

IAL-Series

Description

The IAL-series are general purpose InGaAs APDs with high responsivity and extremely fast rise and fall times throughout the 800 to 1700 nm wavelength range. The peak responsivity at 1550 nm is ideally suited to eye-safe rangefinding applications, free space optical communications, OTDR, and high-resolution Optical Coherence Tomography.

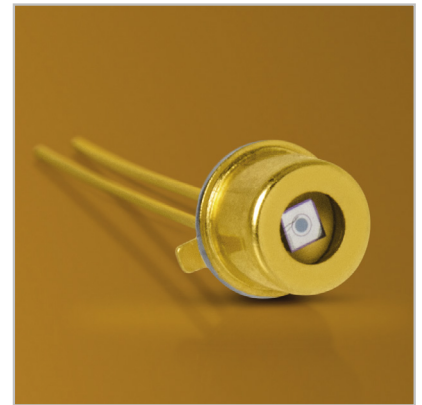
The chip is hermetically sealed in a modified TO-46 package. SMD and pigtailed options are also available.

Features

- 200 μm or 500 μm active area
- Bandwidth up to 2.5 GHz
- Over 70% QE from 1000 to 1600 nm
- Low dark current & noise
- Modified TO-46 or ceramic submount
- Fiber-coupled versions available

Applications

- Rangefinding
- Optical communication systems
- Optical coherence tomography
- Low-light-level detection



Generic Characteristics at $T = 21\text{ }^{\circ}\text{C}$

	IAL-Series			
	Min	Typ	Max	Units
Wavelength range	800		1700	nm
Peak sensitivity	Min	1550		nm

IAL200XX

Device Characteristics

Parameter	Condition	Min	Typ	Max	Unit
Active area diameter			200		µm
Wavelength range		800	–	1700	nm
Peak sensitivity		–	1550	–	nm
Capacitance	M = 10	–	2.4		pf
Voltage breakdown Temperature coefficient		–	0.11	0.15	V/°C
Bandwidth	M = 10; R _L = 50 Ω	–	0.6	–	GHz
Rise time	M = 10; R _L = 50 Ω	–	500	–	ps

Measured Characteristics

Parameter	Condition	Min	Typ	Max	Unit
Responsivity	M = 1; λ = 1550 nm	–	0.9	–	A/W
Dark current	V _{OP} ; 1550 nm	–	25	50	nA
Operating voltage	M = 10	36	51	56	V
Breakdown voltage	I _D = 10 µA	40	55	60	V

T_A = 25 °C unless indicated otherwise

Absolute Maximum Ratings

Parameter	Min	Max	Unit
Storage temperature	-45	100	°C
Operating temperature	-40	85	
Soldering (10 s)	–	260	
Max current	Forward	5	mA
Max current	Reverse	3	mA
Optical input	M = 10; 10 ns; 10 kHz	1	mW

Other options:

IAL080xx – Active Area Diameter 80 µm*

*Lead time may vary

IAL500XX

Device Characteristics

Parameter	Condition	Min	Typ	Max	Unit
Active area diameter			500		µm
Wavelength range		800	–	1700	nm
Peak sensitivity		–	1550	–	nm
Capacitance	M = 10	–	5		pf
Voltage breakdown Temperature coefficient		–	0.11	0.2	V/°C
Bandwidth	M = 10; R _L = 50 Ω	0.25	0.5	–	GHz
Excess noise factor	F @ M = 10	–	6		
Noise equivalent power	V _{op}	0.06	–	2	pW/rtHz
Rise time	M = 10; R _L = 50 Ω	–	700	–	ps

Measured Characteristics

Parameter	Condition	Min	Typ	Max	Unit
Responsivity	M = 1; λ = 1550 nm	–	0.9	–	A/W
Dark current	V _{OP} ; 1550 nm	–	40	250	nA
Operating voltage	M = 10	37	52	57	V
Breakdown voltage	I _D = 10 µA	40	55	60	V

T_A = 25 °C unless indicated otherwise

Absolute Maximum Ratings

Parameter		Min	Max	Unit
Storage temperature		-45	100	°C
Operating temperature		-40	85	
Soldering (10 s)		–	260	
Max current	Forward		5	mA
Max current	Reverse		3	mA
Optical input (average)	M = 10; 10 ns; 10 kHz	–	2	mW

Figure 1:
Spectral Response and Quantum Efficiency
($M = 10$ @ 1550 nm)

