


## High Speed 10-channel Photo Detector IC

### FEATURES

- Dual wavelength 650 and 780nm
- Data channel bandwidth 130 MHz
- Eleven selectable gain settings covering 42dB range
- Group delay error less than 1ns up to 72MHz
- Slew rate up to 400V/us
- Small 16-pin OPLGA package

### APPLICATION

- DVD-RAM with CD-RW capability
- DVD-RW with CD-RW capability
- Writable data storage optical devices

Vs	1	 SP8058 16-Pin OPLGA	16	Vcc
Gain 2	2		15	RF+
Gain 1	3		14	RF-
Gain 3	4		13	C
EF	5		12	B
SAD	6		11	D
GH	7		10	A
SBC	8		9	GND

### GENERAL DESCRIPTION

The SP8058 is a ten channel photo detector IC (PDIC) specially designed for high speed DVD-RAM and DVD-RW applications and can operate at wavelength of 650 and 780 nm. The ten channels consist of four high speed channels (A, B, C, and D), two average speed channels (EF and GH), two slow channels (SAD and SBC), and two channels with balanced differential output (RF+ and RF-). The EF and GH channels output is sum of signals from E + F and G + H sensors respectively. The RF channels output is sum of A + B + C + D + EF + GH channels with identical weights.

The SP8058 has three logic inputs for gain control, one of them operating as TTL compatible (Gain 1), and two other operating as three state logic inputs (Gain 2 and Gain 3). The allowable 14 logic states are used to select 11 gain factors, an adjustment mode, and a sleep mode (see table 4). Adjustment mode is used to adjust the position of the PDIC with respect to the laser beam. In this mode each of the sensors E, F, G, and H is connected to the input of EF, GH, SAD, and SBC channels respectively instead of the standard configuration. In sleep mode all channels are in tri-state condition.

The SP8058 is manufactured with an advanced 10GHz BICMOS technology.

**ABSOLUTE MAXIMUM RATINGS**

These are stress ratings only and functional operation of the device at these ratings or any other above those indicated in the operation sections of the specifications below is not implied. Exposure to absolute maximum rating conditions for extended periods of time may affect reliability.

Supply Voltage (Vcc).....6.0V  
Input Voltage at any input....-0.6V to Vcc +0.5V  
Output Voltage (Vout)..... Vcc  
Storage Temperature.....-40°C to +100°C  
Soldering Temperature.....+235°C

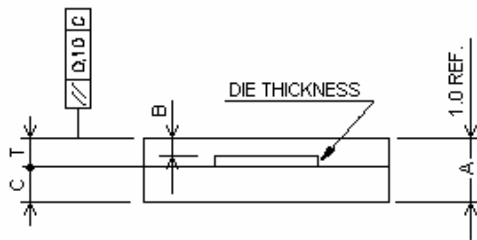
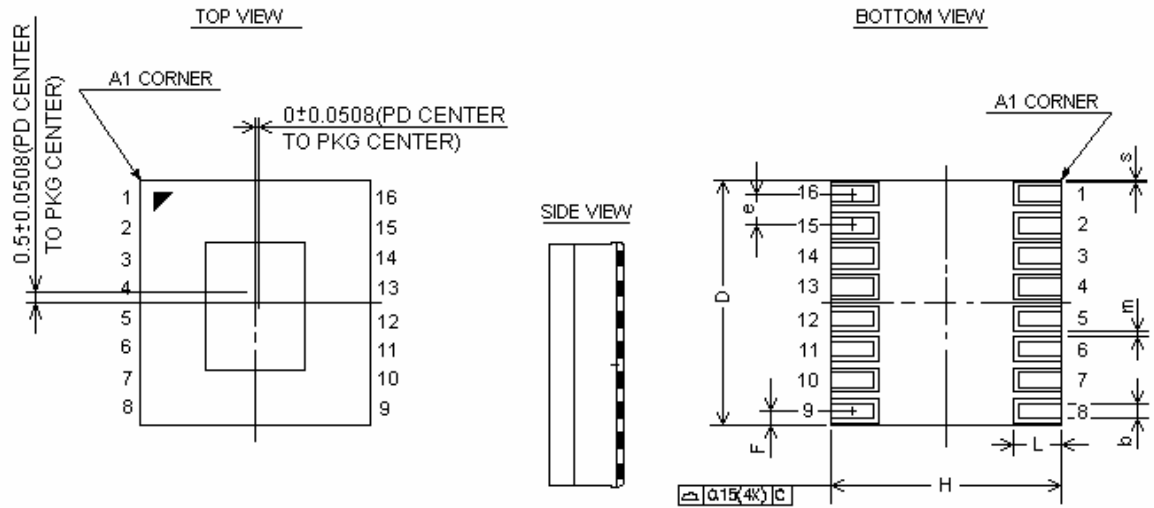
**RECOMMENDED OPERATING CONDITIONS**

Supply Voltage (Vcc).....4.5V to 5.5V  
Reference Voltage (Vs).....1.8V to 2.2V  
Operating temperature.....-30 to +80°C

## PIN ASSIGNMENTS

Pin #	Pin Name	Pin Function
1	Vs	Reference voltage. Bypass to GND with ceramic capacitor 0.1uF
2	Gain 2	Logic input of Gain Controller. Allows three states – low, high, and floating - Z
3	Gain 1	Logic input of Gain Controller. Allows two states – low and high
4	Gain 3	Logic input of Gain Controller. Allows three states – low, high and floating - Z
5	EF	Output of EF channel (sum of E + F sensor signals). In Adjustment mode it is output of E channel
6	SAD	Output of SAD channel. In Adjustment mode it is output of F channel
7	GH	Output of GH channel (sum of G + H sensor signals). In Adjustment mode it is output of G channel
8	SBC	Output of SBC channel. In Adjustment mode it is output of H channel
9	GND	Ground pin
10	A	Output of A channel
11	D	Output of D channel
12	B	Output of B channel
13	C	Output of C channel
14	RF-	Output of RF- channel. $RF- = -(A + B + C + D + EF + GH)$ . In Adjustment mode $RF- = -(A + B + C + D + E + F + G + H)$
15	RF+	Output of RF+ channel. $RF+ = A + B + C + D + EF + GH$ . In Adjustment mode $RF+ = A + B + C + D + E + F + G + H$
16	Vcc	Supply voltage. Bypass to GND with ceramic capacitor 0.1uF

## OPLGA 16L PACKAGE DIMENSIONS



NOTE: DIE THICKNESS 0.2mm (8mill)

SYMBOLS	DIMENSIONS IN MILLIMETERS		
	MIN	NOM	MAX
A	0.90	1.00	1.10
b	0.20	0.25	0.30
C	—	0.56	—
D	3.90	4.00	4.10
B	0.19	—	0.32
H	3.40	3.50	3.60
e	—	0.5	—
F	0.17	0.25	0.33
L	0.60	0.7	.0.80
T	—	0.45	—
s	0.05	—	—
m	0.10	—	—

## ORDERING INFORMATION

Part number	Temperature range	Package Type
SP8058DG	-30 + 80°C	16-pin Optical Land Grid Array (OPLGA)