

Errata to IEEE Standard Test Specification for Thyristor Diode Surge Protective Devices

Sponsor

Surge Protective Devices Committee

of the

IEEE Power & Energy Society

Correction Sheet

Issued 23 October 2009

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**Correction Sheet to
IEEE Std C62.37-1996**

Page 1, Subclause 1.1 Scope, first sentence should read as follows:

This standard applies to two or three terminal, four or five layer, thyristor surge protective devices (SPDs) for application on systems with voltages equal to or less than 1000 V rms or 1200 V dc.

Page 2, Subclause 2.2 Definitions, second sentence should read as follows:

If the volt-ampere characteristics are asymmetrical, then the parameters shall be defined for each polarity.

Page 2, Subclause 2.2.5, non-repetitive peak pulse current (I_{PPS}), sentence should read as follows:

Rated maximum value of peak impulse current of specified amplitude and waveshape that may be applied.

Page 3, Subclause 2.3.7, impulse reset time, title should read

impulse reset time (t_{RESET})

Page 4, Subclause 2.3.11, peak pulse impulse current (I_{PPM}), sentence should read as follows:

Rated maximum value of peak impulse pulse current (I_{PP}) applied for 10 pulses with 10/1000 waveshape and maximum duty factor of 0.01% without causing failure.

Page 5, Subclause 2.5, Gated thyristor surge protection device (SPD), title should read as follows:

Gated thyristor surge protective device (SPD)

Page 5, Subclause 2.5.2, gate reverse current, main terminals short-circuited (I_{GAS} ; I_{GKS}), text after sentence should read as follows:

(See 4.5.21)

Page 10, section 4.4.4, Non-repetitive peak pulse current— I_{PPS} , last paragraph, last sentence should read as follows:

Table 1 shows some wave shapes commonly used to test thyristor SPDs for telecommunication applications.

Page 11, Subclause 4.1, Standard design test criteria, first sentence should read as follows:

The design tests described in 4.4.1 through 4.5.26 provide standardized methods for making single observations of a specified property of a thyristor SPD.

Page 12, Subclause 4.3, Thyristor surge protection device (SPD) test conditions, title should read as follows:

Thyristor surge protective device (SPD) test conditions

Page 12, Subclause 4.3, Thyristor surge protection device (SPD) test conditions, sixth sentence should read as follows:

Normally this would be done by clipping ferrite cores onto the probe cables.

Page 18, Subclause 4.4.8, Critical rate of rise of on-state current— di/dt , first sentence should read as follows:

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The purpose of this test is to verify that a thyristor SPD can survive a fast rising current, as may occur on the wavefront of an impulse.

Page 20, Subclause 4.5.4, Breakover voltage— $V_{(BO)}$ and current— $I_{(BO)}$,

The test generator shall be specified for the open-circuit voltage and short-circuit current waveforms (or equivalents of rate-of-rise, wave shape and wave shape peak value) and, for ac testing, the duration.

Page 23, Subclause 4.5.3, Figures 17, 18 and 19 should be as follows:

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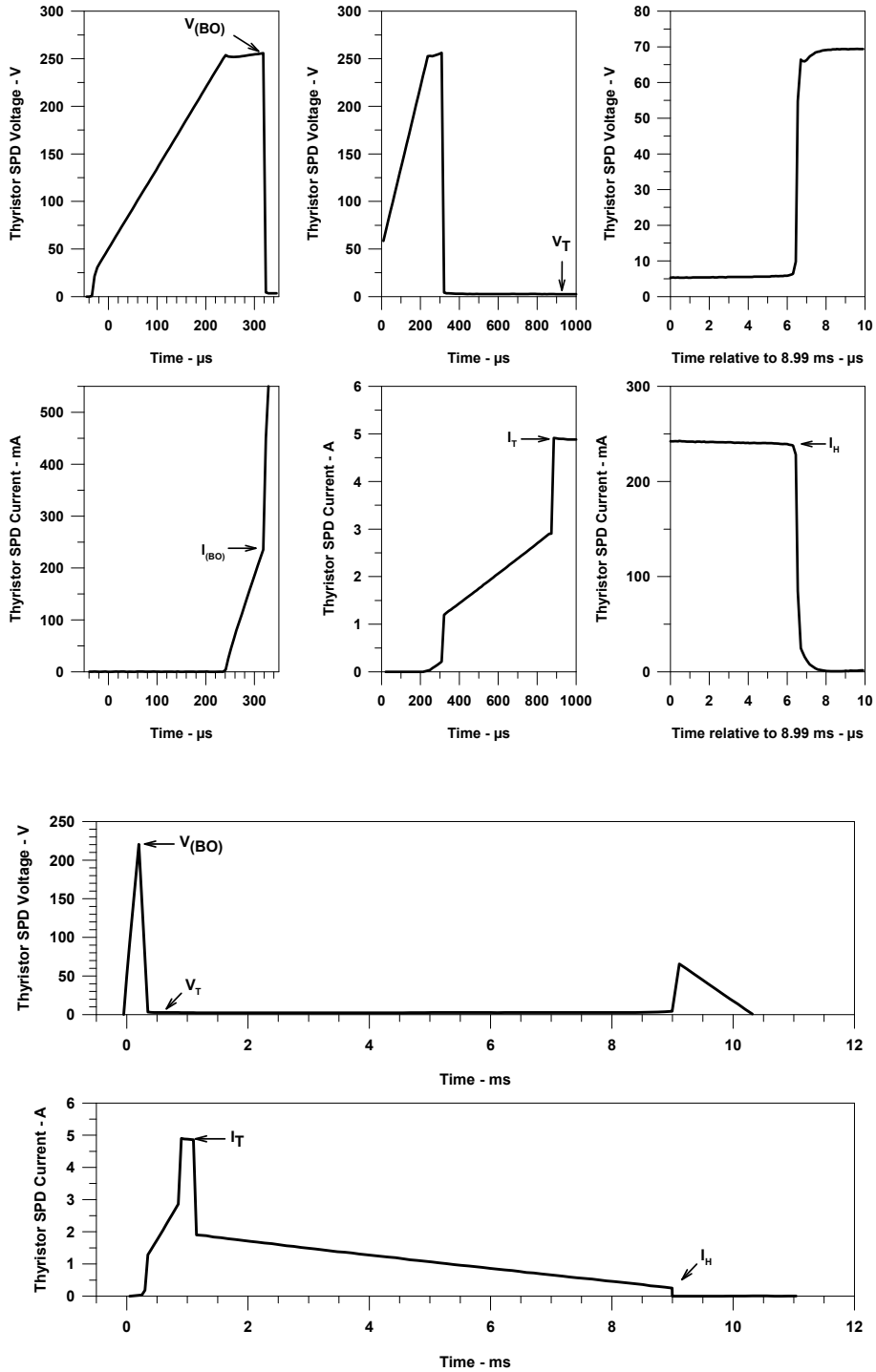


Figure 17—Switching and on-state waveforms for a positive breakdown slope thyristor SPD

