

Approved		Charged
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Customer Approval	Approved	

Specification proposal

(2.5Gbps. APD Preamp Module Vcc=+3.3V)

FU-319SPA-6M20/V6M20/W6M20

PRELIMINARY

MITSUBISHI ELECTRIC CORP.

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	x		
Date		Approved	
1.Mar.'02		H.Kiyosue	

PRELIMINARY

MITSUBISHI (OPTICAL DEVICES)

FU-319SPA-6M20/V6M20/W6M20**InGaAs APD PREAMP MODULE FOR THE 1.31 μm AND 1.55 μm WAVELENGTH RANGE****DESCRIPTION**

FU-319SPA-6M20/V6M20/W6M20 is InGaAs avalanche photodiode module with SiGe 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 SiGe preamplifier.

FEATURES

- High-sensitivity (-33dBm typ)
- 5pin coaxial package
- Single power supply voltage +3.3V.
- Differential output (50 Ω)

APPLICATION

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

ABSOLUTE MAXIMUM RATINGS (T_c=25°C)

Parameter	Symbol	Rating	Unit
APD Reverse voltage	VPD	0~Vbr	V
APD Reverse current (CW)	I _r	2	mA
APD Forward current (CW)	I _f	2	mA
Power supply voltage	VCC	-0.5~6	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 (Tc=25°C,λ=1.55μm,VCC=3.3V, unless otherwise noted)

Parameter	Symbol	Test Conditions	Limits			Unit
			Min.	Typ.	Max.	
Detection range	-	-	1000	-	1600	nm
Responsivity	R13	CW,λ=1.3μm,M=1	0.7	0.85	-	A/W
	R15	CW, λ=1.55μm,M=1	0.8	0.9	-	
Breakdown voltage	Vbr	Id=100μA	35	-	75	V
Temp.coefficient of Vbr (Note 3)	γ	Id=100μA,Tc=-40~85°C	0.07	0.12	0.16	V/°C
Transimpedance	Zt	AC,f=200MHz,RL=50Ω, Pin=-27 dBm,M=10, Single end, (Note 1)	1.0	1.37	1.75	kΩ
Maximum output voltage	Vod_max	AC,RL=50Ω,Pin=-10dBm, M=10,Single end,	75	150	310	mV
Cutoff frequency(-3dB)	fc_High	AC,RL=50Ω,M=10	1.6	1.9	-	GHz
	fc_Low	AC,RL=50Ω	-	30	100	kHz
Average input equivalent noise current density	in	AC,RL=50Ω,1MHz~1.6GHz	-	10	-	pA/√Hz
Output impedance	Zo	(Differential output)	-	50	-	Ω
Sensitivity	Pr	AC,RL=50Ω, λ=1.55μm, NRZ, 2.48832Gbps.,	-	-33	-31	dBm
Over load power	Po	PRBS=2^23-1,BER=10^-10, VPD=Optimum value (Note 2)	-7	-5	-	
Power supply voltage	VCC	-	3.1	3.3	3.5	V
Power supply current	ICC	VCC=3.3V	-	35	60	mA
Optical return loss	Prtn	λ=1.55μm	27	-	-	dB

Note 1. Zt=OUTN/lin lin:Preamp input current amplitude.

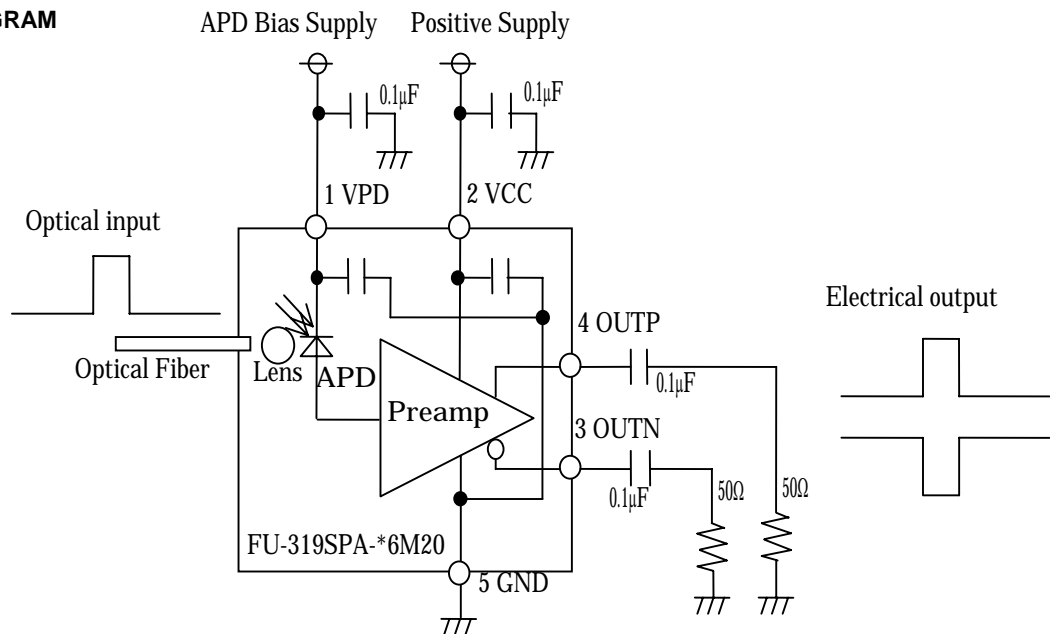
Note 2. Used post-amp bandwidth is 1.86GHz, Laser source extinction ratio is 10dB.

