## SK200DHL066



SEMITOP<sup>®</sup>4

Half controlled bridge rectifier + IGBT braking chopper SK200DHL066

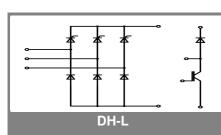
Target Data

## **Features**

- One screw mounting hole
- · Fully compatible with SEMITOP<sup>®</sup>1,2,3
- Improved thermal performances by aluminium oxide substrate
- Trench IGBT brake chopper technology
- CAL technology free-wheeling diode chopper

## **Typical Applications\***

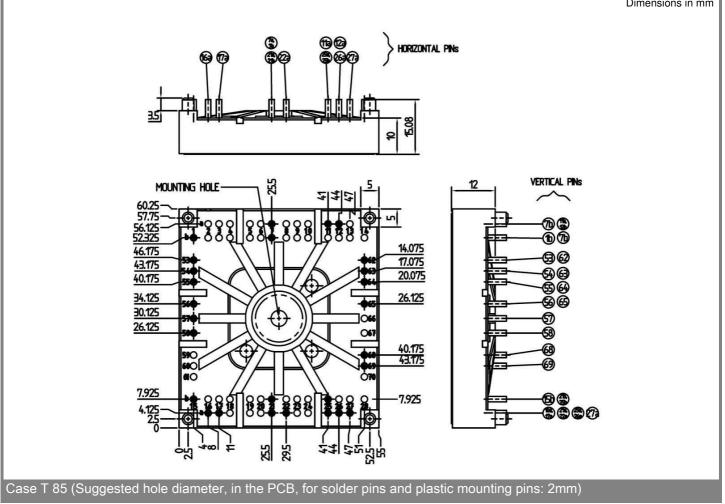
- $V_{CE,sat}$ ,  $V_F$  = chip level value  $I_{CM} = 2xI_{Cnom}$ ,  $t_p \le 1ms$   $I_{FM} = 2xI_{Fnom}$ ,  $t_p \le 1ms$   $I_C = I_{Cnom}$ ,  $I_F = I_{Fnom}$

