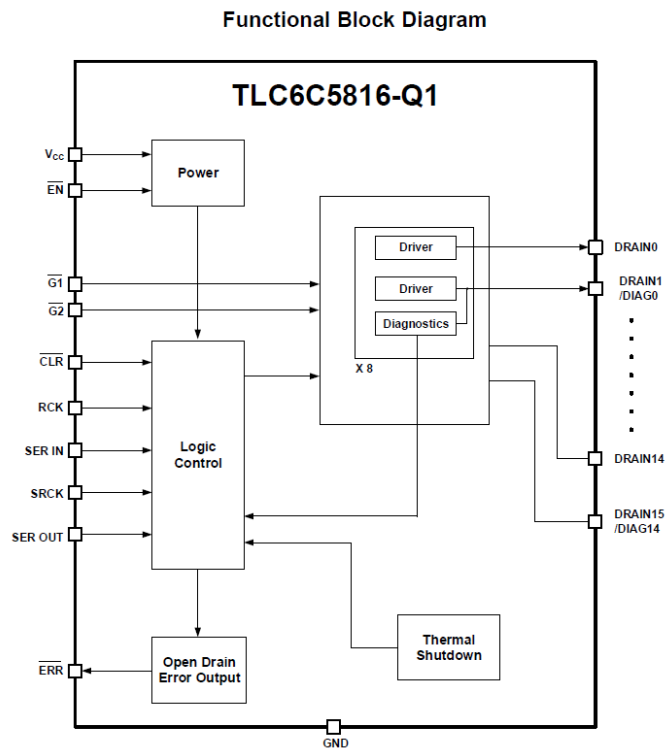


# Functional Safety FIT Rate, Failure Mode Distribution TLC6C5816-Q1

## Power Logic 16-Bit Shift Register LED Driver With Diagnostics



### FIT IEC TR 62380 / ISO 26262 (1)

Per 10<sup>9</sup> Hours (FIT)

Total FIT Rate

23

Die FIT Rate

4

Package FIT Rate

19

### FIT Siemens Norm SN29500 (2)

Table

Category

Ref FIT  $\lambda_{ref}$

Ref Virtual Tj  $\theta_{vi,1}$

5

Digital, Analog, Mixed

25 FIT

55 C

<b>Failure Modes</b>	<b>Failure Mode Distribution (%)</b>
Communication bus fail	15%
DRAINn output out of specification, current or timing	35%
DRAINn output stuck off	5%
DRAINn output stuck on	5%
ERR fails to trip or false trip	35%
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 from Reliability data handbook IEC TR 62380 / ISO 26262 Part 11

Mission Profile: Motor Control from Table 11

Power dissipation 500 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 under operating conditions are calculated from the reference failure rate and virtual junction temperature using conversion 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.

TLC6C5816-Q1 is a catalog product and not compliant to ISO-26262 standards.

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