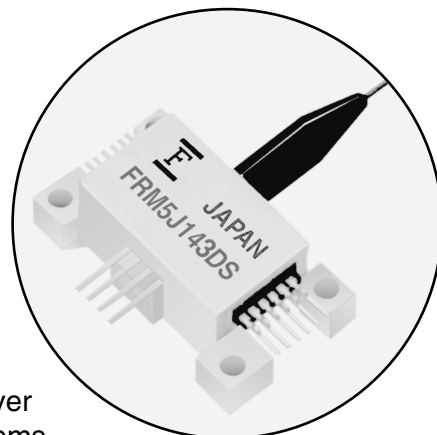


FEATURES

- Integrated Design Optimizes Performance at High Bit Rates up to 10 Gb/s applications.
- -17 dBm Typical Sensitivity
- -0.5 dBm Overload Power (min.)
- 27 dB Optical Return Loss (ORL)
- DC Coupled HBT IC Preamp
- Simplifies Receiver Circuit Design



APPLICATIONS

This PIN with HBT preamp is intended to function as an optical receiver in 1,310nm and 1,550nm SONET, SDH or the other optical fiber systems operating at 10Gb/s. The typical transimpedance (Z_t) value of 1100 Ω optimizes the total bandwidth for 10Gb/s application. The detector preamplifier is DC coupled and has a high electrical differential output.

DESCRIPTION

The FRM5J143DS incorporates a high bandwidth InGaAs PIN photo diode, a GaAs HBT IC amplifier in a hermetically sealed butterfly type package. The PIN is processed with modern MOVPE techniques resulting in reliable performance over a wide range of operating conditions. The lens coupling system and the single mode fiber are assembled using Nd YAG welding.

ABSOLUTE MAXIMUM RATINGS (T_C=25°C)

Parameter	Symbol	Ratings	Unit
Storage Temperature	T _{stg}	-40 to +85	°C
Operating Temperature	T _{op}	0 to +70	°C
Supply Voltage	V _{SS}	-6 to 0	V
PIN Reverse Voltage	V _R	0 to 20	V
PIN Reverse Current	I _R	2	mA

OPTICAL & ELECTRICAL CHARACTERISTICS (T_C=25°C, λ=1,550nm, V_{SS}=-5.2V, V_R=10V, unless otherwise specified)

Parameter	Symbol	Test Conditions	Limits			Unit
			Min.	Typ.	Max.	
PIN Responsivity	R ₁₅	1,550nm	0.75	0.85	-	A/W
AC Transimpedance	Z _t	RL=50Ω, F=130MHz	800	1100	1400	Ω
Bandwidth	BW	Pin = -16dBm, RL=50Ω, -3dB from 130MHz	7.5	8.0	-	GHz
Sensitivity	P _r	NRZ, 10Gb/s PRBS=2 ²³ -1, B.E.R.=10 ⁻¹⁰ ,	-	-18	-17	dBm
Maximum Overload	P _o	NRZ, 10Gb/s PRBS=2 ²³ -1, B.E.R.=10 ⁻¹⁰ ,	-0.5	+1.0	-	dBm
Optical Return Loss	ORL		27	-	-	dB
Power Supply Current	I _{SS}		-	110	130	mA
Power Supply Voltage	V _{SS}		-5.46	-5.2	-4.94	V

