सुक्ष्म, लघु एवं मध्यम उद्यम
MICRO, SMALL & MEDIUM ENTERPRISES
MSME - TECHNOLOGY DEVELOPMENT CENTRE,
MUMBAI

TEST REPORT

Cert. No. T-1358

Accreditation Field: Electrical Testing
Accreditation Valid upto: 01.01.2017
Work Order No. : WO/ETL/063/16-17
Date : 01.08.2016

NABL Accreditation No.: T-1358
Test Report No. :TR/ETL/108/16-17
Date of Testing : 22.08.2016

Test Item : Dual Channel Alpha Beta Radiation Counter

Tested for : M/s. Electronic Enterprises (India) Pvt. Ltd.,
306, Nimesh Indl. Estate,90 Feet Cross Road, Mulund (E), Mumbai - 400 081, Maharashtra, India

Tested at : IDEMI MUMBAI

Specification of Items under test	Specification of Standards Used
Manufacturer : M/s. Electronics Enterprises (India) Pvt. Ltd., Mumbai	Refer page 2 for specification of std. used.
Condition of Item on Reciept : Good	
Range /Rating : 230V AC, 50Hz	
Sr. No. : 1646	
Model No.: ---	
Sample No. : 001	Traceability: Standard used are traceable to National / International Standards

Ambient Conditions :

Temperature : 25°C ± 2.5 °C Relative Humidity : 35 % to 65%

Remarks : Please refer page 2 to 11 for Test Results.

1) Test Specification : The above mentioned item is tested for
   1. **Radiated RF Susceptibility Test : IEC 61000 - 4 - 20 : 2010**
   2. **Conducted RF Susceptibility Test : IEC 61000 - 4 - 6 : 2013**
   3. **Surge Immunity Test : IEC 61000 - 4 - 5 : 2005**
   4. **Electrostatic Discharge Test (ESD) : IEC 61000 - 4 - 2: 2008**
   5. **Power Frequency Magnetic Field Test : IEC 61000 - 4 - 8 : 2009**
      & as per customer's requirement.

C. M. PATIL
ASST. DIRECTOR
AUTHORISED SIGNATORY

ELECTRICAL TESTING LABORATORY

Sample. No. : 001
Date of Testing : 22.08.2016

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Standards/ Equipments used for testing:

Sr. No.	Name of Standards / Equipment	Model No.	Sr. No.	Calibration Validity
1.	Radiated RF EMF Immunity Test System			
i	Signal Generator	SML 02	101408	May 2017
ii	Power meter with power head	PM 2002 PH 2000 PH2000	311639 311215 311216	March 2017
2.	Electrostatic Discharge Generator	ESD 30 N	P1251107892	May 2017
3.	Ultra Compact Simulator	UCS 500 N7	V0944105303	May 2017
4.	Continuous Wave Generator	CWS 500 N1	V1111109081	May 2017

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1. EQUIPMENT UNDER TEST (EUT)

1.1. Brief Description

Dual Channel Alpha Beta Counter is a micro-controller based, economical, stand alone, mains operated instrument for Dual Channel Nuclear Counting application for Alpha – Beta radiations. It is a versatile instrument designed to cater the counting application requirements

Dual Channel Alpha Beta Counter uses Composite Detector (Plastic Scintillator and ZnS(Ag) Scintillator) for detection and measurement of alpha / beta radiation

It is useful for radiation counting for Health Physics applications in radioisotope laboratories, nuclear reactors, nuclear power plants, nuclear medicine centers etc.

1.2 Operating condition & set parameters of EUT During the Testing

- EUT is energized with 230V AC, 50 Hz
- The composite detector is connected to the EUT through coaxial cable.
- The following parameters are set
  HV : 800V (Dial: 7.28)
  Time : 1800 sec.
  Run : 1
- 'Run' Mode is selected & the counter is started.

1.3 Performance Check before, during & after test

- The Dual Channel Alpha Beta Radiation Counter should not get switch OFF or There should not be any malfunctioning in operation.
- During 1800 sec the alpha counts should not exceed 10 counts.
- During 1800 sec the beta counts should not exceed 300 counts.

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1.4 Acceptance Criteria

Performance Criteria – 'A'

Normal performance within limits specified by the manufacturer, requestor or purchaser.

Performance Criteria – 'B'

Temporary loss of function or degradation of performance which ceases after the disturbance ceases, and from which the equipment under test recovers its normal performance, without operator intervention.

Performance Criteria – 'C'

Temporary loss of function or degradation of performance, the correction of which requires operator intervention.

