PLC Receiver for Photovoltaic Array Rapid Shutdown

GENERAL DESCRIPTION

The SiLM6000 is an integrated power line communication (PLC) receiver that is designed for photovoltaic array rapid shutdown. With the integrated NFET driver, the SiLM6000 provides a simple system design that complies with the requirements of the National Electric Code for photovoltaic module level shutdown.

When the PLC receiver detects a system generated keep alive signal on the DC power line, the gate driver controls an external switch to connect the PV module to the string. In the absence of the keep alive signal, the gate drive turns off the external switch and allows the PV module to be disconnected from the string. The SiLM6000 additionally provides a 1V, 10mA regulated output that can be applied to the PV array during shutdown which compliance with the SunSpec™ Alliance specification.

The SiLM6000 operates with input voltage from 10.5V to 110V and supports junction temperature between -40℃ to 125℃.

FEATURES

- Receiver supports SunSpec™ Alliance “Communication Signal for Rapid Shutdown” power line communication protocol
- Provides 1V output voltage during system keep alive signal is absent
- Operates with PV voltage from 10.5V to 110V
- Integrated NFET driver
- Support flash test
- TSSOP14-EP package
- Junction temperature range: -40℃ to 125℃

APPLICATION

- Photovoltaic Rapid Shutdown
- PLC Communication Module (RX only)

TYPICAL APPLICATION CIRCUIT

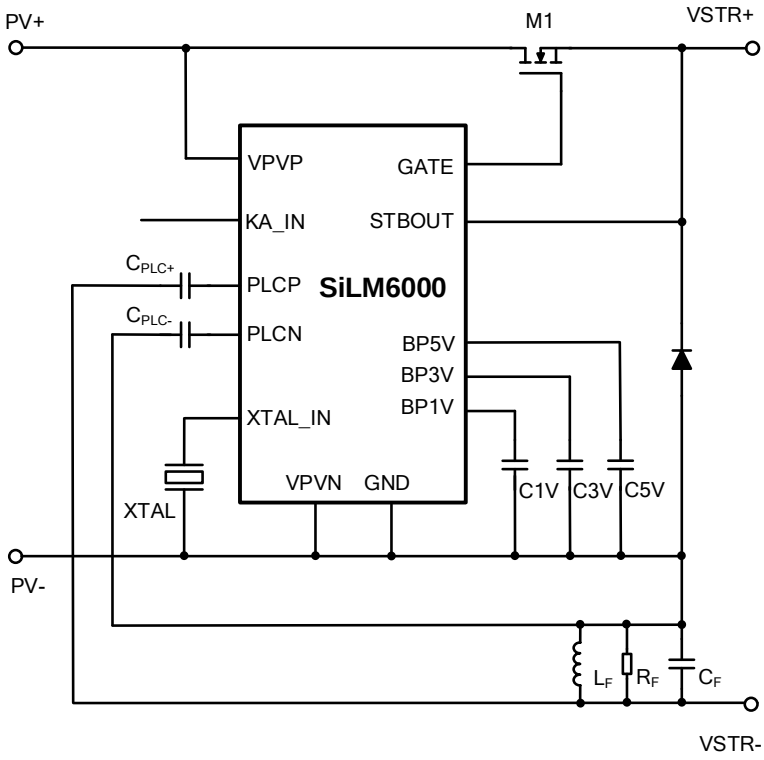
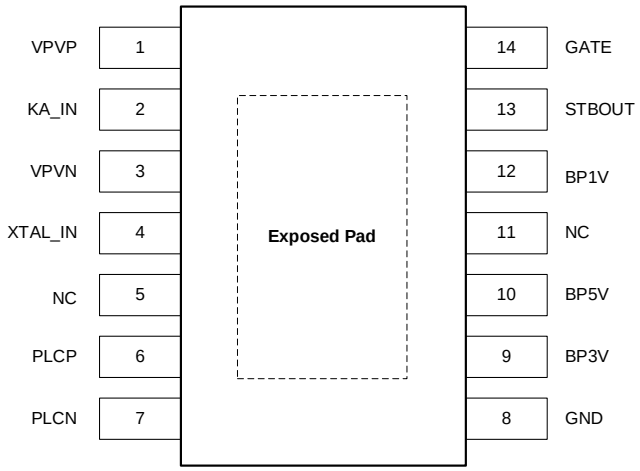


