



**800mA Buck (Step-down) WLED Driver**

**SOT-25**



**Pin Definition:**

1.  $V_{IN}$
2. Ground
3.  $C_T$
4.  $I_{SENSE}$
5. SW

**General Description**

The TS19373 is a continuous mode inductive step-down converter, designed for driving single or multiple series connected LEDs efficiently from a voltage source higher than the LED voltage. The device operates from an input supply between 6V and 40V and provides an externally adjustable output current of up to 800mA.

TS19373 includes the output switch and a high-side output current sensing circuit, which uses an external resistor to set the nominal average output current.

**Features**

- Wide Input Voltage Range 6V~40V
- 800mA Output Current
- High Efficiency up to 90%
- Drives up to 3 (1~3W) LEDs @  $V_{IN}$  12V
- Drives up to 7 (1~3W) LEDs @  $V_{IN}$  24V
- 180kHz Switching Frequency
- Internal PWM Filter

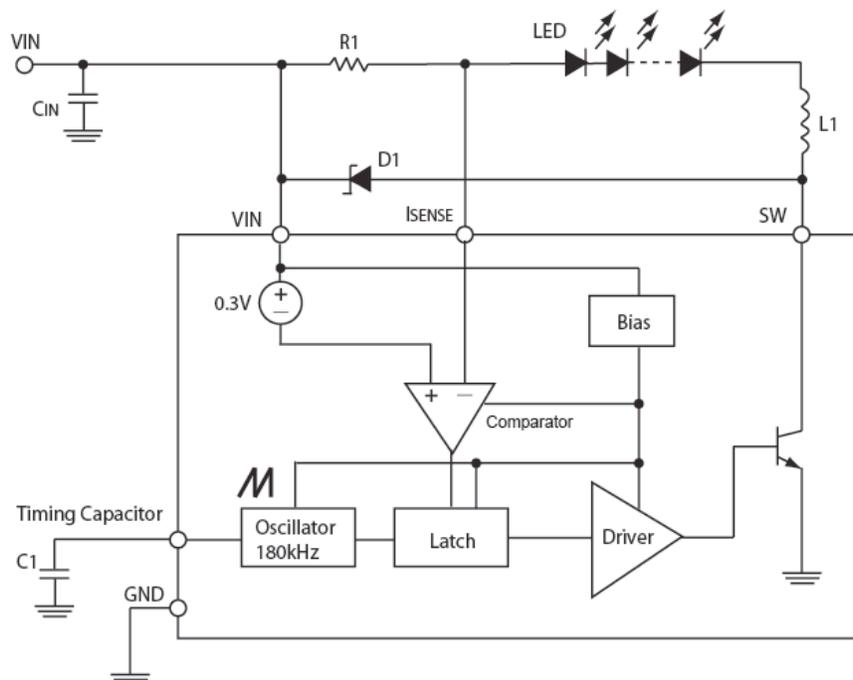
**Application**

- DC/DC or AC/DC LED driver applications
- Back lighting of flat panel displays
- Signage and decorative LED lightings
- Chargers
- LED Lighting Equipment – MR16, Tube

**Ordering Information**

Part No.	Package	Packing
TS19373CX5 RF	SOT-25	3Kpcs / 7" Reel

**Block Diagram**



**Absolute Maximum Rating**

Parameter	Symbol	Limit	Unit
Input Voltage	$V_{IN}$	40	V
Supply Voltage (Recommended)	$V_{IN}$	6 ~ 40	V
FB Voltage	$V_{FB}$	-0.3 ~ 40	V
SW Voltage	$V_{SW}$	36	V
Output SW Current	$I_{SW}$	800	mA
Ambient Temperature Range	$T_A$	-40 to +85	°C
Junction Temperature Range	$T_J$	+150	°C

**Electrical Specifications** ( $T_a = 25^\circ\text{C}$ , unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Input Voltage Range	$V_{IN}$		6	--	40	V
Line Regulation	$REG_{LINE}$		--	1.4	5	mV
Charge Current	$I_{CHARGE}$	$V_{IN} = 6V \sim 40V$	--	30	45	uA
Discharge Current	$I_{DISCHARGE}$	$V_{IN} = 6V \sim 40V$	180	230	290	uA
Switching Frequency	$F_{OSC}$	$C_T = 100pF,$	--	180	--	kHz
Current Limit Sense Voltage	$V_{SENSE}$	$I_{DISCHARGE} = I_{CHARGE}$	250	--	350	mV
Switch $V_{CESAT}$	$V_{SAT}$	$I_{SW} = 300mA$	--	1.0	1.3	V
Supply Current	$I_{CC}$	$V_{IN} = 6V \sim 40V, C_T = 1nF$	--	3	4	mA
Collector off-state Current	$I_{C(OFF)}$	$V_{CE} = 40V$		1	100	uA

