

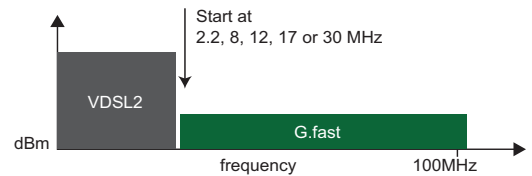
# Reference Design- G.fast Line Driver Tertiary Overvoltage Protection

## Sckipio Reference Design Win

### G.fast line driver tertiary overvoltage protection

G.fast has a targeted data rate of 1Gbps over 100 m of single twisted pair (24 AWG/0.5 mm) cable using DSL-like technology.

This TDD (Time Division Duplex) signaling is a major difference from the existing FDD (Frequency Division Duplex) DSL signaling. G.fast bandwidth will extend up to 106 MHz (with the potential of going as high as 212 MHz) with the start frequency ranging from 2.2 MHz up to 30 MHz in an effort to avoid interference with existing xDSL services. G.fast may also employ "notching" where it suppresses carriers at specific individual frequencies to avoid clashing with local RF services.



The g.fast amplitude is very low as compared to existing xDSL services and thus the varying voltage across the SIDACTor<sup>®</sup> component is very low. This results in imperceptible capacitance variance of the over voltage protection (OVP) component. Rate and reach testing has shown an acceptable loss of less than 0.2dB with the SDP0240T023G6RP component included at the tertiary position. The three Gas Discharge Tubes (GDTs) enhance the OVP without interfering with the data rate or reach. The three components provide differential and common mode protection, specifically needed for outside high exposure applications.

Since this interface is capacitively coupled, no fusing is required for power fault protection, however; selection of appropriately voltage rated capacitors must be considered regarding lightning exposure risks. The preceding GDTs help reduce the required rating to < 1kV. The coupling transformer should have an isolation rating of at least 1.5kV 50/60Hz and consideration of its lightning response characteristics must also be considered. The SDP0240T023G6RP has a peak current surge rating of 30A based on the 8/20 waveshape. This should be sufficient for even the most severe exposure g.fast applications (including GR-1089 Issue 6 inter-building requirements and ITU K20/21/45 Enhanced external line recommendations). **The differential only SDP0080T023G5RP or the new DSLP0080T023G6RP flow-through layout could be used in the tertiary position instead .**

### g.fast Line Driver

