

**SEMIPONT™ 6**

## 3-Phase Bridge Rectifier + IGBT braking chopper

SKD146/..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  $T_j=150^\circ\text{C}$

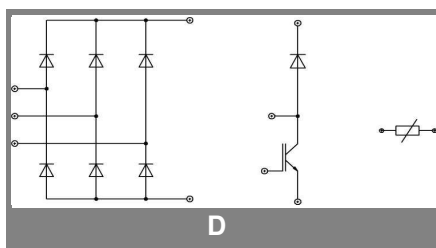
### Typical Applications\*

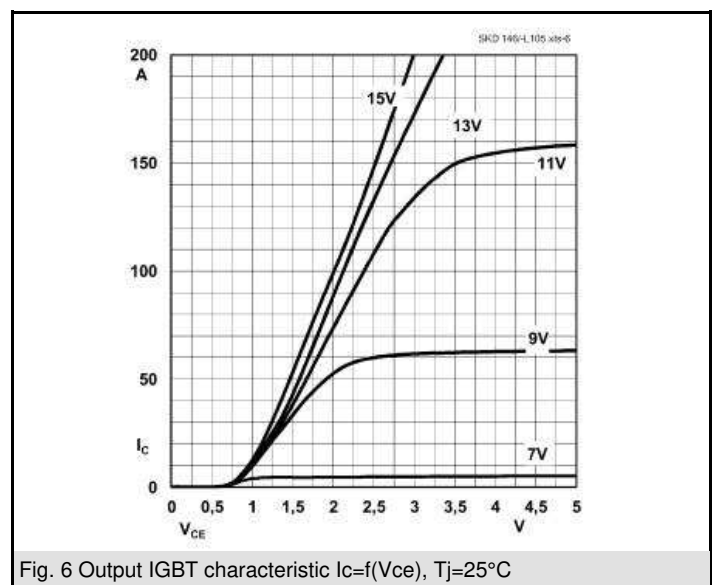
