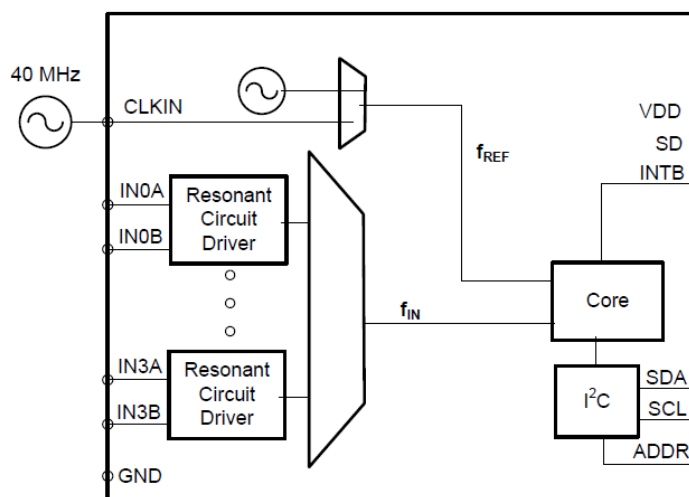


Functional Safety FIT Rate, Failure Mode Distribution

LDC1314-Q1

Multi-Channel 12-Bit Inductance to Digital Converter (LDC) for Inductive Sensing

Functional Block Diagram



Failure Rate Mission Profile (1)		Per 10 ⁹ Hours (FIT)
Total FIT Rate		11
Die FIT Rate		2
Package FIT Rate		9

FIT Siemens Norm SN29500 (2)			
Table	Category	Ref FIT λ_{ref}	Ref Virtual Tj $\theta_{vj,1}$
5	Digital, Analog, Mixed	60 FIT	70 C

Failure Modes	Failure Mode Distribution (%)
Device Functional Mode error	10%
Conversion Result error	20%
Device Status error	10%
Configuration or Setting error	35%
Conversion Gain/Offset drift	10%
I2C communication error	5%
INTB Fail to Trip or False Trip	5%
Short circuit any two pins	5%

(1) Failure Rate, Mission Profile and Failure Modes Distribution

The failure rate and mission profile information come from reliability modeling for Integrated circuits in Reliability data handbook IEC TR 62380 and ISO 26262 Part 11

Mission Profile: Motor Control from Table 11

Power dissipation 50 mW

Climate type: World-wide Table 8

Package factor lambda 3 Table 17b

Substrate Material: FR4

EOS FIT rate assumed = 0

(2) Reference failure rate, Virtual (equivalent) junction temperature

The reference failure rate and virtual junction temperature come from Siemens Norm SN29500-2 tables 1-5.

Failure rate for user mission profile is calculated using the reference failure rate and virtual junction temperature and following the calculation information in SN29500-2 section 4.

The failure mode distribution estimation 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 rates listed reflect random failure events and do not include failures due to misuse or over stress.

The LDC1314-Q1 is a catalog product and not compliant to ISO-26262 standards.

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