

# FSDH0165

## Fairchild Power Switch(SPS)

### Features

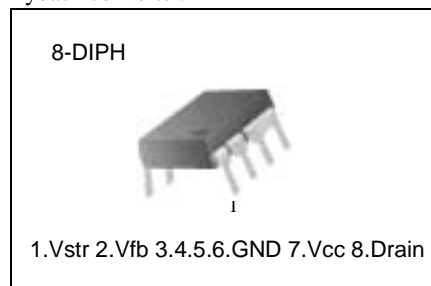
- Single Chip 650V 1A SenseFET PowerSwitch
- Precision Fixed Operating Frequency (100kHz)
- Internal Start-up Switch
- UVLO with Hysteresis (6.7V/8.7V)
- Over Load Protection (typ. 4.5V)
- Over Current Protection (typ. 0.6A)
- Internal Thermal Shutdown Function
- Secondary Side Regulation
- Auto-restart mode

### Applications

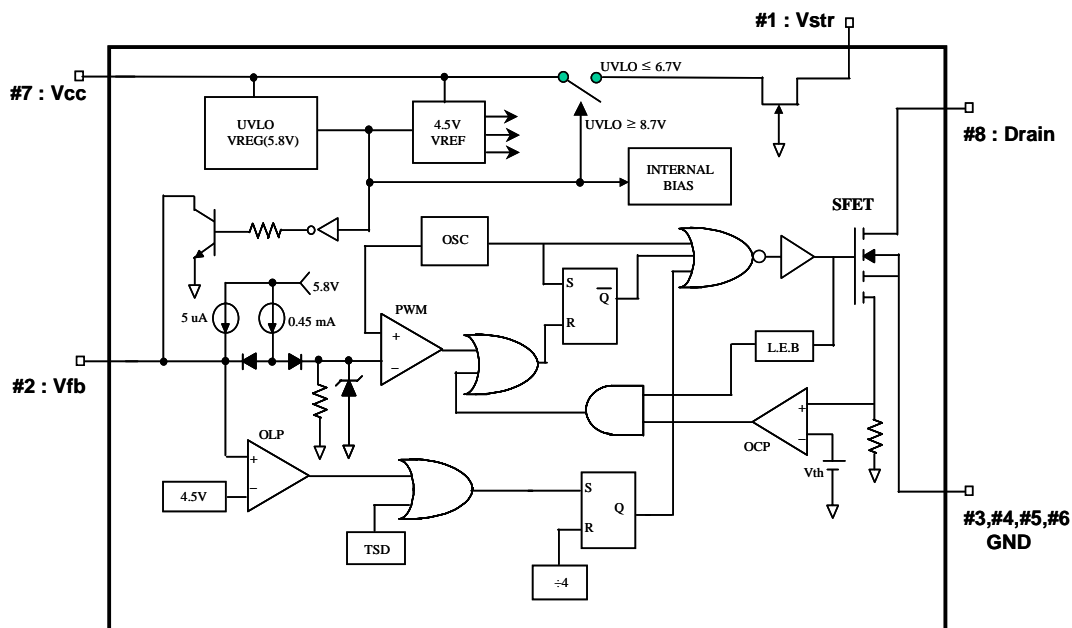
- Charger & Adaptor for Mobile Phone, PDA & MP3
- Auxiliary Power for PC

### Description

The FSDH0165 is specially designed for an off-line SMPS with minimal external components. The FSDH0165 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 FSDH0165 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



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## Absolute Maximum Ratings

(Ta=25°C unless otherwise specified)

Parameter	Symbol	Value	Unit
Maximum Drain Voltage	V <sub>D,MAX</sub>	650	V
Continuous Drain Current (T <sub>C</sub> =25°C)	I <sub>D</sub>	0.6	ADC
Maximum Supply Voltage	V <sub>CC,MAX</sub>	21	V
Input Voltage Range	V <sub>FB</sub>	-0.3 to V <sub>SD</sub>	V
Operating Ambient Temperature	T <sub>A</sub>	-25 to +85	°C
Storage Temperature Range	T <sub>STG</sub>	-55 to +150	°C

