DN66
An OLED bias supply for a clamshell handset sub display

Description

Portable applications such as cell phones are becoming increasingly complex with more and more features designed into every generation. One popular feature is to replace the STN sub display with an OLED sub display. OLED displays have infinite contrast ratio and are self-illuminating. This gives the handset manufacturer two key advantages, the first is lower power consumption and the second is a slimmer display. One disadvantage with OLED sub displays over LCD sub displays is the higher leakage current when not in use, which is the majority of the time. The way to overcome this issue is to disconnect the OLED sub display when the handset is dormant.

The ZXLB1600 is a boost converter that can provide the power requirements for OLED sub display with the additional feature of a fully integrated isolation switch which disconnects the input from output when the ZXLB1600 is shutdown, making it ideally suited to OLED biasing.

The schematic diagram in Figure 1 shows a full color OLED bias supply for clamshell handset sub display.

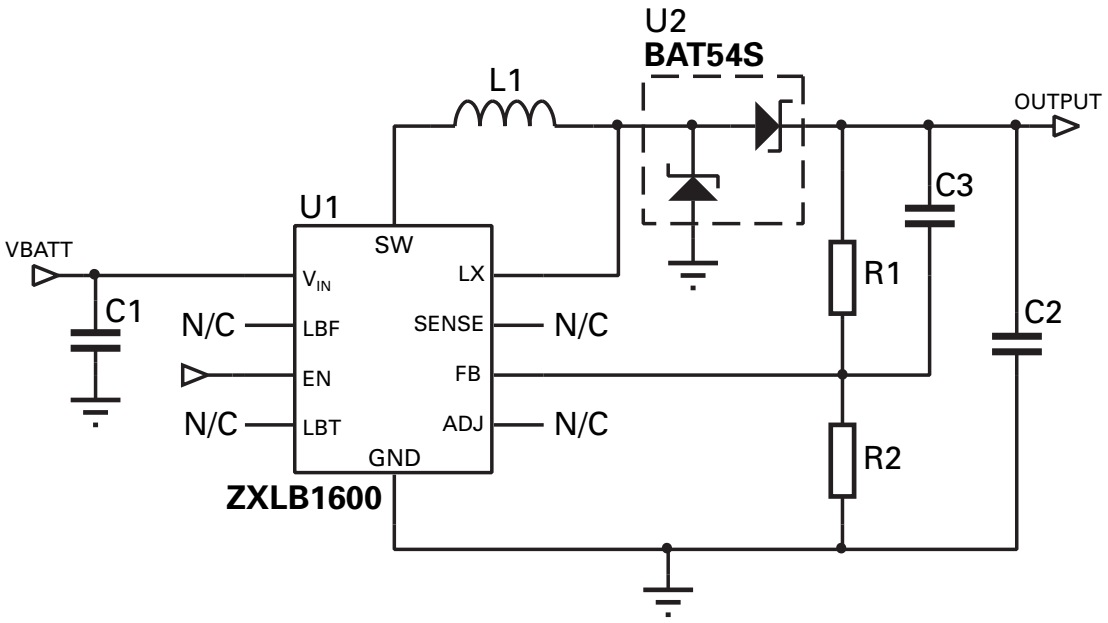


Figure 1 Schematic diagram

Note:
For applications where OLED leakage is not an issue and the ZXLB1600 isolation switch is not needed, the SW pin can be shorted to the V_{IN} pin, giving a further 3% to 5% improvement in efficiency.

DN66

The materials list and associated performance characteristics provide an OLED biasing solution for the following sub display specification:

- Input voltage: 4.2V to 3.0V
- Output voltage: 12V
- Output current: 20mA (max.)
- Output ripple: 50mVpk-pk (max.)

Reference	Value	Part number	Manufacturer	Contact details	Comments
U1		ZXLB1600X10	Zetex	www.zetex.com	OLED bias IC
U2		BAT54S	Zetex	www.zetex.com	Dual Schottky diode
L1	22μH	CMD4D11-220	Sumida	www.sumida.com	1mm height profile
R1	715kΩ	Generic	Generic	NA	0603 size
R2	82kΩ	Generic	Generic	NA	0603 size
C1	10μF/6V3	GRM series	Murata	www.murata.com	0805 size
C2(1)	10μF/16V	GRM series	Murata	www.murata.com	1206 size
C3	82pF/16V	Generic	Generic	NA	0603 size

Table 1 Bill of materials

NOTES:
(1) For a lower profile, two 4.7μF 0805 capacitors can be used by connecting in parallel.

Typical operating characteristics

(For typical application circuit where V_{IN} = 3V, V_{OUT} = 12V, I_{OUT} = 20mA unless otherwise stated)

