TCS1203

USB Dedicated Charging Port Controller

1. Features

- Operating voltage range: 4.5V to 5.5V
- 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
- SOT23-6 package

2. Applications

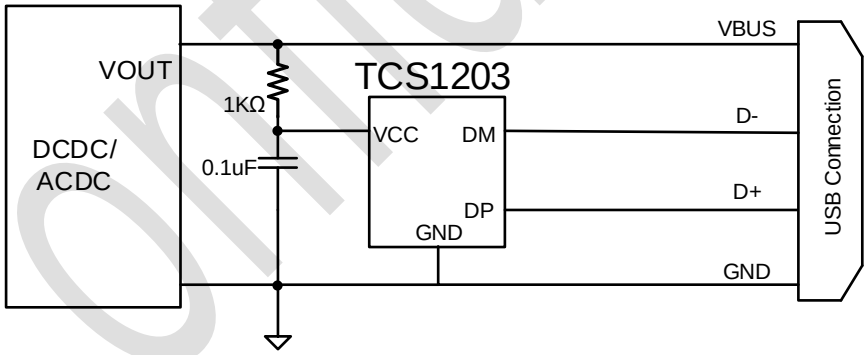
- USB wall Adapters
- USB car chargers
- Power Banks
- USB Peripherals

3. Description

The TCS1203 is USB dedicated charging port(DCP) controllers. Due to integrated auto-detect and auto-switch circuitry, the TCS1203 can apply correct electrical signatures automatically on the USB data lines to charge compliant devices among Apple, Samsung and BC1.2 DCP modes. Therefore, TCS1203 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 TCS1203 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

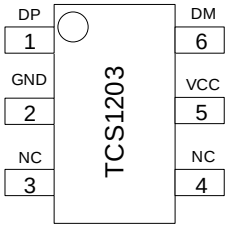


Figure 1 5 Pins SOT23-6 Package (Top view)

5.2 Pin Description

Symbol	Pin Number	IP Type	Description
DP	1	I/O	D+ pin connected to USB connector directly
GND	2	Ground	Ground of chip
NC	3	NC	No connection
NC	4	NC	No connection
VCC	5	Power	Power pin with 0.1μF capacitor to ground
DM	6	I/O	D- pin connected to USB connector 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	DP, DM		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		50		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}=-5μA		30		kΩ
R_{DM_2V7}	DM output resistance	I_{DM}=-5μA		30		kΩ
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_GND}	DP/DM output resistance	I_{DP}=-5μA		100		kΩ
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

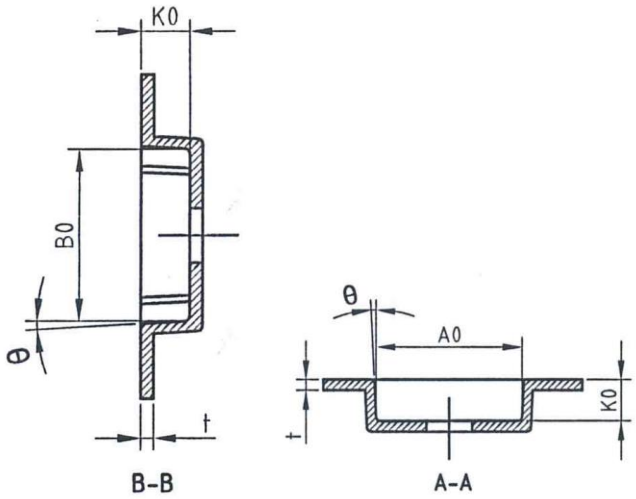
9. Mechanical, Packaging, and Ordering Information

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.

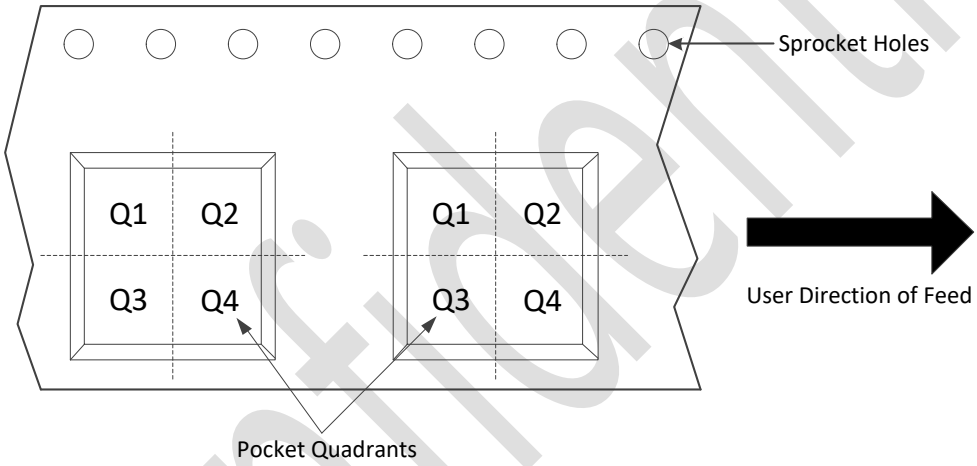
9.1 Ordering Information

Part number	Top side Marking	Package		
		Name	Description	Version
TCS1203DBVR	1203	SOT23-6	SOT23-6	1.0

9.2 Tape and Reel Information

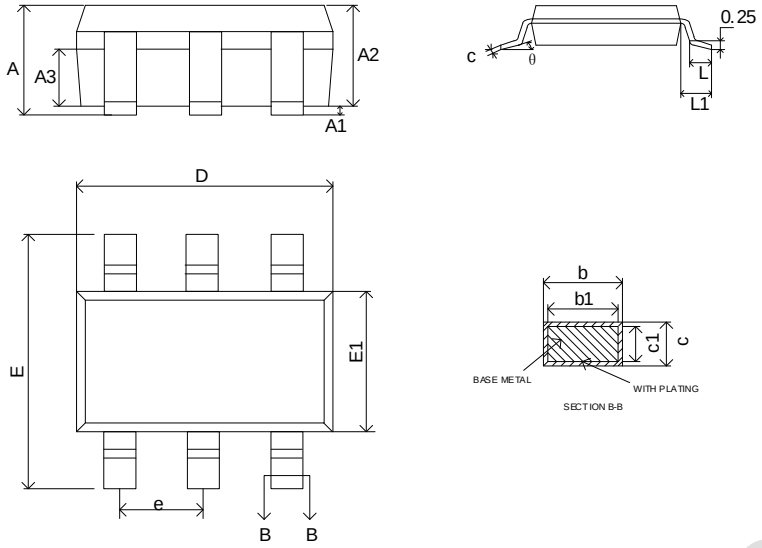


QUADRANT ASSIGNMENTS FOR PIN1 ORIENTATION IN TAPE



Device	W (mm)	P (mm)	A0 (mm)	B0 (mm)	K0 (mm)	t (mm)	θ (mm)	Pin1 Quadrant
TCS1203	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°

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