Note: Low duty cycle pulse techniques are used during test to maintain junction temperature as close to ambient temperature as possible

## Application Information

### Pin Description

Pin	Function	Description
1	VIN	Input Voltage Supply pin
2	Ground	Ground Pin
3	Timing Capacitor	Timing capacitor oscillator input
4	I <sub>SENSE</sub>	Peak current sense input to monitor the voltage drop across an external resistor to limit the peak current through the circuit
5	SW	Switching Pin. This is the internal Darlington switch collector

### Inductor Selection

A 100uH inductor is recommended for most TS19373 applications. Although small size and high efficiency are major concerns, the inductor should have low core losses at 180kHz and low DCR (copper wire resistance).

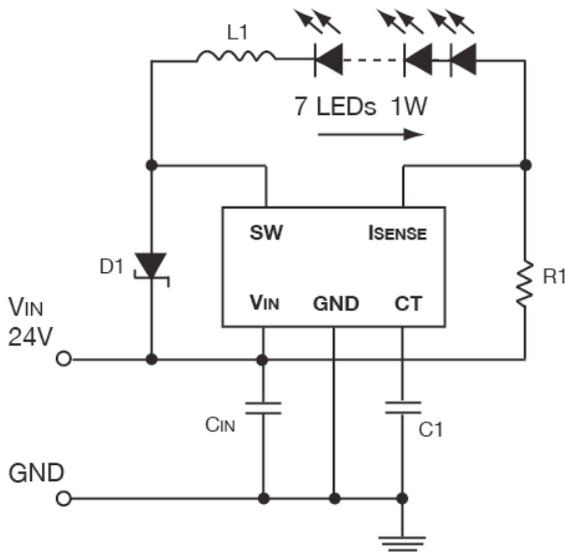
### Diode Selection

Schottky diodes, with their low forward voltage drop and fast reverse recovery, are the ideal choices for TS19373 applications. The forward voltage drop of a Schottky diode represents the conduction losses in the diode while the diode capacitance represents the switching losses. For diode selection, both forward voltage drop and diode capacitance need to be considered. Schottky diodes with higher current ratings usually have lower forward voltage drop and larger diode capacitance, which can cause significant switching losses at the 180kHz switching frequency of the TS19373.

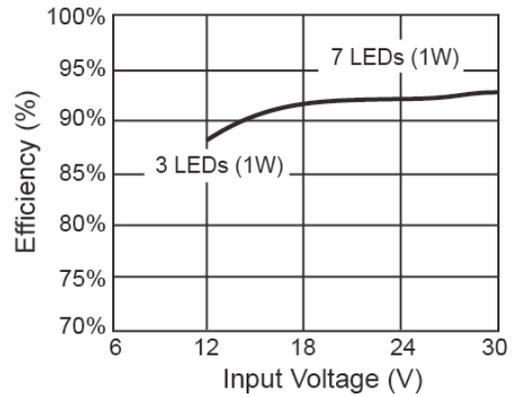
### Capacitor Selection

For Input capacitor and timing capacitor are able to use small ceramic capacitor for most of TS19373 applications. When AC input, to add a 100μF electric capacitor for input capacitor is recommended.

**Typical Application Circuit**



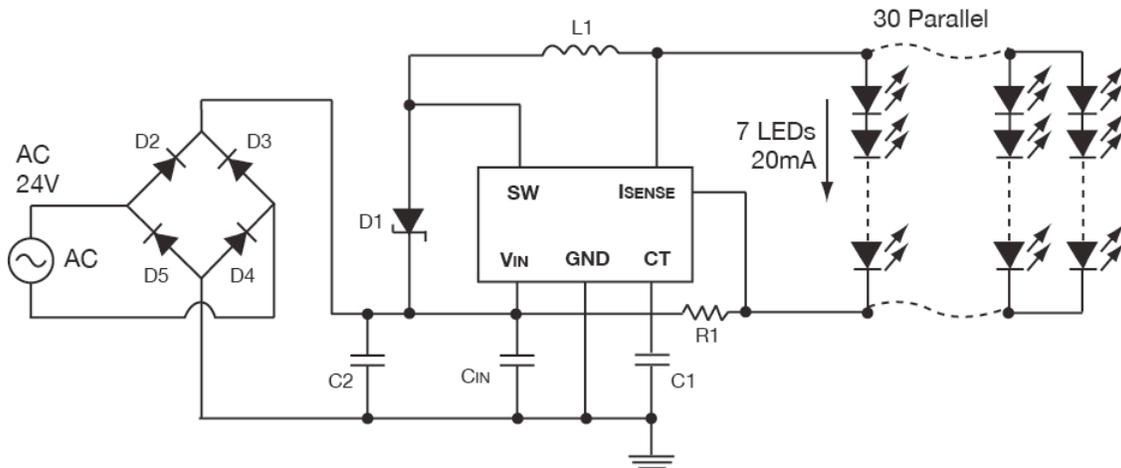
**Input Voltage vs. Efficiency**



**Reference Design Information**

VIN Range (V)	L (uH)	LED (Series)	Current (mA)	Efficiency (%)
12	68	3pcs	300	89
24	100	7pcs	300	90

