

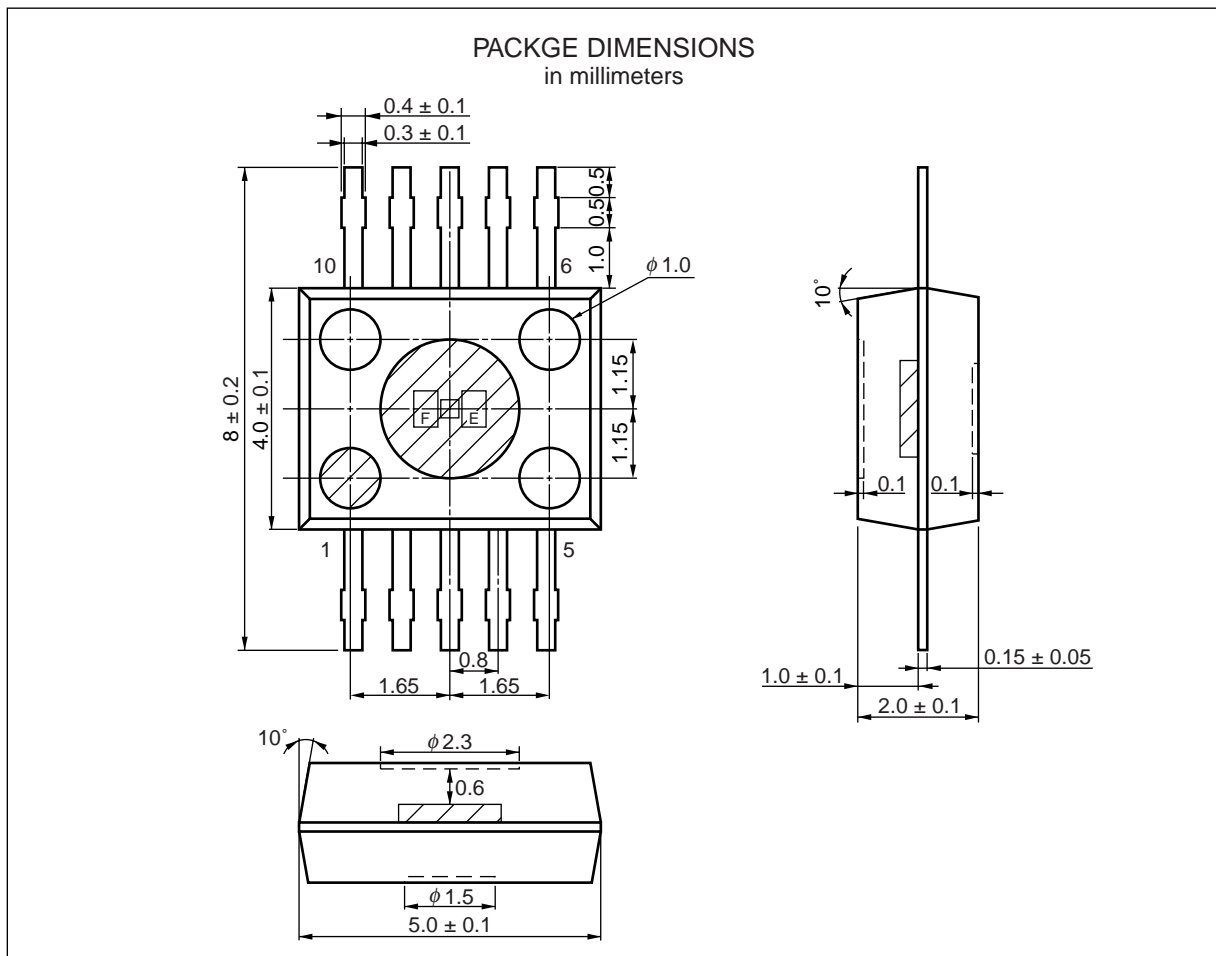
**HIGH SPEED, HIGH SENSITIVITY PHOTO DIODE  
INTERNAL I/V AMPLIFIER DETECTOR FOR DVD**

**DESCRIPTION**

The PH533 is a 6-element photo diode built in I/V amplifiers for DVD. It is easy to adjust the center of beam spot by using the Focus and Tracking input terminal, and possible to obtain high speed and high sensitivity.

