

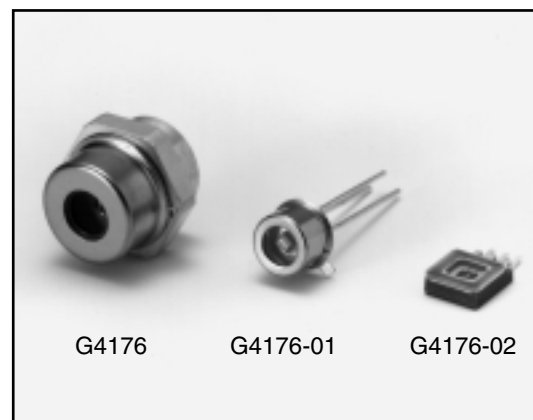
Ultrafast Response ($t_r, t_f = 30\text{ps}$ ^{G4176}), Low Dark Current

■FEATURES

- Ultrafast response
- Low dark current
- Large photosensitive area

■APPLICATIONS

- Optical high speed waveform measurement
- Optical communications



The G4176 is a GaAs MSM (Metal-Semiconductor-Metal) photodetector that achieves ultrafast response times of 30 ps (rise and fall) and a low dark current of 100 pA (at 25 °C).

The photosensitive area of the MSM photodetector is composed of symmetrical and interdigital Schottky contacts, and is relatively larger than other ultra fast photodetectors, thus facilitating coupling with an optical system. So, the MSM photodetector is ideal as an ultrafast detector for digital signal transmission in optical communications.

Additionally, both polarities of the bias voltage are available,

and each polarity of the output pulse can be obtained in response to the applied bias.

The G4176 series consists of various package styles: a coaxial metal package* facilitating connecting with an SMA connector (G4176: The bias-tee is necessary), a general purpose TO-18 package (G4176-01), and a small ceramic package (G4176-02). Fiber-pigtailed or optical connectorised types are also available for G4176 and G4176-01.

*Japanese Patent No.2070802

■ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

Parameter	Symbol	Condition	Value	Unit
Maximum Bias Voltage	V _{Bmax}		10	V
Maximum Light Input	L _{max}	Pulse width ≤ 1ns		
Pulsed Light		Pulse width > 1ns	50	mW
CW to Pulsed Light			5	mW
Operating Temperature	T _{opr}		-40 to +85	°C
Storage Temperature	T _{stg}		-40 to +100	°C

■General Characteristics (Ta=25°C)

Parameter	Symbol	Condition	Value	Unit
Spectral Response Range	λ	V _B =7V	450 to 870	nm
Peak Response Wavelength	λ _p	V _B =7V	850	nm
Effective Sensitive Area	A		0.2×0.2	mm ²
Chip Size			1×1	mm ²
Package				
G4176			TO-5 (Unified with SMA connector)	
G4176-01			TO-18	
G4176-02			Ceramic	

■ELECTRICAL AND OPTICAL CHARACTERISTICS (Ta=25°C, V_B=7V)

Parameter	Symbol	Condition	Value			Unit
			Min.	Typ.	Max.	
Radiant sensitivity	S	λ=850nm	0.2	0.3	-	A/W
Dark Current	I _D		-	100	300	pA
NEP**						
G4176		λ=850nm	-	3×10 ⁻¹⁵	-	W/Hz ^{1/2}
G4176-01			-	4×10 ⁻¹⁵	-	
G4176-02			-	4×10 ⁻¹⁵	-	
Terminal Capacitance	C _t					
G4176			-	0.3	0.4	pF
G4176-01			-	0.5	0.6	
G4176-02			-	0.8	1.0	
Rise Time	t _r					
G4176		10 to 90%	-	30	40	ps
G4176-01			-	50	80	
G4176-02			-	40	60	
Fall Time	t _f					
G4176		10 to 90%	-	30	40	ps
G4176-01			-	50	80	
G4176-02			-	40	60	

**Noise Equivalent Power

ULTRAFAST GaAs MSM PHOTODETECTORS G4176 SERIES

Figure 1: Optical Pulse Response

(Including time response of light source, bias-tee and oscilloscope)

