IXYS

MXHV9910

Off-Line High Brightness LED Driver

Features:

- 8V to 400V Input Voltage Range
- High Efficiency
- Drives from 1 to Hundreds of LEDs in Series/Parallel Combinations
- Regulated LED Drive Current
- Linear or PWM Brightness Control
- Resistor Programmable Oscillator Frequency
- SOIC-8 RoHS Compliant Package

Applications:

- Flat Panel Display RGB Backlighting
- Signage and Decorative LED Lighting
- DC/DC or AC/DC LED Driver Applications

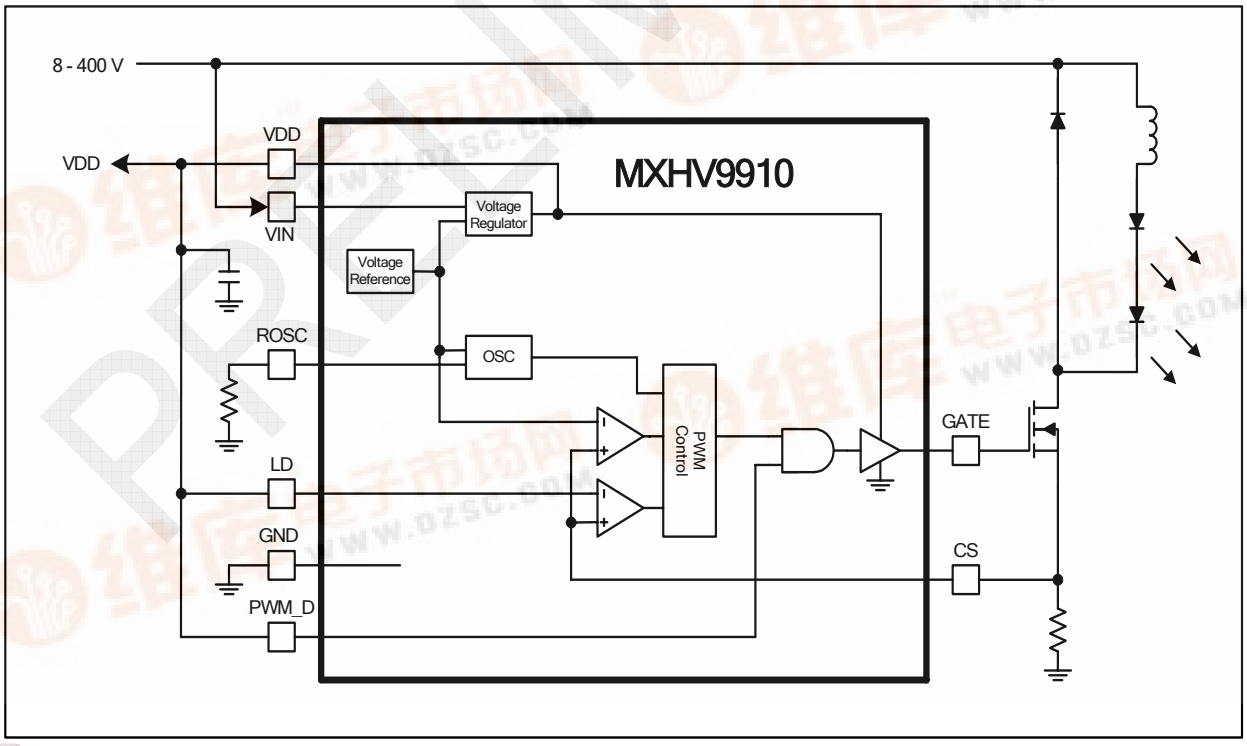
General Description

The MXHV9910 is a high-efficiency off-line LED driver. Manufactured using a dialectically isolated process the MXHV9910 can operate from 8V to 400V. This highly versatile input operating voltage enables a broad range of High Brightness (HB) LED applications. The MXHV9910 drives an external MOSFET at a fixed oscillator frequency set by an external resistor. Peak constant current to an LED string is maintained by modulating the MOSFET GATE signal on and off through the external current sense resistor connected to the CS input. Dimming of and LED string is controlled by adjusting the duty cycle of the PWM input, or applying a control voltage from 0 to 250mV to the LD input.

Ordering Information

Part No.	Description	Qty
HV991000-00	SOIC-8	100
HV991041-00	SOIC-8 Tape & Reel	2500

Functional Block Diagram and Typical Application



Absolute Maximum Ratings

Parameter	Symbol	Maximum	Units
V_{IN} to GND		-0.5 to +500	V
CS		-0.3 to V_{DD}+0.3	V
PD, PWM_D to GND		-0.3 to V_{DD} +0.3	V
GATE to GND		-0.3 to V_{DD}+0.3	V
V_{DDMAX}		15	V
Thermal Resistance, Junction to Ambient	θ_{JA}		^{o}C/W
Operating Ambient	T_A	-40 to +85	^{o}C
Storage Temperature	T_{STG}	-55 to +150	^{o}C

Absolute Maximum Ratings are stress ratings. Stresses in excess of these ratings can cause permanent damage to the device. Functional operation of the device at these or any other conditions beyond those indicated in the operational sections of this data sheet is not implied. Exposure of the device to the absolute maximum ratings for an extended period may degrade the device and affect its reliability.

