



# SP6032

## High Performance Synchronous Rectifying Converter

### DESCRIPTION

SP6032 is a high performance and tightly integrated secondary side synchronous rectifier for switching mode power supply system. It combines a much lower voltage drop N-channel MOSFET to emulate the traditional diode rectifier at the secondary side of Flyback converter, The fundamental of SP6032 synchronous rectifier (SR) driver IC is based on our U.S. patented methods that utilize the principle of “prediction” logic circuit. The IC deliberates previous cycle timing to control the SR in present cycle by “predictive” algorithm that makes adjustments to the turn-off time, in order to achieve maximum efficiency and avoid cross-conduction at the same time. The SP6032 is capable to adapt in almost all existing Resonance converters with few adjustments considered necessary.

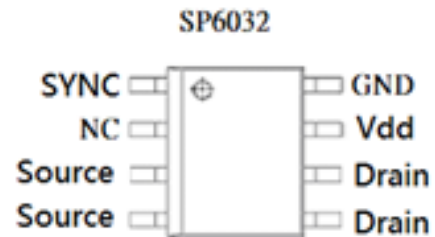
### FEATURES

- Offers efficiency improvement over Schottky Diode (depends on drive configuration of the SR).
- Low Standby Power to meet DOE Lot 6 requirement.
- Secondary-side synchronous rectifier optimized for output system.
- Build-in 100V SR MOSFET with low Rdson
- Operating frequency up to 300 KHz.
- Synchronize to transformer secondary voltage waveform.
- Internal over voltage protection

### APPLICATIONS

- Switching Mode Power Supply (CCM&DCM&QR)
- Storage area network power supplies
- Telecommunication converters
- Embedded systems
- Industrial & commercial systems using high current processors
- Power converters to meet Lot 6 requirement

### PIN CONFIGURATION (SOP-8)



### PART MARKING

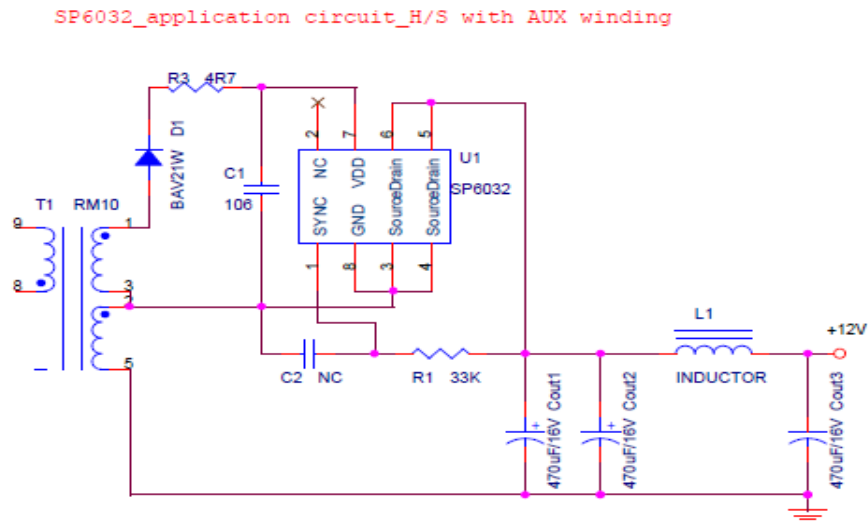
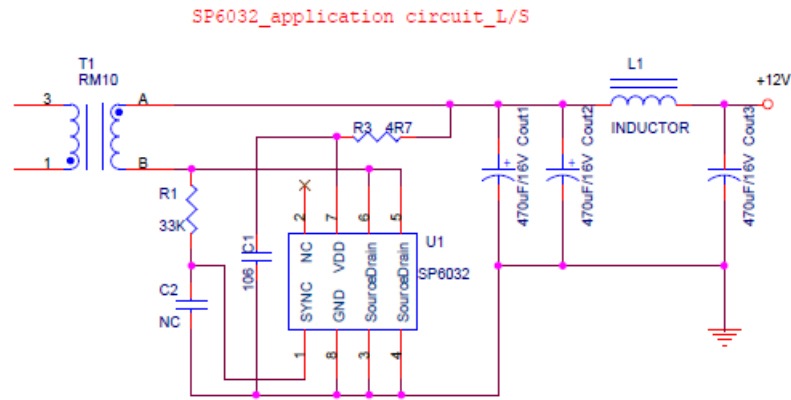




# SP6032

## High Performance Synchronous Rectifying Converter

### TYPICAL APPLICATION CIRCUIT



### PIN DESCRIPTION

Pin	Symbol	Description
1	SYNC	Synchronized signal from Vds of SR MOSFET
2	NC	
3	Source	Internal MOSFET Source
4	Source	Internal MOSFET Source
5	Drain	Internal MOSFET drain
6	Drain	Internal MOSFET drain
7	Vdd	DC supply voltage.
8	GND	Ground connection.

