SGM37310
35.5V High Efficiency, Boost White LED Driver with PWM Dimming Control

GENERAL DESCRIPTION

The SGM37310 is an asynchronous Boost WLED driver with high efficiency, low EMI and high output voltage. The Boost converter integrates a 40V, 1.5A internal FET which operates at 1.2MHz switching frequency. Its strong driving ability can drive single or multiple parallel LED strings, which can be used as LED driver for smart phone and tablet backlight.

The default LED current can be programmed by the external current-sense resistor R_{SET}. By varying the duty cycle of the PWM signal applied to the CTRL pin, the internal reference voltage is adjusted, which ultimately adjusts the LED sink current. With full PWM duty cycle, the internal reference voltage V_{REF} is 200mV (TYP). The SGM37310 is essentially a driver that adopts analog dimming control, and it will not produce audible noise on the output capacitor. The SGM37310 integrates ringing cancellation, and it can effectively reduce EMI noise in DCM mode. The SGM37310 provides excellent line regulation and load regulation, as well as excellent load transient response. The SGM37310 also features various protection functions such as open LED protection, OCP protection and thermal shutdown protection.

The SGM37310 is available in a Green TDFN-2×2-6L package. It operates over an ambient temperature range of -40℃ to +85℃.

FEATURES

- **Input Voltage Range: 2.7V to 5.5V**
- **1:250 Stable Luminance Dimming**
- **Low EMI by Conducting Ringing Cancelling**
- **Improved PSRR for Waveless Lighting**
- **Up to 90% Efficiency**
- **Switching Frequency: 1.2MHz**
- **Integrated 40V/1.5A Switch**
- **Feedback Voltage: 200mV**
- **PWM Dimming Control**
- **35.5V Open LED Protection for 10 LEDs in Series**
- **Automatic Soft-Start for Reduced Inrush Current**
- **Under-Voltage Lockout Protection**
- **Thermal Shutdown**
- **-40℃ to +85℃ Operating Temperature Range**
- **Available in a Green TDFN-2×2-6L Package**

APPLICATIONS

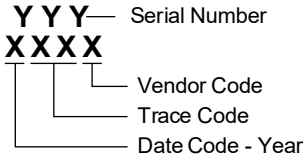
Portable Devices Backlight
Small and Medium Size White LCD Display Backlight

PACKAGE/ORDERING INFORMATION

MODEL	PACKAGE DESCRIPTION	SPECIFIED TEMPERATURE RANGE	ORDERING NUMBER	PACKAGE MARKING	PACKING OPTION
SGM37310	TDFN-2×2-6L	-40℃ to +85℃	SGM37310YTDI6G/TR	0GJ XXXX	Tape and Reel, 3000

MARKING INFORMATION

NOTE: XXXX = Date Code, Trace Code and Vendor Code.



Green (RoHS & HSF): SG Micro Corp defines "Green" to mean Pb-Free (RoHS compatible) and free of halogen substances. If you have additional comments or questions, please contact your SGMICRO representative directly.

ABSOLUTE MAXIMUM RATINGS

Voltage on VIN, CTRL, FB ..... -0.3V to 6V
Voltage on SW ..... -0.3V to 40V
Package Thermal Resistance
TDFN-2×2-6L, θ_{JA} ..... 87℃/W
Junction Temperature ..... +150℃
Storage Temperature Range ..... -65℃ to +150℃
Lead Temperature (Soldering, 10s) ..... +260℃
ESD Susceptibility
HBM 2000V
CDM 1000V

RECOMMENDED OPERATING CONDITIONS

Input Voltage Range ..... 2.7V to 5.5V
Output Voltage Range ..... V_{IN} to 35.5V
Inductor ..... 4.7μH to 10μH
Input Capacitor ..... 1μF (MIN)
Output Capacitor ..... 1μF to 10μF
Operating Temperature Range ..... -40℃ to +85℃

OVERSTRESS CAUTION

Stresses beyond those listed in Absolute Maximum Ratings may cause permanent damage to the device. Exposure to absolute maximum rating conditions for extended periods may affect reliability. Functional operation of the device at any conditions beyond those indicated in the Recommended Operating Conditions section is not implied.

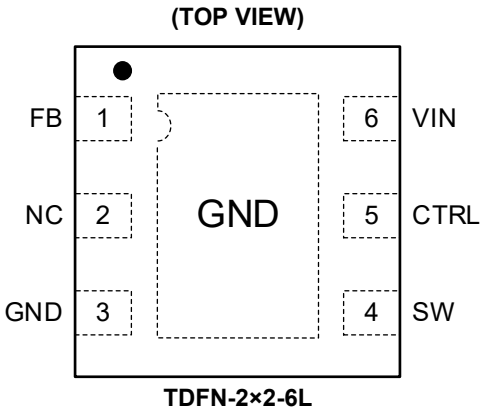
ESD SENSITIVITY CAUTION

This integrated circuit can be damaged if ESD protections are not considered carefully. SGMICRO recommends that all integrated circuits be handled with appropriate precautions. Failure to observe proper handling and installation procedures can cause damage. ESD damage can range from subtle performance degradation to complete device failure. Precision integrated circuits may be more susceptible to damage because even small parametric changes could cause the device not to meet the published specifications.

