

Adjustable Power Switch with Load Detection

FEATURES

- 45 mΩ High-Side MOSFET
- 0.5~4.0 A (typ.) Adjustable Current Limit
- Ultra-Low Load Detection
- Built-in Soft-Start
- Support single layer PCB layout.
- 4.5 ~ 6.5V Single Supply Operation.
- Available EMSOP8 package.

APPLICATIONS

- USB Charger
- USB Wall Adapter

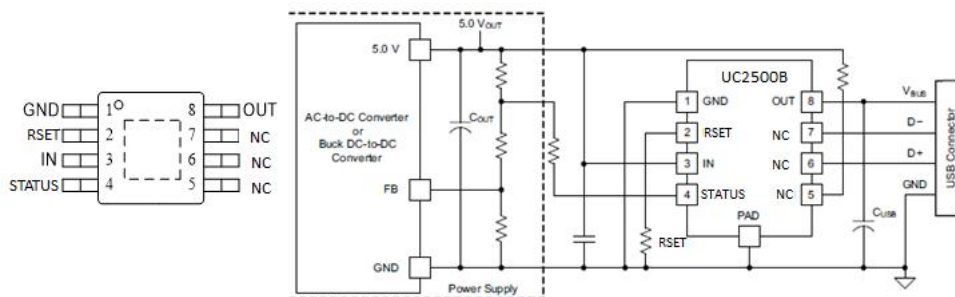
- Car Charger

DESCRIPTION

The UC2500B is a 45mΩ power switch intended for applications where heavy capacitive loads and short-circuits are likely to be encountered. This also provides hiccup mode when enter OTSD.

The UC2500B provides a STATUS pin for ultra-low load detection or USB cable resistance compensation.

PACKAGE AND APPLICATION

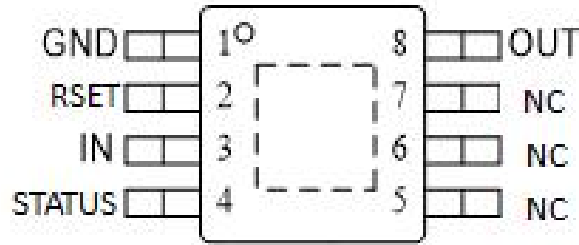


ORDERING INFORMATION

Part Number	Package Type	Package Qty	Op Temp(°C)	Mark
UC2500B	EMSOP8	3000	-40~85	UC2500B XXX

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PINOUT

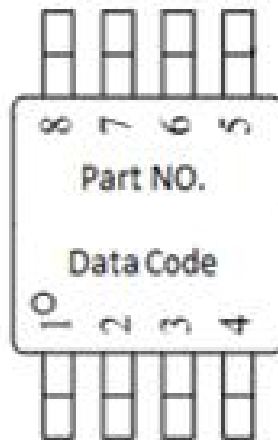


PIN FUNCTIONS

NO.	NAME	TYPE ⁽¹⁾	DESCRIPTION
1	GND	G	Ground connection
2	RSET	I	External resistor used to set current-limit threshold;
3	IN	P/I	Power supply/Input voltage connected to Power Switch; connect a 1 μF or greater ceramic capacitor from IN to GND as close to the IC as possible
4	STATUS	O	Active-low open-drain output, asserted when the load exceeds the load-detection threshold
5	NC	NC	No Connection
6	NC	NC	No Connection
7	NC	NC	No Connection
8	OUT	O	Power-switch output, connected to VBUS of USB; connect a 22μF or greater ceramic capacitor from OUT to GND as close to the IC as possible

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

MARK INFORMATION



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ABSOLUTE MAXIMUM RATINGS ⁽¹⁾

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

PARAMETER		MIN	MAX	UNIT
Supply Voltage Range	IN	-0.3	7.0	V
ESD rating, Human Body Model (HBM)	IN		2	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}	EMSOP8 Package thermal impedance ⁽¹⁾	65	°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
R _{SET}	Resistance of R _{SET}	13	100	kΩ
I _{OUT}	Continuous sink/source current	500	4000	mA
T _J	Operating Junction Temperature	-40	125	°C