### ORDERING INFORMATION

Part Number	Package	Part Marking
SP6032S8RGB	SOP-8	SP6032

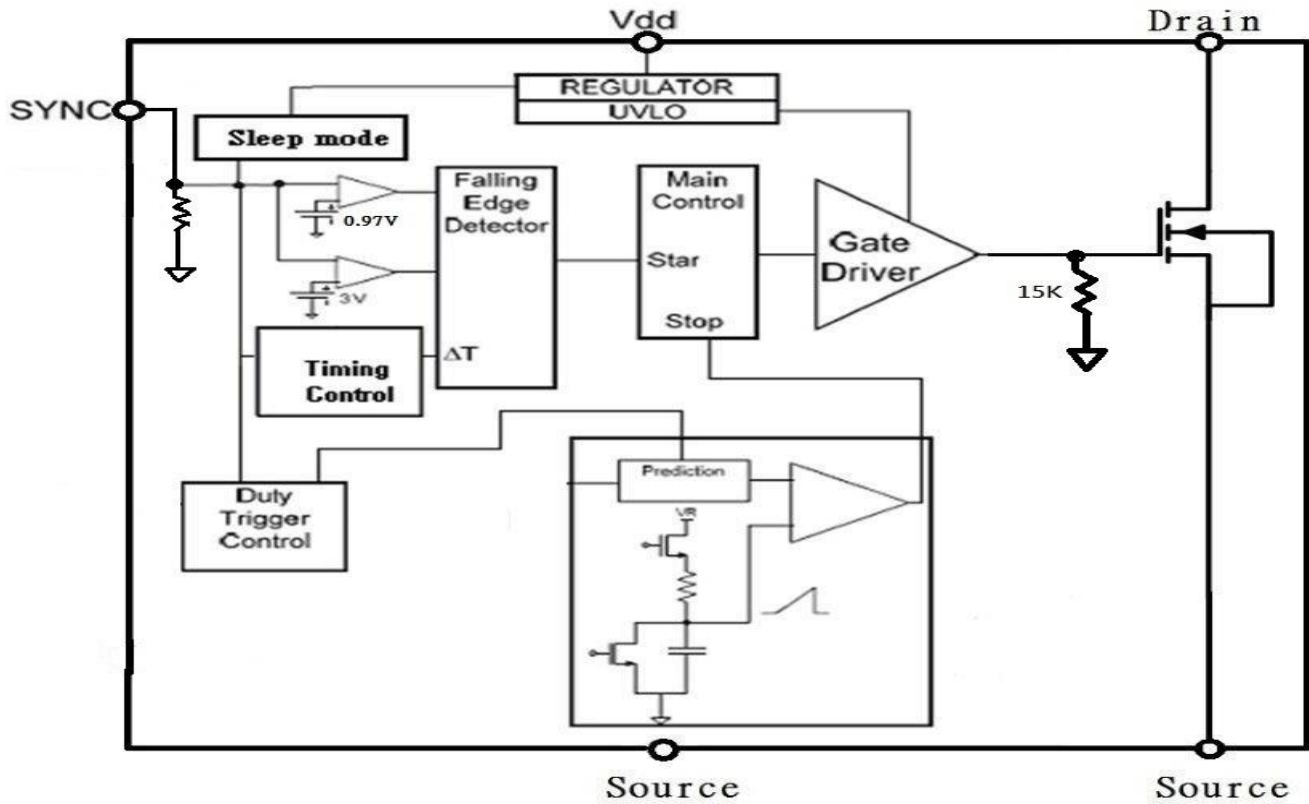
※ SP6032S8RGB : Tape Reel ; Pb – Free ; Halogen - Free



# SP6032

## High Performance Synchronous Rectifying Converter

### BLOCK DIAGRAM



### ABSOLUTE MAXIMUM RATINGS (TA=25°C, unless otherwise specified.)

The following ratings designate persistent limits beyond which damage to the device may occur.