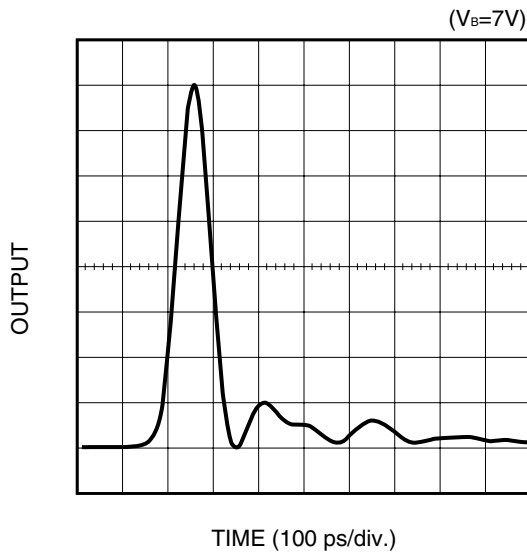


Figure 2: Spectral Response

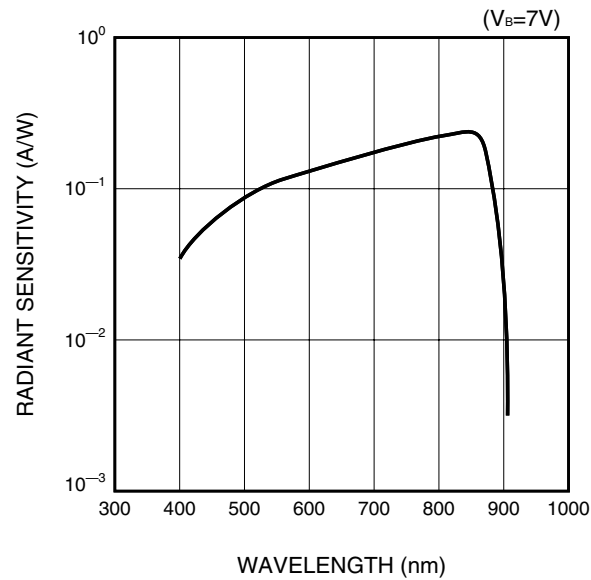
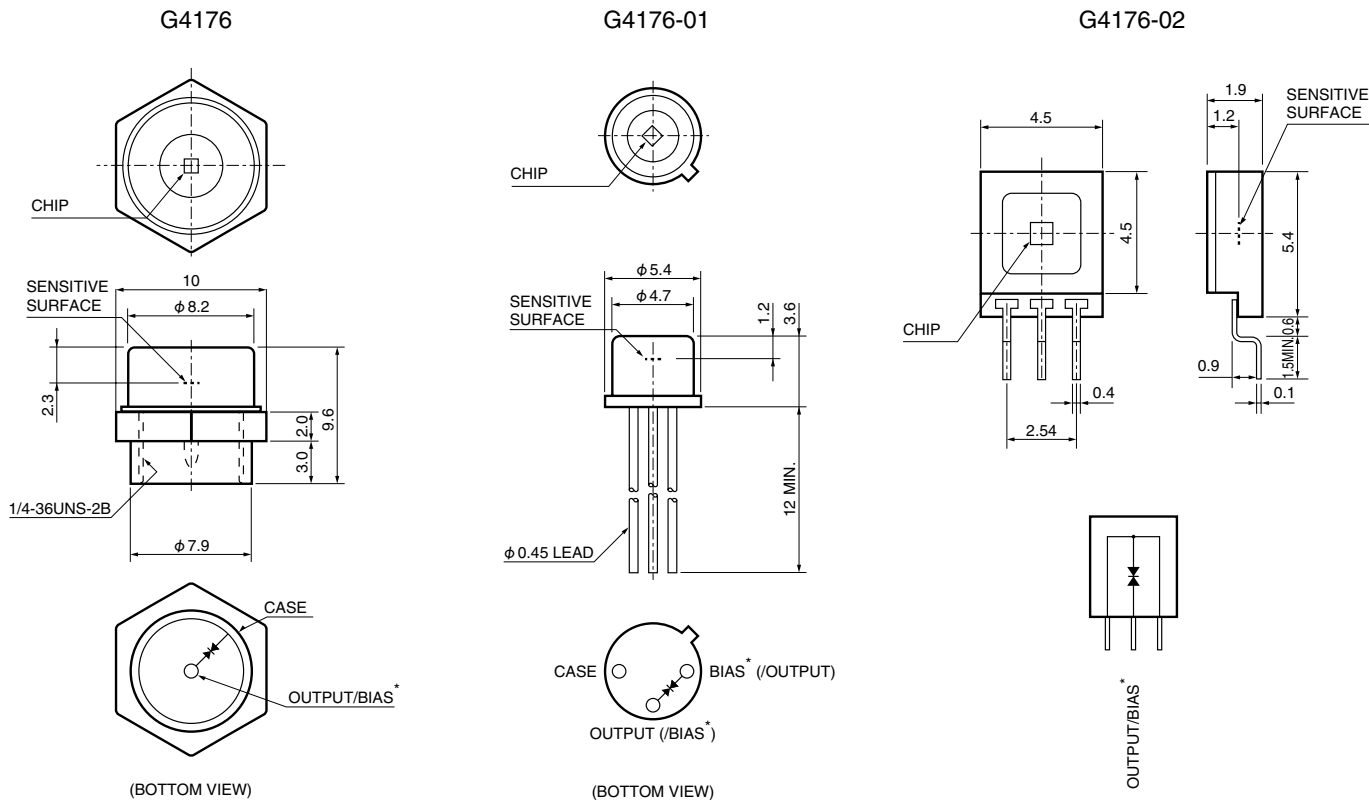


Figure 3: Dimensional Outline (Unit: mm)



* Both polarities of the bias voltage are available.

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