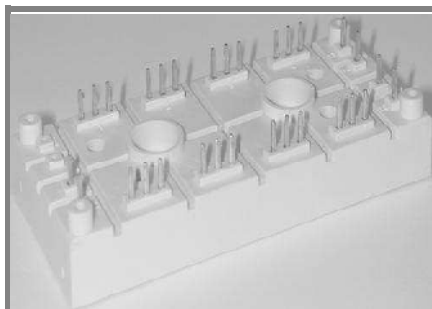




SEMIPONT™ 6

3-Phase Bridge Rectifier + IGBT braking chopper

SKDH146-L105

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
- IGBT Trench4 inside; max $T_j=175^{\circ}\text{C}$
- CAL4F diode inside, max $T_j=175^{\circ}\text{C}$
- $I_{CM}/I_{FM} = 3 \times I_{C,nom}/I_{F,nom}$
- Rectifier diode, max $T_j=150^{\circ}\text{C}$

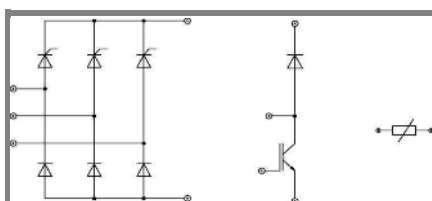
Typical Applications*

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

V_{RSM} V	V_{RRM}, V_{DRM} V	$I_D = 140 \text{ A}$ (maximum value for continuous operation) ($T_s = 80^{\circ}\text{C}$)
1300	1200	SKDH146/12-L105
1700	1600	SKDH146/16-L105

Absolute Maximum Ratings		$T_s = 25^{\circ}\text{C}$, unless otherwise specified		
Symbol	Conditions	Values	Units	
Bridge - Rectifier				
I_D	$T_s = 80^{\circ}\text{C}$; inductive load	140	A	
I_{FSM}/I_{TSM}	$t_p = 10 \text{ ms}$; $\sin 180^{\circ}$; T_{jmax}	1250	A	
i^2t	$t_p = 10 \text{ ms}$; $\sin 180^{\circ}$; T_{jmax}	7800	A^2s	
IGBT - Chopper				
V_{CES}/V_{GES}		1200 / 20	V	
I_C	$T_s = 25 (70)^{\circ}\text{C}$	118 110 (80) 95	A	
I_{CM}	$t_p = 1 \text{ ms}$; $T_s = ^{\circ}\text{C}$	315	A	
Freewheeling - CAL Diode				
V_{RRM}		1200	V	
I_F	$T_s = 25 (70)^{\circ}\text{C}$	91 90 (60) 72	A	
I_{FM}	$t_p = 1 \text{ ms}$; $T_s = ^{\circ}\text{C}$	300	A	
T_{vj}	Diode & IGBT (Thyristor)	- 40 ... + 175 (-40...+ 125)	$^{\circ}\text{C}$	
T_{stg}		- 40 ... + 125	$^{\circ}\text{C}$	
T_{solder}	terminals, 10 s	260	$^{\circ}\text{C}$	
V_{isol}	a.c. (50) Hz, RMS 1 min. / 1 s	3000 / 3600	V	

Characteristics		$T_s = 25^{\circ}\text{C}$, unless otherwise specified		
Symbol	Conditions	min.	typ.	max. Units
Diode - Rectifier				
V_{TO} / r_t	$T_j = 125^{\circ}\text{C}$		0,8 / 4	V / mΩ
$R_{th(j-s)}$	per diode			0,8 K/W
IGBT - Chopper				
$V_{CE(sat)}$	$I_C = 105 \text{ A}$, $T_j = 25^{\circ}\text{C}$; $V_{GE} = 15 \text{ V}$		1,85	2,1 V
$R_{th(j-s)}$	per IGBT		0,46	K/W
$t_{d(on)} / t_r$	valid for all values:		97/185	ns
$t_{d(off)} / t_f$	$V_{CC} = 600\text{V}$; $V_{GE} = 15 \text{ V}$; $I_C = 105\text{A}$; $T_j=150^{\circ}\text{C}$;		443/82	ns
$E_{on}+E_{off}$	$T_j=150^{\circ}\text{C}$; $R_g=3\Omega$ inductive load		47,5	mJ
CAL - Diode - Freewheeling				
$V_{T(TO)} / r_t$	$T_j = 150^{\circ}\text{C}$		0,9 / 12,5	1,1 / 13,7 V / mΩ
$R_{th(j-s)}$	per diode		0,75	K/W
I_{RRM}	valid for all values:		22	A
Q_{rr}	$I_F = 105 \text{ A}$; $V_R = -600\text{V}$ $dI_F/dt = -1700\text{A}/\mu\text{s}$		7	μC
E_{off}	$V_{GE} = 0 \text{ V}$; $T_j = 150^{\circ}\text{C}$		5,94	mJ
Temperature Sensor				
R_{TS}	$T = 25 (100)^{\circ}\text{C}$;		1000 (1670)	Ω
Mechanical data				
M_S	mounting Torque		2,55	3,45 Nm



