

58mΩ, 2A High-Side Power Switch with Flag

General Description

The HM9715 is a cost-effective, low-voltage, single N-MOSFET high-side Power Switch IC for USB application. Low switch-on resistance and low supply current are realized in this IC. The HM9715 integrates an over-current protection circuit, a short fold back circuit, a thermal shutdown circuit and an under-voltage lockout circuit for overall protection. Besides, a flag output is available to indicate fault conditions to the local USB controller. Furthermore, the chip also integrates an embedded delay function to prevent miss-operation from happening due to inrush-current. The HM9715 is an ideal solution for USB power supply and can support flexible applications since it is available in SOT-23-5, SOT-23-3 and DFN2X2-6L package.

Ordering Information

Part Number	Package	Note
HM9715	SOT-23-5	EN (Active High)
HM9715A	SOT-23-5	EN Bar (Active Low)
HM9715B	SOT-23-3	
HM9715D	DFN2X2-6L	EN (Active High)

Features

- 58mΩ (typ.) N-MOSFET Switch
- Operating Range: 2.5V to 5.5V
- Reverse Blocking Current
- Under Voltage Lockout (Power On Reset)
- Deglitched Fault Report (FLG)
- Thermal Protection
- Over Current Protection with Fold-back

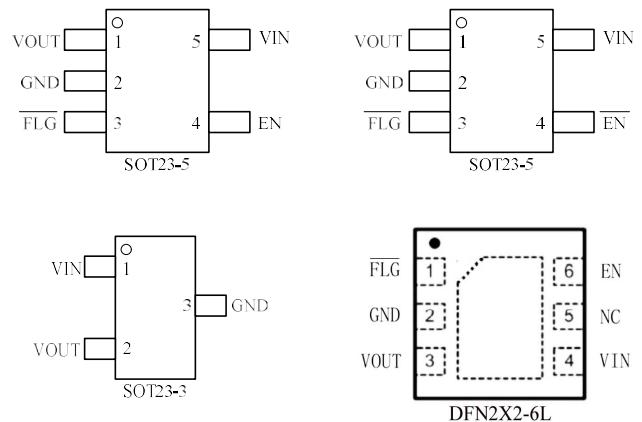
- 2uS Response for Short Circuit Protection
- Soft Start and Fast Turn off

