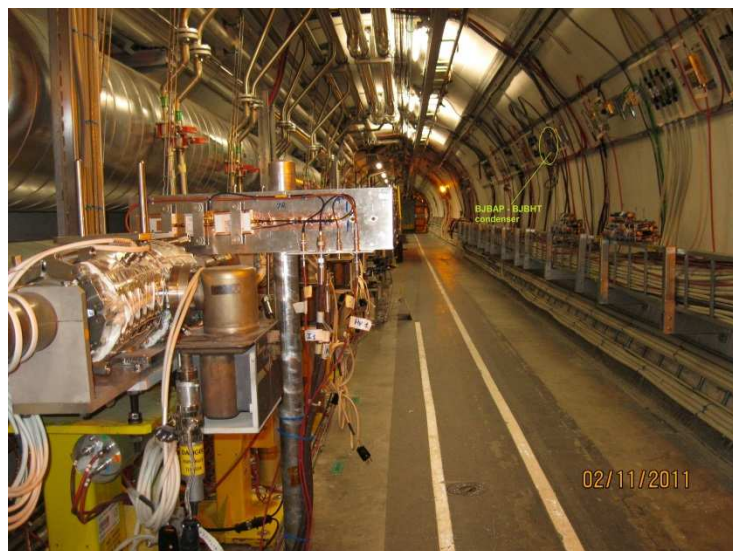


## BE-BI-BL: Passive irradiation test of suppressor diodes for The BLM HV distribution at the Fraunhofer Institut (Co60).

For the modification in the HV distribution of the LHC BLM system we need to add a suppressor diode which will be installed in IP 3 and IP 7. The location of the diodes is close to the collimators, on the inner side of the tunnel (see picture). The estimated total dose per year is 100kGray. Two types of suppressor diodes will be passively irradiated. Both diodes have been installed and tested in the LHC BLM high voltage distribution.



### 1. Diodes under test: 180V and 220V Suppressor diodes.



1.5KE

Transil™

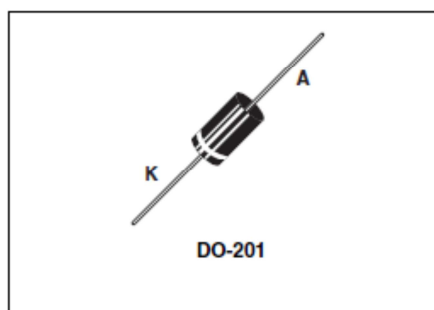
Datasheet – production data

#### Features

- Peak pulse power: 1500 W (10/1000  $\mu$ s)
- Breakdown voltage range:  
From 6.8 V to 440 V
- Uni and bidirectional types
- Low clamping factor
- Fast response time
- UL 497B file number: QVGQ2.E136224

#### Description

Transil diodes provide high overvoltage protection by clamping action. Their instantaneous response to transient overvoltages makes them particularly suited to protect voltage sensitive devices such as MOS Technology and low voltage supplied IC's.



Type 1: **1.5KE-220CA**: Transil™, Suppressor diode; bidirectional



BZW50

Transil™, transient voltage surge suppressor (TVS)

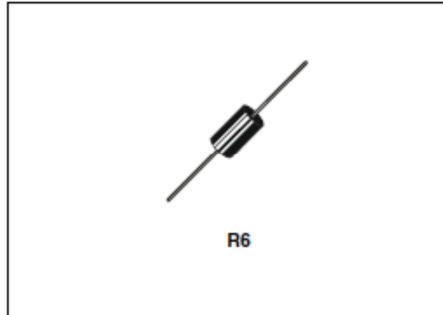
Datasheet – production data

Features

- Peak pulse power: 5000 W (10/1000  $\mu$ s)
- Stand-off voltage range from 10 V to 180 V
- Unidirectional and bidirectional types
- Low clamping factor
- Fast response time
- UL497B, file number: QVGGQ2.E136224

