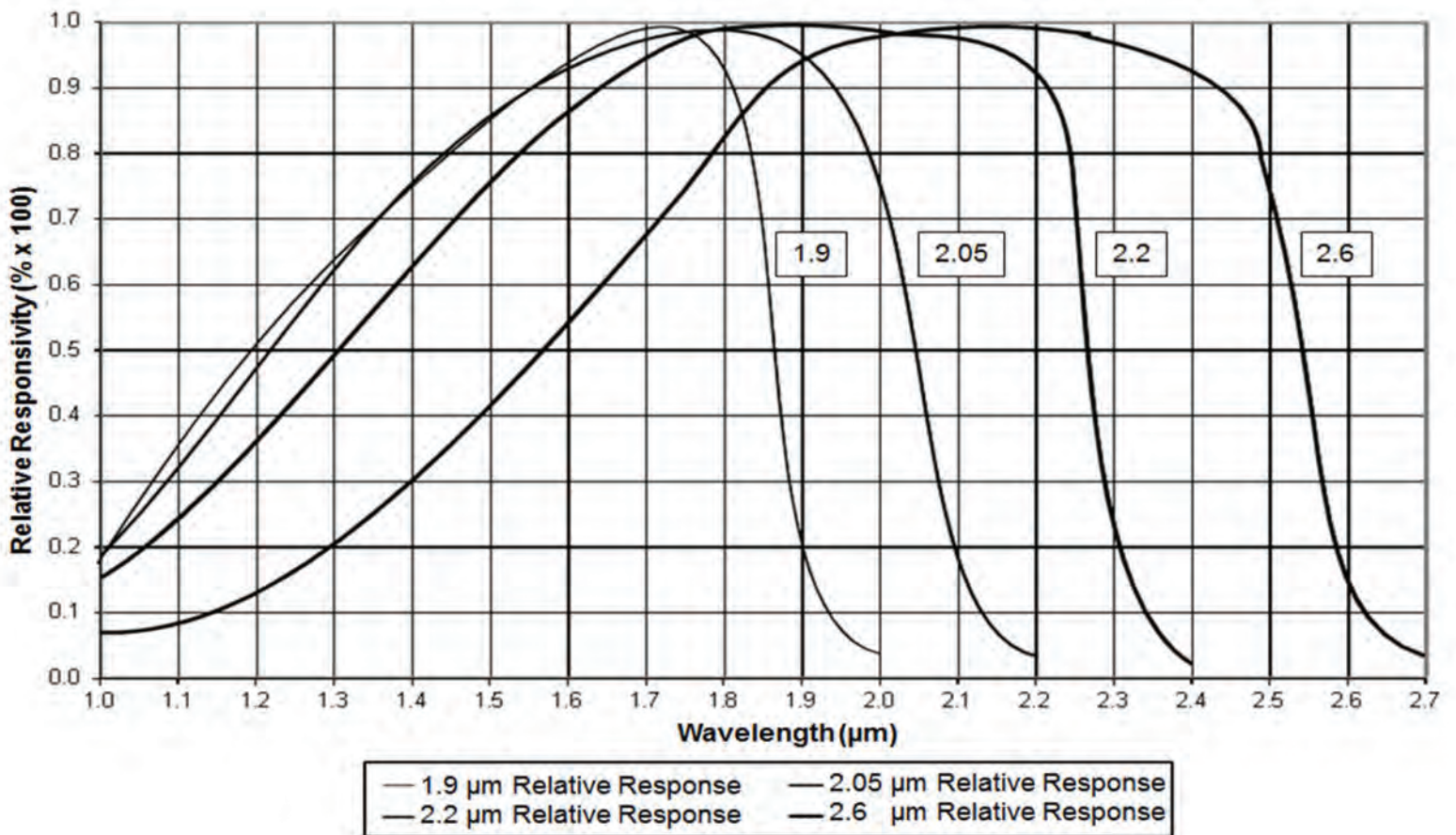
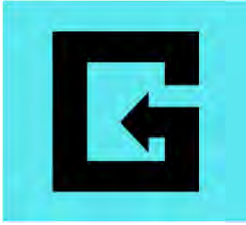


