

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).

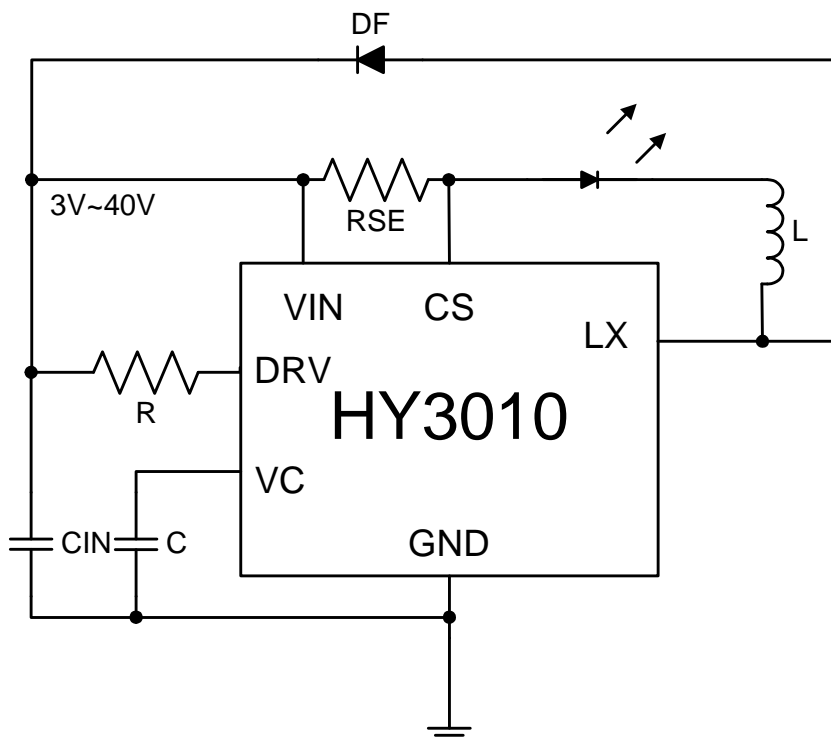
Features

- 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..
- n Automotive qualified according AEC-Q100

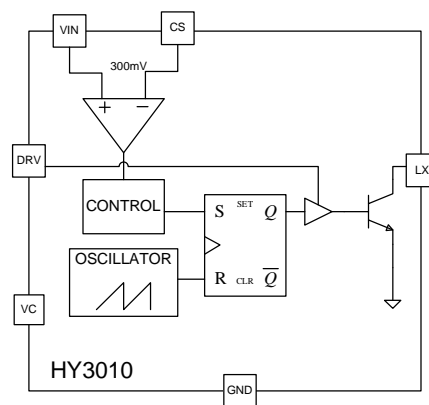
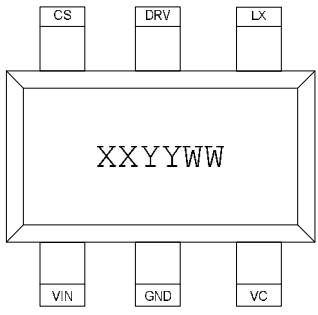
Applications

- n DC/DC LED Driver Application.
- n Automotive LED Lighting Application.
- n Decorative Lighting.
- n MR16.

Typical Applications Circuit



SCHEMATIC DIAGRAM AND PIN DESCRIPTION

	1	VIN	Power Supply	 <p style="text-align: center;">SOT23-6L XX = Device Code (10=HY3010) YY=Year WW=Weekly</p>
	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. $I_{LED} = 0.3 / RSE$	

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	°C
T _S	Storage Temperature	-65 to 150	°C
P _D	Power Dissipation	Internally limited	W
ESD	ESD Protection HBM	2000	V

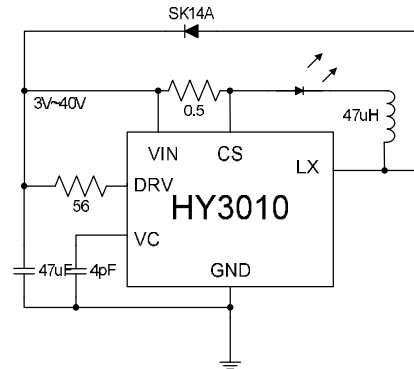
**RECOMMENDED OPERATING CONDITIONS**

SYMBOL	PARAMETER	MIN	MAX	UNIT
V _{IN}	Supply Voltage	3	40	V
T _A	Ambient Temperature	-40	85	°C
I _{OUT}	Output Current		1	A

