High Performance MPP Tracking Buck Controller

GENERAL DESCRIPTION

The SiLM6120 enables Maximum Power Point Tracking (MPPT), providing superior photovoltaic (PV) module energy harvest and reliability as compared to standard panels.

Photovoltaic cells can only deliver maximum power under specific electrical conditionals that vary significantly with exposed irradiance and temperature. Series connections of PV cells creates a significant sensitivity to cell mismatch, resulting in less than optimal power and energy production under real-world conditions. The SiLM6120 which can also support Cell-String Optimizer enables a string of PV cells to deliver their collective maximum power into a wide range of load conditions. This enhanced electrical flexibility eliminates power loss from mismatch in PV strings and arrays, ultimately improving energy production and system design flexibility. The SiLM6120 is available in package QFN5X5-32.

FEATURES

- Fast MPPT Reacts Quickly to Changing Conditions
- Voltage-Limiting Clamps Output Voltage
- Current-Limiting Clamps Output Current
- Eliminates Hot-spots for Panels
- Wide Input Voltage Range: 7.5V to 70V
- Programmable Operation Frequency
- Internal 9V Pre-regulator
- Internal 5V Pre-regulator
- Over Temperature Protection
- QFN5X5-32 package
- Green Product (RoHS, Lead-Free, Halogen-Free Compliant
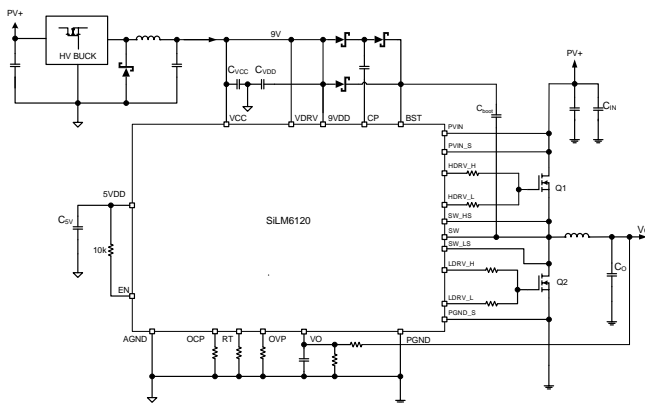
TYPICAL APPLICATION CIRCUIT