Description

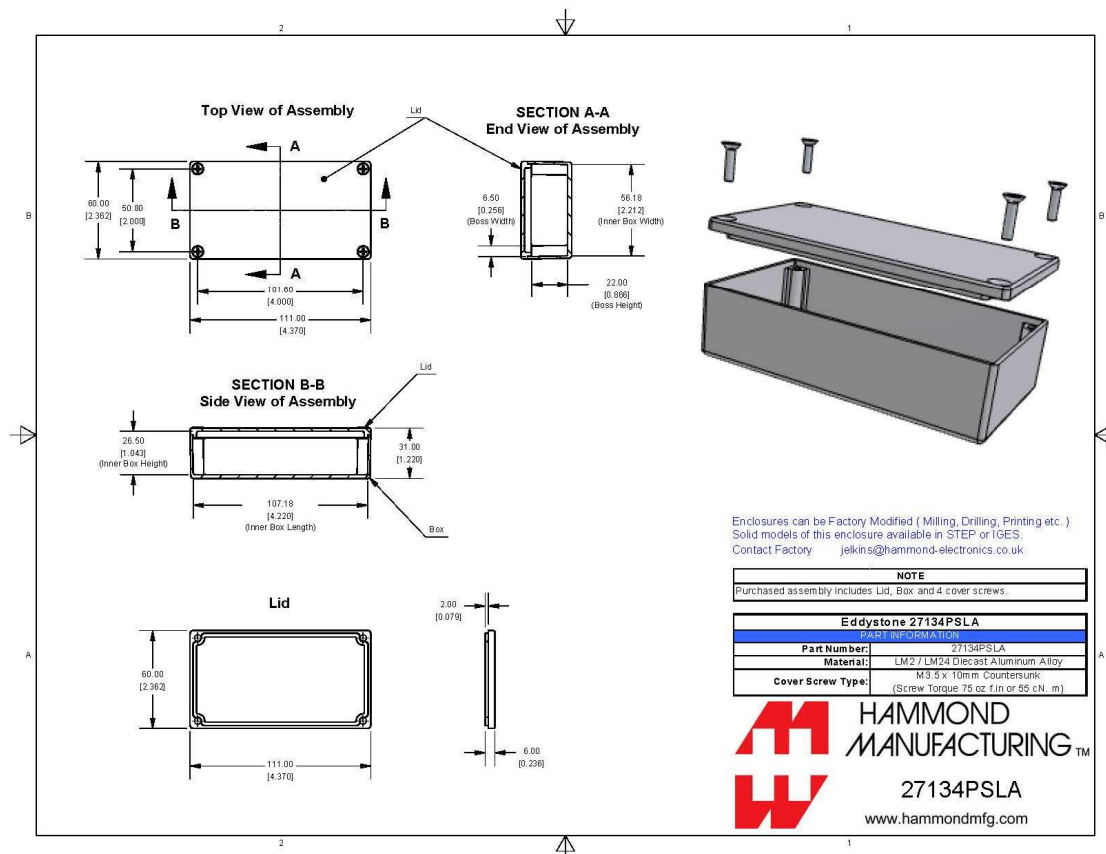
Transil diodes provide high overvoltage protection by clamping action. Their instantaneous response to transient overvoltages makes them particularly suited to protect voltage sensitive devices such as MOS Technology and low voltage supplied ICs.



Type 2: **BZW50-180B** : Transil™, Transient voltage surge suppressor (TVS), bidirectional

2. Test arrangement of passive irradiation of the diodes.

For each specified dose rate a box with the dimension 111mm x 60mm x 31mm (see picture) will be provided containing the diodes.



### **3. Irradiation levels and samples quantity.**

Test will be done at the Fraunhofer institute with a Cobalt 60 source.  
The diodes will be passively irradiated.  
The boxes will irradiated as shown below.

Box 1) up to 10 kGy and contains 5 \* 1.5KE-220CA + 5 \* BZW50-180B

Box 2) up to 50 kGy and contains 5 \* 1.5KE-220CA + 5 \* BZW50-180B

Box 3) up to 100 kGy and contains 5 \* 1.5KE-220CA + 5 \* BZW50-180B

Box 4) up to 300 kGy and contains 5 \* 1.5KE-220CA + 5 \* BZW50-180B

### **4. Verification of the components**

The electrical characteristic of all diodes will be measured before and after the irradiation.  
The verification of the current versus voltage curve will give the indication if the diodes can be used for our application.