Applications

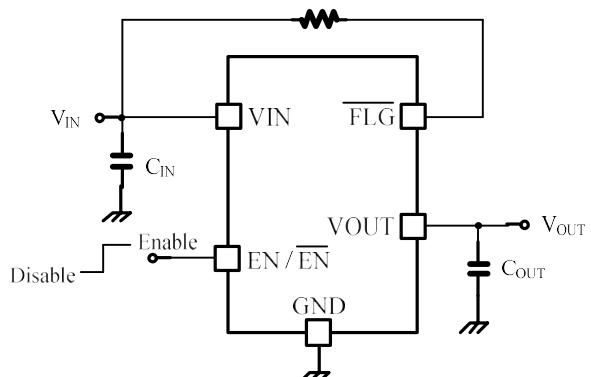


- USB Peripherals
- Notebook PCs

Pin Configuration



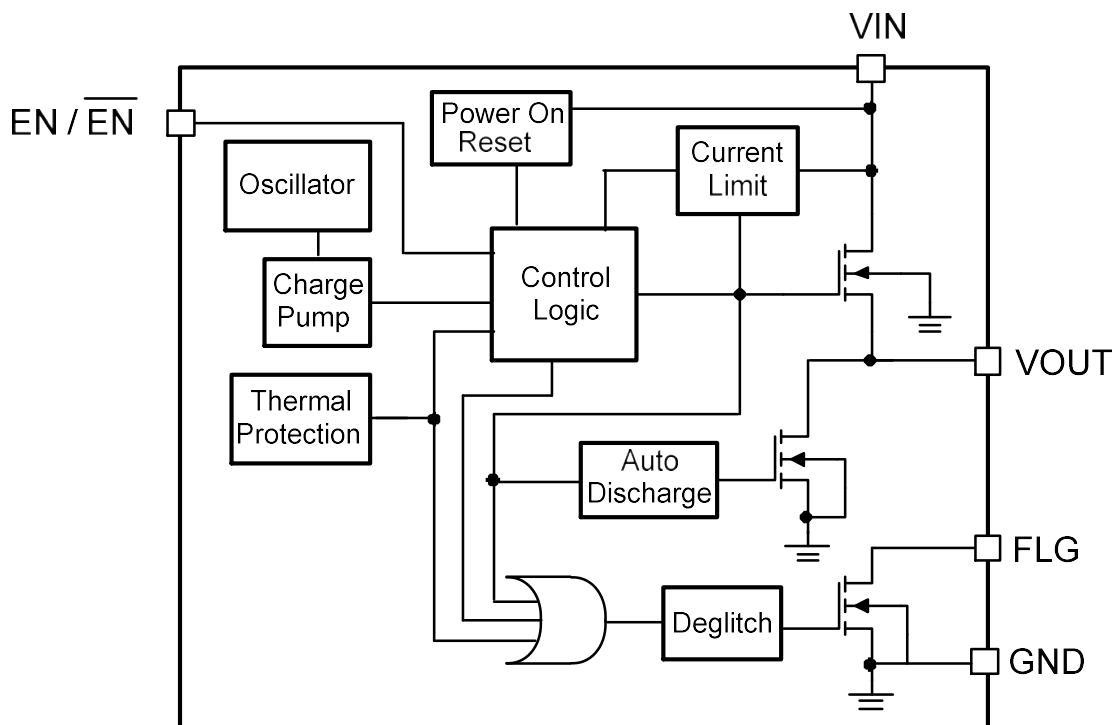
Typical Application Circuit



Pin Assignment

Pin Name	Pin No. SOT-23-5	Pin No. SOT-23-3	Pin Function
VOUT	1	2	Output Voltage
GND	2	3	Ground
FLGB	3	-	Fault FLAG Output Bar
EN / ENB	4	-	Chip Enable (Active High / Low)
VIN	5	1	Power Input Voltage

Function Block Diagram



Absolute Maximum Ratings (Note1)

- VIN ----- -0.3V to +6.0V
- EN ----- -0.3V to +6.0V
- Other pins ----- -0.3V to (VIN+0.3V)
- Junction Temperature----- 125°C
- Lead Temperature (Soldering, 10 sec.)----- 300°C
- Storage Temperature ----- -65°C to 150°C

Recommended Operating Conditions

- VIN ----- +2.5V to +5.5V
- EN ----- 0V to +5.5V
- Junction Temperature ----- 0°C to 125°C

