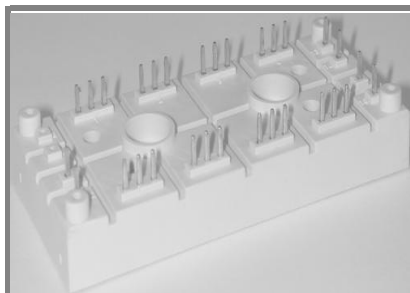


# SKDH 146/.. -L100



**SEMIPONT™ 6**

## 3-Phase Bridge Rectifier + IGBT braking chopper

**SKDH 146/.. -L100**

Preliminary Data

### Features

- Compact design
- Two screws mounting
- Heat transfer and isolation through direct copper bonded aluminium oxide ceramic (DCB)
- High surge currents
- Up to 1600V reverse voltage
- UL recognized, file no. E 63 532

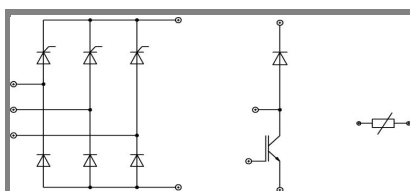
### Typical Applications\*

- DC drives
- Controlled filed rectifiers for DC motors
- Controlled battery charger

$V_{RSM}$ V	$V_{RRM}, V_{DRM}$ V	$I_D = 140$ A (maximum value for continuous operation) ( $T_s = 80$ °C)
1300	1200	SKDH 146/12-L100
1700	1600	SKDH 146/16-L100

Absolute Maximum Ratings		$T_s = 25$ °C, unless otherwise specified	
Symbol	Conditions	Values	Units
<b>Bridge - Rectifier</b>			
$I_D$	$T_s = 80$ °C; inductive load	140	A
$I_{FSM}/I_{TSM}$	$t_p = 10$ ms; $\sin 180^\circ$ ; $T_{jmax}$	1250	A
$i^2t$	$t_p = 10$ ms; $\sin 180^\circ$ ; $T_{jmax}$	7800	A²s
<b>IGBT - Chopper</b>			
$V_{CES}/V_{GES}$	$T_s = 25$ (70) °C	1200 / 20	V
$I_C$	$T_s = 25$ (70) °C	125 (100)	A
$I_{CM}$	$t_p = 1$ ms; $T_s = 25$ (70) °C	250 (200)	A
<b>Freewheeling - CAL Diode</b>			
$V_{RRM}$	$T_s = 25$ (70) °C	1200	V
$I_F$	$T_s = 25$ (70) °C	130 (90)	A
$I_{FM}$	$t_p = 1$ ms; $T_s = 25$ (70) °C	240 (180)	A
$T_{vj}$	Diode & IGBT (Thyristor)	- 40 ... + 150 (-40...+ 125)	°C
$T_{stg}$	terminals, 10 s	- 40 ... + 125	°C
$T_{solder}$	a.c. (50) Hz, RMS 1 min. / 1 s	260	°C
$V_{isol}$		3000 / 3600	V

Characteristics		$T_s = 25$ °C, unless otherwise specified		
Symbol	Conditions	min.	typ.	max. Units
<b>Diode - Rectifier</b>				
$V_{TO} / r_t$	$T_j = 125$ °C		0,8 / 4	V / mΩ
$R_{th(j-s)}$	per diode			0,8 K/W
<b>IGBT - Chopper</b>				
$V_{CE(sat)}$	$I_C = 100$ A, $T_j = 25$ °C; $V_{GE} = 15$ V		2,35	V
$R_{th(j-s)}$	per IGBT			0,3 K/W
$t_{d(on)} / t_r$	valid for all values:		114 / 94,5	ns
$t_{d(off)} / t_f$	$V_{CC} = 600$ V; $V_{GE} = 15$ V; $I_C = 120$ A; $T_j = 125$ °C;		845,5 / 94,5	ns
$E_{on} + E_{off}$	$T_j = 125$ °C; $R_G = 16$ Ω; inductive load		24,4	mJ
<b>CAL - Diode - Freewheeling</b>				
$V_{T(TO)} / r_t$	$T_j = 125$ °C		1 / 8	V / mΩ
$R_{th(j-s)}$	per diode			0,6 K/W
$I_{RRM}$	valid for all values:		65	A
$Q_{rr}$	$I_F = 100$ A; $V_{GE} = -600$ V; $di_F/dt = -1000$ A/μs		15	μC
$E_{off}$	$V_{GE} = 0$ V; $T_j = 125$ °C			mJ
<b>Temperature Sensor</b>				
$R_{TS}$	$T = 25$ (100) °C;		1000 (1670)	Ω
<b>Mechanical data</b>				
$M_S$	mounting Torque	2,55		3,45 Nm