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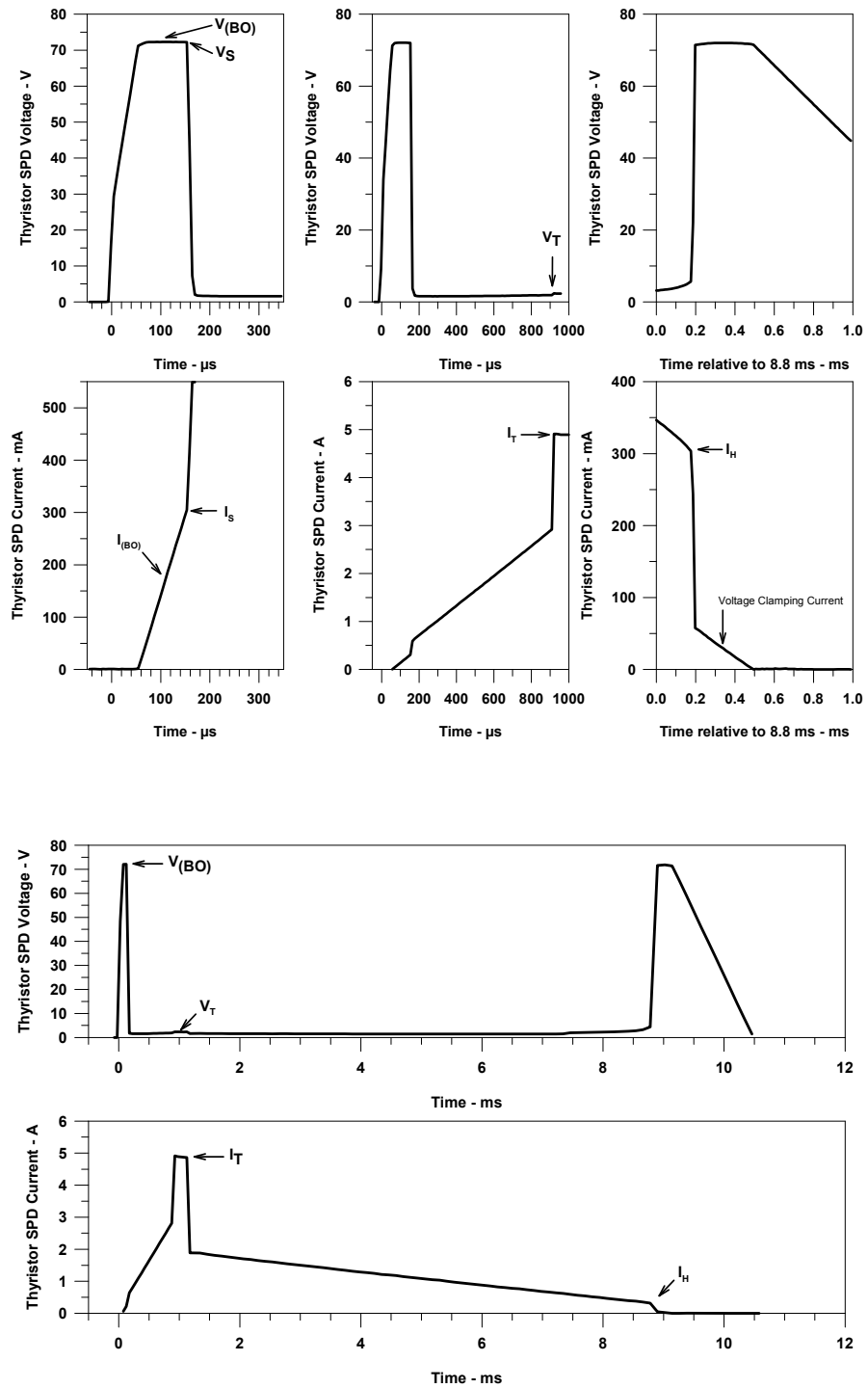


