

1. Features

- Operating voltage range: 4.5V to 5.5V
- Dual ports supporting in one chip
- Supports smart detection on D+ and D- lines
 - Battery Charging specification BC1.2 for DCP
 - Chinese Telecommunication industrial standard YD/T 1591-2009
 - D+/D- option for Apple device 2.4A mode
 - D+/D- option for Samsung device
- 8kV HBM ESD rating on USB port pins
- High accuracy voltage on DP and DM for Apple Mode
- SOT23-6 package
- ALLION's cellphones and tablets charging compatible report available for nearly 100 devices

2. Applications

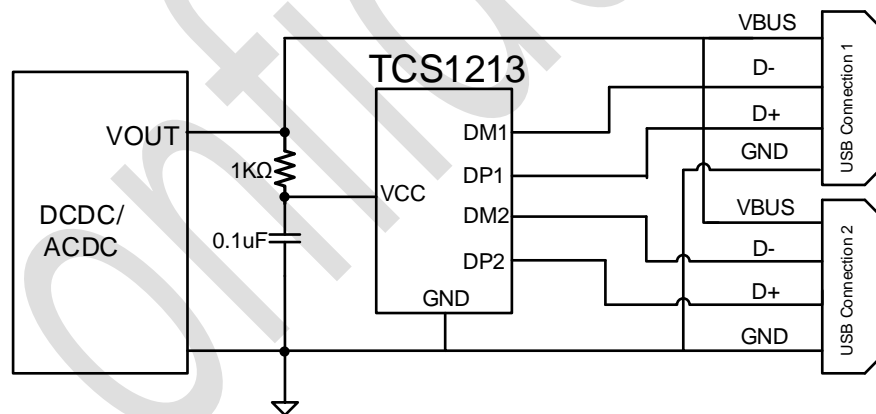
- USB wall Adapters
- USB car chargers
- Power Banks
- USB Peripherals

3. Description

The TCS1213 is USB dedicated charging port(DCP) controllers. Due to integrated auto-detect and auto-switch circuitry, the TCS1213 can apply correct electrical signatures automatically on the USB data lines to charge compliant devices among Apple, Samsung and BC1.2 DCP modes. Therefore, TCS1213 is fully compatible with BC1.2 and non-BC1.2 standards such as YT/D1591-2009, Apple charging specification and specs from Samsung Galaxy family.

The TCS1213 is used to facilitate charging procedure when most of the mainstream handheld devices are detected.

4. Typical Application Circuit



5. Pinning information

5.1 Pinning

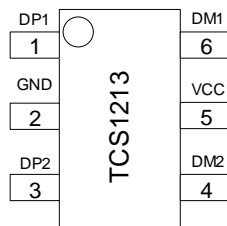


Figure 1 6 Pins SOT23-6 Package (Top view)

5.2 Pin Description

Symbol	Pin Number	IP Type	Description
DP1	1	I/O	D+ pin connected to USB connector 1 directly
GND	2	Ground	Ground of chip
DP2	3	I/O	D+ pin connected to USB connector 2 directly
DM2	4	I/O	D- pin connected to USB connector 2 directly
VCC	5	Power	Power pin with 0.1μF capacitor to ground
DM1	6	I/O	D- pin connected to USB connector 1 directly

6. Absolute DC Maximum Ratings

Items	Descriptions	Min.	Max.	Unit
VCC	Supply voltage range	-0.3	6	V
V_IO	IO voltage range	-0.3	5.5	V
I _{DPDM}	While DPDM shorted, source current from DP to DM		10	mA
V(ESD)	Electrostatic discharge	DP1, DM1, DP2, DM2	8	KV
		Others	4	KV
T _{stg}	Storage temperature	-45	125	°C

7. Recommended Operation Conditions

Parameters	Descriptions	Min.	Max.	Unit
VCC	Supply voltage range	4.5	5.5	V
T _A	Free air temperature	-40	105	°C

