

## SHELF LIFE OF DRY PACKED INTEGRATED CIRCUITS

### Shelf Life

Nordic Semiconductor's parts are generally shipped in moisture-barrier bags (MBB) labeled with a specific indication of calculated shelf life for the components in question.

Unless otherwise expressly noted, expectancy shelf life for dry packed parts is minimum 2 years from bag seal date, provided storage conditions of  $< 40^{\circ}\text{C}$  and  $< 90\% \text{ RH}$ . Within this period, and as long as the Humidity Indicator Card (HIC) does not indicate a need for re-baking, it is safe to reflow components per original MSL rating.

### Prolonged Storage

Customers that may require storage beyond standard shelf life are advised to follow all relevant recommendations outlined in JEDEC publication JEP160.

Following prolonged storage, products in question should be subjected to relevant tests prior board assembly, including but not limited to:

- Solderability Test (JESD 22-B102, J-STD-002 or similar test),
- Functional Test

### Floor Life

IPC/JEDEC J-STD-020 defines the classification procedure for moisture-sensitive components. The moisture sensitivity levels and corresponding floor life are following:

- Level 1 — unlimited floor life at less than or equal to  $30^{\circ}\text{C}/85$  percent RH
- Level 2 — one year floor life at less than or equal to  $30^{\circ}\text{C}/60$  percent RH
- Level 2a — four week floor life at less than or equal to  $30^{\circ}\text{C}/60$  percent RH
- Level 3 — 168 hour floor life at less than or equal to  $30^{\circ}\text{C}/60$  percent RH
- Level 4 — 72 hour floor life at less than or equal to  $30^{\circ}\text{C}/60$  percent RH
- Level 5 — 48 hour floor life at less than or equal to  $30^{\circ}\text{C}/60$  percent RH
- Level 5a — 24 hour floor life at less than or equal to  $30^{\circ}\text{C}/60$  percent RH
- Level 6 — time on label floor life at less than or equal to  $30^{\circ}\text{C}/60$  percent RH.

The MSL level is specified and can be found from the Product Specification.

**Humidity Indicator Card (HIC)**

Before opening, the MBB should be inspected for punctures or openings of any kind that might expose its contents. If openings are found, and the HIC indicates maximum humidity has been exceeded, be it within or beyond the Standard Shelf life, the parts in question should be re-baked according to instructions given in chapter "Drying of Parts".

**Drying of Parts**

If the Floor Life time is exceeded or the Humidity Indicator Card indicates excessive moisture after opening the MBB, baking is required prior to the reflow process in order to remove any moisture out of the plastic package.

Please note that standard packing material such as tape, reel, and tubes are considered low temperature carriers, and SMD packages may not be baked in these carriers at any temperatures higher than 40°C. Only high temperature trays are able to withstand baking process at 125°C. Nordic Semiconductor recommends using 125°C temperature for the baking.

The baking shall be done according to IPC/JEDEC J-STD-033 except for nRF9160 SiP module and otherwise be subjected to relevant testing prior use, ref. "Prolonged Storage" above.

nRF9160 SiP module is recommend to be baked 24hours in high temperature trays at 125°C. This is longer than specified in IPC/JEDEC J-STD-033 because the metal shielding around the package locks in moisture and can only escape through the substrate.

**Date Code policy**

Nordic Semiconductor's standard policy for integrated semiconductor devices is to ship products with assembly date codes no older than 5 years.

**Warranty**

Nordic Semiconductor's warranty terms are outlined in the company's Standard Terms & conditions.

**Important Notes**

The provisions of this document apply to products shipped on and after its effectivity date only.

Subject to change without prior notice.

Unanticipated factors other than moisture sensitivity can affect the total shelf life of components

**For any further inquiries relating to this statement, please contact your local sales representative.**