DH

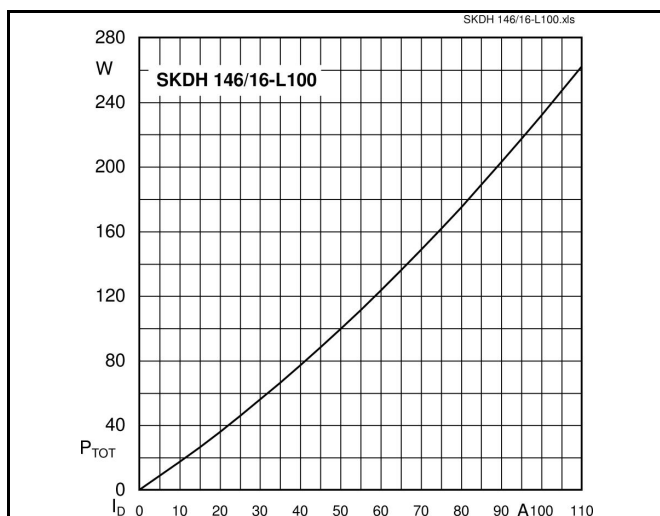


Fig. 1 Power dissipation per module vs. output current

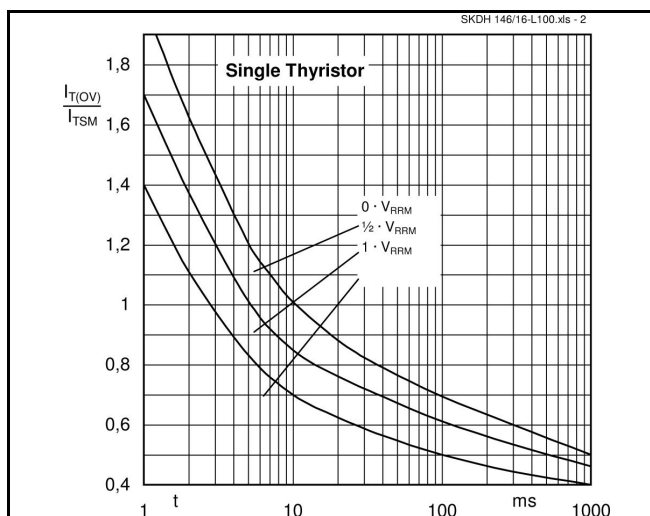


Fig. 2 Surge overload current vs. time

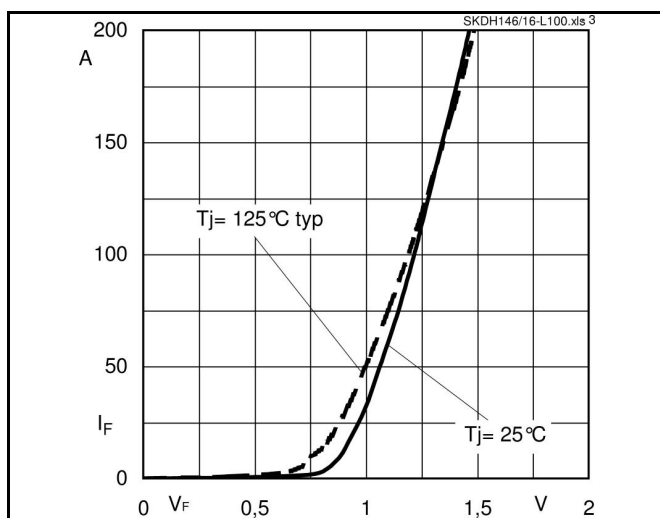


Fig. 3 Forward characteristic of single rectifier diode

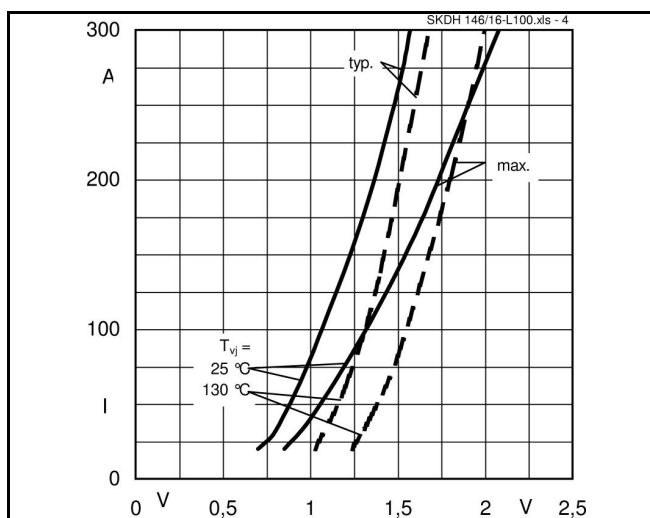


