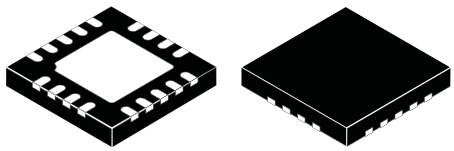
STOD30

300 mA triple DC-DC converter for powering AMOLED display

Data brief



QFN18 3.5x3.5 mm

Features

- Two step-up converters and an inverting converter
- Operating input voltage range from 2.5 V to 4.5 V
- Synchronous rectification for all DC-DC converters
- 300 mA output current for step-up and inverting converters (V_{IN} > 2.9 V)
- 60 mA output current for auxiliary step-up converter
- Step-up converter fixed 4.6 V positive voltage
- Programmable negative voltage by S_{WIRE} from -1.4 V to -5.4 V in 100m V steps
- Greater than 90% efficiency
- Pulse skipping mode at light load condition
- 1.45 MHz PWM mode control switching frequency
- TDMA noise high immunity
- Auxiliary step-up converter positive voltage programmable by S_{WIRE} from 6.7 V to 7.6 V in 300 mV steps and configurable by external pull-down resistor
- Enable pin for auxiliary step-up converter shutdown mode
- Low quiescent current in shutdown mode
- Soft-start with inrush current protection
- Overtemperature protection
- Temperature range -40 °C to 85 °C
- True shutdown mode
- Fast outputs discharge after shutdown
- Short-circuit protection
- Package QFN 3.5x3.5 18 leads, 0.5 mm pitch

Applications

- Active matrix OLED power supply in portable devices
- Cellular phones, multimedia players, camcorders and digital cameras

Description

The STOD30 is a triple DC-DC converter for AMOLED display panel. It integrates 300 mA step-up and inverting DC-DC converters plus auxiliary step-up converter. This device is particularly suitable for battery operated products, in which the major concern is the overall system efficiency. It works in pulse skipping mode during low load condition and PWM mode at 1.45 MHz frequency for medium/high load conditions. The high frequency allows the value and size of external components to be reduced. The enable and SWIRE pins allow the device to be turned off so to reduce the current consumption to less than 1 µA. The negative inverter and auxiliary step-up positive output voltages can be programmed by an MCU through a dedicated pin which implements S_{WIRE} protocol. Auxiliary step-up positive output voltage is also configured by an external pull-down resistor. Soft-start with controlled inrush current limit, thermal shutdown and short-circuit protection are integrated functions of the device.

Table 1. Device summary

Order code	Package	Packaging
STOD30TPQR	QFN18 3.5x3.5 mm	3000 parts per reel

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1 Pin configuration

Figure 1. Pin configuration (top view)

