

SquareTrade Research: 26% of iPhones fail over 2 years, a Decrease from 2009

Synopsis: SquareTrade analyzed iPhone failures for over 25,000 iPhones covered by SquareTrade Care Plans and found that one-quarter of iPhones experienced a failure in the first two years of use, which is lower than the failure rate found in the 2009 study.

Highlights of the study include:

- 25.6% of iPhone owners experienced a failure in the first two years of use. 18.1% reported a failure from accidental damage, while the remaining 7.5% reported a hardware malfunction, a significant drop from a year earlier when we only examined the 3G and original iPhone.
- Touchscreen reliability improved with the iPhone 3GS, which has had half as many touchscreen problems of the 3G in the first year.
- Loss and theft is a minor problem for the iPhone when compared to accidents and normal use failures.
- Drops and cracked screens accounted for over three-quarters of accidents, and liquid damage accounted for one in five accidents.

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iPhone Reliability: in the days leading up to iPhone 4

It's been a year since SquareTrade last examined the reliability of the iPhone. With Apple's much anticipated launch of iPhone 4 this week, we've taken another look at iPhone failure and accident rates to see how they've evolved over the past year.

This time around we examined customer-reported data from over 25,000 iPhone owners who have purchased the device since 2008. We consider hardware failures from normal usage ("malfunctions") separately from accidents ("accidents") in our analysis, and refer to "total failure rate" as the sum of failure rates due to malfunctions and accidents.

As seen in our previous study, accidents accounted for the majority of iPhone failures. 18.1% of iPhone owners reported a failure due to an accident in the first 24 months of ownership, and a further 7.5% of iPhone reported a non-accident related failure. This total failure rate of 25.6% over 2 years indicates that the average iPhone owner experiences significantly fewer total failures than 12 months ago, when we reported an expected failure rate of 33% over 2 years.¹

We also examined the different iPhone problem types reported for each model. While touch screen and power issues continued to be the most frequent problems overall—as found in our previous report—we saw a substantial drop in touchscreen issues in the 3GS.

To supplement our analysis of iPhone failures, we also surveyed iPhone owners to compare the frequency of loss and theft compared to failures. Surprisingly, loss and theft occurred far less often compared to accidents and malfunctions.

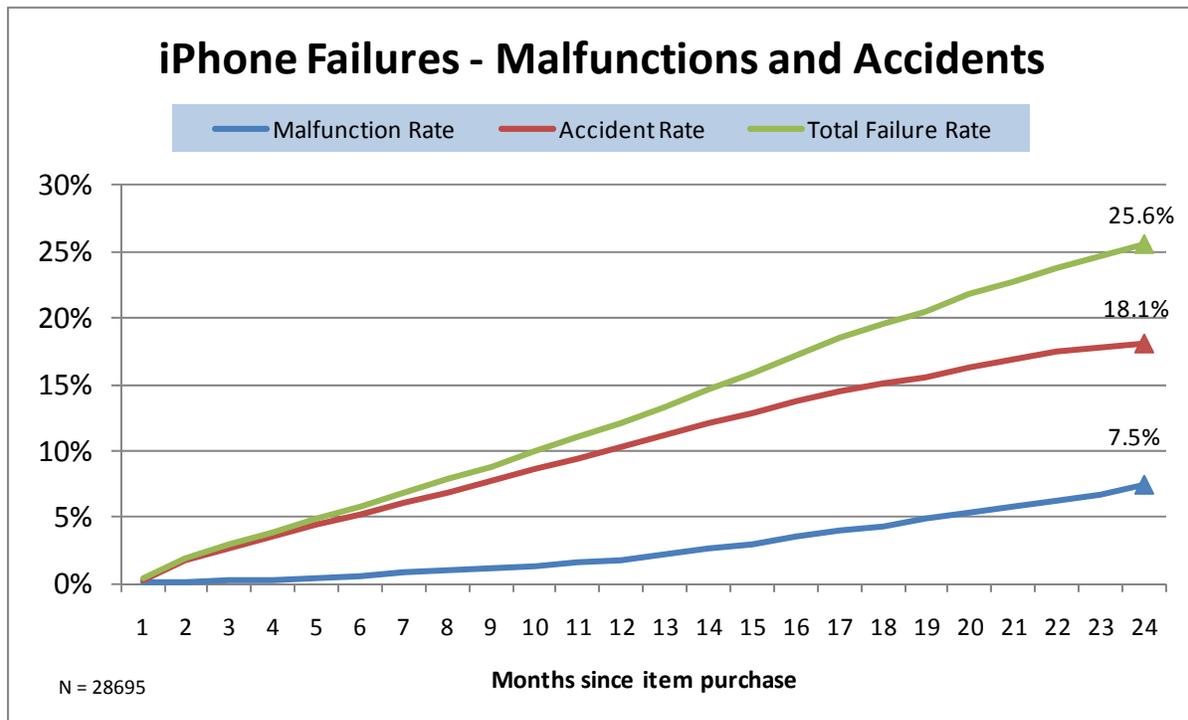
Finally we took a deeper look at the frequency and types of accidental damage reported to SquareTrade. Cracked screens account for an even larger majority of accidents.