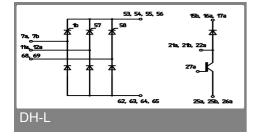


V <sub>RSM</sub> V	I V <sub>RRM</sub> , V <sub>DRM</sub> I V	<sub>D</sub> = 210 A (maximum value for continuous opera (T <sub>s</sub> = 70 °C)	ition)
		( S /	
Absolute	e Maximum Ratings	T <sub>s</sub> =25°C, unless othwerwise sp	pecifi
Symbol	Conditions	Values	Uni
-	Rectifier		
	T <sub>s</sub> = 70 °C; inductive load	210	A
I <sub>FSM</sub> /I <sub>TSM</sub>	$t_p = 10 \text{ ms}; \text{ half sine wave, }; T_{jmax}$		A
²t	$t_p = 10 \text{ ms}; \text{ half sine wave, };T_{jmin}$	ax 7810	A²s
IGBT - C	hopper	_	
V <sub>CES</sub> /V <sub>GES</sub>		600 / 20	V
с	T <sub>s</sub> = 25 (70) °C	174 (131)	A
СМ	t <sub>p</sub> = 1 ms; T <sub>s</sub> = °C	400	A
	eling - CAL Diode		
V <sub>RRM</sub>	T 05 (70) %0	600	V
F	$T_s = 25 (70) °C$	100 (80)	A
FM	$t_p = 1 \text{ ms}; T_s = °C$	200	A °C
Г <sub>vj</sub> Г.	Diode & IGBT (Thyristor)	-40 +150 (-40 +130) -40 +125 (-40 +130)	°C
T <sub>stg</sub> T <sub>solder</sub>	terminals, 10 s	260	°C
V <sub>isol</sub>	a.c. 50 Hz, RMS 1 min. / 1 s	2500 / 3000	V
1301			
Characte	eristics		
Symbol	Conditions	min. typ. max.	Un
-	Rectifier		
V <sub>TO</sub> / r <sub>t</sub>	T <sub>i</sub> = 125 °C	0,8 / 4	V / n
R <sub>th(j-s)</sub>	per diode	0,52	K/V
	r - Rectifier		
V <sub>F(TO)</sub> / r <sub>t</sub>	T <sub>i</sub> = 130 °C	1,1 / 4,5	V / n
R <sub>th(j-s)</sub>	per Thyristor	0,44	K/V
	$T_j = 115 ^{\circ}C;  d.c.$	6	
V <sub>GT</sub> / I <sub>GT</sub>	$T_j = 25 °C$	1,98 / 100	V / n
V <sub>GT</sub> / I <sub>GT</sub> <sub>H</sub> /I <sub>L</sub>	T <sub>j</sub> = 25 °C T <sub>j</sub> = 25 °C	1,98 / 100 220 / 550	V / n m/
V <sub>GT</sub> / I <sub>GT</sub> <sub>H</sub> /I <sub>L</sub> [dv/dt) <sub>cr</sub>	$T_{j} = 25 °C$ $T_{j} = 25 °C$ $T_{j} = 130 °C$	1,98 / 100	V / n m/ V/µ
V <sub>GT</sub> / I <sub>GT</sub> <sub>H</sub> /I <sub>L</sub> (dv/dt) <sub>cr</sub> (di/dt) <sub>cr</sub>	$T_{j}^{'} = 25 °C$ $T_{j} = 25 °C$ $T_{j} = 130 °C$ $T_{j} = 130 °C$	1,98 / 100 220 / 550 1000	V / n m/ V/μ
V <sub>GT</sub> / I <sub>GT</sub>   <sub>H</sub> /I <sub>L</sub> (dv/dt) <sub>cr</sub> (di/dt) <sub>cr</sub>	$T_{j} = 25 °C$ $T_{j} = 25 °C$ $T_{j} = 130 °C$ $T_{j} = 130 °C$ hopper	1,98 / 100 220 / 550 1000	V / n m/ V/μ
V <sub>GT</sub> / I <sub>GT</sub> <sub>H</sub> /I <sub>L</sub> (dv/dt) <sub>cr</sub> (di/dt) <sub>cr</sub>	$T_{j}^{'} = 25 °C$ $T_{j} = 25 °C$ $T_{j} = 130 °C$ $T_{j} = 130 °C$	1,98 / 100 220 / 550 1000 100	V / n m/ V/µ A/µ
V <sub>GT</sub> / I <sub>GT</sub>   <sub>H</sub> /I <sub>L</sub> (dv/dt) <sub>cr</sub> (di/dt) <sub>cr</sub>   <b>GBT - C</b> V <sub>CE(sat)</sub>	$T_{j}^{'} = 25 °C$ $T_{j} = 25 °C$ $T_{j} = 130 °C$ $T_{j} = 130 °C$ <b>hopper</b> $I_{C} = 200 A, T_{j} = 125 °C;$ $V_{GE} = 15 V$ per IGBT	1,98 / 100 220 / 550 1000 100	V / n m/ V/µ A/µ
