

Light emitting/receiving module

P8212

Integrated light emitting/receiving elements for automobile VICS



P8212 is a light emitting/receiving module consisting of an LED array and a photodiode in the same small package. The width of this module is minimized so that automobile antennas can be designed thin. A lens is also fitted onto the photodiode to increase the amount of input light. Although the lens makes the photodiode directivity narrow, this problem was solved by separating the photodiode optical axis from the LED axis to match the light emitting and receiving areas required for VICS.

Features

- Small package
- Lens design optimized for light emitting/receiving timings
- Cylindrical lens with less pickup error during component mounting

Applications

- Automobile VICS

■ Absolute maximum ratings (Ta=25 °C)

Parameter	Symbol	Value	Unit
Photodiode reverse voltage	VR Max.	20	V
LED reverse voltage	VR Max.	4	V
LED pulse forward current *1	IFP	1300	mA
Operating temperature	Topr	-30 to +95	°C
Storage temperature	Tstg	-40 to +115	°C

*1: 64 kHz, duty ratio=50 %, 4 ms ON, average duty ratio=2.5 %

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

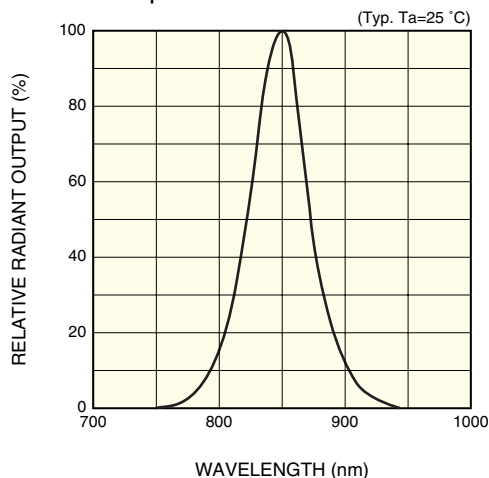
parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Spectral response range	λ		-	480 to 1100	-	nm
Peak sensitivity wavelength	λ_p		-	960	-	nm
Photo sensitivity	S	$\lambda=\lambda_p$	520	620	-	mA/W
		$\lambda=850$ nm	460	540	-	mA/W
Short circuit current	Isc	100 lx, 2856 K	27	33	-	μ A
Dark current	Id	VR=12 V	-	1	10	nA
Cut-off frequency	fc	VR=12 V, RL=1 k Ω $\lambda=850$ nm, -3dB	-	4	-	MHz
Terminal capacitance	Ct	VR=12 V, f=1 MHz	-	40	-	pF
Directivity at half width	-	Direction in long side	-	± 55	-	degree
		Direction in short side	-	+35, -18	-	

■ Electrical and optical characteristics for LED (Ta=25 °C)

parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Peak emission wavelength	λ_p	IF=100 mA	830	850	900	nm
Spectral half width	$\Delta\lambda$	IF=100 mA	-	40	-	nm
Pulse forward voltage	VFP	IFP=900 mA *2	5.5	6.3	7.4	V
Reverse current	IR	VR=4 V	-	-	10	μ A
Pulse radiant intensity	Iep	IFP=900 mA *2	1400	1800	-	mW/sr
Cut-off frequency	fc	IF=100 mA ± 10 mA _{p-p}	-	20	-	MHz
Directivity at half width	-	Direction in long side	-	± 30	-	degree
		Direction in short side	-	± 13	-	

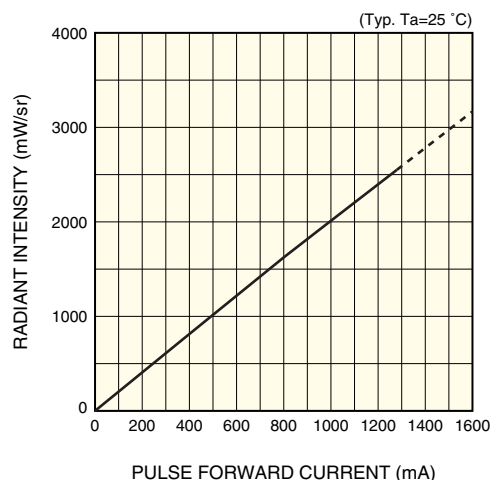
*2: Average peak value in pulse operation at 64 kHz, 50 % duty ratio, 4 ms ON

■ Emission spectrum



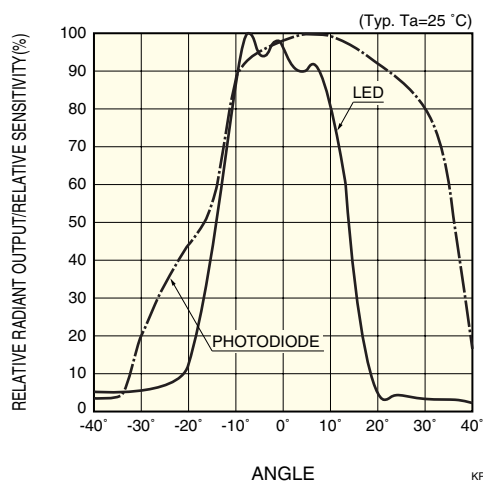
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■ Radiant intensity vs. pulse forward current (LED)