## Electrical Characteristics

(Ta=25°C unless otherwise specified)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
<b>SENSEFET SECTION</b>						
Drain-Source Breakdown Voltage	BVDSS	VGS=0V, ID=100μA	650	-	-	V
Zero gate voltage drain current	IDSS	VDS=520V	-	-	100	μA
Static drain-source on Resistance	RDS(ON)	ID=50mA Tj=25°C	-	15.6	18	Ω
		ID=50mA Tj=100°C	-	25.7	30	Ω
Rise Time	TR	VDS=325V, ID=300mA	-	100	-	nS
Fall Time	TF	VDS=325V, ID=50mA	-	50	-	nS
<b>START UP SECTION</b>						
VSTR Supply Voltage	VST	-	17	-	-	V
<b>UVLO SECTION</b>						
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
<b>OSCILLATOR SECTION</b>						
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	%
<b>FEEDBACK SECTION</b>						
Feedback Source Current	IFB	Vfb=0V	0.40	0.45	0.50	mA
Shutdown feedback Voltage	VSD	-	4.0	4.5	5.0	V
<b>CURRENT LIMIT(SELF-PROTECTION)SECTION</b>						
Peak Current Limit	I <sub>OVER</sub>	peak inductor current	0.5	0.6	0.7	A
<b>PROTECTION SECTION</b>						
Thermal Shutdown Temperature (Tj) <sup>(1)</sup>	TSD	-	125	145	-	°C
<b>TOTAL DEVICE SECTION</b>						
Operating Supply Current	IOPR	VCC=21V (Max)	-	-	4	mA