DH

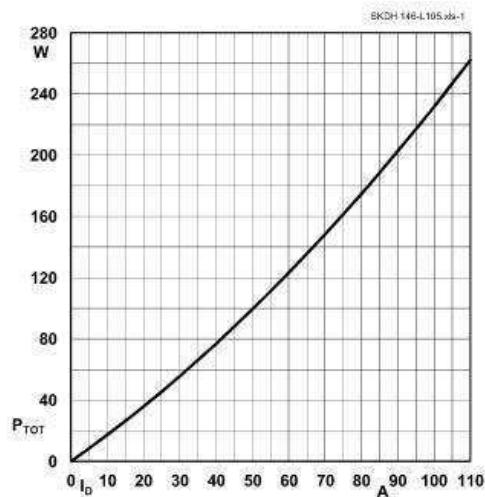


Fig. 1 Power dissipation per module vs. output current

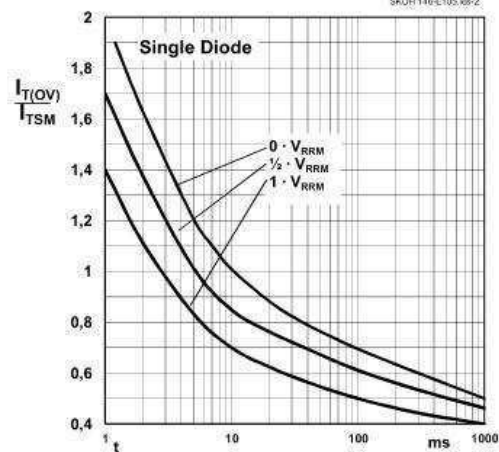


Fig. 2 Surge overload current vs. time

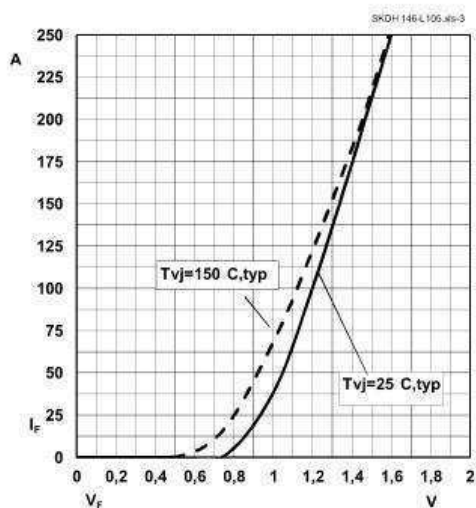


Fig. 3 Forward characteristic of single rectifier diode

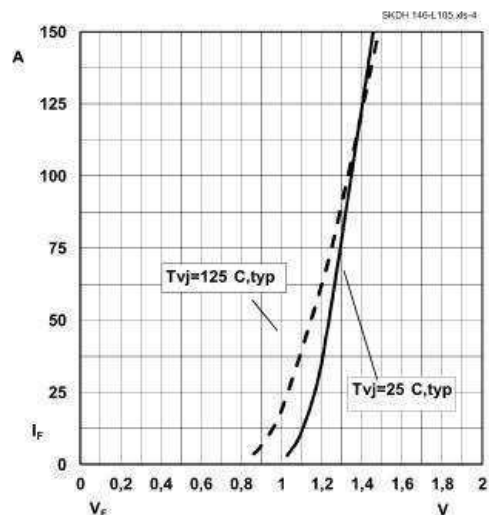


Fig. 4 Forward characteristic of single thyristor

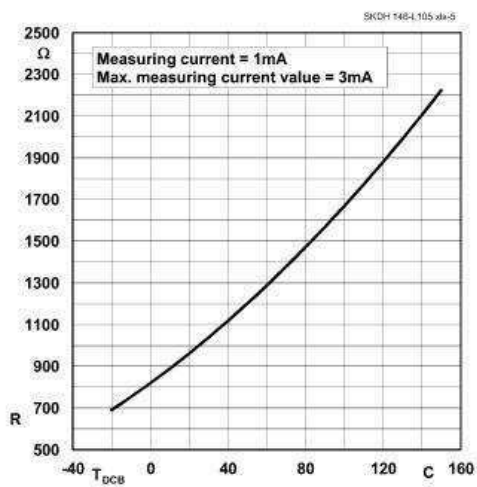


