Description

The WP25151T5 are current limited P-channel MOSFET power switch designed for high-side load switching applications. This switch operates with inputs ranging from 2.5V to 5.5V, making it ideal for both 3.3V and 5V systems. An integrated current-limiting circuit protects the input supply against large currents which may cause the supply to fall out of regulation. The WP25151T5 is also protected from thermal overload which limits power dissipation and junction temperatures. Current limit threshold is fixed internally. The quiescent supply current in active mode is only 25µA. In shutdown mode, the supply current decreases to less than 1µA.

The WP25151T5 is available in Pb-free packages and is specified over the -40°C to +85°C ambient temperature range.
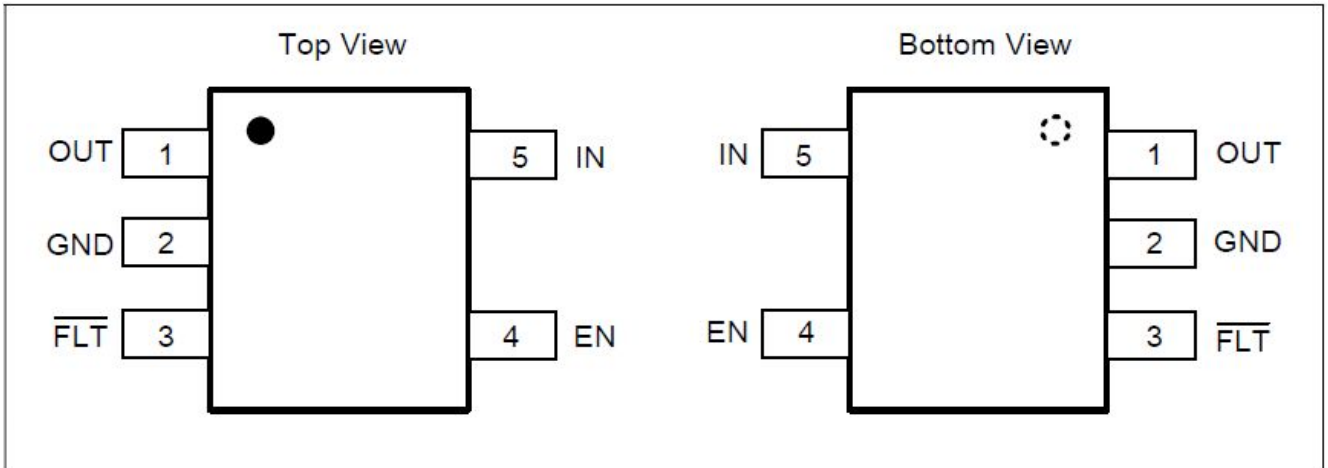
Features

☐ Input Voltage Range: 2.5V to 5.5V

☐ Fixed Current Limit

☐ Reverse Current Blocking

☐ Short-Circuit Response: 350ns

☐ Very Low Quiescent Current: 25µA (Typ)

☐ 1µA Max Shutdown Supply Current

☐ Under-Voltage Lockout

☐ Thermal Shutdown

☐ 4kV ESD Rating

☐ Package: SOT23-5

☐ Ambient Temperature Range: -40°C to +85°C

Applications

☐ 3G Wireless Cards

☐ Smart Phones and PDAs

☐ LCD TVs and Monitors

☐ Set-Top-Boxes

☐ MP3/MP4

☐ Printers

☐ Portable Game Players

☐ Portable Media Players and MIDs

☐ USB Keyboards

☐ USB Hard Disk Drives

☐ USB Memory Drives

☐ USB Hubs

Pin Configuration

Pin Function

| Pin Name	Pin Number	Pin Function
OUT	1	Power output.
GND	2	Ground Pin.
$\overline{FLT}$	3	Overcurrent and over-temperature fault reporting signal output, active low with 6ms blanking time for overcurrent conditions.
EN	4	Enable input, high enable.
IN	5	Power supply input.

