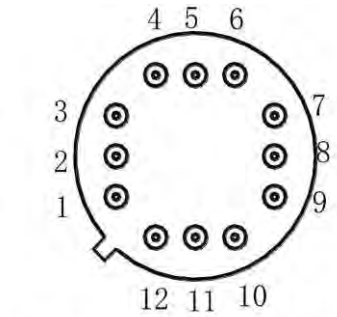


Unit (mm)

Symbol	ΦD1	ΦD2	H	Φe	ΦD3	L	e1	e2	d2	d1	h1)
Max	13.94	11.10	5.65	0.55	15.50	15	10.10	2.60	0.85	1.05	—
Typical	—	—	—	—	—	—	—	—	—	—	1.45
Min	13.90	10.90	5.25	0.45	15.20	10	9.90	2.40	0.75	0.95	—

**Note:
1.The optical distance (visible light) between the photosensitive surface and the outer surface of the optical window is h = 1.45 ± 0.1 mm;
2.The glass window has a thickness of 0.8 ± 0.02 mm and a refractive index of n = 1.47.**

Pin definition



Pin Configuration (Bottom View)

Pin Number	Pin Function	Pin Symbol
1	Output	V_{OUT}
2/6/10	GND	*GND*
5/7/11	Floating or Grounded	*N. C or GND*
3	Negative Power Supply	V_{EE}
4	APD Bias Operating Voltage	V_R
8	TS+	$+V_{TH}$
9	TS-	$-V_{TH}$
12	Positive Power Supply	V_{CC}

Caution

1. Pins are connected strictly according to pins illuminating,Load need large than 2kΩ when coupling output DC
2. It should be kept in storage at an environment that has -55～+100℃ and less than 80％ relative humidity,dryness,airiness，no caustic gas.
3. The suitable ESD protecting measures are recommend in storage,transporting and using
4. It's high voltage device,so we need proper design and measure to escape cause damage to human body when
using and operating

Application

- Laser range finder
- Laser alarming
- Laser communication,etc.application