

## InGaAs Avalanche Photodiodes (APD)

### InGaAs Avalanche Photodiodes

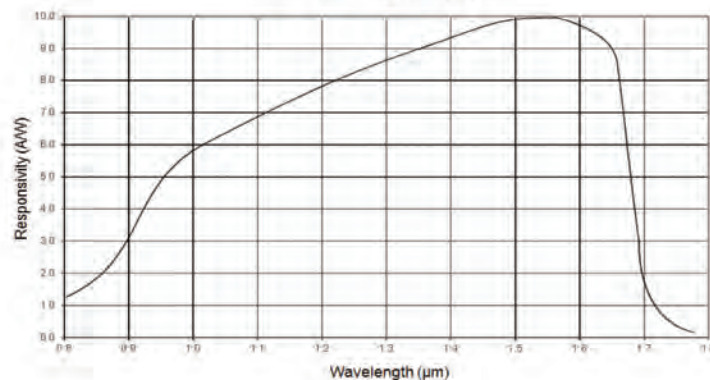
Electrical Characteristics @ 23 °C ± 2 °C

Performance Specification	IAV80	IAV200	IAV350	Units
Active Diameter	80	200	350	μm
Wavelength Range	1.0 - 1.63	1.0 - 1.63	1000 to 1630	μm
Responsivity @ M=1 @ 1.55 μm	0.85 min 0.90 typ  0.95 max	0.85 min 0.94 typ 1.05 max	0.85 min 0.90 typ 0.95 max	A/W
Dark Current @ M = 10	4 typ 15 max	8 typ 25 max	30 typ 250 max	nA
Operating Voltage, V <sub>R</sub> @ M = 10	43 min 55 typ 70 max	43 min 55 typ 70 max	37 min 52 typ 68 max	V
Breakdown Voltage, V <sub>BR</sub> (I <sub>D</sub> =10 μA)	40 min 65 typ 80 max	50 min 63 typ 75 max	45 min 60 typ 75 max	V
Capacitance @ M = 10	0.35 min 0.38 typ 0.45 max	1.8 typ 2.2 max	3.2 typ 4.0 max	pF
V <sub>BR</sub> temperature coefficient	0.06 typ	0.075 typ 0.08 max	0.075 typ	V/°C
Bandwidth @ M = 5	2 min 2.5 typ 3 max	0.5 min 1.5 typ 2 max	0.6 typ	GHz
Bandwidth @ M = 10	1 min 1.5 typ 2 max	1 min 1.5 typ 2 max	0.6 typ	GHz
Bandwidth @ M = 20	1.5 min 2.2 typ 2.5 max	0.5 min 1 typ 1.5 max	0.6 typ	GHz
Excess Noise Factor, F @ M = 10	3.2 typ 3.7 max	3.2 typ 3.7 max	3.2 typ 3.7 max	
Excess Noise Factor, F @ M = 20	5.5 typ 6 max	5.5 typ 6 max	5.5 typ 6 max	
Noise Equivalent Power, @ M = 10	10 typ 40 max	32 typ 100 max	80 typ 100 max	fW/Hz <sup>1/2</sup>
Package	TO-46 window cap	TO-46 window cap	TO-46 window cap	

### Maximum Ratings

Performance Specification	IAV80	IAV200	IAV350	Units
Storage Temperature	-40 to 85	-40 to 85	-40 to 85	°C
Operating Temperature	-40 to 70	-40 to 70	-40 to 70	°C
Reverse Current	1	1	1	mA
Forward Current	10	10	10	mA
Optical Input Density (10 ns pulse width)	200	200	200	kW/cm <sup>2</sup>
Optical Input (average)	1	1	1	mW

InGaAs APD Spectral Response  
(M = 10 @ 1.55 μm)





## GPD Optoelectronics Corp.

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IAV81  
IAV82  
IAV80BL  
IAV80PTS

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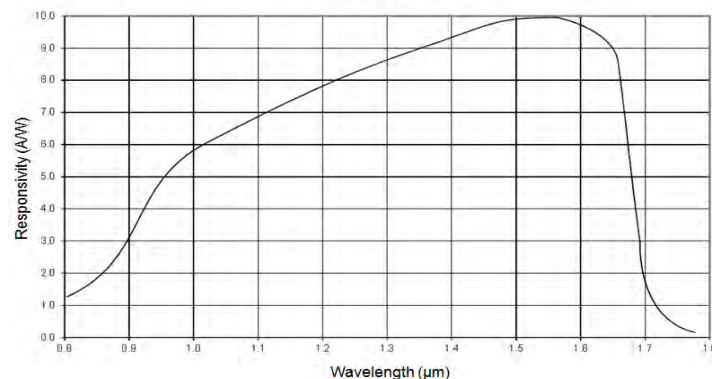
#### Electrical Characteristics @ 23 °C ± 2 °C