ELECTRICAL CHARACTERISTICS(V_{IN} = 5V, T_A = 25°C, UNLESS OTHERWISE SPECIFIED)

PARAMETER	SYMBOL	CONDITION	MIN	TYP	MAX	UNIT
Supply Current	I _{CC}	V _{IN} =5V~40V, C _T =4.0pF			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	V _S	V _{IN} - V _{CS}	280	300	320	mV
Oscillator Charge Current	I _{CHG}	V _{IN} =5V~40V, T _A = 25°C		38	45	uA

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:

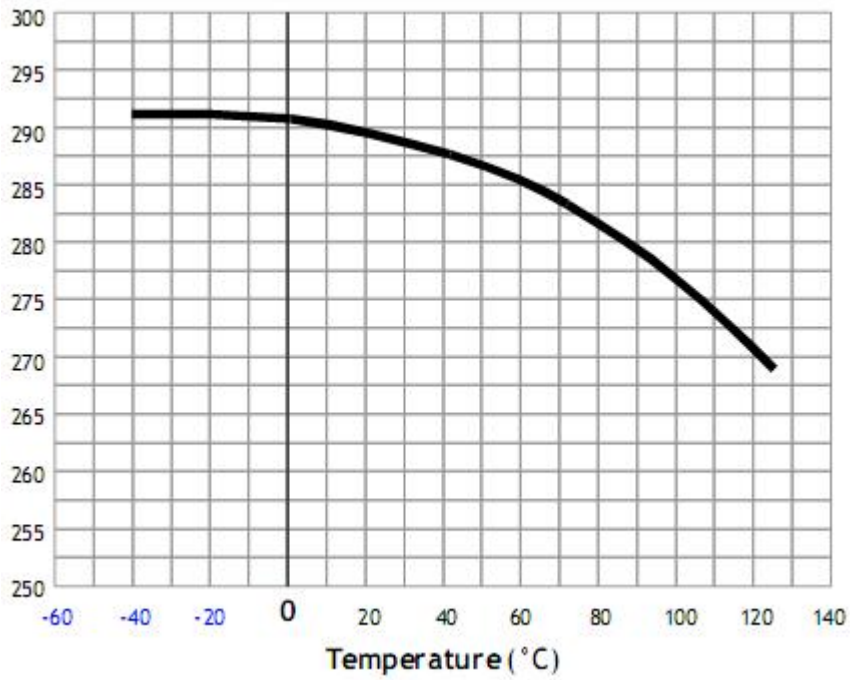
$$IPK = \frac{300mV}{RSE}$$

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

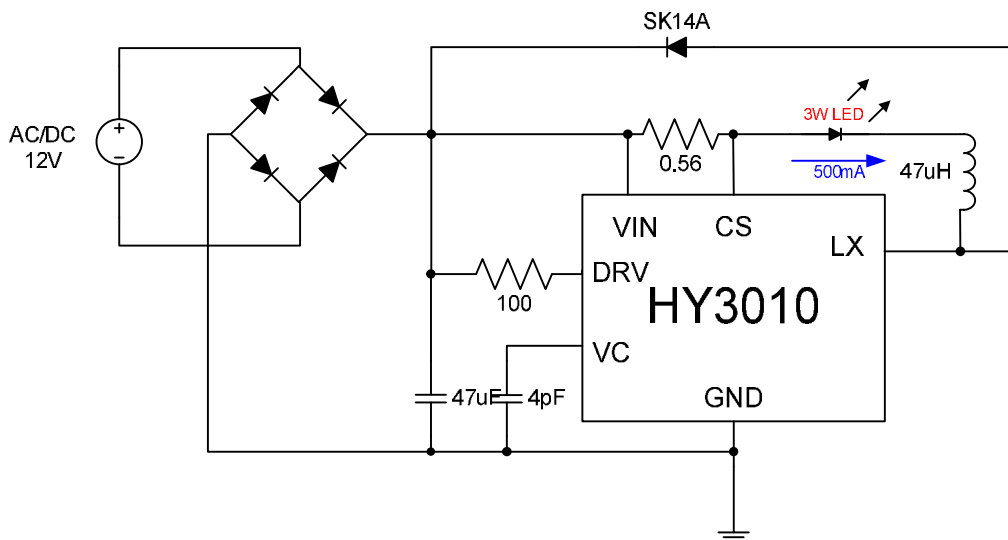
In order to reduce the current ripple on LED(s), the L value should high enough to keep the system working at continuous-conduction mode that inductor current won't fall to zero. Where, $VLED$ is the total forward voltage (at expecting current) of the LED string, VF is the forward voltage of the flywheel 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.

