Description

HY3010 is a PFM power LED driver IC. The driving current is from few milliamps up to 1A. It allows high brightness power LED operating at high efficiency from 3Vdc to 40Vdc. External current sense resistor controlled the maximum output current to LED(s).
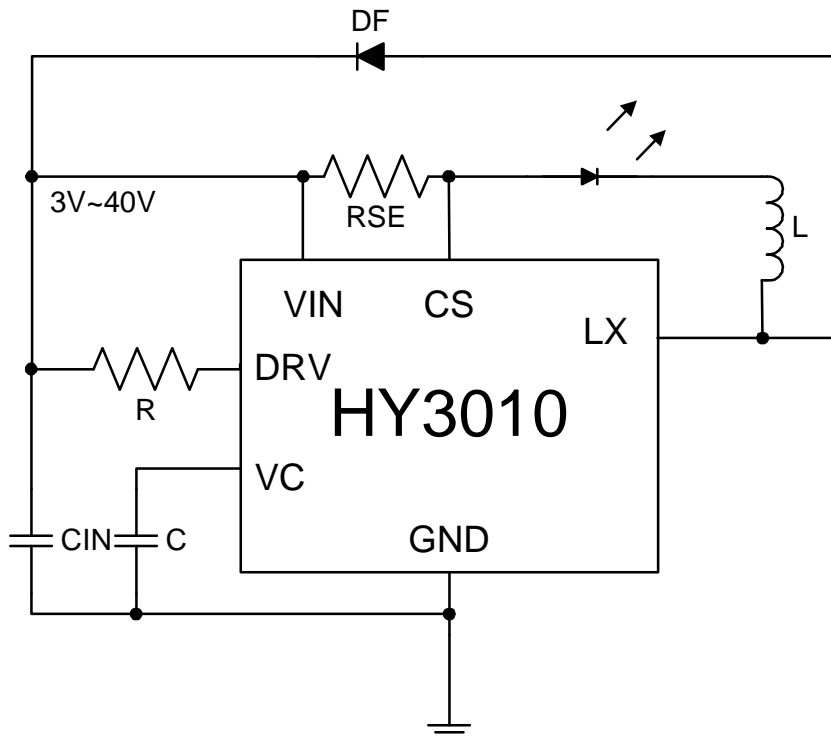
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Features

n Only 6 external components required.

n Operation from 3V to 40V.

n Low standby current.

n Output switching current to 1A.
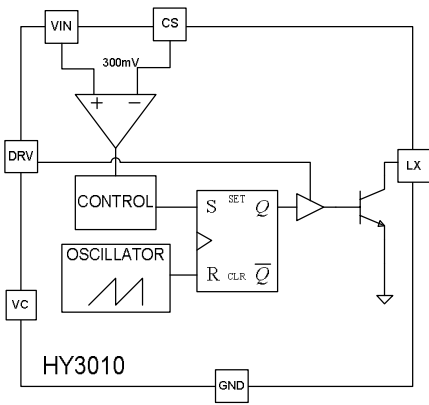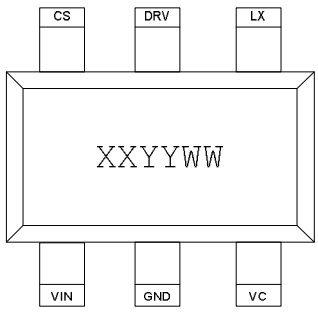
n SOT-23 6-pin small package..

Applications

n DC/DC LED Driver Application.

n Automotive LED Lighting Application.

n Decorative Lighting.

n MR16.

Typical Applications Circuit

HY3010 V1.0

SCHEMATIC DIAGRAM AND PIN DESCRIPTION

1	VIN	Power Supply
2	GND	Ground
3	VC	Oscillator timing capacitor.
4	LX	Driver Output
5	DRV	Current Driver
6	CS	Output current set input. Connect a resistor from CS to VIN to set the LED bias current. $I_{LED} = 0.3 / RSE$

SOT23-6L

XX = Device Code
(10=HY3010)
YY=Year
WW=Weekly

ABSOLUTE MAXIMUM RATINGS

SYMBOL	PARAMETER	VALUE	UNIT
VIN	Supply Voltage	-0.3 to 40	V
OUT	Output Voltage	-0.3 to 40	V
I_{OUT}	Output Current	1	A
T_J	Maximum Junction Temperature	150	℃
T_S	Storage Temperature	-65 to 150	℃
P_D	Power Dissipation	Internally limited	W
ESD	ESD Protection HBM	2000	V

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RECOMMENDED OPERATING CONDITIONS

SYMBOL	PARAMETER	MIN	MAX	UNIT
VIN	Supply Voltage	3	40	**V**
T_A	Ambient Temperature	-40	85	℃
I_{OUT}	Output Current		1	**A**

