Description

The TN3002SE is the USB decated charging port controller IC. The IC is used to facilitate charging procedure when most of the mainstream handheld devices are detected. The TN3002SE is suitable for all the charger products using USB interface like power bank, wall adapter and even MID device with OTG function. The IC is provided with enhanced ESD protection up to +/-8kV with application on D+/D- Pins.

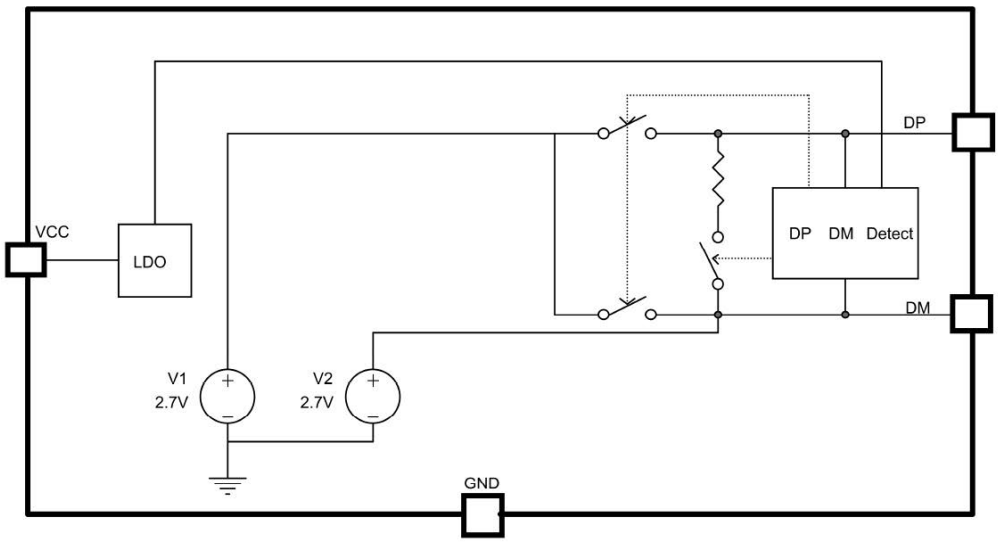
Features

- Supports USB DCP Shorting D+ Line to D– Line per USB Battery Charging Specification, Revision 1.2 (BC1.2)
- Supports Shorted Mode (Shorting D+ Line to D-Line) per Chinese Telecommunication Industry Standard YD/T 1591-2009
- Supports USB DCP Applying 2.7 V on D+ Line and 2.7 V on D- Line
- Supports USB DCP Applying 1.2 V on D+ and D– Lines
- Automatically Switch D+ and D- Lines Connections for an Attached Device
- Operating Range: 4.5 V to 5.5 V
- Available in SOT-23-5 Package

Applications

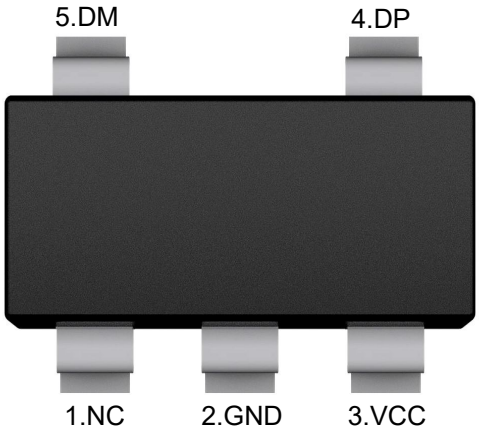
- Power bank
- USB Ports (Hosts and Hubs)
- Wall Charging Adapters

