BATTERY PACK PROTECTION SOLUTION IC

FEATURES

- No External MOSFETs Required
- Integrate MOSFET with Equivalent of 50mOHM Rdson
- Only one external capacitor required
- Over temperature protection
- Three-step Over discharge current detection:OC1,OC2 and short circuiting
- Charger detection Function
- Overcharge current detection
- Delay times are generated internally
- Low Current Consumption:
  -operation mode: 2uA typ.
  -Power down mode : 0.1uA max
- High accuracy voltage detection
- RoHS Compliant and Lead (Pb) Free
- Tiny SOT23-5 Package

APPLICATIONS

- Lithium-ion/Polymer Battery Pack

GENERAL DESCRIPTION

The MT1430 is a battery protection solution IC which is integrated with built-in the protection IC to use a Lithium-ion/Polymer batteries developed for one cell series. The device contains all required protection control circuits together with very-low-resistance MOSFETs to minimize the number of external components. The protection IC is composed of three voltage detectors, over current, short detection circuit, reference voltage sources, oscillator, counter circuit and logical circuits.

The device is not only targeted for digital cellular phones, but also for any other Li-ion/pol battery powered information appliances requiring long term battery life.

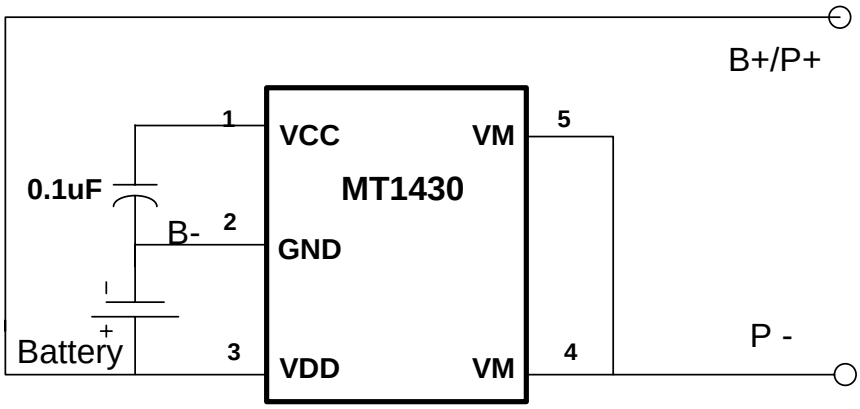
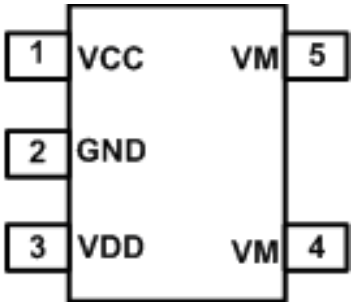


Figure1. Typical Application Circuit

Absolute Maximum Ratings

VCC Voltage…….... ……. -0.3V to 6V
VM Voltage……..... -6V to 11V
VDD Voltage……-0.3V to (VCC+0.3V)
Power Dissipation at T=25°C …….0.4W
Operating Temperature Range … -40°C to +85°C
Junction Temperature(Note2) ……..125°C
Storage Temperature Range .....-65°C to 150°C
Lead Temperature(Soldering,10s) ……..+300°C

Package/Order Information



Pin Description

PIN	NAME	FUNCTION
1	VCC	Core circuit power supply pin
2	GND	Ground Pin
3	VDD	Positive Power Input
4,5	VM	The negative charge input, over current detection

ORDERING INFORMATION

Part Number	Overcharge Detection Voltage(Vcu)	Overcharge Release Voltage(Vcr)	Overdischarge Detection Voltage(Vdl)	Overdischarge Release Voltage(Vdr)	Overcurrent Detection Current(OCD1)
MT1430	4.3V	4.1V	2.4V	3.0V	3A

Electrical Characteristics

(Typical and limits appearing in normal type apply for Ta=25°C.)

Parameter	Conditions	MIN	TYP	MAX	unit
Overcharge Detection Voltage		4.25	4.3	4.35	V
Overcharge Release Voltage		4.05	4.1	4.15	V
Over discharge Detection Voltage		2.3	2.4	2.5	V
Over discharge Release Voltage		2.9	3.0	3.1	V
Charger Detection Voltage		-0.06	-0.13	-0.2	V
Overcharge Current Detection Current	VDD=3.5V	2.0	3.0	4.0	A
Over discharge Current1 Detection Current	VDD=3.5V	2.0	3.0	4.0	A
Over discharge Current2 Detection Current	VDD=3.5V	4.0	6.0	8.0	A
Load Short-Circuiting Detecting Current	VDD=3.5V	6.0	10	14	A
Current Consumption in normal operation	VDD=3.5V		2.0	3.0	uA
Current Consumption in power down	VDD=2V			0.1	uA
Equivalent FET on Resistance	VDD=3.6V,Ivm=1A		55	80	mohm
Over Temperature Protection			120		°C
Over Temperature Recovery Degree			100		°C
Overcharge Voltage Detection Delay Time			120		mS
Over discharge Voltage Detection Delay Time			24		mS
Over discharge Current1 Detection Delay Time			8		mS
Over discharge Current1 Detection Delay Time			4		mS
Load Short circuiting Detection Delay Time			500		uS