¹ iPhone Failure Rates Study, published June 19, 2009. Available at: https://www.squaretrade.com/html/pdf/SquareTrade_iPhone_Study_0609.pdf

iPhone Failure Rates

In the first section of our analysis, we examined the overall iPhone failure rate over the course of 2 years. As shown in Figure 1 below, the failure rate over 2 years was 25.6%, with 7.5% of iPhone owners reporting a hardware malfunction to SquareTrade. Accidents accounted for over 70% of iPhone failures reported to SquareTrade, with 18.1% of owners experiencing a failure due to an accident. For those who hold onto their phone for an additional year, we forecast the 3 year total failure rate to end up in the 35-40% range.

Figure 1. Failure rates for iPhones



In comparing this to the results from our previous iPhone analysis conducted in June 2009, it is evident that the failure rates have come down. At this time last year, we saw a failure rate of 10% at month 22, now we are seeing a 7.5% failure rate at month 24. Some of the variation results from having a larger data set, particularly of phones that are over 12 months old. However, the first 12 months of 3GS data also indicate that the 3GS experiences at least 20% fewer failures than the 3G, mostly because of fewer touchscreen issues, as we will see later in this report.

Accident rates have also decreased, from 21% at month 22 in the last study, to 18% after 24 months in our current data set. This drop in accident rates suggests that the hardware changes made by Apple in the 3GS have made it slightly less prone to failures from accidents.

You may also notice the inflection point around month 12 for the Malfunction Rate curve. This is for two reasons. One is that the 3GS is trending to be more reliable, and none are older than 12 months. Also, just like any other manufacturer, some customers will choose to report problems covered by the manufacturer warranty directly to Apple, rather than coming to SquareTrade first. However, Apple's retail presence makes it much easier to deal with manufacturer warranty issues, compared to other manufacturers without a retail presence.

iPhone Hardware Problem Types

Next we get into some more detail on the types of hardware malfunctions that iPhones experience. First we will look at the distribution of every problem type reported to SquareTrade

In Figure 2 (next page), we divided reported malfunctions into the following problem categories:

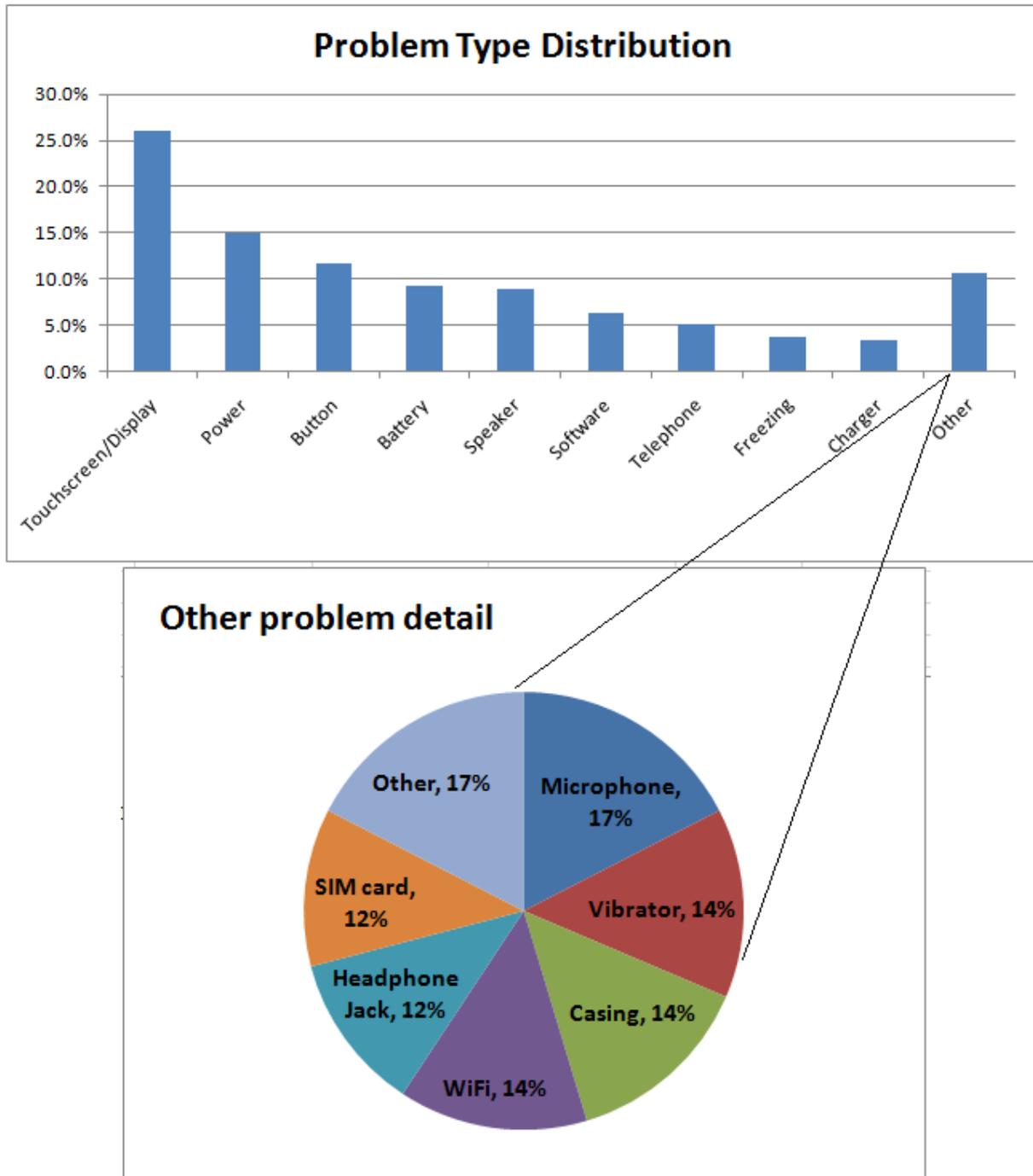
- **Touchscreen/Display.** Mostly bad pixels, white lines, blank screens, or screen is non-responsive
- **Software.** Includes operating system lockups, voice recognition software, etc.
- **Battery.** Primarily batteries that fail to hold a charge, but receives power from charger
- **Button.** Power button, main button, volume button or vibrator switch falling off or not responsive
- **Telephone.** Includes outbound calling, call reception, poor call quality
- **Power Issues.** Phone will not power on or it only powers up momentarily
- **Speaker.** Either phone speaker or external speakers not working
- **Freezing.** Phone locks up and is unusable. Some of these could be software issues, but they happen often enough to get their own category
- **Charger.** Charging port won't allow a connection, battery will not charge at all once charger is plugged in, or phone does not recognize being connected to a computer

The touchscreen topped the list of most common problem for the iPhone and accounted for over one-quarter of all reported problems. The most common complaints we heard involved unresponsive touchscreens that had white lines or had partially turned white.

