10W Single/Dual USB Charger Adapter Emulator

DESCRIPTION

The UC2631/UC2632 is single/dual USB adapter emulators with automatic host charger identification circuitry for USB dedicated chargers.

The devices integrated automatic USB charger identification circuit allow mobile power supply, In-Car charger, USB wall adapters, travel chargers, and other dedicated chargers to identify themselves as a USB dedicated charger to USB devices, like Apple charger to Apple products, Samsung charger to Samsung Galaxy Tab & Smart Phone, and BC1.2 charger to HTC, SONY, LG, BlackBerry, Lenovo, Coolpad, ZTE, Huawei and other legacy D+/D- short detection devices.

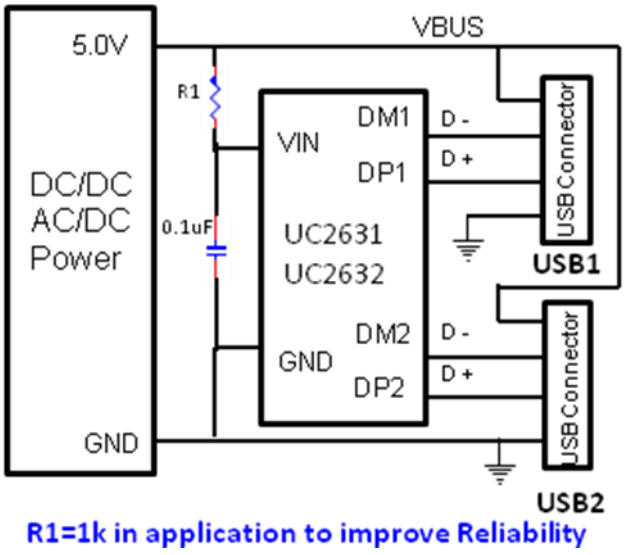
FEATURES

- 4.5V~5.5V Single Supply Operation.
- Automatic USB charger Identification Circuit.
- UC2631/UC2632 Support Apple® Devices fast charging. (Apple® 2.1A / 1.0A mode)
- Support Samsung Galaxy Tab Devices fast Charging. (Samsung® 2.1A mode)
- Support BC1.2 & YD/T 1591-2009 Charging Spec. (DCP® 1.0A mode)
- Available in SOT23-6 Package.

APPLICATIONS

Power Bank/Car Charger
USB Wall Adapter
Travel Charger

PACKAGE AND APPLICATION



R1=1k in application to improve Reliability

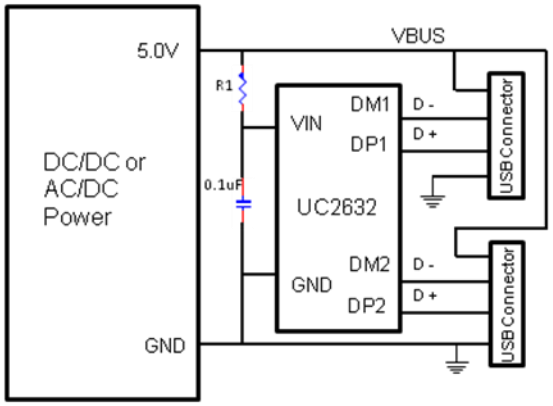
PART NO. TABLE

Part No.	Dual/Single	Apple 12W	Apple 10W	Apple 5W	SS 10W	DCP 5W
UC2631	Single		Support	Support	Support	Support
UC2632	Dual		Support	Support	Support	Support

