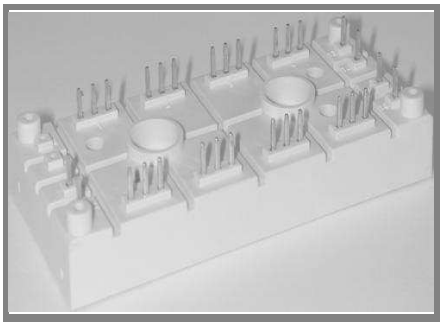
SKDH116/..L140



SEMIPONT™ 6

3-Phase Bridge Rectifier + IGBT braking chopper

SKDH116/..L140

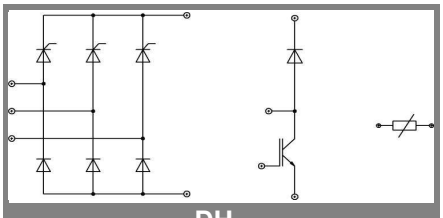
Data

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
- $I_{CM}/I_{FM} = 3xI_{C,nom}/I_{F,nom}$
- Rectifier diode, max Tj=150°C

Typical Applications*

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



DH

V_{RSM} V	V_{RRM}, V_{DRM} V	I_D = 110 A (maximum value for continuous operation) (T_s = 80 °C)
1300	1200	SKDH116/12-L140
1700	1600	SKDH116/16-L140

Absolute Maximum Ratings		T_s = 25 °C, unless otherwise specified	
Symbol	**Conditions**	**Values**	**Units**
Bridge - Rectifier			
I_D	T_s = 80 °C; inductive load	110	A
I_{FSM}/I_{TSM}	t_p = 10 ms; sin 180 ; T_{jmax}	950	A
i^2t	t_p = 10 ms; sin 180 ; T_{jmax}	4500	A^2s
IGBT - Chopper			
V_{CES}/V_{GES}		1200 / 20	V
I_C	T_s = 25 (70) °C	150 (120)	A
I_{CM}	t_p = 1 ms; T_s = 25 (70) °C	520	A
Freewheeling - CAL Diode			
V_{RRM}		1200	V
I_F	T_s = 25 (70) °C	130 (105)	A
I_{FM}	t_p = 1 ms; T_s = 25 (70) °C	450	A
T_{vj}	Diode & IGBT (Thyristor)	- 40 ... + 175 (-40...+ 125)	°C
T_{stg}		- 40 ... + 125	°C
T_{solder}	terminals, 10 s	260	°C
V_{isol}	a.c. (50) Hz, RMS 1 min. / 1 s	3000 / 3600	V

Characteristics		T_s = 25 °C, unless otherwise specified			
Symbol	**Conditions**	**min.**	**typ.**	**max.**	**Units**
Diode - Rectifier					
V_{TO} / r_t	T_j = 125 °C		0,8 / 7		V / mΩ
$R_{th(j-s)}$	per diode			1	K/W
Thyristor - Rectifier					
$V_{F(TO)}$ / r_t	T_j = 125 °C		1,1 / 6		V / mΩ
$R_{th(j-s)}$	per Thyristor			0,85	K/W
I_{GD}	T_j = 125 °C; d.c.		5		mA
V_{GT} / I_{GT}	T_j = 25 °C			3 / 150	V / mA
I_H/I_L	T_j = 25 °C		250 / 600		mA
$(dv/dt)_{cr}$	T_j = 125 °C			1000	V/µs
$(di/dt)_{cr}$	T_j = 125 °C			100	A/µs
IGBT - Chopper					
$V_{CE(sat)}$	I_C = 140 A, T_j = 25 °C; V_{GE} = 15 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 V; V_{GE} = 15 V; I_C = 140 A; T_j = 150 °C;		443 / 82		ns
$E_{on}+E_{off}$	T_j = 150 °C; R_G = 4 Ω; inductive load		63,3		mJ
CAL - Diode - Freewheeling					
$V_{T(TO)}$ / r_t	T_j = 150 °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 A; V_R = - -600 V; dI_F/dt = - -1700 A/µs		9		µC
E_{off}	V_{GE} = 0 V; T_j = 150 °C		7,92		mJ
Temperature Sensor					
R_{TS}	T = 25 (100) °C;		1000 (1670)		Ω
Mechanical data					
M_S	mounting Torque	2,55		3,45	Nm