DISCLAIMER

SG Micro Corp reserves the right to make any change in circuit design, or specifications without prior notice.

PIN CONFIGURATION



PIN DESCRIPTION

PIN	NAME	I/O	FUNCTION
1	FB	I	Feedback Input for Current. Connect the sense resistor between FB and GND.
2	NC	—	No Connection.
3	GND	O	Ground.
4	SW	I	The Switch Pin of the Device. It is connected to the drain of the internal N-channel power FET.
5	CTRL	I	PWM Dimming Input.
6	VIN	I	Input Supply Pin.
Exposed Pad	GND	—	It should be soldered to the ground plane.

NOTE: I: input, O: output.

TYPICAL APPLICATION

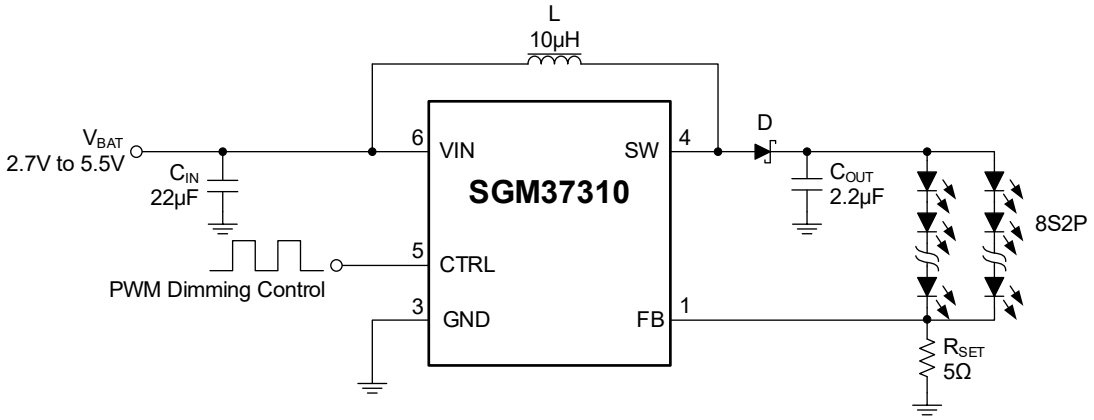
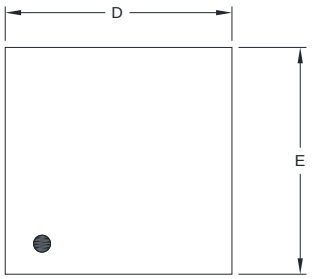


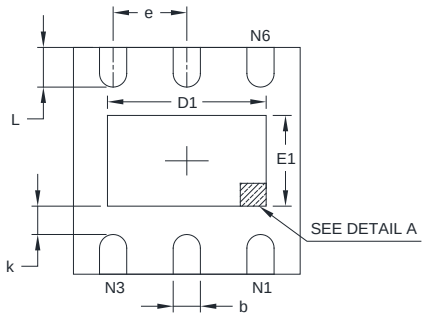
Figure 1. Typical Application

PACKAGE OUTLINE DIMENSIONS

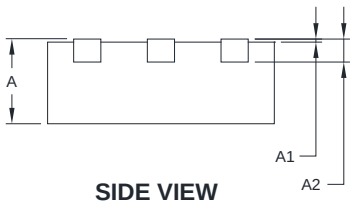
TDFN-2×2-6L



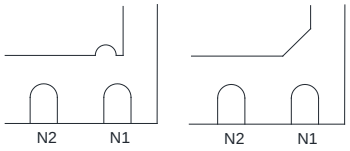
TOP VIEW



BOTTOM VIEW



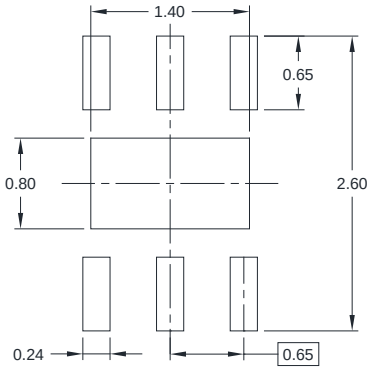
SIDE VIEW



DETAIL A

Pin #1 ID and Tie Bar Mark Options

NOTE: The configuration of the Pin #1 identifier is optional, but must be located within the zone indicated.