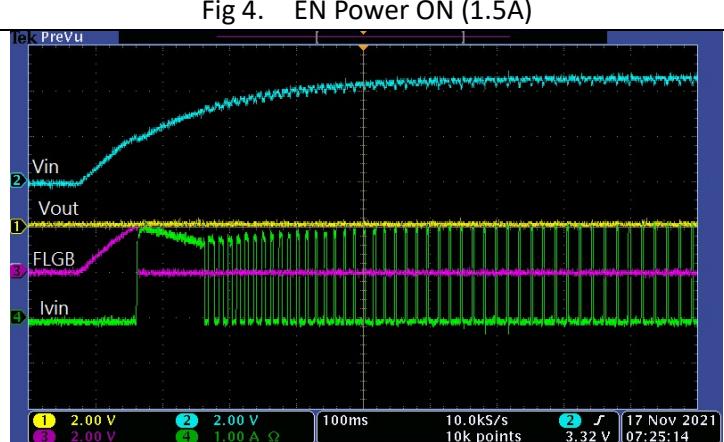
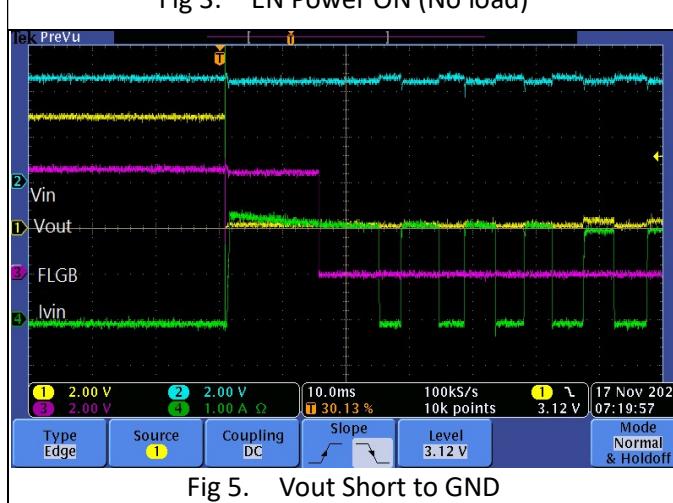
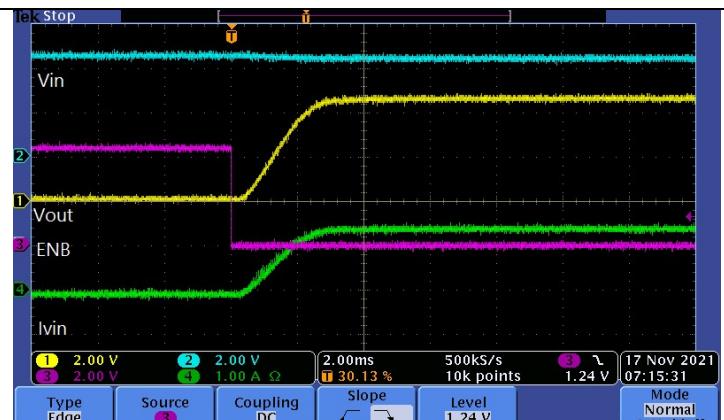
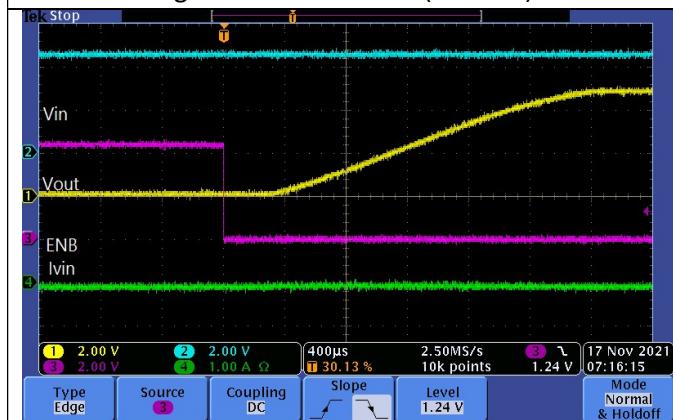
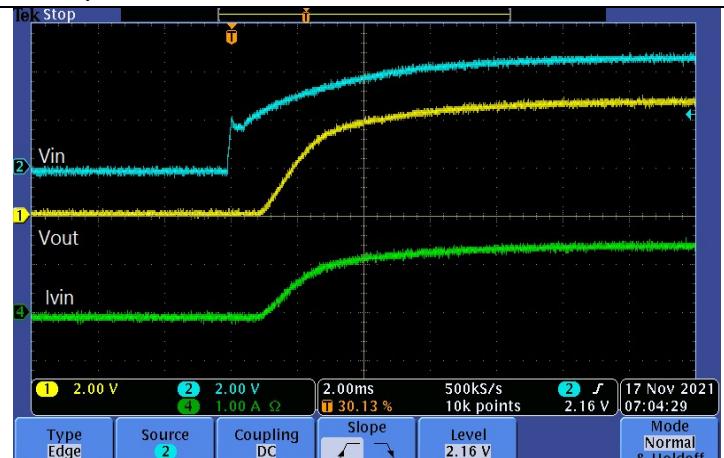
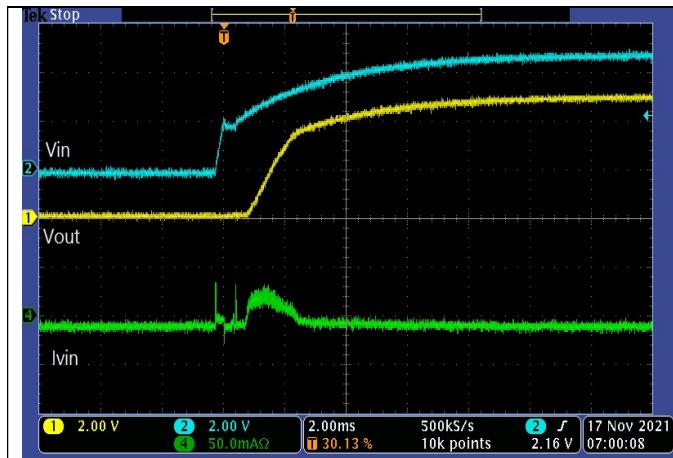
Electrical Characteristics