Performance Specification	IAV81	IAV82	IAV80BL	IAV80PTS	Units
Active Diameter	80	80	80	80	μm
Wavelength Range	1.0 - 1.63	1.0 - 1.63	1.0 - 1.63	1.0 - 1.63	μm
Responsivity @ M=1 @ 1.55 μm	0.85 min 0.90 typ  0.95 max	0.85 min 0.90 typ  0.95 max	0.85 min 0.90 typ  0.95 max	0.85 min 0.90 typ  0.95 max	A/W
Dark Current @ M = 10	4 typ 15 max	4 typ 15 max	4 typ 15 max	4 typ 15 max	nA
Operating Voltage, V <sub>R</sub> @ M = 10	43 min 55 typ 70 max	43 min 55 typ 70 max	43 min 55 typ 70 max	43 min 55 typ 70 max	V
Breakdown Voltage, V <sub>BR</sub> (I <sub>D</sub> =10 μA)	40 min 65 typ 80 max	40 min 65 typ 80 max	40 min 65 typ 80 max	40 min 65 typ 80 max	V
Capacitance @ M = 10	0.35 min 0.38 typ 0.45 max	0.35 min 0.38 typ 0.45 max	0.35 min 0.38 typ 0.45 max	0.35 min 0.38 typ 0.45 max	pF
V <sub>BR</sub> temperature coefficient	0.06 typ	0.06 typ	0.06 typ	0.06 typ	V/°C
Bandwidth @ M = 5	2 min 2.5 typ 3 max	2 min 2.5 typ 3 max	2 min 2.5 typ 3 max	2 min 2.5 typ 3 max	GHz
Bandwidth @ M = 10	1 min 1.5 typ 2 max	1 min 1.5 typ 2 max	1 min 1.5 typ 2 max	1 min 1.5 typ 2 max	GHz
Bandwidth @ M = 20	1.5 min 2.2 typ 2.5 max	1.5 min 2.2 typ 2.5 max	1.5 min 2.2 typ 2.5 max	1.5 min 2.2 typ 2.5 max	GHz
Excess Noise Factor, F @ M = 10	3.2 typ 3.7 max	3.2 typ 3.7 max	3.2 typ 3.7 max	3.2 typ 3.7 max	
Excess Noise Factor, F @ M = 20	5.5 typ 6 max	5.5 typ 6 max	5.5 typ 6 max	5.5 typ 6 max	
Noise Equivalent Power, @ M = 10	10 typ 40 max	10 typ 40 max	10 typ 40 max	10 typ 40 max	fW/Hz <sup>1/2</sup>
Package	Ceramic submount w/ ball lens	Ceramic submount	TO-46 w/ AR coated ball lens cap	TO-46 w/ singlemode fiber	

#### Maximum Ratings

Performance Specification	IAV81	IAV82	IAV80BL	IAV80PTS	Units
Storage Temperature	-40 to 85	-40 to 85	-40 to 85	-40 to 85	°C
Operating Temperature	-40 to 70	-40 to 70	-40 to 70	-40 to 70	°C
Reverse Current	1	1	1	1	mA
Forward Current	10	10	10	10	mA
Optical Input Density (10 ns pulse width)	200	200	200	200	kW/cm <sup>2</sup>
Optical Input (average)	1	1	1	1	mW

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IAV202  
IAV203  
IAV204  
IAV205

### InGaAs Avalanche Photodiodes

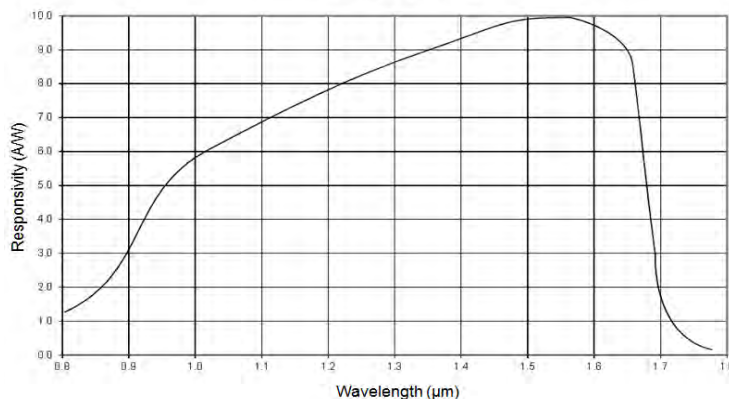
#### Electrical Characteristics @ 23 °C ± 2 °C

