NT1775

3/4-Cell Lithium-Ion/Polymer Protector

Features

- High Detection Accuracy
  - Over-charge Detection: ±25mV
  - Over-discharge Detection: ±80mV
  - Discharge Over-current Detection: ±25mV
- Discharge Over-current Protection
- High Withstand Voltage
  - Absolute maximum ratings: 40V (VDD – VSS)
- Low Supply Current
  - Supply current: 12μA (Typ.)
  - Standby current: 0.1μA (Max.)
   (Power Down Mode)
- Three Types of Current Protections
- Ultra Small Package
  - TSSOP-16L

Description

The NT1775 protects lithium-ion/lithium-polymer rechargeable battery in the abnormal events of over-charge, over-discharge, discharging over-current and for a 3/4-cell lithium-ion/lithium polymer battery pack.

If any of above abnormal conditions occurred. NT1775 would turn off the MOSFETs to protect battery.
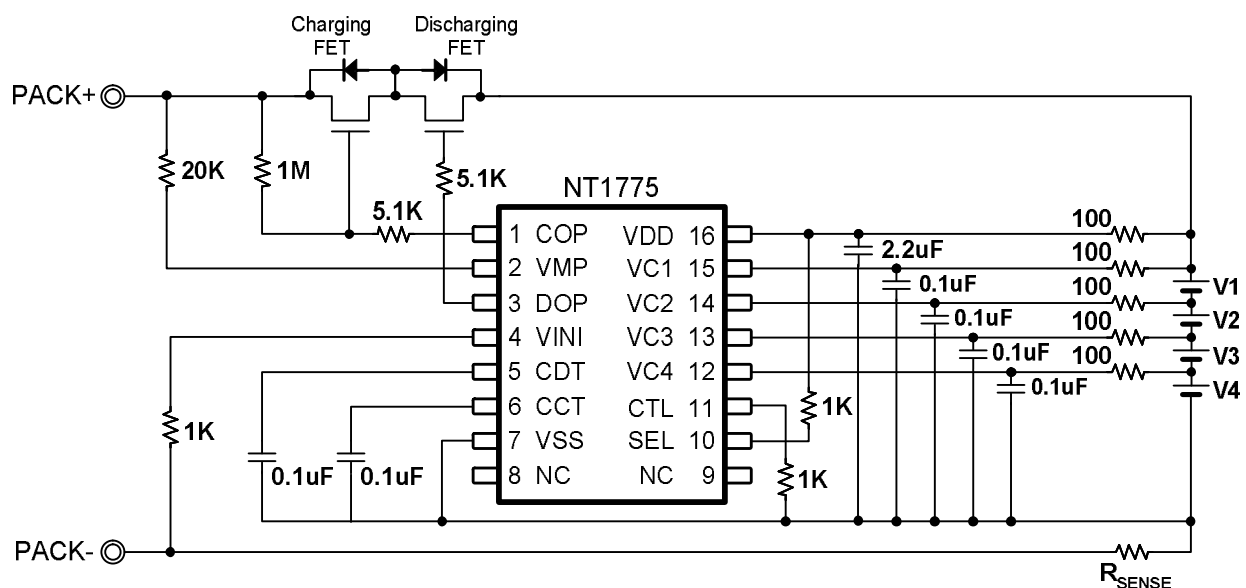
NT1775 would enter power down mode when over-discharge protection occurs to minimize the current consumption.

The tiny package of 16 pin TSSOP is especially suitable for the battery packs in portable devices.
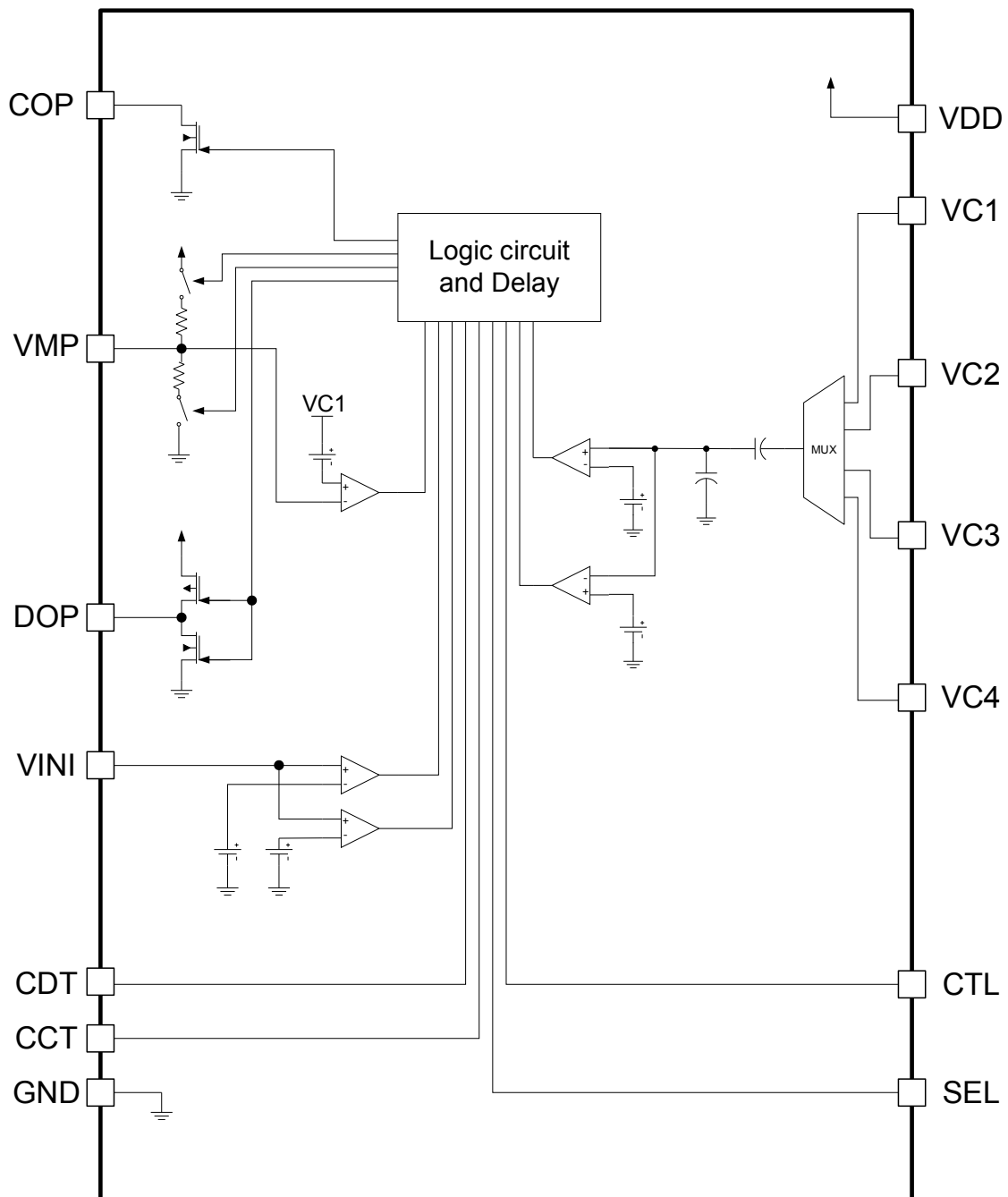
Applications

