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IEM Rechargeable Battery Solutions

International Electronics Marketing has many solutions for your battery and recharger needs. IEM has been in this business since 1994. Our daily output of batteries is greater than 750kunits per day. We offer these technologies; Ni-MH, Ni-Cd, Li-ion, Li-Fe and sealed Lead Acid. We also have the capabilities to do custom modifications to size and power output. We maintain a limited selection in our warehouse in California. We warranty all products for 1 year. Technical support is available from FAE's we have available.

Technologies offered;

Ni-MH - Nickel-metal hydride: Rechargeable type battery. Typical output voltage 1.25V/cell. Less expensive than Li-ion batteries. Most popular sizes are AAA and AA but A, C, D and F available. 9V and coin cell are also available. Anything else is usually a multi-cell package. A NiMH battery can have two to three times the capacity of an equivalent size NiCd, and their energy density approaches that of a lithium-ion cell. The significant disadvantage of NiMH batteries is the high rate of self-discharge. Overcharging can damage the cell. IEM capacity range available: 80mAh – 1400mAh

Ni-Cd - Nickel-cadmium: Rechargeable type battery. Typical output voltage 1.25V/cell. Compared with other types of rechargeable cells but its significant advantage is the ability to deliver practically its full rated capacity at high discharge rates. Most popular sizes are AAA and AA but A, C, D and F available. 9V and coin cell are also available. Anything else is usually a multi-cell package. This technology is not popular and been replaced by Ni-MH batteries for the most part, making it more expensive than Ni-NM. IEM capacity range available: 110mAh – 1200mAh

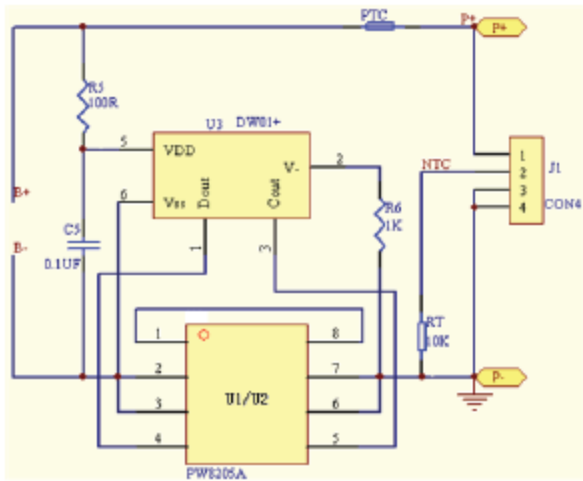
Li-ion, Li-Fe (LiFePO₄), - Lithium-ion and Lithium iron phosphate: Rechargeable type battery. Typical output voltage 3.7V/cell for Li-ion and 3.2V/cell for Li-Fe. Lithium ion batteries come in 4 shapes, cylindrical (small & large), pouch and Prismatic. With the sizes are various capacities (mAh). Lithium ion batteries are more expensive than NiMH batteries but operate over a wider temperature range, with higher energy densities, no

memory effect, and only a slow loss of charge when not in use. Li-Fe batteries have somewhat lower energy density than the more common Lithium-ion device, but offers longer lifetimes, better power density (the rate that energy can be drawn from them) and are inherently safer. They require a protective circuit to limit peak voltage. Air freight is a challenge with anything Lithium. IEM capacity range available: 45mAh – 89.6Ah: Saft series available

Lead Acid - Rechargeable type battery. Typical output voltage 2.0V/cell. Feature is large power-to-weight ratio. Available output from 2V to 24V. Lead acid batteries come in all shapes and sizes. Relatively inexpensive compared to other battery technologies. Air freight is a challenge with lead acid batteries. IEM capacity range available: .5Ah – 3000Ah



Reference designs IEM can support for examples of battery module protection (shown below), in-circuit battery recharger (shown below) and USB battery recharger (not shown). Contact us, we have FAE's that will help with any of these design needs.



Example of battery protection module circuit above and options for 2 or 3 wire interface

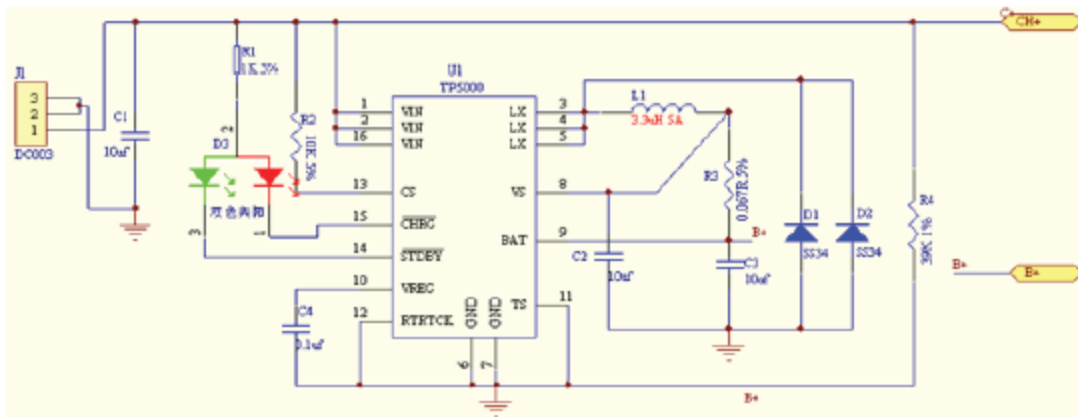
If remove NTC, (or cut off lead wire of NTC), it will turn to a two wire with PTC protection PCM.

If remove PTC, this will be a nominal three wire PCM with NTC protection.

For NTC protection, more functions is possible, such as adjust the charging current, limit the output etc

Li-ion internal recharger example below for a 2,000mAh battery, 5 volt input to J1

No	Item	Condition	Specification
1	Charge voltage	5.0~6.0V	/
2	Trickle Charge Threshold	$V_{bat(th)}=2.9V$	1/10C Charge (150±50mA)
3	Constant current	$V_{bat} = 4.2 V \ 1\%$	1500mA
4	Constant voltage	$4.2 \pm 0.1V$	/
5	Termination Current Threshold	$4.2 \pm 0.05V$	1/10C Charge (150±50mA)
6	Operating Junction Temperature	-40 to +85 °C	<145°C



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Technologies offered;

Li-MnO₂ and Li-SOCl₂ - Lithium manganese dioxide and Lithium thionyl chloride: Not rechargeable type batteries. Typical output voltage 3.0V/cell for Li-MnO₂ and 3.6V/cell for Li-SOCl₂. Most popular sizes are AA but A, C, D and coin cell are available. Although they are more costly than lithium-ion cells will provide much longer life. This family of Lithium exhibit very long life cycles. Lithium batteries maintain higher voltage for longer periods than alkaline cells in similar applications. Air freight is a challenge with anything Lithium. IEM capacity range available: 1.2mAh – 1800mAh

LiFeS₂, - Lithium iron disulfide: Not rechargeable type battery. Typical output voltage 1.5V/cell. Most popular sizes are AAA and AA, with the sizes are various capacities (mAh). Li-Fe batteries have somewhat lower energy density than the more common Lithium-ion device, but offers longer lifetimes, better power density (the rate that energy can be drawn from them) and are inherently safer. Air freight is a challenge with anything Lithium. IEM capacity range available: 1100mAh – 2900mAh

Alkaline battery: Not rechargeable type batteries. Typical output voltage 1.5V/cell. Most popular sizes are AAA and AA thru A, C, D and F. 9V and coin cell are also available. Least expensive of the non rechargeable type batteries and widely available. IEM capacity range available: 18mAh – 20500mAh