Block Diagram



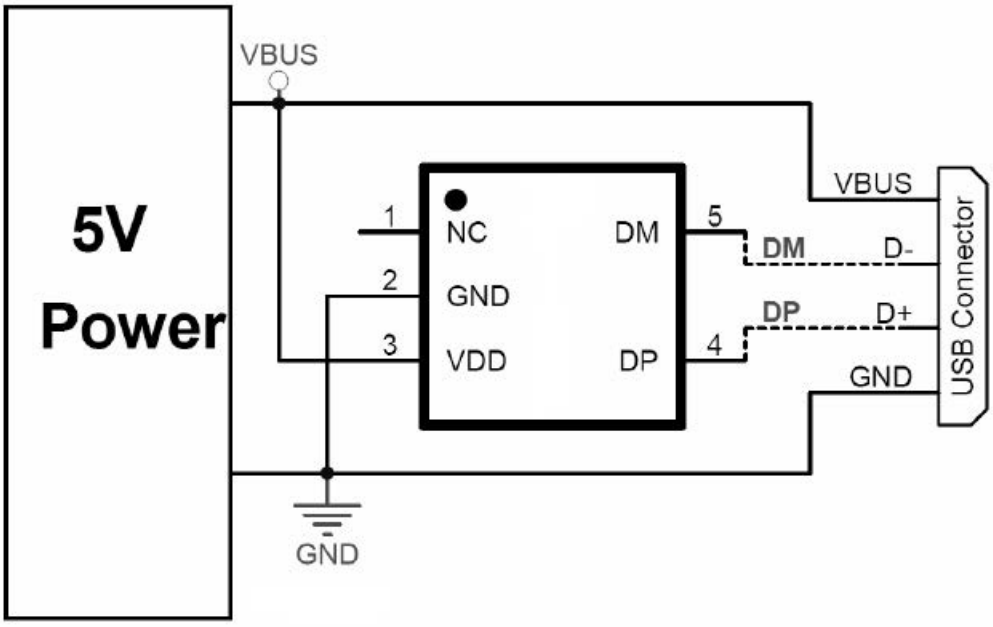
Pin Function And Descriptions

SOT-23-5



Pin	Name	Description
1	NC	No Connected
2	GND	Ground
3	VCC	Power suppler
4	DP	USB positive data-channel to external USB device
5	DM	USB negative data-channel to external USB device

Application Circuits



2.4A Configuration / Typical application circuits

Absolute Maximum Ratings (at T_A = 25°C)

Characteristics	Symbol	Rating	Unit
VIN to GND		-0.3 to +7	V
DP1,DM1,DP2,DM2 to GND		-0.3 to +6	V
Operating Junction Temperature		-40 to +125	°C
Storage Junction Temperature		-55 to +150	°C
Junction to Ambient Thermal Resistance	$R_{\theta JA}$	180	°C/W
Junction to board thermal resistance	$R_{\theta JB}$	120	°C/W
Junction to case thermal resistance	$R_{\theta JC}$	42	°C/W

ESD Ratings

		Value	Unit
Electrostatic discharge	Human-body model (HBM)	±8000	V

Recommended Operating Conditions

	Symbol	Min.	Max.	Unit
Input voltage of VCC	V_{CC}	4.5	5.5	V
DP1,DP2 data line input voltage	V_{DP}	0	5.5	V
DM1,DM2 data line input voltage	V_{DM}	0	5.5	V
DP1,DP2 Continuous sink or source current	I_{DP}	0	±10	mA
DM1,DM2 Continuous sink or source current	I_{DM}	0	±10	mA

Electrical Characteristics

(T_J=25°C. V_{CC}=5V, unless otherwise specified)

