



OMNITERM LPS Loop Splitter Module

Model C2464B Loop Splitter

RELIABILITY DATA

1. PRODUCT DESCRIPTION.

The models C2464B Omniterm LPS is a high-reliability Loop Splitter module. The LPS accepts a 0-25mA input and repeats this current signal on each of the two outputs. The outputs are isolated from the input and from each other.

Omniterm LPS is designed to operate with 4-20mA input range in safety-related applications, so that current output outside this range can be used for fault detection.

For detailed specifications consult the product datasheet.

2. CONDITIONS OF USE IN SAFETY-RELATED APPLICATIONS.

- The LPS must be used within its electrical and mechanical specifications.
- EMC environment must be “typical industrial environment” as specified in IEC61000-4-4.
- Input current range must be 4-20mA under normal conditions.
- The unit receiving the output signal (logic solver) must be able to recognise signals $\leq 3.6\text{mA}$ and $\geq 21\text{mA}$ as indication of a fault condition.
- For the purposes of this report only one output is considered as part of a Safety Function. The same results apply to the second output if it is also used in a safety function.

3. RELIABILITY INFORMATION.

Hardware reliability analysis yields the results as summarised in the Table below. The LPS has no software.

Subsystem	Type A
DC	81%
SFF	86%
PFD _{avg} , (TI = 1 year)	8.84×10^{-4}
PFD _{avg} , (TI = 2 years)	1.76×10^{-3}
MTBF (in years)	80.2
λ (total)	1423 FIT
λ_{SD}	40 FIT
λ_{SU}	344 FIT
λ_{DD}	839 FIT
λ_{DU}	200 FIT

An MTTR of 8hrs was used in the above PFD calculations. For compliance with SIL requirements, see “Explanation of results”.

KEY:

DC = Diagnostic Coverage	λ = failure rate per billion hours (1 FIT = 1 failure in 10^9 hours)
SFF = Safe Failure Fraction	Failure Rate Categories:
PFD = Probability of Failure on Demand	SU = Safe Undetected
TI = Test Proof Interval	SD = Safe Detected
MTBF = Mean Time Between Failures	DU = Dangerous Undetected
MTTR = Mean Time To Repair	DD = Dangerous Detected





4. EXPLANATION OF RESULTS.

Any hardware failure, which does not affect output current accuracy is considered a safe failure. Any hardware failure which results in output current becoming smaller than 3.6mA or greater than 21mA is considered a 'dangerous-detected' failure.

Any hardware failure, which affects LPS output accuracy, with current remaining in the 4-20mA range, is deemed a 'dangerous-undetected' failure. The Omniterm LPS module does not generate independent diagnostic signals.

In the analysis only the failures of one channel, which is used in the safety function, are considered. The failures of the other channel are only considered if they affect the safety function. All other failures of the second channel are not relevant to the safety function and are not included in the MTBF or λ figures.

PFD figures for the LPS with Proof Test Interval of 1 year are better than the SIL2 requirements of EN61508-1 par. 7.6.2.9, Table 2. Since LPS is only one part of the entire safety function it should not claim more than 10% of the required PFD range. It fulfils this requirement as well. The results also exceed the requirements of IEC61508-2 par. 7.4.5.4 Table 2 for SIL2 Type A subsystems without hardware fault tolerance.

PFD figures for Proof Test Interval of 2 years are better than the SIL1 requirements of EN61508-1 and fulfil the requirement not to claim more than 10% of allowed range.

The listed failure rates are valid for operating stress conditions of a "typical industrial environment" similar to that specified in IEC61000-4-4 with an average temperature over a long period of time not greater than 40°C.

A user of the model C2464B Omniterm LPS and module can utilise the failure rates presented in this report in order to determine Safety Integrity Level (SIL) of the entire safety function.

5. DISCLAIMER

This datasheet provides reliability figures only. Omniflex does not assume responsibility for the correct and safe application of the LPS and its reliability data. In safety-related applications, it is the user's responsibility to comply with all other requirements of EN61508, which may be applicable to the safety system in question.

Omniflex reserves the right to change specifications without notice.

