

### 3-Phase Bridge Rectifier + IGBT braking chopper

### SKDH116/..L140

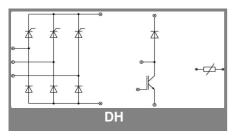
Data

### **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 Tj=175°C
- CAL4F inside, max Tj=175°C
- I<sub>CM</sub>/I<sub>FM</sub> = 3xI<sub>C,nom</sub>/I<sub>F,nom</sub> Rectifier diode, max Tj=150°C

### Typical Applications\*

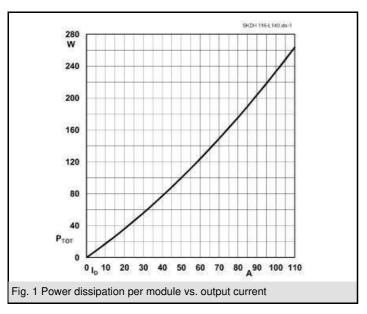
- DC drives
- Controlled filed rectifiers for DC motors
- · Controlled battery charger

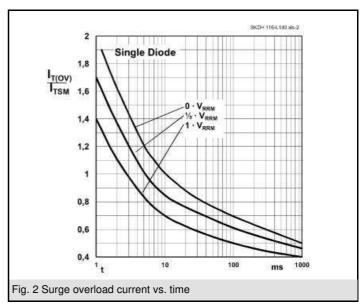


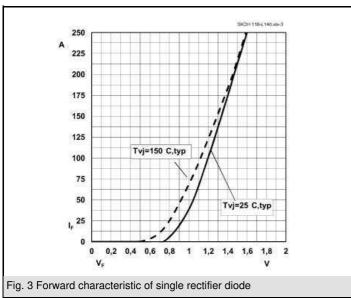
$V_{RSM}$	$V_{RRM}, V_{DRM}$	I <sub>D</sub> = 110 A (maximum value for continuous operation)			
V	V	(T <sub>s</sub> = 80 °C)			
1300	1200	SKDH116/12-L140			
1700	1600	SKDH116/16-L140			

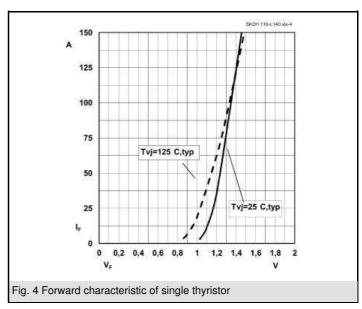
<b>Absolute Maximum Ratings</b> T <sub>s</sub> = 25 °C, unless otherwise specified							
Symbol	Conditions	Values	Units				
Bridge - Rectifier							
I <sub>D</sub>	T <sub>s</sub> = 80 °C; inductive load	110	Α				
$I_{FSM}/I_{TSM}$	$t_p = 10 \text{ ms}; \sin 180 ; T_{jmax}$	950	Α				
i²t	$t_p = 10 \text{ ms}; \sin 180; T_{jmax}$	4500	A²s				
IGBT - Chopper							
$V_{CES}/V_{GES}$		1200 / 20	V				
I <sub>C</sub>	T <sub>s</sub> = 25 (70) °C	150 (120)	Α				
I <sub>CM</sub>	$t_p = 1 \text{ ms; } T_s = 25 (70) \text{ °C}$	520	Α				
Freewheeling - CAL Diode							
$V_{RRM}$		1200	V				
I <sub>F</sub>	T <sub>s</sub> = 25 (70) °C	130 (105)	Α				
I <sub>FM</sub>	$t_p = 1 \text{ ms; } T_s = 25 (70) \text{ °C}$	450	Α				
T <sub>vi</sub>	Diode & IGBT (Thyristor)	- 40 + 175 (-40+ 125)	°C				
T <sub>stg</sub>		- 40 <b>+</b> 125	°C				
T <sub>solder</sub>	terminals, 10 s	260	°C				
V <sub>isol</sub>	a.c. (50) Hz, RMS 1 min. / 1 s	3000 / 3600	V				