ELECTRICAL CHARACTERISTICS

(VIN = 5V, TA = 25°C, UNLESS OTHERWISE SPECIFIED)

PARAMETER	SYMBOL	CONDITION	MIN	TYP	MAX	UNIT
Supply Current	I_{CC}	VIN=5V~40V, C_T=1.0nF			4	mA
Output Drop-out Voltage	V_{DP}	I_{OUT}=0.8A, V_{CS}-V_{OUT}		0.6	0.9	V
Output Off Current	I_{OFF}	V_{CS} - V_{OUT} = 40V		0.01	100	uA
Current Sense Voltage	Vs	VIN - V_{CS}	280	300	320	mV
Maximum Duty Cycle	T_{DC}	VIN = V_{CS}		85		%
Oscillator Charge Current	I_{CHG}	VIN=5V~40V, TA = 25°C		38	45	uA

HY3010 V1.0

APPLICATION INFORMATION
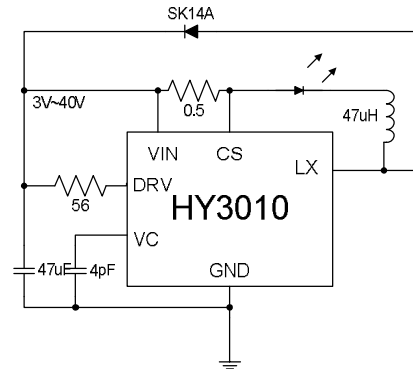
（ **Fig.1** ）

Fig.1 shows the HY3010 typical application circuit for input voltage range from 4V to 40V. Only 6 external components were required total forward voltage of the LED(s) should lower than supply voltage by 1.6V at least.

LED Driving Current

The peak current IPK flow though LED(s) was shown as below:

$$IPK = \frac{300mV}{RSE}$$

The average current on LED(s) was determined by the peak-to-peak ripple current that was decided by inductor L. The RSE value should higher than 300mΩ so that driving current won't over the recommended maximum driving current 1.0A.

Inductor

In order to reduce the current ripple on LED(s), the L value should high enough to keep the system working at continuous-conduction mode that inductor current won't fall to zero. Where, VLED is the total forward voltage (at expecting current) of the LED string, VF is the forward voltage of the flywheel diode DF, VRSE is the peak value of the voltage drop across RSE which is 300mV, and VSAT is the saturation voltage of the switch which has a typical value of 1V, the value of inductance can be calculated.

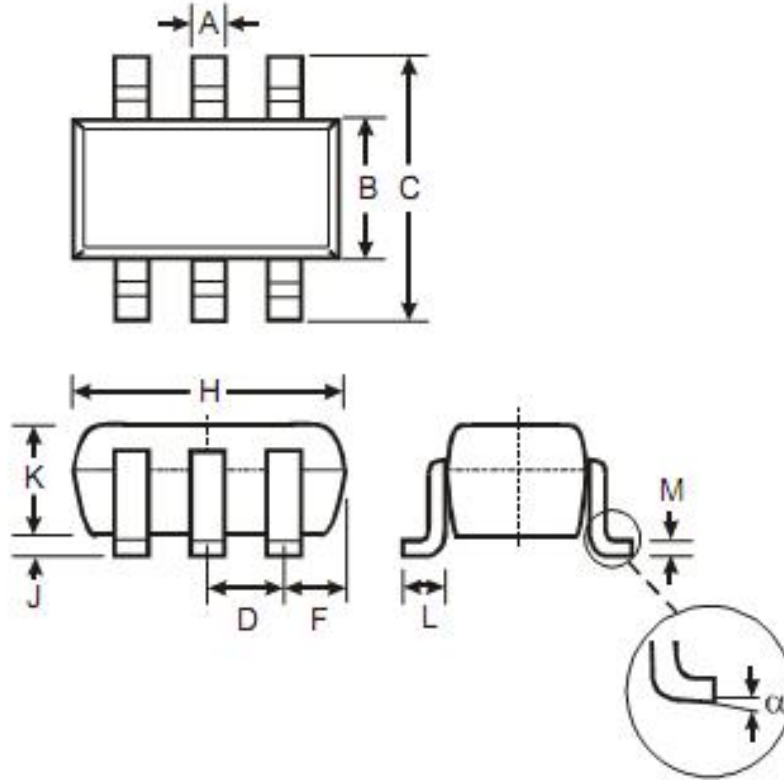$$L = \frac{VIN - VRSE - VSAT - VLED}{IPK} \times Ton \qquad (\text{ Ton is on state duty of period})$$