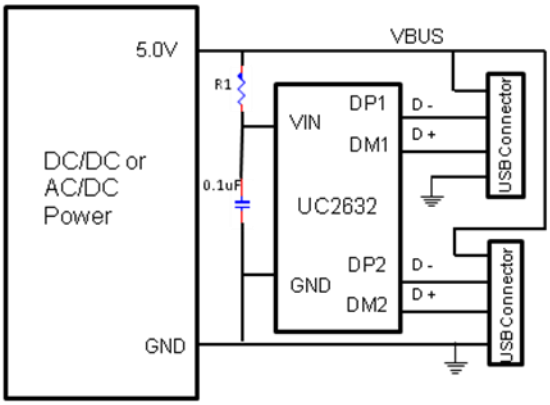
ORDING INFORMATION

Part Number	Package Type	Package Qty	Op Temp(°C)
UC2631	SOT23-6	3000	-40~85
UC2632	SOT23-6	3000	-40~85

APPLICATION SCHEMATIC



2×10W Application



2×5W Application

ABSOLUTE MAXIMUM RATINGS (1)

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

PARAMETER		MIN	MAX	UNIT
supply voltage range	IN	-0.3	6	V
Input voltage range	DP1,DM1,DP2,DM2	-0.3	5.8	
Continuous output sink current	DP1,DP2 input current, DM1,DM2 input current		35	mA
Continuous output source current	DP1,DP2 output current, DM1,DM2 output current		35	
ESD rating, Human Body Model (HBM)	IN		8	kV
	DP1,DP2,DM1,DM2		8	
ESD rating, Charging Device Model (CDM)			500	V
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}	Package thermal impedance(1)	180	°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	5.5	V
$V_{DP1/DP2}$	D+ data line input voltage		5.5	
$V_{DM1/DM2}$	D- data line input voltage		5.5	
$I_{DP1/DP2}$	Continuous sink/source current		±10	mA
$I_{DM1/DM2}$	Continuous sink/source current		±10	
T_J	Operating Junction Temperature	-40	125	°C

PINOUT

PIN FUNCTIONS

NO.	NAME	TYPE(1)	DESCRIPTION
1	DP1	O/I	DP date line to connector, output for hand-shake voltage to portable equipment, high impedance while disabled
2	GND	G	Ground connection
3	NC (UC2631)	NC	No Connection
	DP2 (UC2632)	O/I	DP date line to connector, output for hand-shake voltage to portable equipment, high impedance while disabled
4	NC (UC2631)	NC	No Connection
	DM2 (UC2632)	O/I	DM data line to connector, input for hand-shake voltage from portable equipment high impedance while disabled
5	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
6	DM1	O/I	DM 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

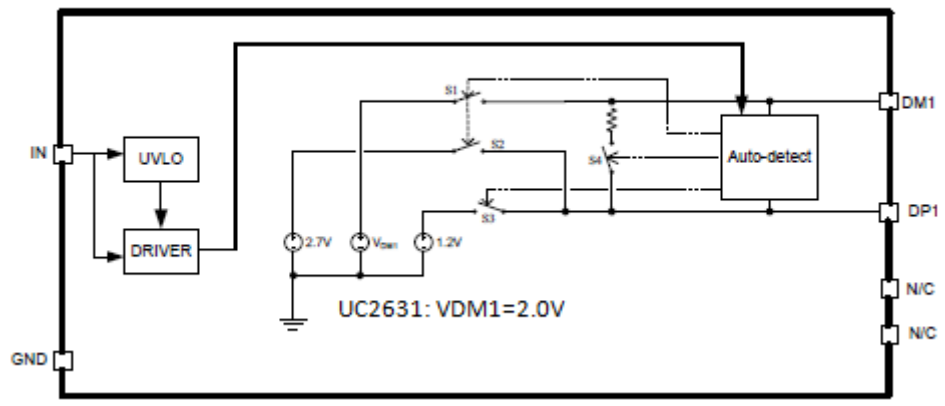
ELECTRICAL CHARACTERISTICS

Conditions are **-40°C ≤ (T_J =T_A) ≤ 125°C and 4.5 V ≤ V_{IN} ≤ 5.5 V unless otherwise noted. Typical value is at 25°C. All voltages are with respect to GND unless otherwise noted.**