Fig. 1 Relative Frequency Response

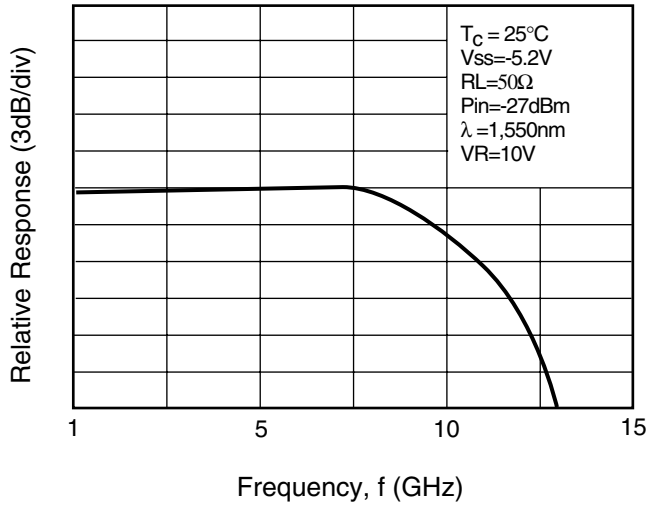


Fig.2 Bit Error Rate

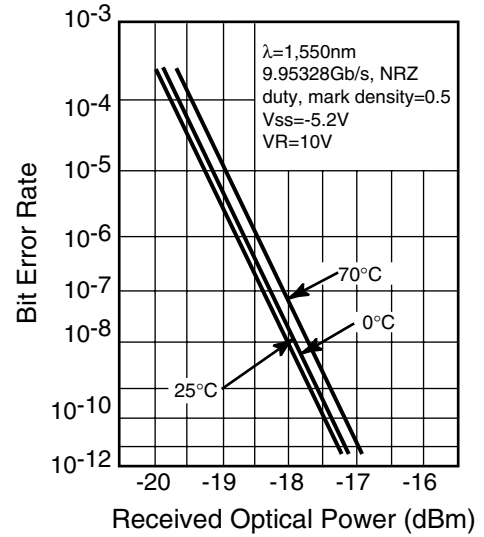
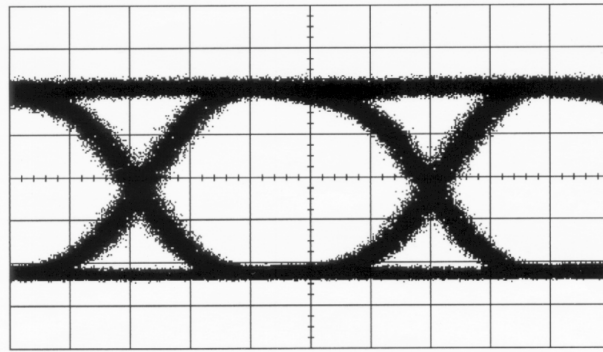
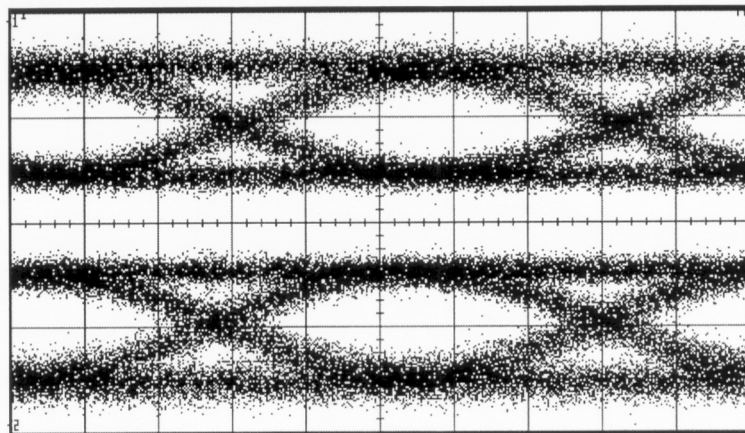


Fig. 3 Input Wave Form 1,550nm, 9.9528Gb/s NRZ, 2²³-1 PRBS duty and mark density=0.5



20psec/div

Fig. 4 Output Wave Form Tc=25°C, RL=50Ω Pin=-17dBm, Vss=-5.2V, VR=10V



20psec/div

Fig. 4 Output Wave Form $T_c=25^\circ\text{C}$, $R_L=50\Omega$,
 $P_{in}=-10\text{dBm}$, $V_{ss}=-5.2\text{V}$, $V_R=10\text{V}$