Fig. 4 Forward characteristic of single thyristor

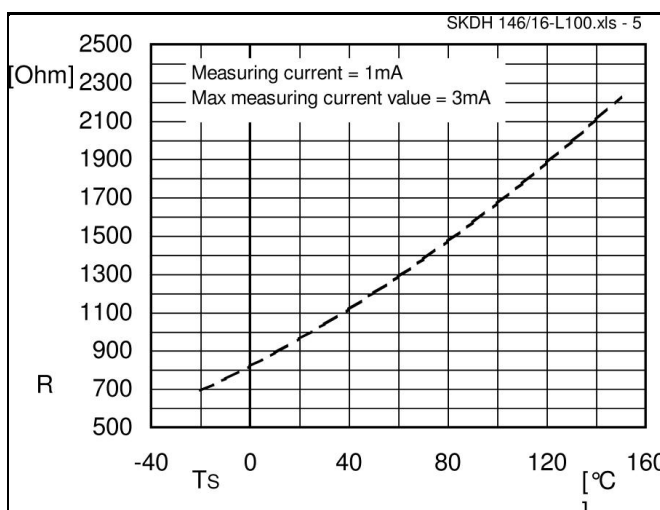


Fig. 5 Temperature sensor characteristic

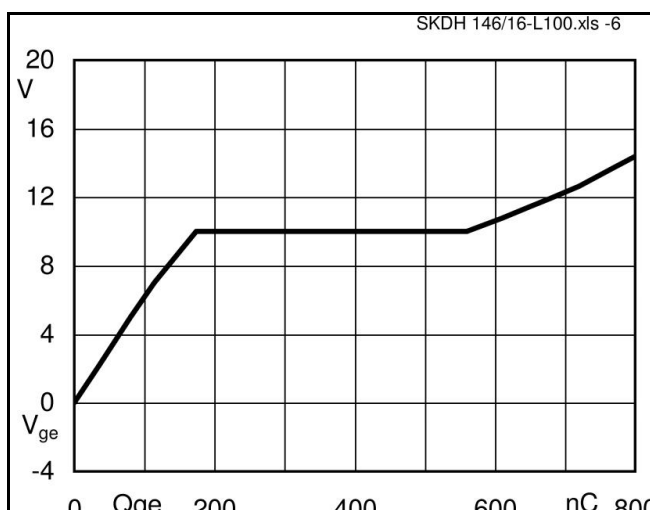


Fig. 6 Typ gate charge characteristic

SKDH 146/16-L100.xls -7

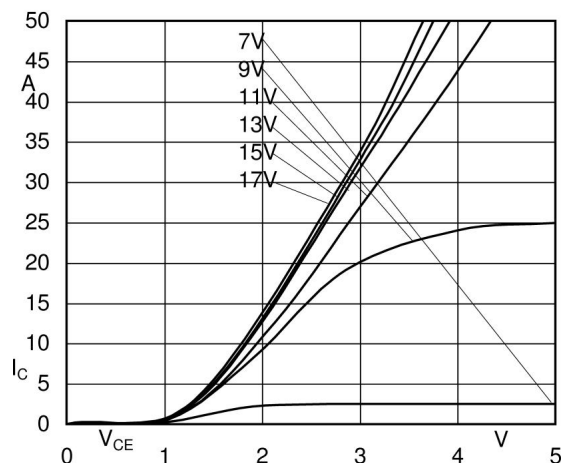


Fig. 7 Output IGBT characteristics  $I_c = f(V_{ce})$ ,  $T_j = 25^\circ\text{C}$

