




## High Speed 12-channel Photo Detector IC

### FEATURES

- Dual wavelength 650 and 780nm
- Data channel bandwidth 140 MHz
- Three selectable gain settings
- Group delay error less than 1ns up to 86MHz
- 500V/us Slew rate
- Small 16-pin COB package

### APPLICATION

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

Vs	1	 SP8052 16-Pin COB	16	V <sub>CC</sub>
GND	2		15	Gain
GK	3		14	D
HL	4		13	C
EI	5		12	B
FJ	6		11	A
WPP1	7		10	RF+
WPP2	8		9	RF-

### GENERAL DESCRIPTION

The SP8052 is a twelve-channel photo detector IC (PDIC) specially designed for high speed DVD-RAM and DVD+/-RW applications and can operate at wavelengths of 650 and 780 nm. The device contains three photo diode (sensor) arrays, with each having four sensors (A – D, E – H, and I – L respectively). The twelve channels consist of four high speed channels (A, B, C, and D), four slow channels (EI, FJ, GK, and HL), two fast channels (WPP1 and WPP2), and two channels with paraphase output (RF+ and RF-). The slow channels output is the sum of signals from two sensors of different sensor arrays (E – H and I – L). The WPP1 and WPP2 channels output is sum of signals A + B and C + D sensors respectively, but at much lower gain (than at A – D outputs) to prevent amplifier saturation in write mode. The RF channels output is sum of A + B + C + D channels with identical weights. Low noise operation enables data recovery at very low signal levels.

The SP8052 has a logic input for gain control that operate as a three-state logic input (Low, Mid, and High states). These states are used to select three gain factors that affect all channels.

The SP8052 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.....+260°C\*\*

\*) This Rating applies to the output of all channels  
\*\*) Duration 3s maximum

## RECOMMENDED OPERATING CONDITIONS

Supply Voltage (Vcc).....4.75V to 5.25V  
Reference Voltage (Vs).....2.2V to 2.4V  
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	GND	Ground pin
3	GK	Output of GK channel (sum of G + K sensor signals)
4	HL	Output of HL channel (sum of H + L sensor signals)
5	EI	Output of EI channel (sum of E + I sensor signals)
6	FJ	Output of FJ channel (sum of F + J sensor signals)
7	WPP1	Output of WPP1 channel (sum of A + B sensor signals)
8	WPP2	Output of WPP2 channel (sum of C + D sensor signals)
9	RF-	Output of RF- channel. $RF- = -(A + B + C + D)$
10	RF+	Output of RF+ channel. $RF+ = A + B + C + D$
11	A	Output of A channel
12	B	Output of B channel
13	C	Output of C channel
14	D	Output of D channel
15	GAIN	Logic input of Gain Controller. Allows three states – low, high, and floating - Z
16	V <sub>CC</sub>	Supply voltage. Bypass to GND with ceramic capacitor 0.1uF

## BOARD LAYOUT AND GROUNDING

To obtain the best performance from the SP8052, a printed circuit board with ground plane is required. High quality, low series resistance ceramic 0.1uF bypass capacitors should be used at the V<sub>CC</sub> and V<sub>s</sub> 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.



## ORDERING INFORMATION

Part number	Temperature range	Package Type
SP8052	-30 + 80°C	16-pin Chip-On-Board (COB)