



M4Z28-BR00SH M4Z32-BR00SH

ZEROPOWER® SNAPHAT® (Battery & Crystal)

FEATURES SUMMARY

- PROVIDES BATTERY BACKUP POWER FOR NON-VOLATILE ZEROPOWERs and CONTROLLERS IN THE SNAPHAT SOIC PACKAGE
- REMOVABLE BATTERY AVOIDS HEAT ASSOCIATED WITH SURFACE-MOUNT PROCESS
- SNAPS DIRECTLY ONTO SURFACE-MOUNTED SNAPHAT SOIC
- CHOICE OF BATTERY CAPACITIES
 - M4Z28-BR00SH = 48 mAh
 - M4Z32-BR00SH = 120 mAh
- KEYED INSERTION TO INSURE PROPER ASSEMBLY
- REMOVABLE FOR REPLACEMENT and PROPER DISPOSAL
- AVAILABLE IN TUBES OR TAPE & REEL
- FOR USE WITH THE 28-pin SOIC VERSION OF THE ZEROPOWER PRODUCT FAMILIES

Figure 1. Package

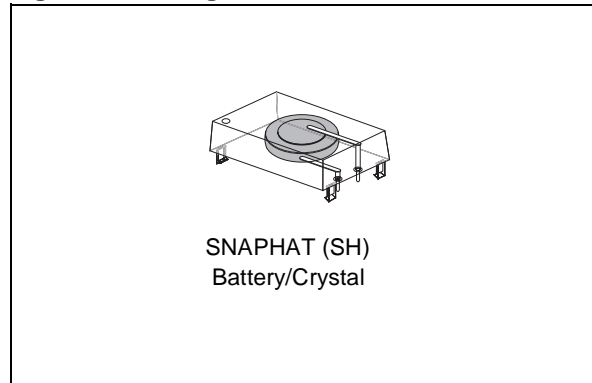


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SUMMARY DESCRIPTION

The M4ZXX-BR00SH SNAPHAT® top is a detachable lithium power source for ST's non-volatile ZEROPOWER® surface-mount SOIC (MH) package (28-pin).

The SNAPHAT top contains a lithium battery and is designed to be “snapped on” after the SOIC is surface mounted on the PC board. The two-piece solution prevents the battery from having to be exposed to the high temperatures of the surface mount process.

Figure 2. Logic Diagram

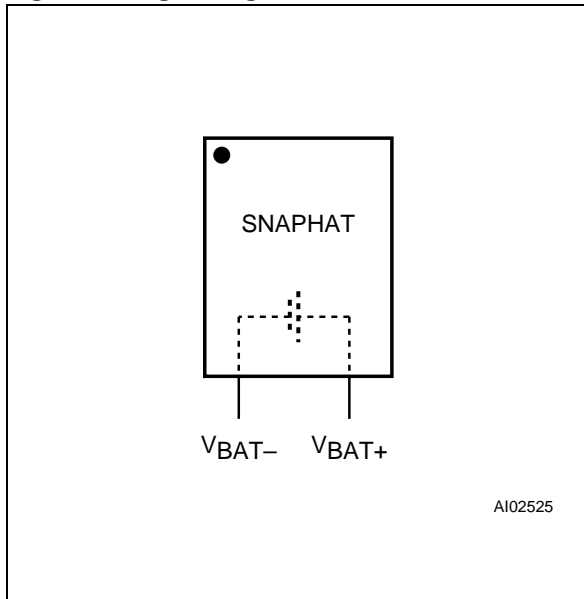


Table 1. Signal Names

| | |
|-------------------|------------------|
| X1 | Crystal Input |
| X2 | Crystal Output |
| V _{BAT-} | Negative Voltage |
| V _{BAT+} | Positive Voltage |

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MAXIMUM RATING

Stressing the device above the rating listed in the “Absolute Maximum Ratings” table may cause permanent damage to the device. These are stress ratings only and operation of the device at these or any other conditions above those indicated in the Operating sections of this specification is

not implied. Exposure to Absolute Maximum Rating conditions for extended periods may affect device reliability. Refer also to the STMicroelectronics SURE Program and other relevant quality documents.

