

EFE300

IEC61000 DATA

Issue :	1	2	3					
Mod :	Release	43517	45708					
Date :	9.6.09	05.08.09	13.04.10					
Initials :	KM	VP	AC					
Drawn :	KM-MIS							

I N D E X

	PAGE
1.Electrostatic Discharge Immunity Test (IEC61000-4-2)	R - 1
2.Radiated Radio-Frequency Electromagnetic Field Immunity Test (IEC61000-4-3)	R - 2
3.Electrical Fast Transient / Burst Immunity Test (IEC61000-4-4)	R - 3
4.Surge Immunity Test (IEC61000-4-5)	R - 4
5.Conducted Disturbances Induced by Radio-Frequency Field Immunity Test (IEC61000-4-6)	R - 5
6.Power Frequency Magnetic Field Immunity Test (IEC61000-4-8)	R - 6
7.Voltage Dips, Short Interruptions Immunity Test (IEC61000-4-11)	R - 7

* Test results are typical data. Nevertheless the following results are considered to be actual capability data because all units have nearly the same characteristics.

1. Electrostatic Discharge Immunity Test (IEC61000-4-2)

MODEL : EFE300

(1) Equipment Used

Electro Static Discharge Simulation System : NSG435 (Schaffner)

Discharge resistance : 330Ω Energy-Storage Capacitor : 150pF

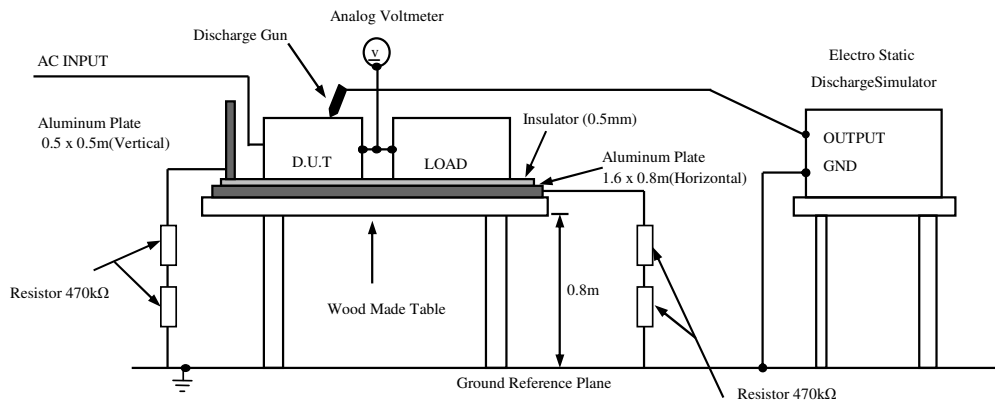
(2) Test Conditions

Input Voltage : 230VAC Output Voltage : Rated
 Output Current : 100% Polarity : Positive, Negative
 Number of Tests : 10 times Discharge Interval > 1 second
 Ambient Temperature : 25°C

(3) Test Method and Device Test Point

Contact Discharge : FG, Case Screw, Each Face of Case, Input and Output Terminal
 Vertical and Horizontal coupling Plate

Air Discharge : Expose Frame of FAN
 Input terminals are only tested with the unit switched off.



(4) Acceptable Conditions

1. Output voltage regulation not to exceed $\pm 5\%$ of initial (before test) value during test.
2. Output voltage to be within regulation specification after the test.
3. Along with 1 and 2, no discharge of fire or smoke, as well as no output failure.