Performance Specification	IAV202	IAV203	IAV204	IAV205	Units
Active Diameter	200	200	200	200	μm
Wavelength Range	1.0 - 1.63	1.0 - 1.63	1.0 - 1.63	1.0 - 1.63	μm
Responsivity @ M=1 @ 1.55 μm	0.85 min 0.94 typ 1.05 max	0.85 min 0.90 typ 0.95 max	0.85 min 0.90 typ 0.95 max	0.85 min 0.90 typ 0.95 max	A/W
Dark Current @ M = 10	8 typ 25 max	8 typ 25 max	8 typ 25 max	8 typ 25 max	nA
Operating Voltage, V <sub>R</sub> @ M = 10	43 min 55 typ 70 max	43 min 55 typ 70 max	43 min 55 typ 70 max	43 min 55 typ 70 max	V
Breakdown Voltage, V <sub>BR</sub> (I <sub>D</sub> =10 μA)	50 min 63 typ 75 max	50 min 63 typ 75 max	50 min 63 typ 75 max	50 min 63 typ 75 max	V
Capacitance @ M = 10	1.8 typ 2.2 max	1.8 typ 2.2 max	1.8 typ 2.2 max	1.8 typ 2.2 max	pF
V <sub>BR</sub> Temperature Coefficient	0.075 typ 0.08 max	0.075 typ 0.08 max	0.075 typ 0.08 max	0.075 typ 0.08 max	V/°C
Bandwidth @ M = 5	0.5 min 1.5 typ 2 max	0.5 min 1.5 typ 2 max	0.5 min 1.5 typ 2 max	0.5 min 1.5 typ 2 max	GHz
Bandwidth @ M = 10	1 min 1.5 typ 2 max	1 min 1.5 typ 2 max	1 min 1.5 typ 2 max	1 min 1.5 typ 2 max	GHz
Bandwidth @ M = 20	0.5 min 1 typ 1.5 max	0.5 min 1 typ 1.5 max	0.5 min 1 typ 1.5 max	0.5 min 1 typ 1.5 max	GHz
Excess Noise Factor, F @ M = 10	3.2 typ 3.7 max	3.2 typ 3.7 max	3.2 typ 3.7 max	3.2 typ 3.7 max	
Excess Noise Factor, F @ M = 20	5.5 typ 6 max	5.5 typ 6 max	5.5 typ 6 max	5.5 typ 6 max	
Noise Equivalent Power, @ M = 10	32 typ 100 max	32 typ 100 max	32 typ 100 max	32 typ 100 max	fW/Hz <sup>1/2</sup>
Package	Ceramic Package	TO-46 2 lead	TO-46 aperture cap	TO-46 2 lead aperture cap	

#### Maximum Ratings

Performance Specification	IAV202	IAV203	IAV204	IAV205	Units
Storage Temperature	-40 to 70	-40 to 70	-40 to 70	-40 to 70	°C
Operating Temperature	-40 to 85	-40 to 85	-40 to 85	-40 to 85	°C
Reverse Current	1	1	1	1	mA
Forward Current	10	10	10	10	mA
Optical Input Density (10 ns pulse width)	200	200	200	200	kW/cm <sup>2</sup>
Optical Input (average)	1	1	1	1	mW

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IAV350  
IAV352  
IAV353

## InGaAs Avalanche Photodiodes

Electrical Characteristics @ 23 °C ± 2 °C

Performance Specification	IAV350	IAV352	IAV353	Units
Active Diameter	350	350	350	μm
Wavelength Range	1000 to 1630	1000 to 1630	1000 to 1630	nm
Responsivity @ M=1 @ 1550 nm	0.85 min 0.90 typ 0.95 max	0.85 min 0.90 typ 0.95 max	0.85 min 0.90 typ 0.95 max	A/W
Dark Current @ M = 10	30 typ 250 max	30 typ 250 max	30 typ 250 max	nA
Operating voltage, V <sub>R</sub> @ M = 10	37 min 52 typ 68 max	37 min 52 typ 68 max	37 min 52 typ 68 max	V
Breakdown Voltage, V <sub>BR</sub> (I <sub>D</sub> =10 μA)	45 min 60 typ 75 max	45 min 60 typ 75 max	45 min 60 typ 75 max	V
Capacitance @ M = 10	3.2 typ 4.0 max	3.2 typ 4.0 max	3.2 typ 4.0 max	pF
VBR temperature coefficient	0.075 typ	0.075 typ	0.075 typ	V/°C
Bandwidth @ M = 5	0.6 typ	0.6 typ	0.6 typ	GHz
Bandwidth @ M = 10	0.6 typ	0.6 typ	0.6 typ	GHz
Bandwidth @ M = 20	0.6 typ	0.6 typ	0.6 typ	GHz
Excess Noise Factor, F @ M = 10	3.2 typ 3.7 max	3.2 typ 3.7 max	3.2 typ 3.7 max	
Excess Noise Factor, F @ M = 20	5.5 typ 6 max	5.5 typ 6 max	5.5 typ 6 max	
Noise Equivalent Power, @ M = 10	80 typ 100 max	80 typ 100 max	80 typ 100 max	fW/Hz <sup>1/2</sup>
Package	TO-46-3 pin	Ceramic submount	Wrap Around Ceramic	

### Maximum Ratings

	IAV350	IAV352	IAV353	Units
Storage Temperature	-40 to 85	-40 to 85	-40 to 85	°C
Operating Temperature	-40 to 70	-40 to 70	-40 to 70	°C
Reverse Current	1	1	1	mA
Forward Current	10	10	10	mA
Optical Input Density (10 ns pulse width)	200	200	200	kW/cm <sup>2</sup>
Optical Input (average)	0	0	0	dBm

InGaAs APD Spectral Response  
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