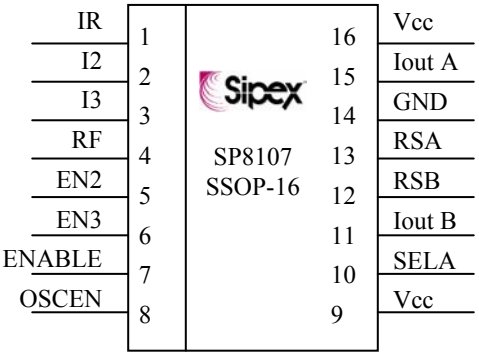
Three Channel High Performance Laser Driver

FEATURES

- Three current controlled inputs with independent ENABLE/DISABLE
- Two selectable outputs for grounded laser diodes
- Output current up to 400mA (250mA per input channel)
- Independent swing for each output channel controlled by external resistor
- On-chip oscillator with resistor controlled frequency
- Single 5V power supply
- Common ENABLE and oscillator ENABLE inputs
- TTL/CMOS logic level control signals
- Small SSOP16 package



APPLICATION

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

GENERAL DESCRIPTION

The SP8107 is a three channel laser diode driver specifically designed for high speed DVD-RW or DVD-RAM applications. It operates two grounded laser diodes (650nm for DVD and 780nm for CD) and features three input channels that allow setting of three different optical power levels. The first channel (IR) has lower gain (100mA/mA) and output current (up to 200mA) and is used as a read channel. The second (I2) and third (I3) channels have higher gain (250mA/mA) and output current (up to 250mA) and are used as write channels. Each write channel may be switched on/off at very fast switching speeds with TTL/CMOS logic level signals applied to EN2 and EN3 inputs - channels are enabled at low logic level and disabled at high logic level. Outputs of all channels are summed together and connected to one of the outputs I_{OUT} A or I_{OUT} B depending on logic signal at the input SELA. High logic level at SELA selects output I_{OUT} A, while low logic level selects output I_{OUT} B. Inputs IR, I2, and I3 are current-controlled with 200 ohm DC impedance but allow voltage control by using external limiting resistors.

An on-chip oscillator is used to reduce laser mode hopping in read mode. The frequency of this oscillator may be changed by an external resistor connected to the RF pin. Oscillator swing can be set separately for I_{OUT} A and I_{OUT} B outputs by two resistors connected to RSA and RSB pins respectively. The oscillator is enabled by high logic level at the OSCEN pin.

Low logic level at the ENABLE pin disables the entire device. Supply current in disabled mode is below 100uA. Pins EN2 and EN3 have internal pull-up resistors. Pins ENABLE, OSCEN, and SELA have internal pull-down resistors.

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PIN ASSIGNMENTS

Pin Number	Pin Name	Pin Function
1	IR	Read Channel current controlled input
2	I2	Write Channel 2 current controlled input
3	I3	Write Channel 3 current controlled input
4	RF	Connection of an external resistor to GND to set oscillator frequency
5	EN2	Write Channel 2 enable input with an internal pull-up resistor. Logic high or floating turns channel off.
6	EN3	Write Channel 3 enable input with an internal pull-up resistor. Logic high or floating turns channel off.
7	ENABLE	Common device enable input with pull-down resistor. Logic low or floating turns device off.
8	OSCEN	Oscillator enable input with pull-down resistor. Logic low or floating turns oscillator off.
9	Vcc	Supply voltage. Bypass to GND with 0.1uF ceramic capacitor
10	SELA	Output select input with pull-down resistor. Logic high selects output A, low or floating selects output B
11	I_{OUT} B	Output current source B for a laser diode
12	RSB	Connection of an external resistor to GND to set oscillator swing at the output B
13	RSA	Connection of an external resistor to GND to set oscillator swing at the output A
14	GND	Ground pin
15	I_{OUT} A	Output current source A for a laser diode
16	Vcc	Supply voltage. Bypass to GND with ceramic capacitors 0.1 and 0.01uF in parallel

BOARD LAYOUT AND GROUNDING

To obtain the best performance from the SP8107, a printed circuit board with ground plane is required. Layout should ensure that analog signal lines (IR, I2, and I3) are separated as much as possible from digital and output power lines. Output power lines should be as short and wide as possible. High quality, low series resistance ceramic 0.1 and 0.01uF bypass capacitors should be used at the Vcc pins 9 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.

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ORDERING INFORMATION

Part number	Temperature range	Package Type
SP8107	-40 to +85^{0}C	16-pin SSOP

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