HY3010 V1.0
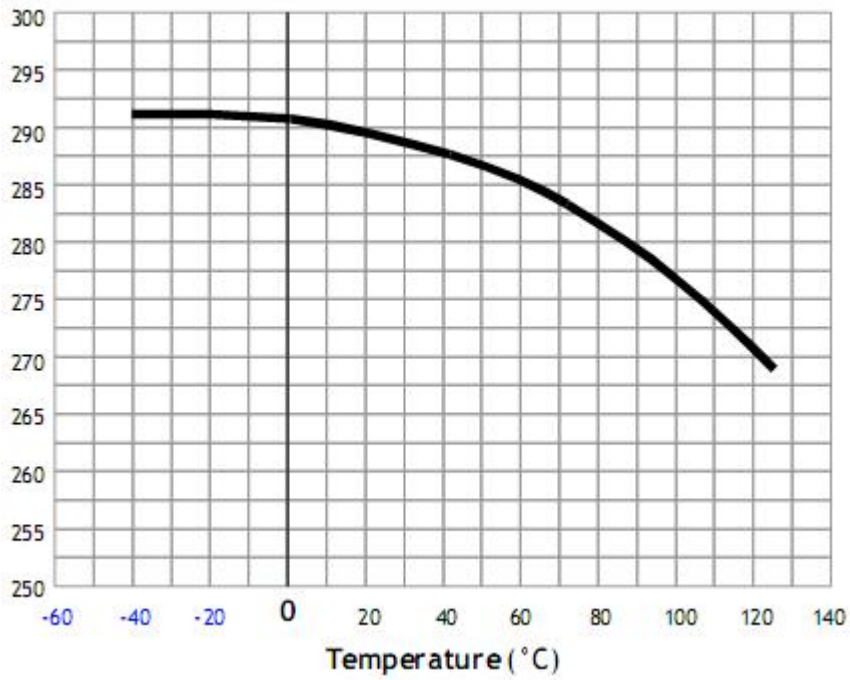
Current Sense Voltage versus. Temperature

APPLICATION MR16 (3W)

HY3010 V1.0
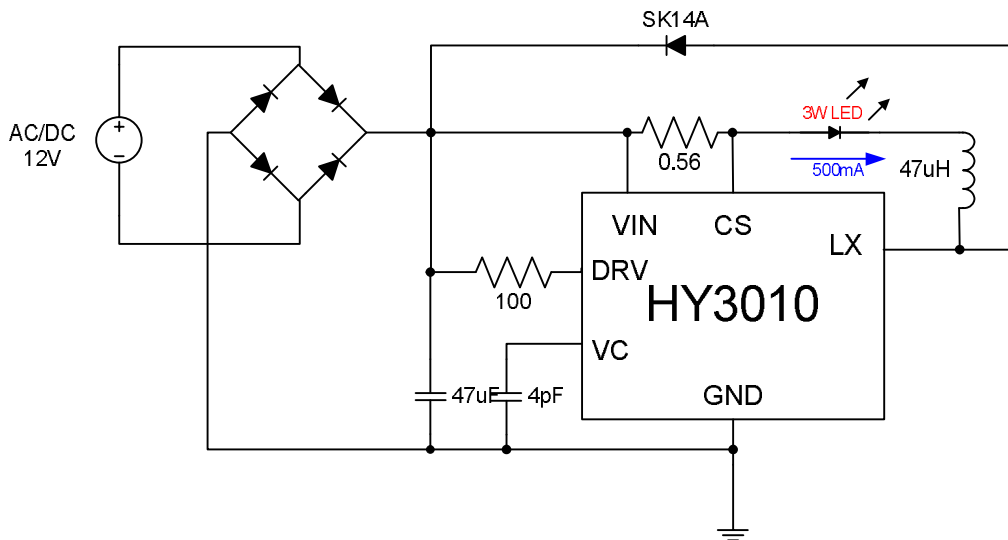
Package Outline Dimensions

SOT-26			
Dim	**Min**	**Max**	**Typ**
A	0.35	0.50	0.38
B	1.50	1.70	1.60
C	2.70	3.00	2.80
D	—	—	0.95
F	—	—	—
H	2.90	3.10	3.00
J	0.013	0.10	0.05
K	1.00	1.30	1.10
L	0.35	0.55	0.40
M	0.10	0.20	0.15
α	0°	8°	—
All Dimensions in mm			

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ORDERING INFORMATION

HY3010 ST26 R

Circuit Type

Package Type
ST26 : SOT23-6

Shipping
R: Tape & Reel

ORDERING REMEMBER	OUTPUT VOLTAGE	PACKAGE	SHIPPING
HY3010ST26R	N/A	SOT23-6L	3,000 Units/ Tape & Reel

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