

Attracting Tomorrow



CeraCharge™

Backup battery
for real time clock



TDK Electronics AG
Piezo & Protection Devices Business Group
Multilayer Technology
Munich, Germany
May 1, 2020

CeraCharge™ as backup battery for real time clock (RTC)

- RTCs have to continue counting the time during **energy interruption** and for that need a back up source of energy
- **CeraCharge™** is the ideal back up energy solution for RTC, offering many opportunities of process/product optimizations to designers

Advantages of CeraCharge™

- **Longer life time** (>15 years)
- **Miniaturized** (SMD EIA1812) and maintenance free battery
- Wide temperature range (no leak, no burn and **no explode**)
- Replaces Coin and Li batteries and super cap (electrolytic / ADLC)
- 100% **lead free** = **RoHs**-conform

Key questions

- RTC type?
- Backup period? <35 days
- Voltage threshold? <1.4 V
- Standby current? <1 μ A
- No. of cycles? <1000

Specifications

Nominal voltage	1.5 V
Operating voltage	0 to 1.6 V _{op}
Nominal capacity	100 μ Ah
Nominal discharge current	20 μ A
Operating temperature	-20 to +80 °C



Application note

Teaser

Development kit



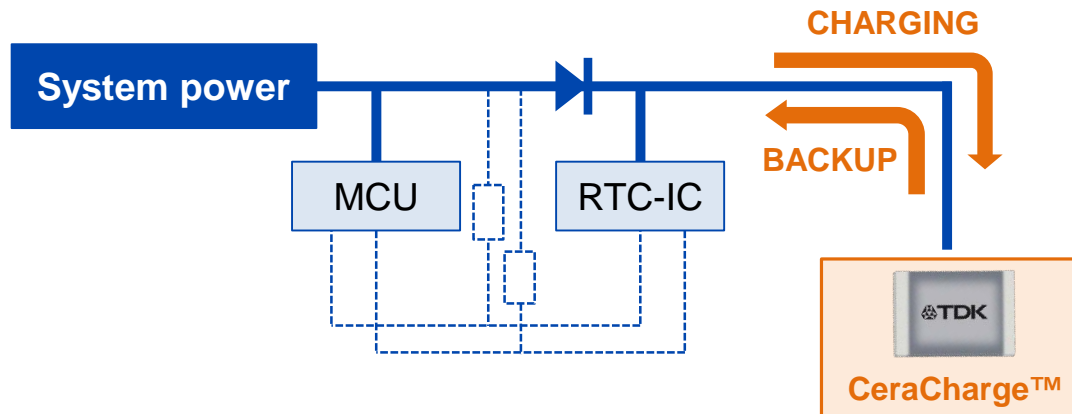
CeraCharge™ as backup battery for real time clock (RTC)

- RTCs have to continue counting the time during **energy interruption** and for that need a back up source of energy
- **CeraCharge™** is the ideal back up energy solution for RTCs, offering many opportunities of process/product optimizations to designers

Charging circuit suggestion

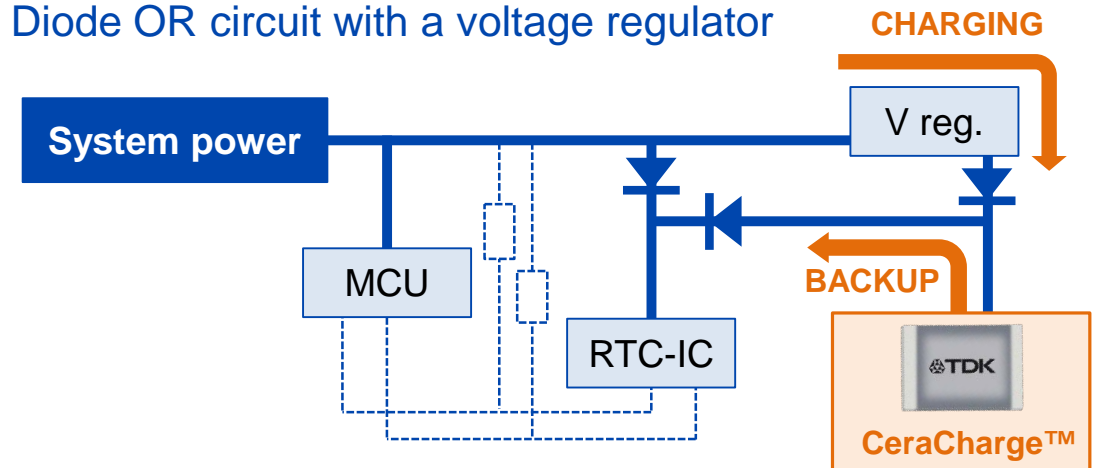
1. Power line voltage is compatible with CeraCharge™ specifications

