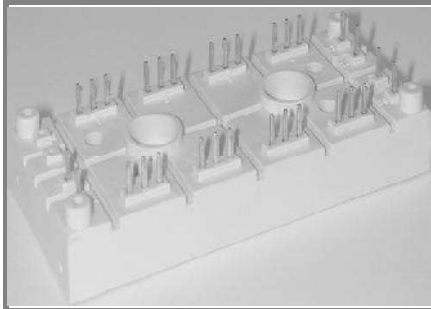




SEMIPONT™ 6

3-Phase Bridge Rectifier + IGBT braking chopper

SKDH146/...-L140

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 $T_j=150^\circ\text{C}$

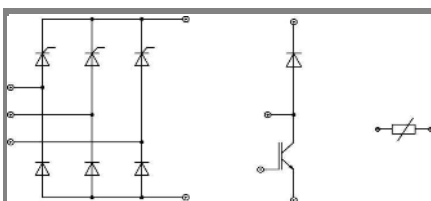
Typical Applications*

- 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-L140
1700	1600	SKDH146/16-L140

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 ² s
IGBT - Chopper			
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
Freewheeling - CAL Diode			
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 (-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				
$V_{CE(sat)}$	$I_C = 140 \text{ A}$, $T_j = 25^\circ\text{C}$; $V_{GE} = 15 \text{ V}$		1,85	2,1 V
$R_{th(j-s)}$	per IGBT		0,38	K/W
$t_{d(on)} / t_r$	valid for all values:		97 / 185	ns
$t_{d(off)} / t_f$	$V_{CC} = 600 \text{ V}$; $V_{GE} = 15 \text{ V}$; $I_C = 140 \text{ A}$; $T_j = 150^\circ\text{C}$;		443 / 82	ns
$E_{on}+E_{off}$	$T_j = 150^\circ\text{C}$; $R_G = 4 \Omega$; inductive load		63,3	mJ
CAL - Diode - Freewheeling				
$V_{T(TO)} / r_t$	$T_j = 150^\circ\text{C}$		0,9 / 7,8	1,1 / 8,6 V / mΩ
$R_{th(j-s)}$	per diode		0,56	K/W
I_{RRM}	valid for all values:		30	A
Q_{rr}	$I_F = 140 \text{ A}$; $V_R = -600 \text{ V}$; $di_F/dt = -1700 \text{ A}/\mu\text{s}$		9	μC
E_{off}	$V_{GE} = 0 \text{ V}$; $T_j = 150^\circ\text{C}$		7,92	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