Absolute Maximum Ratings

| Parameter	Rating	Unit
IN, EN, $\overline{FLT}$ Voltage	-0.3 to 6	V
OUT Voltage	-0.3 to VIN + 0.3	V
OUT Current	Internal Limited	A
Power Dissipation	300	mW
Package Thermal Resistance(θ_{JA})	250	ºC/W
Operating Junction Temperature	-40 to 125	ºC
Storage Temperature	-55 to 150	ºC
Lead Temperature (Soldering, 10 sec)	300	ºC

Electrical Characteristics

(VIN = +5.0V, TA = -40°C to 85°C, typical values at TA=25°C, unless otherwise stated)

| Symbol	Parameter	Test Conditions	Min	Typ.	Max	Unit
V_{IN}	Input Voltage Range		2.5		5.5	V
V_{UVLO}	Input UVLO		1.4	1.8	2.2	V
I_{SHDN}	Input Shutdown Quiescent Current	Disabled, V_{EN}=0V, OUT floating or shorted to ground		0.1	1	µA
I_Q	Input Quiescent Current /Channel	Enabled, $V_{EN}=V_{IN}$, I_{OUT}= 0		25	40	µA
$R_{DS(ON)}$	Switch on-resistance	V_{IN}=5V, I_{OUT}=0.6A		90	130	mΩ
I_{LMT}	Current Limit	V_{IN}=5V, V_{OUT}=4.5V	1.6	2.1	2,7	A
V_{IL}	EN Input Logic Low Voltage				0.8	V
V_{IH}	EN Input Logic High Voltage		2			V
I_{SINK}	EN Input leakage	V_{EN} = 5V		0.01	1	µA
$T_{D(ON)}$	Output Turn-on Delay Time	V_{IN} =5V, C_L=1uF, R_{LOAD}=100Ω	0.2	0.6	1	ms
T_R	Output Turn-on Rise Time	V_{IN} =5V, C_L=1uF, R_{LOAD}=100Ω	0.2	0.5	0.8	ms
$T_{D(OFF)}$	Output Turn-off Delay Time	V_{IN} =5V, C_L=1uF, R_{LOAD}=100Ω	0.1	0.3	0.5	ms
T_F	Output Turn-off Fall Time	V_{IN} =5V, C_L=1uF, R_{LOAD}=100Ω	50	120	200	µs
T_{FLT_BLANK}	FLT Blanking Time		2	6	10	ms
V_{FLT_Lo}	FLT Logic Low Voltage	$I_{FLT(SINK)}$ =1mA			0.2	V
I_{FLT}	FLT Leakage Current	V_{FLT} = 5V, Enabeld, No Fault Conditions		0.1	1	µA
$R_{discharge}$	Output discharge FET R_{dson}	V_{IN} = 5V, EN=0V, V_{OUT}=5V	200	400	800	Ω
I_{REV}	Rverse leakage current	V_{OUT}= 5V , V_{IN}=0V measure I_{VOUT}		0.1	1	µA
T_{SHDN}	Thermal shutdown threshold	V_{IN} = 5V	120	135	155	°C
T_{HYS}	Thermal shutdown hysteresis	V_{IN} = 5V		15		°C

