# SKKH 280/20 E H4

**SEMIPACK® 3**

Thyristor / Diode Modules

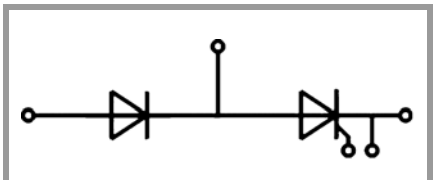
**SKKH 280/20 E H4**

### Features*

- Heat transfer through aluminum nitride ceramic insulated metal baseplate
- Precious metal pressure contacts for high reliability
- Thyristor with amplifying gate
- UL recognized, file no. E 63 532

### Typical Applications

- DC motor control (e. g. for machine tools)
- AC motor starters
- Temperature control (e. g. for ovens, chemical processes)
- Professional light dimming (studios, theaters)



**SKKH**

**Absolute Maximum Ratings**

| Symbol | Conditions | | Values | Unit |
|---|---|---|---|---|
| **Chip** | | | | |
| $I_{T(AV)}$ | sinus 180° | $T_c$ = 85 °C | 252 | A |
| | | $T_c$ = 79 °C | 280 | A |
| $I_{TRMS}$ | continuous operation | | 440 | A |
| $I_{TSM}$ | 10 ms | $T_j$ = 25 °C | 8500 | A |
| | | $T_j$ = 125 °C | 7500 | A |
| $i^2t$ | 10 ms | $T_j$ = 25 °C | 361250 | $A^2s$ |
| | | $T_j$ = 125 °C | 281250 | $A^2s$ |
| $V_{RSM}$ | | | 2100 | V |
| $V_{RRM}$ | | | 2000 | V |
| $V_{DRM}$ | | | 2000 | V |
| $(di/dt)_{cr}$ | $T_j$ = 125 °C | | 250 | A/µs |
| $(dv/dt)_{cr}$ | $T_j$ = 125 °C | | 1000 | V/µs |
| $T_j$ | | | -40 ... 125 | °C |
| **Module** | | | | |
| $T_{stg}$ | | | -40 ... 125 | °C |
| $V_{isol}$ | a.c.; 50 Hz; r.m.s. | 1 min | 4000 | V |
| | | 1 s | 4800 | V |

**Characteristics**

| Symbol | Conditions | | min. | typ. | max. | Unit |
|---|---|---|---|---|---|---|
| **Chip** | | | | | | |
| $V_T$ | $T_j$ = 25 °C, $I_T$ = 750 A | | | | 1.55 | V |
| $V_{T(TO)}$ | $T_j$ = 125 °C | | | | 0.90 | V |
| $r_T$ | $T_j$ = 125 °C | | | | 0.75 | mΩ |
| $I_{DD}$;$I_{RD}$ | $T_j$ = 125 °C, $V_{DD}$ = $V_{DRM}$; $V_{RD}$ = $V_{RRM}$ | | | | 90 | mA |
| $t_{gd}$ | $T_j$ = 25 °C, $I_G$ = 1 A, $di_G/dt$ = 1 A/µs | | | 1 | | µs |
| $t_{gr}$ | $V_D$ = 0.67 * $V_{DRM}$ | | | 2 | | µs |
| $t_q$ | $T_j$ = 125 °C | | 50 | 150 | 150 | µs |
| $I_H$ | $T_j$ = 25 °C | | | 150 | 500 | mA |
| $I_L$ | $T_j$ = 25 °C, $R_G$ = 33 Ω | | | 300 | 2000 | mA |
| $V_{GT}$ | $T_j$ = 25 °C, d.c. | | 3 | | | V |
| $I_{GT}$ | $T_j$ = 25 °C, d.c. | | 200 | | | mA |
| $V_{GD}$ | $T_j$ = 125 °C, d.c. | | | | 0.25 | V |
| $I_{GD}$ | $T_j$ = 125 °C, d.c. | | | | 10 | mA |
| $R_{th(j-c)}$ | cont. | per chip | | | 0.11 | K/W |
| | | per module | | | 0.055 | K/W |
| $R_{th(j-c)}$ | sin. 180° | per chip | | | 0.116 | K/W |
| | | per module | | | 0.058 | K/W |
| $R_{th(j-c)}$ | rec. 120° | per chip | | | 0.13 | K/W |
| | | per module | | | 0.065 | K/W |
| **Module** | | | | | | |
| $R_{th(c-s)}$ | chip | | | 0.04 | | K/W |
| | module | | | 0.02 | | K/W |
| $M_s$ | to heatsink M5 | | 4.25 | | 5.75 | Nm |
| $M_t$ | to terminals M8 | | 7.65 | | 10.34 | Nm |
| a | | | | | 5 * 9.81 | $m/s^2$ |
| w | | | | 600 | | g |