Table 2. Absolute Maximum Ratings

| Symbol | Parameter | | Value | Unit |
|------------------|---|---------|-----------|------|
| T _A | Ambient Operating Temperature | Grade 1 | 0 to 70 | °C |
| | | Grade 6 | -40 to 85 | °C |
| T _{STG} | Storage Temperature (V _{CC} Off, Oscillator Off) | SNAPHAT | -40 to 85 | °C |

CAUTION: Do NOT wave solder SOIC to avoid damaging SNAPHAT sockets.

DC AND AC PARAMETERS

This section summarizes the operating and measurement conditions, as well as the DC and AC characteristics of the device. The parameters in the following DC and AC Characteristic tables are derived from tests performed under the Measure-

ment Conditions listed in the relevant tables. Designers should check that the operating conditions in their projects match the measurement conditions when using the quoted parameters.

Table 3. Operating and AC Measurement Conditions

| Parameter | M4Z28-BR00SH | M4Z32-BR00SH | Unit |
|--|--------------|--------------|------|
| Nominal Battery Voltage (V _{CC}) | 2.8 | 2.8 | V |
| Nominal Battery Capacity | 48 | 120 | mAh |
| Battery Chemistry | Li(CF) | Li(CF) | |
| Crystal Load Capacitance (C _L) | 12.5 | 12.5 | pF |
| Nominal Crystal Frequency | 32.768 | 32.768 | kHz |
| Crystal Series Resistance | 60 | 60 | kΩ |

