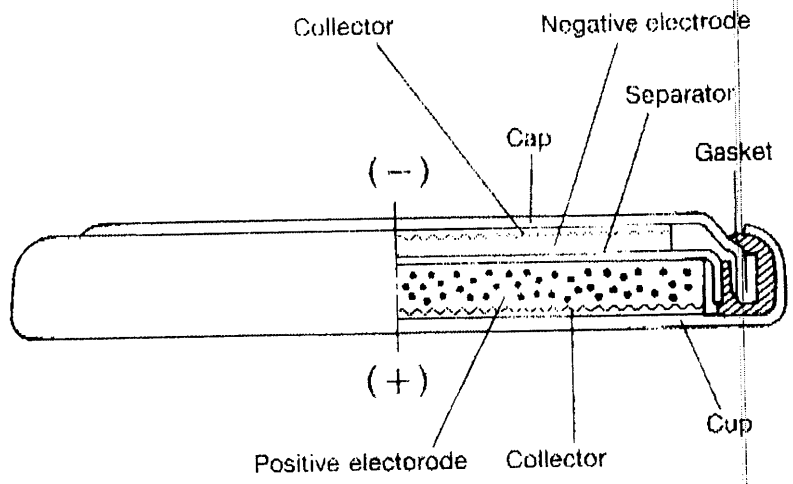
303-2080

From Jeff CPC Team. BT01218. (1 of 3)

LITHIUM SECONDARY BATTERY

ML *Manganese Dioxide Lithium Battery (MnO_2Li)*

Our New type of Battery for Today's New Types of Backup Applications



Battery Components

Anode	- Lithium-Aluminum Alloy (Li-Al Alloy)	Metal
Cathode	- Manganese Dioxide (MnO_2)	Solid
Electrolyte	- Organic	Liquid

Discharge Reaction

MnO_2+(Li-Al) → MnO_2(Li)+Al

ML

Features

High Voltage of 3V
The voltage of ML batteries is a full 3V, more than double that of Ni-Cd batteries.

Stable Discharge Characteristics
ML batteries are well-suited for all types of backup applications because their low internal resistance realizes stable discharge voltage characteristics. What's more, ML batteries can withstand as many as 1500 charge/discharge cycles at 2.5mAh per cycle (10% of discharge depth) and 500 cycles at 5mAh per cycle (20% of discharge depth).

Wide Operating Range
The operating range of ML batteries is as wide as -20°C ~ 60°C (-4°F ~ 140°F), making them suitable for use almost anywhere.

Outstanding Leakage Resistance and Long-Term Reliability
Maxell's ML batteries are made using our exclusive sealing process for long-term reliability — a process so effective that self-discharge is only about 3% per year at 20°C.

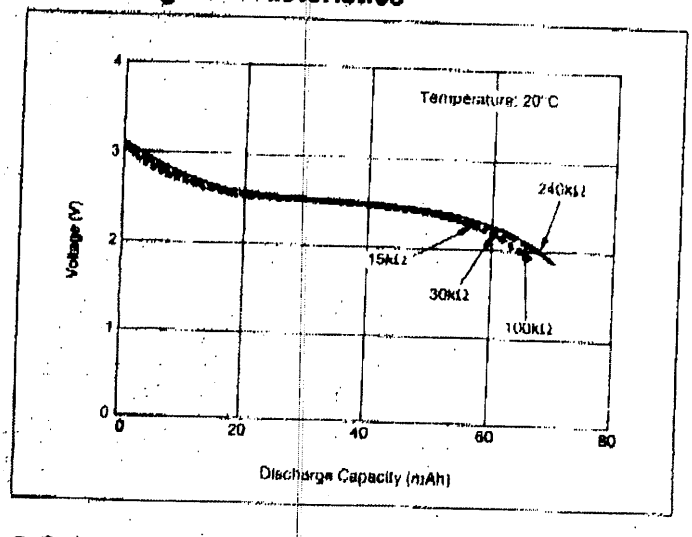
Major Applications

1) CMOS RAM backup
2) Alternative to solar cells for hybrid power applications
3) Power supply for hand-held equipment

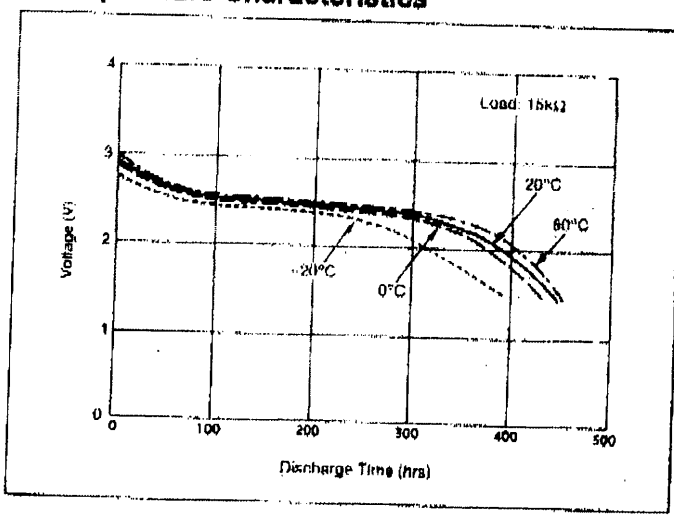
ML Manganese Dioxide Lithium Battery (MnO2/Li) ML2032