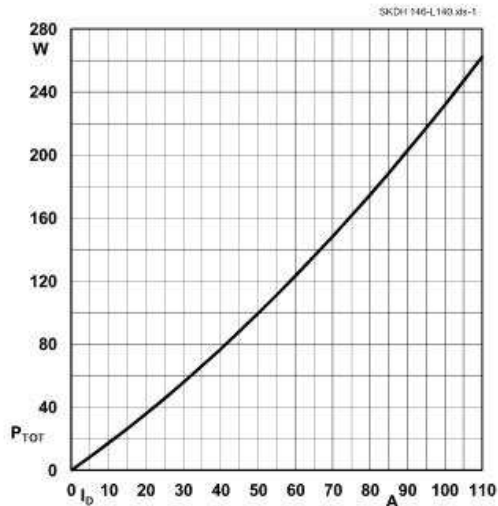


Fig. 1 Power dissipation per module vs. output current

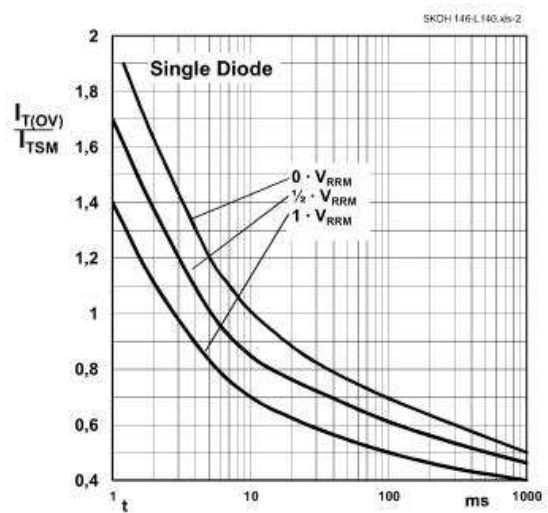


Fig. 2 Surge overload current vs. time

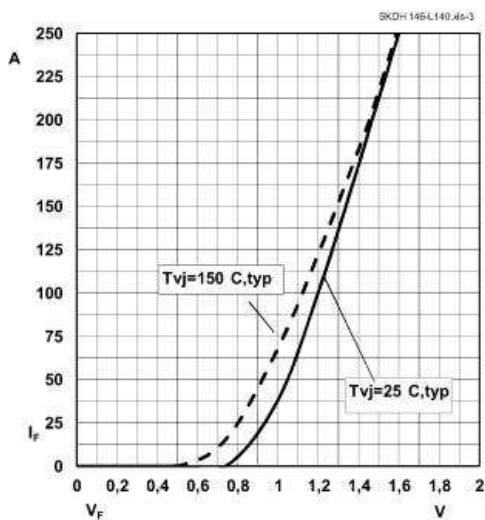


Fig. 3 Forward characteristic of single rectifier diode

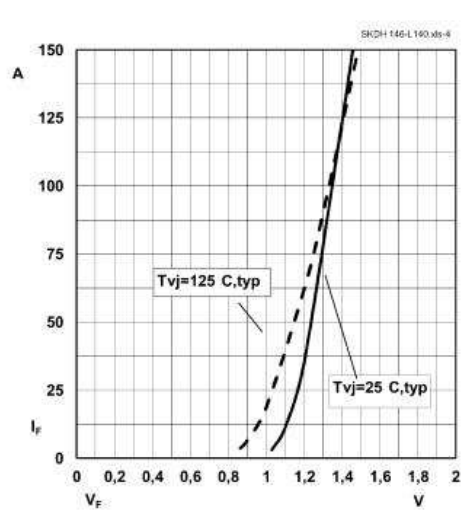


Fig. 4 Forward characteristic of single thyristor

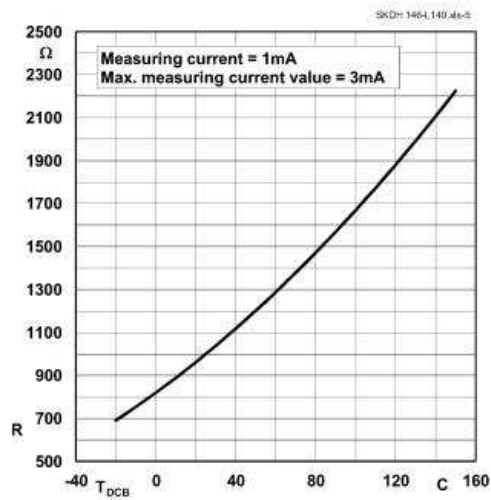


