

Application Note AN-76

Failure Mode and Effect Analysis

BridgeSwitch Family

Device information

Please refer to BridgeSwitch data sheet for pin assignment. Refer to Figure 1 for the package information.

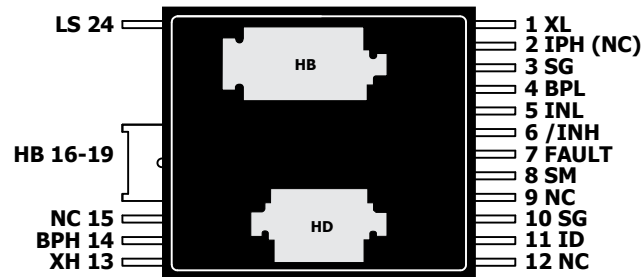


Figure 1. Part Under Test.

Test Results Summary

Adjacent Pin-to-Pin Short Test

Fault Mode	Operation Condition		Operation Behavior Notes	
	Start-up	During Operation	Start-up	During Operation
XL to IPH short	No failure	No failure	Device switching disabled	Low-side switching is disabled
IPH to SG short	No failure	No failure	normal operation with no IPH signal	normal operation with no IPH signal
BPL to SG short	No failure	No failure	Device non operational	Device switching is disabled device case temperature will rise
BPL to INL short	No failure	Safe failure	Device non operational	Device non-operational, INL pin damaged, INL pin shorted to SG
INL to /INH short	No failure	No failure	Normal Operation	Normal operation
/INH to FAULT short	No failure	No failure	Device switching disabled	Device switching disabled
FAULT to SM short	No failure	No failure	Normal operation	Normal operation
SM to NC short	No failure	No failure	Normal operation	Normal operation
NC to SG short	No failure	No failure	Normal operation	Normal operation
SG to ID short	No failure	No failure	Normal operation	Normal operation
ID to NC short	No failure	No failure	Normal operation	Normal operation
XH to BPH short	Safe failure	Safe failure	Device non-operational, XH pin is damaged safely	Device non-operational, XH pin is damaged safely
BPH to NC short	No failure	No failure	Normal operation	Normal operation
NC to HB short	No failure	No failure	Normal operation	Normal operation

Pin Open Test

Fault Mode	Operation Condition		Operation Behavior Notes	
	Start-up	During Operation	Start-up	During Operation
XL open	No failure	No failure	Device switching disabled	Device switching disabled
IPH open	No failure	No failure	Normal operation, no IPH feature as expected	Normal operation, no IPH feature as expected
SG open (one at a time)	No failure	No failure	Normal operation	Normal operation
BPL open	No failure	No failure	Device non operational	Device non operational
INL open	No failure	No failure	Device switching disabled, note short-circuit loop is <2 inch length	Device switching disabled, note short-circuit loop is <2 inch length
/INH open	No failure	No failure	Device switching disabled	Device switching disabled
FAULT open	No failure	No failure	Normal operation with no FAULT feature as expected	Normal operation with no FAULT feature as expected
SM open	No failure	No failure	Normal operation with no SM feature as expected	Normal operation with no SM feature as expected
ID open	No failure	No failure	Normal operation, as one of the ID pin configurations	Normal operation, as one of the ID pin configurations
XH Open	No failure	No failure	Device switching disabled	Device switching disabled
BPH open	No failure	No failure	Device switching disabled, note no probe is connected	Device switching disabled, note no probe is connected
LS open	Safe failure	Safe failure	Device non-operational, BPL pin is damaged safely	Device non-operational, BPL pin is damaged safely

Logic Pin Short to Logic Ground (SG Pin)

Fault Mode	Operation Condition		Operation Behavior Notes	
	Start-up	During Operation	Start-up	During Operation
XL to SG short	No failure	No failure	Device switching disabled	Device switching disabled
IPH to SG short	No failure	No failure	Normal operation with no IPH signal	normal operation with no IPH signal
BPL to SG short	No failure	No failure	Device non operational	Device switching is disabled, device case temperature will rise
INL to SG short	No failure	No failure	Device switching disabled, note test with INL / INH tied together	Device switching disabled, note test with INL / INH tied together
/INH to SG short	No failure	No failure	Device switching disabled, note test with INL / INH tied together	Device switching disabled, note test with INL / INH tied together
FAULT to SG short	No failure	No failure	Normal operation with no FAULT feature as expected	Normal operation with no FAULT feature as expected
SM to SG short	No failure	No failure	Normal operation with no SM feature as expected	Normal operation

High-Side Driver Logic Pin Short to Half-Bridge Connection (HB Pin)

Fault Mode	Operation Condition		Operation Behavior Notes	
	Start-up	During Operation	Start-up	During Operation
XH short to HB	No failure	No failure	Device switching disabled	Device switching disabled
BPH to HB short	No failure	No failure	Device switching disabled	Device switching disabled

Revision	Notes	Date
A	Initial Release.	06/18

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