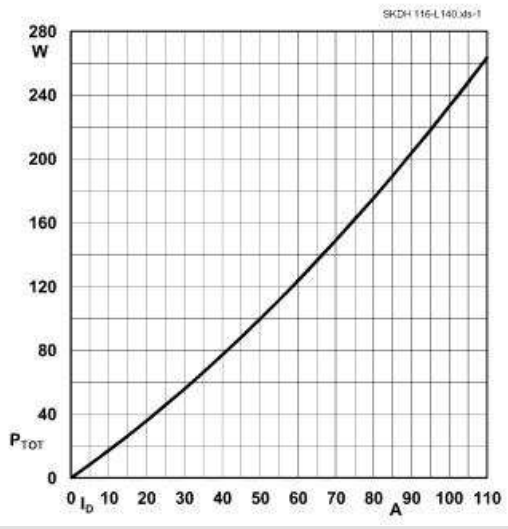


Fig. 1 Power dissipation per module vs. output current

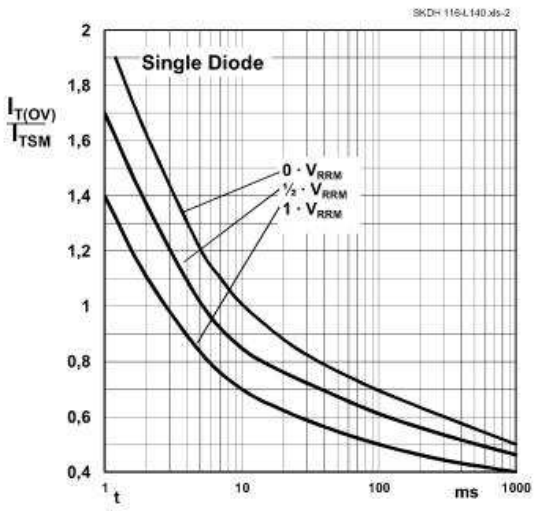


Fig. 2 Surge overload current vs. time

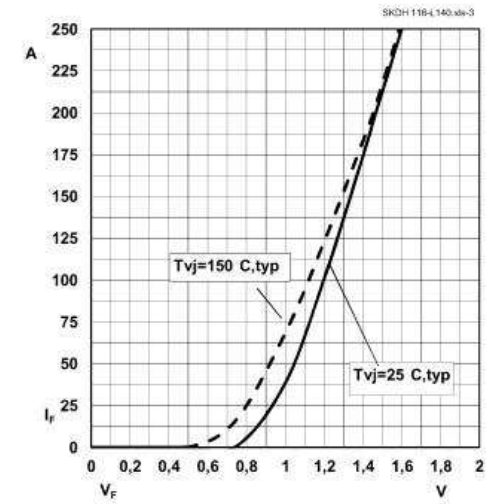


Fig. 3 Forward characteristic of single rectifier diode

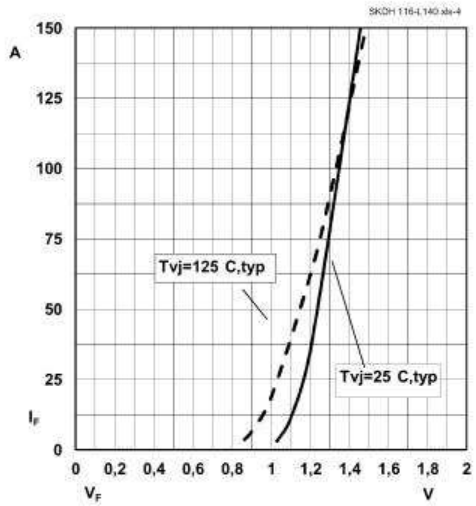


Fig. 4 Forward characteristic of single thyristor

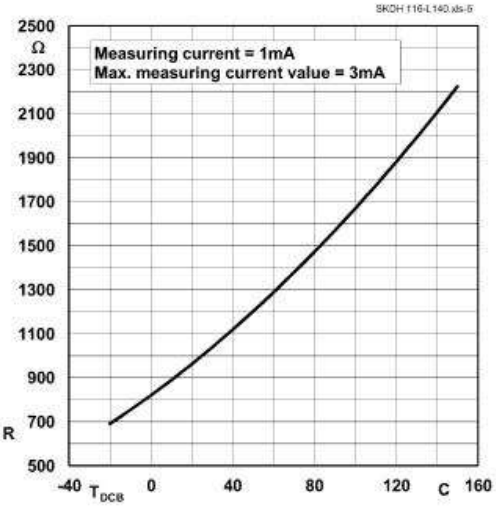


Fig. 5 Temperature sensor characteristic

