

DESCRIPTION

The SP6082 is a high performance and tightly integrated secondary side synchronous rectifying converter for switching mode power supply system. It combines a low Rdson N-channel MOSFET to emulate the traditional diode rectifier at the secondary side of Flyback converter

The SP6082 generates its own supply voltage and does not need auxiliary winding for either high-side or low-side applications. Programmable ringing detection circuitry prevents the SP6082 from false turning on at V_{DS} oscillations during discontinuous conduction mode (DCM) and quasi-resonant (QR) operation. It has a timing pin to allow SP6082 to turn on at a selected load.

The SP6082 is capable to adapt in almost all existing 12V Resonance converters with few adjustments considered necessary. SP6082 is available in space saving SOP-8 package.

FEATURES

- Does not need auxiliary winding for either high-side or low-side applications
- Fast turn-on and turn-off delay
- Ringing detection prevents false turn-on during DCM and QR operations
- Less than 100mW standby power
- <400uA quiescent current at light load mode
- Supports CCM, DCM and QR operation
- Support both high-side and low-side rectification
- Build-in 100V SR MOSFET with low Rdson
- Available in space saving SOP-8 package

APPLICATIONS

- Industrial Power Systems
- Distributed Power Systems
- Battery Powered Systems
- Flyback Converters
- USB PD Quick Chargers

PIN CONFIGURATION (SOP-8)



PART MARKING





TYPICAL APPLICATION CIRCUIT



PIN DESCRIPTION

Pin No.	Pin Name	Description		
1	VDD	Linear regulator output. Supply voltage for internal circuits		
2	VD	External FET drain voltage sensing and input of linear regulator		
3,4	Source	Internal MOSFET Source		
5,6,7,8	Drain	Internal MOSFET Drain		

ORDERING INFORMATION

Part Number	Package	Part Marking
SP6082S8RGB	SOP-8	SP6082

* SP6062S8RGB : Tape Reel ; Pb – Free ; Halogen – Free



BLOCK DIAGRAM



The following ratings designate persistent limits. Beyond those limits, damage to the device may occur.

Symbol	Parameter	Value	Unit		
VDD	VDD pins voltages to Source	-0.3 ~ 8.0	V		
VD	VD pin voltage to Source	-0.7 ~ 200	V		
PD	Power Dissipation @ TA=85°C (*)	0.3	W		
TJ	Junction temperature	-40 ~ 150	°C		
T _{STG}	Storage temperature	-40 ~ 150	°C		
TLEAD	Lead soldering temperature for 5 sec	260	°C		
THERMAL RESISTANCE					
Symbol	Danamatan	Value	Unit		

Symbol	Parameter	Value	Unit
Roja	Thermal Resistance Junction –to Ambient (*1)	70	°C/W
Rojc	Thermal Resistance Junction –to Case (*2)	32	°C/W

(*1) θ_{JA} is measured in natural convection (still air) at $T_A = 25 \,^{\circ}C$ with the component mounted on a low effective thermal conductivity test board of JEDEC 51-3 thermal measurement standard.

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



ELECTRICAL CHARACTERISTICS

 $(T_A=25^{\circ}C, V_{DD}=5.5V, unless otherwise specified)$

Symbol	Parameter Conditions		Min	Тур	Max	Unit	
Supply Section							
UVLO	VDD UVLO rising		3.5	4	4.5	V	
	VDD UVLO Hysteresis		0.1	0.3	0.5	V	
	VDD clamp voltage	$I_{DD} = 10 \text{mA}$		7.5		V	
т	VDD sharping symmetry	$V_D = 20V, V_{DD} = 0V$		20		mA	
I _{VD}	VDD charging current	$V_D = 20V, RVDD = 1K\Omega$		7		mA	
	VDD regulation voltage	$V_D = 20V$	5.7	6.1	6.5	V	
I _{CC}	Operating current	C _{iss} =1.45nF, F _{SW} =50kHz		5		mA	
	Shutdown current	$V_{DD}=UVLO-0.5V$			50	uA	
I _{STANDBY}	Light-load mode current	$R_{timing}=90k\Omega$		250	400	uA	
Control	Circuitry Section						
V _{LL-DS}	VSS-VD turn-on threshold			230		mV	
V _{fwd}	VSS-VD forward voltage			20		mV	
	VSS-VD turn-off threshold			3		mV	
T _{Don}	Turn-on delay	$C_{iss}=1.45nF, V_{GS}=2V$			75	ns	
	Turn-off propagation delay(*)	$V_D = V_{SS}$		15		ns	
T_{Doff}	Turn-off total delay	$V_{D}=V_{SS}, C_{iss}=1.45nF, V_{GS}=2V$		30		ns	
T _{Bon}	Turn-on blanking time			1.2		us	
V_{Boff}	Turn-off blanking V _{DS} threshold		1.5		2.5	V	
T _{timing}	Falling slope detection timer	R_{timing} =90k Ω , V_D transition from 2V to 0.35V		25		nS	
T _{LL1}	Light-load-enter pulse width			1.3		us	
T _{LL1-H}	Light-load-enter pulse width			0.5		us	
	hysteresis						
T _{LL2}	Light-load-enter pause width			1		ms	
T _{LL-DEL}	Light-load-enter delay			6		cycle	
SR MOS	FET Section						
BVdss	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250uA$	100			V	
R _{DS(on)}	Drain-Source On-Resistance	$V_{GS}=4.5\overline{V,I_D}=2A$		10.5	13	mΩ	
Ciss	Input Capacitance			1450			
Coss	Output Capacitance	$V_{DS}=20V, V_{GS}=0V, f=1MHz$		273		pF	
Crss	Reverse Transfer Capacitance			5			
Td(on)	Turn On Time	$V_{DS}=20V, I_{D}=10A, V_{GS}=10V,$		6		nC	
Td(off)	Turn Off Time	Rg=10Ω		18		115	

Notes:

(*)Guaranteed by design and characterization.



TYPICAL CHARACTERISTICS









SOP-8 PACKAGE OUTLINE



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SYMBOL	MIN	NOM	MAX
Α	1.35		1.75
A1	0.10		0.25
A2	1.25	1.40	1.65
A3	0.50	0.60	0.70
b	0.33	-	0.51
с	0.17		0.25
D	4.80	4.93	5.05
Е	5.80	6.00	6.20
E1	3.80	3.90	4.00
e	1.17	1.27	1.37
L	0.45	0.60	0.80
L1	1.04 REF		
L2		0.25BSC	
R	0.07		
R1	0.07		0.20
h	0.25		0.50
θ	0°		8°
θ 1	15°	17°	19°
θ 2	11°	13°	15°
θ3	15°	17°	19°
θ4	11°	13°	15°



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