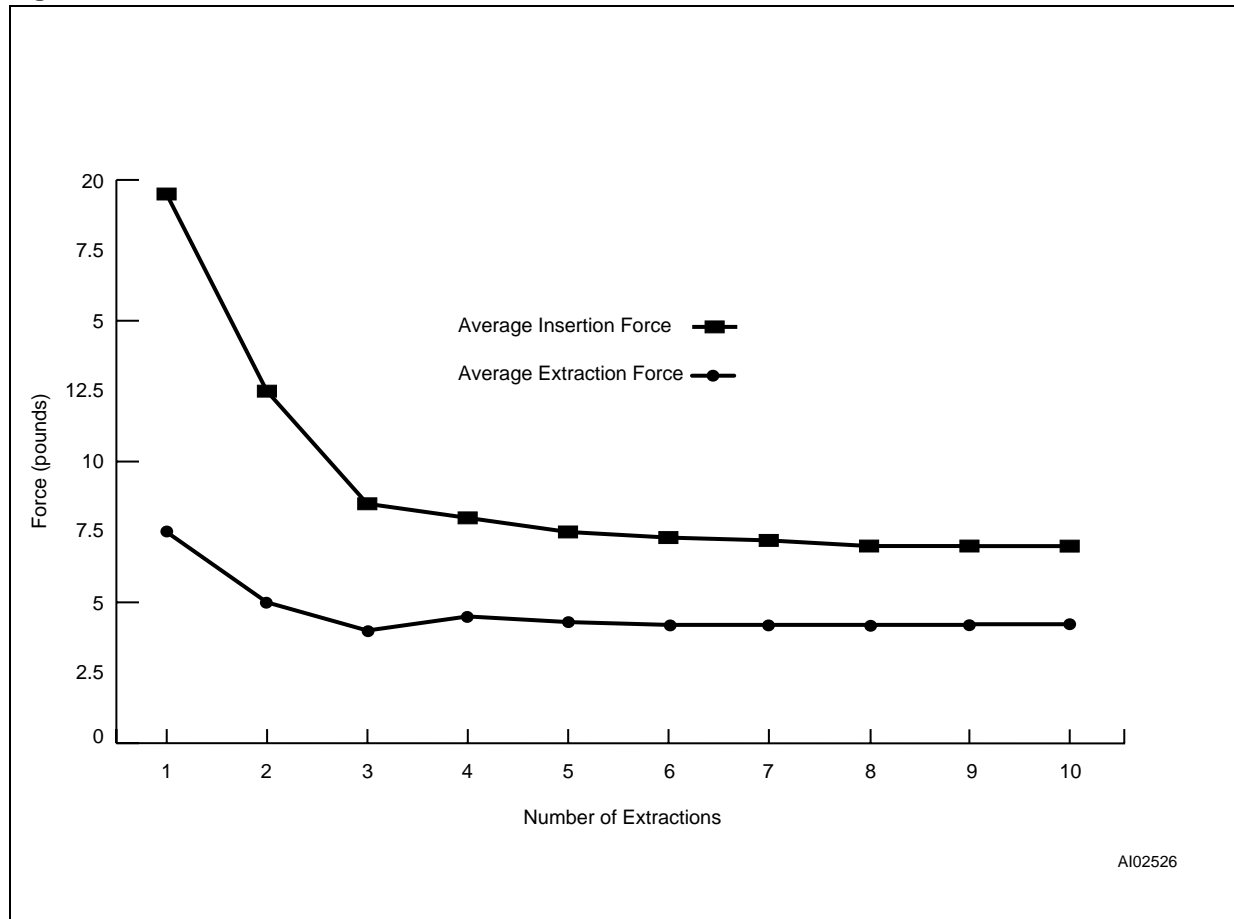
MECHANICAL INFORMATION

Electrical connection to the SOIC is made through two pins that connect to the press fitted sockets at one end of the SOIC. Critical contact points between the pins and sockets are gold-plated to resist oxidation. Internally, each socket contains six independent contact fingers to form redundant connections between the two components. These sockets were designed to provide high point contact force to provide the lowest possible contact resistance. The SNAPHAT® top also incorporates four molded-in retaining clips which hold onto the ends of the SOIC insuring mechanical and electrical connection even under severe mechanical shock and vibration. The combined SOIC and SNAPHAT assembly can sustain shock levels in

excess of 100 g without separating. This package also passes variable frequency testing in accordance with MIL-STD-883, method 2007.2, condition A.

Figure 2 illustrates the affect of repeated insertion and extraction of the SNAPHAT top to the SOIC. The force required to extract the SNAPHAT, and then to re-insert it, reduces each time. After three or four extractions, though, the reduction starts to become unnoticeable, and the force required remains at a fairly constant figure. Typically, though, the SNAPHAT will only need to be extracted and re-inserted once in its lifetime.

Figure 3. SNAPHAT Insertion/Extraction Forces



Battery Characteristics

Figure 3 illustrates the lithium coin cell discharge rate for a given load. This demonstrates the characteristically flat voltage level supplied by the battery until very near the end of its life. These discharge levels have been greatly accelerated in comparison to the normal, actual usage.

UL Recognition

The M4ZXX-BR00SH has been recognized by Underwriters Laboratories under their Component Recognition Program and carries U.L. File Number E89556.

Battery Life

For information on Data Retention Life and Battery Storage Life, please refer to the Application Note AN1012.

General Notes

To remove the SNAPHAT® top for replacement, a DIP/IC extractor tool should be used (see Figure 5). The SNAPHAT top should be grabbed by the narrow end to avoid bending the pins.

Caution: To avoid draining battery do NOT place SNAPHAT pins in a conductive foam.