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

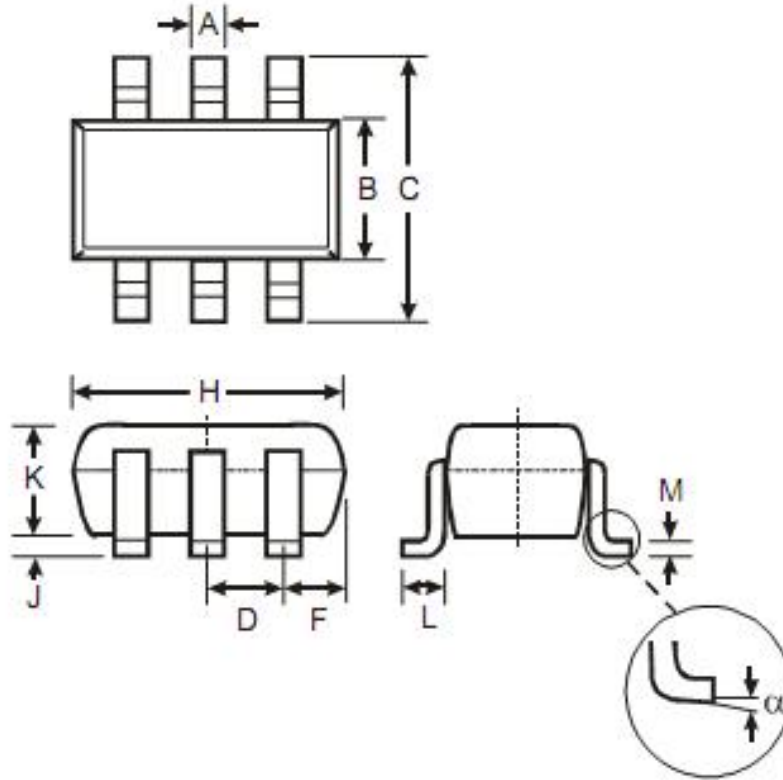


Current Sense Voltage versus. Temperature

APPLICATION MR16 (3W)



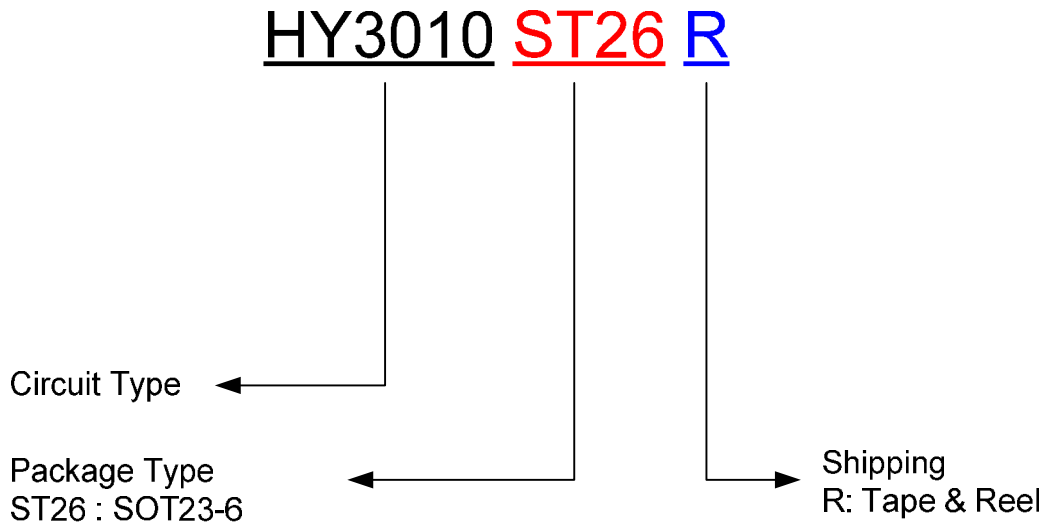
Package Outline Dimensions



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			



ORDERING INFORMATION



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