V <sub>GT</sub> / I <sub>GT</sub> I <sub>H</sub> /I <sub>L</sub> (dv/dt) <sub>cr</sub> (di/dt) <sub>cr</sub> IGBT - C V <sub>CE(sat)</sub> R <sub>th(j-s)</sub>	$T_{j}^{'} = 25 °C$ $T_{j} = 25 °C$ $T_{j} = 130 °C$ $T_{j} = 130 °C$ <b>hopper</b> $I_{C} = 200 A, T_{j} = 125 °C;$ $V_{GE} = 15 V$ per IGBT valid for all values:	1,98 / 100 220 / 550 1000 100 1,7 2,15	V / n m/ V/µ A/µ V K/V
V <sub>GT</sub> / I <sub>GT</sub> I <sub>H</sub> /I <sub>L</sub> (dv/dt) <sub>cr</sub> (di/dt) <sub>cr</sub> IGBT - C V <sub>CE(sat)</sub> R <sub>th(j-s)</sub>	$T_{j}^{'} = 25 °C$ $T_{j} = 25 °C$ $T_{j} = 130 °C$ $T_{j} = 130 °C$ <b>hopper</b> $I_{C} = 200 A, T_{j} = 125 °C;$ $V_{GE} = 15 V$ per IGBT valid for all values:	1,98 / 100 220 / 550 1000 100 1,7 2,15	V / n m/ V/µ A/µ V K/V
$\begin{array}{c} \sqrt{G_{\text{GT}}} / I_{\text{GT}} \\ + \sqrt{I_{\text{I}}} \\ (dv/dt)_{cr} \\ (di/dt)_{cr} \\ \hline \textbf{GBT - C} \\ \hline \textbf{GBT - C} \\ \sqrt{CE(sat)} \\ \hline \textbf{R}_{th(j-s)} \\ \hline $	$ \begin{array}{c} T_{j}^{'} = 25 \ ^{\circ}\text{C} \\ T_{j} = 25 \ ^{\circ}\text{C} \\ T_{j} = 130 \ ^{\circ}\text{C} \\ \hline T_{j} = 130 \ ^{\circ}\text{C} \\ \end{array} \\ \hline \textbf{hopper} \\ \hline \textbf{I}_{C} = 200 \ \text{A}, \ T_{j} = 125 \ ^{\circ}\text{C}; \\ V_{GE} = 15 \ \text{V} \\ per \ \text{IGBT} \\ \hline \hline \textbf{valid for all values:} \\ V_{CC} = 300 \ \text{V}; \ V_{GE} = 15 \ \text{V}; \\ \hline \textbf{I}_{C} = 200 \ \text{A}; \ \textbf{T}_{j} = 125 \ ^{\circ}\text{C}; \\ \end{array} $	1,98 / 100 220 / 550 1000 100 1,7 2,15 0,45	V / n m/ V/µ A/µ V K/V ns ns
$\begin{array}{c} V_{\text{GT}} / I_{\text{GT}} \\ I_{\text{H}} / I_{\text{L}} \\ (\text{dv/dt})_{\text{cr}} \\ (\text{di/dt})_{\text{cr}} \\ \hline \textbf{IGBT - C} \\ \hline \textbf{V}_{\text{CE(sat)}} \\ \hline \textbf{R}_{\text{th}(j-s)} \\ \hline \textbf{R}_{\text{th}(j-s)} \\ \hline \textbf{t}_{\text{d}(on)} / \textbf{t}_{\text{r}} \\ \hline \textbf{t}_{\text{d}(off)} / \textbf{t}_{\text{f}} \end{array}$	$T_{j}^{'} = 25 °C$ $T_{j} = 25 °C$ $T_{j} = 130 °C$ $T_{j} = 130 °C$ <b>hopper</b> $I_{C} = 200 A, T_{j} = 125 °C;$ $V_{GE} = 15 V$ per IGBT valid for all values:	1,98 / 100 220 / 550 1000 100 1,7 2,15	V / n mA V/µ A/µ V K/V ns ns
$\begin{array}{c} \sqrt{G_{\text{GT}} / I_{\text{GT}}} \\ H^{/I_{\text{L}}} \\ (dv/dt)_{cr} \\ (di/dt)_{cr} \\ \hline \\ $	$ \begin{array}{l} T_{j}^{'} = 25 \ ^{\circ}\text{C} \\ T_{j} = 25 \ ^{\circ}\text{C} \\ T_{j} = 130 \ ^{\circ}\text{C} \\ \hline T_{j} = 130 \ ^{\circ}\text{C} \\ \end{array} \\ \hline \textbf{hopper} \\ \hline \textbf{H}_{C} = 200 \ \text{A}, \ T_{j} = 125 \ ^{\circ}\text{C}; \\ V_{GE} = 15 \ \text{V} \\ per \ \text{IGBT} \\ \hline \textbf{valid for all values:} \\ \hline V_{CC} = 300 \ \text{V}; \ V_{GE} = 15 \ \text{V}; \\ \hline \textbf{H}_{C} = 200 \ \text{A}; \ T_{j} = 125 \ ^{\circ}\text{C}; \\ \hline \textbf{T}_{j} = 125 \ ^{\circ}\text{C}; \ \textbf{R}_{G} = 4 \ \Omega; \\ \hline \textbf{inductive load} \\ \end{array} $	1,98 / 100 220 / 550 1000 100 1,7 2,15 0,45	V / n m/ V/µ A/µ V K/V ns ns