Symbol	Parameter	Value	Unit
V <sub>dd</sub>	DC Supply Voltage	16	V
V <sub>d</sub> to V <sub>s</sub>	Drain to Source	100	V
P <sub>D</sub>	Power Dissipation @ T <sub>A</sub> =85°C (*)	0.3	W
T <sub>J</sub>	Operating Junction Temperature Range	-40 to 125	°C
T <sub>STG</sub>	Storage Temperature Range	-40 to 150	°C
T <sub>LEAD</sub>	Lead Soldering Temperature for 5 sec.	260	°C

### THERMAL RESISTANCE

Symbol	Parameter	Value	Unit
R <sub>θJA</sub>	Thermal Resistance-Junction to Ambient (*)	110	°C/W

(\*) The power dissipation and thermal resistance are evaluated under copper board mounted with free air conditions.



# SP6032

## High Performance Synchronous Rectifying Converter

### ELECTRICAL CHARACTERISTICS

(T<sub>A</sub>=25°C, V<sub>dd</sub>=5V, Freq. =50 KHz, Duty Cycle=50%, unless otherwise specified.)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
<b>SUPPLY INPUT</b>						
I <sub>dd</sub>	Supply current	No load & Sleep mode		0.2	0.35	mA
		V <sub>SYNC</sub> =V <sub>dd</sub> , No load	2.0	3.0	4.0	mA
V <sub>dd</sub>	Supply voltage	I <sub>dd</sub> peak < 1A	4.3		16	V
V <sub>dd on</sub>	Enable voltage		3.35	3.7	4.1	V
V <sub>dd hysteresis</sub>	Enable voltage			0.2		V
V <sub>ovp</sub>	Over voltage protection		17	17.5	18.5	V
V <sub>OVP</sub> hysteresis	Enable voltage			0.67		V
<b>SYNC REFERENCE (SYNC)</b>						
V <sub>shth</sub>	SYNC high threshold			3.0		V
V <sub>slth</sub>	SYNC low threshold			0.9		V
V <sub>sync</sub>	SYNC clamp voltage	I <sub>sync</sub> =3mA	V <sub>dd</sub> +1.5			V
V <sub>sync WK</sub>	SYNC wake-up voltage	Pulse width > 1uS for V <sub>dd</sub> =5V	6			V
I <sub>sync</sub>	SYNC input current				3	mA
<b>Dynamic Protect</b>						
D <sub>t</sub>	Dynamic variable			5.1		uS
T <sub>on-min</sub>	MOSG-C on time	PWM adjusts time > D <sub>t</sub>	0.4		0.7	uS
<b>SR MOSFET SECTION</b>						
BV <sub>dss</sub>	MOSFET Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250uA	100			V
R <sub>ds(on)</sub>	Drain-Source On-Resistance	V <sub>GS</sub> =10V, I <sub>D</sub> =15A		14	17	mΩ
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =50V, V <sub>GS</sub> =0V f=1MHz		840		pF
C <sub>oss</sub>	Output Capacitance			147		
C <sub>rss</sub>	Reverse Transfer Capacitance			4.9		
T <sub>d(on)</sub>	Turn On Time	V <sub>DD</sub> =50V, I <sub>D</sub> =15A, V <sub>GS</sub> =10V		6		nS
T <sub>d(off)</sub>	Turn Off Time	R <sub>G</sub> =10Ω		13		



# SP6032

## High Performance Synchronous Rectifying Converter

---

Information provided is alleged to be exact and consistent. SYNC Power Corporation presumes no responsibility for the penalties of use of such information or for any violation of patents or other rights of third parties, which may result from its use. No license is granted by allegation or otherwise under any patent or patent rights of SYNC Power Corporation. Conditions mentioned in this publication are subject to change without notice. This publication surpasses and replaces all information previously supplied. SYNC Power Corporation products are not authorized for use as critical components in life support devices or systems without express written approval of SYNC Power Corporation.

© The SYNC Power logo is a registered trademark of SYNC Power Corporation

© 2020 SYNC Power Corporation – Printed in Taiwan – All Rights Reserved

SYNC Power Corporation

7F-2, No.3-1, Park Street

NanKang District (NKSP), Taipei, Taiwan, 115, R.O.C

Phone: 886-2-2655-8178

Fax: 886-2-2655-8468

<http://www.syncpower.com>