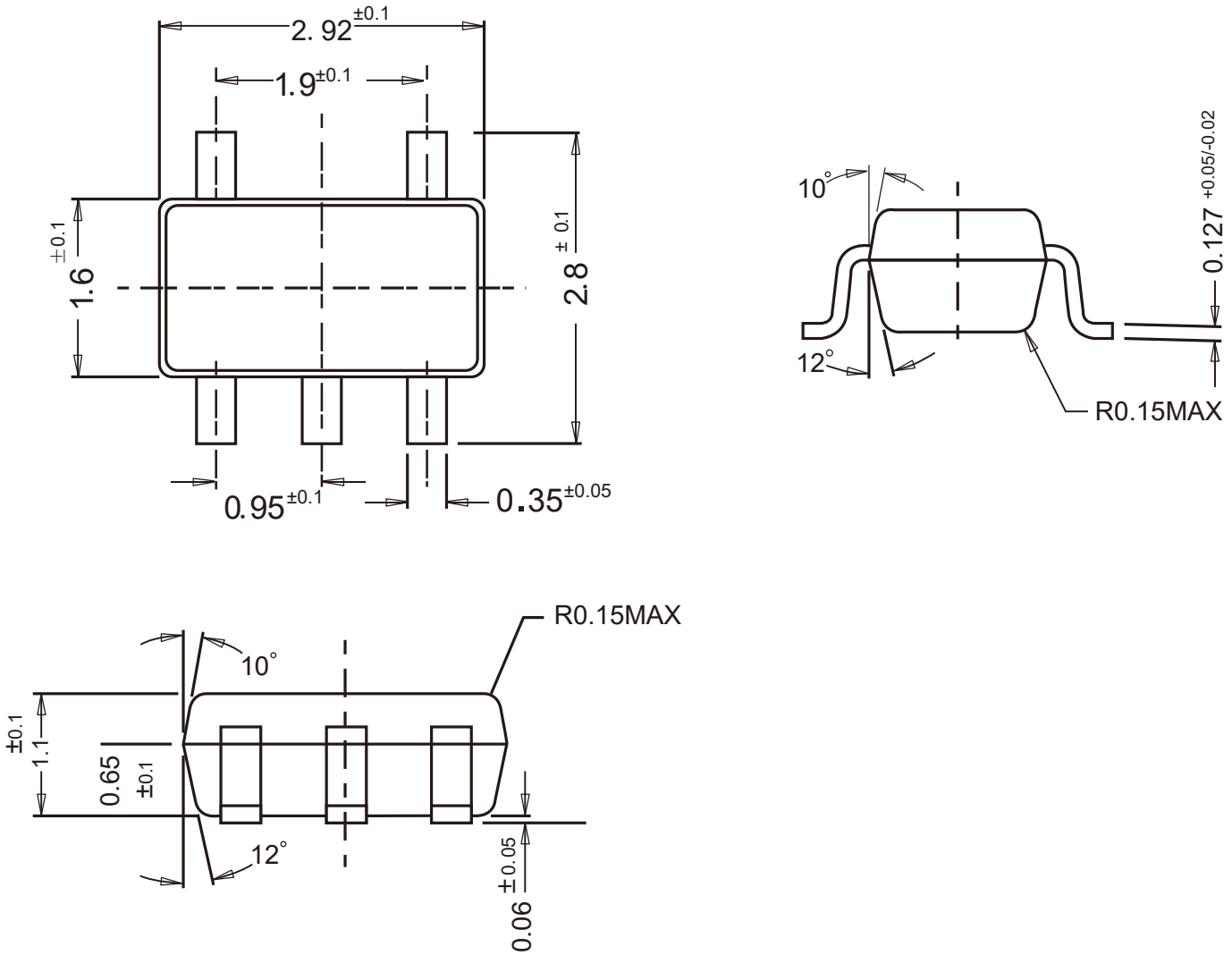
Characteristics	Symbol	Conditions	Min.	Typ.	Max.	Units
Input Voltage	VCC		4.3	5	5.5	V
UVLO Voltage	V_{UVLO}		3.1	3.7	4.3	V
UVLO Hysteresis				0.1		V
Quiescent Current	I_{CCQ}	VCC=5V		220		uA
BC 1.2 DCP Mode						
DP,DM Short Resistance	R_{DPM}			160	200	Ω
Resistance between DPx and GND	R_{DPG}	VDPx=0.8V		650	1000	KΩ
Resistance between DMx and GND	R_{DMG}	VDMx=0.8V		650	1000	KΩ
DPx threshold of Goes to divider mode	V_{DPX_TH}			300		mV
Divider Mode						
DPx output voltage	$V_{DPX\_2.7}$		2.6	2.7	2.8	V
DMx output voltage	$V_{DMX\_2.7}$		2.6	2.7	2.8	V
DPx output impedance	R_{DPX}		24	30	36	KΩ
DMx output impedance	R_{DMX}		24	30	36	KΩ
1.2V /1.2V Mode						
DPX output voltgage	$V_{DPX\_1.2}$		1.12	1.2	1.28	V
DMX output voltgage	$V_{DMX\_1.2}$		1.12	1.2	1.28	V

