4.5 Bipolar ICs

4.5.1 ICs for automotive use

4.5.1.1 Design

⚠CAUTION

① If your design includes an inductive load such as a motor coil, incorporate diodes into your design to prevent negative current from flowing in. The load current generated by powering the device on and off may cause it to function erratically or to break down, which could in turn cause the device to explode resulting in injury to the user.

② Ensure that the power supply to any device which incorporates protective functions is stable. If the power supply is unstable, the device may operate erratically, preventing the protective functions from working correctly. If protective functions fail, the device may break down, causing the device to explode and resulting in injury to the user.

(1) System power supply and driver ICs generate heat. When using these devices, refer to the technical databooks entitled "ICs for Automotive Use" and the "General-Purpose Bipolar IC Databook", and incorporate sufficient heat radiation for the devices used into your design, so that the heat generated will not exceed the stipulated junction temperature (Tj) at which the ICs' internal heat-isolating protective circuits are activated.

(2) Power supply fuses
These ICs contain various protective circuits to prevent them from breaking down due to faulty wiring or when pulses of noise are input to the power supply. However, should the IC break down, a large current may continue to flow. To prevent this, use a fuse of the appropriate capacity for the power supply.
For information about the various types of protective circuit incorporated into the ICs, refer to the individual datasheets for the devices used.

4.5.1.2 Mounting

(1) Heat sinks
Depending on the type of package used (e.g. an HSIP7-P-2.54), a device's characteristics may be degraded if the package is attached to a heat sink using screws. In such cases please consult Toshiba or a Toshiba distributor.

4.5.2 Communication equipment ICs

4.5.2.1 Design

When using these devices in power amps (e.g. in speaker amps in telephones), be aware that because the current capacity of the output pins is so high, the device's DC output current may increase due to incorrect internal differential input offset level settings or due to the effects of external components (in particular, leak current from feedback resistors or NF capacitors). In some cases this will cause the product to generate heat or to catch fire. Take this into account when designing your product and choosing which components to use.

4.5.2.2 Mounting

Trends toward lightweight and compact design in mobile communications have resulted in the device-mounting board becoming vulnerable to distortion or deformation due to a lack of strength. This causes the devices to be imperfectly connected when mounted on the board. Therefore, carefully examine the board design and mounting methods to ensure that device pins are firmly connected to the board.

4.5.3 Audio/Video equipment ICs

These devices are designed for use in consumer electronics, typically in television and audio equipment. When using these devices in low-frequency audio amps, system power supply ICs, driver ICs or power ICs, pay attention to the following points:

4.5.3.1 Design

(1) Circuit design
Large leakage current in input or NF capacitors cause the DC output voltage of power ICs to increase. In this case, if the speaker's DC input withstand voltage is low, the speaker may emit smoke or catch fire.
This must be fully taken into account when selecting the types of capacitors and speakers to use, especially in the case of power ICs of the BTL (bridge-tied load) connection type, in which the DC output voltage is input directly to the speaker.

(2) Heat radiation
Power ICs, system power supply ICs and driver ICs generate heat. When using these devices, refer to the individual product datasheets and to the general audio/car audio LSI databooks, and incorporate sufficient heat radiation for the devices used into your design, so that the heat generated will not exceed the stipulated junction temperature (Tj = 150°C) at which the ICs' internal thermal shutdown protective circuits are activated.

Also, take into account the operating temperature ranges and characteristics of the peripheral components used with power ICs.

(3) Power supply fuses
These ICs contain various protective circuits to prevent them from breaking down due to faulty wiring or when pulses of noise are input to the power supply. However, should the IC break down, a large current may continue to flow. To prevent this, use a fuse of the appropriate capacity for the power supply.
For information about the various types of protective circuit incorporated into the ICs, refer to the individual datasheets for the devices used.

4.6 CCD Image Sensors

4.6.1 Storage

After removing the devices from their packing boxes, do not stack them directly on top of one another.

4.6.2 Mounting

(1) Mounting (1)
Dust or dirt sticking to the window glass surface can cause black flaws to appear in the image. Therefore, clean the window glass surface before using these devices. (For example, use a soft cloth or paper soaked in a small amount of organic solvent, such as

alcohol, to wipe off dust and dirt.)

(2) Mounting (2)
Toshiba recommends the use of an IC inserter or other appropriate tool to attach the devices to a printed circuit board. Also, it is recommended that the devices be attached without lead forming.