1 Measurement Setup

Fig. 1 shows a typical measurement setup using the high voltage pulse generator TLP-xxxyyA/C, CMTI-xxxyyA/C including pulse width extenders TLP-3011C or TLP-8012A5, TLP-12012A6. The red lines indicate the high voltage charge line interconnection. The blue lines indicate pulsed high voltage.

Fig. 2 shows the high voltage equivalent circuit of the measurement setup, to be used for the job hazard risk evaluation. Depending on model options all devices TLP-xxxyyA/C, CMTI-xxxyyA/C can have implemented 6 kV or 10 kV high voltage power supply modules.

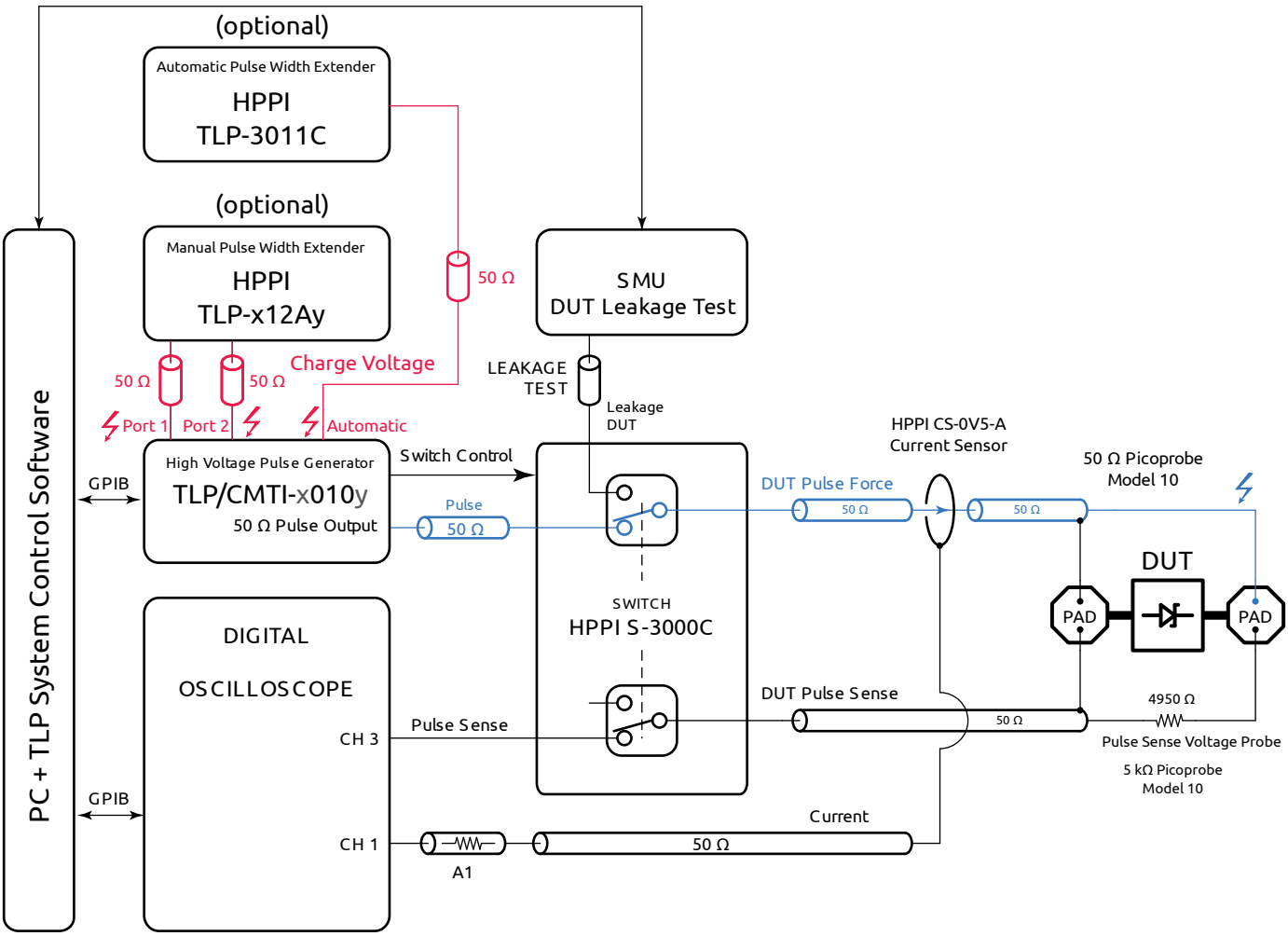

Figure 1: General high voltage pulse generator TLP-xxxyyA/C, CMTI-xxxyyA/C measurement setup.