Connected to a power line in parallel with RTC-IC



2. Power line voltage is higher than CeraCharge™ specifications

Diode OR circuit with a voltage regulator



- 1) Voltage regulator: XC6206 (TOREX)
- 2) Schotky barrier diode: RB530SM-30T2R (ROHM)



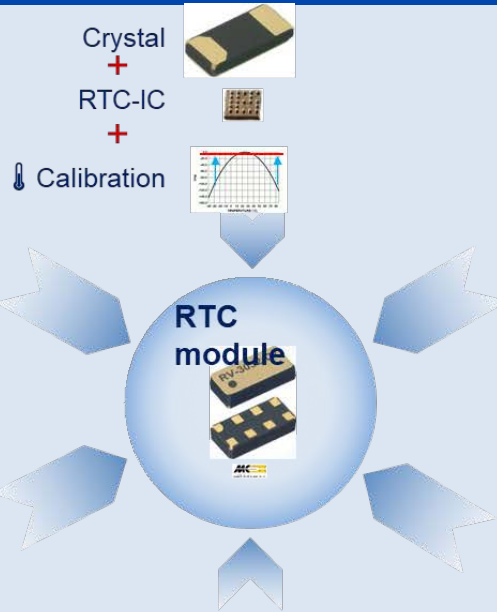
- Application note
- Teaser
- Development kit



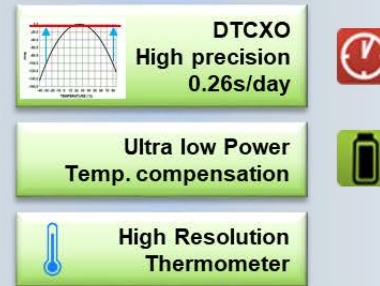
CeraCharge™ as backup battery for real time clock (RTC)

Why cooperation with Microcrystal: IC RV-3032-C7

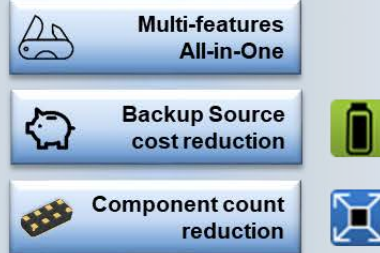
Tamper protection / Data Security



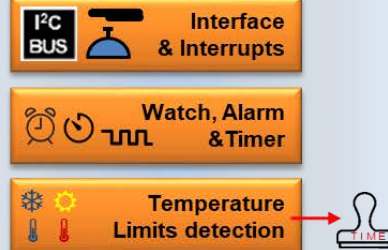
Performances



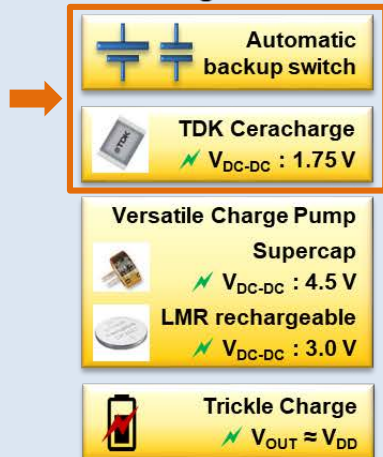
Cost effectiveness



Other features



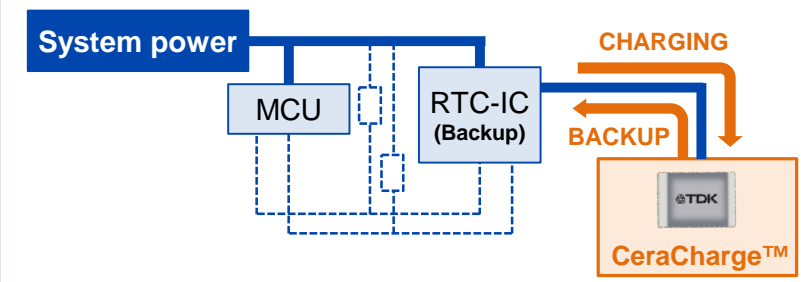
Power Management



- CeraCharge™ used as *plug & play*
- Suitable for ALL power supplies
- No extra circuit needed
- Automatic backup switch to CeraCharge™ for long life
 - # Module (IC + Crystal + CeraCharge™ + charging control) available
 - # Single IC available

Power supply 1.5 to 5.0 V

Connected to a battery backup pin of RTC-IC





www.tdk-electronics.tdk.com