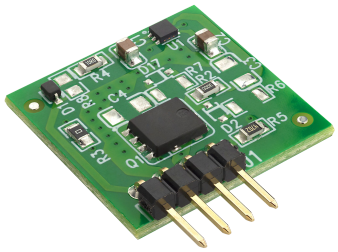
EVLSRK1004A/B/C/D/E/F

Data brief

SRK1004x synchronous rectifier controller for non-complementary Active Clamp Flyback converter demonstration board with SR MOSFET



Features

- Secondary-side synchronous rectification controller optimized for Non-Complementary Active Clamp Flyback converter (NC-ACF).
- Able to operate in both low-side and high-side configuration.
- Supporting logic level (A, B and E) and standard level (C, D and F) MOSFETs
- Wide range supply voltage: 4 V to 36 V
- DVS (drain-source) sensing voltage for SR MOSFET (190 V AMR)
- Operating frequency up to 500 kHz
- Fast short-circuit detector
- Internal gate drive for N-channel MOSFET
- SR MOSFET type PowerFLAT 5 x 6 reported in table below

Product status link
EVLSRK1004A
EVLSRK1004B
EVLSRK1004C
EVLSRK1004D
EVLSRK1004E
EVLSRK1004F

Description

The EVLSRK1004x are demonstration boards, designed for evaluation of the SRK1004x synchronous rectification controller.

The SRK1004 is a family of controllers intended for secondary-side synchronous rectification (SR) in both Non- Complementary Actively Clamped Flyback converters and Quasi Resonant Flyback converters. The six different variants of this IC provide a gate-drive output voltage suitable for N-channel logic-level or standard level power MOSFETs.

The control scheme of this IC is such that the SR MOSFET is switched on as soon as current starts flowing through its body diode and it is then switched off as current approaches zero. The SRK1004 can be used with the SR MOSFET placed either between the secondary-side GND and transformer (low-side configuration) or between the transformer and output voltage (high-side configuration).

The boards are provided with a setting suitable for ACF or QR application in low-side mode. In this case, the devices are supplied directly from the converter's output voltage.

When operated in high-side configuration, a special function enables a quick detection of short-circuit conditions to inhibit its operation as if the IC were powered directly from the output voltage. In the case that it is used in high-side configuration, it is recommended to power the board from a dedicated auxiliary winding and to use R5 > 47 K to configure Vout,sc (for short-circuit detection with Vout > 0 V). For example R5 = 150 K to configure Vout,sc = 2 V.

The boards include the SR MOSFET (PowerFLAT 5 x 6 package) and can be easily implemented into an existing converter to substitute rectifier diodes.

1 Product summary specification

Table 1. **Product summary**

Board	MOSFET				Controller		
Pn	Pn	VDS [V]	ID [A]	Rds,on [mΩ]	Pn	VCC [V]	Typ. turn-off delay [ns]
EVLSRK1004A	BSC080N12LS-G	120	99	9.5 @4.5V	SRK1004A	5.5	25
EVLSRK1004B	BSC034N10LS5	100	156	4.5 @4.5V	SRK1004B	5.5	150
EVLSRK1004C	BSC093N15NS5	150	87	9.3 @10V	SRK1004C	9	25
EVLSRK1004D	STL120N10F8	100	125	4.6 @10V	SRK1004D	9	150
EVLSRK1004E	BSC080N12LS-G	120	99	9.5@4.5V	SRK1004E	5.5	25
EVLSRK1004F	BSC093N15NS5	150	87	9.3@10V	SRK1004F	9	25