Figure 4. Battery Discharge Rates

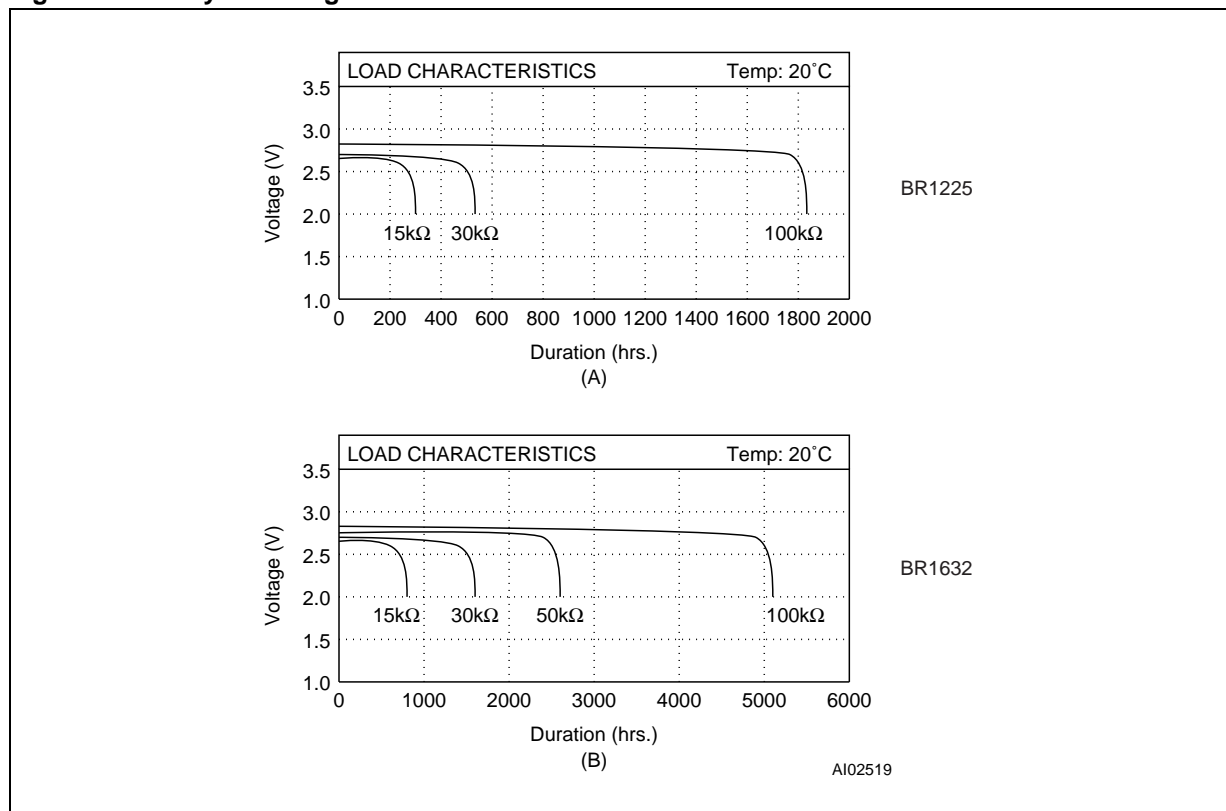
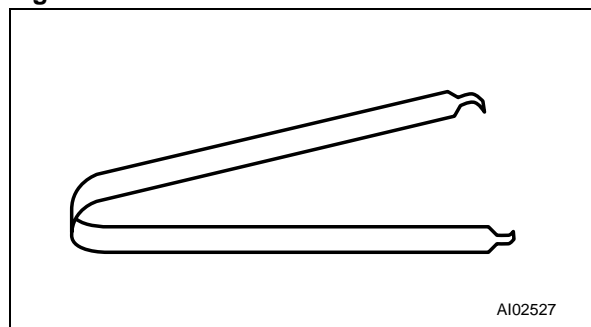