Block Diagram
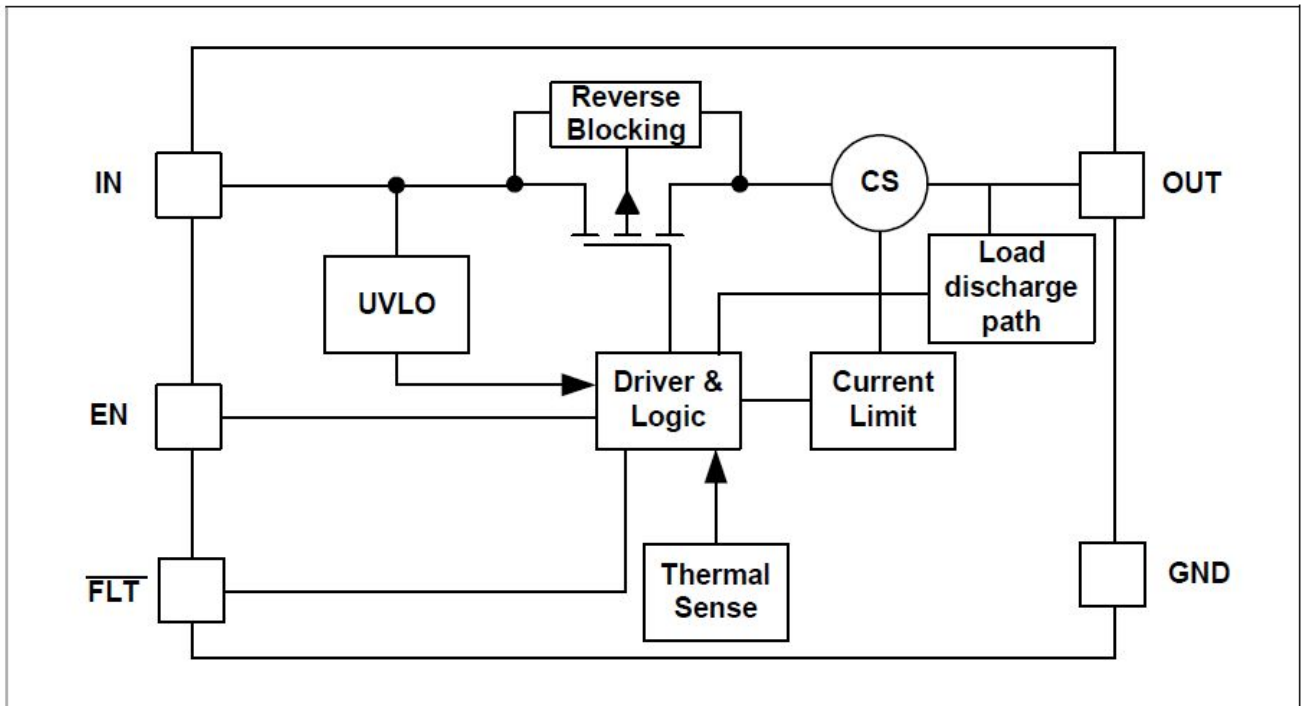
Typical Performance Characteristics
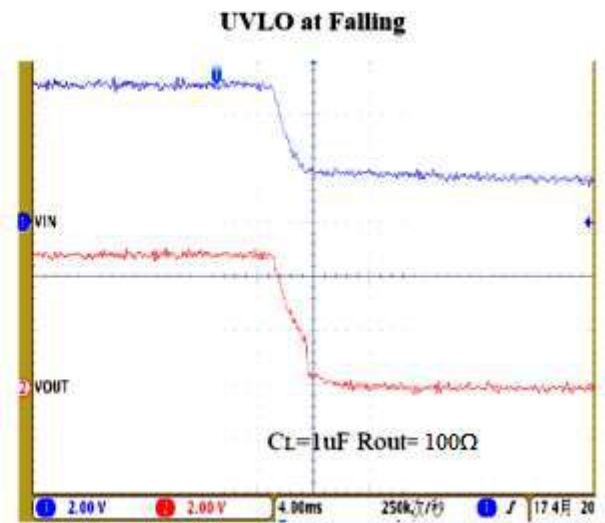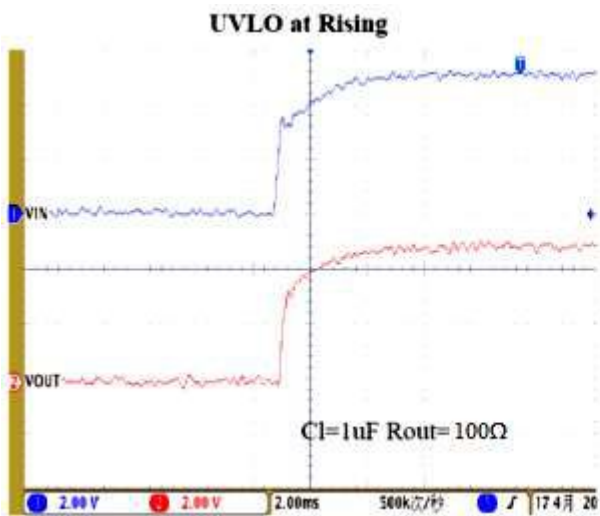
Over Load Response VS Vout

