

FIT Rate and FMD for LMT86-Q1

This document provides important information on the LMT86-Q1 (SC70 package) that can aid in functional safety system designs. This document discusses:

- The failure In Time (FIT) rates of the semiconductor component estimated by the application of industry reliability standards in combination with expert judgement
- The component failure modes and their distribution (FMD) based on the primary function of the device

Figure 1 shows the device functional block diagram for reference.

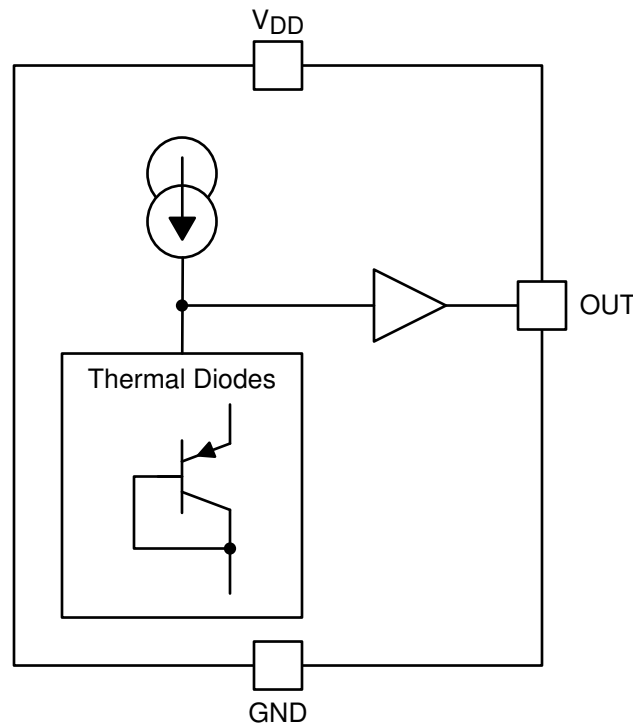


Figure 1. Functional Block Diagram

The LMT86-Q1 was developed using a quality-managed development process, but was not developed in accordance with the ISO 26262 standards.

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1 Failure In Time (FIT) Rates

This section provides Failure In Time (FIT) rates for LMT86-Q1 based on two different industry-wide used reliability standard. [Table 1](#) provides FIT rates based on IEC TR 62380 / ISO 26262 part 11.

Table 1. Component Failure Rates per IEC TR 62380 / ISO 26262 Part 11

FIT IEC TR 62380 / ISO 26262	FIT (Per 10 ⁹ Hours)
Total Component FIT Rate	4
Die FIT Rate	2
Package FIT Rate	2

The failure rate and mission profile information in [Table 1](#) comes from the Reliability data handbook IEC TR 62380 / ISO 26262 part 11:

- Mission Profile: Motor Control from Table 11
- Power dissipation: 1.0mW
- Climate type: World-wide Table 8
- Package factor lambda 3 Table 17b
- Substrate material: FR4
- EOS FIT rate assumed: 0 FIT

2 Failure Mode Distribution (FMD)

The failure mode distribution estimation for LMT86-Q1 in [Table 2](#) comes from the combination of common failure modes listed in standards such as IEC 61508 and ISO 26262, the ratio of sub-circuit function size and complexity, and from best engineering judgments.

The failure modes listed in this section reflect random failure events and do not include failures due to misuse or overstress.

Table 2. Die Failure Modes and Distribution

Die Failure Modes	Failure Mode Distribution (%)
VOUT open (HIZ)	15%
VOUT short to VDD	20%
VOUT short to GND	20%
VOUT not in specification	45%

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