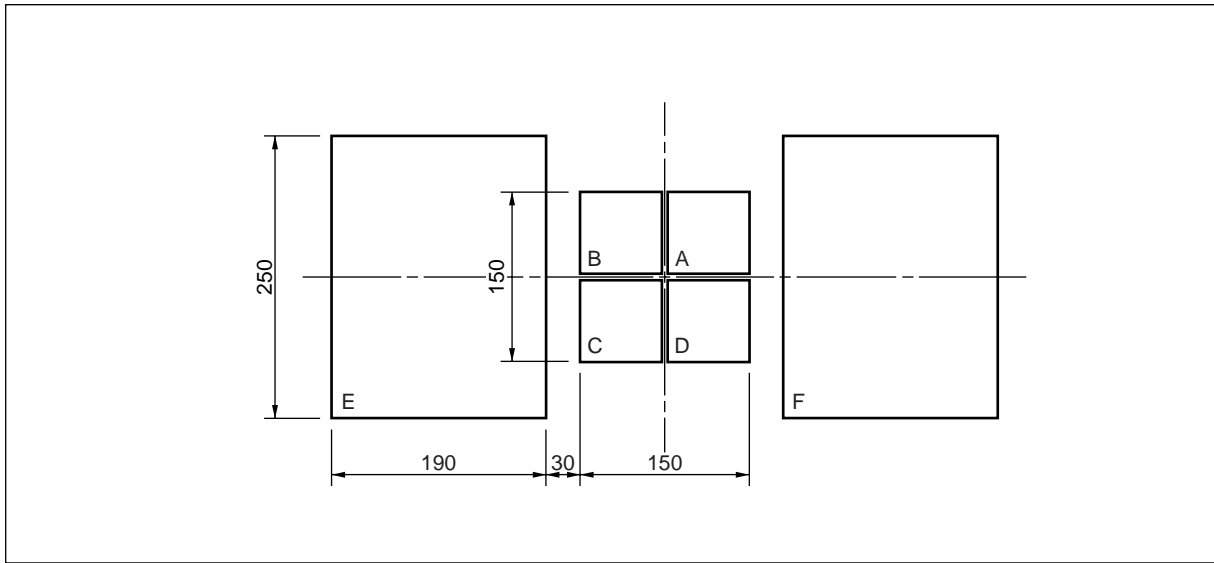
**FEATURES**

- |                                    |  |  |
|------------------------------------|--|--|
| • High speed                       | Frequency Response                                 | $f_c = 49 \text{ MHz TYP.}$                        |
| • High sensitivity                 | Output Voltage                                     | $V_{OF} = 125 \text{ mV}, V_{OT} = 200 \text{ mV}$ |
| • Wide operating temperature range | $T_A = -20 \text{ to } +80 \text{ }^\circ\text{C}$ |  |
| • Small package                    | $4.0 \times 5.0 \text{ mm}$                        |  |
| • With gain switch                 | $V_{OF} = 125 \text{ mV or } 370 \text{ mV}$       |  |