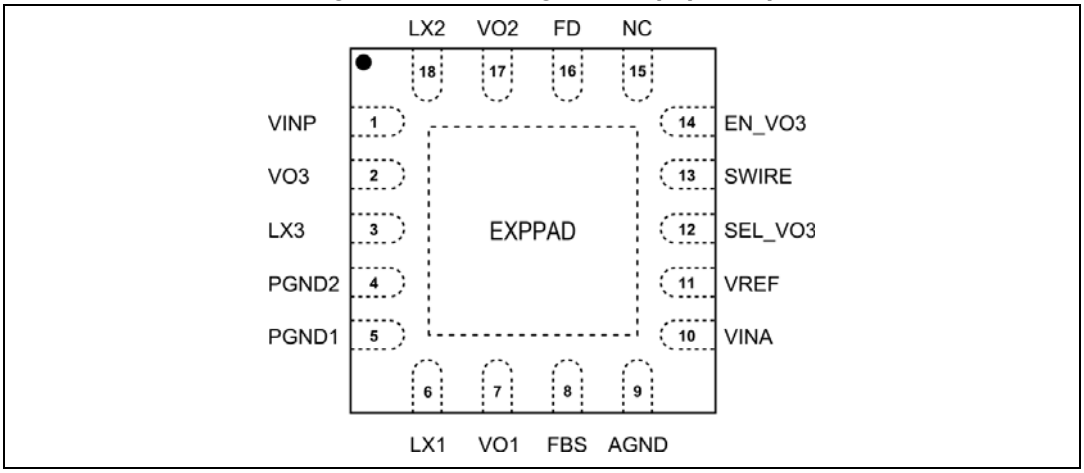


Table 2. Pin description

Pin	Pin name	Description
1	VINP	Power input voltage pin
2	VO3	Aux. step-up output voltage pin
3	LX3	Aux. step-up switching pin
4	PGND2	Power ground
5	PGND1	Power ground
6	LX1	Step-up switching pin
7	VO1	Step-up output voltage pin
8	FBS	Feedback sense
9	AGND	Analog Ground
10	VINA	Analog input voltage pin
11	VREF	Reference voltage pin
12	SEL_VO3	Aux. step-up output voltage select pin
13	SWIRE	SWIRE pin
14	EN_VO3	Aux. step-up enable pin
15	NC	Not connected
16	FD	Fast Discharge configuration pin
17	VO2	Inverter output voltage pin
18	LX2	Inverter switching pin
EXPPAD		To guarantee proper operation of the device exposed pad must be connected to ground layers on the PCB

2 Package mechanical data

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK® packages, depending on their level of environmental compliance. ECOPACK® specifications, grade definitions and product status are available at: *www.st.com*.
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Figure 2. QFN18 3.5x3.5x0.55 pitch 0.5 mm drawing

