Triple-Output Power Supply for AMOLED

1 DESCRIPTION

The SC6104 is a triple-channel switching mode power supply which is designed to drive AMOLED displays requiring V_{ELVDD}, V_{ELVSS}, and V_{AVDD}.

It integrates a boost converter for V_{ELVDD}, an inverting buck-boost converter for V_{ELVSS} and a boost converter for V_{AVDD}. The output voltage is highly precise and can be programmed by the external signal.

For the portable devices applications, size, power consumption and reliability are always in the first consideration. The SC6104 uses a tiny package and it switches at a high frequency to minimize the inductor and the capacitor size. Besides, synchronous rectification (each rail) and Dual-phase (ELVSS only) topologies are used to maximize the power efficiency.

The SC6104 uses innovative technology enabling excellent line and load regulation. All the output rails allow being programmed by MC pin in digital steps.

The device integrates SCP, OTP, UVLO, and OCP to protect itself from abnormal condition.

The SC6104 adopts 32 pin QFN 4x4 package.

2 FEATURES

- 2.5V to 4.6V Input Voltage Range
- ELVDD Output Voltage 4.6V~5.6V, 0.5% Accuracy
- ELVSS Output Voltage -1.4V~ -6.4V, 1% Accuracy
- 1.2A Output Current Capability for ELVDD&ELVSS
- AVDD Output Voltage 5.8V~7.9V, 1% Accuracy
- 0.15A Output Current Limit for AVDD
- Programmable Fast Discharge
- Input to Output, Output to Input Isolation
- Internal Soft Start to Limit Inrush Current
- Dual-phase operation for ELVSS Rail
- External Output Sense for ELVDD
- Under Voltage Protection
- Over Current Protection
- Over Load Protection
- Short Circuit Protection
- Thermal Shutdown
- Package: 4×4×0.75mm, 32Pin QFN