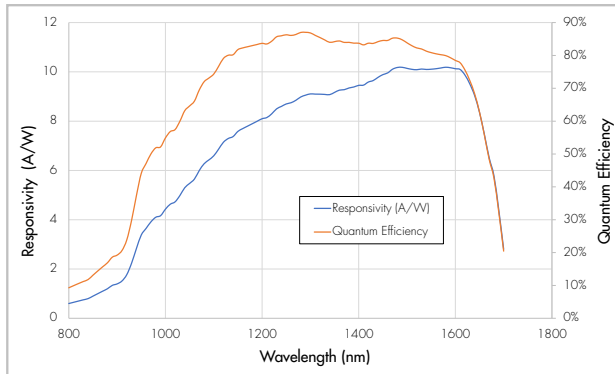


Figure 2:
Responsivity-Voltage Characteristics (25 °C)

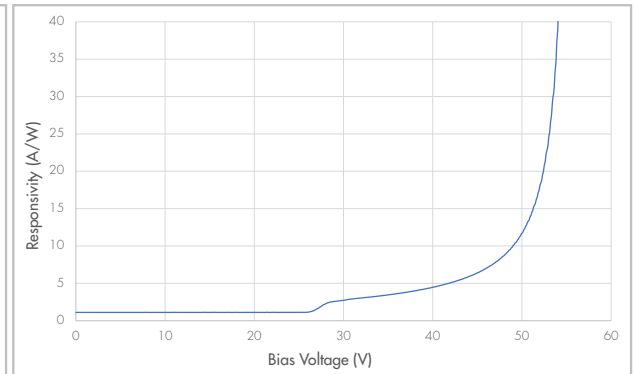


Figure 3:
Typical APD Noise Density as a Function of Gain

