

PROTECTION PRODUCTS

IEC 61000-4-2 ESD Review and Test Setup

IEC 61000-4-2 is a basic EMC Standard for electrostatic discharge (ESD). It is driving ESD standard worldwide for two primary reasons. One is because the European Union mandates it for any product being shipped into Europe. The second reason is because its test levels, test methods and test procedures are all reasonable and they work.

Test criteria for individual products are defined by the product and product family standards. The product and product family standards determine which basic EMC standards (such as IEC 61000-4-2) must be met. It specifies what ports are required to be tested. It also defines the failure criteria. The basic EMC standards define the test methods and simulators to be used. It also provides recommended test levels. With the fast emergence of new products, it is impossible to have product standards that will cover all products. When a product standard does not exist for a certain product, the generic standards are used. Generic standards are a special kind of product family standard that make sure there is a method for compliance for any

electronic or electrical product that can be conceived. The IEC 61000-4-2 ESD test setup is diagrammed in Figure 1. The standard requires air and contact discharges in positive and negative polarity. All points and surfaces that are accessible to personnel should be tested. The IEC 61000-4-2 defines four test levels and provides a fifth open level. The test levels are shown in Table 1. The product and product family standards or the manufacturer defines what level of testing is required. Testing should cover all normal modes of operation and the equipment under test (EUT) should remain continually operational. EUT's that are battery powered or ungrounded will need to be discharged after each ESD surge. Since the unit is not grounded, the charges from the surge can only be dissipated capacitively through the air or the ground plane. This can take a while and the EUT may stay at that potential for a long time, making the subsequent surges impossible or at unexpected levels. The EUT can be manually discharged through a 470 kΩ resistor to ground.

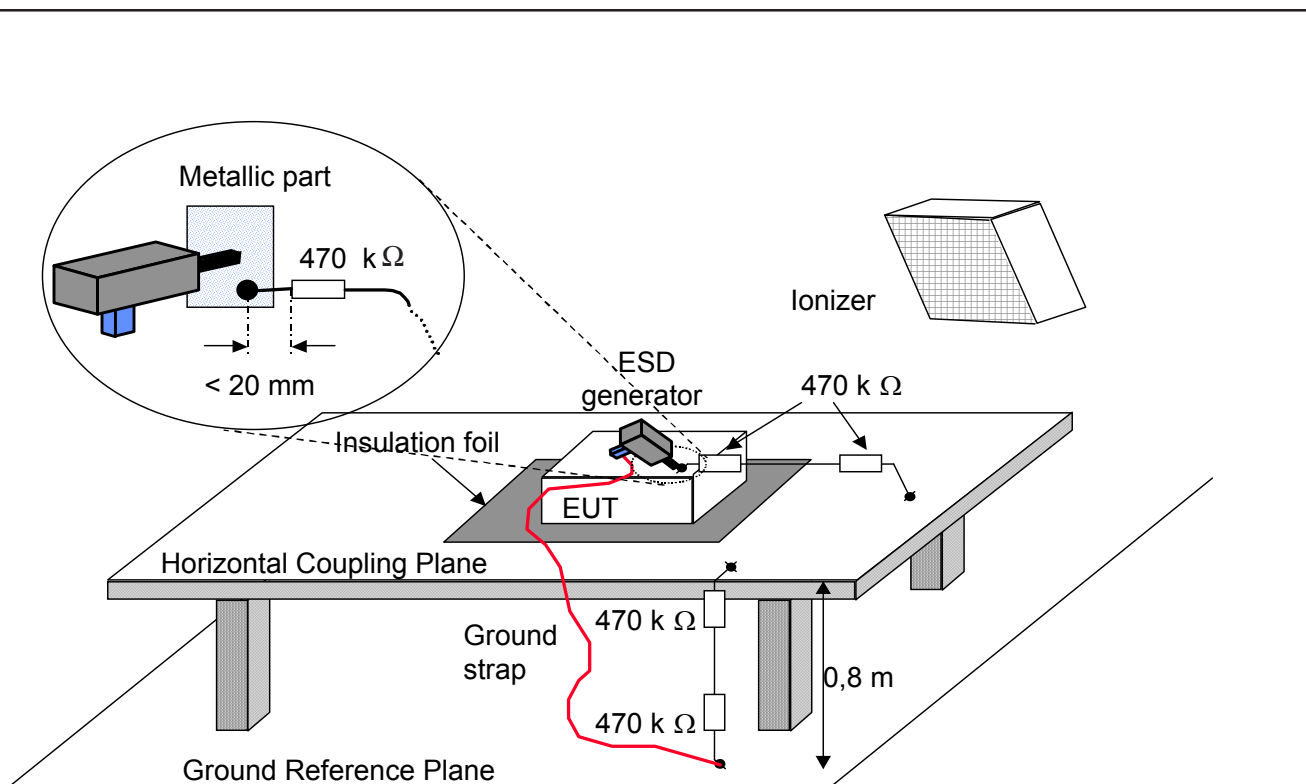


Figure 1 - IEC 61000-4-2 Test Setup Diagram

PROTECTION PRODUCTS

Contact Discharge		Air Discharge	
Level	Test Voltage kV	Level	Test Voltage kV
1	2	1	2
2	4	2	4
3	6	3	8
4	8	4	15
X ¹⁾	Special	X ¹⁾	Special

Table 1 - IEC 61000-4-2 Test level

¹⁾ "x" is an open level. The level has to be specified in the dedicated equipment specification. If higher voltages than those shown are specified, special test equipment may be needed.

Contact Information for Semtech International AG

Taiwan Branch	Tel: 886-2-2748-3380 Fax: 886-2-2748-3390	Semtech Switzerland GmbH Japan Branch	Tel: 81-3-6408-0950 Fax: 81-3-6408-0951
Korea Branch	Tel: 82-2-527-4377 Fax: 82-2-527-4376	Semtech Limited (U.K.)	Tel: 44-1794-527-600 Fax: 44-1794-527-601
Shanghai Office	Tel: 86-21-6391-0830 Fax: 86-21-6391-0831	Semtech France SARL	Tel: 33-(0)169-28-22-00 Fax: 33-(0)169-28-12-98
Semtech International AG is a wholly-owned subsidiary of Semtech Corporation, which has its headquarters in the U.S.A.		Semtech Germany GmbH	Tel: 49-(0)8161-140-123 Fax: 49-(0)8161-140-124