Characteristics

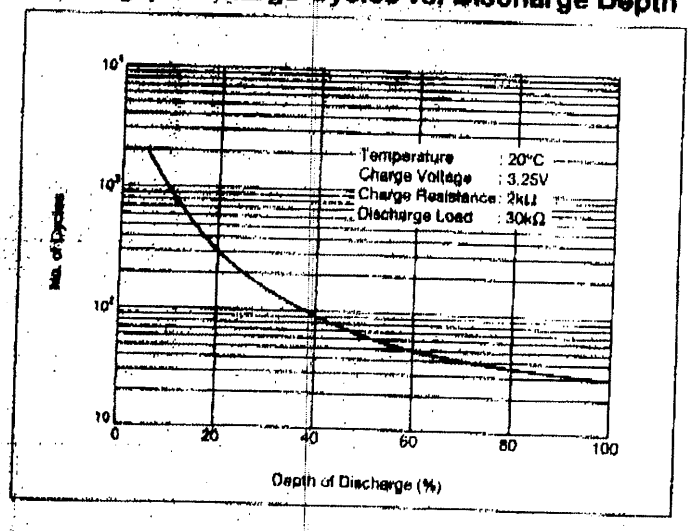
● Discharge Characteristics



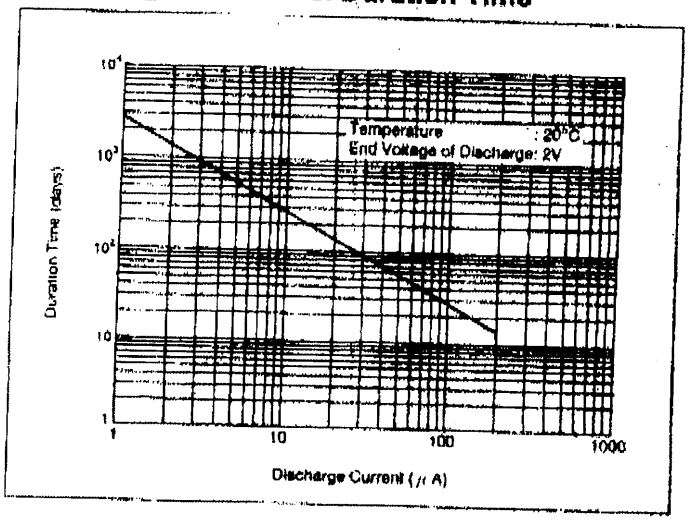
● Temperature Characteristics



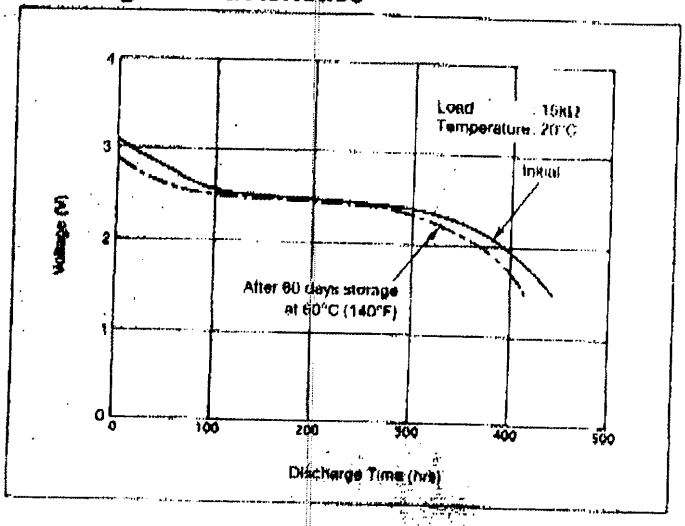
● Charge/Discharge Cycles vs. Discharge Depth