# Extended InGaAs Photodiodes

Extended 1.9 - 2.6  $\mu\text{m}$  InGaAs Photodiode Relative Responsivity





# GPD Optoelectronics Corp.

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GAP300/1.9  
GAP500/1.9  
GAP1000/1.9  
GAP2000/1.9  
GAP3000/1.9

## 1.9 $\mu\text{m}$ Extended Response

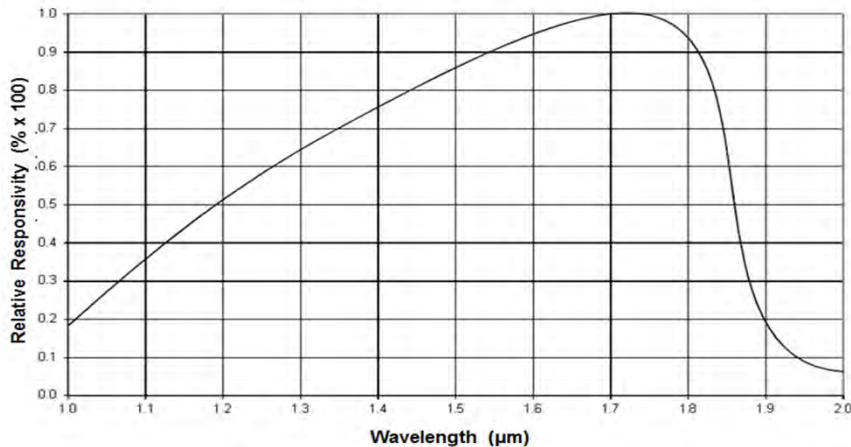
### Electrical Characteristics @ 23 $^{\circ}\text{C} \pm 2$ $^{\circ}\text{C}$

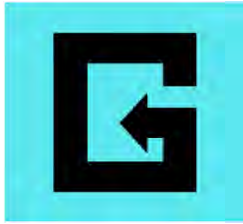
Performance Specification	GAP300/1.9	GAP500/1.9	GAP1000/1.9	GAP2000/1.9	GAP3000/1.9	Units
Active Diameter	0.3	0.5	1	2	3	mm
Peak Wavelength (typ)	$1.7 \pm 0.1$	$1.7 \pm 0.1$	$1.7 \pm 0.1$	$1.7 \pm 0.1$	$1.7 \pm 0.1$	$\mu\text{m}$
Cutoff Wavelength (50%)	$1.9 \pm 0.1$	$1.9 \pm 0.1$	$1.9 \pm 0.1$	$1.9 \pm 0.1$	$1.9 \pm 0.1$	$\mu\text{m}$
Responsivity @ $\lambda_p$ (min/typ)	0.9/1.0	0.9/1.0	0.9/1.0	0.9/1.0	0.9/1.0	A/W
Shunt Resistance (min)	15	2	1	0.25	0.11	M $\Omega$
Dark Current (max)	0.1 @ 1 V	0.9 @ 1 V	4 @ 1 V	10 @ 1 V	22.5 @ 0.5 V	$\mu\text{A}$
Capacitance (typ) @ 0 V	60	200	600	3000	6750	pF
Bandwidth w/ 50 $\Omega$ @ 0 V (typ)	53	16	5.3	1.1	0.47	MHz
Rise time w/ 50 $\Omega$ @ 0 V (typ)	6.6	22	66	330	742	ns
NEP @ $\lambda_{\text{PEAK}}$ (typ)	$3 \times 10^{-14}$	$9 \times 10^{-14}$	$12.8 \times 10^{-14}$	$26 \times 10^{-14}$	$38 \times 10^{-14}$	W/Hz <sup>1/2</sup>
Linearity ( $\pm 0.2$ dB @ 0 V)	6	6	6	6	6	dBm
Case Style	TO-46	TO-46	TO-46	TO-5	TO-5	