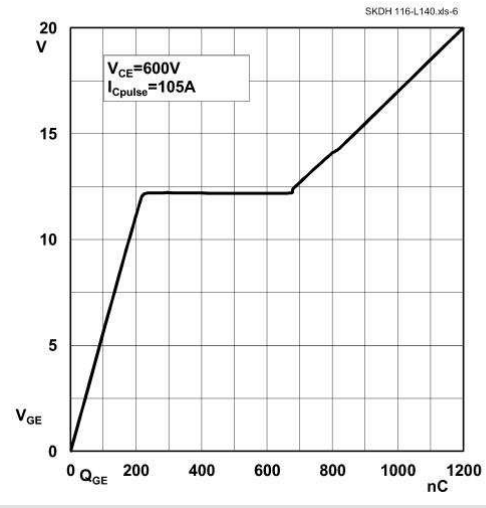


Fig. 6 Typ gate charge characteristic

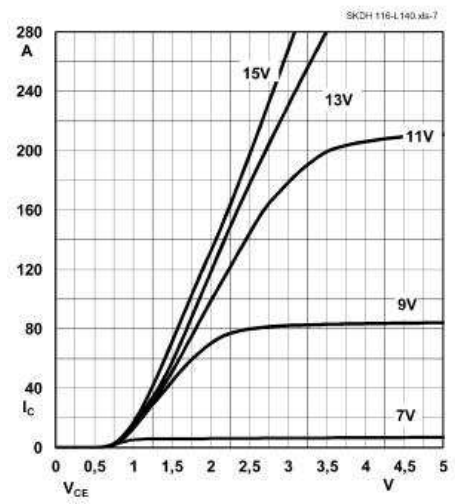


Fig.7 Output Igbt characteristic Ic=f(Vce) Tj=25°C

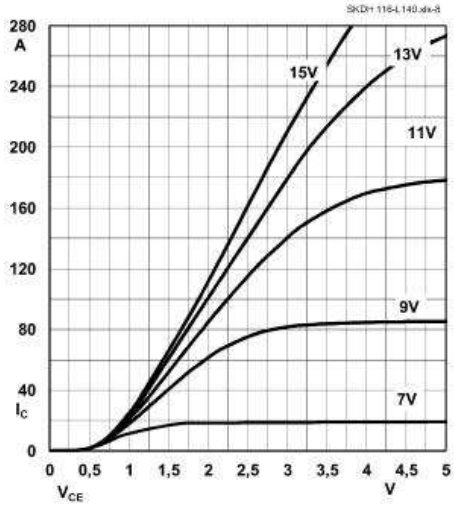


Fig. 8 Output Igbt characteristic Ic=f(Vce) Tj=125°C

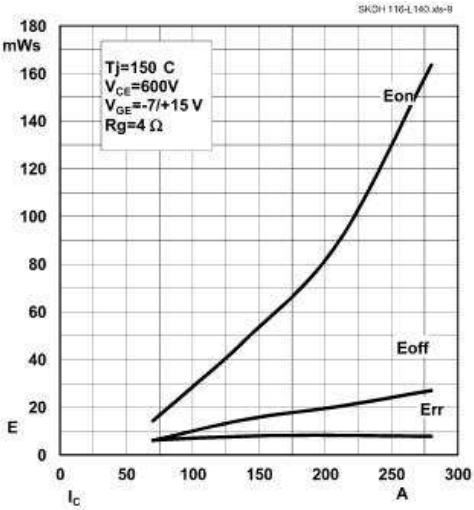


Fig. 9 Turn-on/-off energy=f(Ic)

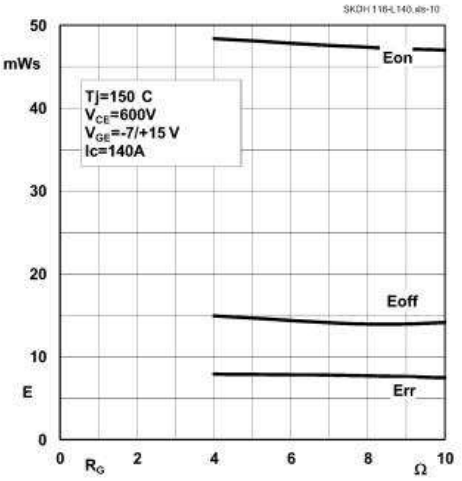


Fig. 10 turn-on/-off energy=f(Rg)