- Lithium-ion rechargeable battery packs
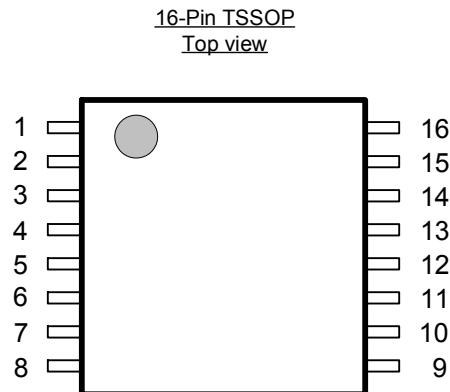- Lithium-polymer rechargeable battery packs

Typical Application Circuit

These devices have limited build-in ESD protection. The leads must be shorted together or the device placed in conductive foam during storage or handling to prevent electrostatic damage to the MOS gates.
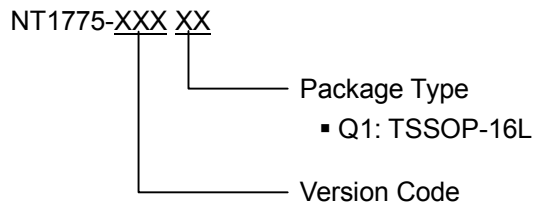
NT1775 DS V5.17

Block Diagram

Package and Pin Configurations

16-Pin TSSOP
Top view

Pin No.	Symbol	Pin description
1	COP	FET gate control pin for charging path (Nch open-drain output)
2	VMP	Voltage detction pin between VC1 and VMP (Short-circuit detection pin)
3	DOP	FET gate control pin for discharging path (CMOS output)
4	VINI	Voltage detction pin between VSS and VINI (Over-current 1,2 detection pin)
5	CDT	Capacitor connection for over-discharge detection, over-current detection 1 delay time
6	CCT	Capacitor connection for over-charge detection delay time
7	VSS	Negative power input pin
8	NC	No connection
9	NC	No connection
10	SEL	Pin for switching 3cell/4cell series SEL pin=VSS: 3cell, SEL pin=VDD: 4cell
11	CTL	Control of charge FET and discharge FET <table><tr><td>CTL Pin</td><td>COP Pin</td><td>DOP Pin</td></tr><tr><td>High</td><td>Hi-Z</td><td>VDD</td></tr><tr><td>Open</td><td>Hi-Z</td><td>VDD</td></tr><tr><td>Low</td><td>Normal status*</td><td>Normal status*</td></tr></table>
12	VC4	Cell V4 positive voltage and cell 3 negative voltage input pin
13	VC3	Cell V3 positive voltage and cell 2 negative voltage input pin
14	VC2	Cell V2 positive voltage and cell 1 negative voltage input pin
15	VC1	Cell V1 positive voltage input pin
16	VDD	Power supply input pin

Ordering Information

NT1775-<u>XXX</u> <u>XX</u>

Package Type
- Q1: TSSOP-16L

Version Code

Product version code

Product Name	Version Code	Package Type	Over-charge Detection Voltage (V_{OV})	Over-charge Release Voltage (V_{REL1})	Over-discharge Detection Voltage (V_{OD})	Over-discharge Release Voltage (V_{REL2})	Discharge Over-current Detection Voltage 1 (V_{DOC1})	0V Battery Charge Function
NT1775	LNG	Q1	4.225V	4.075V	2.4V	3.0V	0.20V	Available
NT1775	AAN	Q1	4.250V	4.150V	2.5V	3.0V	0.10V	Available
NT1775	AAV	Q1	4.250V	4.150V	2.7V	3.0V	0.20V	Available
NT1775	JPM	Q1	4.275V	4.075V	2.3V	2.7V	0.13V	Available
NT1775	GNG	Q1	4.300V	4.150V	2.4V	3.0V	0.20V	Available
NT1775	ENK	Q1	4.350V	4.150V	2.4V	3.0V	0.15V	Available
NT1775	DNX	Q1	4.400V	4.200V	2.4V	3.0V	0.17V	Available