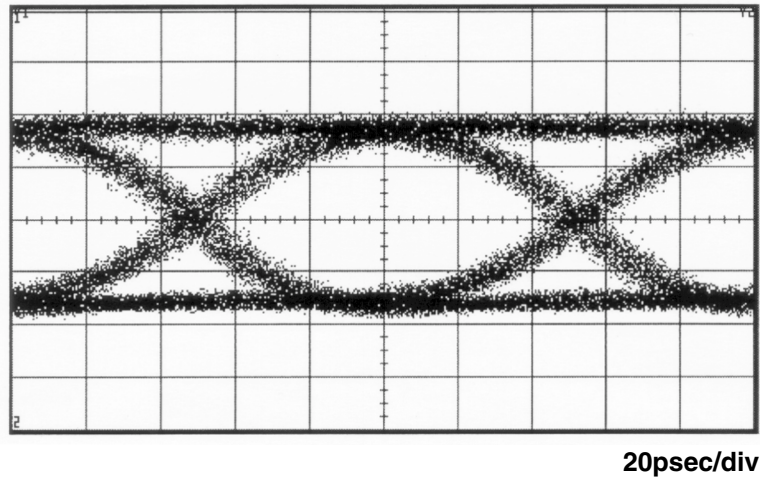
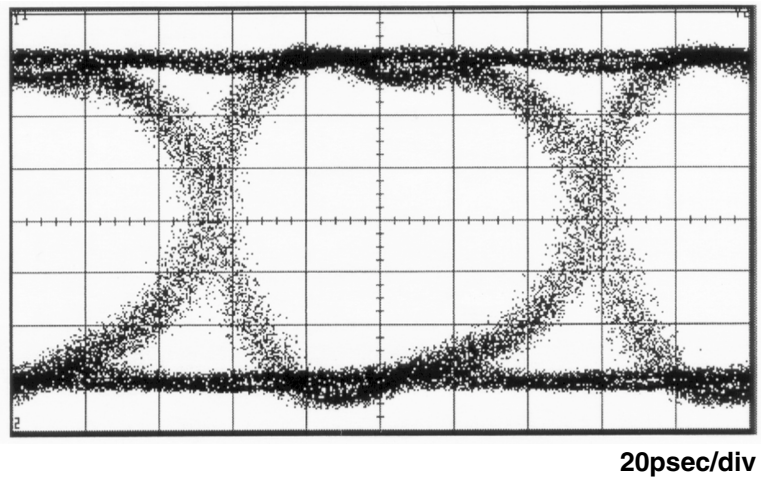
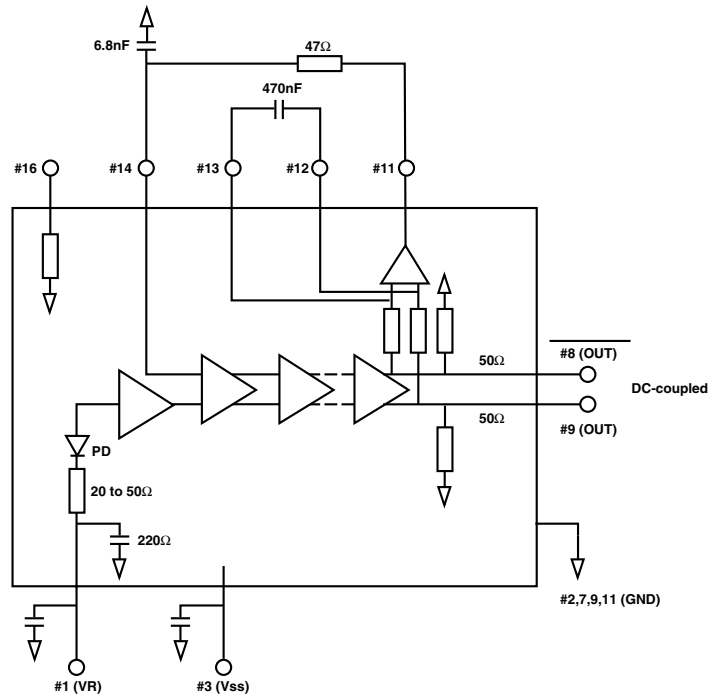