### Maximum Ratings

Performance Specification	GAP300/1.9	GAP500/1.9	GAP1000/1.9	GAP2000/1.9	GAP3000/1.9	Units
Storage Temperature	-40 to 125	-40 to 125	-40 to 125	-40 to 125	-40 to 125	$^{\circ}\text{C}$
Operating Temperature	-40 to 85	-40 to 85	-40 to 85	-40 to 85	-40 to 85	$^{\circ}\text{C}$
Reverse Voltage	3	2	2	2	1	V
Reverse Current	10	10	10	10	10	mA
Forward Current	10	10	10	10	10	mA
Power Dissipation	50	50	50	50	50	mW

**Extended 1.9  $\mu\text{m}$  InGaAs Photodiode Relative Responsivity**





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GAP300/2.05  
 GAP500/2.05  
 GAP1000/2.05  
 GAP2000/2.05  
 GAP3000/2.05

### 2.05 $\mu\text{m}$ Extended Response

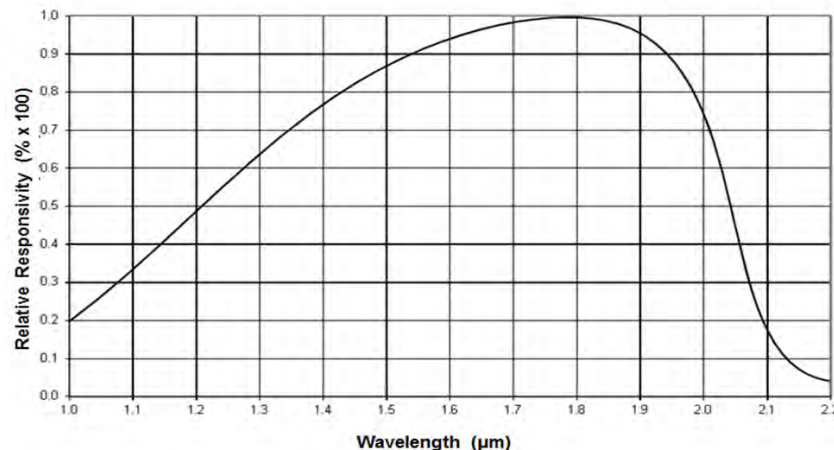
Electrical Characteristics @ 23 °C  $\pm$  2 °C

Performance Specification	GAP300/2.05	GAP500/2.05	GAP1000/2.05	GAP2000/2.05	GAP3000/2.05	Units
Active Diameter	0.3	0.5	1	2	3	mm
Peak Wavelength (typ)	1.8 $\pm$ 0.1	1.8 $\pm$ 0.1	1.8 $\pm$ 0.1	1.8 $\pm$ 0.1	1.8 $\pm$ 0.1	$\mu\text{m}$
Cutoff Wavelength (50%)	2.05 $\pm$ 0.1	2.05 $\pm$ 0.1	2.05 $\pm$ 0.1	2.05 $\pm$ 0.1	2.05 $\pm$ 0.1	$\mu\text{m}$
Responsivity @ $\lambda_p$ (min/typ)	0.9/1.0	0.9/1.0	0.9/1.0	0.9/1.0	0.95/1.1	A/W
Shunt Resistance (min/typ)	2M/5M	1M/2.5M	0.3M (min)	90k (min)	15k/20k	$\Omega$
Dark Current (max)	0.5 @ 1 V	1 @ 1 V	4 @ 1 V	10	12 @ 0.5 V	$\mu\text{A}$
Capacitance (typ) @ 0 V	80	250	500	1600	4000	pF
Bandwidth w/ 50 $\Omega$ @ 0 V (typ)	40	12.7	6.4	2	0.8	MHz
Rise time w/ 50 $\Omega$ @ 0 V (typ)	9	27.5	55	176	440	ns
NEP @ $\lambda_{PEAK}$ (typ)	5.7 $\times 10^{-14}$	8.1 $\times 10^{-14}$	23.4 $\times 10^{-14}$	42.8 $\times 10^{-14}$	90.7 $\times 10^{-14}$	W/Hz <sup>1/2</sup>
Linearity ( $\pm$ 0.2 dB @ 0 V)	6	6	6	6	6	dBm
Case Style	TO-46	TO-46	TO-46	TO-5	TO-5	