Fig. 5 Temperature sensor characteristic

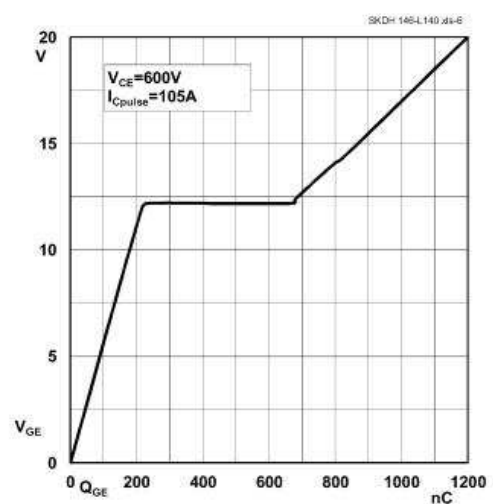


Fig. 6 Typ. gate charge characteristic

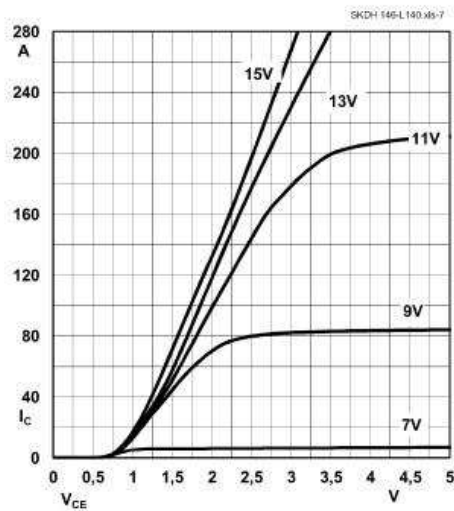
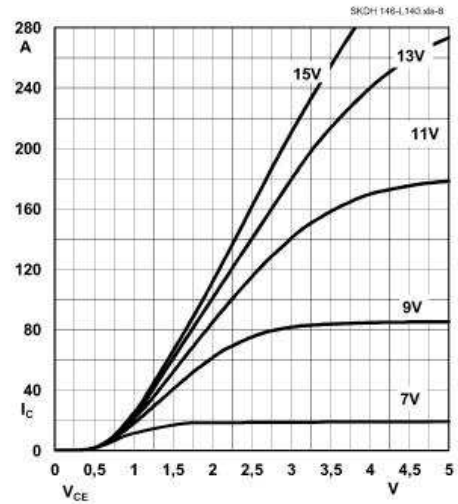
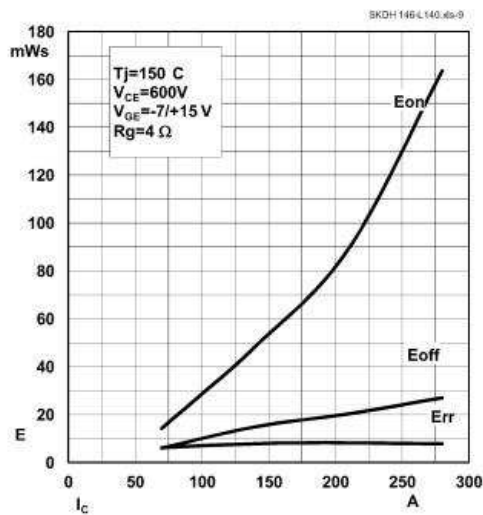
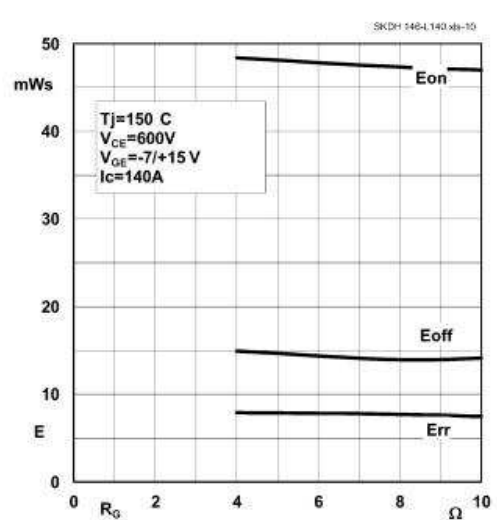
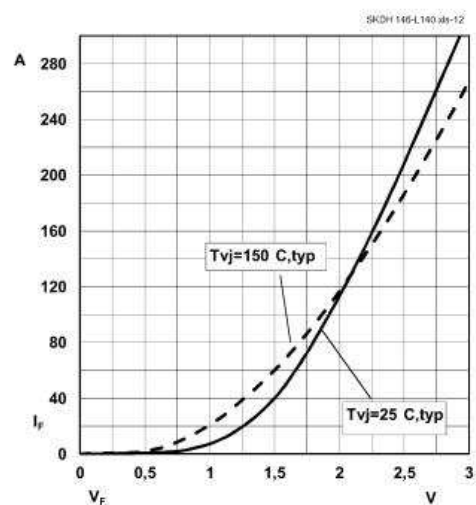
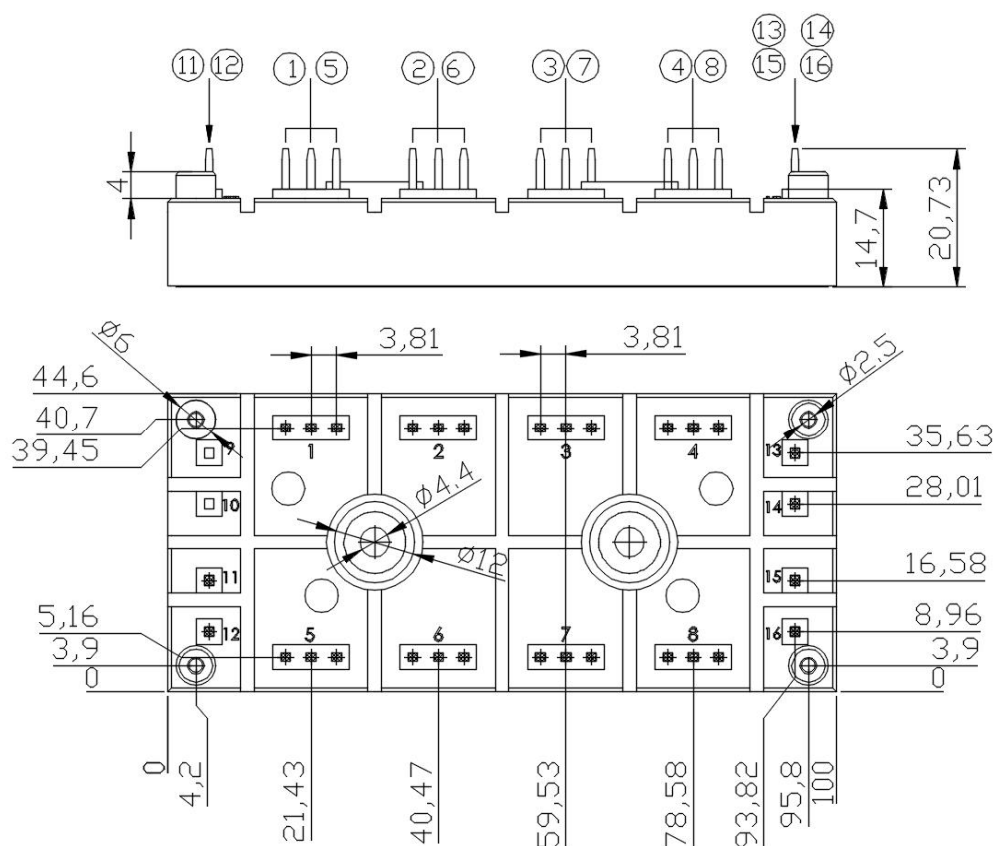
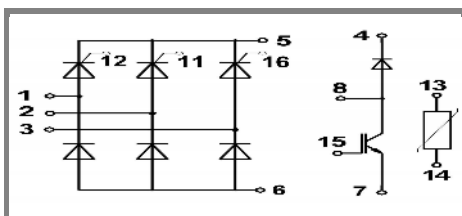
Fig. 7 Output IGBT characteristic $I_C = f(V_{CE})$, $T_j = 25^\circ\text{C}$ Fig. 8 Output IGBT characteristic $I_C = f(V_{CE})$, $T_j = 125^\circ\text{C}$ Fig. 9 Turn-on/-off energy $= f(I_C)$ Fig. 10 Turn-on/-off energy $= f(R_g)$ 

Fig. 12 Freewheeling diode forward characteristic



Case G 59



Case G 59

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

*IMPORTANT INFORMATION AND WARNINGS

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