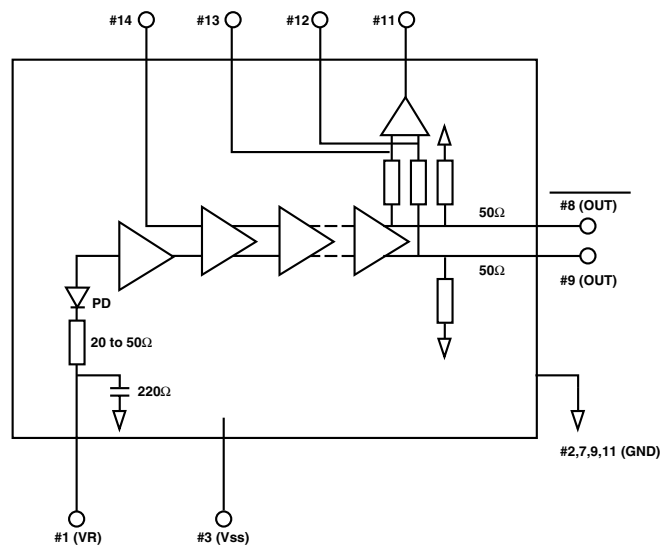
Fig. 5 Output Wave Form $T_c=25^\circ\text{C}$, $R_L=50\Omega$,
 $P_{in}=-3\text{dBm}$, $V_{ss}=-5.2\text{V}$, $V_R=10\text{V}$

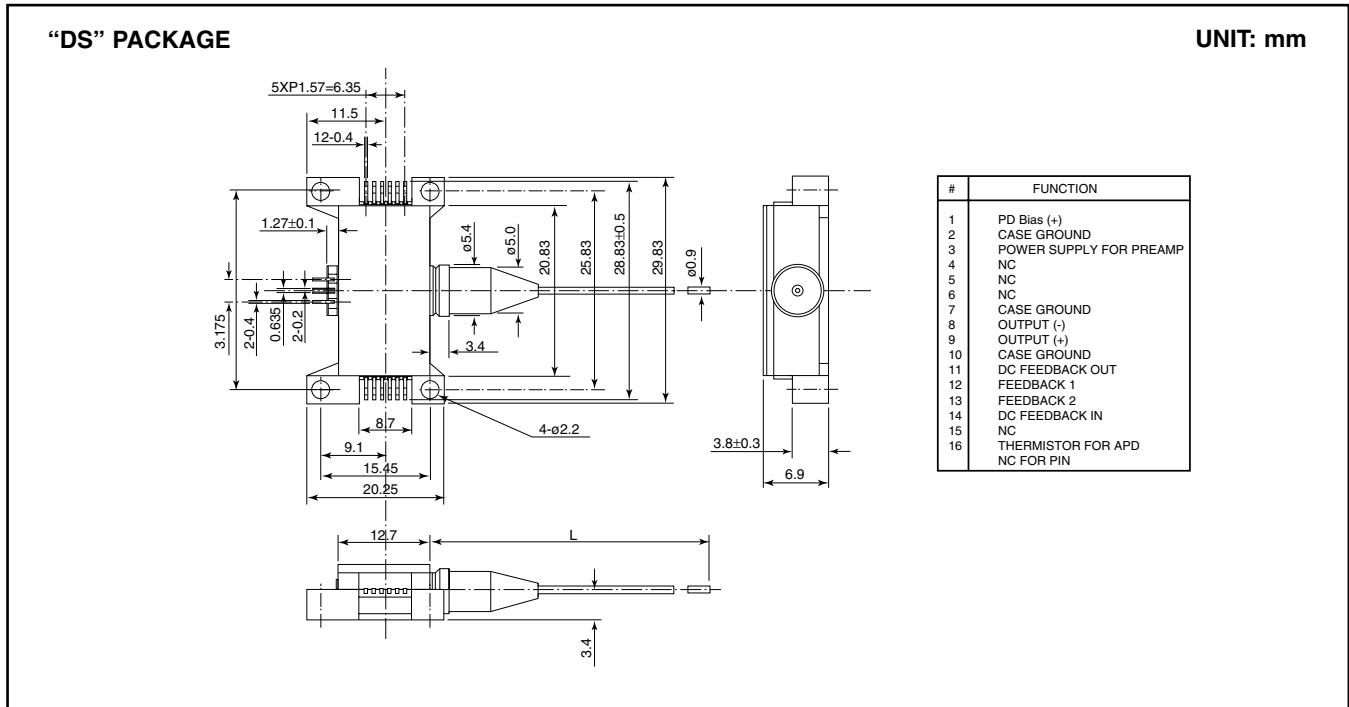


FRM5J143DS Recommended Circuit



FRM5J143DS Block Diagram





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