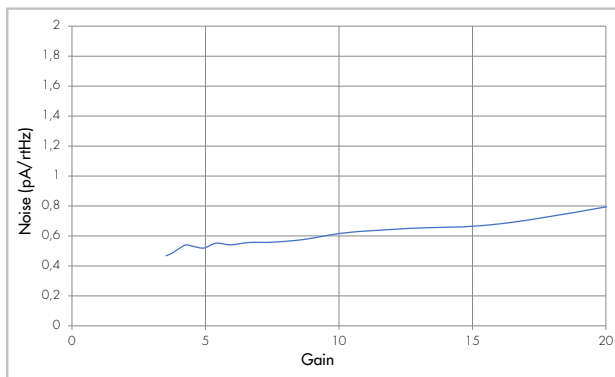


Figure 4:
Capacitance vs. Reverse Voltage

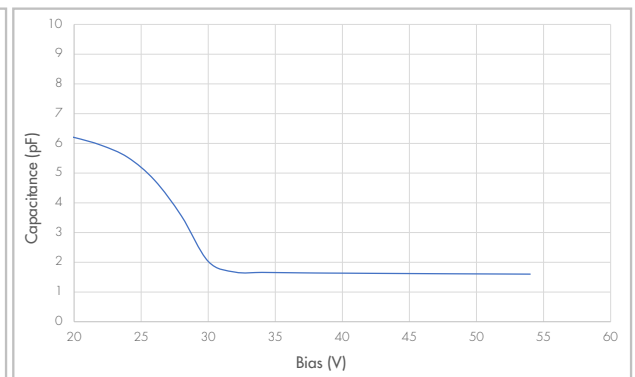
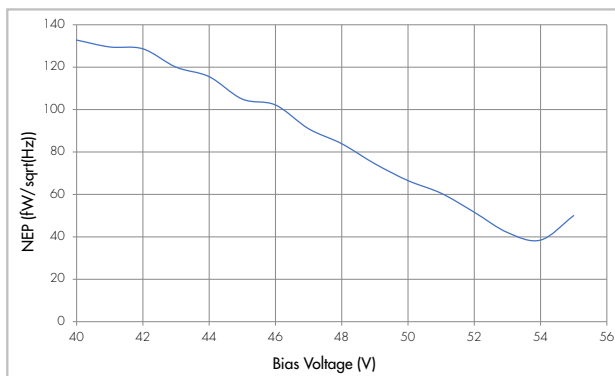
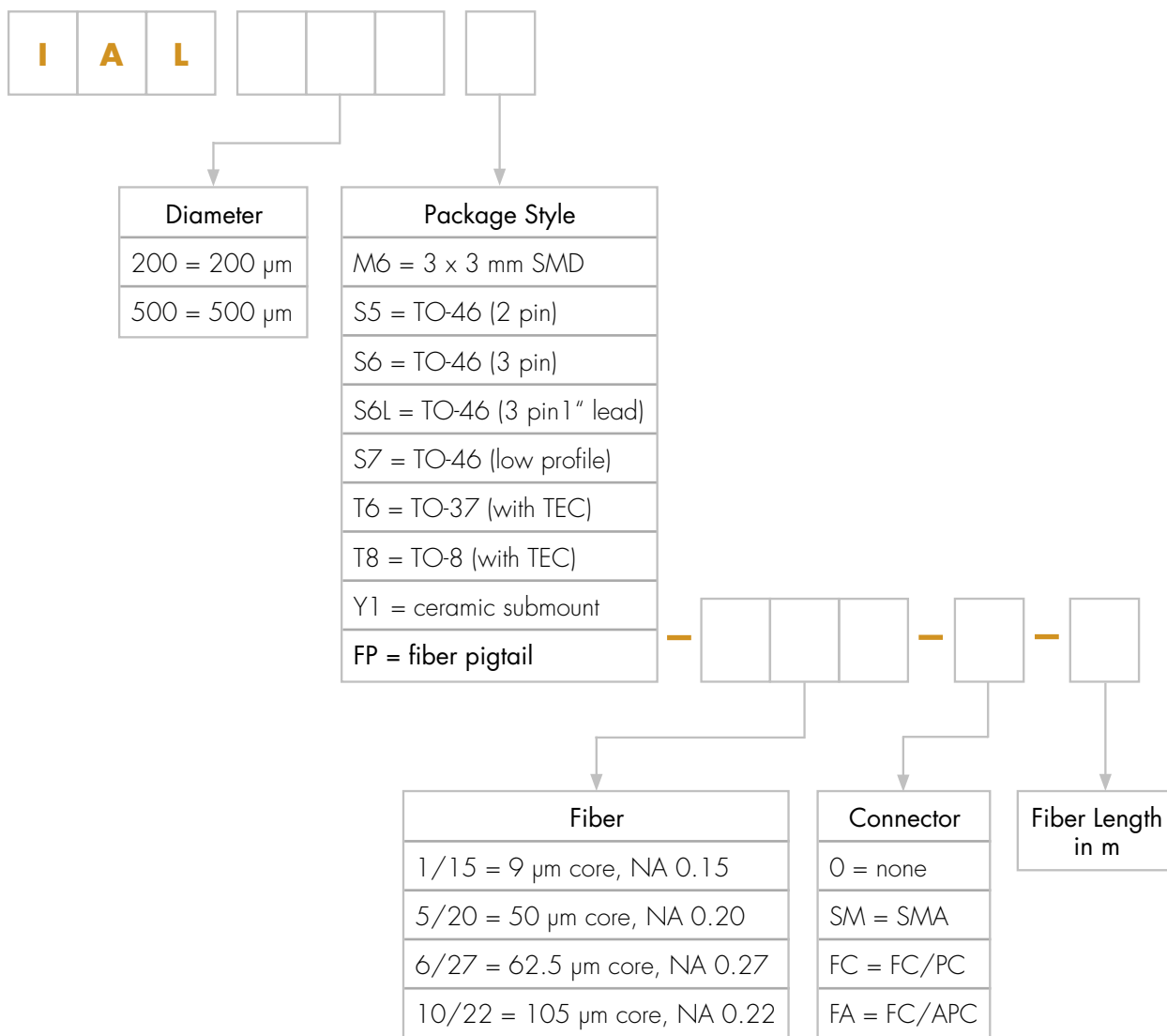