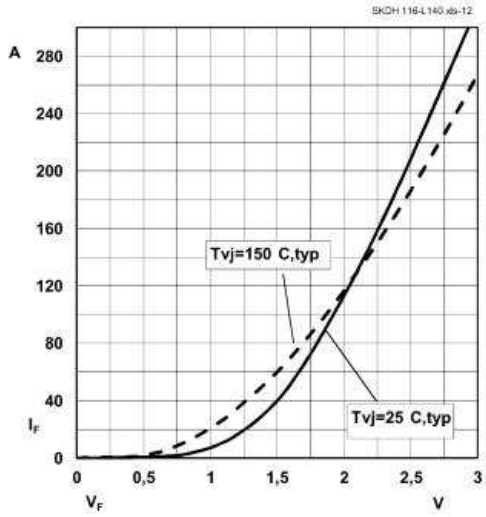
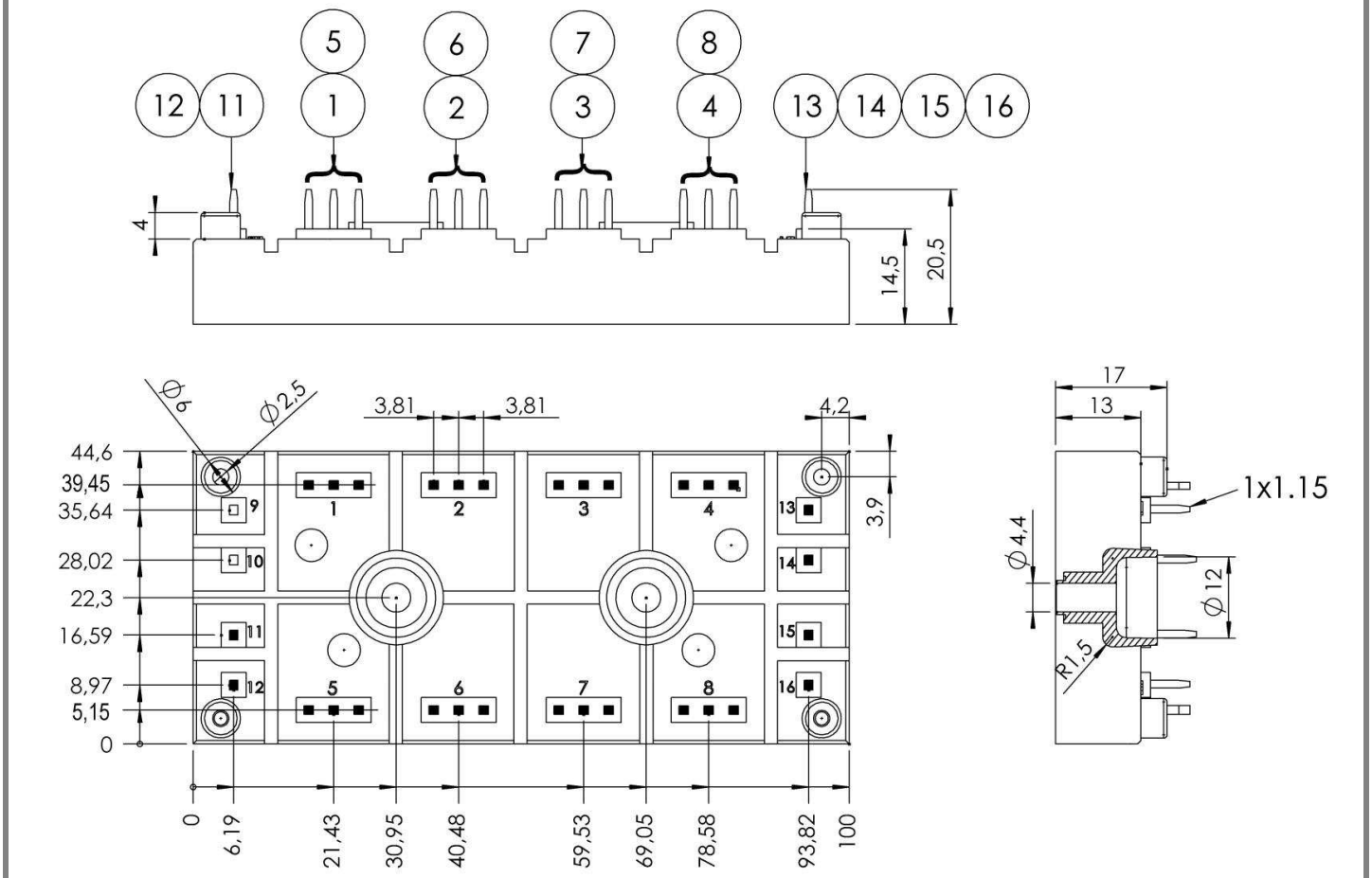


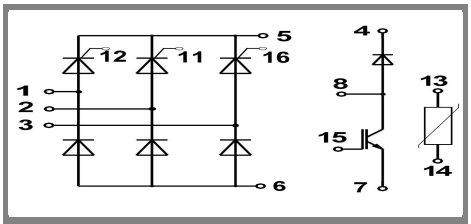
Fig. 12 Freewheeling diode forward characteristic

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.