Figure 18—Switching and on-state waveforms of a gated thyristor SPD

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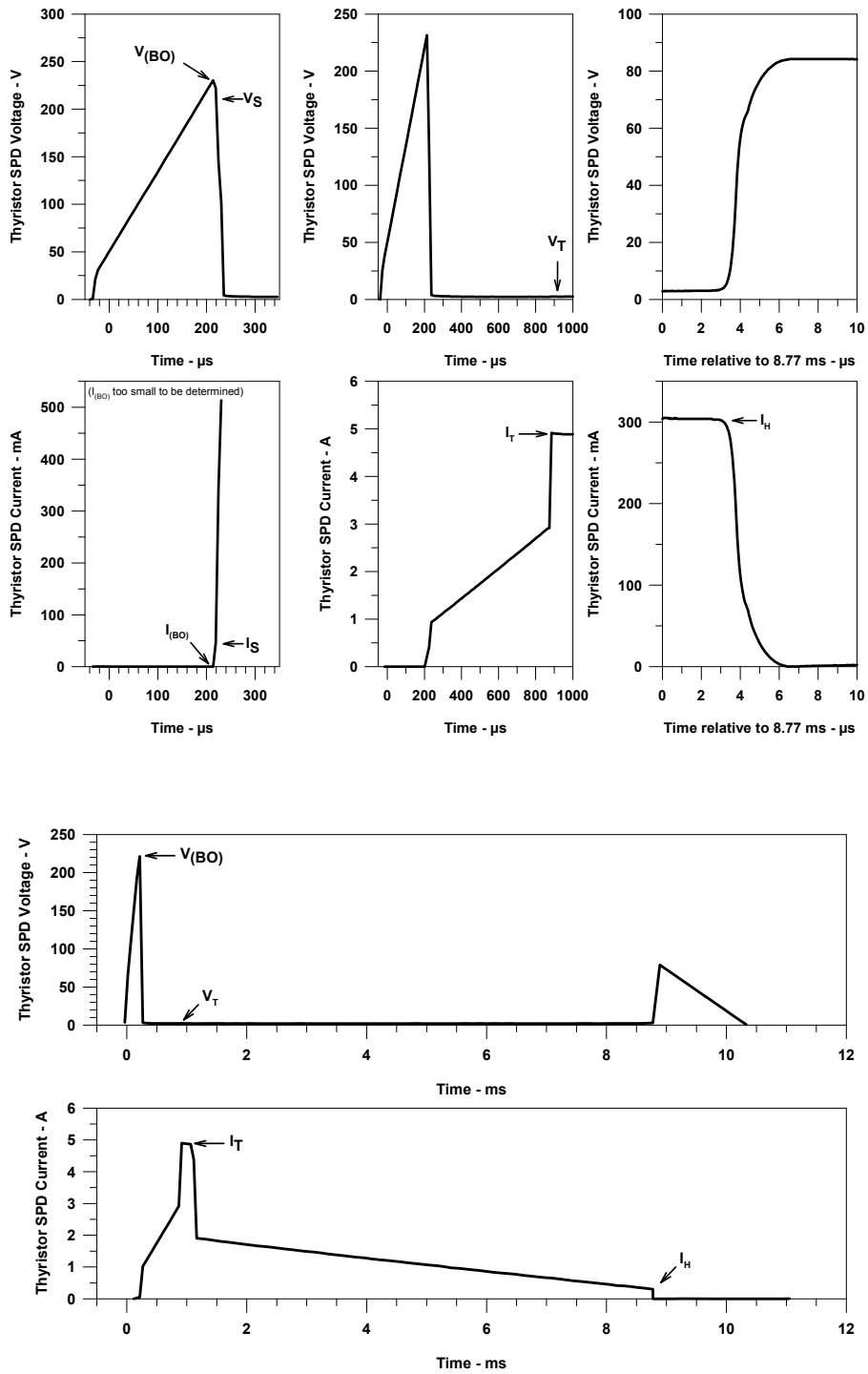


Figure 19—Switching and on-state waveforms for a negative breakdown slope thyristor SPD

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Page 25, Subclause 4.5.6, Holding current— I_H , third sentence should read as follows:

The test generator shall be specified for the open circuit voltage and short-circuit current values, or equivalents, of wave shape and wave shape peak value

Page 25, Subclause 4.5.6, Holding current— I_H , second to last sentence should read as follows:

To increase the switch off voltage level, the generator and a current (< minimum specified value of I_H) from a dc voltage supply (< V_{DRM}) should be diode ORed onto the DUT (see Figure 21).

Page 26, Subclause 4.5.6, Holding current— I_H , Figure 21 title should read as follows:

Figure 21—Test circuit for holding current (I_H) with additional dc bias (impulse reset)

Page 28, Subclause 4.5.8, Breakdown voltage— $V_{(BR)}$, last sentence of second paragraph should read as follows:

For a negative breakdown slope thyristor SPD (see Figures 4, 5, and 6) this measurement approach can be used to determine $V_{(BO)}$.

Page 29, Subclause 4.5.9, Switching voltage— V_S and current— I_S , sixth sentence should read as follows:

A V-I characteristic can be produced by plotting the recorded current against the recorded voltage.

Page 30, Subclause 4.5.11, Peak forward recovery voltage— V_{FRM} , third sentence should read as follows:

The generator shall switch the diode section on at a specified rate of forward current rise, dI_F/dt , and the value of peak forward recovery voltage, V_{FRM} , shall be measured (see Figure 25).