3 APPLICATIONS

- AMOLED Displays ≧ 8 inch

4 ORDERING INFORMATION

Part Number	Package	Dimension
SC6104QDER	QFN32L	4*4*0.75mm

5 Typical Application Circuit

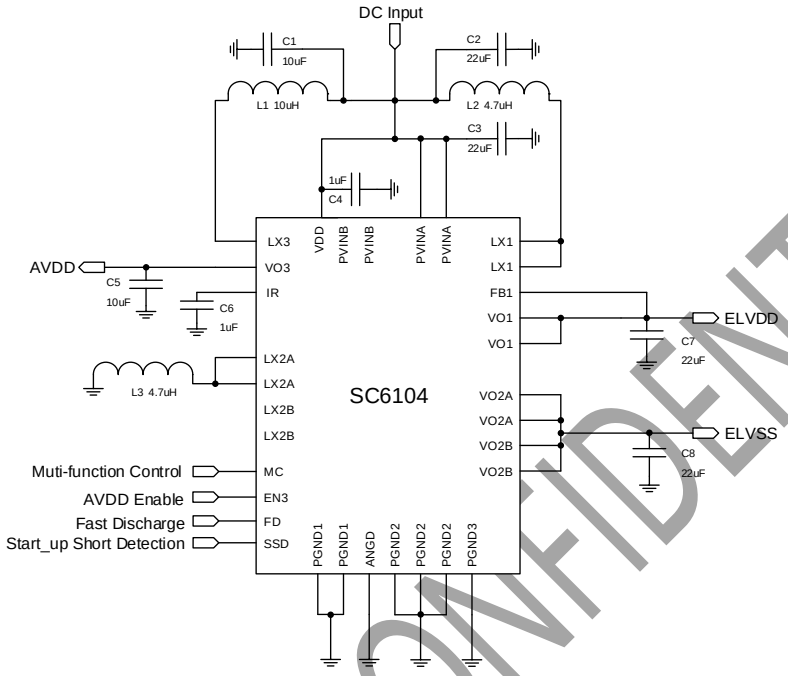


Figure 1 Typical Application for single-phase operation

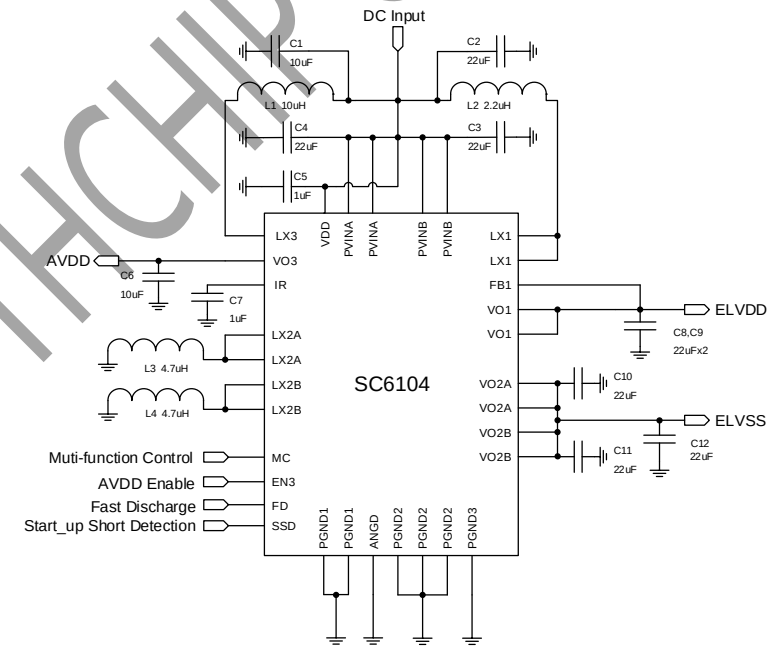
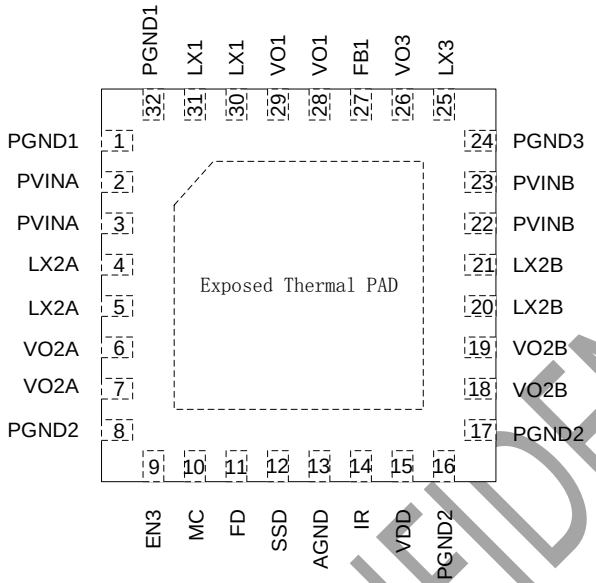


Figure 2 Typical Application for dual-phase operation

6 Pin Configurations and Function



TERMINAL		I/O	DESCRIPTION
NUMBER	NAME		
1,32	PGND1	PWR	ELVDD boost converter power ground
2,3	PVINA	PWR	ELVSS buck-boost converter 1 power supply input
4,5	LX2A	PWR	ELVSS buck-boost converter 1 switch pin
6,7	VO2A	PWR	ELVSS buck-boost converter 1 output
8,16,17	PGND2	PWR	ELVSS buck-boost converter power ground
9	EN3	I	Enable AVDD boost converter
10	MC	I	Multifunction Control pin for programming and enabling / disabling the device
11	FD	I	Fast Discharge enable / disable
12	SSD	I	Start_up short detection enable / disable
13	AGND	PWR	Analog ground
14	IR	PWR	Internal Regulation
15	VDD	PWR	Logic circuit power supply input
18,19	VO2B	PWR	ELVSS buck-boost converter 2 output
20,21	LX2B	PWR	ELVSS buck-boost converter 2 switch pin
22,23	PVINB	PWR	ELVSS buck-boost converter 2 power supply input
24	PGND3	PWR	AVDD boost converter power ground
25	LX3	PWR	AVDD boost converter switch pin
26	VO3	PWR	AVDD boost converter output
27	FB1	I	ELVDD boost converter output sense
28,29	VO1	PWR	ELVDD boost converter output
30,31	LX1	PWR	ELVDD boost converter switch pin
	Thermal-PAD	PWR	For thermal dissipation. Connect to AGND or PGND.