8. Characteristics

Parameters	Descriptions	Test conditions	Min.	Typ.	Max.	Unit
SUPPLY CURRENT						
I_{VIN}		$V_{CC}=5V$, no device attached		75		μA
UVLO						
V_{UVLO}	VCC UVLO threshold voltage	VCC rising	3.5	3.7	3.9	V
	VCC UVLO hysteresis	VCC falling hysteresis		0.3		V
DIVIDER MODE						
V_{DP_2V7}	DP output voltage	$V_{IN}=5V$	2.6	2.7	2.8	V
V_{DM_2V7}	DM output voltage	$V_{IN}=5V$	2.6	2.7	2.8	V
R_{DP_2V7}	DP output resistance	$I_{DP}=-5\mu A$		30		k Ω
R_{DM_2V7}	DM output resistance	$I_{DM}=-5\mu A$		30		k Ω
1.2V/1.2V MODE						
V_{DP_1V2}	DP output voltage	$V_{IN}=5V$		1.2		V
V_{DM_1V2}	DM output voltage	$V_{IN}=5V$		1.2		V
R_{1V2}	DP/DM output resistance	$I_{DP}=-5\mu A$		100		k Ω
BC1.2 DCP MODE						
R_{short_DPDM}	DP and DM short resistance	$V_{DP}=0.8V$, $I_{DM}=1mA$		100		Ω
V_{DPL_DETACH}	Voltage on DP while device goes back to divider mode			0.33		V

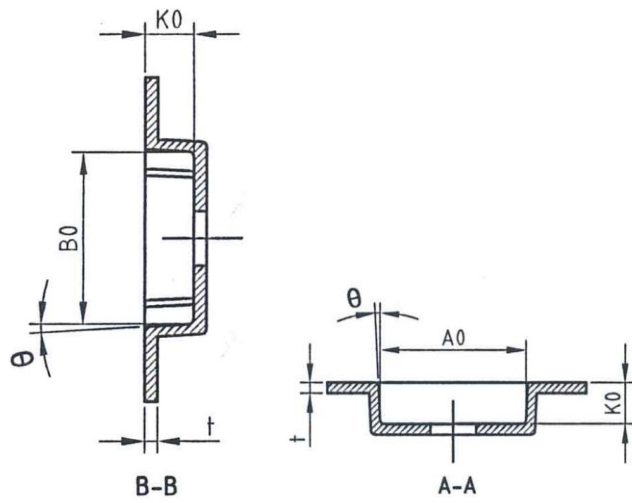
9. Mechanical, Packaging, and Ordering Information

The following pages include mechanical, packaging, and orderable information. This information is the most current data available for the designated devices. This data is subject to change without notice and revision of this document.

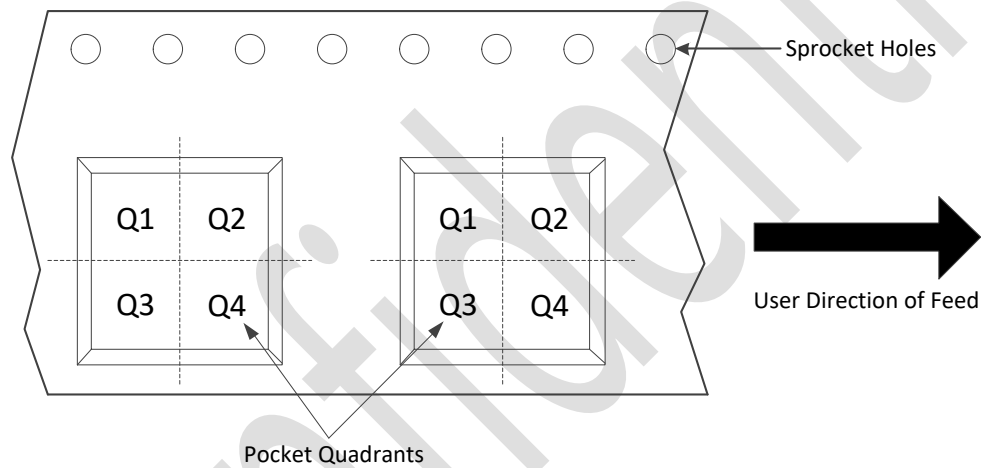
9.1 Ordering Information

Part number	Top side Marking	Package		
		Name	Description	Version
TCS1213DBVR	1213	SOT23-6	SOT23-6	1.0

