Indirect Lightning Induced Transient Susceptibility Test System

(Waveforms 2,3 and 6) ETS 160MB

In Compliance with

> RTCA/DO-160G S22
> MIL-STD-461G CS117
> AECTP 250
> AECTP 500
> GJB 8848-2016
> HB 6167.24

Introduction

When an aircraft is flying in severe convection environment, it will be frequently affected by lightning stroke, which will generate transient induced voltage or current on circuits and cables of airborne equipment, such phenomenon is called indirect lightning effect. It may make the aircraft get out of control, even bring about fuselage fire and other serious accidents. For safety reasons, the airborne equipment must be designed properly and tested completely to ensure the system and equipment with critical safety function to perform normally and its flight security when the aircraft is influenced by lightning stroke.

The ETS 160MB test system is capable of generating waveforms 2,3 and 6 specified in RTCA/DO-160 Section 22, test level is from 1 to 5 for pins direct injection method and cable bundle cable induction method; Additionally, the test system is not only meet the test requirement of lightning induced transients conducted susceptibility in MIL-STD-461G CS117, but also the A/B/C/D EUT pulse injection level requirement in GJB 8848: 2016 is satisfied.

The ETS 160MB test system includes various test auxiliary equipment to make it convenient to conduct tests, such as coupling transformer, power blocking device, transient blocking device, pin injection probe etc. What's more, the Corelab software is also available for test remote control, which makes your test easy and convenient.

Features

> Modular design, the waveform module is detachable;
> Capable of performing signal pins & power pins - direct injection method and cable bundle - cable induction method;
> Capable of generating waveforms 2, 3 and 6;
> 5.7" color touch screen with easy and distinct operation control;
> Phase synchronization function in signal pins & power pins-direct injection method;
> Corelab software are available for remote control;

Application Areas

> Military
> Aviation

Technical Parameters—Voltage Waveform 2 Cable Bundle Cable Induction Tests	
Coupling Mode	Cable Induction
Rise Time	< 100 ns
Duration	6.4 µs ± 20%
Test Level for Single Stroke Tests	50 V ~ 2000 V +20%, -0%
Test Level for Multiple Stroke Tests	50 V ~ 2000 V +20%, -0% (first stroke)
	25 V ~ 1000 V +50%, -0% (subsequent stroke)
Polarity	Positive or negative
Coupling Transformer	LVT-2

Technical Parameters—Voltage Waveform 3 (1MHz) Signal Pins & Power Pins Injection Tests	
Coupling Mode	Pin injection
Output Impedance	25 Ω
Frequency	1 MHz± 20 %
Decay Rate of 5th Waveshape	25% ~ 75%
Test Level for Single Stroke Tests	100 V ~ 4500 V +10%, -0%
	4 A ~ 180 A +10%, -0% （short-circuit current）
Polarity	Positive or negative
Phase Sync	0° ~ 359°, resolution 1°
EUT Power Supply	Max. AC 230 V, DC ±50 V
EUT Power Frequency	800 Hz

Technical Parameters—Voltage Waveform 3 (1 MHz-H) Cable Bundle Cable Induction Multiple Burst	
Coupling Mode	Cable Induction
Frequency	1 MHz± 20 %
Decay Rate of 5th Waveshape	25% ~ 75%
Output Impedance	⩾60 ohm
Coupling Transformer	LVT-2

Technical Parameters—Voltage Waveform 3 (1 MHz) Cable Bundle Cable Induction Tests	
Coupling Mode	Cable Induction
Frequency	1 MHz± 20%
Decay Rate of 5th Waveshape	25% ~ 75%
Test Level for Single Stroke Tests	50 V ~ 4500 V +20%, -0%
Test Level for Multiple Stroke Tests	50 V ~ 4500 V +20%, -0% (first stroke)
	50 V ~ 2250 V +50%, -0% (subsequent stroke)
Polarity	Positive or negative
Coupling Transformer	LVT-2