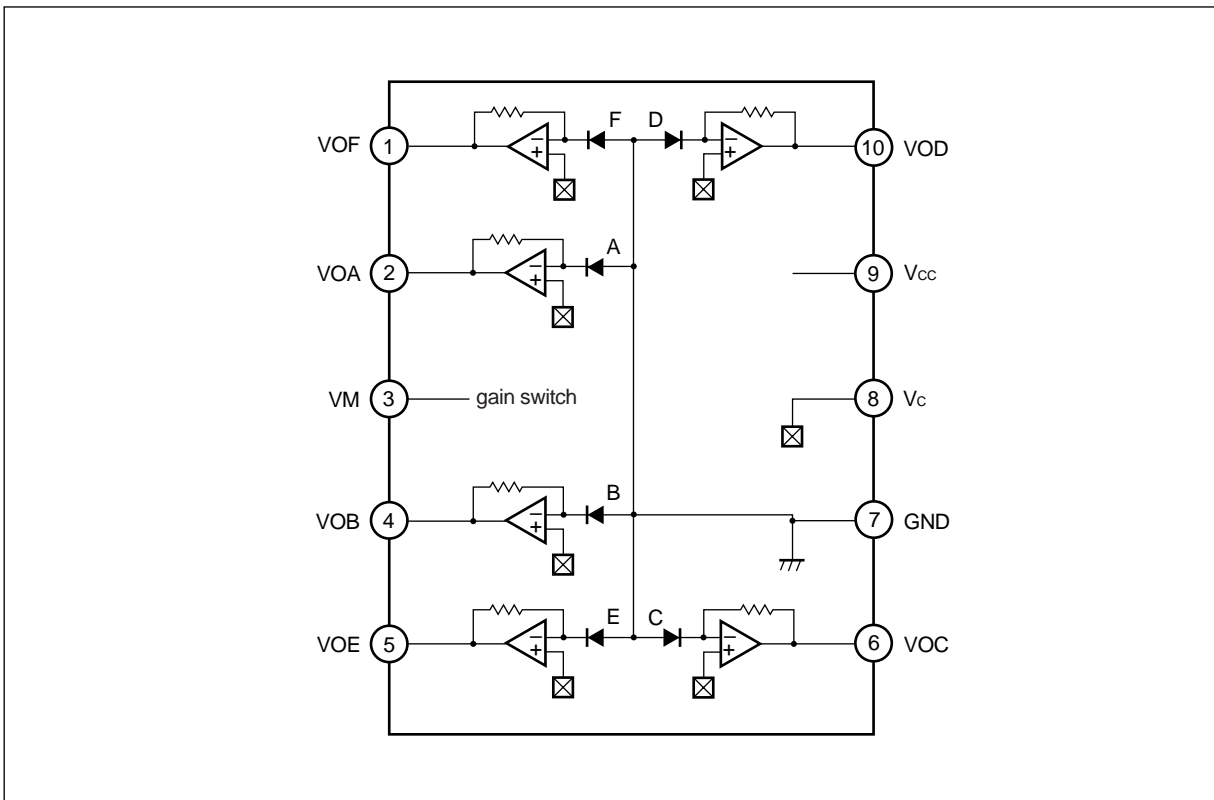


The information in this document is subject to change without notice.

CHIP PATTERN (Unit:  $\mu\text{m}$ )



PIN CONNECTIONS



**ABSOLUTE MAXIMUM RATINGS (T<sub>A</sub> = 25 °C, unless otherwise specified)**

Parameter	Symbol	Ratings	Unit
Supply Voltage	V <sub>CC</sub>	9	V
Power Dissipation	P <sub>D</sub>	100	mV
Operating Temperature	T <sub>A</sub>	-20 to +80	°C
Storage Temperature	T <sub>stg</sub>	-30 to +100	°C

**RECOMMENDED OPERATING CONDITIONS (T<sub>A</sub> = 25 °C, unless otherwise specified)**

Parameter	Symbol	MIN.	TYP.	MAX.	Unit
Supply Voltage of V <sub>c</sub>	V <sub>c</sub>	2.0	2.5	V <sub>CC</sub> -1.3	V
Supply Voltage	V <sub>CC</sub>	4.5	5.0	5.5	V

**ELECTRO-OPTICAL CHARACTERISTICS**

(T<sub>A</sub> = 25 ± 2 °C, V<sub>CC</sub> = 5 V, R<sub>L</sub> = 3 kΩ, C<sub>L</sub> = 10 pF, R<sub>H</sub> ≤ 70 %, unless otherwise specified)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Circuit Current	I <sub>CC</sub>	Shield a light		12	18	mA
Output Voltage <sup>*1</sup>	V <sub>OF</sub>	P <sub>i</sub> = 10 μW, λ = 650 nm, A to D, V <sub>M</sub> = 0 V	100	125	150	mV
	V <sub>OT</sub>	P <sub>i</sub> = 10 μW, λ = 650 nm, E, F, V <sub>M</sub> = 0 V	160	200	240	
	V <sub>OF</sub>	P <sub>i</sub> = 10 μW, λ = 650 nm, A to D, V <sub>M</sub> = 5 V	290	370	450	mV
	V <sub>OT</sub>	P <sub>i</sub> = 10 μW, λ = 650 nm, E, F, V <sub>M</sub> = 5 V	470	590	710	
Output Offset Voltage <sup>*2</sup>	V <sub>off</sub>	A to D	-15	0	25	mV
		E, F	-20	0	20	
Difference of Offset Voltage	ΔV <sub>off</sub>	(A+C)-(B+D)	-20	0	20	mV
		E-F	-15	0	15	
Frequency Response	f <sub>c</sub>	λ = 650 nm, f = 100 kHz, -3 dB, A to D, V <sub>M</sub> = 0 V	35	49		MHz
		λ = 650 nm, f = 100 kHz, -3 dB, A to D, V <sub>M</sub> = 5 V	21	29		
		λ = 650 nm, f = 100 kHz, -3 dB, E, F	1	6		
Group Delay		λ = 650 nm, f = 1 to 20 MHz, -3 dB, A to D, V <sub>M</sub> = 0 V		2	7	ns
		λ = 650 nm, f = 1 to 20 MHz, -3 dB, A to D, V <sub>M</sub> = 5 V		5	10	
Output noise		Δf = 30 kHz, f = 1 to 20 MHz, -3 dB, A to D, V <sub>M</sub> = 0 V		-74	-67	dBm
		Δf = 30 kHz, f = 1 to 20 MHz, -3 dB, A to D, V <sub>M</sub> = 5 V		-68	-61	

\*1 V<sub>o</sub>; Reference for Output offset voltage

\*2 V<sub>off</sub>; Reference for Supply Voltage of V<sub>c</sub>.

### Warning on Handling

**Precaution must be taken against electrostatic discharge damage.**

**Please do not apply infrared ray reflow.**

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Anti-radioactive design is not implemented in this product.