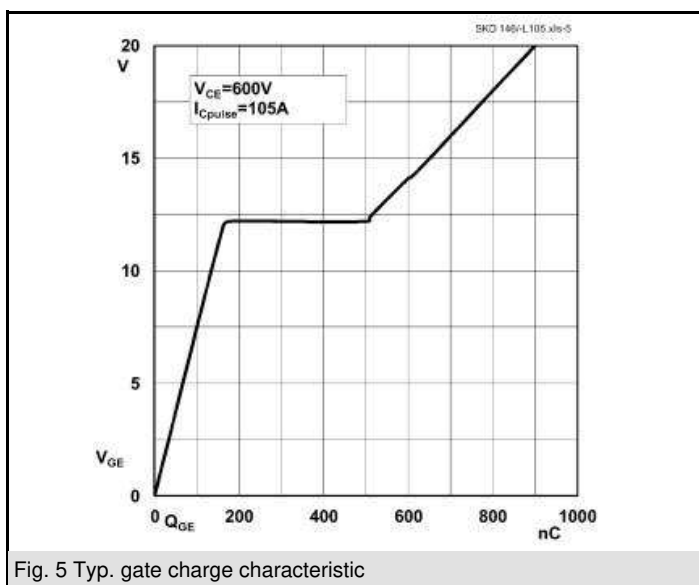
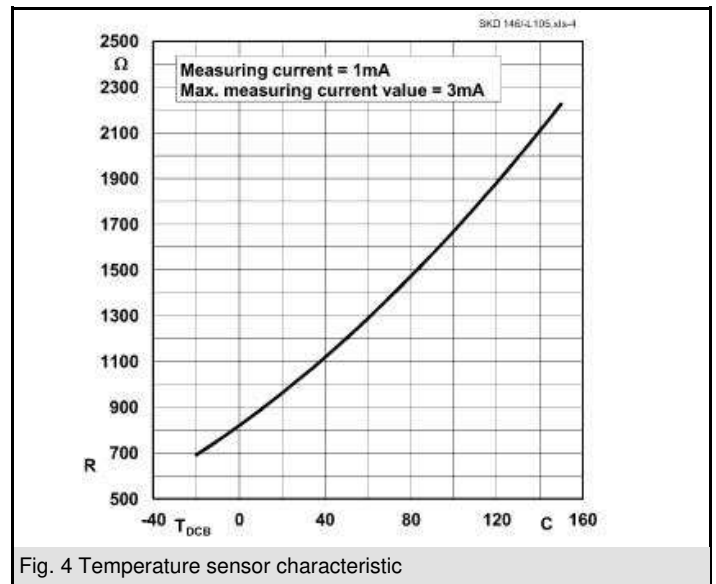
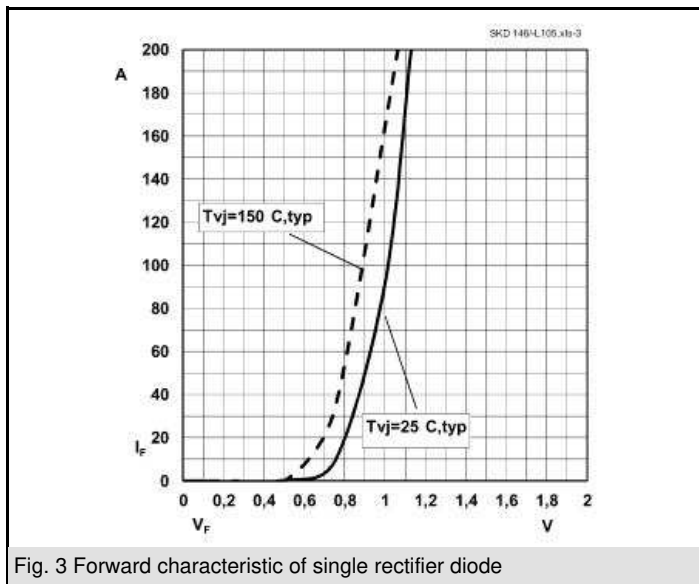
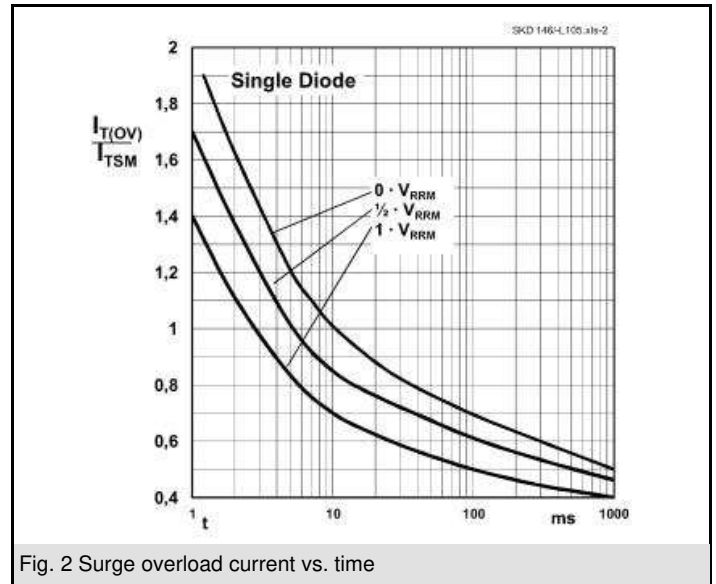
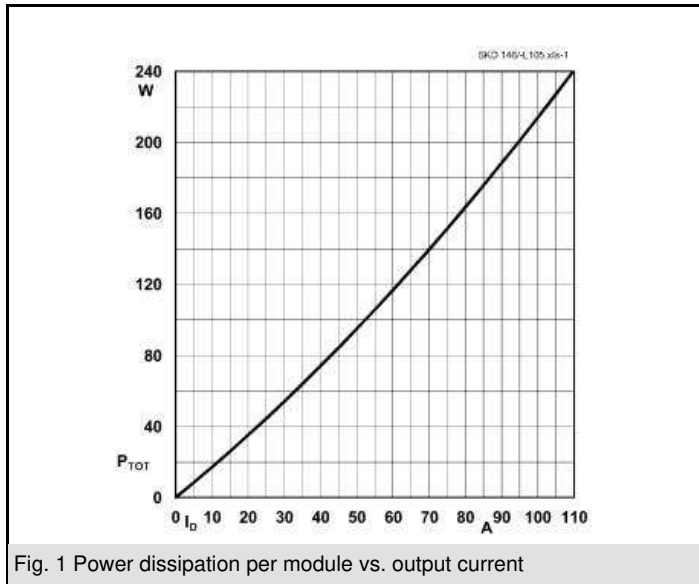
- DC drives
- Controlled field rectifiers for DC motors
- Controlled battery charger

