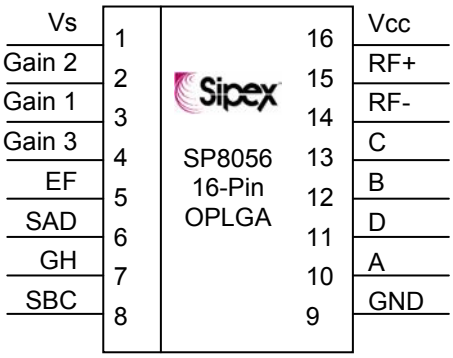
SP8056

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

GENERAL DESCRIPTION

The SP8056 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 paraphase 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. Low noise operation enables data recovery at very low signal levels.
The SP8056 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 SP8056 is manufactured with an advanced 10GHz BICMOS technology.

GAIN MODE SELECTION

Gain Mode	Gain Factor	Logic level		
		Gain1	Gain2	Gain3
RW-read	128	Low	Low	DC
		Low	Z	Low
R-read	32	Low	Z	High
		Low	High	DC
RW-write(speed 1)	16	High	Low	High
RW-write(speed 2)	12	High	Low	Z
RW-write(speed 3)	8	High	Low	Low
RW-write(speed 4)	6	High	Z	Low
R-write(speed 1)	4	High	Z	High
R-write(speed 2)	3	High	High	Z
R-write(speed 3)	2	High	High	High
R-write(speed 4)	1	High	High	Low
Adjustment mode	32	High	Z	Z
Sleep mode (output=High-Z)		Low	Z	Z

Note: DC - Don't Care, Z - High impedance

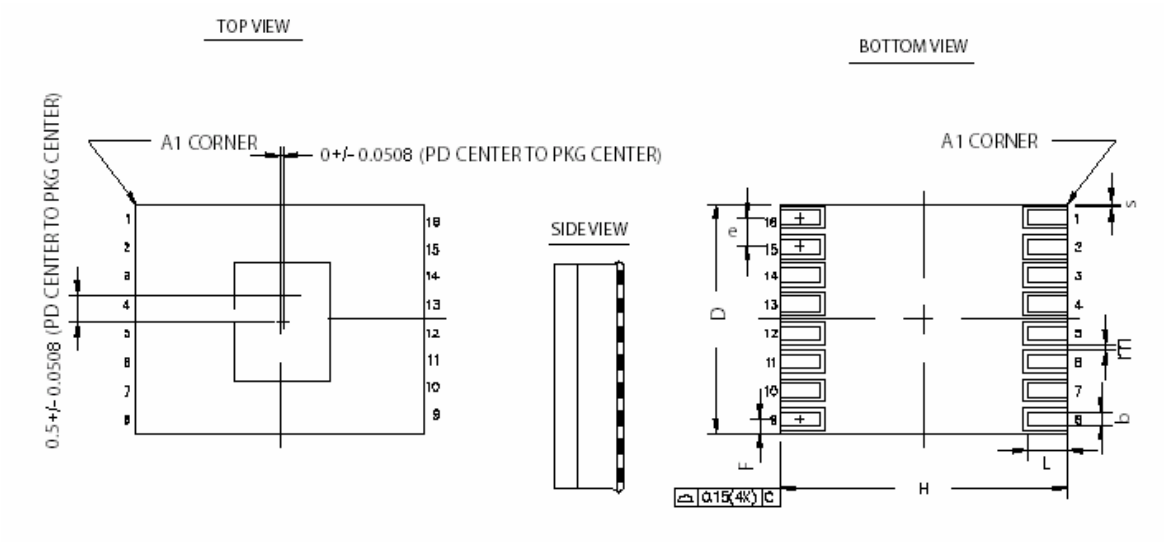
PIN ASSIGNMENTS

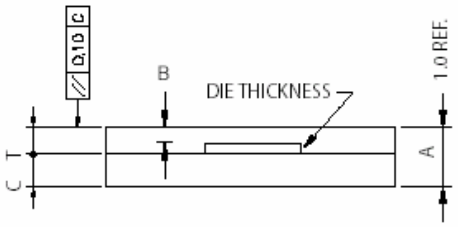
Pin #	Pin Name	Pin Function
1	Vs	Reference voltage. Bypass to GND with ceramic capacitor 0.1uF
2	Gain 2	Logic input of Gain Controller. Allows three states – low, high, and floating - Z
3	Gain 1	Logic input of Gain Controller. Allows two states – low and high
4	Gain 3	Logic input of Gain Controller. 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

BOARD LAYOUT AND GROUNDING

To obtain the best performance from the SP8056, a printed circuit board with ground plane is required. High quality, low series resistance ceramic 0.1uF bypass capacitors should be used at the Vcc and Vs pins (pins 1 and 16). These capacitors must be located as close to the pins as possible. The traces connecting the pins and the bypassing capacitors must be kept short and should be made as wide as possible.

OPLGA 16L PACKAGE DIMENSIONS





NOTE: DIE THICKNESS 0.2 mm (8MIL)

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
SP8056EG	-30 + 80^{0}C	16-pin Optical Land Grid Array (OPLGA)