I. Charging Characteristics

Although any charging of BR Lithium cells is to be avoided, some charging may occur even in a well designed electrical circuit due to leakage current of the protecting diodes. The diode used in a circuit design with a BR Lithium cell should minimize leakage to within 3% of the rated capacity of the cell over the lifetime of the cell's use. Figure 9 below provides the maximum total charge allowance for all cell sizes. Figure 10, which illustrates these limits as they apply to the BR1225 & BR2325 cell sizes at various drain rates, follows.

Maximum Total Charge Allowance

Cell Size	Rated Capacity	3% of Capacity
BR1225	50 mAh	1.50 mAh
BR1632	130 mAh	3.90 mAh
BR2032	195 mAh	5.85 mAh
BR2325	180 mAh	5.40 mAh
BR2335	300 mAh	9.00 mAh

Figure 9

Formula to calculate charge current:

$$I_{max}(nA) = \frac{114.15 \times c}{t}$$

Where: I_{max} = Maximum allowable charge current in nanoAmperes (nA)

c = Maximum total charge capacity in mAh from table above

t = Time on charge in years

Maximum Total Charge Allowance

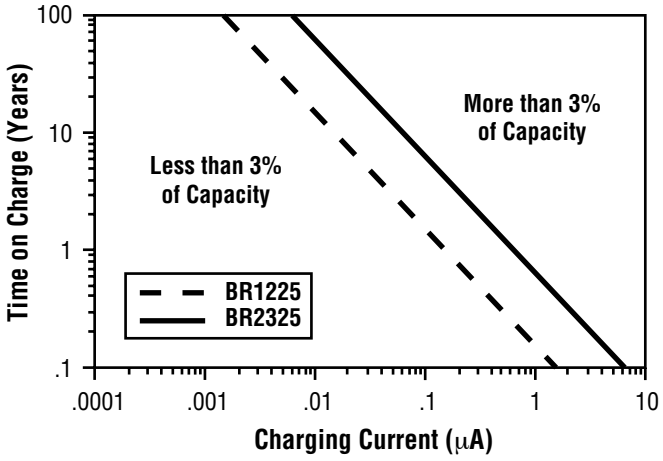

Figure 10

J. Short Circuit Recovery

In the process of wave soldering tabbed versions of the BR Lithium batteries to circuit boards, a temporary short will occur. Figure 11 below shows the voltage recovery of a Rayovac BR2325 coin cell after a 5 second short circuit which would typically occur in the wave soldering process.

BR2325 Voltage Recovery after 5 Second Short

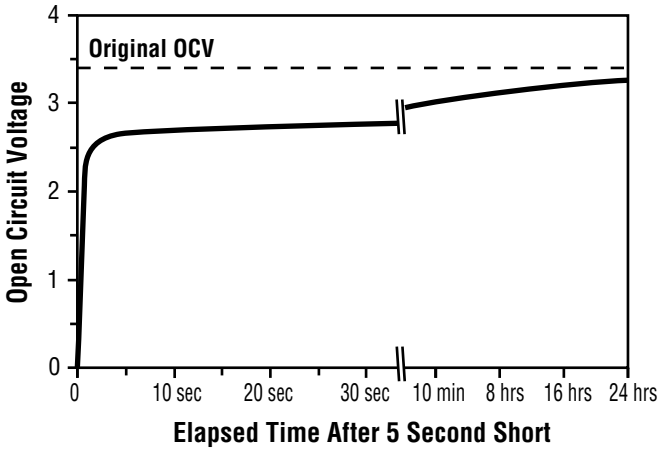

Figure 11

K. Leakage Resistance

The electrolyte in BR Lithium batteries is based on an organic solvent instead of a corrosive alkaline or acidic solution found in most conventional batteries. This greatly improves the cell's leakage resistance and guards against the negative effects caused by leakage.

L. Orientation

Since Rayovac batteries use solid active components, the performance characteristics described are obtained regardless of the installation position.

