Report date: 03.04.2013
Software version: 1.0.2
Data version: 18.01.2013

Lifetime Calculation for RENATA Batteries

Project: Timer for shutter controls
Customer: Jauch
Reference: Life time > 10 Jahre

Battery type:	CR1632
Data source:	CR1632.86
Nominal capacity:	125.0 mAh
Capacity calculated until cut-off voltage of 2.0V:	131.0 mAh
Maximum recommended continuous discharge current:	1.500 mA

Load profile	*Current*	*Pulse length*	*Pulses per unit*	
Constant current:	100 nA			
Pulse 1:	2 mA	1 s	1 / year	
Pulse 2:	1 uA	8760 h	1 / lifetime	
Average load current:				0.0002 mA

Temperature profile: 365 days @ 25°C;

Average ambient temperature:	25.0°C
Self discharge rate per year at 25.0°C:	1.4 %
Self discharge current:	0.202 uA

Pulse current peak:	2 mA
Minimum temperature at pulse current peak:	0°C
Maximum internal resistance for pulse current peak:	425 Ohm

Average calculation at room temperature of 20°C:

	hours	*days*	*years*	*%*
Lifetime with average load current and self discharge:	423439	17643	48.3	100.0

Average calculation at ambient temperature of 25.0°C:

	hours	*days*	*years*	*%*
Lifetime with average load current and self discharge:	355526	14814	40.6	84.0
considering pulse current peak at room temperature:	347039	14460	39.6	82.0
considering pulse current peak at min. temperature of 0°C:	338398	14100	38.6	79.9

3 Sigma calculation (worst case) at ambient temperature of 25.0°C:

	hours	*days*	*years*	*%*
Lifetime with average load current and self discharge:	334626	13943	38.2	79.0
considering pulse current peak at room temperature:	306994	12791	35.0	72.5
considering pulse current peak at min. temperature of 0°C:	289965	12082	33.1	68.5