VIN=5V, C_{IN}=10uF, C_{OUT}=0.1uF, T_J=25°C , unless otherwise specified

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Input Voltage VIN Range	VIN		2.5	--	5.5	V
VIN POR Threshold	VINPOR		--	2.2	2.5	V
Quiescent Current	I _Q	Iout = 0mA	--	60	80	uA
Shutdown Current	I _{SD}	ENB = 5V	--	0.1	1	uA
R _{DS} ON	R _{DSON}	Iout = 500mA	--	58	78	mΩ
Reverse Leakage Current	I _{REV}	Vin = 0V, Vout = 5V	--	0.1	2	uA
Soft Start Time	T _{SS}		--	1.5	2.5	mS
Enable High Level	V _{EN}		1.2	--	--	V
Shutdown Low Level	V _{SD}		--	--	0.5	V
EN input Current	I _{EN}	VIN=VCC= VEN =5V, IOUT=0A, VOUT=VREF	--	0.1	1	uA
FLG Output Resistor	R _{FLG}	I _{SINK} = 1mA	--	20	80	Ω
FLG Off Current	I _{FLG_OFF}	V _{FLG} = 5V	--	0.1	1	uA
FLG Delay Time	T _{DELAY}		8	15	22	mS
VOUT Discharge Resistor	R _{DIS}		--	100	--	Ω
Over Current Threshold	I _{OCP}		2.2	2.9	3.6	A
VOUT Short Circuit Current	I _{SC}			1.8		A
Thermal Shutdown Temperature	T _{SD}		--	160	--	°C
Thermal Shutdown Hysteresis	T _{SDHY}		--	30	--	°C

Typical Characteristics

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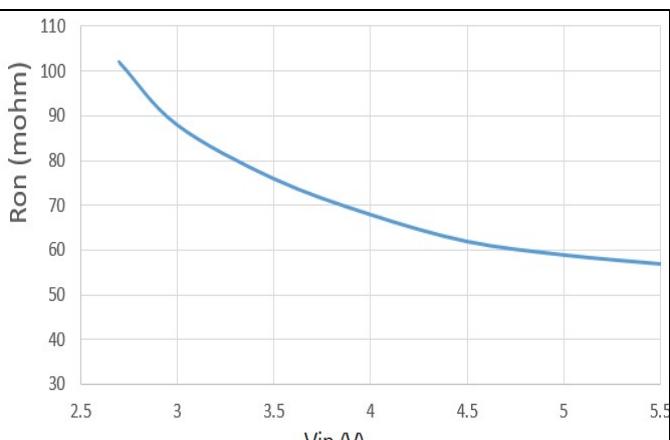


Fig 7. Ron vs Vin

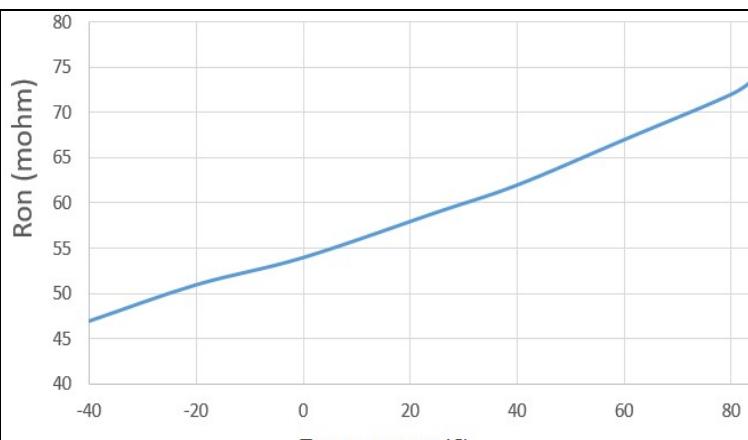


Fig 8. Ron vs Temperature