1.2A Triple-Outputs Power Supply for AMOLED

1 Descriptions

The SC6104 is a triple-channel switching mode power supply which is designed to drive AMOLED displays requiring VELVDD, VELVSS and VAVDD.

It integrates a boost converter for VELVDD, an inverting buck-boost converter for VELVSS and a boost converter for VAVDD. The output voltage is highly precise and can be programmed by the external signal.

For the portable device 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 output voltage regulation and line transient performance. All the output rails allow being programmed by MC pin in digital steps.

The device provides programmable output current limit for ELVDD from 0.6~1.3A and can be disabled by MC function. The AVDD rail also has a selectable 150mA over load protection function. The over current protection for ELVDD and AVDD is disabled per default. Once the function is disabled, the device keeps switching until the inductor current reaches the internal limitation and stops switching by the short circuit protection.

The device integrates full protection for itself from abnormal condition

The SC6104 adopts 32 pin QFN 4x4 package.

2 Features

- 2.5V to 5.0V Input Voltage Range
- ELVDD Output Voltage 4.6V~5.6V, 0.5% Accuracy
- ELVSS Output Voltage -1.4V~ -6.4V, 1% Accuracy
- 1.2A Continuous Output Current Capability: VIN≥3V, ELVDD=4.6V, ELVSS=-3V
- AVDD Output Voltage 5.8V~7.9V, 1% Accuracy
- Dual-phase operation for ELVSS Rail
- External Output Sense for ELVDD
- Selectable 0.15A Output Current Limit for AVDD
- Programmable Over Current Protection for ELVDD
- Programmable Fast Discharge
- Transient Time Control Function for ELVSS
- Start Short Detection
- Input to Output, Output to Input Isolation
- Internal Soft Start to Limit Inrush Current
- Under Voltage Protection
- Peak Current Limitation
- Short Circuit Protection
- Thermal Shutdown
- Package: 4×4×0.75mm, 32Pin QFN

3 Applications

- AMOLED Displays

4 Device Information

ORDER NUMBER	PACKAGE	BODY SIZE
SC6104QDER	QFN32L	4 x 4 x 0.75mm

5 Typical Application Circuit

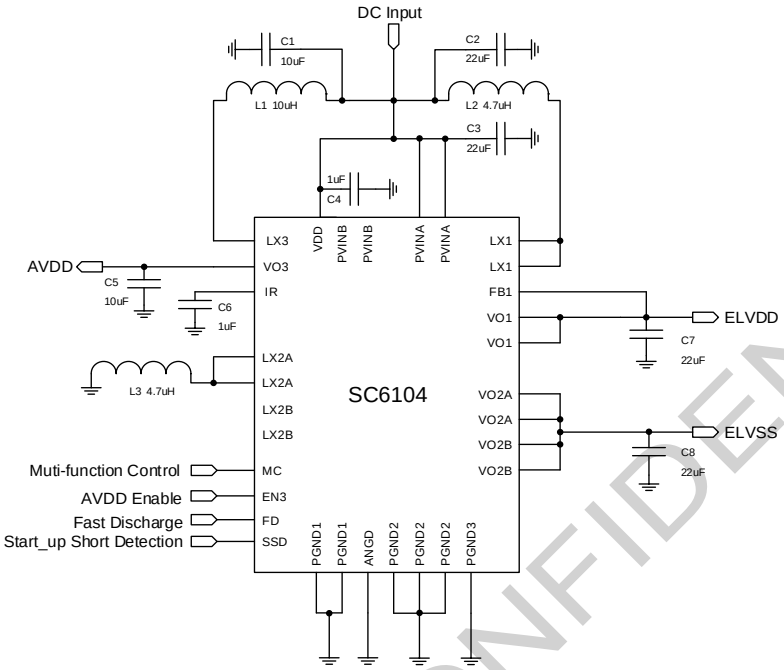


Figure 1 Typical Application for single-phase operation

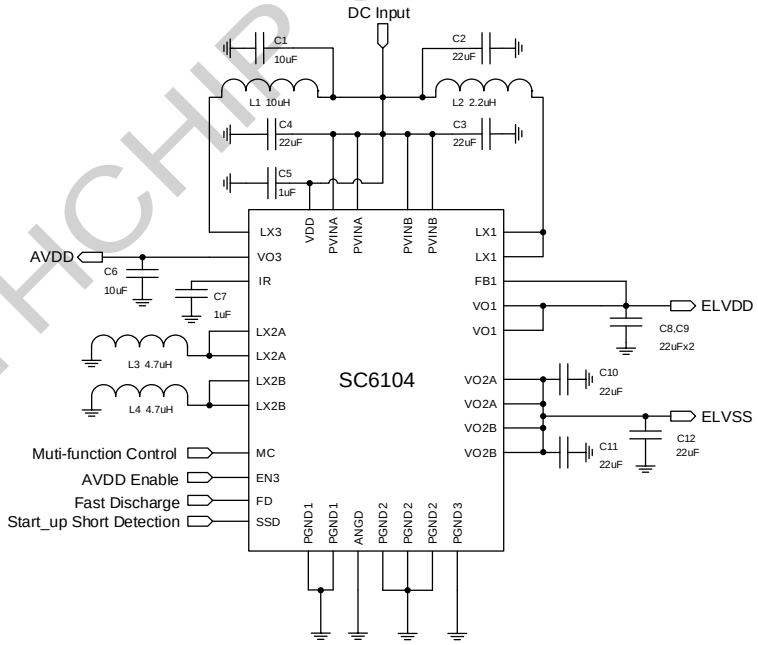
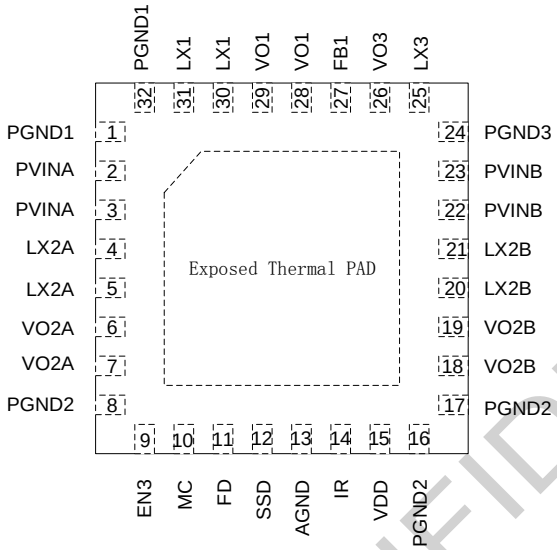


Figure 2 Typical Application for dual-phase operation

6 Terminal Configuration and Functions

Top View



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.