X. Product Availability & Cross Reference Table

Stock Number*	Description	Interchangeable Numbers	Figure Number	Tab Style	Case Quantity
BR1225-B	3.0-volt, 50 mAh coin cell	BR1225	28	N/A	4,480
BR1225T2R-B	BR1225 with 2 Tabs	–	29	A	1000
BR1225RT2-B	BR1225R with 2 Short Tabs	–	30	G	2,700
BR1225SM2-B	BR1225 Surface Mount Style	–	31	C	1,650
BR1225SR2-B	BR1225 Surface Mount Style	–	32	B	1,540
BR1225T2-B	BR1225 with 2 Tabs	BR1225-1HB	33	A	800
BR1225T2V-B	BR1225 with 2 Tabs - Vertical Mount	BR1225-1VB	34	A	2,340
BR1225T3H-B	BR1225 with 2 Tabs, 3 Stands - Horizontal Mount	–	35	E	800
BR1632-B	3.0-volt, 130 mAh coin cell	–	36	N/A	3,520
BR1632DK2-B	BR1632 - Leaded coin cell	–	37	N/A	360
BR1632T2-B	BR1632 with 2 Tabs	–	38	A	750
BR1632T3L-B	BR1632 with 2 Tabs, 3 Stands	–	39	F	800
BR1632R18-B	BR1632 Surface Mount Style	–	40	D	1,300
BR2032-B	3.0-volt, 195 mAh coin cell	BR2032	41	N/A	2,560
BR2032T2-B	BR2032 with 2 Tabs	BR2032-1HE1	42	A	750
BR2032T2K-B	BR2032 with 2 Tabs	BR2032-1HSE*	43	A	800
BR2032T3L-B	BR2032 with 2 Tabs, 3 Stands	BR2032-1GS**	44	F	750
BR2032T3V-B	BR2032 with 3 Stands - Vertical	BR2032-1GV	45	H	750
BR2325-B	3.0-volt, 180 mAh coin cell	BR2325	46	N/A	3,760
BR2325P2-B	BR2325 with 2 Pins	–	47	PIN	750
BR2325T2-B	BR2325 with 2 Tabs	BR2325-1HB, BR2325-1HE	48	A	750
BR2325T3L-B	BR2325 with 2 Tabs, 3 Stands	–	49	F	750
BR2325T3V-B	BR2325 with 3 Stands - Vertical	BR2325-1VG	50	H	840
BR2335-B	3.0-volt, 300 mAh coin cell	BR2330**	51	N/A	2,800
BR2335SM-B	BR2335 Surface Mount Style	–	52	B	800
BR2335T2-B	BR2335 with 2 Tabs	BR2330-1HE**	53	A	750
BR2335T3L-B	BR2335 with 2 Tabs, 3 Stands	BR2330-1GU**	54	F	750
BR2335T3V-B	BR2335 with 3 Stands - Vertical	BR2330-1VG**	55	H	735

*Suffix "-B" designates bulk packaged.
**Height difference - closest equivalent

X. FB Lithium Carbon-monofluoride Batteries

Rayovac FB batteries consist of two Lithium Carbon-monofluoride coin cells encapsulated within a glass filled polyester molded housing. The FB series of batteries are configured to allow for series or parallel interconnection between the cells.

FB batteries utilize Rayovac BR Lithium Carbon-monofluoride technology to assure the greatest reliability at very wide temperatures and the lowest self-discharge rate.

A. Features

- Meets or exceeds typical hermetically sealed battery shelf life vs. temperature capability
  Operating Temperature Range:
  -40°C to + -100°C (-40°F to +212°F)
- PCB mountable, wave solderable, and process tolerant
- Inherently safe chemistry
- Application flexibility
- Robotically placeable

B. Typical Applications

- Time/data protection
- Industrial control
- Communication equipment
- Portable Instruments

C. Specification Table

Part Number	*Nominal Voltage (volts)*	*Nominal Capacity (mAh)*	*Nominal Pulse Capability (mA*)*	*Dimensions*				
				Width	*Length*	*Height***	*Weight*	*Volume*
FB1225H2	3.0 Parallel 6.0 Series	100 Parallel 50 Series	16 Parallel 8 Series	15.9 mm (0.625")	15.9 mm (0.625")	10.3 mm (0.405")	4.2 g (0.15 oz.)	2.00 cc (6.12 in^3)
FB2325H2	3.0 Parallel 6.0 Series	360 Parallel 180 Series	20 Parallel 10 Series	25.4 mm (1.000")	25.4 mm (1.000")	10.8 mm (0.425")	11.9 g 0.42 oz.)	6.14 cc (0.375 in^3)

* Consult Rayovac OEM Engineering Division for assistance in determining pulse capability for your application.

** Height above circuit board.
NEDA and IEC numbers have not been assigned to FB products.