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ELECTRICAL CHARACTERISTICS

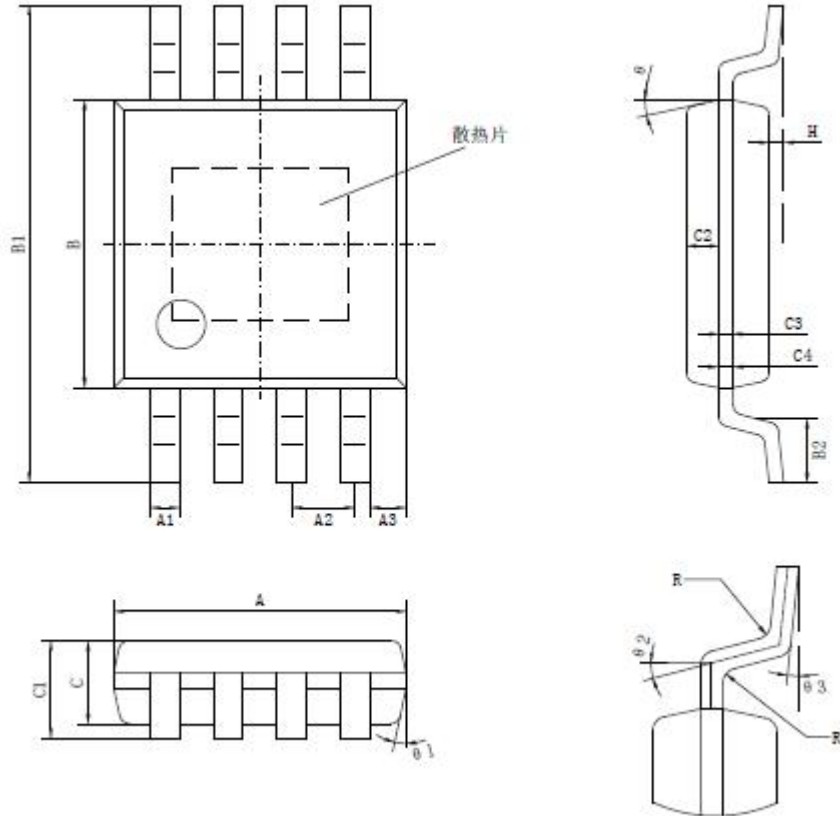
Conditions are: TA = 25°C, VIN = 5.0 V, RSET = 33.0kΩ. Positive current are into pins. All voltages are with respect to GND (unless otherwise noted).

PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNIT	
Power Switch						
R _{DS(on)}	EMSOP8 Package	I _{OUT} =1A		45	68	mΩ
Current Limit						
I _{OUT}		R _{set} =33.0k	2.50	2.84	3.15	A
Hiccup Mode						
T _{ON_HICCUP}	ON Time of Hiccup mode			130		ms
T _{OFF_HICCUP}	OFF Time of Hiccup mode			1.3		s
Load Detection						
I _{LD_RISING}	I _{OUT} Rising Load Detection Threshold	R _{set} =33.0k	135	195	255	mA
I _{LD_FALLING}	I _{OUT} Falling Load Detection Threshold		90	145	200	
T _{LD_SET}	Load Detection Set time			128		ms
T _{LD_RESET}	Load Detection Reset time			128		
Thermal Shutdown						
	Temperature Rising Threshold			172		°C
	Hysteresis			20		
UNDERVOLTAGE LOCKOUT						
V _{UVLO}	IN rising UVLO threshold voltage		3.75	3.95	4.15	V
	Hysteresis			100		mV
SUPPLY CURRENT						
I _{IN}	IN supply current			160	350	μA

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PACKAGE INFORMATION

EMSOP8



标注	尺寸	最小(mm)	最大(mm)	标注	尺寸	最小(mm)	最大(mm)
A		2.90	3.10	C3		0.152	
A1		0.28	0.35	C4		0.15	0.23
A2		0.65TYP		H		0.02	0.15
A3		0.375TYP		θ		12° IYP4	
B		2.90	3.10	θ1		12° IYP4	
B1		4.70	5.10	θ2		14° IYP	
B2		0.45	0.75	θ3		0° ~ 6°	
C		0.75	0.95	R		0.15TYP	
C1		--	1.10	R1		0.15TYP	
C2		0.328TYP					

* 注: EMSOP8产品框架基岛尺寸为1.80X1.80, 散热片尺寸为1.80X1.55 (单位: mm)