(5) Test Result

Contact Discharge (kV)	EFE300-12	Air Discharge (kV)	EFE300-12
8	PASS	15	PASS

2. Radiated Radio-Frequency Electromagnetic Field Immunity Test (IEC61000-4-3)

MODEL : EFE300

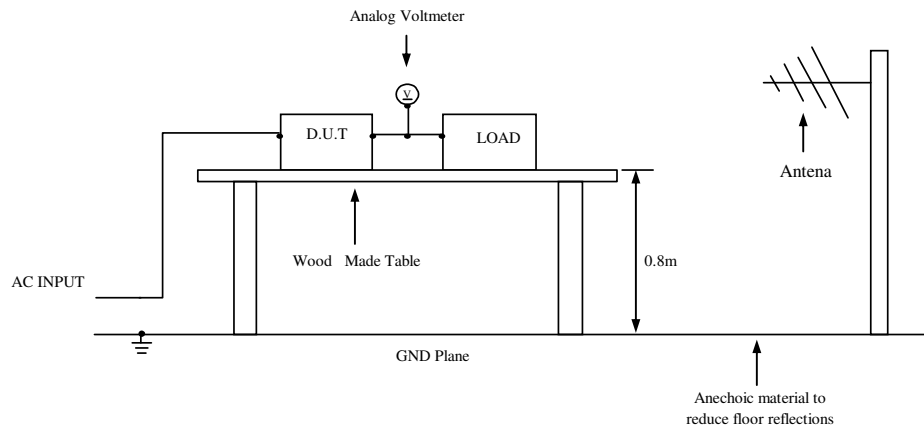
(1) Equipment Used

RF POWER AMP	: 5150(Ophir)
RF SINGLE GENERATOR	: 2041(Marconi)
BILOG ANTENNA	: LPB-2520(ARA)
WIDEBAND AMPLIFIER	: SMX100(IFI)
AMPLIFIER	: CMX3001(IFI)

(2) Test Conditions

Input Voltage	: 110V,230VAC	Output Voltage	: Rated
Output Current	: 100%	Amplitude Modu	: 80%, 1 k Hz
Electromagnetic Frequency	: 80-1000MHz 1.4GHz – 2.7GHz	Ambient Temperature	: 25°C
Distance	: 3.0m	Wave Angle	: Horizontal and Vertical
Sweep Condition	: 1.0%Step Up, 2.8 Seconds Hold		
Test Angle	: Top/Bottom, Both Sides, Front/Back		

(3) Test Method and Device Test Point



(4) Acceptable Conditions

1. Output voltage regulation not to exceed $\pm 5\%$ of initial (before test) value during test.
2. Output voltage to be within regulation specification after the test.
3. Along with 1 and 2, no discharge of fire or smoke, as well as no output failure.

(5) Test Result

Radiation Field Strength (V/m)	EFE300-12
10	PASS

3. Electrical Fast Transient / Burst Immunity Test (IEC61000-4-4)

MODEL : EFE300

(1) Equipment Used

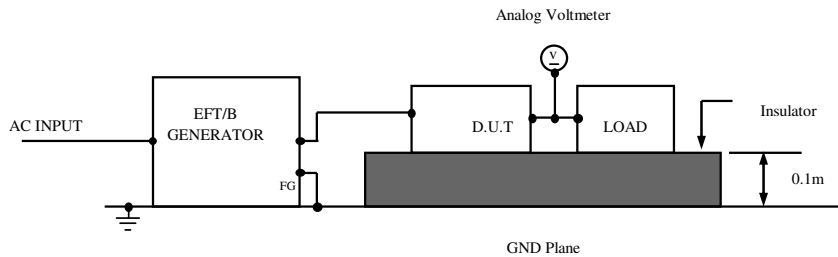
EFT/B Generator : TRA-2000-IN6 (EMC Partner)
 Coupling Clamp : CDN125(Shaffner)

(2) Test Conditions

Input Voltage : 110V,230VAC Output Voltage : Rated
 Output Current : 100% Test Time : 1minute
 Polarity : Positive, Negative Ambient Temperature : 25°C
 Number of Tests : 3 times

(3) Test Method and Device Test Point

Apply to (N,L,FG),(N,L),(N),(L),(FG), (N,FG), (L,FG).



(4) Acceptable Conditions

1. Output voltage regulation not to exceed $\pm 5\%$ of initial (before test) value during test.
2. Output voltage to be within output voltage regulation specification after the test.
3. Along with 1 and 2, no discharge of fire or smoke, as well as no output failure.