Note 3. γ=(Vbr(25°C+ΔT)-Vbr(25°C))/ΔT [V/°C]

OPTICAL FIBER SPECIFICATION

Parameter	Limits			Unit
	FU-319SPA-6M20	FU-319SPA-V6M20	FU-319SPA-W6M20	
From of fiber end on delivery	Cut or ferrule	FC/PC connector	SC/PC connector	-
Type	SM			-
Mode filed dia.	9.5±1			μm
Cladding dia.	125±2			μm
Jacket dia.	0.9 typ.			mm
Connector return loss	40(min)			dB

BLOCK DIAGRAM



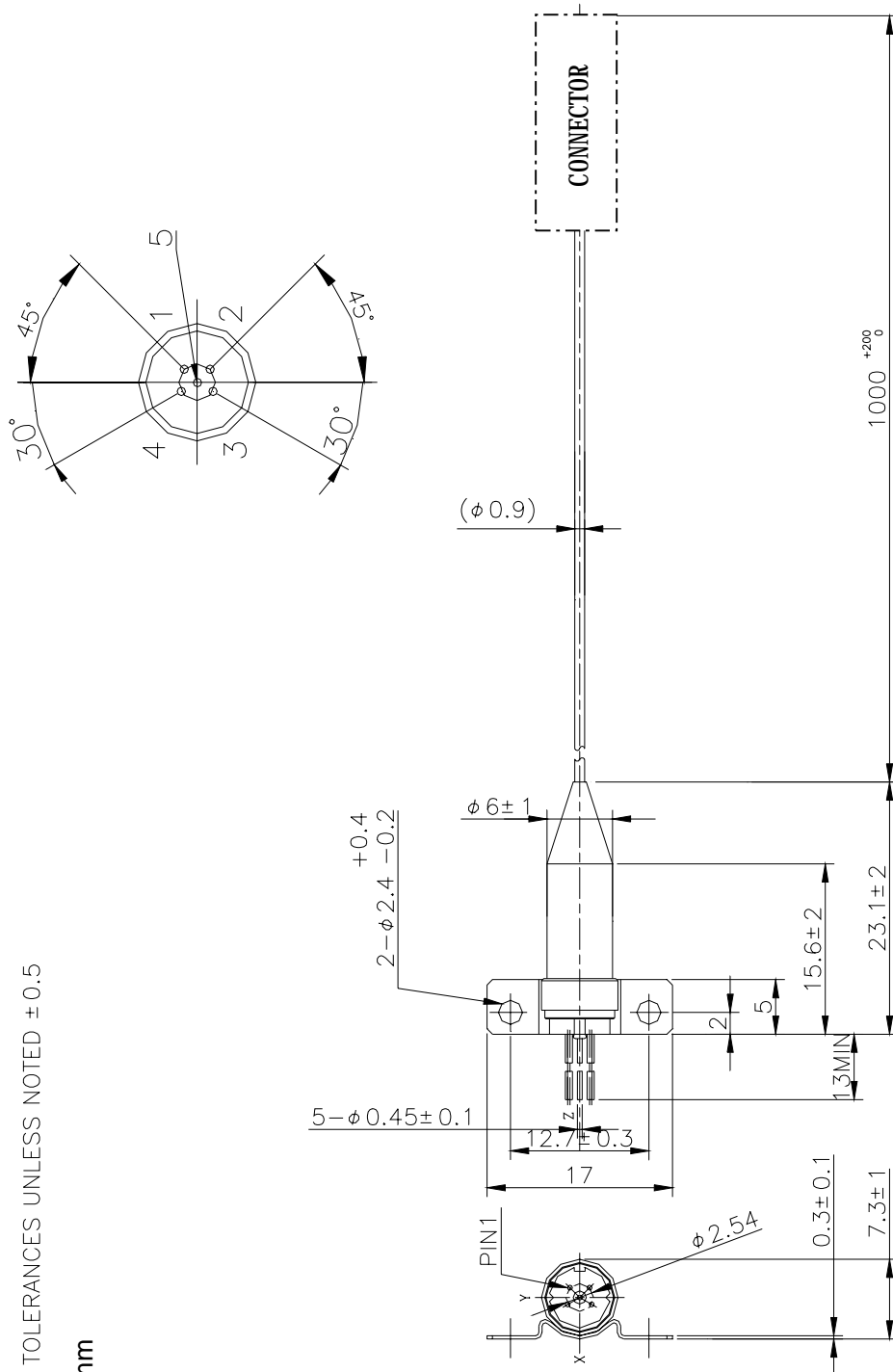
PRELIMINARY

TZ7-02-132A(4/4)

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Note 1. TOLERANCES UNLESS NOTED ± 0.5

UNIT:mm

- 1: VPD
- 2: VCC
- 3: OUTN
- 4: OUTP
- 5: GND