Power problems accounted for 15% of failures and were the second most common failure. Usually this meant that the phone did not turn on at all. We tried to distinguish these from battery problems as much as possible.

We found it a bit surprising that the buttons were the 3rd most common problem, since buttons are a fairly simple part of the phone compared to other components. The most common complaint in this category involved the failure of the vibrator on/off switch.

Figure 2. Problem type distribution as a % of all problems reported to SquareTrade



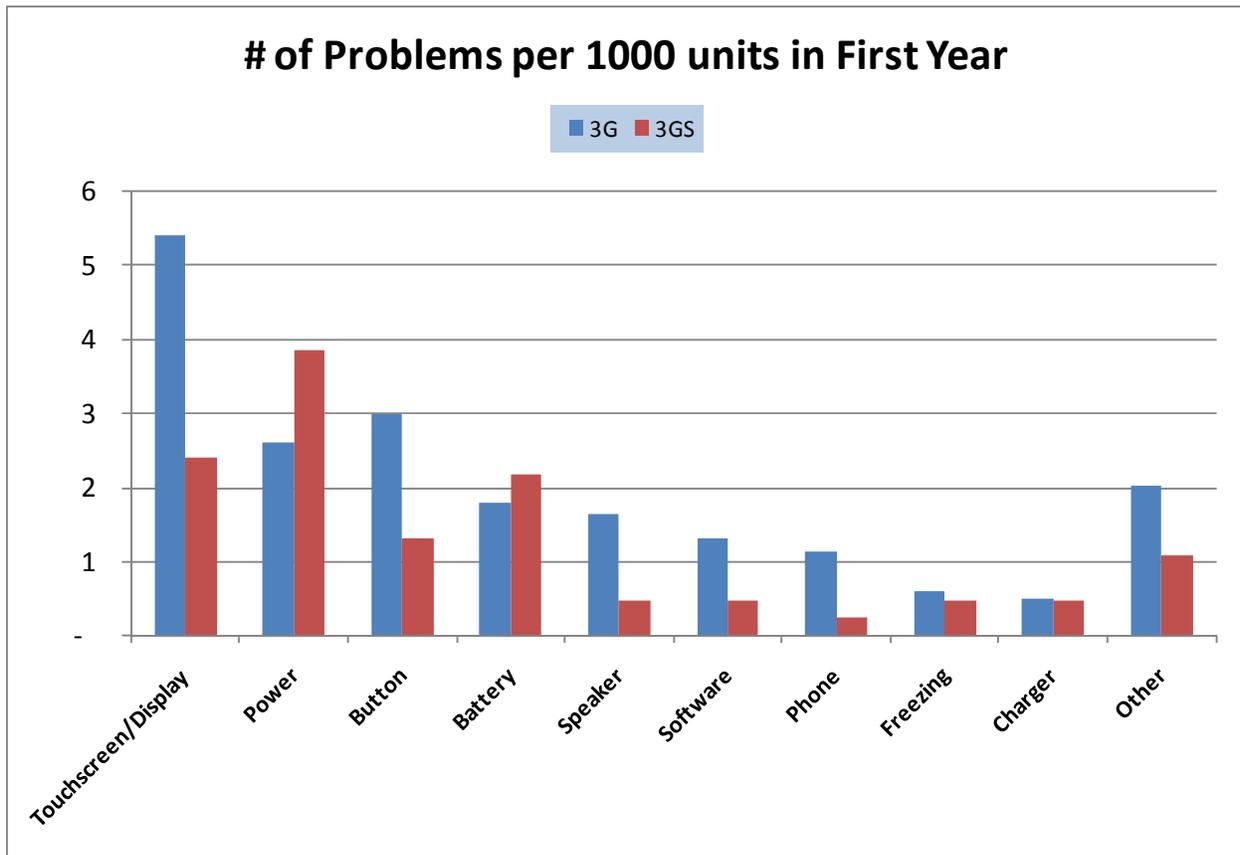
Next we compare problem types between the 3G and 3GS models.

