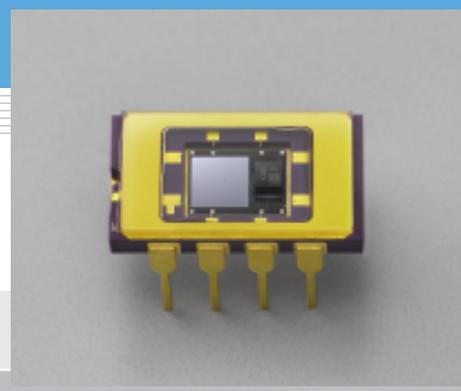


Si photodiode with preamp S7998

Photodiode (3 × 3 mm)/preamplifier assembly in compact package



S7998 is a UV to near IR detector using a 3 × 3 mm photodiode integrated with preamplifier. The photodiode chip and the preamplifier are assembled at high density by direct bump connections. The preamplifier bias current is so small that a high feedback resistance of 1 GΩ can be used. Built-in feedback resistance types and metal package types are also available upon request.

Features

- Compact ceramic package: 13.2 × 7.37 mm
- Uses a UV to near IR Si photodiode (3 × 3 mm) for high-precision photometry
- Uses a low bias current preamplifier: $I_b=64$ pA Max.
- Low noise
- Low current consumption

Applications

- Precision photometry
- General photometry

■ Absolute maximum ratings (Ta=25 °C)

Parameter	Symbol	Value	Unit
Preamp supply voltage	Vcc	± 6	V
Photodiode reverse voltage	VR	5	V
Operating temperature	Topr	-20 to +60	°C
Storage temperature	Tstg	-20 to +80	°C

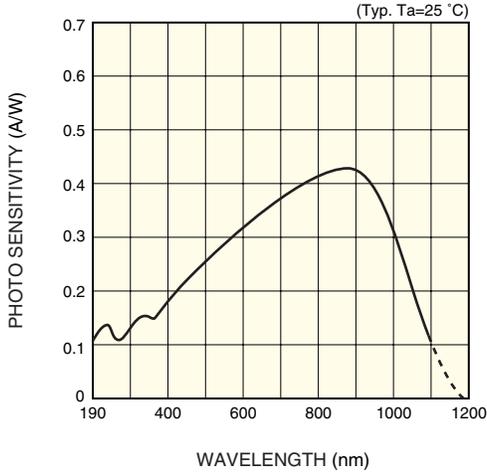
■ Electrical and optical characteristics of photodiode (Ta=25 °C)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Spectral response range	λ		-	190 to 1100	-	nm
Peak sensitivity wavelength	λ_p		-	880	-	nm
Photo sensitivity	S	$\lambda=200$ nm	0.1	0.12	-	A/W
		$\lambda=\lambda_p$	-	0.43	-	A/W
Dark current	Id	VR=10 mV	-	50	250	pA
Shunt resistance	Rsh	VR=10 mV	-	0.2	-	GΩ
Terminal capacitance	Ct	VR=0 V, f=10 kHz	-	120	-	pF

■ Electrical and optical characteristics of preamp (Ta=25 °C, Vcc=±5 V)

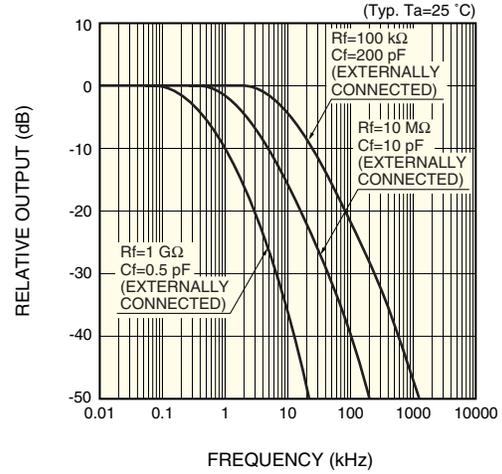
Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Input offset voltage	Vos		-	±0.7	±5	mV
Input offset voltage temperature drift	ΔV_{os}		-	4	-	$\mu V/^\circ C$
Input bias current	Ib		-	±1	±64	pA
Input offset current	Ios		-	0.5	32	pA
Output voltage amplitude	Vo	RL=2 kΩ	±4.8	±4.9	-	V
Gain bandwidth	GBW		-	1.3	-	MHz
Equivalent noise input voltage	Vn	f=10 kHz	-	33	-	nVrms/Hz ^{1/2}
Equivalent noise input current	In	f=10 kHz	-	1.5	-	fA/Hz ^{1/2}
Supply current	Icc		-	1.3	1.7	mA

■ Spectral response (photodiode only)



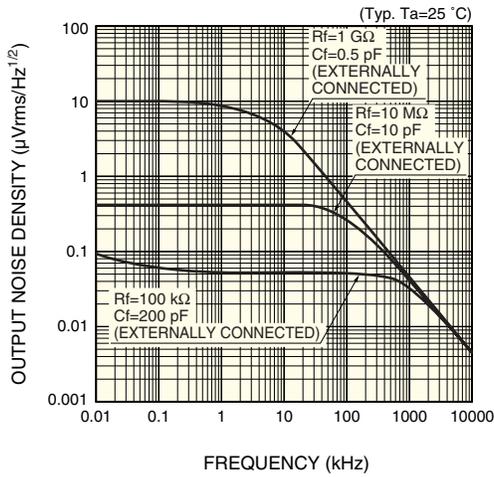
KSPDB0191EA

■ Frequency response



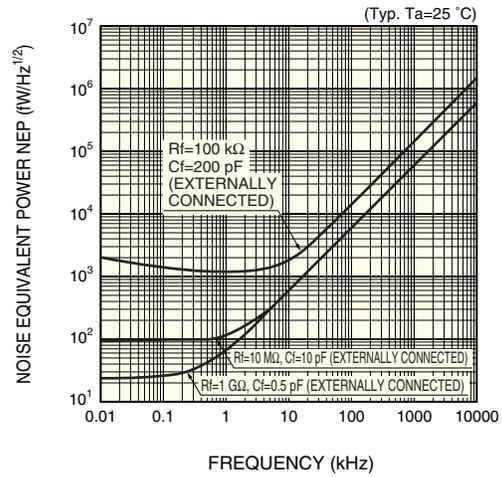
KSPDB0192EA

■ Output noise characteristics



KSPDB0193EA

■ Noise equivalent power vs. frequency



KSPDB0194EA