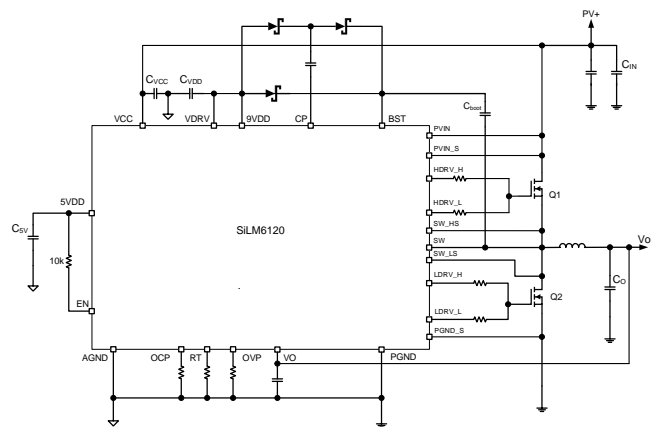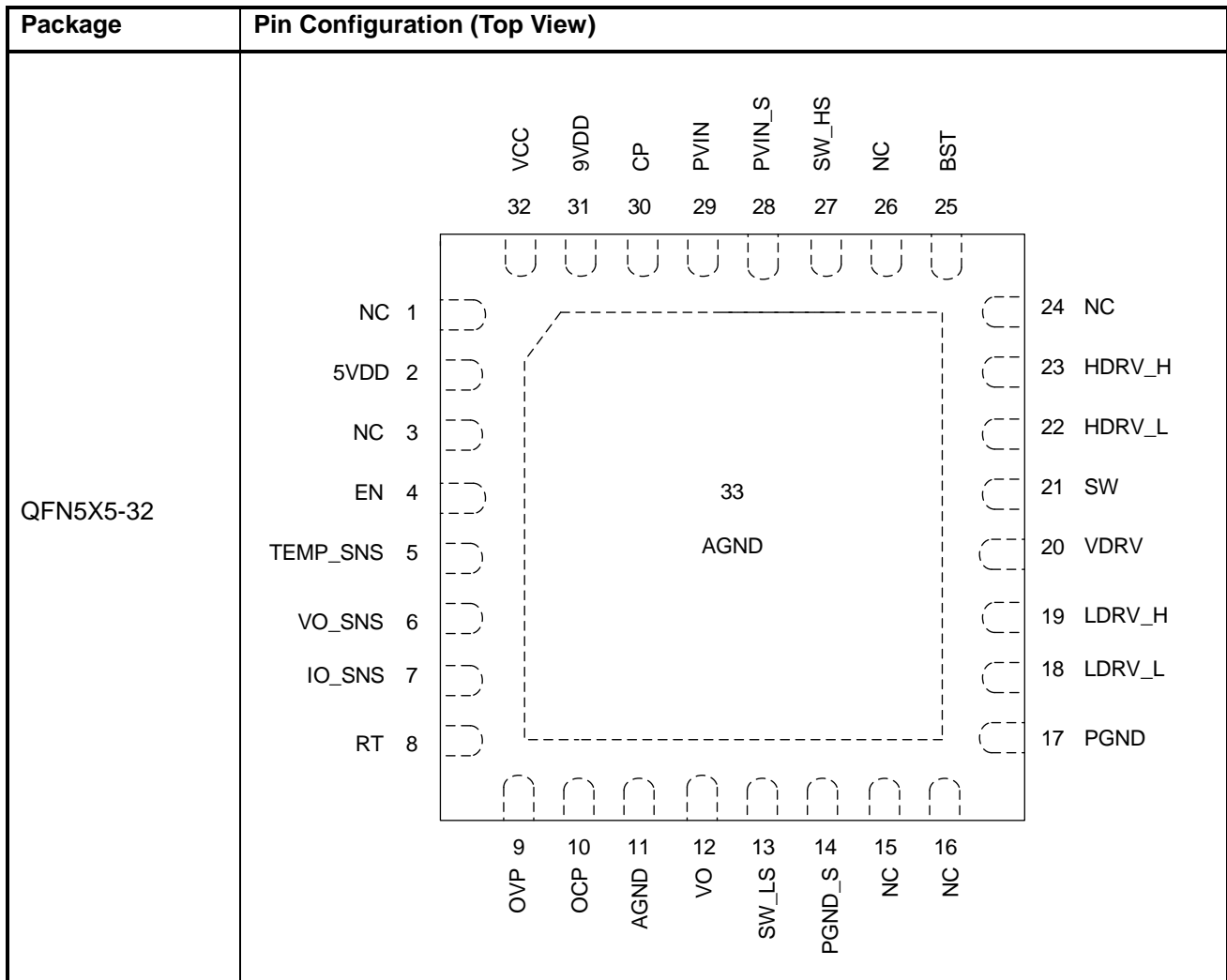Figure 1. Typical application for module-level Optimizer

Figure 2. Typical application for cell-string Optimizer

PIN CONFIGURATION

Package	Pin Configuration (Top View)
QFN5X5-32	

PIN FUNCTION DESCRIPTIONS

No.	Pin Name	Function Description
1, 3, 15, 16, 24, 26	NC	--
2	5VDD	Internal Linear Regulator Output. Connect a bypass capacitor between this pin and AGND.
4	EN	Precision enable input pin. If the enable pin is not used, connect this pin to 5VDD.
5	TEMP_SNS	Temperature sensing output. Connect a negative temperature coefficient thermistor between TEMP_SNS and AGND. This pin provides a constant
6	VO_SNS	Sensing output of the output voltage.
7	IO_SNS	Sensing output of the output current.
8	RT	Switching Frequency Setting Pin. Connect a resistor between RT and AGND to set the switching frequency.
9	OVP	Over voltage protection input pin.
10	OCP	Over Current protection input pin.
11	AGND	The analog ground pin.
12	VO	VO Pin offers the output voltage information to the chip.
13	SW_LS	Low-side MOSFET's drain voltage sense input.
14	PGND_S	Low-side MOSFET's source voltage sense input.
17	PGND	The Power ground pin.
18	LDRV_L	Low-side Gate Driver Pin. This pin is the gate driver for turning off the Low-side MOSFET.
19	LDRV_H	Low-side Gate Driver Pin. This pin is the gate driver for turning on the Low-side MOSFET.
20	VDRV	Gate Driver Power Pin. Connect a bypass capacitor between this pin and AGND.
21	SW	Connect this pin to the source of the upper MOSFET and the drain of the lower MOSFET. This pin is used as the sink for the high side driver.
22	HDRV_L	High-side Gate Driver Pin. This pin is the gate driver for turning off the High-side MOSFET.
23	HDRV_H	High-side Gate Driver Pin. This pin is the gate driver for turning on the High-side MOSFET.
25	BST	Bootstrap Capacitor Connection. Connect a capacitor between BST and SW Pin.
27	SW_HS	High-side MOSFET's source voltage sense input.
28	PVIN_S	High-side MOSFET's drain voltage sense input.
29	PVIN	PVIN Pin offers the input voltage information to the chip.
30	CP	Charge Pump Switching node.
31	9VDD	Internal Linear Regulator Output. Connect a bypass capacitor between this pin and AGND.
32	VCC	Internal Linear Regulator input.
	Exposed Pad	Connect the exposed pad to an external ground plane to improve thermal performance.

