

# Strata DK Sales Bulletin

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## Strata DK Mean Time Between Failure

We are pleased to provide current Mean Time Between Failure (MTBF) rates for the Toshiba Strata DK8, DK16, and DK280 systems, and the 2000-series digital telephones. This information is intended to assist your sales efforts by substantiating Toshiba's reputation for producing excellent telecommunication products.

One of the primary customer concerns when purchasing business equipment is quality and reliability. Toshiba has established a well-deserved reputation for quality and reliability as a worldwide manufacturer of all types of electronic equipment.

This reputation has contributed significantly to our growth as one of the leading suppliers of telecommunication systems, and it is a key component of our marketing strategy. As such, it is important to have a method of measuring and quantifying just how reliable these products are.

### MTBF Rates

Based on actual field data compiled over a minimum of six (6) months, the minimum MTBF rates for the Toshiba Strata DK8, DK16, DK280, and 2000-series digital telephones are as follows.

- ◆ Strata DK 8, DK16, and DK280  
Major: **44.7** years  
Minor: **8.4** years
- ◆ 2000-Series Digital Telephones: **67.3** years

### Definition

Toshiba TSD distinguishes between the following two types of failures.

- ◆ **Major Failures** are those where a problem is diagnosed that renders the system completely inoperative.  
Parts used to calculate major failures in the Toshiba Strata DK280 are, equipment cabinets, common control components, and power supplies.
- ◆ **Minor Failures** are those where a problem is diagnosed that affects only part of the system, such as a single telephone circuit or trunk circuit failure.  
Parts used to calculate minor failures include all system and common control components, including trunk and station interfaces, but not telephones.

Because the same proprietary digital telephones are utilized throughout the Toshiba TSD product line, MTBF rates for them are provided separately.

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## Methodology

An industry standard method of determining reliability is through Mean Time Between Failure (MTBF) rates. Although an officially recognized way of calculating these rates does exist, various manufacturers use different information which can make their figures look better than they actually are. For example, some manufacturers count each circuit on a KSU, or PCB as one unit, so that an eight circuit card counts as eight units. This increases the total number of units in operation, so MTBF rates would be stated higher than normal. Toshiba believes that the method used and described below represents the most accurate statement of industry standard MTBF rates.

The following is a description of the industry standard method used by Toshiba America Information Systems, Inc., Telecommunication Systems Division (TAIS/TSD) to calculate MTBF rates for the Strata DK8, DK16, DK280, and 2000-series digital telephones.

### 1. Individual PCB/sub-assembly MTBF

- ✦ The total number of each component in the field is multiplied by the number of hours of operation.
- ✦ This number is then divided by the total number of reported failures during the same calendar period.

#### Formula:

$$\text{MTBF (hours)} = \frac{\text{(Number of pieces) X (Operation Time in Hours)}}{\text{Number of Failures}}$$

### 2. System MTBF: The MTBF for a group of components, such as those used in the Major and Minor system failure calculations, is calculated by adding the reciprocals of the individual MTBF values and then taking the reciprocal of that sum as follows.

- ✦ The individual component MTBF value is divided into 1 to produce the reciprocal.
- ✦ If more than one of that component (5 for example) is included in the system calculation, that reciprocal is multiplied by that quantity (5 in this example).
- ✦ All of the individual MTBF reciprocals are added together and that sum is divided into 1 to produce the total MTBF.
- ✦ Any necessary conversions are done to convert the value to years.

#### Formula:

$$\text{MTBF} = T \qquad T \text{ (total)} = \frac{1}{\frac{1}{T_1} + \frac{1}{T_2} + \frac{1}{T_3} + \frac{1}{T_N}}$$

## Selling Advantages

These Toshiba MTBF figures are very impressive and we welcome comparison with the MTBF rates of other manufacturers' telecommunication products. As authorized Toshiba dealers, you have the facts and figures to back up Toshiba's reputation for quality and reliability. Other manufacturers make the same claims, but they lack the quantifiable proof.

This type of data is very important in many selling situations in which prospective customers ask for statistical data to substantiate claims of superior reliability. This includes sales presentations, specific inquiries, and responses to RFPs issued by consultants and end users.

We are confident you will find this MTBF information very useful. If you have any questions or suggestions about this information, please call Jon Nelson at 714/583-3388.