### Notes:

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

## Typical Performance Characteristics

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

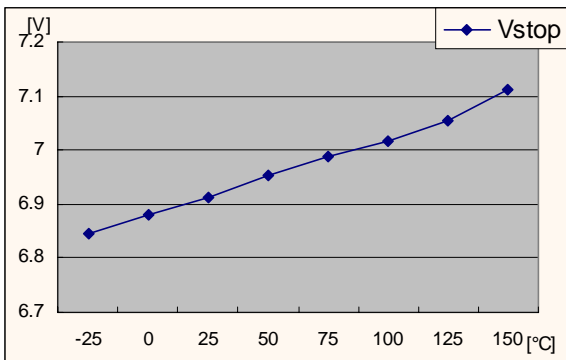


Fig 1. Stop Threshold Voltage

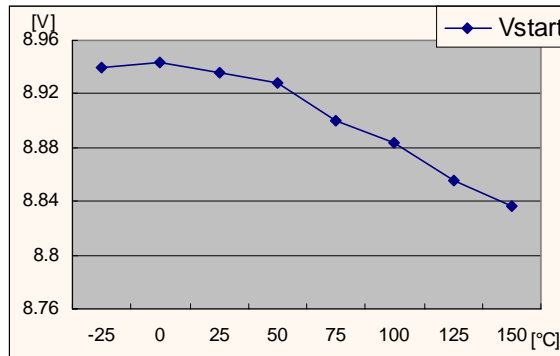


Fig 2. Start Threshold Voltage

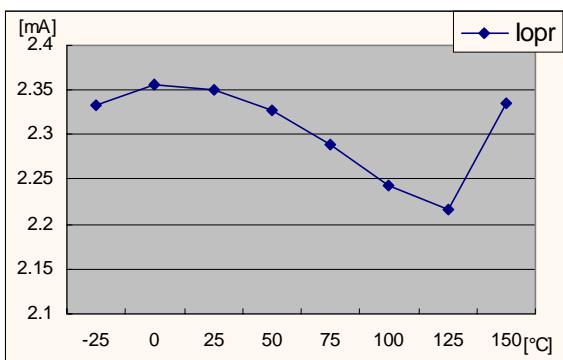


Fig 3. Operating Supply Current

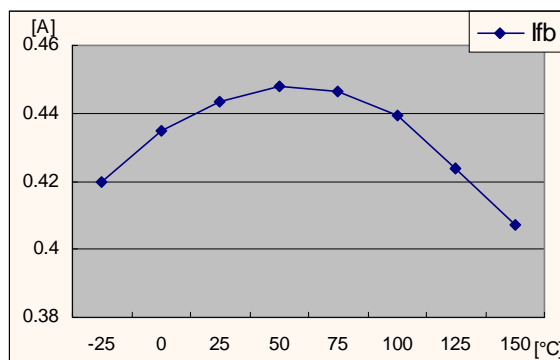


Fig 4. Feedback Source Current

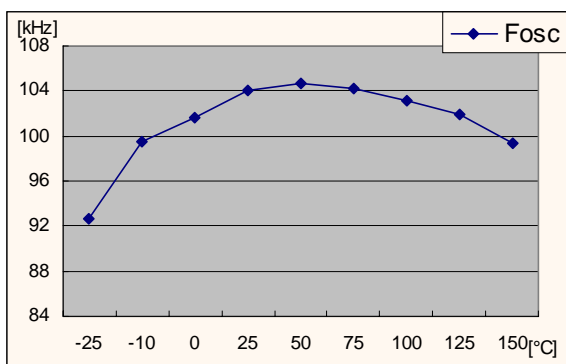


Fig 5. Initial Accuracy

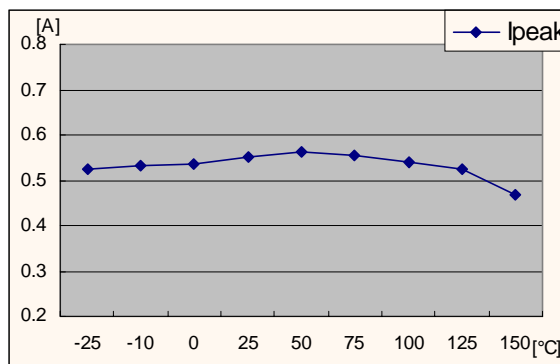


Fig 6. Peak Current Limit

## Typical Performance Characteristics (Continued)

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

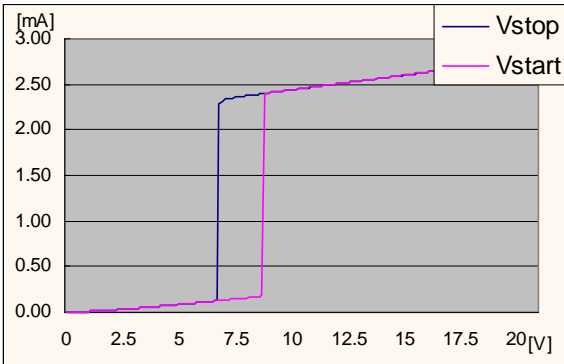


Fig 7. Stop/Start Threshold Voltage