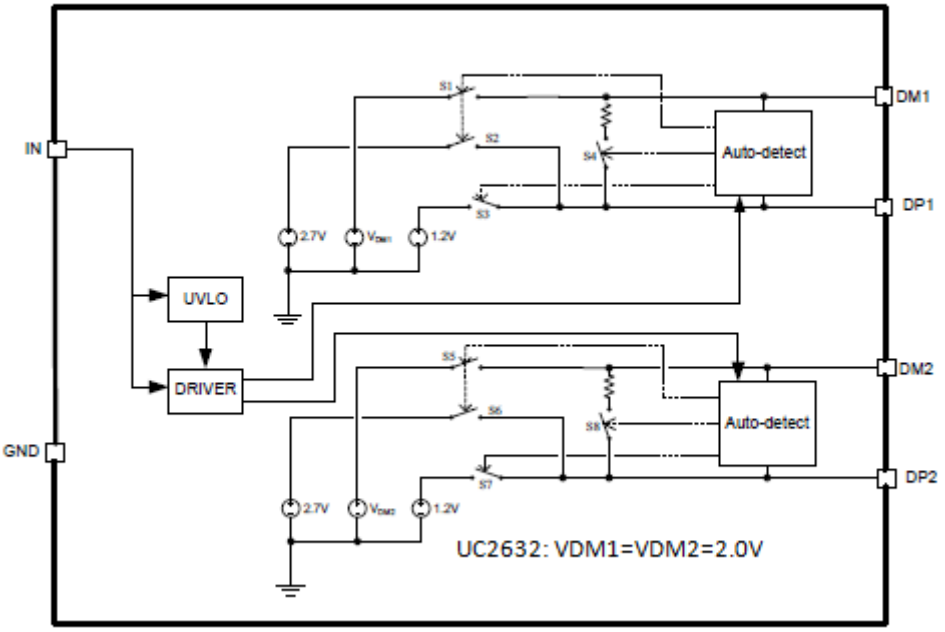
PARAMETER		TEST CONDITIONS	MIN	TYP	MAX	UNIT
UNDERVOLTAGE LOCKOUT						
V_{UVLO}	IN rising UVLO threshold voltage		3.9	4.1	4.3	V
	Hysteresis			100		mV
SUPPLY CURRENT						
I_{IN}	IN supply current			160	250	μA
BC 1.2 DCP MODE (SHORT)						
R_{DPM_SHORT}	DP / DM shorting resistance	V_{D+} = 0.8V, I_{D-} = 1mA,		125	200	Ω
R_{DCHG_SHORT}	Resistors connected DP /DM to GND after hand-shaking	V_{D+} = 0.8V		200	400	kΩ
$V_{DPL\_TH\_DETACH}$	DP low threshold while detaching BC1.2 devices		310	330	350	mV
$V_{DPL\_TH\_DETACH\_HYS}$	hysteresis			50		mV
IPAD MODE(UC2631/UC2632)						
V_{DP_IPAD}	DP1/DP2 output voltage		2.55	2.7	2.85	V
V_{DM_IPAD}	DM1/DM2 output voltage		1.9	2.0	2.1	V
R_{DP_IPAD}	DP1/DP2 output impedance	I_{D+} = -5uA	20	30	40	kΩ
R_{DM_IPAD}	DM1/DM2 output impedance	I_{D-} = -5uA	20	30	40	kΩ
Galaxy Tab MODE						
V_{DP_GAL}	DP1/DP2 output voltage		1.1	1.2	1.3	V
V_{DM_GAL}	DM1/DM2 output voltage		1.1	1.2	1.3	
R_{DP_GAL}	DP1/DP2 output impedance	I_{D+} = -5uA	80	105	130	kΩ
R_{DM_GAL}	DM1/DM2 output impedance	I_{D-} = -5uA	80	105	130	

FUNCTIONAL BLOCK DIAGRAM

UC2631 Block Diagram



UC2632 Block Diagram



PACKAGE INFORMATION

SOT23-6