Figure 5:
NEP vs. Bias Voltage



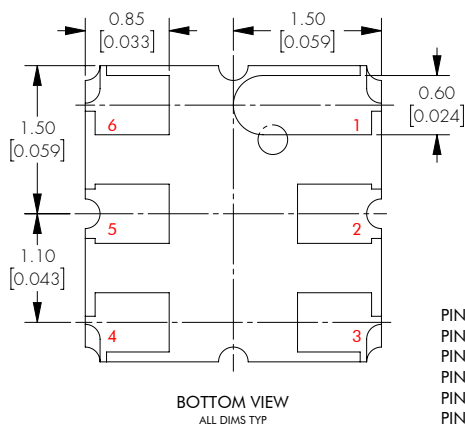
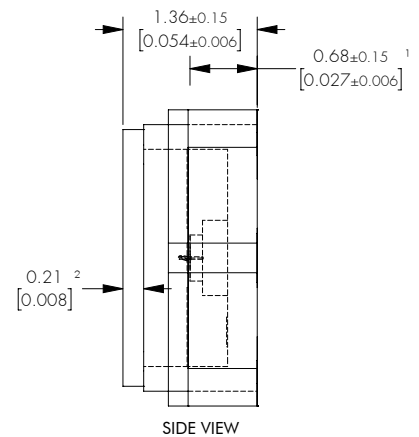
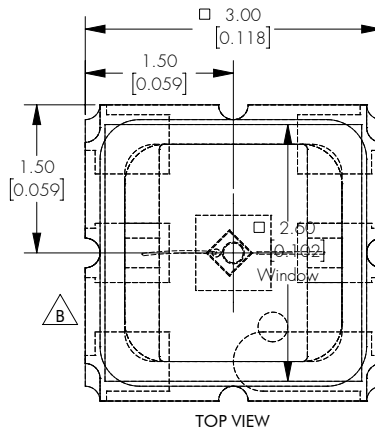
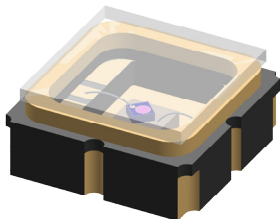
Product Number Designations



Note: other fibers and connectors are available on request.

Package Drawings

Package M6

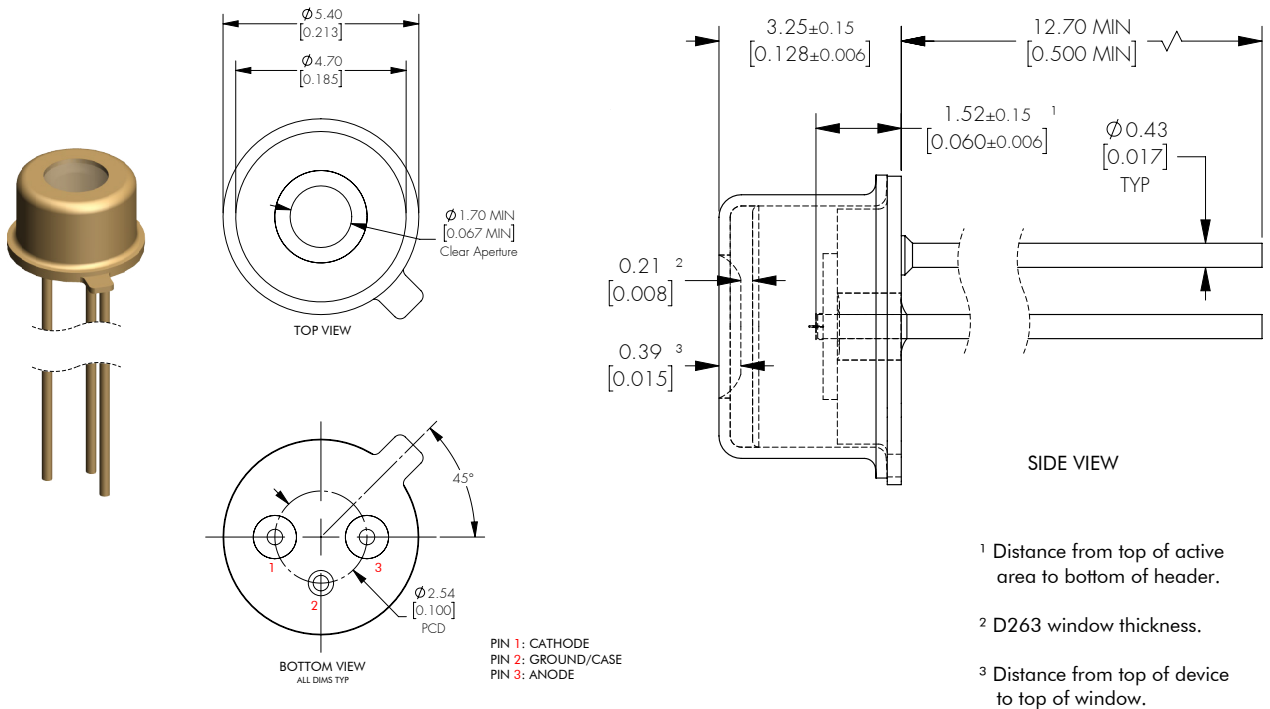


PIN 1: NC
PIN 2: CATHODE
PIN 3: NC
PIN 4: NC
PIN 5: ANODE
PIN 6: NC

¹ Distance from top of active area to bottom of header.

² BK7 window thickness.

Package S6 TO-46 (3-pin)



Other package options available on request.