### Maximum Ratings

Performance Specification	GAP300/2.05	GAP500/2.05	GAP1000/2.05	GAP2000/2.05	GAP3000/2.05	Units
Storage Temperature	-40 to 125	-40 to 125	-40 to 125	-40 to 125	-40 to 125	°C
Operating Temperature	-40 to 85	-40 to 85	-40 to 85	-40 to 85	-40 to 85	°C
Reverse Voltage	2	2	2	2	1	V
Reverse Current	10	10	10	10	10	mA
Forward Current	10	10	10	10	10	mA
Power Dissipation	50	50	50	50	50	mW

**Extended 2.05  $\mu\text{m}$  InGaAs Photodiode Relative Responsivity**





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GAP300/2.2  
 GAP500/2.2  
 GAP1000/2.2  
 GAP2000/2.2  
 GAP3000/2.2

### 2.2 $\mu\text{m}$ Extended Response

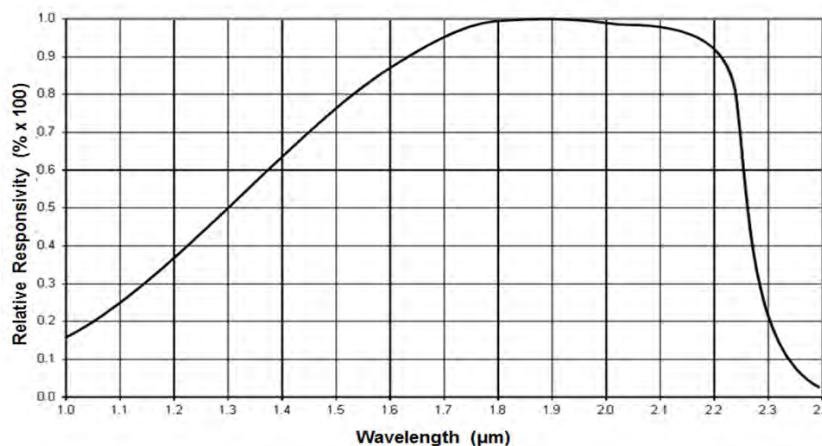
Electrical Characteristics @ 23 °C  $\pm$  2 °C

Performance Specification	GAP300/2.2	GAP500/2.2	GAP1000/2.2	GAP2000/2.2	GAP3000/2.2	Units
Active Diameter	0.3	0.5	1	2	3	mm
Peak Wavelength (typ)	2.0 $\pm$ 0.1	2.0 $\pm$ 0.1	2.0 $\pm$ 0.1	2.0 $\pm$ 0.1	2.0 $\pm$ 0.1	$\mu\text{m}$
Cutoff Wavelength (50%)	2.2 $\pm$ 0.1	2.2 $\pm$ 0.1	2.2 $\pm$ 0.1	2.2 $\pm$ 0.1	2.2 $\pm$ 0.1	$\mu\text{m}$
Responsivity @ $\lambda_p$ (min/typ)	0.9/1.0	0.9/1.0	0.9/1.0	0.9/1.0	0.9/1.0	A/W
Shunt Resistance (min/typ)	0.5M/0.8M	0.18M/0.33M	40k/75k	6k/10k	2k/6k	$\Omega$
Dark Current (max)	1 @ 1 V	5 @ 1 V	10 @ 1 V	40 @ 1 V	100 @ 1 V	$\mu\text{A}$
Capacitance (typ) @ 0 V	90	275	1000	4000	8000	pF
Bandwidth w/ 50 $\Omega$ @ 0 V (typ)	35	11.6	3.18	0.795	0.397	MHz
Rise time w/ 50 $\Omega$ @ 0 V (typ)	10	30	110	440	881	ns
NEP @ $\lambda_{PEAK}$ (typ)	14.3x 10 <sup>-14</sup>	22.3 x 10 <sup>-14</sup>	46.8 x 10 <sup>-14</sup>	128 x 10 <sup>-14</sup>	287 x 10 <sup>-14</sup>	W/Hz <sup>1/2</sup>
Linearity ( $\pm$ 0.2 dB @ 0 V)	6	6	6	6	6	dBm
Case Style	TO-46	TO-46	TO-46	TO-5	TO-5	

