

MITSUBISHI (OPTICAL DEVICES)  
**FU-319SPA-C6**

**InGaAs APD PREAMP MODULE FOR THE 1.31  $\mu\text{m}$  AND 1.55  $\mu\text{m}$  WAVELENGTH RANGE**

**DESCRIPTION**

FU-319SPP-C6 is InGaAs avalanche photodiode module with GaAs preamplifier, designed for use in high-speed, long haul optical communication systems.

The coaxial package contains InGaAs avalanche photodiode coupled with single-mode fiber pigtail and GaAs preamplifier.

**FEATURES**

- High-sensitivity (-33dBm typ)
- 5pin coaxial package
- Selectable single power supply voltage (+5V or -5.2V). (InGaAs avalanche photodiode and GaAs preamplifier are isolated from the case.)
- GaAs preamplifier with AGC function
- Differential output (50 $\Omega$ )

**APPLICATION**

2.5Gbps optical receiver (OC-48, STM-16)  
Extended reach datacom and telecom applications  
Long haul optical communication systems

**ABSOLUTE MAXIMUM RATINGS (Tc=25°C)**

Parameter	Symbol	Conditions	Rating	Unit
APD Reverse voltage	VPD	VSS=0V	0~Vbr	V
APD Reverse current (CW)	Ir	-	500	$\mu\text{A}$
APD Forward current (CW)	If	-	2	mA
Power supply voltage	VDD	VSS=0V	0~7	V
Operating case temperature	Tc	-	-40~+85	°C
Storage temperature	Tstg	-	-40~+85	°C

Vbr: APD breakdown voltage. (Vbr value is specified on the data sheet.)

# FU-319SPA-C6

InGaAs APD PREAMP MODULE FOR THE 1.31 μm AND 1.55 μm WAVELENGTH RANGE

**ELECTRICAL/OPTICAL CHARACTERISTICS** (Tc=25°C, λ=1.55μm, VDD=5V, VSS=0V unless otherwise noted)

Parameter	Symbol	Test Conditions	Limits			Unit
			Min.	Typ.	Max.	
Detection range	-	-	1000	-	1600	nm
Responsivity(Note 1)	R13	CW, λ=1.3μm, M=1	0.70	0.85	-	A/W
	R15	CW, λ=1.55μm, M=1	0.85	0.95	-	
Breakdown voltage	Vbr	Id=100μA	35	-	75	V
Temp.coefficient of Vbr(Note 3)	β	Id=100μA, Tc=-40~85°C	0.1	-	0.25	%/°C
Transimpedance	Zt(off)	AC, f=100MHz AGC_off (Note 1)	-	1.5	-	kΩ
	Zt(on)	AC, f=100MHz AGC_on	-	0.2	-	
Cutoff frequency	fc_High	AC, RL=50Ω, M=10	1.8	-	-	GHz
	fc_Low	AC, RL=50Ω	-	-	100	kHz
Average input equivalent noise current density	in	AC, RL=50Ω, 1MHz~1.8GHz	-	6.5	-	pA/ √Hz
Output impedance	Zo	(Differential output)	-	50	-	Ω
Sensitivity	Pr	AC, RL=50Ω, λ=1.55μm, NRZ, 2.48832Gbps., PRBS=2^23-1, BER=10^-10,VPD=Optimum value (Note 2)	-	-33	-32	dBm
Over load power	Po		-7	-5	-	
Power supply voltage	VDD	VSS=0V	4.75	5	5.46	V
Power supply current	IDD	VDD=5V	-	35	60	mA
Optical return loss	Prtn	λ=1.55μm	25	-	-	dB

Note 1. Transimpedance value apply when AGC(Bit by bit) function is fully off.

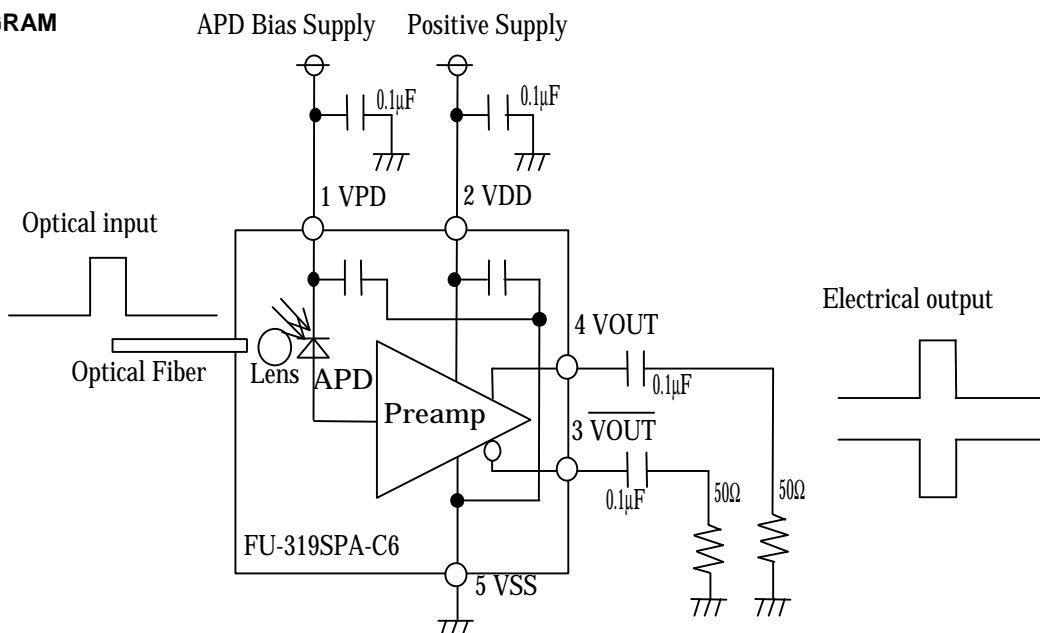
Note 2. Used post-amp bandwidth is 1.8GHz, Laser source extinction ratio is 10dB.

Note 3.  $\beta = \frac{V_{br}(25^\circ\text{C} + \Delta T) - V_{br}(25^\circ\text{C})}{V_{br}(25^\circ\text{C})} \times \Delta T \times 100$  [%/°C]

**OPTICAL FIBER SPECIFICATION**

Parameter	Limits	Unit
Type	SM	-
Mode field dia.	9.5±1	μm
Cladding dia.	125±2	μm
Jacket dia.	0.9 typ.	mm
Connector return loss	40(min)	dB

**BLOCK DIAGRAM**



OUTLINE DIAGRAM (FC Connector type)

(Unit : mm)

