Life Testing and Life Expectancy

A life test is a destructive test conducted to ensure the reliability of reed switches for different combinations of voltage, current, and operating frequencies. The parameters tested during a life test are OAT, RAT, CR, and operate and release times.

Measurement parameters

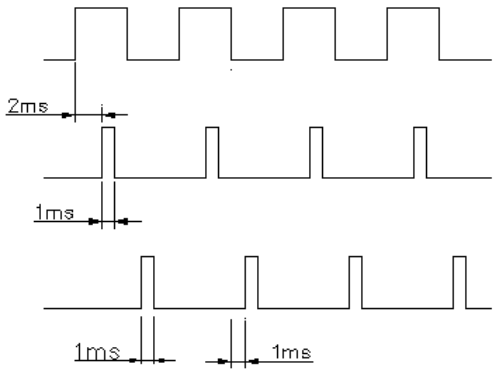
Test current - Rated current of the particular reed switch type.
Test voltage - Rated voltage of the particular reed switch type.
Operating time - monitored for 1 ms, 2ms from contact make
Release time - Monitored 1 ms, 1ms from contact break
Operating frequency - 1 to 25 Hz for standard size reed switches and 25 to 125Hz for miniature reed switches at 50% duty cycle
contact resistance - less than 5% of test load
coil drive - 25% overdrive

Failure Criteria

Contact resistance exceeds 5% of test load at contact make
Contact resistance less than 500% of test load at contact break
Missed operation during make or break (failure to make or break)
Reed Switch weld

Windows

After the test environment is set up for the required load current and voltage, the reed switches are subject to continuous 'make' and 'break' operations. When the make operation occurs, the rated current flows through the reed switch for the 'make' time and when the break operation occurs the contacts are open and no current flows. The rated voltage continues to be present across the open contacts of the reed switch during this period.



A 'failure to make' is identified by monitoring the status of the reed switch, 2 ms after the coil is energized, continuously for 1 ms. If in the 1 ms monitor window, the reed switch 'breaks' or fails to close, then it is considered as a 'failure to make'. A 'failure to break' is identified by monitoring the status of the reed switch 1 ms after the coil is de-energized, continuously for 1 ms. If in the 1 ms monitor window, the reed switch 'makes' contact or fails to open, then it is considered as a 'failure to break'. The process is repeated through out the life test, for the expected number of operations, or until the reed switch fails. During this period the contact resistance is monitored from time to time so that the actual behaviour of the reed switch under load is understood.