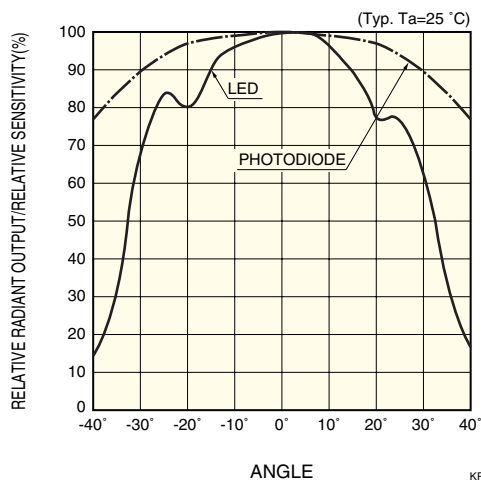
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■ Directivity: direction in short side



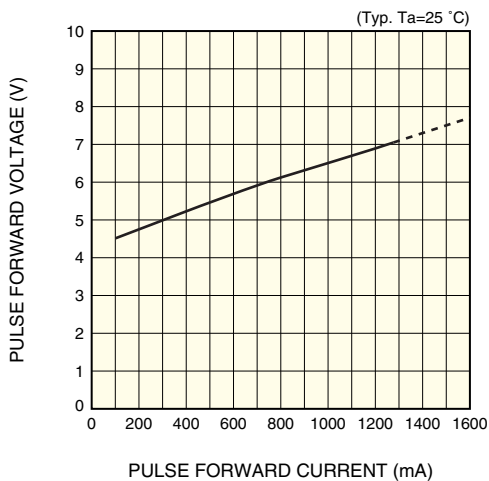
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■ Directivity: direction in long side



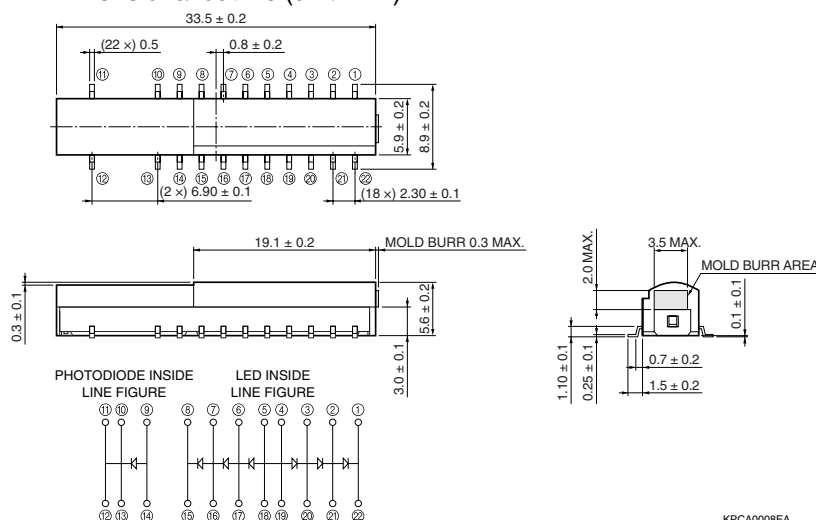
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■ Pulse forward voltage vs. pulse forward current (LED)



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■ Dimensional outline (unit: mm)



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HAMAMATSU PHOTONICS K.K., Solid State Division

1126-1 Ichino-cho, Higashi-ku, Hamamatsu City, 435-8558 Japan, Telephone: (81) 53-434-3311, Fax: (81) 53-434-5184, <http://www.hamamatsu.com>

U.S.A.: Hamamatsu Corporation: 360 Foothill Road, P.O.Box 6910, Bridgewater, N.J. 08807-0910, U.S.A., Telephone: (1) 908-231-0960, Fax: (1) 908-231-1218

Germany: Hamamatsu Photonics Deutschland GmbH: Arzbergerstr. 10, D-82211 Herrsching am Ammersee, Germany, Telephone: (49) 08152-3750, Fax: (49) 08152-2658

France: Hamamatsu Photonics France S.A.R.L.: 19, Rue du Saule Trappu, Parc du Moulin de Massy, 91882 Massy Cedex, France, Telephone: 33-(1) 69 53 71 00, Fax: 33-(1) 69 53 71 10

United Kingdom: Hamamatsu Photonics UK Limited: 2 Howard Court, 10 Tewin Road, Welwyn Garden City, Hertfordshire AL7 1BW, United Kingdom, Telephone: (44) 1707-294888, Fax: (44) 1707-325777

North Europe: Hamamatsu Photonics Norden AB: Smidesvägen 12, SE-171 41 Solna, Sweden, Telephone: (46) 8-509-031-00, Fax: (46) 8-509-031-01

Italy: Hamamatsu Photonics Italia S.R.L.: Strada della Moia, 1/E, 20020 Arese, (Milano), Italy, Telephone: (39) 02-935-81-733, Fax: (39) 02-935-81-741

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