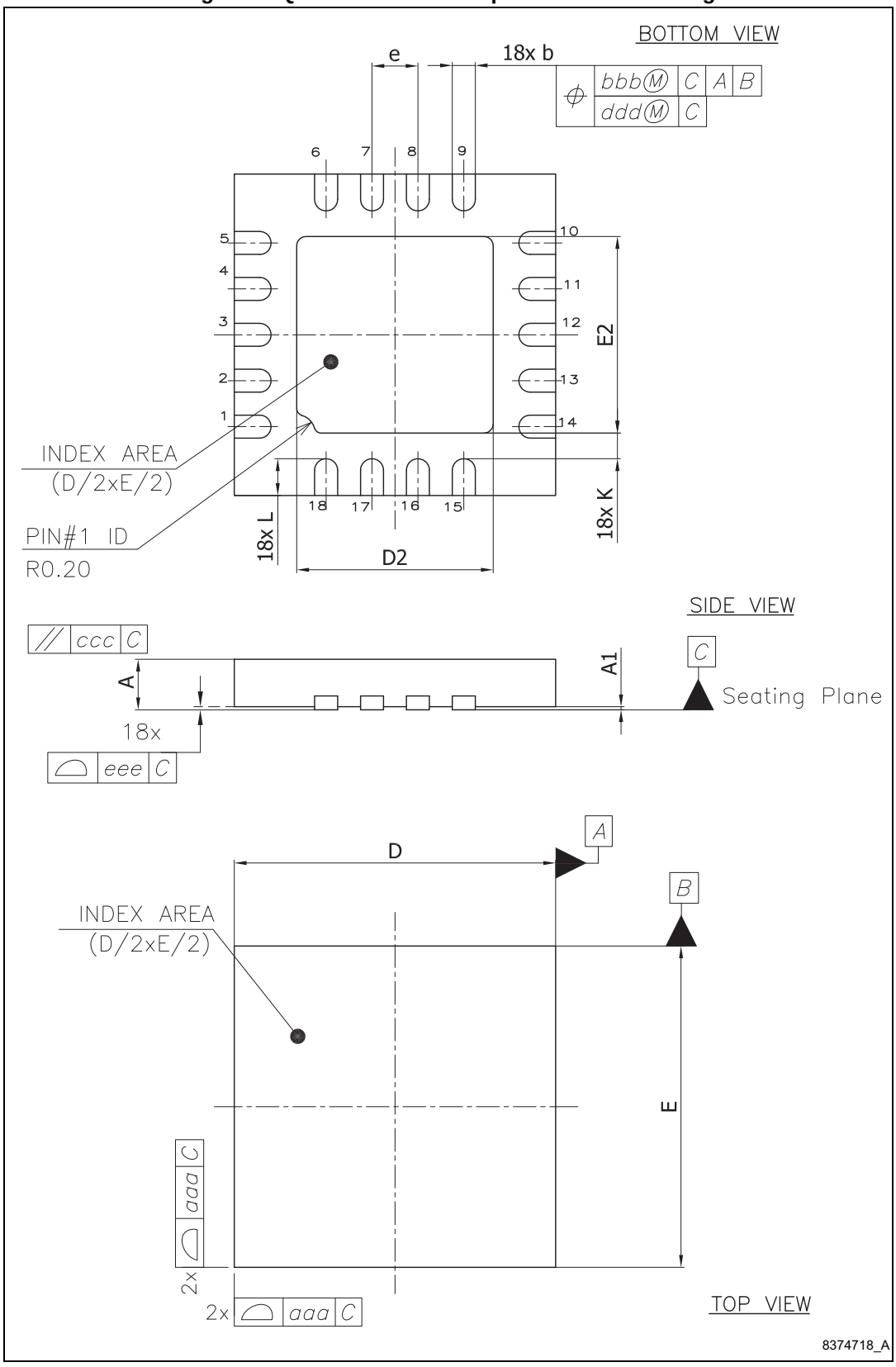
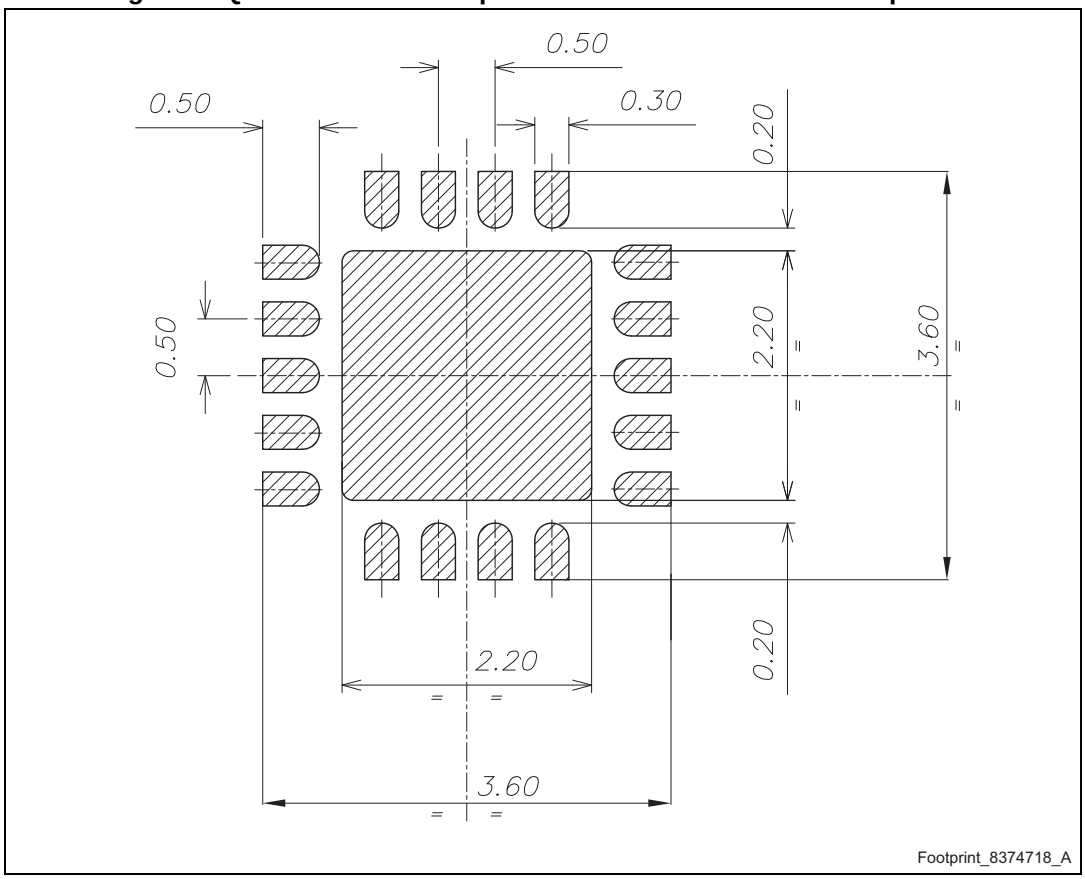


Table 3. QFN18 3.5x3.5x0.55 pitch 0.5 mm mechanical data

Dim.	mm		
	Min.	Typ.	Max.
A	0.51	0.55	0.60
A1	0.00	0.02	0.05
b	0.18	0.25	0.30
D		3.50	
E		3.50	
D2	1.99	2.14	2.24
E2	1.99	2.14	2.24
e		0.50	
L	0.30	0.40	0.50
K	0.20		
aaa		0.05	
bbb		0.10	
ccc		0.10	
ddd		0.05	
eee		0.08	

Figure 3. QFN18 3.5x3.5x0.55 pitch 0.5 mm recommended footprint [(a)]



a. All dimensions are in millimeters

3 Revision history

Table 4. Document revision history

Date	Revision	Changes
07-Jan-2014	1	Initial release.

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