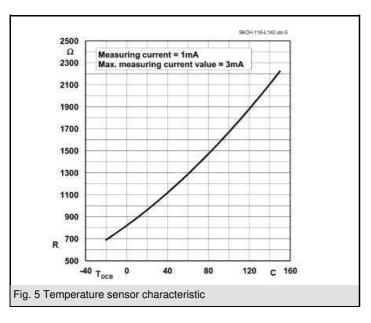
Characteristics		T <sub>s</sub> = 25 °C	T <sub>s</sub> = 25 °C, unless otherwise specified					
Symbol	Conditions	min.	typ.	max.	Units			
Diode - Rectifier								
$V_{TO}$ / $r_{t}$	T <sub>j</sub> = 125 °C		0,8 / 7		V / mΩ			
$R_{th(j-s)}$	per diode			1	K/W			
	- Rectifier							
$V_{F(TO)} / r_t$	T <sub>i</sub> = 125 °C		1,1 / 6		V / mΩ			
$R_{th(j-s)}$	per Thyristor			0,85	K/W			
$I_{GD}$	$T_j = 125 ^{\circ}\text{C}; \text{d.c.}$		5		mA			
$V_{\rm GT}$ / $I_{\rm GT}$	T <sub>j</sub> = 25 °C			3 / 150	V / mA			
I <sub>H</sub> /I <sub>L</sub>	$T_j = 25 ^{\circ}\text{C}$		250 / 600		mA			
(dv/dt) <sub>cr</sub>	T <sub>j</sub> = 125 °C			1000	V/µs			
(di/dt) <sub>cr</sub>	T <sub>j</sub> = 125 °C			100	A/µs			
IGBT - Ch	nopper							
$V_{CE(sat)}$	I <sub>C</sub> = 140 A, T <sub>j</sub> = 25 °C; V <sub>GE</sub> = 15 V		1,85	2,1	V			
$R_{th(j-s)}$	per IGBT		0,38		K/W			
t <sub>d(on)</sub> / t <sub>r</sub>	valid for all values:		97 / 185		ns			
$t_{d(off)}$ / $t_{f}$	$V_{CC}$ = 600 V; $V_{GE}$ = 15 V; $I_{C}$ = 140 A; $T_{i}$ = 150 °C;		443 / 82		ns			
$E_{on}+E_{off}$	$T_i = 150 ^{\circ}\text{C};  R_G = 4 \Omega;$		63,3		mJ			
	inductive load							
CAL - Dio	ode - Freewheeling	•			•			
$V_{T(TO)} / r_t$	T <sub>i</sub> = 150 °C		0,9 / 7,8	1,1 / 8,6	$V$ / $m\Omega$			
R <sub>th(j-s)</sub>	per diode		0,56		K/W			
I <sub>RRM</sub>	valid for all values:		30		Α			
Q <sub>rr</sub>	$I_F = 140 \text{ A}; V_R =600 \text{ V};$ $dI_F/dt =1700 \text{ A/}\mu\text{s}$		9		μC			
$E_{off}$	V <sub>GE</sub> = 0 V; T <sub>j</sub> = 150 °C		7,92		mJ			
Temperat	ture Sensor	•						
R <sub>TS</sub>	T = 25 (100) °C;		1000 (1670)		Ω			
Mechanic	cal data	1						
$M_S$	mounting Torque	2,55		3,45	Nm			

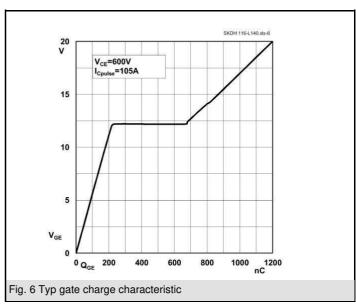


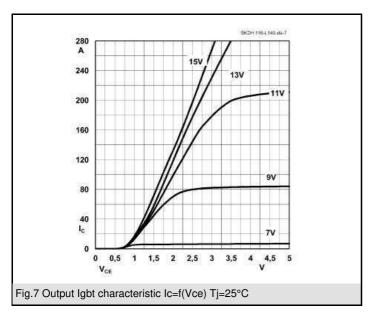


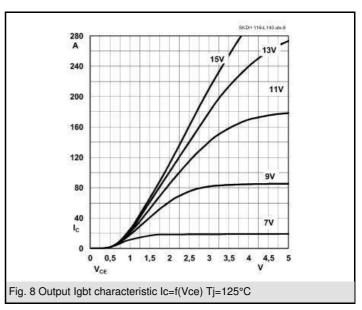


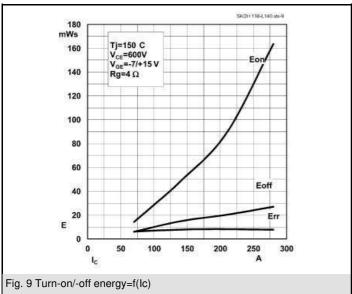


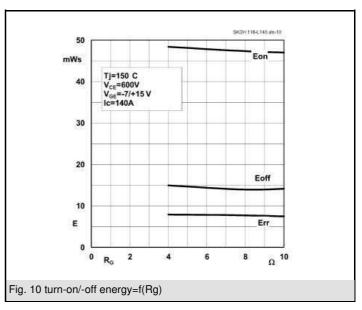


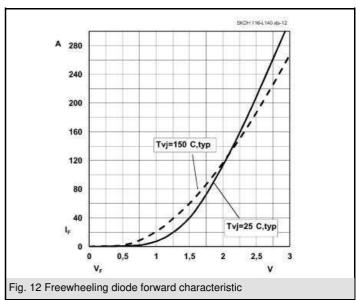


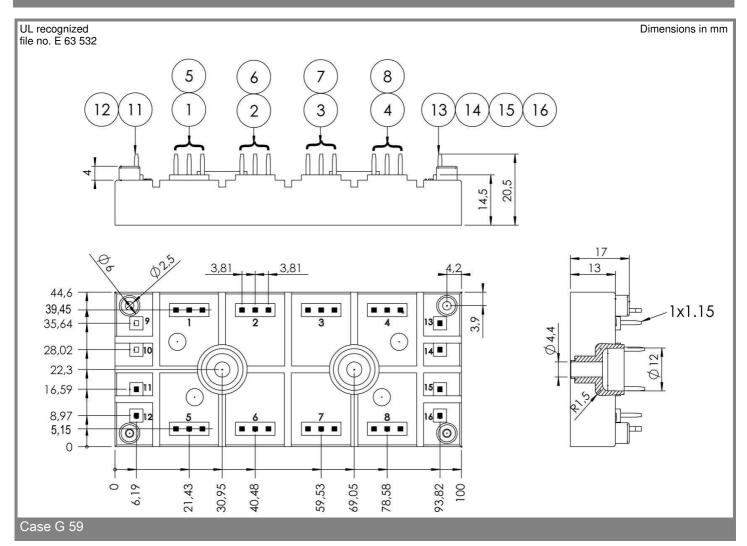


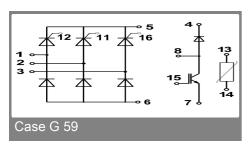












This is an electrostatic discharge sensitive device (ESDS), international standard IEC 60747-1, Chapter IX.

\* 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.

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