

FU-12AP-N/FU-316AP

APD MODULE FOR LONG WAVELENGTH BAND

DESCRIPTION

FU-12AP-N and FU-316AP are detector module containing highly reliable Ge APD (Avalanche photodiode) for long wavelength band (0.8~1.5 μ m) and has high-speed response.

These modules are used as detector for high-speed, long and medium haul optical communication systems.

FEATURES

- High-speed response ($f_c = 1\text{GHz}$)
- Low operating voltage
- High-responsivity (0.72A/W)
- Low dark current
- FU-12AP-N is FC receptacle type
FU-316AP is pigtail type

APPLICATION

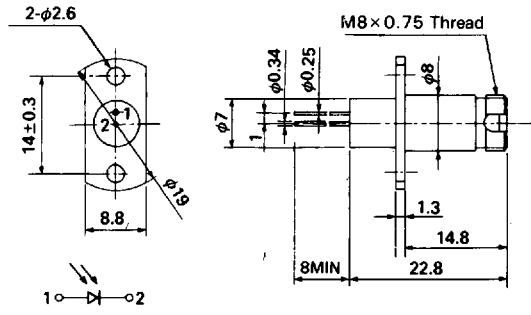
FitL, LAN, Picture transmission, Trunk Line

ABSOLUTE MAXIMUM RATINGS (T_c = 25°C)

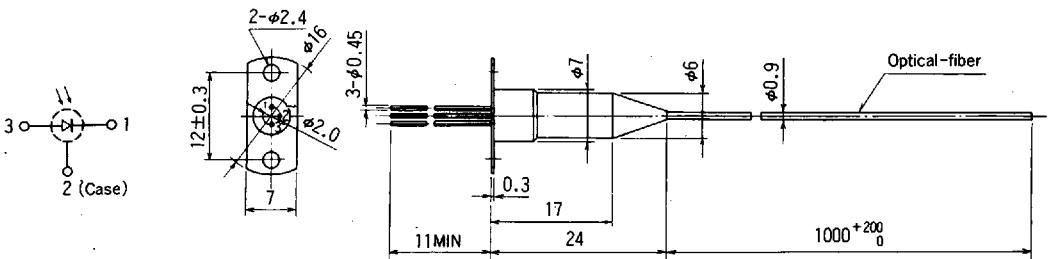
| Parameter | Symbol | Conditions | Rating | | Unit |
|----------------------------|------------------|------------|-----------|----------|------|
| | | | FU-12AP-N | FU-316AP | |
| Reverse current | I _R | - | 1 | 1 | mA |
| Forward current | I _F | - | 100 | 100 | mA |
| Operating case temperature | T _C | - | -30~+70 | -40~+85 | °C |
| Storage temperature | T _{stg} | - | -40~+70 | -40~+85 | °C |

OUTLINE DIAGRAM

(Unit : mm)



FU-12AP-N



FU-316AP

FU-12AP-N/FU-316AP

APD MODULE FOR LONG WAVELENGTH BAND

ELECTRICAL OPTICAL CHARACTERISTICS (T_c = 25°C, unless otherwise noted)

| Parameter | Symbol | Test conditions | Limits | | | | | | Unit |
|---|-----------------|--|-----------|-------------------|------|----------|-------------------|------|------|
| | | | FU-12AP-N | | | FU-316AP | | | |
| | | | Min. | Typ. | Max. | Min. | Typ. | Max. | |
| Detection range | - | - | 800~1500 | | | 800~1500 | | | nm |
| Responsivity (Note 1) | R | λ = 1300nm, V _R = 10V | 0.68 | 0.72 | - | 0.68 | 0.72 | - | A/W |
| Breakdown voltage | V _{BR} | I _D = 100μA | 25 | 30 | 40 | 25 | 30 | 40 | V |
| Temperature coefficient of breakdown voltage (Note 2) | β | - | - | 0.1 | - | - | 0.1 | - | %/°C |
| Dark current | I _D | V _R = 0.9V _{BR} | - | 0.3 | 0.5 | - | 0.3 | 0.5 | μA |
| Excess noise factor | F | λ = 1300nm, M = 10 (Note 3) I _{PO} = 2μA, B = 1MHz | - | M ^{0.95} | - | - | M ^{0.95} | - | - |
| Cutoff frequency (-3dB) | f _c | λ = 1300nm, M = 10, R _L = 50Ω | 800 | 1000 | - | 800 | 1000 | - | MHz |
| Capacitance | C _t | V _R = 20V, f = 1MHz | - | 2 | 2.5 | - | 2 | 2.5 | pF |
| Optical connector type (Note 4) | - | - | FC | | | - | | | - |