Figure 5. DIP Extractor Tool



PART NUMBERING

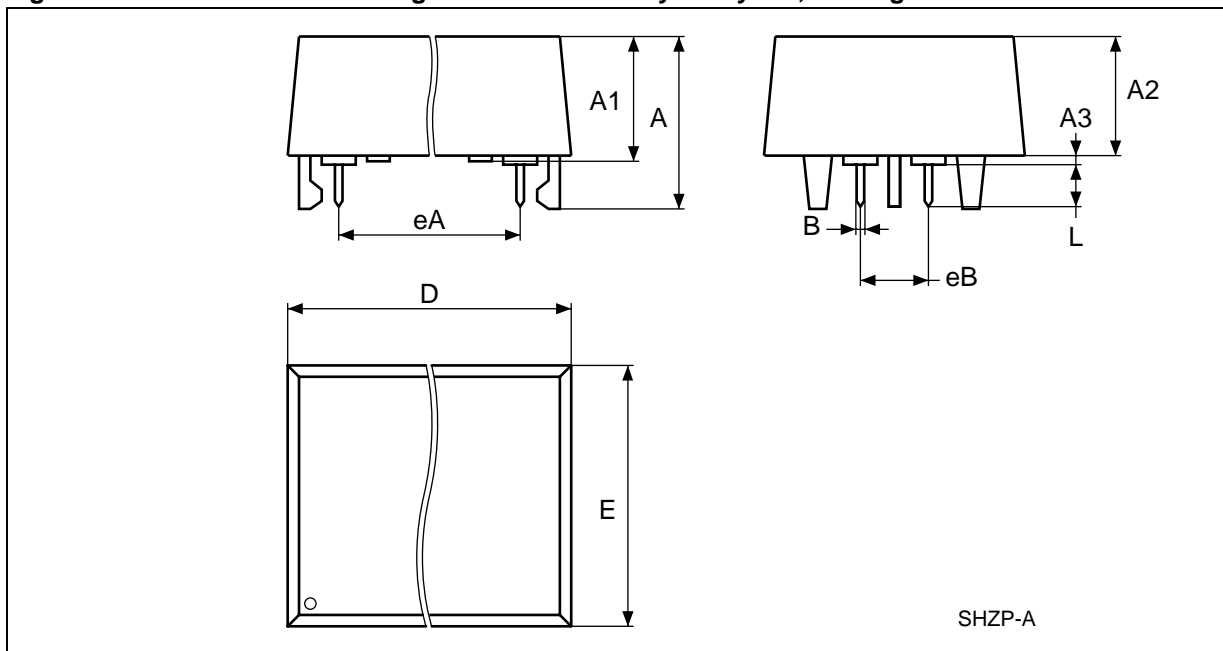
Table 4. Ordering Information Scheme

| Example: | M4Z | 28-BR00 | SH | 1 | TR |
|-------------------------------------|-----|---|---------------|-----------------------------------|-----------------------------------|
| Device Type | M4Z | | | | |
| Battery Voltage and Capacity | | 28-BR00 = BR1225, 3 V, 48 mAh 32-BR00 = BR1632, 3 V, 120 mAh | | | |
| Package | | | SH = SNAPHAT® | | |
| Temperature Range | | | | 1 = 0 to 70 °C 6 = -40 to 85°C | |
| Shipping Method | | | | | blank = Tubes TR = Tape & Reel |

For a list of available options (e.g., Speed, Package) or for further information on any aspect of this device, please contact the ST Sales Office nearest to you.