Note: 1. DPX Stands for DP1 or DP2, DMX Stands for DM1 or DM2

Package Outline

SOT-23-5

Dimensions in mm



Ordering Information

Device	Package	Shipping
TN3002SE	SOT-23-5	3,000PCS/Reel&7inches

Contact Information

TANI website: **http://www.tanisemi.com** Email:tani@tanisemi.com

For additional information, please contact your local Sales Representative.

® is registered trademarks of TANI Corporation.

Product Specification Statement

The product specification aims to provide users with a reference regarding various product parameters, performance, and usage. It presents certain aspects of the product's performance in graphical form and is intended solely for users to select product and make product comparisons, enabling users to better understand and evaluate the characteristics and advantages of the product. It does not constitute any commitment, warranty, or guarantee.

The product parameters described in the product specification are numerical values, characteristics, and functions obtained through actual testing or theoretical calculations of the product in an independent or ideal state. Due to the complexity of product applications and variations in test conditions and equipment, there may be slight fluctuations in parameter test values. TANI shall not guarantee that the actual performance of the product when installed in the customer's system or equipment will be entirely consistent with the product specification, especially concerning dynamic parameters. It is recommended that users consult with professionals for product selection and system design. Users should also thoroughly validate and assess whether the actual parameters and performance when installed in their respective systems or equipment meet their requirements or expectations. Additionally, users should exercise caution in verifying product compatibility issues, and TANI assumes no responsibility for the application of the product. TANI strives to provide accurate and up -to- date information to the best of our ability. However, due to technical, human, or other reasons, TANI cannot guarantee that the information provided in the product specification is entirely accurate and error-free. TANI shall not be held responsible for any losses or damages resulting from the use or reliance on any information in these product specifications.

TANI reserves the right to revise or update the product specification and the products at any time without prior notice, and the user's continued use of the product specification is considered an acceptance of these revisions and updates. Prior to purchasing and using the product, users should verify the above information with TANI to ensure that the prod uct specification is the most current, effective, and complete. If users are particularly concerned about product parameters, please consult TANI in detail or request relevant product test reports. Any data not explicitly mentioned in the product specification shall be subject to separate agreement.

Users are advised to pay attention to the parameter limit values specified in the product specification and maintain a certain margin in design or application to ensure that the product does not exceed the parameter limit values defined in the product specification. This precaution should be taken to avoid exceeding one or more of the limit values, which may result in permanent irreversible damage to the product, ultimately affecting the quality and reliability of the system or equipment.

The design of the product is intended to meet civilian needs and is not guaranteed for use in harsh environments or precision equipment. It is not recommended for use in systems or equipment such as medical devices, aircraft, nuclear power, and similar systems, where failures in these systems or equipment could reasonably be expected to result in personal injury. TANI shall assume no responsibility for any consequences resulting from such usage.

Users should also comply with relevant laws, regulations, policies, and standards when using the product specification. Users are responsible for the risks and liabilities arising from the use of the product specification and must ensure that it is not used for illegal purposes. Additionally, users should respect the intellectual property rights related to the product specification and refrain from infringing upon any third- party legal rights. TANI shall assume no responsibility for any disputes or controv ersies arising from the above-mentioned issues in any form.