Page 32, Subclause 4.5.14, Temperature coefficient of breakdown voltage, title should read as follows:

Temperature coefficient of breakdown voltage— $\alpha_{V(BR)}$

Page 33, Subclause 4.5.17, Thermal resistance— R_θ , Third equation should read as follows:

$$R_{\theta JL} = (T_{JPK} - T_L) / P_{TOT} \text{ } ^\circ\text{C/W}$$

Page 34, Subclause 4.5.17, Thermal resistance— R_θ , Figure 28 title should read as follows:

Figure 28—Test circuit for thermal resistance (R_θ) and impedance (Z_θ)

Page 35, Subclause 4.5.18, Transient thermal impedance— $Z_{\theta(t)}$, Figure 29 should be as follows:

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THERMAL RESPONSE

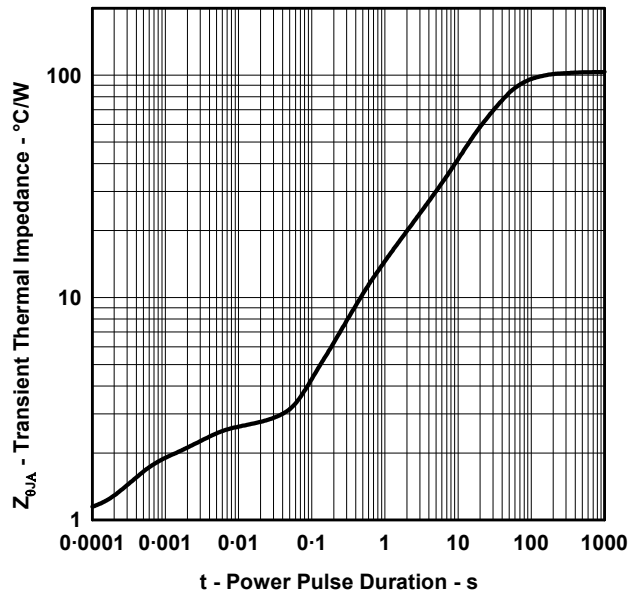
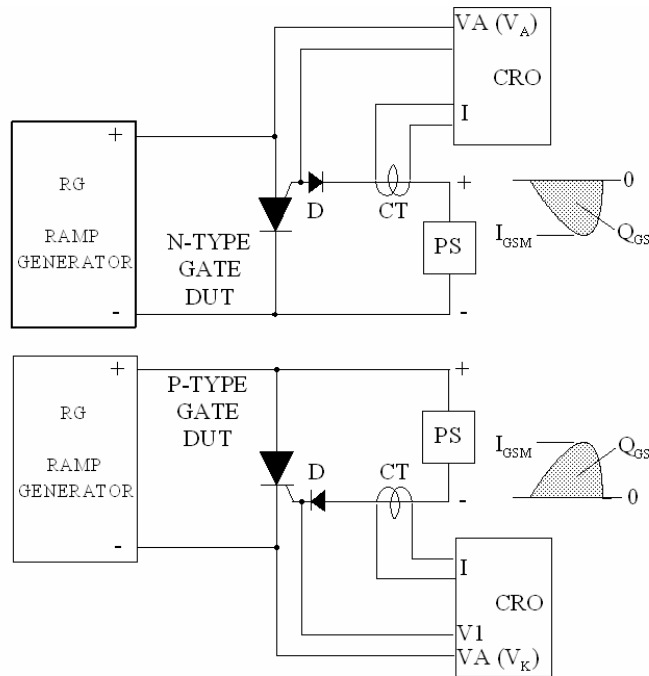


Figure 29—Thermal impedance ($Z_{\theta JA}$) vs. time

Page 40, Subclause 4.5.24, Gate switching charge— Q_{GS} , Figure 35 should be as follows:

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- DUT = Device Under Test
- VA = Adjacent terminal voltage
- V1 = Monitored gate voltage
- D = Series gate diode
- RG = Ramp generator with specified di/dt and dv/dt characteristics
- PS = DC power supply, set at specified gate voltage, V_{GG}
- CT = Current transformer or equivalent
- CRO = Dual channel oscilloscope or equivalent