CL=1uF Rout=10Ω to 2Ω
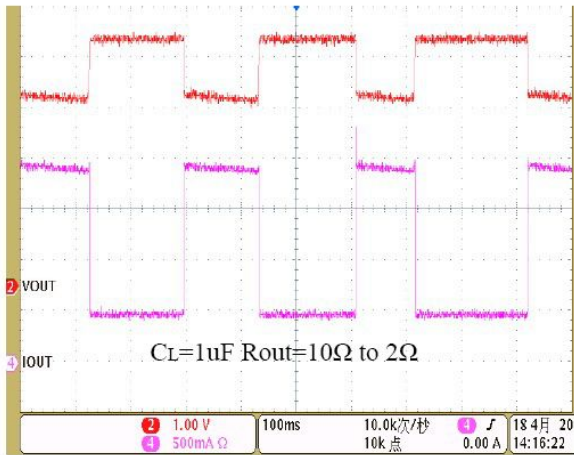
Short Circuit Response and Thermal Shut Down

Thermal Shut Down
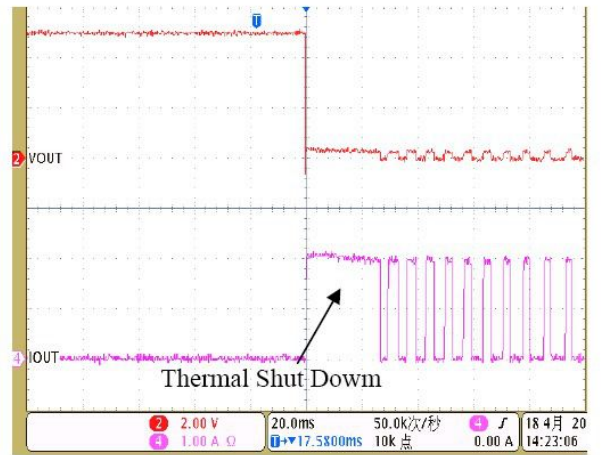
Over Load Response VS FLT