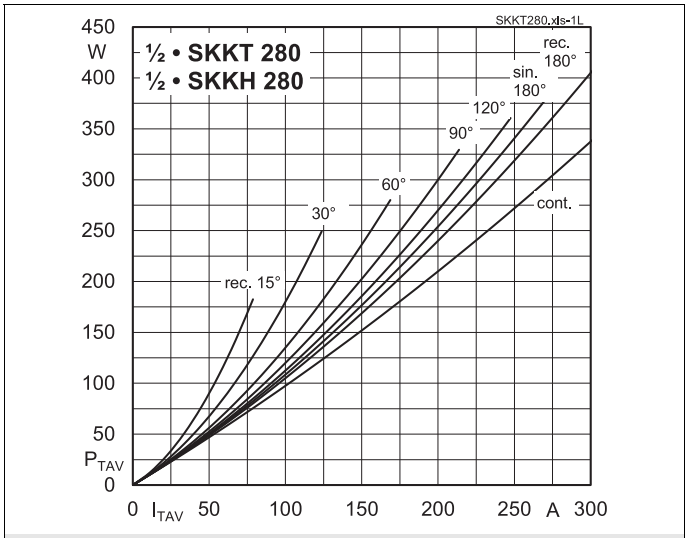



Fig. 1L: Power dissipation per thyristor vs. on-state current

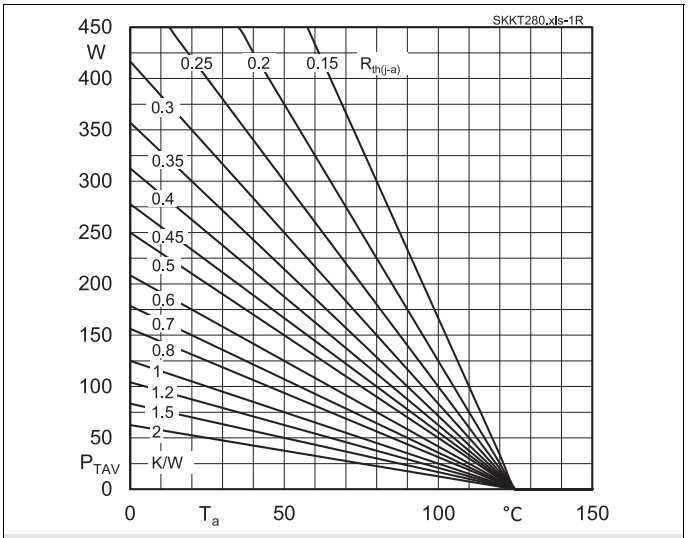



Fig. 1R: Power dissipation per thyristor vs. ambient temperature

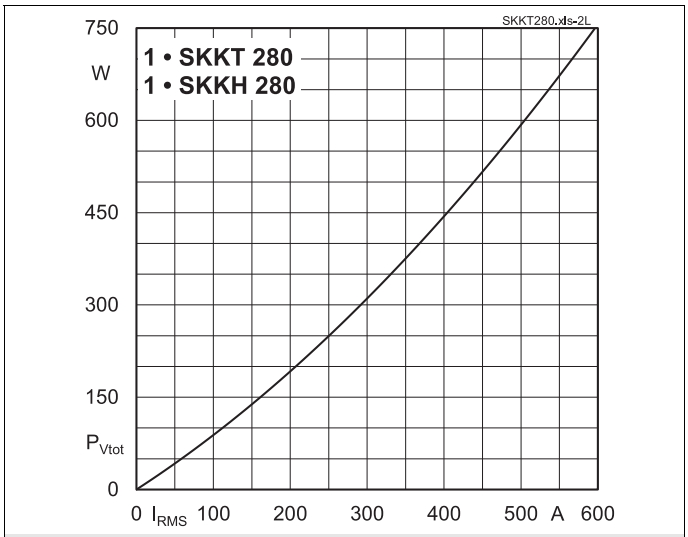



Fig. 2L: Power dissipation of one module vs. rms current

