25mΩ Adjustable Current-Limited Power Switch

FEATURES

- 25 mΩ High-Side MOSFET in SOT23-6
- 2.0~4.0 A Adjustable Current Limit
- Built-in Soft-Start
- Available SOT23-6 package

APPLICATIONS

- USB Charger
- USB Wall Adapter
- Car Charger

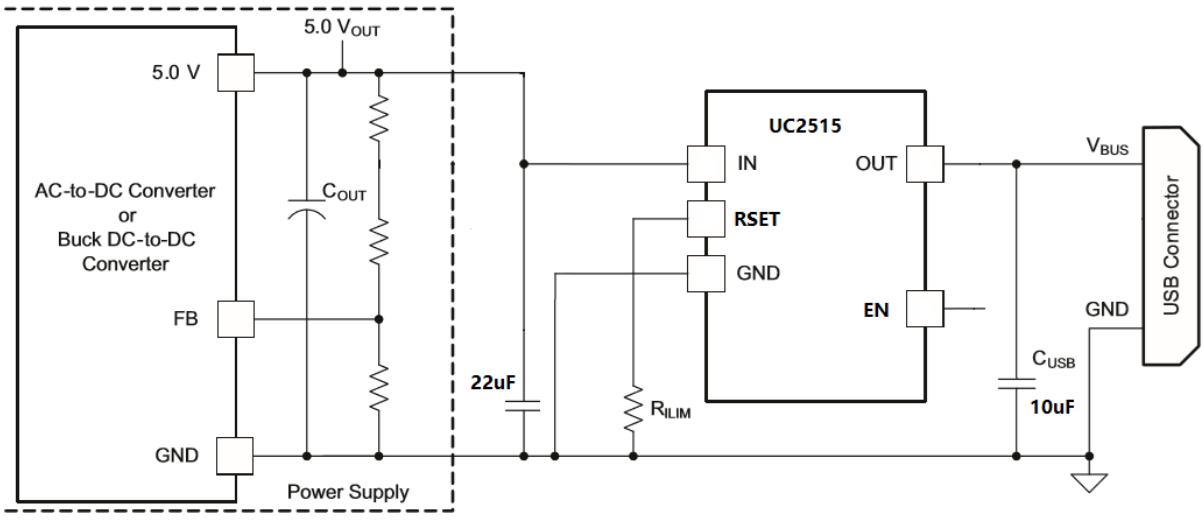
DESCRIPTION

UC2515 is a 25mΩ adjustable current limited power switch intended for applications where heavy capacitive loads and short-circuits are likely to be encountered. These devices offer a programmable current-limit threshold between 2.0A and 4.0A (typ) via an external resistor.

UC2515 will enter hiccup mode when OUT voltage is less than 3V or OTSD. It can significant reduce the output current and reduce thermal effect to the system.

UC2515 devices limit the output current to a safe level by switching into a constant-current mode when the output load exceeds the current-limit threshold.

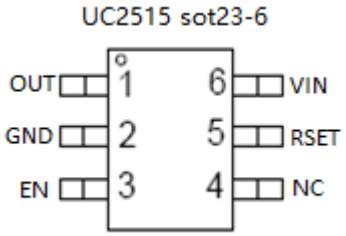
PACKAGE AND APPLICATION



ORDING INFORMATION

Part Number	Package Type	Package Qty	Op Temp(°C)	Mark
UC2515	SOT23-6	3000	-40~85	UC2515 XXX

PINOUT



PIN FUNCTIONS

Pin Name	TYPE(1)		DESCRIPTION
	SOT23-6		
OUT	1	O	Power-switch output, connected to VBUS of USB; connect a 10μF or greater ceramic capacitor from OUT to GND as close to the IC as possible
GND	2	G	Ground connection
EN	3	I	Enable input, logic low turns on UC2515
NC	4	I/O	NO connection
RSET	5	I	External resistor used to set current-limit threshold;
VIN	6	P/I	Power supply/Input voltage connected to Power Switch; connect a 10μF or greater ceramic capacitor from IN to GND as close to the IC as possible

(1) G = Ground, I = Input, O = Output, P = Power

ABSOLUTE MAXIMUM RATINGS (1)

Over recommended operating free-air temperature range (unless otherwise noted)

PARAMETER		MIN	MAX	UNIT
Supply Voltage Range	IN, OUT	-0.3	7.0	V
ESD rating, Human Body Model (HBM)	IN, OUT		6	kV
Operating Junction Temperature	T_J	-40	125	°C
Storage Temperature Range	T_{stg}	-65	150	

(1) Stresses beyond those listed under *Absolute Maximum Ratings* may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under *Recommended Operating Conditions* is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

THERMAL CHARACTERISTICS

over operating free-air temperature range (unless otherwise noted)

THERMAL METRIC			UNIT
θ_{JA}	SOT23-6 Package thermal impedance(1)	165	°C/W

(1) The package thermal impedance is calculated in accordance with JESD 51-7.