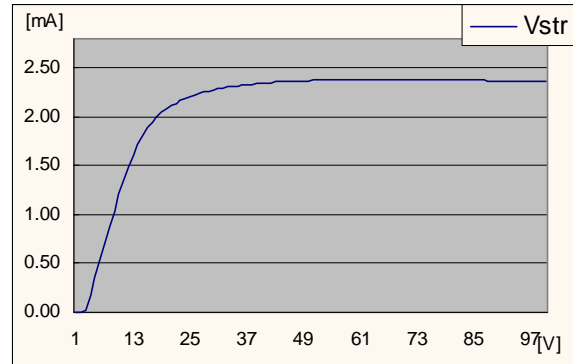


Fig 8. VSTR Supply Voltage

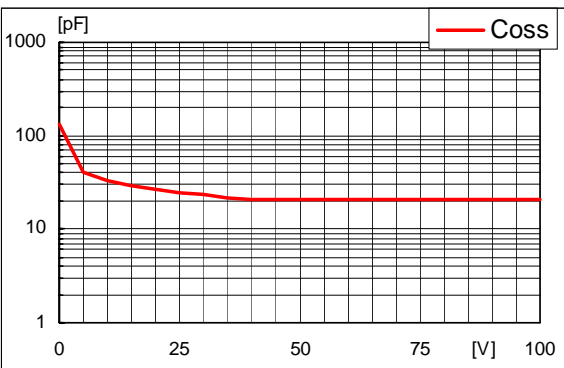


Fig 9. Coss vs. Drain Voltage

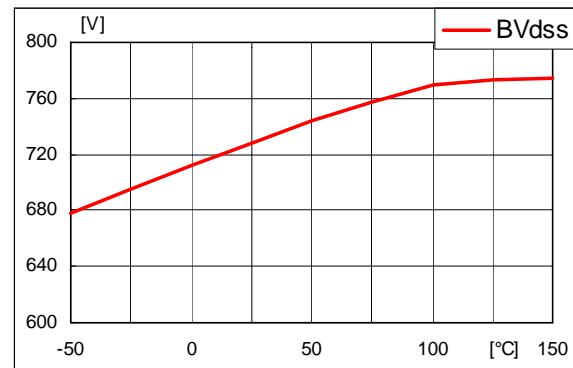
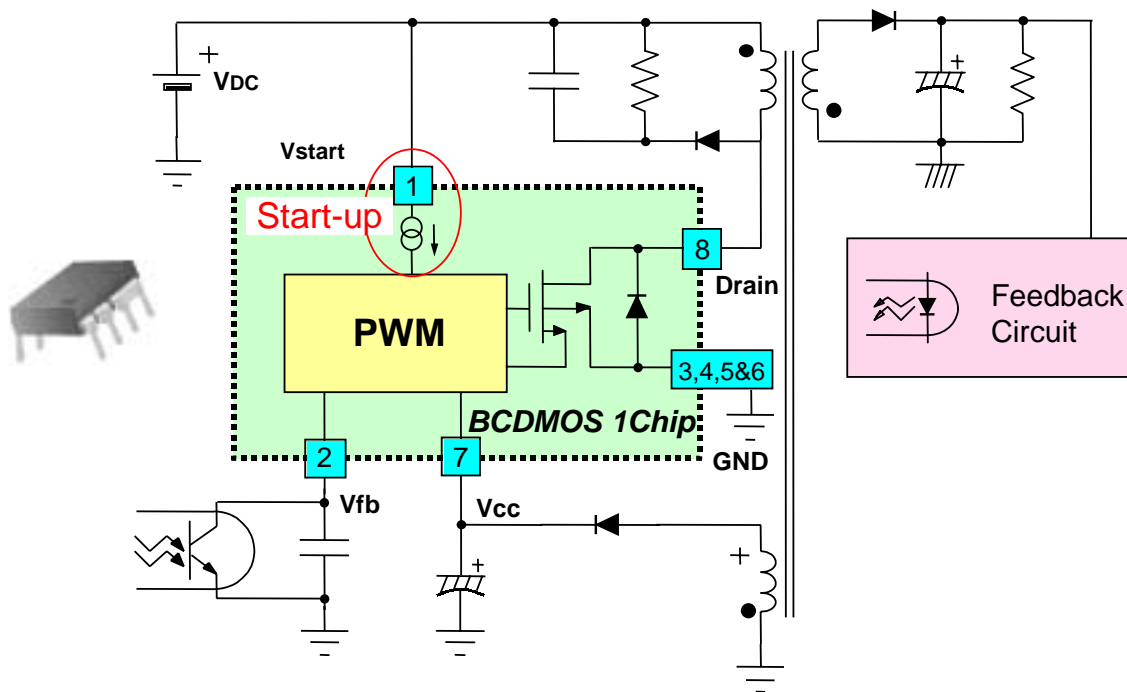


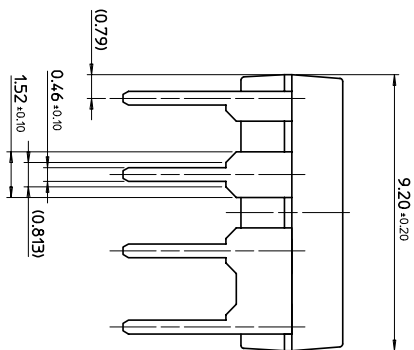
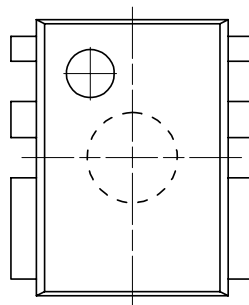
Fig 10. Breakdown vs. Temperature

# Application Circuit



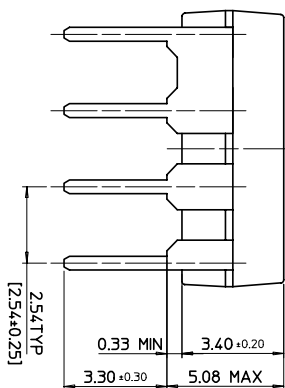
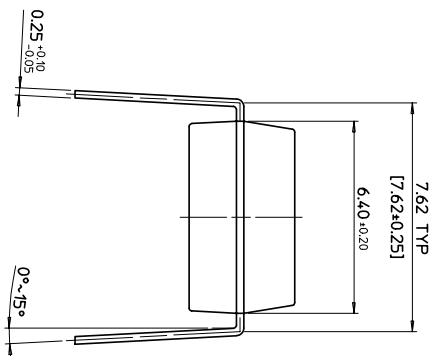
# Package Dimensions

## 8-DIPH



(NOTE)

1. THESE DIMENSIONS DO NOT INCLUDE MOLD PROTRUSION.
2. ( ) IS REFERENCE
3. [ ] IS ASSY OUT QUALITY



**Ordering Information**

<b>Product Number</b>	<b>Package</b>	<b>Rating</b>	<b>Topr (°C)</b>
FSDH0165	8-DIPH	650V, 1A	-25°C to +85°C





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