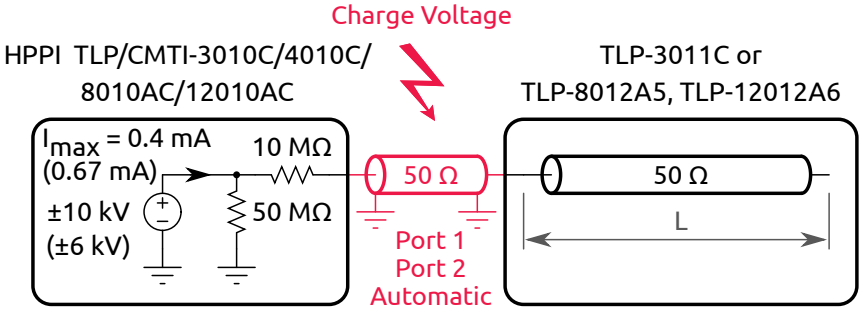

Figure 2: High voltage equivalent circuit. L is 50 Ω cable length in [m].

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2 Job Hazard Risk Evaluation

The following risk evaluation is related to Section 6.3.1 in [1]. The integrated 6 kV or 10 kV high voltage power supply module has internal current limiter at 0.67 mA or 0.4 mA, respectively. In addition the high voltage output is isolated by 50 MΩ shunt resistance and 10 MΩ series resistance (Fig. 2).

Pulse Generator	Extender	Charge Voltage	Pulse Width	Cable Length	Capacitance	Charge	Interlock[1)]
TLP/CMTI-3010C	TLP-3011C	3 kV	≤1.5 µs	≤150 m	≤15 nF	≤45 µC	NO
TLP/CMTI–3010C	TLP-3011C	3 kV	>1.5 µs	>150 m	>15 nF	>45 µC	**YES**
TLP/CMTI–4010C	TLP-3011C	3 kV	≤1.5 µs	≤150 m	≤15 nF	≤45 µC	NO
TLP/CMTI–4010C	TLP-3011C	3 kV	>1.5 µs	>150 m	>15 nF	>45 µC	**YES**
TLP/CMTI–8010A	TLP-8012A5	6 kV	≤0.75 µs	≤75 m	≤7.5 nF	≤45 µC	NO
TLP/CMTI–8010A	TLP-8012A5	6 kV	>0.75 µs	>75 m	>7.5 nF	>45 µC	**YES**
TLP/CMTI–8010C	TLP-3011C	3 kV	≤1.5 µs	≤150 m	≤15 nF	≤45 µC	NO
TLP/CMTI–8010C	TLP-3011C	3 kV	>1.5 µs	>150 m	>15 nF	>45 µC	**YES**
TLP/CMTI–8010C	TLP-8012A5	6 kV	≤0.75 µs	≤75 m	≤7.5 nF	≤45 µC	NO
TLP/CMTI–8010C	TLP-8012A5	6 kV	>0.75 µs	>75 m	>7.5 nF	>45 µC	**YES**
TLP/CMTI–12010A	TLP-12012A6	7 kV	≤0.64 µs	≤64 m	≤6.4 nF	≤45 µC	NO
TLP/CMTI–12010A	TLP-12012A6	7 kV	>0.64 µs	>64 m	>6.4 nF	>45 µC	**YES**
TLP/CMTI–12010C	TLP-3011C	3 kV	≤1.5 µs	≤150 m	≤15 nF	≤45 µC	NO
TLP/CMTI–12010C	TLP-3011C	3 kV	>1.5 µs	>150 m	>15 nF	>45 µC	**YES**
TLP/CMTI–12010C	TLP-12012A6	7 kV	≤0.64 µs	≤64 m	≤6.4 nF	≤45 µC	NO
TLP/CMTI–12010C	TLP-12012A6	7 kV	>0.64 µs	>64 m	>6.4 nF	>45 µC	**YES**
TLP/CMTI–16010A	TLP-16012A	8 kV	≤0.56 µs	≤56 m	≤5.6 nF	≤45 µC	NO
TLP/CMTI–16010A	TLP-16012A	8 kV	>0.56 µs	>56 m	>5.6 nF	>45 µC	**YES**

[1)] For all configurations marked “Interlock = **YES**” the interlock function must be installed and activated.

Table 1: Evaluation of interlock requirement for different setup combinations

Tab. 1 shows the charge evaluation according Section 6.3.1 in [1]. For all configurations marked “Interlock = **YES**” the interlock function must be installed and activated. Please refer to the document “TLP System Interlock Safety Shutdown ILK”: https://www.hppi.de/files/Interlock_Safety_Shutdown.pdf

References

[1] VDE, *DIN EN 61010-1:2010 + Cor.:2011, Sicherheitsbestimmungen für elektrische Mess-, Steuer-, Regel- und Laborgeräte, Teil 1: Allgemeine Anforderungen*, IEC 61010-1:2010 + Cor.:2011, Jul. 2011.