

LMT87-Q1 Functional Safety FIT Rate and FMD

1 Overview

This document contains information for LMT87-Q1 (SC70 package) to aid in a functional safety system design. Information provided are:

- Functional Safety Failure In Time (FIT) rates of the semiconductor component estimated by the application of industry reliability standards
- 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.

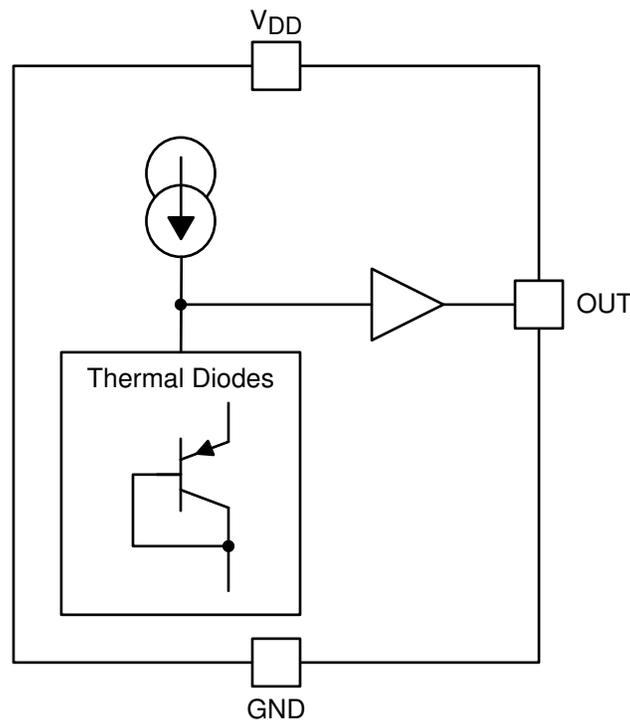


Figure 1. Functional Block Diagram

LMT87-Q1 was developed using a quality-managed development process, but was not developed in accordance with the IEC 61508 or ISO 26262 standards.

2 Functional Safety Failure In Time (FIT) Rates

This section provides Functional Safety Failure In Time (FIT) rates for LMT87-Q1 based on two different industry-wide used reliability standards:

- [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 (Failures 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: 1.0 mW
- Climate type: World-wide Table 8
- Package factor lambda 3 Table 17b
- Substrate Material: FR4
- EOS FIT rate assumed: 0 FIT

3 Failure Mode Distribution (FMD)

The failure mode distribution estimation for LMT87-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 judgment.

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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