SKDH 146/16-L100.xls -8

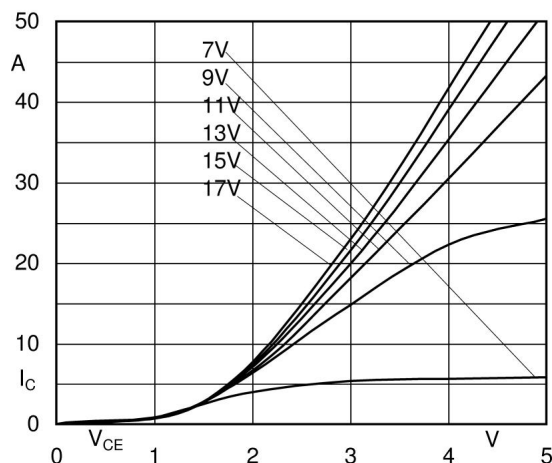


Fig. 8 Output IGBT characteristics  $I_c = f(V_{ce})$ ,  $T_j = 125^\circ\text{C}$

SKDH 146/16-L100.xls -9

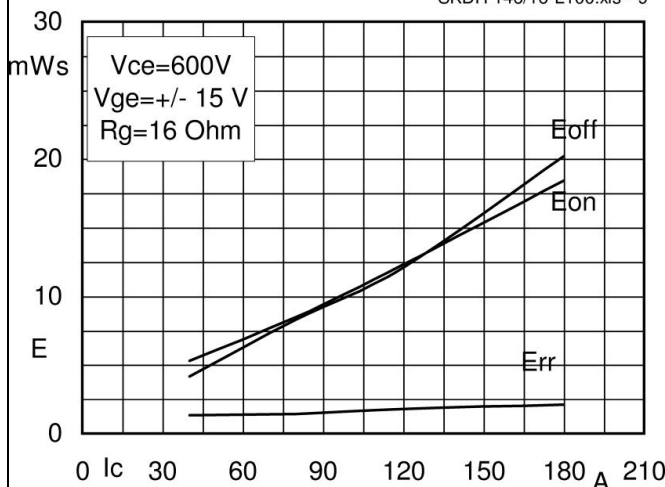


Fig. 9 Turn-on/-off energy  $= f(I_c)$

SKDH 146/16-L100.xls -10

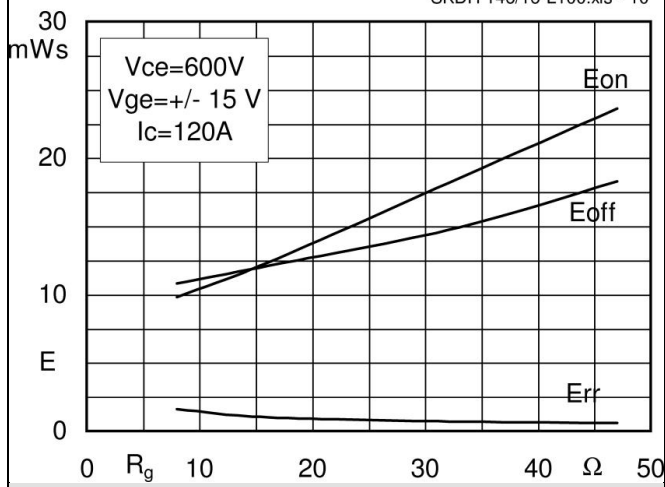


Fig.10 Turn-on/-off energy  $= f(R_g)$

SKDH 146/16-L100.xls -11

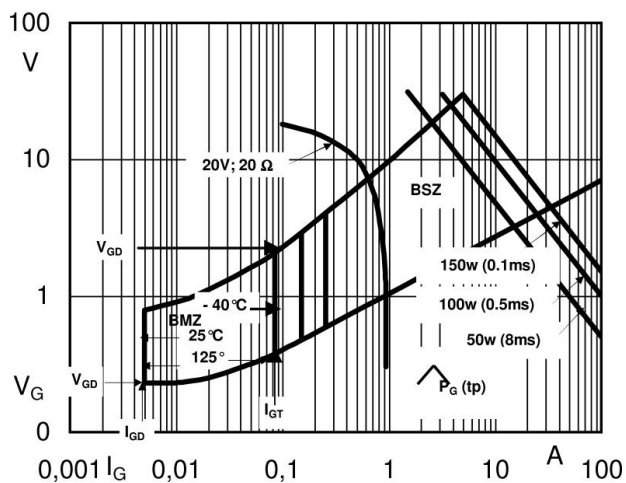