Fig. 5 Temperature sensor characteristic

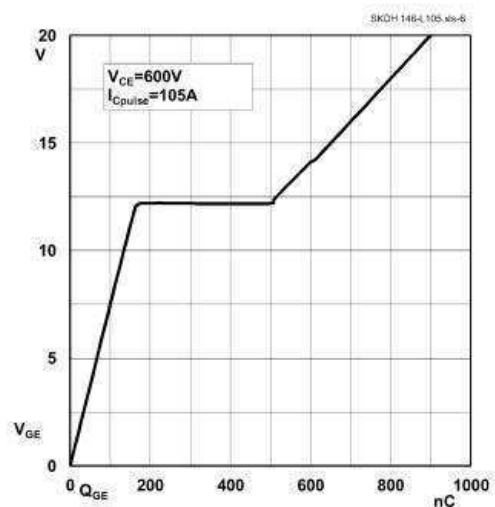


Fig. 6 Typ. gate charge characteristic

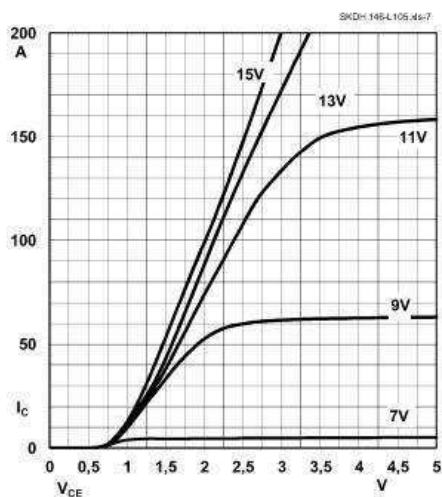
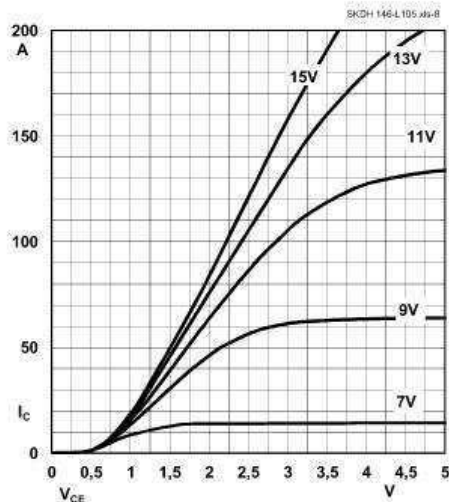
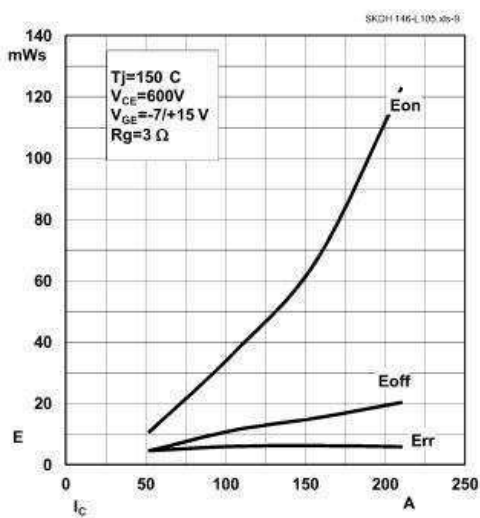
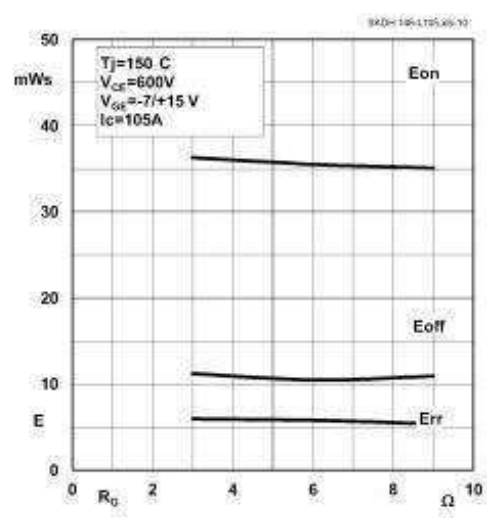
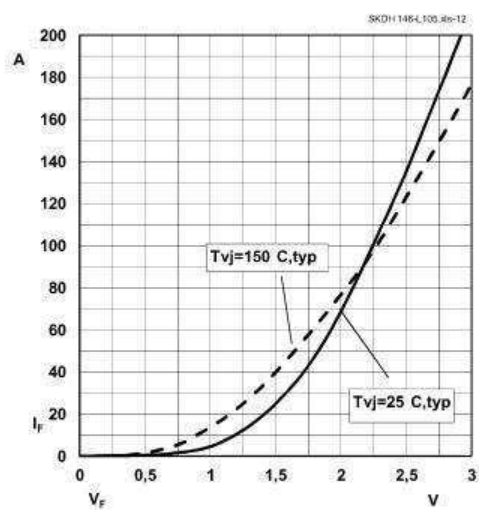
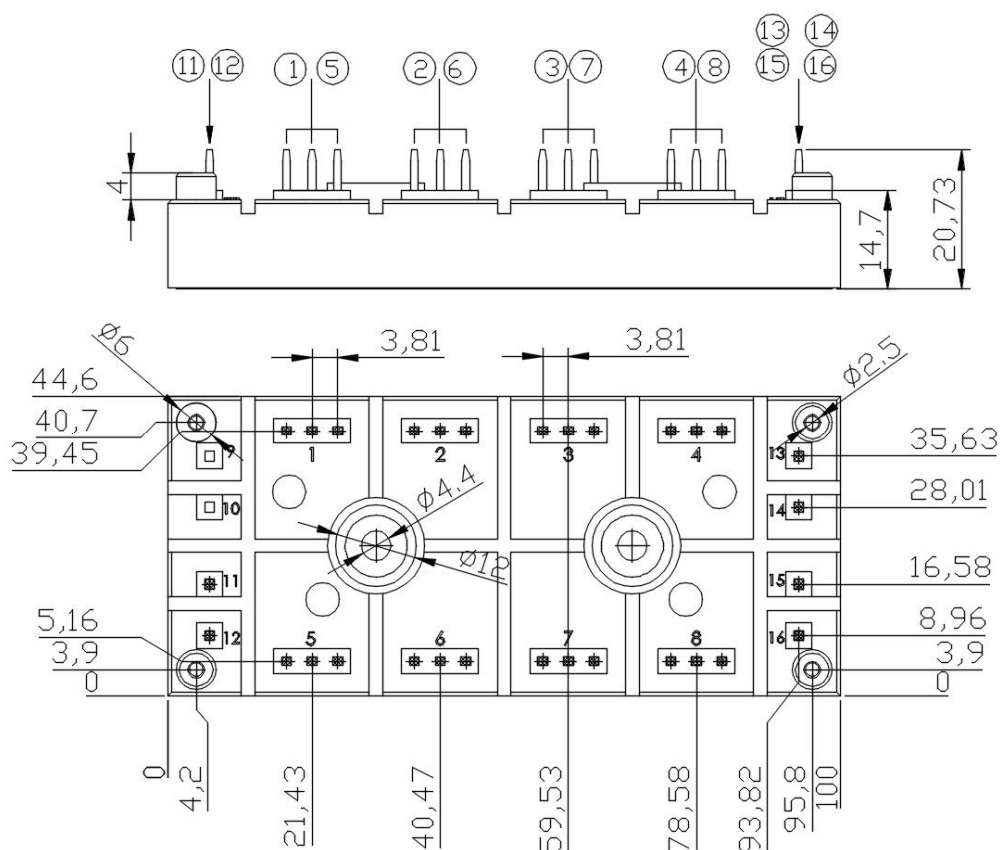
Fig. 7 Output IGBT characteristic $I_c = f(V_{ce})$, $T_j = 25^\circ\text{C}$ Fig. 8 Output IGBT characteristic $I_c = f(V_{ce})$, $T_j = 125^\circ\text{C}$ Fig. 9 Turn-on/-off energy $= f(I_c)$ Fig. 10 Turn-on/-off energy $= f(R_g)$ 

Fig. 12 Freewheeling diode forward characteristic

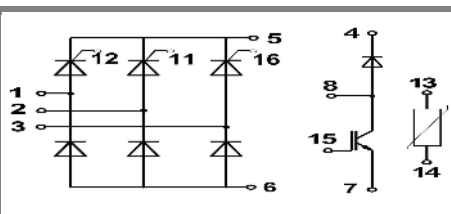
SKDH146/..-L105

UL recognized
file no. E 63 532

Dimensions in mm



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 staff.