(5) Test Result

Test Voltage (kV)	Repetition Rate (kHz)	EFE300-12
4	5 and 100	PASS

4. Surge Immunity Test (IEC 61000-4-5)

MODEL : EFE300

(1) Equipment Used

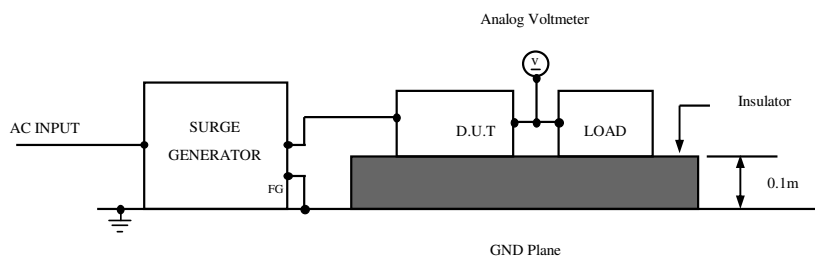
Surge Generator	: TRA-2000-IN6 (EMC Partner)		
Coupling Impedance	: Common	12Ω	Coupling Capacitance
	: Normal	2Ω	
			: Common
			: Normal
			9μ F
			18μ F

(2) Test Conditions

Input Voltage	: 110V,230VAC	Output Voltage	: Rated
Output Current	: 100%	Number of Tests	: 5 times
Polarity	: Positive, Negative	Mode	: Common, Normal
Phase	: 0°, 90°, 180°, 270°	Ambient Temperature	: 25°C

(3) Test Method and Device Test Point

Apply to Common mode(N-FG,L-FG)and Normal mode(N-L)



(4) Acceptable Conditions

- Output voltage regulation not to exceed $\pm 5\%$ of initial (before test) value during test.
- Output voltage to be within regulation specification after the test.
- Along with 1 and 2, no discharge of fire or smoke, as well as no output failure.

(5) Test Result

Test Voltage (kV) Common	EFE300-12	Test Voltage (kV) Normal	EFE300-12
1	PASS	0.5	PASS
2	PASS	1	PASS
2.2	PASS	1.1	PASS

5. Conducted Disturbances Induced by Radio-Frequency Field Immunity Test (IEC61000-4-6)

MODEL : EFE300

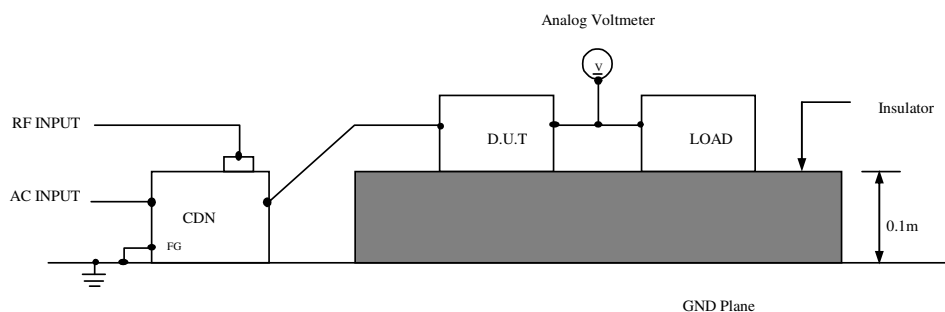
(1) Equipment Used

- RF GENERATOR : 2041 (Marconi)
 RF AMP : SMX100 (IFI)
 INJECTION CLAMP : CIC81000 (Chase)
 COUPLING DE-COUPPLING NETWORK (CDN) : 801 (Luthi)

(2) Test Conditions

- Input Voltage : 110V, 230VAC Output Voltage : Rated
 Output Current : 100% Electromagnetic Frequency : 150kHz ~ 80MHz
 Sweep Condition : 1.0% Step Up, 2.8 Seconds Hold
 Ambient Temperature : 25°C

(3) Test Method and Device Test Point



(4) Acceptable Conditions

1. Output voltage regulation not to exceed $\pm 5\%$ of initial (before test) value during test.
2. Output voltage to be within regulation specification after the test.
3. Along with 1 and 2, no discharge of fire or smoke, as well as no output failure.