$V_{GT} / I_{GT}$ $ A _L   (dv/dt)_{cr}   (dv/dt)_{cr}   (di/dt)_{cr}   (di/dt)_$	$T_{j}^{'} = 25 °C$ $T_{j} = 25 °C$ $T_{j} = 130 °C$ $T_{j} = 130 °C$ $Hopper$ $I_{C} = 200 A, T_{j} = 125 °C;$ $V_{GE} = 15 V$ per IGBT valid for all values: $V_{CC} = 300 V; V_{GE} = 15 V;$ $I_{C} = 200 A; T_{j} = 125 °C;$ $T_{j} = 125 °C; R_{G} = 4 \Omega;$ inductive load ode - Freewheeling	1,98 / 100 220 / 550 1000 100 1,7 2,15 0,45	V / n m/ V/µ A/µ V K/V ns ns ms
$V_{GT} / I_{GT}  _{H} / I_{L} (dv/dt)_{cr} (di/dt)_{cr} IGBT - C V_{CE(sat)} R_{th(j-s)} t_{d(off)} / t_{r} t_{d(off)} / t_{f} E_{on} + E_{off} CAL - Di V_{T(TO)} / r_{t} $	$ \begin{array}{l} T_{j}^{'} = 25 \ ^{\circ}\text{C} \\ T_{j} = 25 \ ^{\circ}\text{C} \\ T_{j} = 130 \ ^{\circ}\text{C} \\ \hline T_{j} = 130 \ ^{\circ}\text{C} \\ \end{array} \\ \hline \textbf{hopper} \\ \hline \textbf{H}_{C} = 200 \ \text{A}, \ T_{j} = 125 \ ^{\circ}\text{C}; \\ V_{GE} = 15 \ \text{V} \\ per \ \text{IGBT} \\ \hline \textbf{valid for all values:} \\ \hline V_{CC} = 300 \ \text{V}; \ V_{GE} = 15 \ \text{V}; \\ \hline \textbf{H}_{C} = 200 \ \text{A}; \ T_{j} = 125 \ ^{\circ}\text{C}; \\ \hline \textbf{T}_{j} = 125 \ ^{\circ}\text{C}; \ \textbf{R}_{G} = 4 \ \Omega; \\ \hline \textbf{inductive load} \\ \end{array} $	1,98 / 100 220 / 550 1000 100 1,7 2,15 0,45 13,8	V / n mA V/µ A/µ V K/V ns ns m. V / n
$V_{GT} / I_{GT}$ $H/I_{L} (dv/dt)_{cr} (di/dt)_{cr}$ $GBT - C$ $V_{CE(sat)}$ $R_{th(j-s)} (don) / t_{r}$ $Gon + E_{off}$ $CAL - Di$ $V_{T(TO)} / r_{t}$ $R_{th(j-s)} (dt)$	$\begin{array}{c} T_{j}^{'} = 25 \ ^{\circ}\text{C} \\ T_{j} = 25 \ ^{\circ}\text{C} \\ T_{j} = 130 \ ^{\circ}\text{C} \\ \hline T_{j} = 130 \ ^{\circ}\text{C} \\ \hline \textbf{hopper} \\ \hline \textbf{l}_{C} = 200 \ \textbf{A}, T_{j} = 125 \ ^{\circ}\text{C}; \\ V_{GE} = 15 \ V \\ per \ IGBT \\ \hline \textbf{valid for all values:} \\ V_{CC} = 300 \ V; \ V_{GE} = 15 \ V; \\ I_{C} = 200 \ \textbf{A}; T_{j} = 125 \ ^{\circ}\text{C}; \\ T_{j} = 125 \ ^{\circ}\text{C}; \ \textbf{R}_{G} = 4 \ \Omega; \\ inductive \ load \\ \hline \textbf{ode - Freewheeling} \\ T_{j} = 150 \ ^{\circ}\text{C} \\ \end{array}$	1,98 / 100 220 / 550 1000 100 100 1,7 2,15 0,45 13,8 0,85 / 3,5	V / n mA V/µ A/µ K/V ns ns m K/V
$\begin{array}{c} \sqrt{GT} / I_{GT} \\ H/I_{L} \\ dv/dt)_{cr} \\ dv/dt)_{cr} \\ \hline \\ $	$\begin{array}{c} T_{j}^{'} = 25 \ ^{\circ}\text{C} \\ T_{j} = 25 \ ^{\circ}\text{C} \\ T_{j} = 130 \ ^{\circ}\text{C} \\ \hline T_{j} = 130 \ ^{\circ}\text{C} \\ \hline \textbf{hopper} \\ \hline \textbf{hopper} \\ \hline \textbf{l}_{C} = 200 \ \text{A}, \ T_{j} = 125 \ ^{\circ}\text{C}; \\ \hline \textbf{V}_{GE} = 15 \ \text{V} \\ per \ IGBT \\ \hline \textbf{valid for all values:} \\ \hline \textbf{V}_{CC} = 300 \ \text{V}; \ \textbf{V}_{GE} = 15 \ \text{V}; \\ \hline \textbf{l}_{C} = 200 \ \text{A}; \ T_{j} = 125 \ ^{\circ}\text{C}; \\ \hline \textbf{T}_{j} = 125 \ ^{\circ}\text{C}; \ \textbf{R}_{G} = 4 \ \Omega; \\ \hline \textbf{inductive load} \\ \hline \textbf{ode - Freewheeling} \\ \hline \textbf{T}_{j} = 150 \ ^{\circ}\text{C} \\ per \ diode \\ \end{array}$	1,98 / 100 220 / 550 1000 100 100 1,7 2,15 0,45 13,8 0,85 / 3,5	V / r m V/µ A/µ V/ K/V Ns ns m. V / n K/V A
$\begin{array}{c} \sqrt{GT} / I_{GT} \\ H/I_{L} \\ (dv/dt)_{cr} \\ (di/dt)_{cr} \\ \hline \\ $	$\begin{array}{c} T_{j}^{'} = 25 \ ^{\circ}\text{C} \\ T_{j} = 25 \ ^{\circ}\text{C} \\ T_{j} = 130 \ ^{\circ}\text{C} \\ \hline T_{j} = 130 \ ^{\circ}\text{C} \\ \hline \textbf{hopper} \\ \hline \textbf{hopper} \\ \hline \textbf{l}_{C} = 200 \ \textbf{A}, \ T_{j} = 125 \ ^{\circ}\text{C}; \\ \hline V_{GE} = 15 \ V \\ per \ IGBT \\ \hline \textbf{valid for all values:} \\ \hline V_{CC} = 300 \ V; \ V_{GE} = 15 \ V; \\ \hline \textbf{l}_{C} = 200 \ \textbf{A}; \ T_{j} = 125 \ ^{\circ}\text{C}; \\ \hline T_{j} = 125 \ ^{\circ}\text{C}; \ \textbf{R}_{G} = 4 \ \Omega; \\ \textbf{inductive load} \\ \hline \textbf{ode - Freewheeling} \\ \hline T_{j} = 150 \ ^{\circ}\text{C} \\ per \ diode \\ \hline \textbf{valid for all values:} \\ \hline \textbf{l}_{F} = 200 \ \textbf{A}; \ V_{R} = - 600 \ V; \\ \hline \end{array}$	1,98 / 100 220 / 550 1000 100 100 1,7 2,15 0,45 13,8 0,85 / 3,5	V / n MA/µ V/µ A/µ K/V ns ns m. K/V A µC
$V_{GT} / I_{GT}  _{H} / I_{L} (dv/dt)_{cr} (di/dt)_{cr} IGBT - C V_{CE(sat)} R_{th(j-s)} t_{d(off)} / t_{r} E_{on} + E_{off} CAL - Di V_{T(TO)} / r_{t} R_{th(j-s)}  _{RRM} Q_{rr} E_{off} $	$\label{eq:relation} \begin{split} & T_{j}^{'} = 25 \ ^{\circ}C \\ & T_{j} = 25 \ ^{\circ}C \\ & T_{j} = 130 \ ^{\circ}C \\ \hline & T_{j} = 130 \ ^{\circ}C \\ \hline & hopper \\ & l_{C} = 200 \ A, \ T_{j} = 125 \ ^{\circ}C; \\ & V_{GE} = 15 \ V \\ & per \ IGBT \\ \hline & valid \ for \ all \ values: \\ & V_{CC} = 300 \ V; \ V_{GE} = 15 \ V; \\ & I_{C} = 200 \ A; \ T_{j} = 125 \ ^{\circ}C; \\ & T_{j} = 125 \ ^{\circ}C; \ R_{G} = 4 \ \Omega; \\ & inductive \ load \\ \hline \\ \hline & ode \ \textbf{-Freewheeling} \\ & T_{j} = 150 \ ^{\circ}C \\ & per \ diode \\ \hline & valid \ for \ all \ values: \\ & I_{F} = 200 \ A; \ V_{R} = - 600 \ V; \\ & dI_{F} / dt = - A / \mu s \\ \end{split}$	1,98 / 100 220 / 550 1000 100 100 1,7 2,15 0,45 13,8 0,85 / 3,5	V / n MA V/µ A/µ K/V Ns ns m. K/V A µC