Pin Description

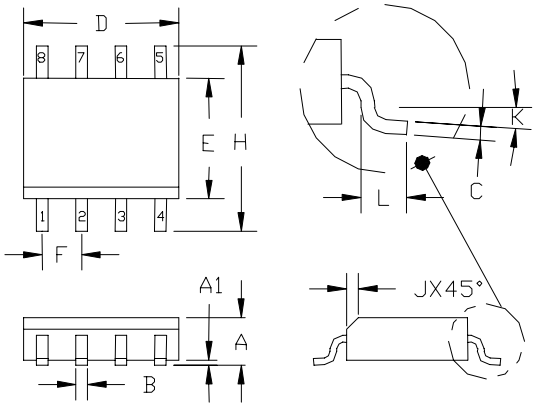
Pin No.	Pin Name	Description
1	VIN	Input Voltage 8V to 400V DC
2	CS	LED Current Sense input. Internal current sense threshold is set at 250mV. The external sense resistor sets the maximum LED current.
3	GND	Device Ground
4	GATE	External MOSFET Gate Driver Output
5	PWM_D	Low frequency PWM Dimming Control input with internal pull-down resistor.
6	VDD	7.8V regulated supply voltage output. Requires a storage capacitor to ground.
7	LD	Linear Dimming. Sets the current limit lower than the internal 250mV threshold at the current sense comparator.
8	ROSC	Resistor to ground sets the oscillator / primary PWM frequency.

Electrical Characteristics

T_A=25 °C unless otherwise specified.

Parameter	Symbol	Condition	Min	Typ	Max	Units
Input DC Voltage Range	V_{INDC}	DC input voltage	8		400	V
Shut-Down mode supply current	I_{INsd}	PWM_D to GND V_{IN} = 15-400V			1	mA
Internal DC Voltage Regulator	V_{DD}	V_{IN} = 15-400V, I_{DD}(ext) = 0 Gate output open.		7.8		V
Maximum voltage to V_{DD} pin	V_{DD}max	External voltage applied to the V_{DD} pin			15	
V_{DD} current available for external circuitry	I_{DD}(ext)	V_{IN} = Limited by package power dissipation.		1.0		mA
PWM_D input low voltage		V_{IN} = 8-400V			0.8	V
PWM_D input high voltage		V_{IN} = 8-400V	2.4			V
PWM_D pull-down resistance	R_{EN}			125		kΩ
Current sense threshold voltage	V_{CS}(hi)	T_A = -40 °C to +85 °C		250		mV
GATE high output voltage	V_{GATE}(hi)	I_{OUT} = 10mA		V_{DD} -0.3		V
GATE low output voltage	V_{GATE}(lo)	I_{OUT} = -10mA		0.3		V
Oscillator frequency	f_{OSC}	R_{OSC} = 400kΩ		64		kHz
Maximum Oscillator PWM Duty Cycle	D_{MAX}hf				85	%
Linear Dimming Voltage Range	V_{LD}	V_{IN} = 15V	0		250	mV
Current Sense Blanking Interval	T_{BLANK}			400		nS
Delay from CS trip to GATE lo	t_{DELAY}			300		nS
GATE output rise time	t_{RISE}	C_{GATE} = 500pF		30		nS
GATE output fall time	t_{FALL}	C_{GATE} = 500pF		30		nS

8-LEAD SOIC



DIMENSIONS (1)					
DIM.	INCH		MM.		NOTE
	MIN.	MAX.	MIN.	MAX.	
A	.0532	.0688	1.35	1.75	----
A1	.0040	.0098	.10	.25	----
B	.013	.020	.33	.51	----
C	.0075	.0098	.19	.25	----
D	.1890	.1968	4.80	5.00	(2)
E	.1497	.1574	3.80	4.00	(2)
F	.050 BSC		1.27 BSC		----
H	.2284	.2440	5.80	6.20	----
J	.0099	.0196	.25	.50	----
K	0°	8°	0°	8°	----
L	.016	.050	.40	1.27	----

3. MOLDED PACKAGE SHALL CONFORM TO JEDEC STANDARD CONFIGURATION MS-012 VARIATION AA.

(2) DIMENSIONS D AND E DO NOT INCLUDE MOLD PROTRUSIONS.

(1) CONTROLLING DIMENSIONS: MILLIMETERS.

NOTES: (UNLESS OTHERWISE SPECIFIED)

IXYS Corporation
3540 Bassett Street
Santa Clara, CA 925054
Tel: 408-892-0700
Fax: 408-496-0670
e-mail:sales@ixys.net

Micronix
An **IXYS** Company
145 Columbia
Aliso Viejo, CA 92656-1490
Tel: 1-949-831-4622
Fax: 1-949-831-4628

SALES OFFICES AMERICAS

Eastern Region
[Eastern North America, Mexico, South America]
IXYS Corporation
Beverly, MA
Tel: 508-528-6883
Fax: 508-528-4562
wgh@ixys.net

Central Region
[Central North America]
IXYS Corporation
Greensburg, PA
Tel: 724-836-8530
Fax: 724-836-8540
neil.lejeune@westcode.com

Western Region
[Western North America]
IXYS Coporation
Solana Beach, CA
Tel: 858-792-1101
slodor@ix.netcom.com

SALES OFFICES EUROPE

European Headquarters
IXYS Semiconductor GMBH
Edisonstrasse 15
D- 68623 Lampertheim
Germany
Tel: 49-6206-503203
Fax: 49-6206-503286
marcom@ixys.de

United Kingdom
IXYS Semiconductor Limited
Langley Park Way
Langley Park
Chippenham
Wiltshire SN 15 1GE - England
Tel: 44 1249 444524
Fax: 44 1249 659448
sales@ixys.co.uk

Sales Offices ASIA / PACIFIC

Asian Headquarters
IXYS
Room 1016, Chia-Hsin, Bldg II,
10F, No. 96, Sec. 2
Chung Shan North Road
Taipei, Taiwan R.O.C.
Tel: 886-2-2523-6368
Fax: 886-2-2523-6368
bradley.green@ixys.co.uk
Jhong@clare.com

Check the IXYS Website for the local sales office nearest you. (www.ixys.com)

http://www.claremicronix.com

Specification: MXHV9910