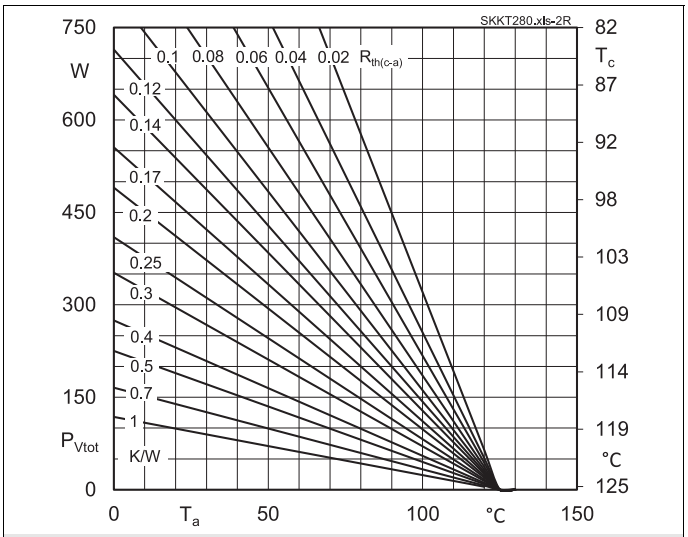



Fig. 2R: Max. power dissipation of one module vs. case temperature

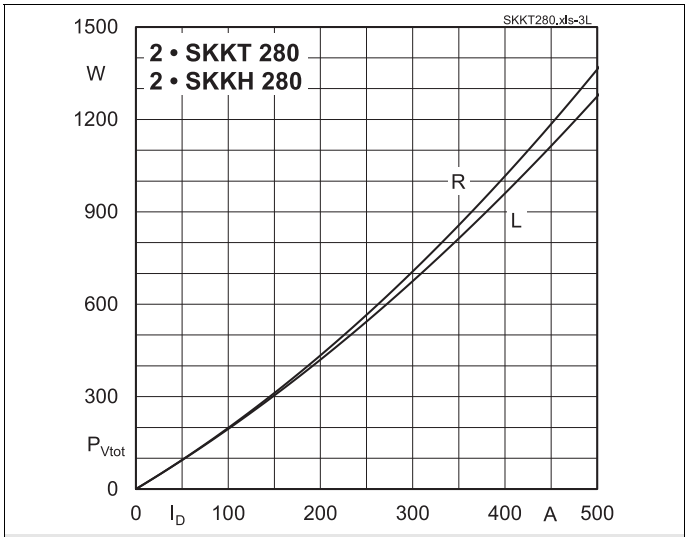



Fig. 3L: Power dissipation of two modules vs. direct current

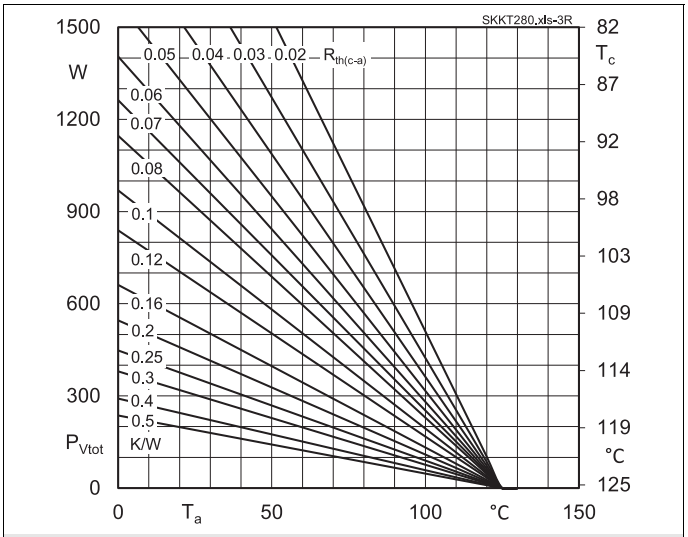



Fig. 3R: Power dissipation of two modules vs. case temperature

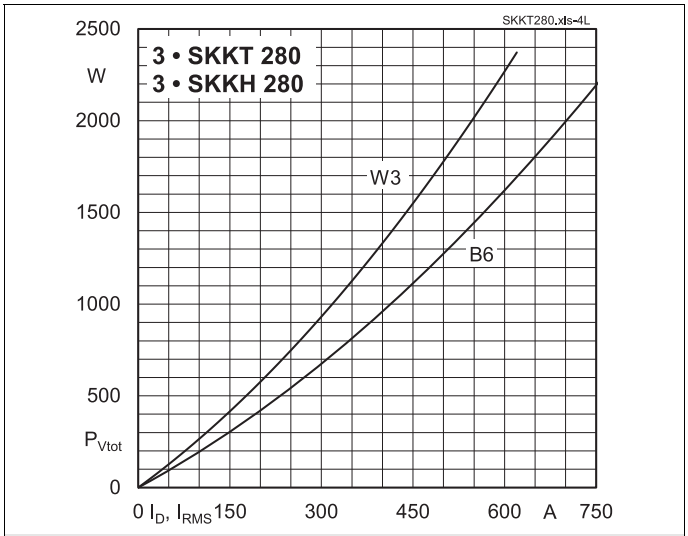