RECOMMENDED OPERATING CONDITIONS

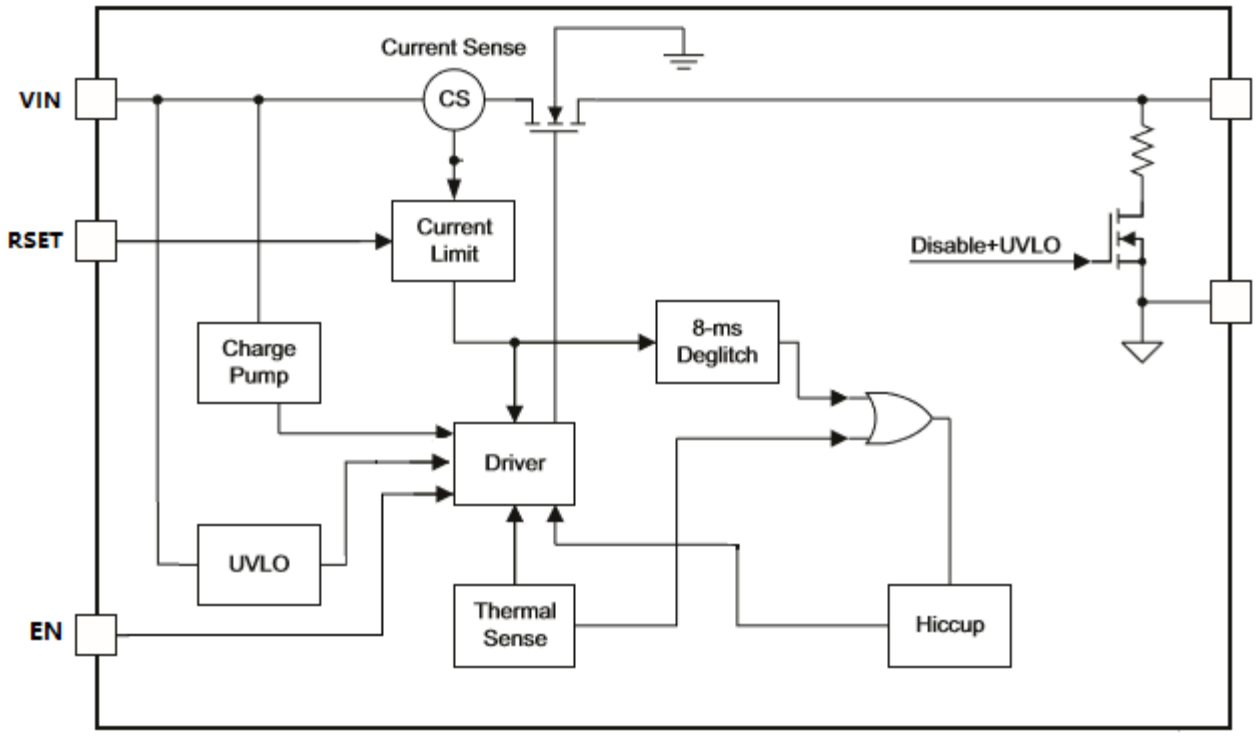
PARAMETER		MIN	MAX	UNIT
V_{IN}	Input voltage of IN	4.5	6.5	V
$V_{DP/DM}$	DP data line input voltage		5.5	
$I_{DP/DM}$	Continuous sink/source current		±10	mA
R_{SET}	Resistance of R_{SET}	13	100	kΩ
I_{OUT}	Continuous sink/source current	2000	4000	mA
T_J	Operating Junction Temperature	-40	125	°C

ELECTRICAL CHARACTERISTICS

Conditions are: TA = 25°C, IN = 5.0 V, Positive current are into pins. All voltages are with respect to GND (unless otherwise noted).

PARAMETER		TEST CONDITIONS	MIN	TYP	MAX	UNIT
Power Switch						
R_{DSON}	SOT23-6	I_{OUT}=2.4A		25		mΩ
Current Limit						
I_{OUT}	OUT current limited	RSET=19.1K	2.5	2.7	2.9	A
SUPPLY CURRENT						
I_{IN}	IN supply current	IN= 5.0V,		230	400	μA
I_{INL}	IN Disable Supply Current	IN= 5.0V		0	5	
Thermal Shutdown						
T_{OTSD}	Temperature Rising Threshold			150		°C
T_{HYS}	Hysteresis			20		
Enable Pin(EN)						
V_{EN}	ENB threshold voltage, falling		0.7	1.33	2.0	V
V_{ENB_HYS}	Hysteresis			150		mV

FUNCTION BLOCK DIAGRAM



PCB LAYOUT NOTIFICATION

Input capacitance CIN(red position) of the pin 6 of uc2515:

The voltage entering the pin 6 must pass through the input capacitor CIN at a single point(单点过电容), the CIN must be close to the pin6.

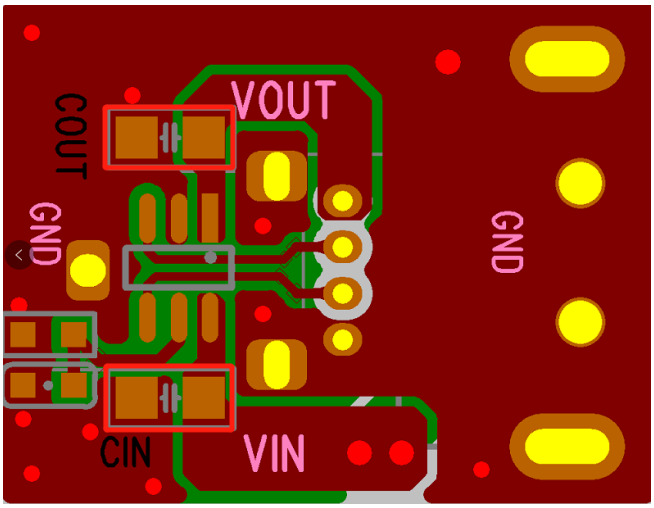
Output capacitance COUT(red position)of pin 1:

The pin1 to USB must pass through the output capacitor COUT and be close to pin 1.

Recommended capacitance CIN is 0805 size, value is 22uF;

Recommended capacitance COUT is 0805 size, value is 10uF;

Based the difference of AC/DC or DC/DC, the CIN and COUT can be bigger or smaller.



PACKAGE INFORMATION

SOT23-6