

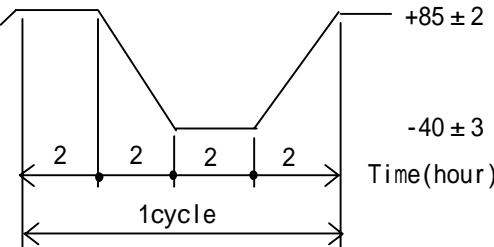
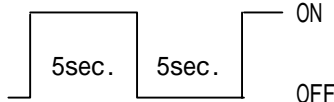
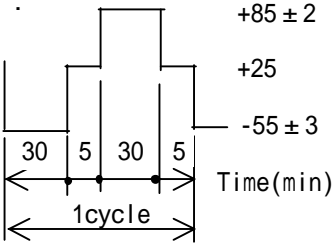
VFD RELIABILITY TEST

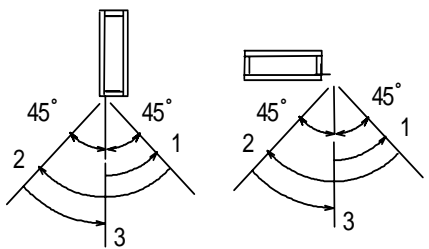
12-Nov-07

NO. TT-07-3081A

NORITAKE ITRON CORPORATION

Quality Assurance Dept.

Test Item		Test Conditions	Criteria
Function Durability Test	Life	Time : 1000hours on at room temperature Drive condition : Standard operating drive	A
	High Temperature Operation	Temperature : 85 ± 2 Duration : 96hours Drive condition : Standard operating drive	A
	Low Temperature Operation	Temperature : -40 ± 3 Duration : 96hours Drive condition : Standard operating drive	A
	Temperature Cycling	Condition :  Cycle : 25cycles Drive condition : Standard operating drive	A
	Filament On-Off	Condition : 5seconds on/5seconds off  Cycle : 20000cycles Drive condition : Filament voltage=Maximum	B
Environmental Test	High Temperature Storage	Temperature : 85 ± 2 Duration : 96hours Drive condition : Storage test	A
	Low Temperature Storage	Temperature : -50 ± 3 Duration : 96hours Drive condition : Storage test	A
	Humidity (steady state)	Temperature : 40 ± 2 Humidity : 90 ~ 95%RH (No dewing) Duration : 96hours Drive condition : Storage test	C
	Thermal shock	Condition :  Cycle : 5cycles Drive condition : Storage test	E

Test Item		Test Conditions	Criteria
Physical Characteristics Test	Vibration	Frequency : 10 ~ 55 ~ 10Hz Total amplitude : 1.5mm Sweep time : 1minute Duration : X・Y・Z=2hours Drive condition : Storage test	D
	Shock	Acceleration : 980m/s ² Duration time : 6ms Shock time : XX'・YY'・ZZ'=3times Impulse wave : Half sine wave Drive condition : Storage test	D
	Solderability	Solder sort : Sn-0.5Cu-3.0Ag Flux : rosin base Solder pot : 245±5 Flood time : 3~5seconds Flood area : Dip 3.0mm from the edge of the glass substrate	F
	Soldering heat	1.Solder pot : 350±10 Flood time : 3±1/0seconds 2.Solder pot : 260±5 Flood time : 10±1seconds It is immersed from a glass substrate to 3mm at the conditions of either 1 or 2.	D
	Lead Fatigue<Pull>	Weight : S Minimum across section area on the each terminal S<0.2mm ² 5.0N S 0.2mm ² 10.0N Keep time : 10±1seconds	G
	Lead Fatigue<Bend>	Weight : 2.5N An angle bend : Right and left45°=90° Cycle : 2cycles(The following figures 1~3 1cycle) 	G

CRITERIA

The sign of judgment	Contents of judgment
A	Electric characteristic shall be satisfied approved specification. The brightness shall be not less than 80% of Min. be of specification.
B	No filament wire broken.
C	No corrosion of a terminal and crack , lack part.
D	No lack part and crack.
E	Electric characteristic shall be satisfied approved specification. The brightness shall be not less than 80% of Min. of specification. Unusual lack part and crack.
F	Lead pin surface area shall be solder more than 90%.
G	Terminals and a part attaching terminal shall be no damaged and no cracks.

Notes1 ; Except an environmental temperature test when there is no specification it carries out at room temperature.

Notes2 ; High temperature, low temperature, and a thermal shock test should be satisfied the standard after 24 hours with room temperature.