CL=1uF Rout=10Ω to2Ω
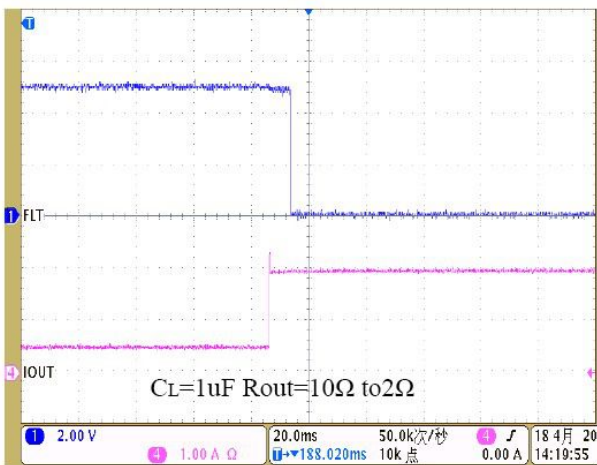
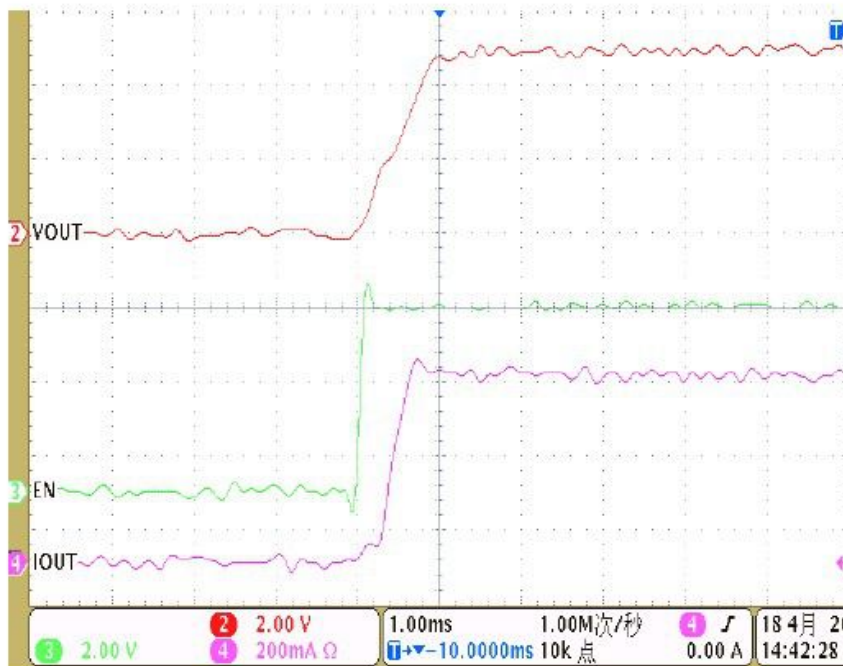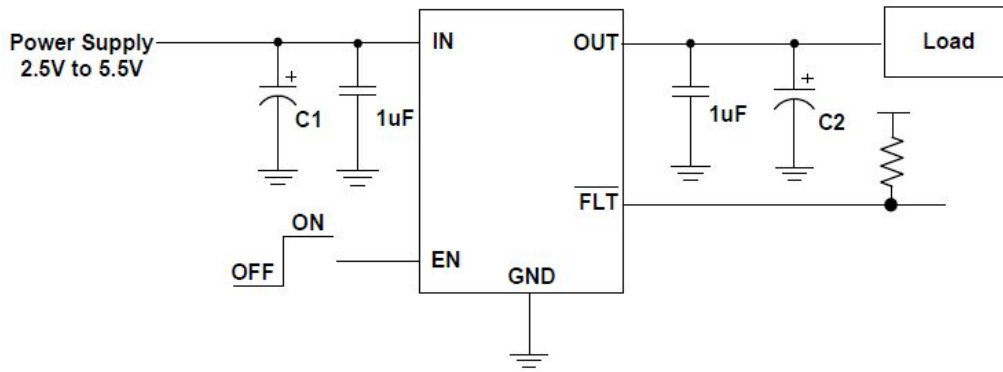## Turnoff Delay and Fall time
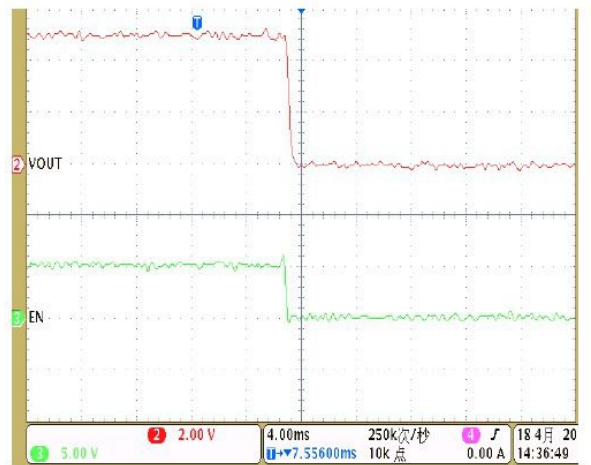
Turnon Delay and Output Response

Application Circuits

Note: Tantalum or Aluminum Electrolytic capacitors (C1 and C2) may be required for USB applications

Package

Unit:mm