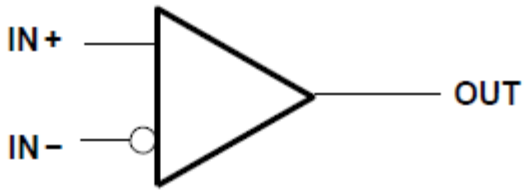
Functional Safety FIT Rate, Failure Mode Distribution TLC393-Q1

DUAL MICROPOWER LinCMOS™ VOLTAGE COMPARATOR

symbol (each comparator)



FIT IEC TR 62380 / ISO 26262-11 (1)	Per 10^9 Hours (FIT)
Total FIT Rate	10
Die FIT Rate	3
Package FIT Rate	7

FIT Siemens Norm SN29500 (2)			
Table	Category	Ref FIT λ_{ref}	Ref Virtual Tj $\theta_{vj,1}$
2	BiCMOS Comparators	4 FIT	45 C

Failure Modes	Failure Mode Distribution (%)
Out open (HIZ)	15%
Out saturate high	25%
Out saturate low	25%
Out functional not in specification	30%
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 1.0 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.

TLC393-Q1 was developed using a quality-managed development process, but was not developed in accordance with the ISO 26262 standards.

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