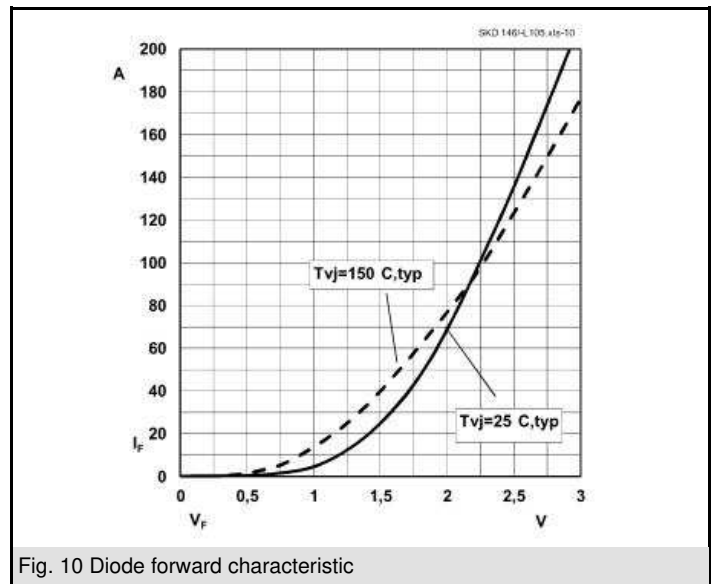
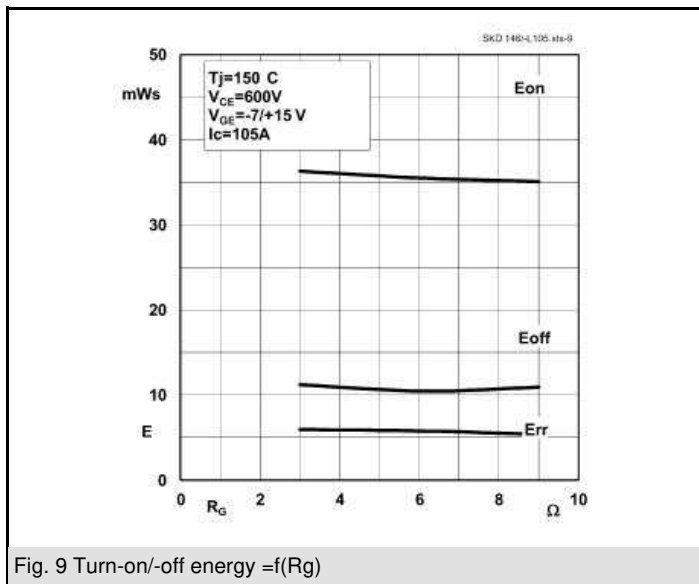
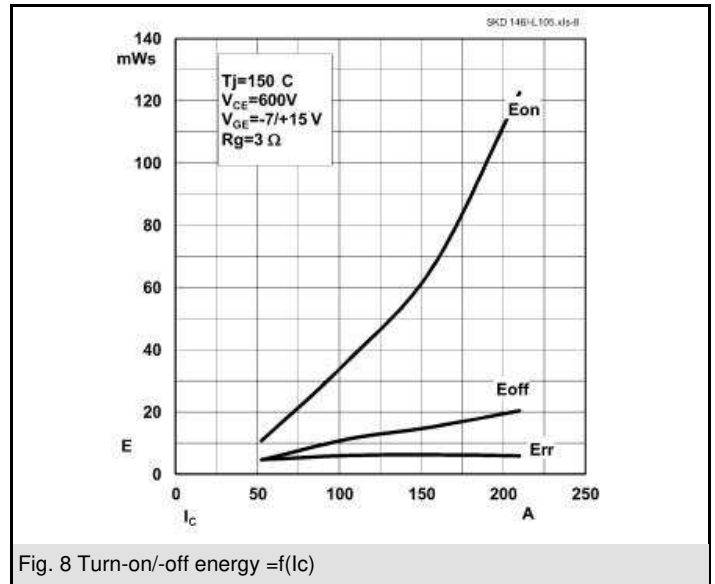
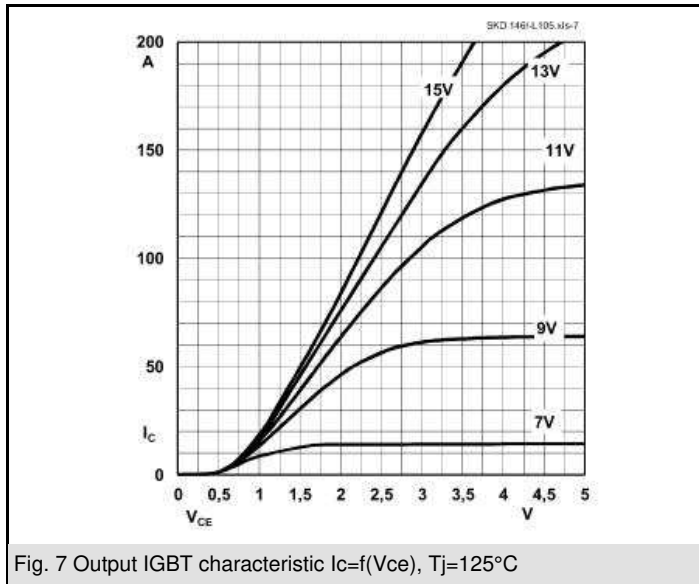
$V_{RSM}$ V	$V_{RRM}, V_{DRM}$ V	$I_D = 120 \text{ A}$ (maximum value for continuous operation) ( $T_s = 70^\circ\text{C}$ )
1300	1200	SKD146/12-L105
1700	1600	SKD146/16-L105