Fig. 4L: Power dissipation of three modules vs. direct and rms current

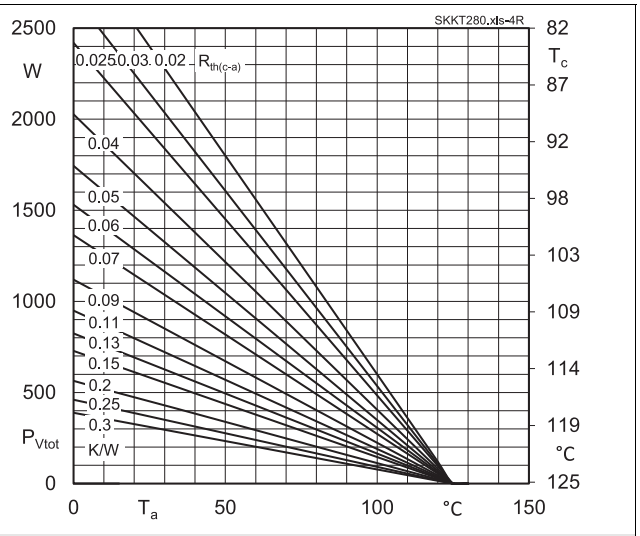



Fig. 4R: Power dissipation of three modules vs. case temperature

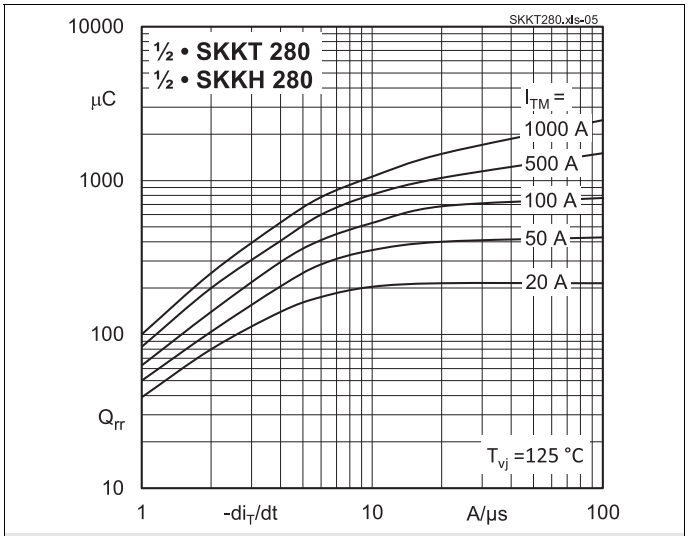



Fig. 5: Recovered charge vs. current decrease

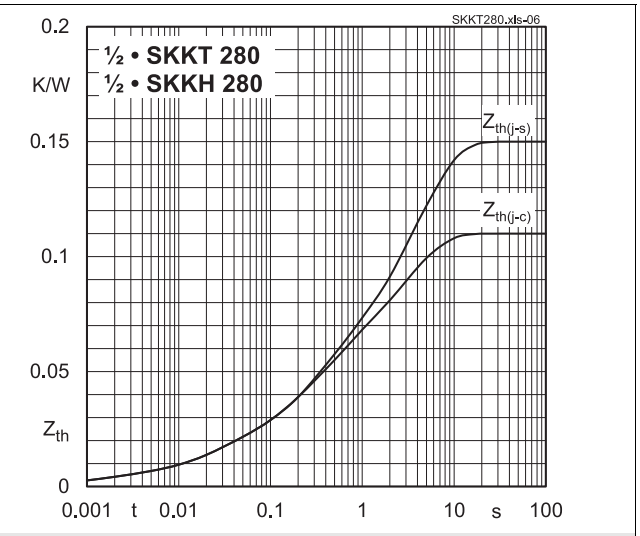