### Maximum Ratings

Performance Specification	GAP300/2.2	GAP500/2.2	GAP1000/2.2	GAP2000/2.2	GAP3000/2.2	Units
Storage Temperature	-40 to 125	-40 to 125	-40 to 125	-40 to 125	-40 to 125	°C
Operating Temperature	-40 to 85	-40 to 85	-40 to 85	-40 to 85	-40 to 85	°C
Reverse Voltage	2	2	1	1	1	V
Reverse Current	10	10	10	10	10	mA
Forward Current	10	10	10	10	10	mA
Power Dissipation	50	50	50	50	50	mW

**Extended 2.2  $\mu\text{m}$  InGaAs Photodiode Relative Responsivity**





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GAP300/2.6  
 GAP500/2.6  
 GAP1000/2.6  
 GAP2000/2.6  
 GAP3000/2.6

### 2.6 $\mu\text{m}$ Extended Response

Electrical Characteristics @ 23 °C  $\pm$  2 °C

Performance Specification	GAP300/2.6	GAP500/2.6	GAP1000/2.6	GAP2000/2.6	GAP3000/2.6	Units
Active Diameter	0.3	0.5	1	2	3	mm
Peak Wavelength (typ)	2.2 $\pm$ 0.1	2.2 $\pm$ 0.1	2.2 $\pm$ 0.1	2.2 $\pm$ 0.1	2.2 $\pm$ 0.1	$\mu\text{m}$
Cutoff Wavelength (50%)	2.6 $\pm$ 0.1	2.6 $\pm$ 0.1	2.6 $\pm$ 0.1	2.6 $\pm$ 0.1	2.6 $\pm$ 0.1	$\mu\text{m}$
Responsivity @ $\lambda_p$ (min/typ)	0.9/1.0	0.9/1.0	0.9/1.0	0.9/1.0	0.9/1.0	A/W
Shunt Resistance (min/typ)	16k/25k	5k/8k	2k/4k	0.5k/1.5k	0.2k/0.5k	$\Omega$
Dark Current (max)	13 @ 1 V	20 @ 0.5 V	80 @ 0.5 V	320 @ 0.5 V	500 @ 0.5 V	$\mu\text{A}$
Capacitance (typ) @ 0 V	100	270	1000	4400	10000	pF
Bandwidth w/ 50 $\Omega$ @ 0 V (typ)	32	16	3.2	0.8	0.35	MHz
Rise time w/ 50 $\Omega$ @ 0 V (typ)	11	22	110	440	1000	ns
NEP @ $\lambda_{PEAK}$ (typ)	81 x 10 <sup>-14</sup>	143 x 10 <sup>-14</sup>	203 x 10 <sup>-14</sup>	331 x 10 <sup>-14</sup>	574 x 10 <sup>-14</sup>	W/Hz <sup>1/2</sup>
Linearity ( $\pm$ 0.2 dB @ 0 V)	6	6	6	6	6	dBm
Case Style	TO-46	TO-46	TO-46	TO-5	TO-5	

### Maximum Ratings

Performance Specification	GAP300/2.6	GAP500/2.6	GAP1000/2.6	GAP2000/2.6	GAP3000/2.6	Units
Storage Temperature	-40 to 125	-40 to 125	-40 to 125	-40 to 125	-40 to 125	°C
Operating Temperature	-40 to 85	-40 to 85	-40 to 85	-40 to 85	-40 to 85	°C
Reverse Voltage	2	0.5	0.5	0.5	0.5	V
Reverse Current	10	10	10	10	10	mA
Forward Current	10	10	10	10	10	mA
Power Dissipation	50	50	50	50	50	mW

### Extended 2.6 $\mu\text{m}$ InGaAs Photodiode Relative Responsivity