ORDERING INFORMATION

Order Part No.	Package	QTY
SiLM6120EH-DG	QFN5X5-32	1000/Reel

PACKAGE CASE OUTLINES

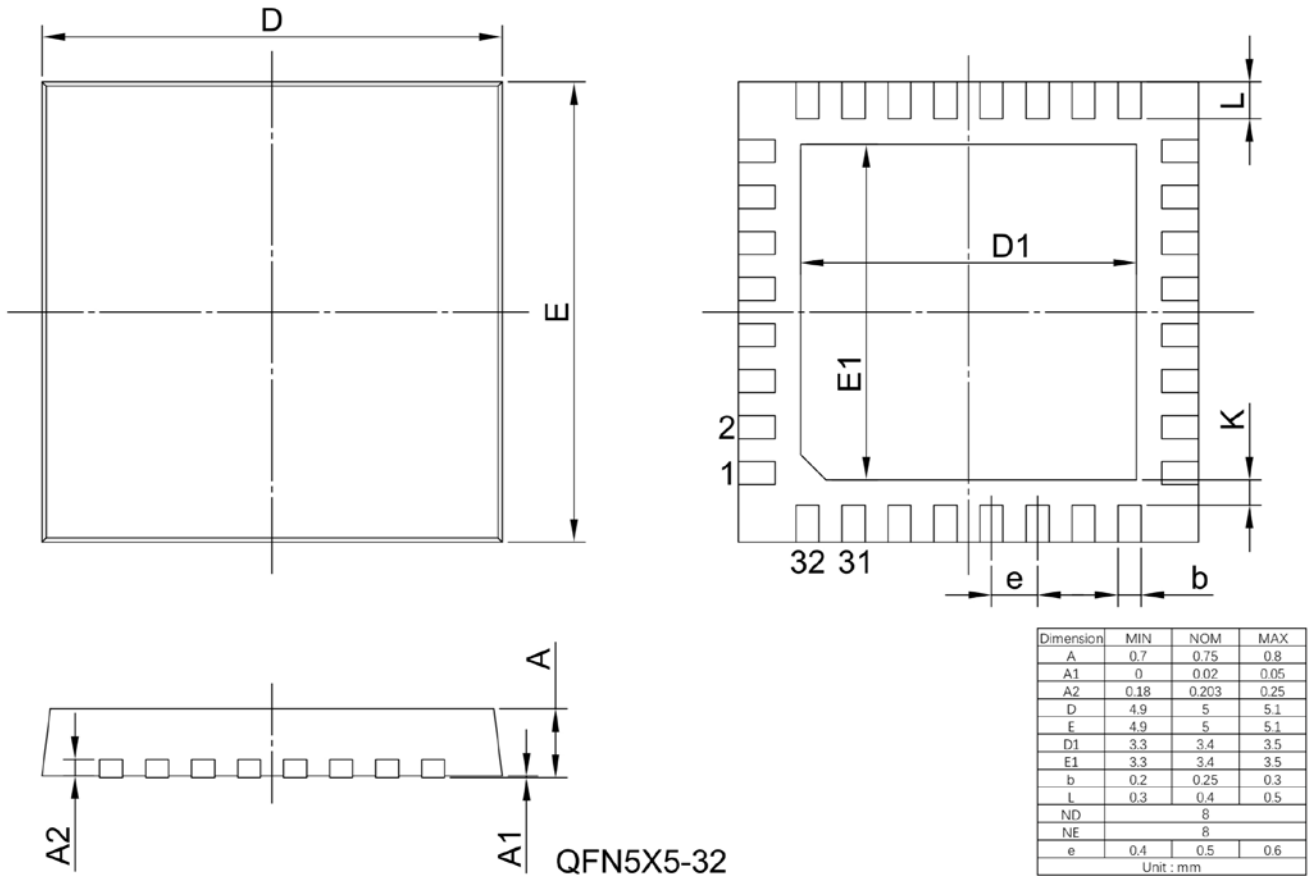| Dimension	MIN	NOM	MAX
A	0.7	0.75	0.8
A1	0	0.02	0.05
A2	0.18	0.203	0.25
D	4.9	5	5.1
E	4.9	5	5.1
D1	3.3	3.4	3.5
E1	3.3	3.4	3.5
b	0.2	0.25	0.3
L	0.3	0.4	0.5
ND		8	
NE		8	
e	0.4	0.5	0.6
Unit : mm			

Figure 3. QFN5X5-32 Outline Dimensions