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2. RADIATED RF SUSCEPTIBILTY TEST

a. Test Rationale :

To study the immunity characteristics of the EUT when subjected to continuous Radiated RF Field.

b. Test Condition :

Set-up	:	As per IEC 61000-4-20: 2010
Field Strength	:	10 V/m
Frequency Band	:	80 MHz - 1000 MHz
Modulation	:	80% AM @ 1 kHz
Dwell Time	:	3 Sec.
Incremental Steps in Frequency	:	1%
Operating condition	:	EUT operating condition as per Sr. No. 1.2

c. Requirements :

Performance Criteria 'A'

d. Observations :

No degradation or any malfunctioning in the essential performance was observed during & after the test. The Alpha & Beta count was found to be within limit after the test.

e. Result :

Complied. (Meets Criteria 'A')

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3. CONDUCTED RF SUSCEPTIBILITY TEST

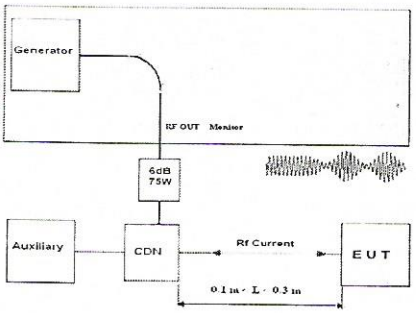
a. Test Rationale:

To check Immunity characteristics of EUT when subjected to continuous conducted Noise

b. Test Condition:

Set-up	:	As per IEC 61000-4-6: 2013
Frequency	:	150 kHz - 80 MHz
Modulation	:	80% AM @ 1kHz
Amplitude	:	10 V
Simulation	:	Direct Injection
EUT Operating Condition	:	EUT operating condition as per Sr. No. 1.2

c. Test Procedure:



Noise in the above frequency range was superimposed on AC mains using a 150 Ω CDN and the operation of the equipment was monitored.

d. Requirements:

Performance Criteria 'A'

e. Observations:

No degradation or any malfunctioning in the essential performance was observed during & after the test. The Alpha & Beta count was found to be within limit after the test.

f. Results:

Complied (Meets Criteria 'A')

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4. SURGE IMMUNITY TEST

a. Test Rationale:

To check immunity characteristics of the EUT against Surges generated because of capacitive bank Switching Faults, Lightning and the like.

b. Test condition:

Set up	:	As per IEC 61000-4-5: 2005
Pulse	:	1.2/50 µs
Pulse Amplitude	:	Mains: Differential Mode: ± 2kV Common Mode: ± 2kV
No of Transients	:	Five in Each Mode
Simulation Method	:	Mains direct injection
EUT Operating condition	:	EUT operating condition as per Sr. No. 1.2

c. Requirements:

Performance criteria 'B'.

d. Observations:

No degradation or any malfunctioning in the essential performance was observed during & after the test. The Alpha & Beta count was found to be within limit after the test.

e. Result:

Complied (Meets Criteria 'A')

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5. ELECTROSTATIC DISCHARGE (ESD) TEST:

a. Test Rationale:

To check Immunity characteristics of the EUT against Discharge of Static Electricity that may occur when a charged operator touches the EUT.

b. Test Condition:

Set-up	:	As per IEC 61000-4-2:2008
Mode of simulation	:	Contact Discharge on conductive surfaces Air Discharge on non-conductive surfaces
Test Voltage	:	Contact Discharge: ± 6 kV Air Discharge: ± 8kV
No. of Discharge	:	10
Polarity	:	Positive & Negative (for both)
Points of Discharges	:	**Contact Discharge** Enclosure **Air Discharge** On all non-conductive surfaces 1. Front Display 2. Function Keys
Simulation	:	Using ESD Gun
EUT Operating Condition	:	EUT operating condition as per Sr. No. 1.2

c. Test Procedure:

At susceptible points, ten single discharges were applied.

d. Requirements:

Performance criteria 'B'

e. Observations:

No degradation or any malfunctioning in the essential performance was observed during & after the test. The Alpha & Beta count was found to be within limit after the test.

f. Result:

Complied (Meets Criteria 'A')

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6. POWER FREQUENCY MAGNETIC FIELD TEST

a. Test Rationale:

To check Immunity characteristics of EUT when subjected to magnetic disturbances at power frequency

b. Test Condition:

Set-up	:	As per IEC 61000-4-8: 2009
Test Level	:	30A/m
Power Frequency	:	50 Hz
Orientation	:	X, Y, Z
EUT Operating Condition	:	EUT operating condition as per Sr. No.1.2

c. Test Procedure

- EUT is subjected to power magnetic field with different orientations.

d. Requirements:

Performance criteria 'A'

e. Observations:

Orientation	Field	Observation
X	30 A/m	No degradation or any malfunctioning in the essential performance was observed during & after the test. The Alpha & Beta count was found to be within limit.
Y	30 A/m	
Z	30 A/m	

f. Results:

Complied (Meets Criteria 'A')

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