

FSDH565

Fairchild Power Switch(FPS)

Features

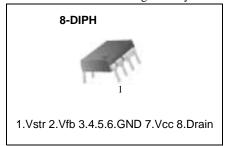
- Single Chip 650V 0.5A SenseFET Power Switch
- Precision Fixed Operating Frequency (100kHz)
- Internal Start up Switch
- UVLO with Hysteresis (6.7V/8.7V)
- · Over Load Protection
- Over Current Protection (0.3A)
- Internal Thermal Shutdown Function
- · Secondary Side Regulation
- · Auto-restart mode
- No load consumption <250mW at 265VAC input

Applications

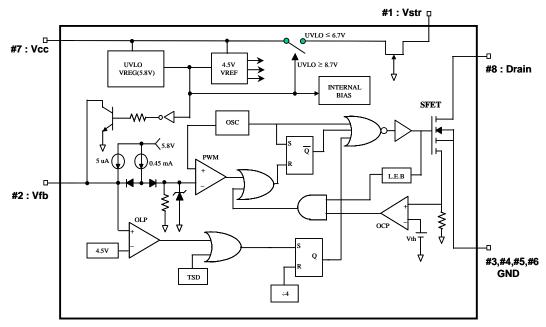
- Charger & Adaptor for Mobile Phone, PDA & MP3
- Auxiliary Power for PC, C-TV, Monitor

Description

The FSDH565 is specially designed for an off-line SMPS with minimal external components. The FSDH565 is a monolithic high voltage power switching regulator that combine the SenseFET(LDMOS) with voltage mode PWM control block. Included PWM controller features integrated fixed oscillator, under voltage lock out, leading edge blanking, optimized gate turn-on/turn-off driver, thermal shut down protection and temperature compensated precision current sources for loop compensation and fault protection circuitry. compared to discrete MOSFET and controller or RCC switching converter solution, a FSDH565 can reduce total component count, design size, weight and at the same time increase efficiency, productivity, and system reliability. It has a basic platform well suited for cost effective design in a flyback converter.



Internal Block Diagram



Absolute Maximum Ratings

(Ta=25°C unless otherwise specified)

Parameter	Symbol	Value	Unit
Maximum Drain Voltage	V _{D,MAX}	650	V
Continuous Drain Current (TC=25°C)	ID	0.3	ADC
Maximum Supply Voltage	VCC,MAX	21	V
Input Voltage Range	VFB	-0.3 to VSD	V
Operating Ambient Temperature	TA	−25 to +85	°C
Storage Temperature Range	TSTG	−55 to +150	°C

PIN Definitions

Pin Number	Pin Name	Pin Function Description		
1	Vstr	This pin connects directly to the rectified AC line voltage source. At start up the internal switch supplies internal bias and charges an external capacitor that connects from the Vcc pin to ground. once this reaches 8.7V, Vstr is isolated internally.		
2	Vfb	This pin is the inverting input of the PWM comparator, and it operates normally between 0.5V and 2.5V. It has a 0.45mA current source connected internally and a capacitor and opto coupler connected externally. A feedback voltage of 3.5V to 4.5V triggers overload protection (OLP). There is a time delay due to the 5uA current source, which prevents false triggering under transient conditions but still allows the protection mechanism to operate under true overload conditions.		
3, 4, 5, 6	GND	These pins are the control ground and the SenseFET Source.		
7	Vcc	This is the positive supply voltage input. During start up, power is supplied to this input from Pin 1. When Vcc reaches the UVLO upper threshold (8.7V), the start up Internal Switch (Vstr) turns off and power is supplied from auxiliary transformer winding.		
8	Drain	This pin is designed to directly drive the converter transformer and is capable of switching a maximum of 650V and 1A.		

Electrical Characteristics

(Ta=25°C unless otherwise specified)

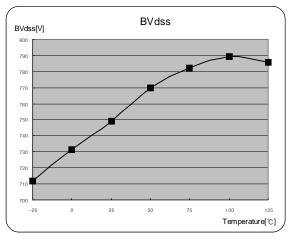
Parameter	Symbol	Condition	Min.	Тур.	Max.	Unit	
SENSEFET SECTION				I.			
Drain-Source Breakdown Voltage	BVDSS	$VGS = 0V, ID = 100\mu A$	650	-	-	V	
Zero gate voltage drain current	IDSS	V _{DS} = 520V	-	-	100	μΑ	
Static drain-source on Resistance	RDS(ON)	ID = 50mA Tj = 25°C	-	36	39	Ω	
Static drain-source on Resistance		I _D = 50mA Tj = 100°C	-	51	59	Ω	
Rise Time	TR	V _{DS} = 325V, I _D = 300mA	-	100	-	nS	
Fall Time	TF	V _{DS} = 325V, I _D = 50mA	-	50	-	nS	
START UP SECTION				•			
VSTR Supply Voltage	VsT	-	17	-	-	V	
UVLO SECTION							
Start Threshold Voltage	Vstart	-	8.0	8.7	9.4	V	
Stop Threshold Voltage	Vstop	After turn on	6.0	6.7	7.4	V	
OSCILLATOR SECTION							
Initial accuracy	Fosc	Tj = 25°C	90	100	110	kHz	
Maximum Duty Cycle	DMAX	Vfb = 3V	64	67	70	%	
Minimum Duty Cycle	DMIN	Vfb = 0V	-	0	0	%	
FEEDBACK SECTION							
Feedback Source Current	IFB	Vfb = 0V	0.40	0.45	0.50	mA	
Shutdown feedback Voltage	VsD	-	4.0	4.5	5.0	V	
CURRENT LIMIT(SELF-PROTECTION)	SECTION						
Peak Current Limit	Iover	peak inductor current	0.25	0.3	0.35	Α	
PROTECTION SECTION							
Thermal Shutdown Temperature (Tj) (1)	T _{SD}	-	125	145	-	°C	
TOTAL DEVICE SECTION							
Operating Supply Current	lop	Vcc = 9.5V (Max)	-	-	3.5	mA	