$V_{GT} / I_{GT}$ $ _{H} / I_{L}$ $(dv/dt)_{cr}$ $(di/dt)_{cr}$ $IGBT - C$ $V_{CE(sat)}$ $R_{th(j-s)}$ $t_{d(on)} / t_{r}$ $t_{d(off)} / t_{f}$ $E_{on} + E_{off}$ $CAL - Di$ $V_{T(TO)} / r_{t}$ $R_{th(j-s)}$ $R_{RRM}$ $Q_{rr}$ $E_{off}$ $Tempera$	$\begin{array}{c} T_{j}^{'} = 25 \ ^{\circ}\text{C} \\ T_{j} = 25 \ ^{\circ}\text{C} \\ T_{j} = 130 \ ^{\circ}\text{C} \\ \hline T_{j} = 130 \ ^{\circ}\text{C} \\ \hline \textbf{hopper} \\ \hline \textbf{I}_{C} = 200 \ \textbf{A}, \ T_{j} = 125 \ ^{\circ}\text{C}; \\ \hline V_{GE} = 15 \ V \\ per \ IGBT \\ \hline \textbf{valid for all values:} \\ \hline V_{CC} = 300 \ V; \ V_{GE} = 15 \ V; \\ \hline \textbf{I}_{C} = 200 \ \textbf{A}; \ T_{j} = 125 \ ^{\circ}\text{C}; \\ \hline T_{j} = 125 \ ^{\circ}\text{C}; \ \textbf{R}_{G} = 4 \ \Omega; \\ \textbf{inductive load} \\ \hline \textbf{ode - Freewheeling} \\ \hline \textbf{T}_{j} = 150 \ ^{\circ}\text{C} \\ per \ diode \\ \hline \textbf{valid for all values:} \\ \hline \textbf{I}_{F} = 200 \ \textbf{A}; \ V_{R} = - 600 \ V; \\ \hline \textbf{d}_{F}/dt = - \ \textbf{A}/\mu s \\ \hline V_{GE} = V; \ T_{j} = 125 \ ^{\circ}\text{C} \\ \end{array}$	1,98 / 100 220 / 550 1000 100 100 1,7 2,15 0,45 13,8 0,85 / 3,5	V / n MA/μ V/μ A/μ V K/V Ns ns m K/V A μC
V <sub>T(TO)</sub> / r <sub>t</sub> R <sub>th(j-s)</sub> I <sub>RRM</sub> Q <sub>rr</sub> E <sub>off</sub>	$\begin{array}{c} T_{j}^{'} = 25 \ ^{\circ}\text{C} \\ T_{j} = 25 \ ^{\circ}\text{C} \\ T_{j} = 130 \ ^{\circ}\text{C} \\ \hline \textbf{T}_{j} = 130 \ ^{\circ}\text{C} \\ \hline \textbf{hopper} \\ \hline \textbf{I}_{C} = 200 \ \text{A}, \ \textbf{T}_{j} = 125 \ ^{\circ}\text{C}; \\ \hline \textbf{V}_{GE} = 15 \ \text{V} \\ per \ IGBT \\ \hline \textbf{valid for all values:} \\ \hline \textbf{V}_{CC} = 300 \ \text{V}; \ \textbf{V}_{GE} = 15 \ \text{V}; \\ \hline \textbf{I}_{C} = 200 \ \text{A}; \ \textbf{T}_{j} = 125 \ ^{\circ}\text{C}; \\ \hline \textbf{T}_{j} = 125 \ ^{\circ}\text{C}; \ \textbf{R}_{G} = 4 \ \Omega; \\ \textbf{inductive load} \\ \hline \textbf{ode - Freewheeling} \\ \hline \textbf{T}_{j} = 150 \ ^{\circ}\text{C} \\ per \ diode \\ \hline \textbf{valid for all values:} \\ \hline \textbf{I}_{F} = 200 \ \text{A}; \ \ \textbf{V}_{R} = - 600 \ \text{V}; \\ \hline \textbf{dI}_{F}/dt = - \ \textbf{A}/\mu s \\ \hline \textbf{V}_{GE} = \ \text{V}; \ \textbf{T}_{j} = 125 \ ^{\circ}\text{C} \\ \hline \textbf{ature Sensor} \\ \hline \textbf{T} = \ ^{\circ}\text{C}; \\ \hline \end{array}$	1,98 / 100 220 / 550 1000 100 100 1,7 2,15 0,45 13,8 0,85 / 3,5	MA V / n MA/μ A/μ K/V NS nS m K/V A K/V A A μC m

## SK200DHL066

Dimensions in mm





This is an electrostatic discharge sensitive device (ESDS), international standard IEC 60747-1, Chapter IX.

\* The specifications of our components may not be considered as an assurance of component characteristics. Components have to be tested for the respective application. Adjustments may be necessary. The use of SEMIKRON products in life support appliances and systems is subject to prior specification and written approval by SEMIKRON. We therefore strongly recommend prior consultation of our personal.