Absolute Maximum Ratings		$T_s = 25^\circ\text{C}$ , unless otherwise specified		
Symbol	Conditions	Values		Units
<b>Bridge - Rectifier</b>				
$I_D$	$T_s = 85^\circ\text{C}$ ; 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		$\text{A}^2\text{s}$
<b>IGBT - Chopper</b>				
$V_{CES}/V_{GES}$	$T_s = 25 (70)^\circ\text{C}$	1200 / 20		V
$I_C$	$T_s = 25 (70)^\circ\text{C}$	110 (80)		A
$I_{CM}$	$t_p = 1 \text{ ms}$ ; $T_s = ^\circ\text{C}$	315		A
<b>Freewheeling - CAL Diode</b>				
$V_{RRM}$	$T_s = 25 (70)^\circ\text{C}$	1200		V
$I_F$	$T_s = 25 (70)^\circ\text{C}$	90 (60)		A
$I_{FM}$	$t_p = 1 \text{ ms}$ ; $T_s = ^\circ\text{C}$	300		A
$T_{vj}$	Diode & IGBT (Thyristor)	- 40 ... + 175 (0 ... + 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
<b>Diode - Rectifier</b>					
$V_{TO} / r_t$	$T_j = 125^\circ\text{C}$		0,8 / 4		V / $\text{m}\Omega$
$R_{th(j-s)}$	per diode			0,8	K/W
<b>IGBT - Chopper</b>					
$V_{CE(sat)}$	$I_C = 105 \text{ A}$ , $T_j = 25^\circ\text{C}$ ; $V_{GE} = 15 \text{ V}$		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
<b>CAL - Diode - Freewheeling</b>					
$V_{T(TO)} / r_t$	$T_j = 150^\circ\text{C}$		0,9 / 12,5	1,1 / 13,7	V / $\text{m}\Omega$
$R_{th(j-s)}$	per diode		0,75		K/W
$I_{RRM}$	valid for all values:				A
$Q_{rr}$	$I_F = 140 \text{ A}$ ; $V_R = - -600 \text{ V}$ ; $di_F/dt = - \text{A}/\mu\text{s}$				$\mu\text{C}$
$E_{off}$	$V_{GE} = 0 \text{ V}$ ; $T_j = 150^\circ\text{C}$				mJ
<b>Temperature Sensor</b>					
$R_{TS}$	$T = 25 (100)^\circ\text{C}$ ;		1000 (1670)		$\Omega$
<b>Mechanical data</b>					
$M_S$	mounting Torque		2,55	3,45	Nm



