

MITSUBISHI (OPTICAL DEVICES)
FU-319SPA-CV6

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

DESCRIPTION

FU-319SPA-CV6 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 (50Ω)

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)	I _r	-	500	μA
APD Forward current (CW)	I _f	-	2	mA
Power supply voltage	VDD	VSS=0V	0~7	V
Operating case temperature	T _c	-	-40~+85	°C
Storage temperature	T _{stg}	-	-40~+85	°C

Vbr: APD breakdown voltage.



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ELECTRICAL/OPTICAL CHARACTERISTICS ($T_c=25^\circ\text{C}$, $\lambda=1.55\mu\text{m}$, $V_{DD}=5\text{V}$, $V_{SS}=0\text{V}$ unless otherwise noted)

Parameter	Symbol	Test Conditions	Limits			Unit
			Min.	Typ.	Max.	
Detection range	-	-	1000	-	1600	nm
Responsivity(Note 1)	R13	CW, $\lambda=1.3\mu\text{m}$, $M=1$	0.7	0.85	-	A/W
	R15	CW, $\lambda=1.55\mu\text{m}$, $M=1$	0.8	0.9	-	
Breakdown voltage	Vbr	$I_d=100\mu\text{A}$	35	-	75	V
Temp.coefficient of Vbr(Note 3)	β	$I_d=100\mu\text{A}$, $T_c=-40\sim 85^\circ\text{C}$	0.1	-	0.25	%/ $^\circ\text{C}$
Transimpedance	Zt(off)	AC, $f=100\text{MHz}$, $R_L=\text{High}$ AGC_off (Note 1)	-	1.7	-	k Ω
	Zt(on)	AC, $f=100\text{MHz}$, $R_L=\text{High}$ AGC_on	-	0.5	-	
Cutoff frequency(-3dB)	fc_High	AC, $R_L=50\Omega$, $M=10$	1.8	-	-	GHz
	fc_Low	AC, $R_L=50\Omega$	-	-	100	kHz
Average input equivalent noise current density	in	AC, $R_L=50\Omega$, 1MHz~1.8GHz	-	6.5	-	pA/ $\sqrt{\text{Hz}}$
Output impedance	Zo	(Differential output)	-	50	-	Ω
Sensitivity	Pr	AC, $R_L=50\Omega$, $\lambda=1.55\mu\text{m}$, NRZ, 2.48832Gbps., PRBS=2 ²³ -1, BER=10 ⁻¹⁰ , VPD=Optimum value (Note 2)	-	-33	-31	dBm
Over load power	Po		-7	-5	-	
Power supply voltage	VDD	$V_{SS}=0\text{V}$	4.75	5	5.46	V
Power supply current	IDD	$V_{DD}=5\text{V}$	-	35	60	mA
Optical return loss	Prtn	$\lambda=1.55\mu\text{m}$	27	-	-	dB

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

Note 2. Used post-amp bandwidth is 1.86GHz, Laser source extinction ratio is 10dB.

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

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