Note 1. Fiber: GI type with core dia. 50μm and N.A.0.2

$$2. \beta = \frac{V_{BR}(25^\circ\text{C} + \Delta T) - V_{BR}(25^\circ\text{C})}{V_{BR}(25^\circ\text{C}) \cdot \Delta T} \times 100 \text{ (\%/}^\circ\text{C)}$$

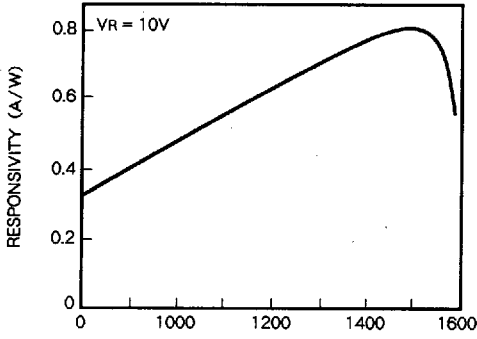
3. M: Multiplication rate

4. FU-12AP-N only

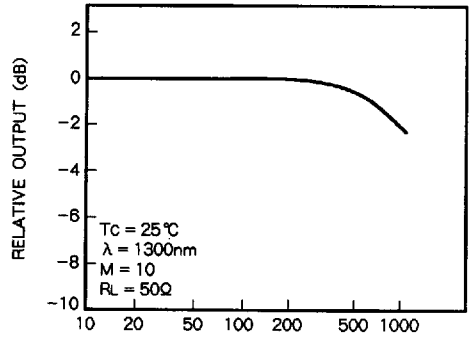
OPTICAL-FIBER SPECIFICATIONS (FU-316AP only)

| Parameter | Limits | Unit |
|---------------|----------|------|
| Type | GI | - |
| Core dia. | 50 ± 3 | μm |
| N. A. | 0.2 | - |
| Cladding dia. | 125 ± 3 | μm |
| Jacket dia. | 0.9 typ. | mm |

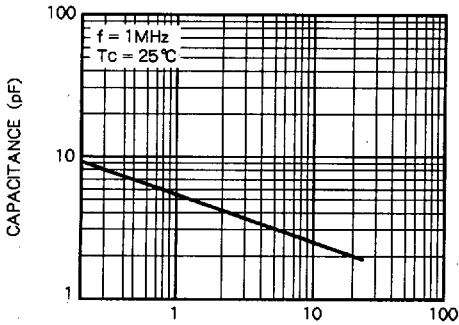
TYPICAL CHARACTERISTICS



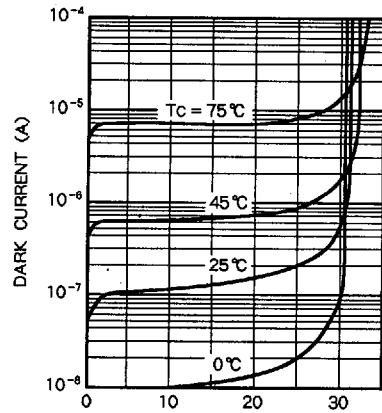
WAVELENGTH RESPONSIVITY



FREQUENCY RESPONSE



REVERSE VOLTAGE VS. CAPACITANCE



REVERSE VOLTAGE VS. DARK CURRENT