(5) Test Result

Voltage Level (V)	EFE300-12
10	PASS

6. Power Frequency Magnetic Field Immunity Test (IEC61000-4-8)

MODEL : EFE300

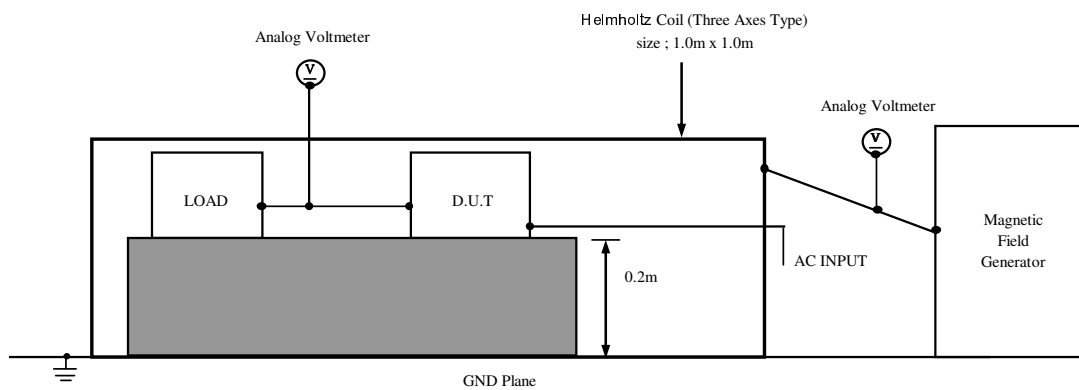
(1) Equipment Used

Modulator : MA30 (Solartron)
 Amplifier : PA12-CP (Allen&Health)
 Digital multi meter : 77 (Fluke)
 Helmholtz coil : 1m, 34Turn

(2) Test Conditions

Input Voltage	: 230VAC	Output Voltage	: Rated
Output Current	: 100%	Magnetic Frequency	: 50Hz
Test Time	: More than 10 sec (Each direction)	Direction	: X,Y,Z
Ambient Temperature	: 25°C		

(3) Test Method and Device Test Point



(4) Acceptable Conditions

1. Output voltage regulation not to exceed ±5% of initial (before test) value during test.
2. Output voltage to be within regulation specification after the test.
3. Along with 1 and 2, no discharge of fire or smoke, as well as no output failure.

(5) Test Result

Magnetic Field Strength (A/m)	EFE300-12
1	PASS
3	PASS
10	PASS
30	PASS

7. Voltage Dips, Short Interruptions Immunity Test (IEC61000-4-11)

MODEL : EFE300

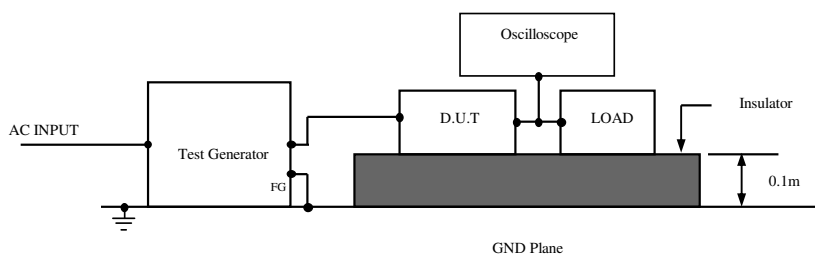
(1) Equipment Used

Test Generator : TRA-2000-IN6 (EMC Partner)
 Oscilloscope : Wavesurfer 434 (LeCroy)

(2) Test Conditions

Input Voltage : 110V, 230VAC Output Voltage : Rated
 Output Current : 100% Ambient Temperature : 25°C
 Number of Tests : 3 times Test interval : More than 10sec

(3) Test Method and Device Test Point



(4) Acceptable Conditions

At Test level 80%, 70%

1. Output voltage regulation not to exceed $\pm 5\%$ of initial (before test) value during test.
2. Output voltage to be within output voltage regulation specification after the test.
3. Along with 1 and 2, no discharge of fire or smoke, as well as no output failure.

At Test level 40%, 0%

1. Output voltage to be within output voltage regulation specification after the test.
2. No discharge of fire or smoke.

(5) Test Result

Test Level	Dip rate	Continue Time	EFE300-12
80%	20%	5000ms	PASS
70%	30%	10ms,500ms	PASS
40% (*1)	60%	100ms,200ms	PASS
0%	100%	10ms,20ms,5000ms(*2)	PASS

*1 When Input Voltage is less than 180Vac, output voltage shut down. Then it recover again itself.

*2 When Continue Time is 20ms and 5000ms, output voltage shut down. Then it recover again itself.