**Typical Application Circuit – LED Tube**

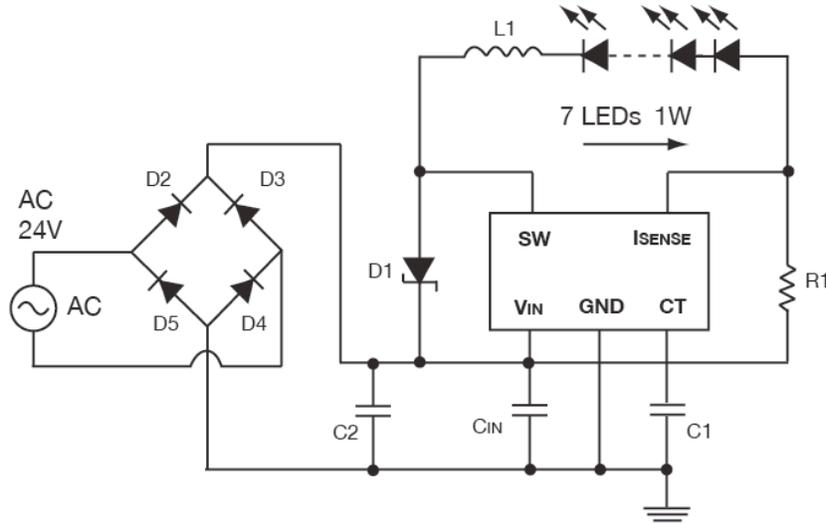


**Bill of Materials:**

Designation	Description	Package	Manufacture	Remark
LED Driver	TS19373CX5	SOT-25	TSC	--
D1,2,3,4,5	SS14L	SMA	TSC	1A, 40V
L1	100uH	--	Generic	Isat > 500mA
R1	0.5Ω	1206	Generic	--
Cin	10uF	805	Generic	Ceramic
C1	200pF	805	Generic	Ceramic
C2	100uF		Generic	Tantalum or Electrolysis * AC Input

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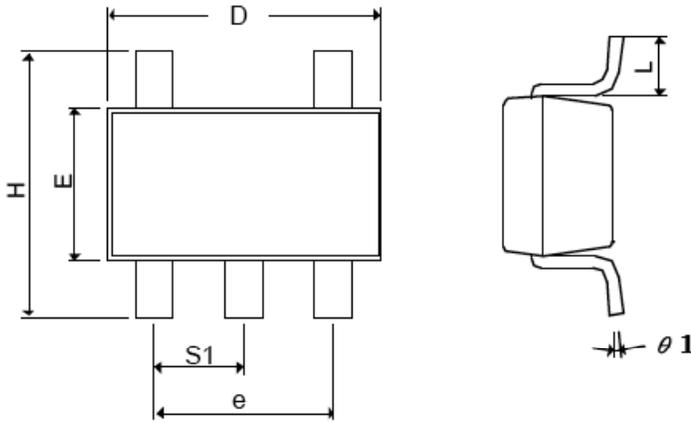
**Typical Application Circuit – MR16**



**Bill of Materials:**

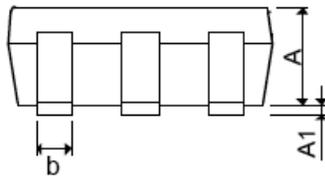
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C2	100uF		Generic	Tantalum or Electrolysis * AC Input

**SOT-25 Mechanical Drawing**



DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX.
A+A1	0.09	1.25	0.0354	0.0492
B	0.30	0.50	0.0118	0.0197
C	0.09	0.25	0.0035	0.0098
D	2.70	3.10	0.1063	0.1220
E	1.40	1.80	0.0551	0.0709
e	1.90 BSC		0.0748 BSC	
H	2.40	3.00	0.09449	0.1181
L	0.35 BSC		0.0138 BSC	
$\Theta 1$	0°	10°	0°	10°
S1	0.95 BSC		0.0374 BSC	

**Front View**



**Marking Diagram**



- 73** = Device Code
- Y** = Year Code
- M** = Month Code  
(A=Jan, B=Feb, C=Mar, D=Apr, E=May, F=Jun, G=Jul, H=Aug, I=Sep, J=Oct, K=Nov, L=Dec)
- L** = Lot Code

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