3G vs. 3GS problem types

When we broke out problem types by model, we found that the 3GS had fewer problems across every problem type category, except with power and battery issues. The 3GS has almost a 50% greater chance of having a power issue than the 3G model.

Most notably, Apple may have made some significant improvements to the touchscreen, as there were far fewer issues with the 3GS touchscreens than the 3G. Even though touchscreen failures were still the second most frequently reported issue in the 3GS, the 3GS screen failed less than half as frequently as the 3G screen.

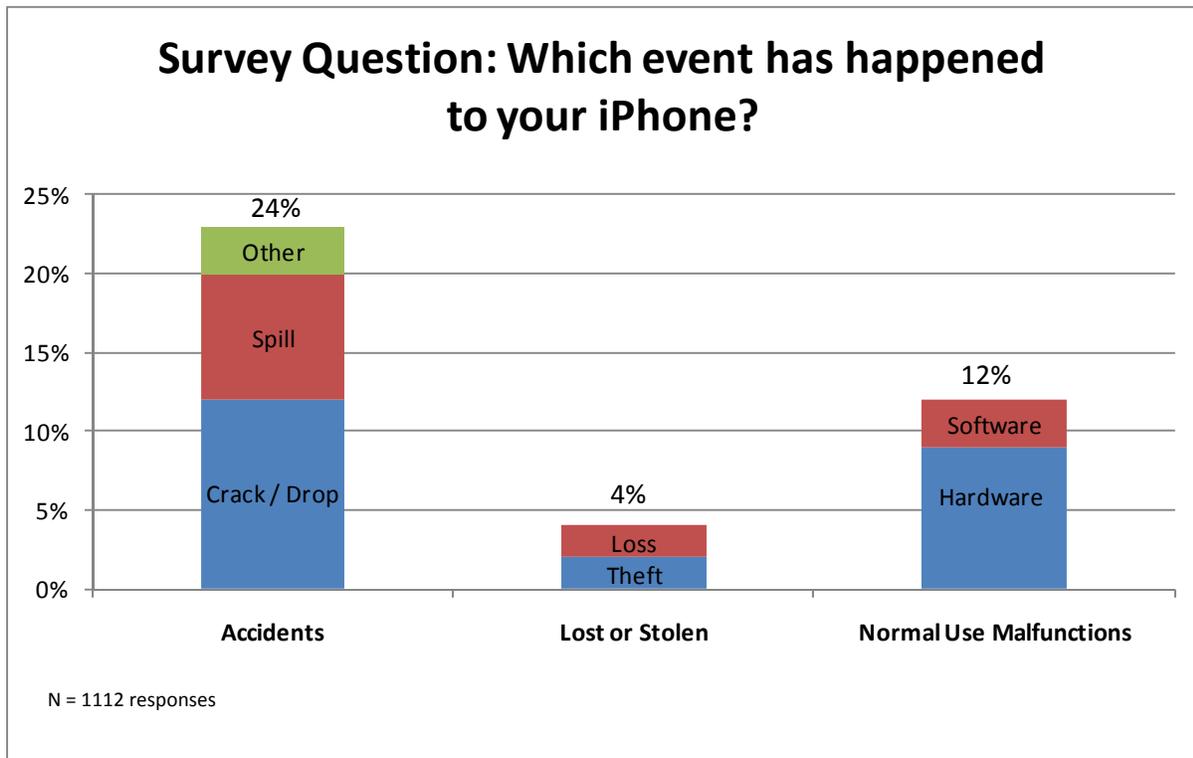
Figure 3. Number of problems per 1000 units sold



Accidents versus Loss

In addition to accidents, we looked into the question of how big an issue loss and theft were for iPhone owners, relative to failures caused by accidents and normal use. To do this, we surveyed a set of SquareTrade customers who had purchased their phones an average of 18 months ago, and found that loss/theft was a much smaller issue than either accidents or normal failures.

Figure 3. Number of survey respondents reporting each event



In figure 3, we see that while 24% of the surveyed group had an iPhone accident, and 13% experienced a normal use failure, only 4% had their phone lost or stolen. iPhone Customers are six times more likely to have their iPhone fail from an accident and three times more likely to have their iPhone fail from a normal use failure.