Figure 35—Test circuit for gate switching current, gate switching charge, and gate-to adjacent terminal breakover voltage (I_{GSM} , Q_{GS} , $V_{GK(BO)}$, $V_{GA(BO)}$)

Page 40, Figure 35, last listed item should read as follows:

CRO = Dual channel oscilloscope or equivalent

Page 41, Figure 36, last listed item should read as follows:

CRO = Dual channel oscilloscope or equivalent

Page 42, Subclause 4.5.24, Gate switching charge— Q_{GS} , Figure 37 should be as follows:

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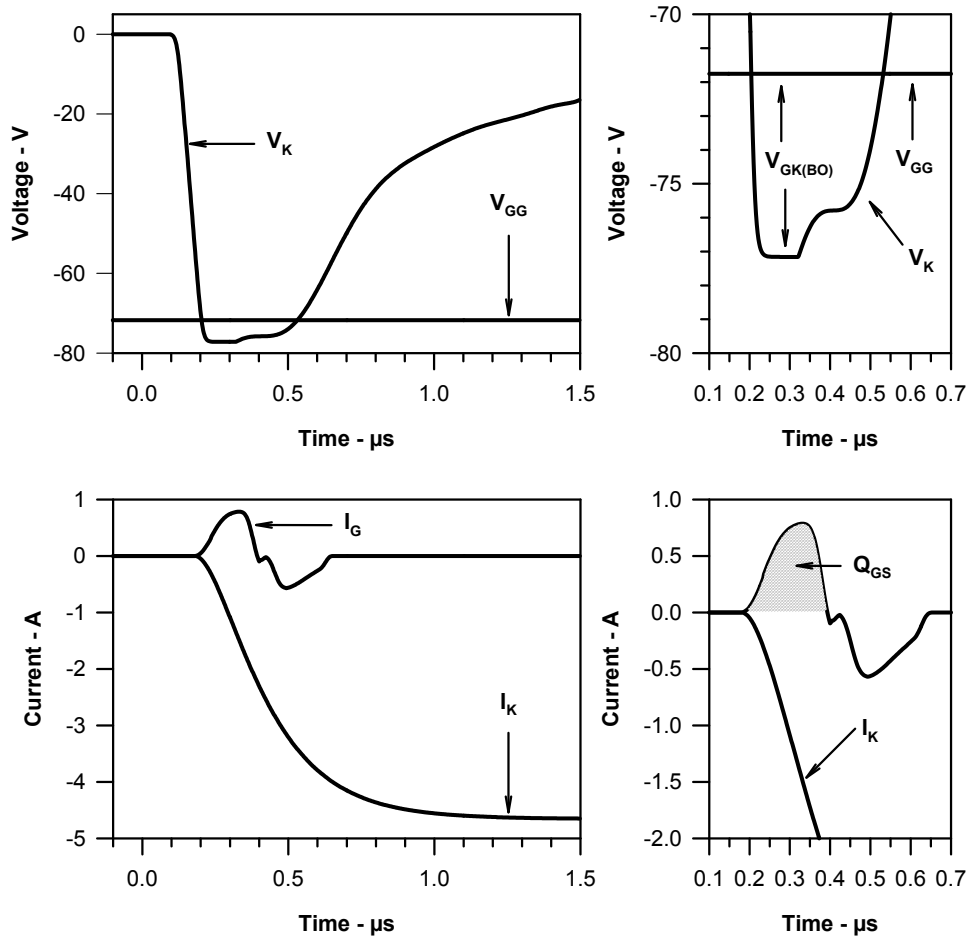


Figure 37—Overall and expanded clamping waveforms for a p-type gate DUT to illustrate $V_{GK(BO)}$ and Q_{GS} measurement ($di_K/dt=10 \text{ A}/\mu\text{s}$)

Page 47, Subclause A.1.31, quadrant, second sentence should read as follows:

These quadrants are numbered counterclockwise as 1 through 4.

Page 48, Subclause A.1.41, unidirectional thyristor surge protection device (SPD), title should read as follows:

unidirectional thyristor surge protective device (SPD):

Page 41, Figure 36, last listed item should read as follows:

CRO = Dual channel oscilloscope or equivalent

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