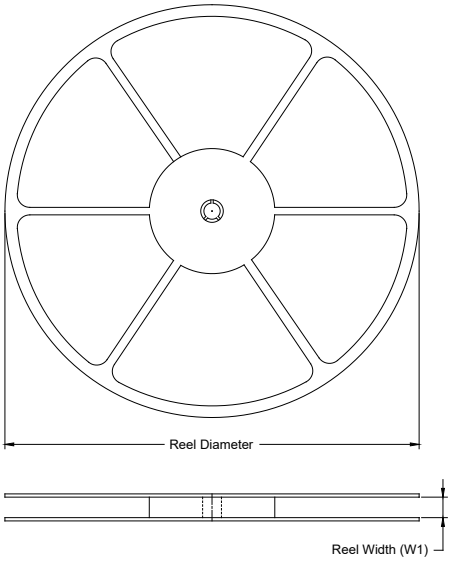
RECOMMENDED LAND PATTERN (Unit: mm)

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A	0.700	0.800	0.028	0.031
A1	0.000	0.050	0.000	0.002
A2	0.203 REF		0.008 REF	
D	1.900	2.100	0.075	0.083
D1	1.100	1.450	0.043	0.057
E	1.900	2.100	0.075	0.083
E1	0.600	0.850	0.024	0.034
k	0.200 MIN		0.008 MIN	
b	0.180	0.300	0.007	0.012
e	0.650 TYP		0.026 TYP	
L	0.250	0.450	0.010	0.018

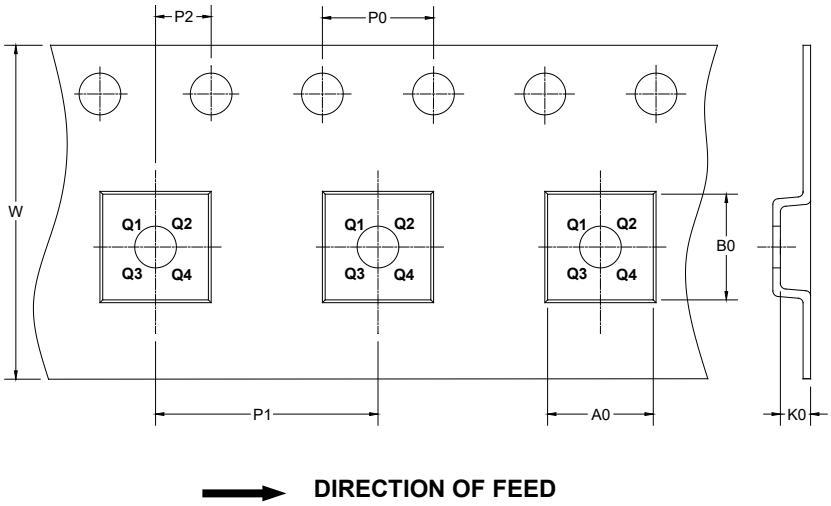
NOTE: This drawing is subject to change without notice.

TAPE AND REEL INFORMATION

REEL DIMENSIONS



TAPE DIMENSIONS



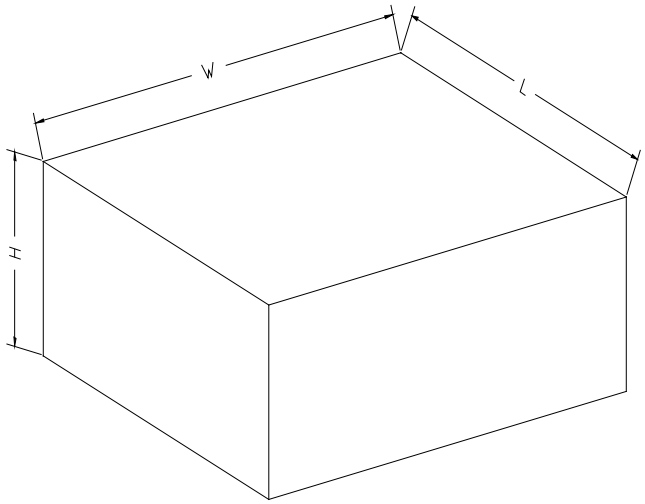
NOTE: The picture is only for reference. Please make the object as the standard.

KEY PARAMETER LIST OF TAPE AND REEL

Package Type	Reel Diameter	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P0 (mm)	P1 (mm)	P2 (mm)	W (mm)	Pin1 Quadrant
TDFN-2×2-6L	7″	9.5	2.30	2.30	1.10	4.0	4.0	2.0	8.0	Q1

DD0001

CARTON BOX DIMENSIONS



NOTE: The picture is only for reference. Please make the object as the standard.

KEY PARAMETER LIST OF CARTON BOX

Reel Type	Length (mm)	Width (mm)	Height (mm)	Pizza/Carton
7″ (Option)	368	227	224	8
7″	442	410	224	18

DD0002