PACKAGE MECHANICAL INFORMATION

Figure 6. SH - SNAPHAT Housing for 48 mAh Battery & Crystal, Package Outline

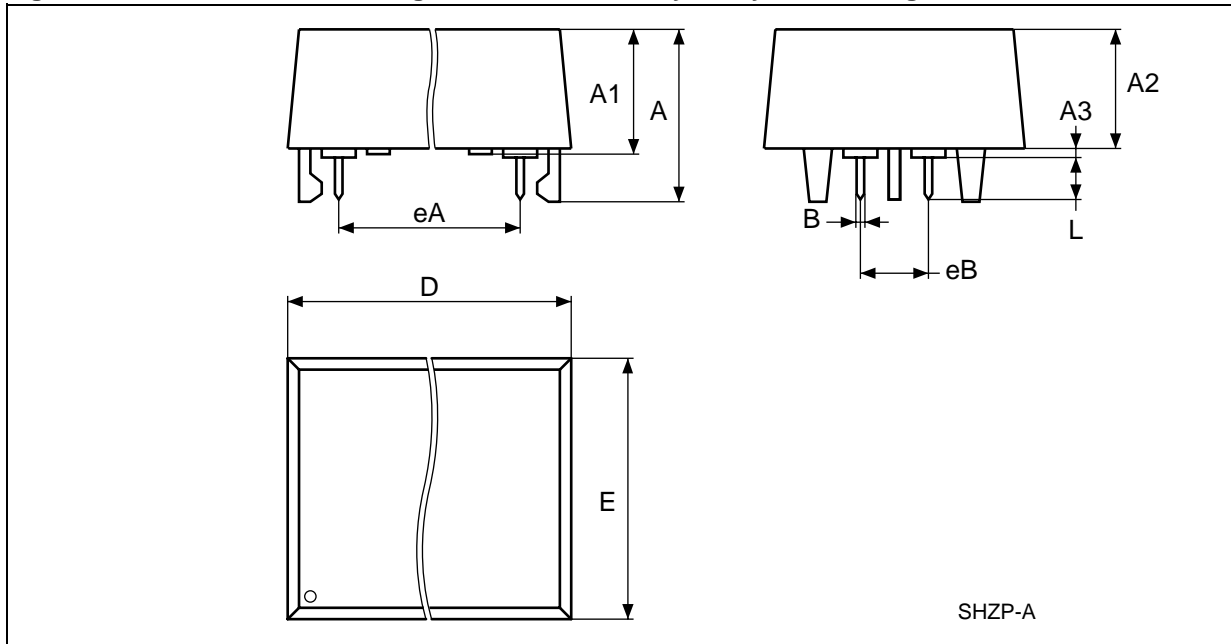


Note: Drawing is not to scale.

Table 5. SH - SNAPHAT Housing for 48 mAh Battery & Crystal, Package Mechanical Data

| Symb | mm | | | inches | | |
|------|-----|-------|-------|--------|-------|-------|
| | Typ | Min | Max | Typ | Min | Max |
| A | | | 9.78 | | | 0.385 |
| A1 | | 6.73 | 7.24 | | 0.265 | 0.285 |
| A2 | | 6.48 | 6.99 | | 0.255 | 0.275 |
| A3 | | | 0.38 | | | 0.015 |
| B | | 0.46 | 0.56 | | 0.018 | 0.022 |
| D | | 21.21 | 21.84 | | 0.835 | 0.860 |
| E | | 14.22 | 14.99 | | 0.560 | 0.590 |
| eA | | 15.55 | 15.95 | | 0.612 | 0.628 |
| eB | | 3.20 | 3.61 | | 0.126 | 0.142 |
| L | | 2.03 | 2.29 | | 0.080 | 0.090 |

Figure 7. SH - SNAPHAT Housing for 120 mAh Battery & Crystal, Package Outline



Note: Drawing is not to scale.

Table 6. SH - SNAPHAT Housing for 120 mAh Battery & Crystal, Package Mechanical Data

| Symb | mm | | | inches | | |
|------|-----|-------|-------|--------|-------|-------|
| | Typ | Min | Max | Typ | Min | Max |
| A | | | 10.54 | | | 0.415 |
| A1 | | 8.00 | 8.51 | | 0.315 | 0.335 |
| A2 | | 7.24 | 8.00 | | 0.285 | 0.315 |
| A3 | | | 0.38 | | | 0.015 |
| B | | 0.46 | 0.56 | | 0.018 | 0.022 |
| D | | 21.21 | 21.84 | | 0.835 | 0.860 |
| E | | 17.27 | 18.03 | | 0.680 | 0.710 |
| eA | | 15.55 | 15.95 | | 0.612 | 0.628 |
| eB | | 3.20 | 3.61 | | 0.126 | 0.142 |
| L | | 2.03 | 2.29 | | 0.080 | 0.090 |

REVISION HISTORY

Table 7. Document Revision History

| Date | Revision Details |
|---------------|-------------------------|
| November 1999 | First Issue |
| 03/01/01 | Reformatted |

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