Functional Block Diagram

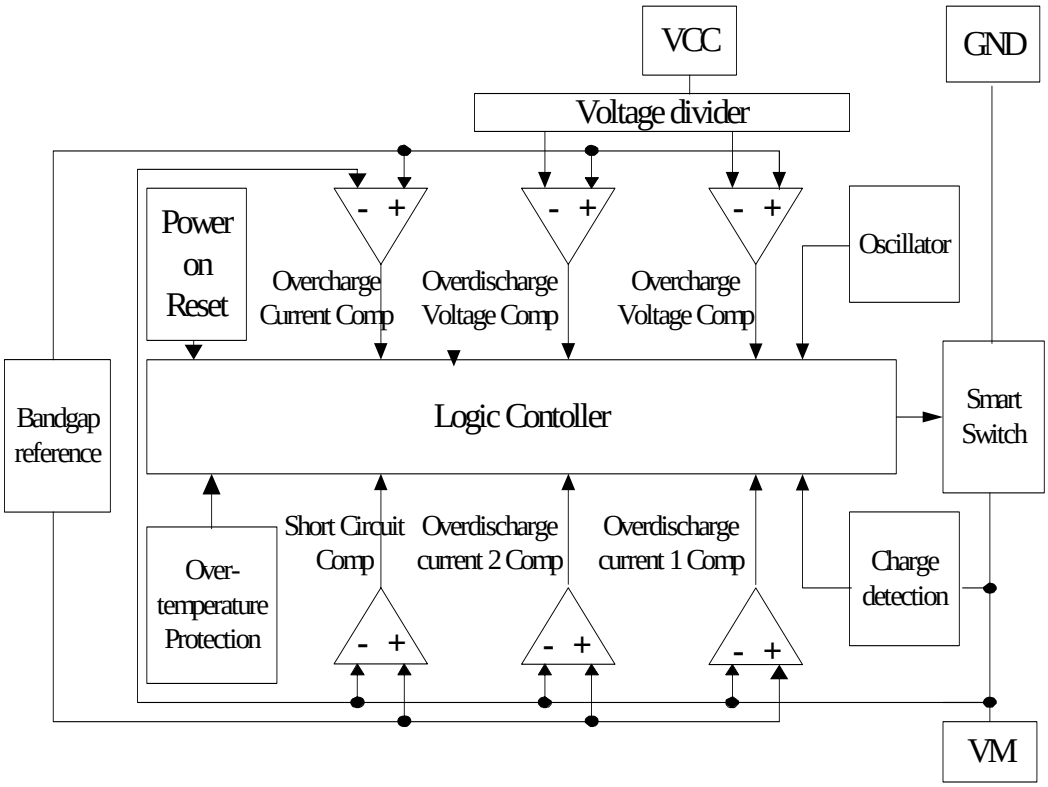
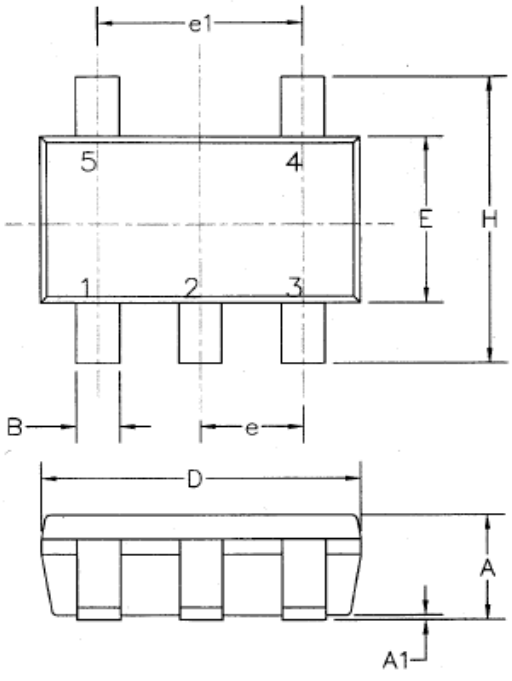


Figure 2. MT1430 Block Diagram

Package Description



5LD SOT-23 PACKAGE OUTLINE DIMENSIONS
ALL DIMENSIONS IN MM.

Dimension	Min.	Max.
A	0.9	1.10
A1	0.01	0.13
B	0.3	0.5
C	0.09	0.2
D	2.8	3.0
H	2.5	3.1
E	1.5	1.7
e	0.95 REF.	
e1	1.90 REF.	
L1	0.2	0.55
L	0.35	0.8
Q	0°	10°