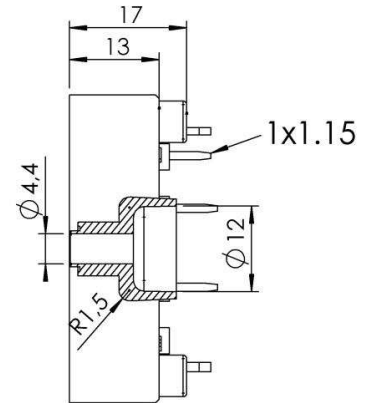
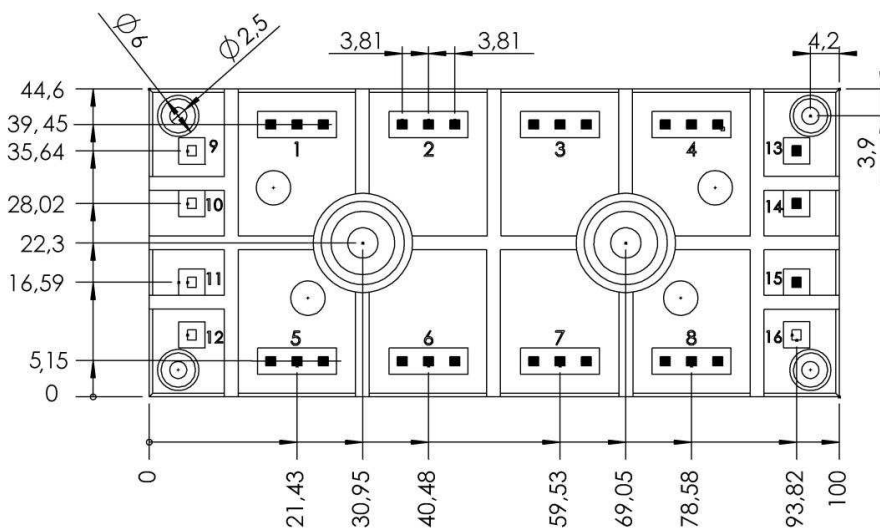
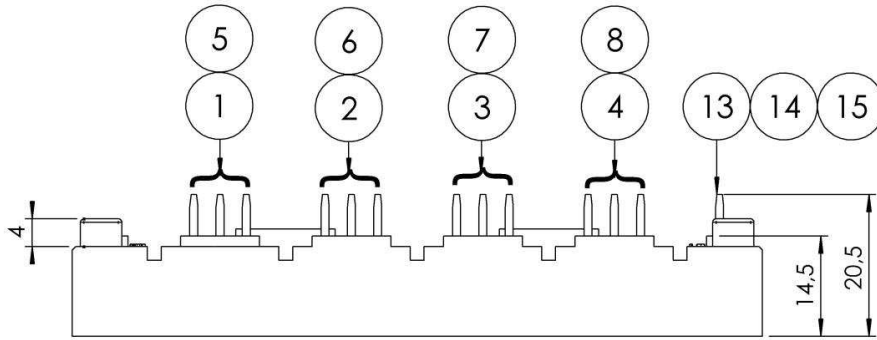




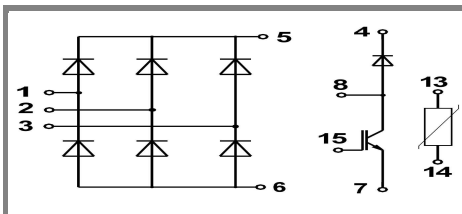
# SKD146/..L105

UL recognized  
file no. E 63 532

Dimensions in mm



Case G 60



Case G 60

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.