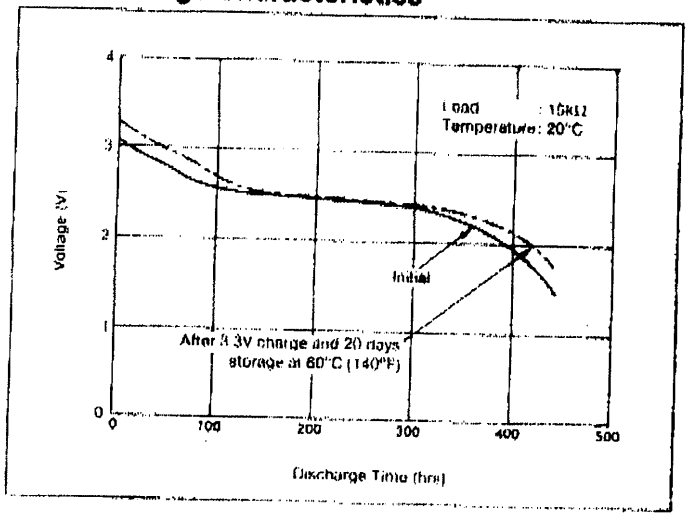
● Discharge Current vs. Duration Time



● Storage Characteristics



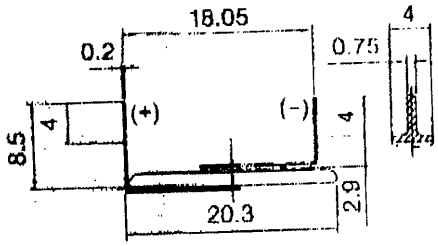
● Over-Charge Characterictics



ML Manganese Dioxide Lithium Battery (MnO2-Li)

Specifications

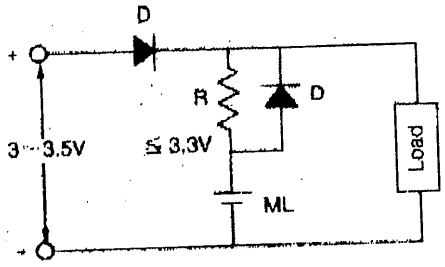
Model	Nominal Voltage (V)	Nominal*1 capacity (mAh)	Standard discharge current (mA)	Charge/discharge cycle	Standard charge conditions	Dimensions (mm)*2 Diameter	Dimensions (mm)*2 Height	Weight*3 (g)
ML2032	3	65	0.2	1000 cycles at 6.5mAh 300 cycles at 13mAh	current: 0.2mA cut off voltage: 3.25V	20.0	3.2	3.0
ML2016	3	25	0.2	1500 cycles at 2.5mAh 500 cycles at 5mAh	current: 0.2mA cut off voltage: 3.25V	20.0	1.6	1.8



*1: Nominal capacity is calculated at an end voltage of 2.0V when the battery is allowed to discharge with a standard current level (0.2mA) at 20°C.
*2: Dimensions are excluding terminals.
*3: Weight is excluding terminals.

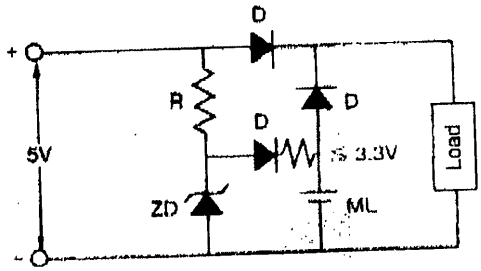
Charging Circuits

① For 3V power supply:



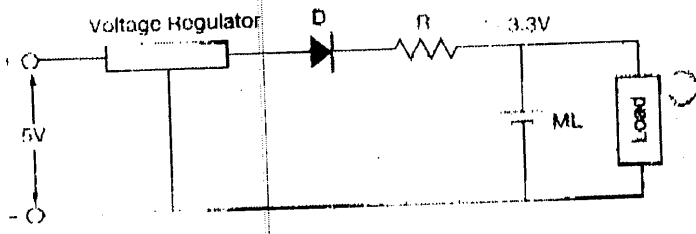
D: Diode R: Resistor

② For 5V power supply:



D: Diode R: Resistor ZD: Zener Diode

③ For IC use:



D: Diode R: Resistor

Notes:
- The above circuits are typical.
- Battery performance is affected by the diode and resistor.
- Never over-charge (>3.3V).

[redacted]

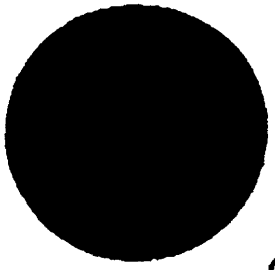
-303-2000

BTO1214
BTO1216

ML

Manganese dioxide lithium rechargeable battery for backup applications

- High 3 volt discharge is approximately double that of most other types of batteries
- Wide operating temperature range makes ML batteries suitable for use almost anywhere
- Outstanding leakage resistance and long-term reliability



BTO1214
16

BTO1218

SPECIFICATIONS

		Unit	ML2032	ML2016
Nominal Voltage		V	3	3
Capacity		mAh	65	25
Standard Discharge Current		mA	≤0.2	≤0.2
Charge/Discharge Cycle		—	1,000 Cycles at 5 mAh	1,500 Cycles at 2 mAh
		—	300 Cycles at 10 mAh	500 Cycles at 4 mAh
Standard Charge Conditions	Current	mA	0.2	0.2
	Cut Off Voltage	V	3.25	3.25
Weight		g	3.0	1.8
Dimensions	Diameter	mm	20.0	20.0
	Height	mm	3.2	1.6

BTO1218

ML2032

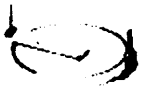
ML2032 T6

ML2032 T17

ML2032 T25

BTO1214

ML2016



ML2016 T6

ML2016 T17

ML2016 T25

BTO1216

INFO ON BTO1218

REGARDS

CPC HTRN..

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