Figure 1. Typical Application Circuit

PIN CONFIGURATION

Package	Pin Configuration (Top View)
TSSOP14-EP	

PIN DESCRIPTION

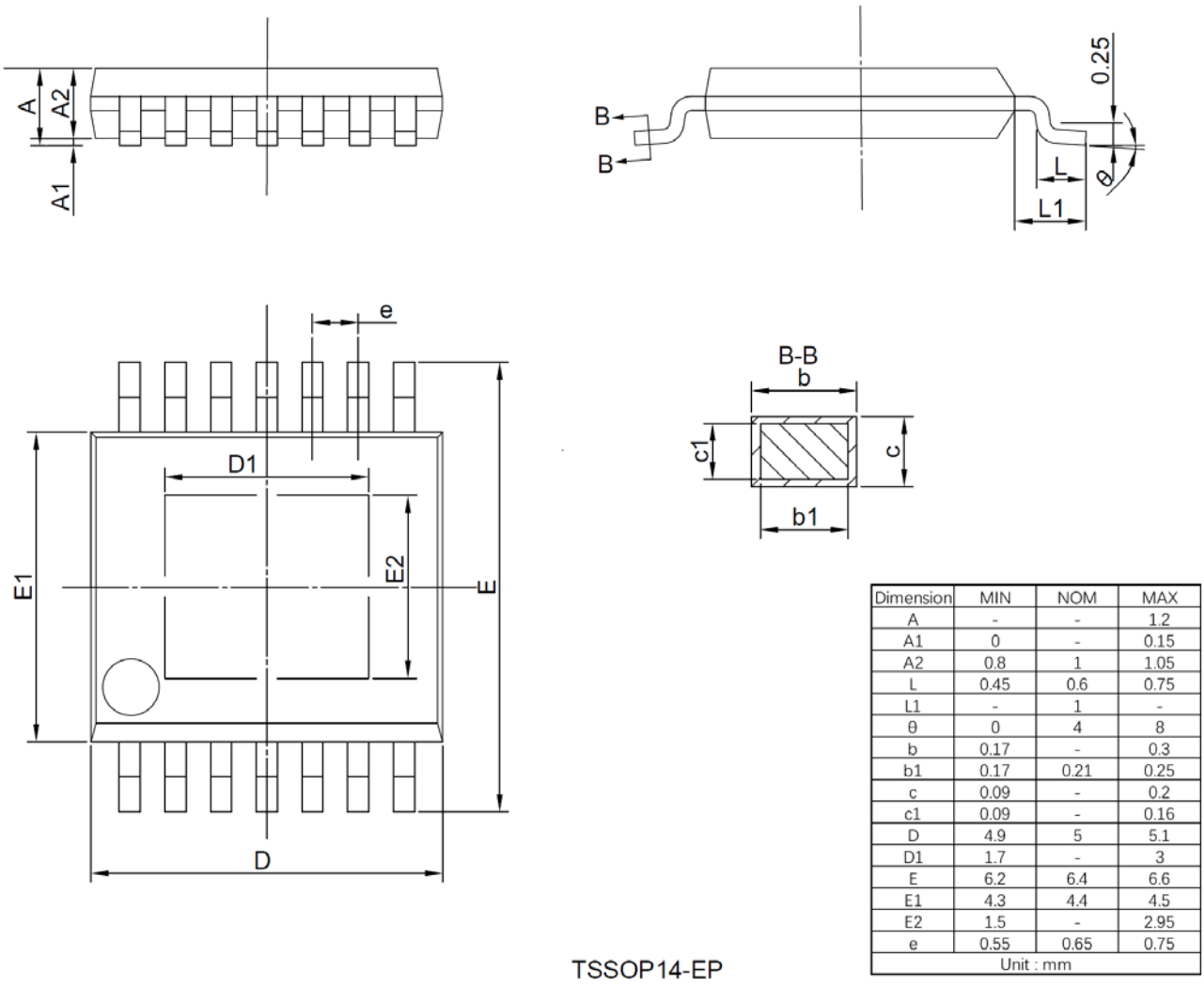
Pin Number	Pin Name	Description
1	VPVP	PV positive input.
2	KA_IN	Input for force keep-alive
3	VPVN	PV negative input
4	XTAL_IN	Input for the crystal oscillator.
5	NC	No connection
6	PLCP	Line coupling input for power line communication
7	PLCN	Line coupling input for power line communication.
8	GND	IC ground.
9	BP3V	3.3V regulator output. Connect a 1uF capacitor between this pin and ground.
10	BP5V	5.0V regulator output. Connect a 1uF capacitor between this pin and ground. This BP5V also support external power supply to power the IC. The external voltage should be between 5.1V to 5.5V.
11	NC	No connection
12	BP1V	1.0V regulator output. Connect a 1uF capacitor between this pin and ground.
13	STBOUT	Output for shutdown mode. This pin should connect to the source of the external NFET.
14	GATE	Output driver for external NFET. During keep-alive mode, the GATE turn on an external NFET. While in shutdown mode, the GATE turn off an external NFET.
EPAD	Exposed Pad	The exposed pad should be soldered to an external ground plane underneath the IC for thermal dissipation.

ORDERING INFORMATION

Industrial Range: -40°C to +125°C

Order Part No.	Package	QTY
SiLM6000MF-DG	TSSOP14-EP	5000/Reel

PACKAGE CASE OUTLINES



Dimension	MIN	NOM	MAX
A	-	-	1.2
A1	0	-	0.15
A2	0.8	1	1.05
L	0.45	0.6	0.75
L1	-	1	-
θ	0	4	8
b	0.17	-	0.3
b1	0.17	0.21	0.25
c	0.09	-	0.2
c1	0.09	-	0.16
D	4.9	5	5.1
D1	1.7	-	3
E	6.2	6.4	6.6
E1	4.3	4.4	4.5
E2	1.5	-	2.95
e	0.55	0.65	0.75
Unit : mm			

TSSOP14-EP

Figure 2. TSSOP14-EP Package Outline Dimensions