2 Specifications

Figure 1. **EVLSRK1004x - Schematic**

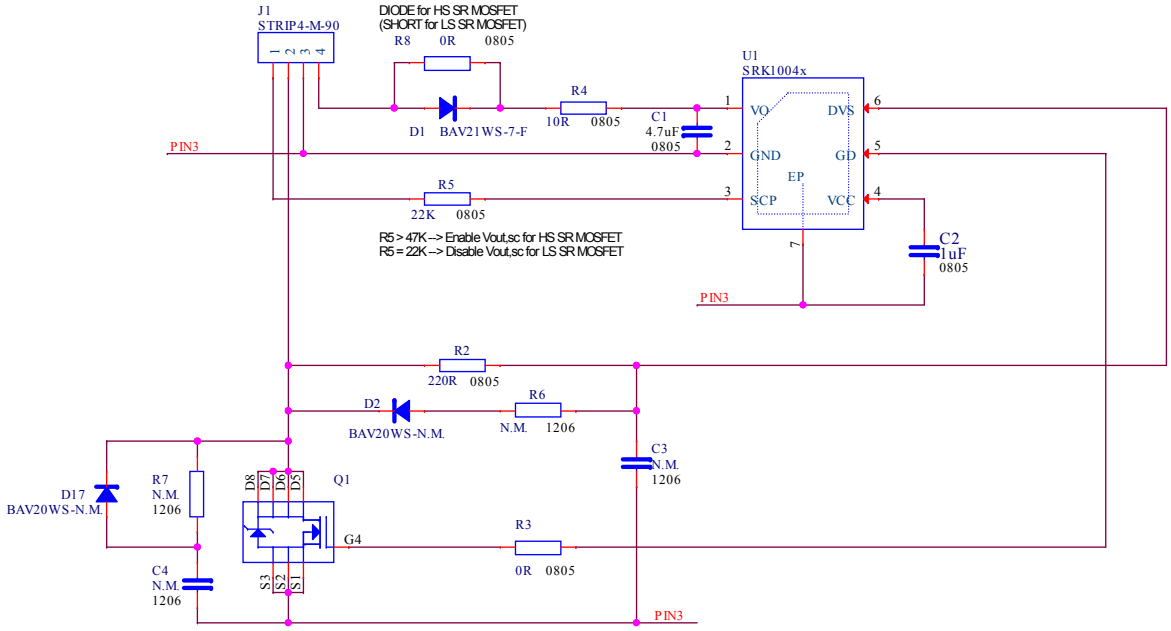


Table 2. **EVLSRK1004x - bill of material**

Reference	Value	Description	Package	Manufacturer	Part number
C1	4.7uF	50V CERCAP X7R - General purpose	0805	TDK	C2012X7R1H475K125AC
C2	1uF	25V CERCAP - X7R - 10%	0805		
C3	N.M.	500V CERCAP - X7R - 10%			
C4	N.M.	500V CERCAP - X7R - 10%			
D1	BAV21WS-7-F	SMD Schottky rectifier	SOD-323	Diodes Incorporated	BAV21WS-7-F
D2	BAV20WS-N.M.	Small signal switching diode			
D17	BAV20WS-N.M.	Small signal switching diode			
J1	STRIP4-M-90	4 pins strip, right angle, male		WURTH	61304011021
Q1	BSC080N12LS-G (A,E) BSC034N10LS5 (B) BSC093N15NS5 (C,F) STL120N10F8 (D)	N-Channel power MOSFET 120 V 12A N-Channel power MOSFET 100V 19A/100A N-Channel power MOSFET 100 V 125A N-Channel power MOSFET 150V 87A	8-PowerTDFN	Infineon Infineon Infineon STMicroelectronics	BSC080N12LS-G BSC034N10LS5 BSC093N15NS5 STL120N10F8
R2	220R	SMD standard film RES - 1/8W -5% - 250ppm/°C	0805		
R3	0R	SMD standard film RES - 1/8W -5% - 250ppm/°C	0805		
R4	10R	SMD standard film RES - 1/8W -5% - 250ppm/°C	0805		
R5	22K	SMD standard film RES - 1/8W -5% - 250ppm/°C	0805		

Reference	Value	Description	Package	Manufacturer	Part number
R6	N.M.	SMD standard film RES - 1/8W -5% - 250ppm/°C			
R7	N.M.	SMD standard film RES - 1/8W -5% - 250ppm/°C			
R8	0R	SMD standard film RES - 1/8W -5% - 250ppm/°C	0805		
U1	SRK1004A/B/C/D/E/F	SRK1004A/B/C/D/E/F - VFDFPN 6L 2x2 pitch 0.65	6DFN_2X2	STMicroelectronics	SRK1004A/B/C/D/E/F

3 Waste and recycling

The evaluation board is not to be disposed of as urban waste. At the end of its life cycle, waste sorting guidelines must be followed. Consult the local authorities for more information on the proper disposal channels and recycling centers. It is mandatory to discard separately the evaluation board and make sure it is delivered to the appropriate waste management and recycling centers. As of 15 August 2018, in all the countries belonging to the European Union, the evaluation board is subject to the requirements of the WEEE Directive **2012/19/EU**, and therefore it is forbidden to dispose of the evaluation board as undifferentiated waste or with other domestic waste. Improper disposal of the evaluation board may cause damage to the environment and violators may incur fines based on specific countries' rules, regulations, and laws.

Revision history

Table 3. **Document revision history**

Date	Version	Changes
02-Nov-2023	1	Initial release.
25-Nov-2025	2	EVLSRK1004E and EVLSRK1004F description added.

Contents

List of tables

List of figures