Fig. 11 Gate trigger characteristic of a single thyristor

SKDH 146/16-L100.xls -12

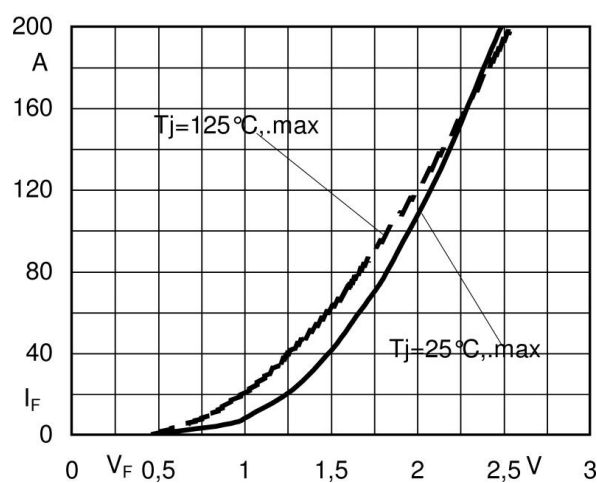
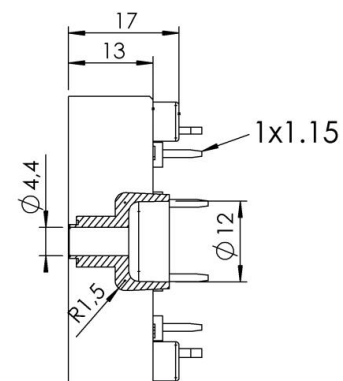
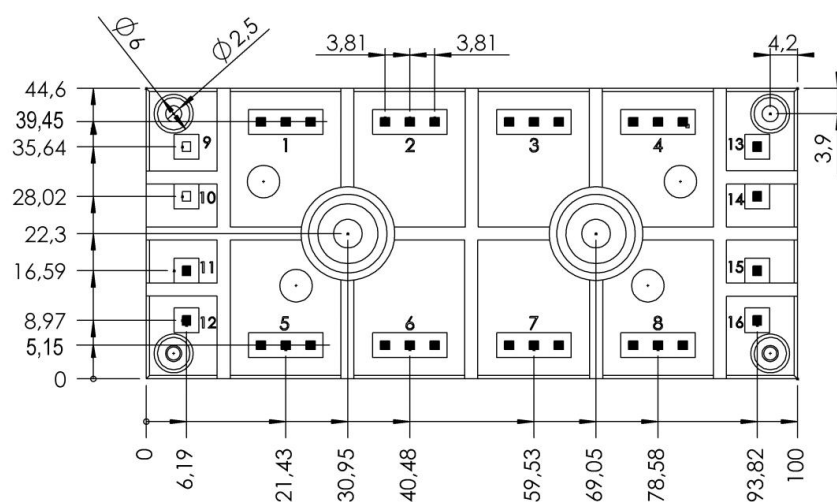
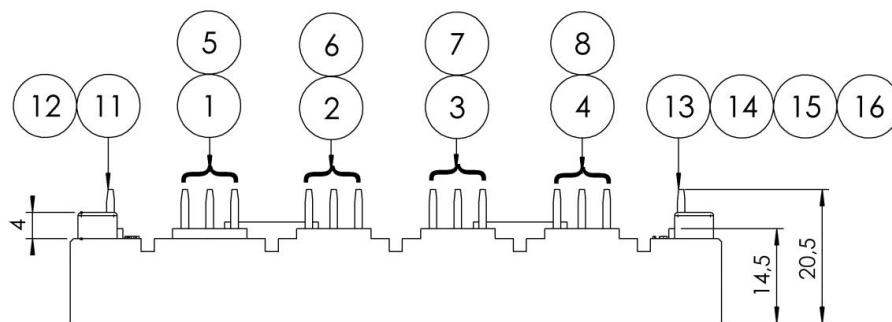
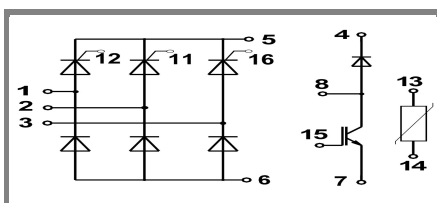


Fig. 12 Freewheeling diode forward characteristic



Case G 59



Case G 59

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.