Fig. 6: Transient thermal impedance vs. time

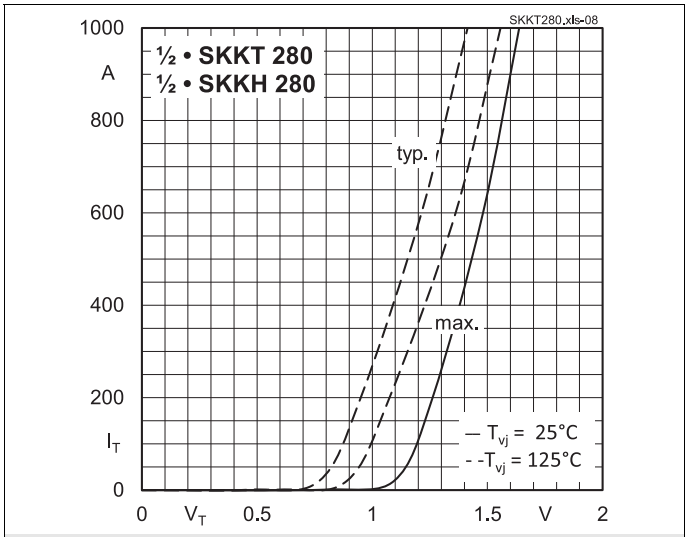



Fig. 7: On-state characteristics

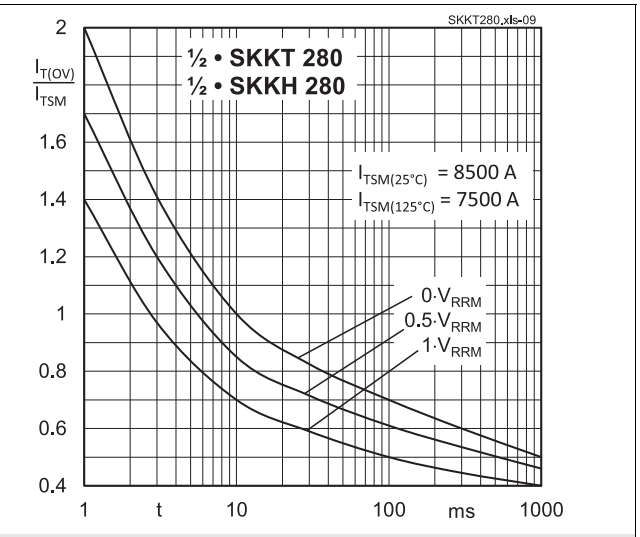



Fig. 8: Surge overload current vs. time

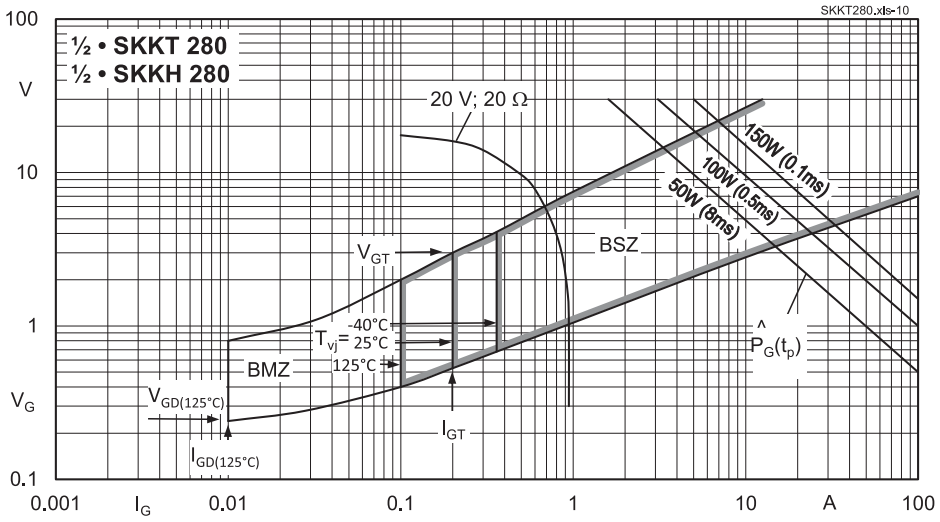
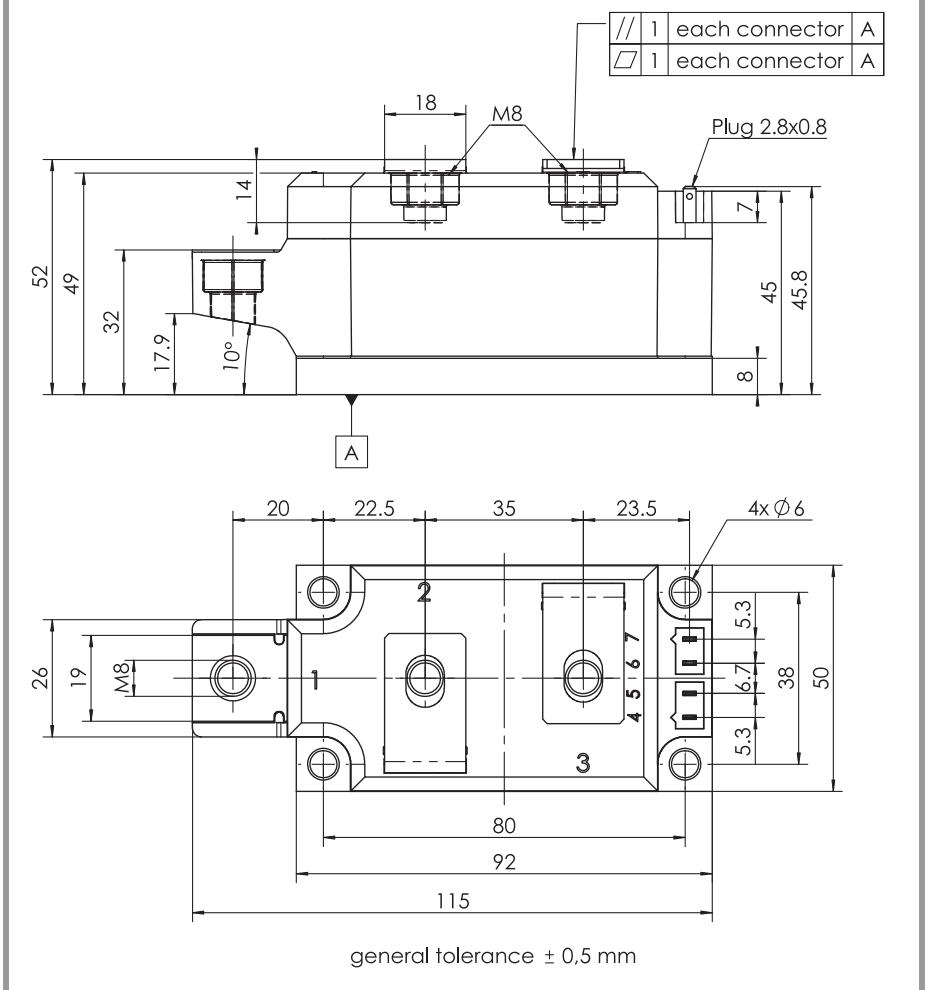



Fig. 9: Gate trigger characteristics

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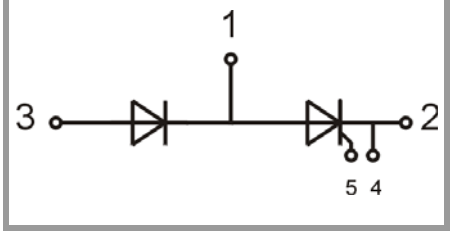


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This is an electrostatic discharge sensitive device (ESDS) due to international standard IEC 61340.

***IMPORTANT INFORMATION AND WARNINGS**

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