USB Charger Emulator with Adjustable Power Switch

FEATURES

- 15 mΩ High-Side MOSFET in SOT23-6
- 2.0~4.0 A Adjustable Current Limit
- Low Average Current in OUT shorted GND
- Support Apple @ 2.4A fast Charging
- Support Samsung @ 2.1A fast Charging
- Support BC1.2 & YD/T 1591-2009 Charging
- Built-in Soft-Start
- Available SOT23-6 package

APPLICATIONS

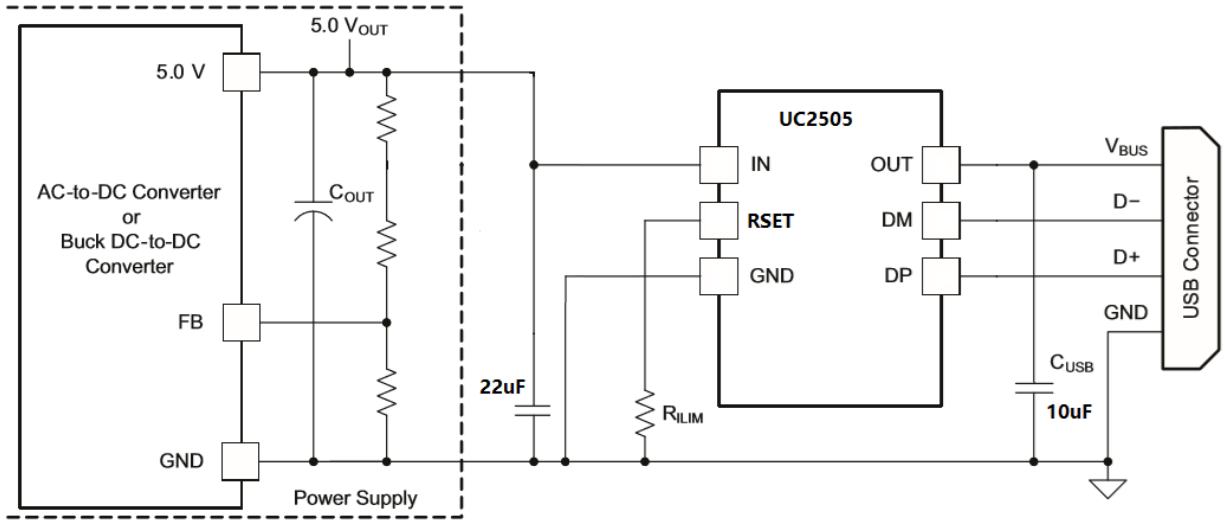
- USB Charger
- USB Wall Adapter
- Car Charger

DESCRIPTION

The UC2505 integrated USB charger emulators with automatic host charger identification circuitry and high performance adjustable current limiting power switch. An automatic USB charger identification circuit allows mobile power supply can automatically provides the correct modes on the data lines to charger compliant devices among the Apple, Samsung and BC1.2 modes.

The UC2505 is a 15mΩ in SOT23-6 package power switch intended for applications where heavy capacitive loads and short-circuits are likely to be encountered. This also provides hiccup mode when OUT voltage is less than 3.0V or OTSD.

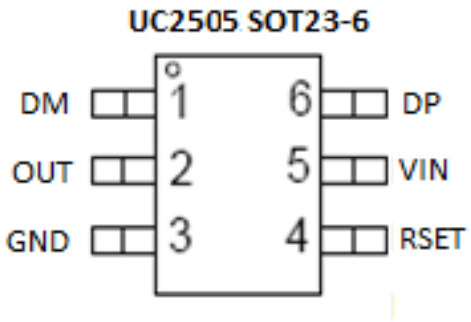
PACKAGE AND APPLICATION



ORDING INFORMATION

Part Number	Package Type	Package Qty	Op Temp(℃)	Mark
UC2505	SOT23-6	3000	-40~85	UC2505 XXX

PINOUT

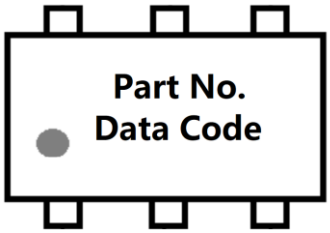


PIN FUNCTIONS

Pin Name	TYPE(1)		DESCRIPTION
	SOT23-6		
DM	1	I	DM data line to connector, input for hand-shake voltage from portable equipment high impedance while disabled
OUT	2	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	3	G	Ground connection
RSET	4	I	External resistor used to set current-limit threshold;
VIN	5	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
DP	4	I	DP data line to connector, input for hand-shake voltage from portable equipment high impedance while disabled

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

MARK INFORAMTION



注： UC2505，AXXX， 第一个X指年份， 后面两个X指哪周

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
Input voltage range	DP, DM	-0.3	5.8	
Continuous output sink current	DP input current, DM input current		35	mA
Continuous output source current	DP output current, DM output current		35	
ESD rating, Human Body Model (HBM)	IN, DP, DM		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}	ESOP8 Package thermal impedance(1)	45	℃/W
θ_{JA}	EMSOP8 Package thermal impedance(1)	65	
θ_{JA}	SOT23-6 Package thermal impedance(1)	165	

(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℃, 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						
RDSON	SOT23-6	IOUT=2.4A		15		mΩ
Current Limit						
I_{OUT}	OUT current limited	RSET=19.1k	2.5	2.7	2.9	A
IPAD MODE 2.4A Mode						
V_{DP_IPAD}	DP output voltage		2.5	2.7	2.9	V
V_{DM_IPAD}	DM output voltage		2.5	2.7	2.9	
Galaxy Tab MODE						
V_{DP_GAL}	DP output voltage		1.1	1.2	1.3	V
V_{DM_GAL}	DM output voltage		1.1	1.2	1.3	
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		℃
T_{HYS}	Hysteresis			20		

PACKAGE INFORMATION

SOT23-6