9.2 Tape and Reel Information

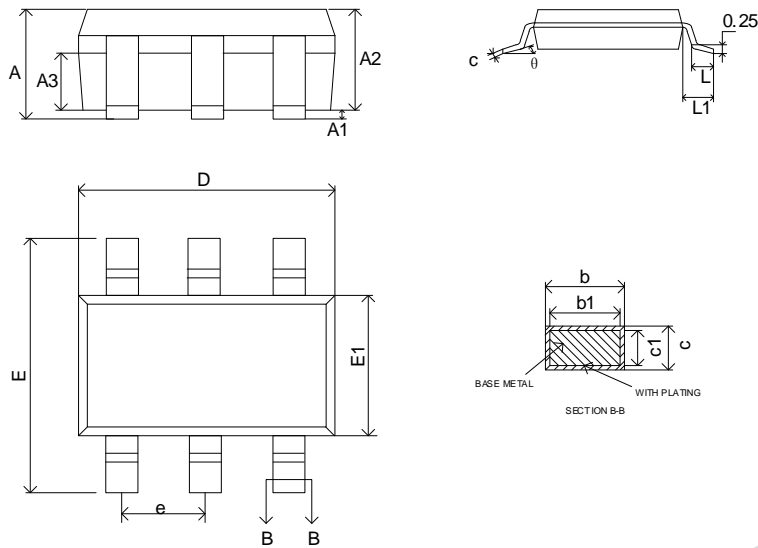


QUADRANT ASSIGNMENTS FOR PIN1 ORIENTATION IN TAPE



Device	W (mm)	P (mm)	A0 (mm)	B0 (mm)	K0 (mm)	t (mm)	θ (mm)	Pin1 Quadrant
TCS1213	8.0±0.1	4.0±0.1	3.26±0.1	3.3±0.1	1.4±0.1	0.2±0.02	3° -5°	Q1

9.3 Package description



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	-	-	1.25
A1	0.04	-	0.10
A2	1.00	1.10	1.20
A3	0.60	0.65	0.70
b	0.33	-	0.41
b1	0.32	0.35	0.38
c	0.15	-	0.19
c1	0.14	0.15	0.16
D	2.82	2.92	3.02
E	2.60	2.80	3.00
E1	1.50	1.60	1.70
e	0.95BSC		
L	0.30	-	0.60
L1	0.60REF		
θ	0	-	8°

10. Disclaimer

Information in this document is believed to be accurate and reliable. However, CHENGYI Semiconductors Technology Co. Ltd(CHENGYI Semiconductors) does not give any representations or warranties, expressed or implied, as to the accuracy or completeness of such information and shall have no liability for the consequences of use of such information.

CHENGYI Semiconductors reserves the right to make changes to information published in this document, including without limitation specifications and product descriptions, at any time and without notice. Customers shall obtain the latest relevant information before placing orders and shall verify that such information is current and complete. This document supersedes and replaces all information supplied prior to the publication hereof.

CHENGYI Semiconductors products are not designed, authorized or warranted to be suitable for use in medical, military, aircraft, space or life support equipment, nor in applications where failure or malfunction of an CHENGYI Semiconductors product can reasonably be expected to result in personal injury, death or severe property or environmental damage. CHENGYI Semiconductors accepts no liability for inclusion and/or use of CHENGYI Semiconductors products in such equipment or applications and therefore such inclusion and/or use is at the customer's own risk.

Applications that are described herein for any of these products are for illustrative purposes only. CHENGYI Semiconductors makes no representation or warranty that such applications be suitable for the specified use without further testing or modification.

All products are sold subject to the general terms and conditions of commercial sale supplied at the time of order acknowledgement.

Nothing in this document may be interpreted or construed as an offer to sell products that is open for acceptance or the grant, conveyance or implication of any license under any copyrights, patents or other industrial or intellectual property rights.

Reproduction of CHENGYI information in CHENGYI data books or data sheets is permissible only if reproduction is without alteration and is accompanied by all associated warranties, conditions, limitations, and notices. CHENGYI is not responsible or liable for such altered documentation. Information of third parties may be subject to additional restrictions.

Resale of CHENGYI components or services with statements different from or beyond the parameters stated by CHENGYI for that component or service voids all express and any implied warranties for the associated CHENGYI component or service and is an unfair and deceptive business practice. CHENGYI is not responsible or liable for any such statements.

11. Contact information

For more information, please visit: <http://www.chsemi.com>

For sales office addresses, please send an email to: sales@chsemi.com