Note:

^{1.} These parameters, although guaranteed, are not 100% tested in production

Typical Performance Characteristics

(These characteristic graphs are normalized at Ta=25°C)



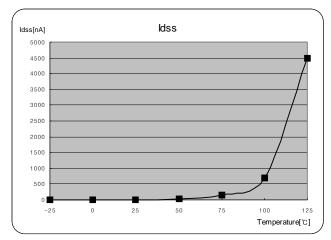
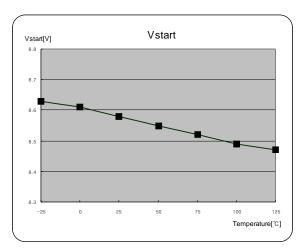


Figure 1. Breakdown vs.Temperature

Figure 2. Zero gate voltage drain current vs.Temperature



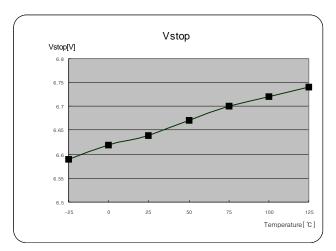
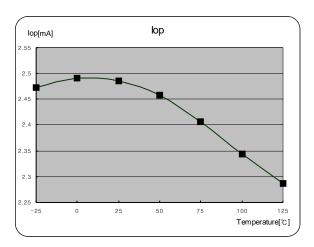


Figure 3. Start Threshold Voltage

Figure 4. Stop Threshold Voltage



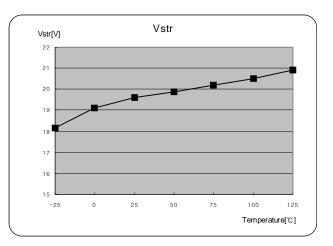
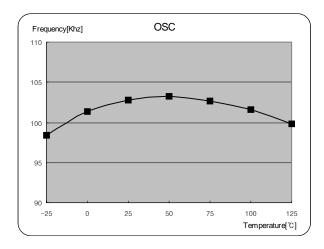


Figure 5.Operating Supply Current

Figure 6.Vstr Supply Voltage

Typical Performance Characteristics (Continued)

(These characteristic graphs are normalized at Ta=25°C)



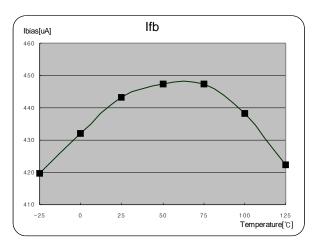


Figure 7. Output Frequency

Figure 8. Feedback Source Current

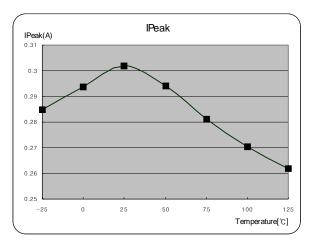
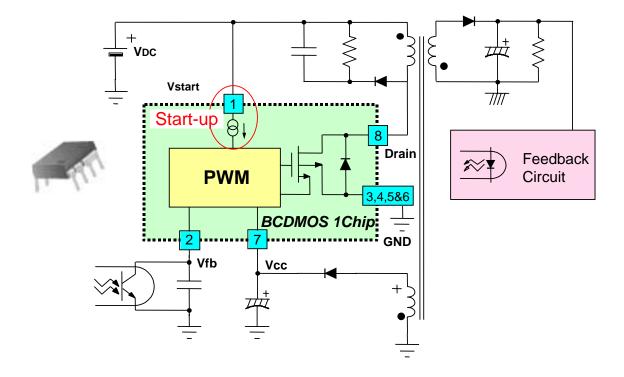


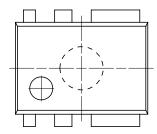
Figure 9. Peak Current Limit

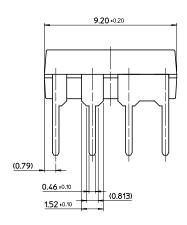
Typical Circuit

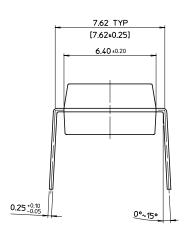


Package Dimensions

8-DIPH







Ordering Information

Product Number	Package	Rating	Topr (°C)
FSDH565	8-DIPH	650V, 0.5A	–25°C to +85°C

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