

4.2.4 Mounting

Power devices are housed in various types of package, such as modules, lead insertion packages, surface-mount packages and flat-type packages. The signal pins and the method of attaching the package to a heat sink (e.g. screwing, soldering or direct bond) are different for each type of package. For the screwing and direct bond heat sink attachment methods, there is a recommended tightening torque; in these cases all the screws must be tightened evenly (i.e. one screw should not be fully tightened while the rest are still only loosely tightened). Similarly, soldering should be performed with caution so that no thermal stress is applied to the device. To ensure that device reliability will not be impaired, devices must be fitted so that they remain within stipulated torque and stress limits. For details of these limits, refer to the relevant individual datasheets and databooks for the devices used.

4.3 Microcontrollers

4.3.1 Design

4.3.1.1 Using Resonators not Listed Under “Recommended Types”

Resonators recommended for use with Toshiba products in microcontroller oscillator applications are listed in Toshiba databooks along with information about oscillation conditions. If you use a resonator not included in this list, please consult Toshiba or the resonator manufacturer concerning the suitability of the device for your application.

4.3.1.2 Undefined Functions

In some microcontrollers certain instruction code values do not constitute valid processor instructions. Also, it is possible that the values of bits in registers will become undefined. Take care in your applications not to use invalid instructions or to let register bit values become undefined.

4.4 ASIC Products

4.4.1 Design

4.4.1.1 Verifying Power Dissipation

When conducting design verification, it is necessary to consider any temperature increase due to power dissipation by the device itself. It is important to estimate the power dissipation under actual device operating conditions with the device mounted on the printed circuit board.

4.4.1.2 Failure Detection Rate

Toshiba uses customer-approved test data in its production tests. In order to conduct an exacting and reliable production test, Toshiba requires test data with a high failure detection rate.