Technical Parameters—Voltage Waveform 3 (10 MHz) Cable Bundle Cable Induction Tests	
Coupling Mode	Cable Induction (CI)
Frequency	10 MHz± 20 %
Decay Rate of 5th Waveshape	25% ~ 75%
Test Level for Single Stroke	50 V ~ 4000 V +20%, -0%
Test Level for Multiple Stroke	50 V ~ 4000 V +20%, -0% (first stroke)
	50 V ~ 2000 V +50%, -0% (subsequent stroke)
Polarity	Positive or negative
Coupling Transformer	LVT-2

Technical Parameters—Current Waveform 6 Cable Bundle Cable Induction Tests	
Coupling Mode	Cable Induction
Current Range	5 A ~ 160 A
Rise Time	0.25 µs ±20%
Duration	4 µs ±20%
Coupling Transformer	LVT-3

General parameters

Working Power	AC 110 V/220 V±10%， 50 Hz/60 Hz±5% （Default AC 220 V, 50 Hz in mainland China）
Max. Power Consumption	200 W
Dimension	4U*2
Weight	37 kg
Ambient Temperature	15 ℃ ~ 35 ℃
Relative Humidity	45% ~ 75%
Atmospheric Pressure	86 kPa ~ 106 kPa

Accessories

Fuse*2 (spare parts), Power line, ground line, Test line, User manual, Coaxial line

Options

1. Coupling Transformer LVT-2 	The LVT-2 is used to couple Voltage Waveform 2 and 3 (1 MHz & 10 MHz); It satisfies single/multiple stroke and multiple burst tests of cable bundle; Test level is from 1 to 5; Max. coupling voltage is 2000 V for W2; Max. coupling voltage is 4500 V for W3;
2. Coupling Transformer LVT-3 	The LVT-3 is used to couple current of waveform 6; It satisfies multiple burst tests of cable bundle; Test level is from 1 to 5; Max. coupling current is 160 A;
3. Power Blocking Device CN-2 	The CN-2 is used to isolate voltages at the pins of the EUT from the low generator impedance in waveform 3 pins direct injection test;

Options

4.Transient Blocking Device DN-416T 	Used to prevent W3 transient waveform from damaging EUT power supply; AC power supply voltage 3-phase 400 V 16 A, 0-400 Hz (common mode); DC power supply voltage 600 V 16 A. Can meet the requirement of direct injection of W3 waveform into pins for power testing;
5. Handheld Pin Injection Probe HIP 5000 	The probe is used in pin injection tests of waveform 3 (1 MHz); Handheld structure design makes pin injection tests convenient;
6. Current Divider MCS 01 	The MCS 01 is used to measure current of waveforms 2,3 and 6.
7. 35U rack ETS 160MB-35U 	The ETS 160MB-35U is used to place all devices and accessories to makes the storage in order; There are two main unit storage tanks and four waveform input modules storage tanks, and each tank having sliding rail, which makes it easy to insert or pull out the modules;
8. Digital Oscilloscope MDO3012 (Tektronix) 	Frequency 100 MHz,; Sample Rate 1.25 GS/s; Record length 10 Mb;
9. Differential Probe THDP0100 (Tektronix) 	It is used to measure voltage of all waveforms; 6 kV differential mode, 100 MHz;
10. Wide-band Current Monitor CM 0103M 	The CM 0103M is used to measure W2, W3(1 & 10 MHz) and W6; Max. peak current 5 kA; Sensitivity 0.1 V/A; Frequency: 200 Hz ~ 20 MHz Current time product: 0.2 A·s;
11. Corelab Software	The software is used for remote control; Support connection with oscilloscope for monitoring waveforms; support generating test report;

SUZHOU 3CTEST ELECTRONIC CO., LTD.

Add.: No. 99 E'meishan Road, SND, Suzhou, Jiangsu Province, China
Tel: +86 (0)512 6807 7192 Fax: +86-512-68079795
Sales Email: globalsales@3ctest.cn Service Email: service@3ctest.cn
www.3c-test.com