Cracks in the fragile glass screens are clearly the most frequent type of iPhone accident failure in the 3G and 3GS generation of iPhones. With the new glass backside to the iPhone 4, it will be interesting to see if it will result in a return of a higher likelihood of accidental damage. Conversely, it is possible there will be fewer issues if Apple has made significant improvements to the durability of the screen components.

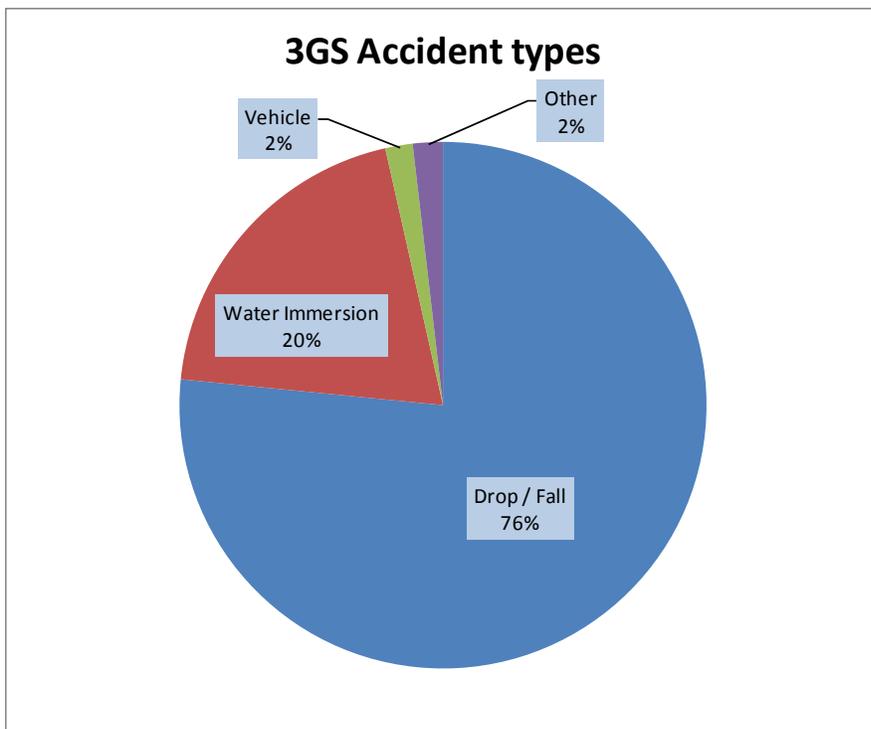
Types of Accidental Damage

Lastly, we briefly re-examined the types of accidents reported to SquareTrade for the 3GS model. Just like in our last report which focused on the 3G model, drops made up the majority of accidents as the cause of 76% of all accidents.

Liquid damage came in a distant second place, being the primary cause of failure in 20% of reported incidents.

Other accidents are rare. Occasionally we'll see the hungry pet or lawnmower accident, but those are far and few between.

Figure 5. Primary causes of failure from accidental damage



Conclusions on iPhone Reliability

As we have seen before, Apple has created one of the most reliable smart phones on the market, especially considering how the typical cell phone sees more use and abuse than any other consumer electronic item. While the 3GS model shows evidence of fewer touchscreen problems than the previous iPhone generation, we will keep a close eye on failure rates to see if the new construction of the iPhone 4 results in a higher rate of accidental damage.

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Appendix: Notes about the Data and Methodology Used

For this study, SquareTrade analyzed the failures reported by the owners of SquareTrade iPhone warranties. Included in this study were 12796 3GS, 12109 3G and 3824 original (edge) iPhone units. We included only items that were purchased brand new (i.e. not refurbished or used).

The following disclaimers apply to our data and analysis:

- Only malfunctions reported directly to SquareTrade are included in the data. Other malfunctions, including software/hardware issues handled directly by Apple, problems associated with product recalls, and those fixed by software/firmware updates, may not be represented in this data.
- We did not take into consideration purchase location.

Limitations:

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