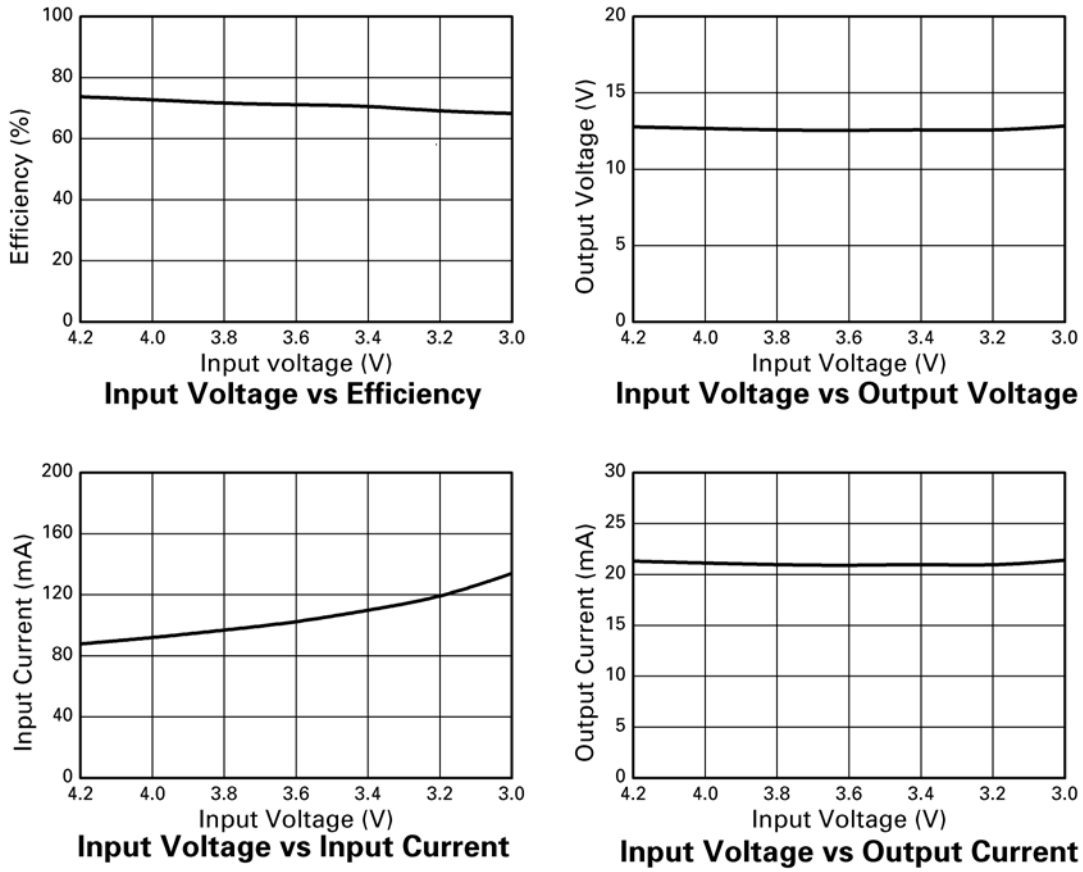
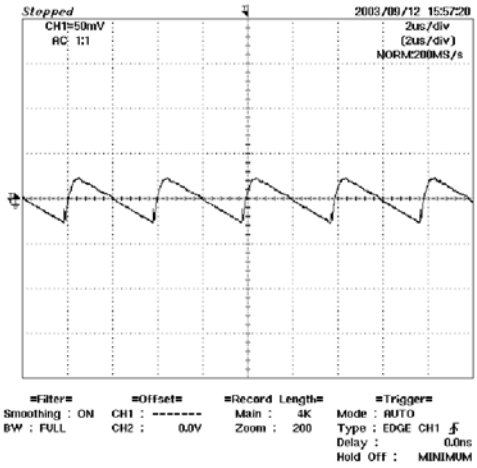


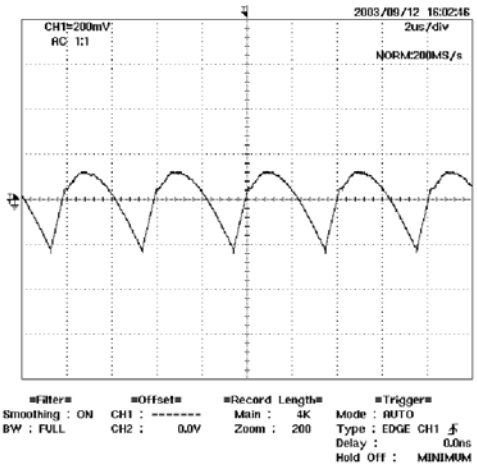
Figure 2 Performance graphs

Typical operating waveforms

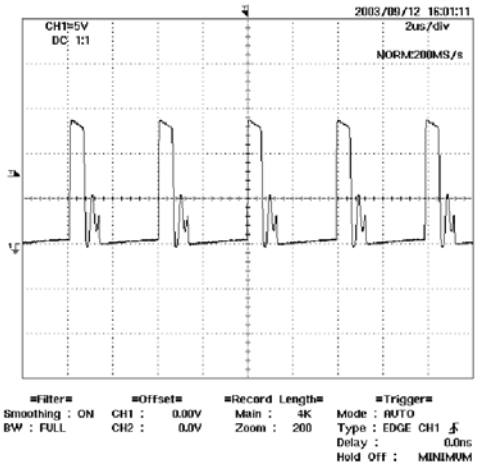
(For typical application circuit where V_{IN} = 3V, V_{OUT} = 12V, I_{OUT} = 20mA unless otherwise stated)



Output voltage ripple



Input voltage ripple



LX switching

Figure 3 Typical operating waveforms

Intentionally left blank

DN66

Europe	Americas	Asia Pacific	Corporate Headquarters
Zetex GmbH Streitfeldstraße 19 D-81673 München Germany	Zetex Inc 700 Veterans Memorial Highway Hauppauge, NY 11788 USA	Zetex (Asia Ltd) 3701-04 Metroplaza Tower 1 Hing Fong Road, Kwai Fong Hong Kong	Zetex Semiconductors plc Zetex Technology Park, Chadderton Oldham, OL9 9LL United Kingdom
Telefon: (49) 89 45 49 49 0 Fax: (49) 89 45 49 49 49 europe.sales@zetex.com	Telephone: (1) 631 360 2222 Fax: (1) 631 360 8222 usa.sales@zetex.com	Telephone: (852) 26100 611 Fax: (852) 24250 494 asia.sales@zetex.com	Telephone: (44) 161 622 4444 Fax: (44) 161 622 4446 hq@zetex.com

For international sales offices visit **www.zetex.com/offices**

Zetex products are distributed worldwide. For details, see **www.zetex.com/salesnetwork**