SEMIPACK® 1

Thyristor / Diode Modules

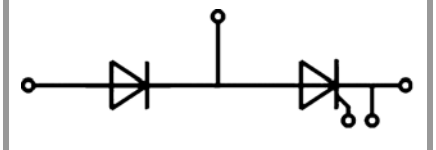
SKKH 60/16 E

Features*

- Heat transfer through aluminium oxide ceramic insulated metal baseplate
- UL recognized, file no. E63532

Typical Applications

- Rectifier for motor drives
- Process control
- Rectifier for power supplies



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Absolute Maximum Ratings

Symbol	Conditions		Values	Unit
Thyristor / diode				
$I_{F(AV)}/I_{T(AV)}$	sin. 180°	T_c = 85 °C	60	A
	T_j = 130 °C	T_c = 100 °C	46	A
I_{FSM}/I_{TSM}	t_p = 10 ms	T_j = 25 °C	1100	A
		T_j = 130 °C	900	A
i^2t	t_p = 10 ms	T_j = 25 °C	6050	A^2s
		T_j = 130 °C	4050	A^2s
V_{RSM}	T_j = 25 °C, thyristor, diode		1700	V
V_{RRM}	T_j = 25 °C, thyristor, diode		1600	V
V_{DRM}	T_j = 25 °C, thyristor		1600	V
$(di/dt)_{cr}$	T_j = 130 °C, thyristor		50	A/µs
$(dv/dt)_{cr}$	T_j = 130 °C, thyristor		1000	V/µs
T_j			-40 ... 130	°C
Module				
T_{stg}			-40 ... 125	°C
V_{isol}	a.c.; 50 Hz; r.m.s.	1 min	3000	V
		1 s	3600	V

Characteristics

Symbol	Conditions		min.	typ.	max.	Unit
Thyristor						
V_T	T_j = 25 °C, I_T = 180 A				1.85	V
$V_{T(TO)}$	T_j = 130 °C				0.92	V
r_T	T_j = 130 °C				5.8	mΩ
$I_{DD};I_{RD}$	T_j = 130 °C, V_{DD} = V_{DRM}; V_{RD} = V_{RRM}				15	mA
t_{gd}	I_G = 1 A di_G/dt = 1 A/µs V_D = 0.67 * V_{DRM}	T_j = 25 °C		1		µs
t_{gr}		T_j = 25 °C		2		µs
t_q	T_j = 130 °C			110		µs
I_H	T_j = 25 °C				220	mA
I_L	T_j = 25 °C, R_G = 33 Ω				550	mA
V_{GT}	T_j = 25 °C, d.c.		2.5			V
I_{GT}	T_j = 25 °C, d.c.		100			mA
V_{GD}	T_j = 130 °C, d.c.				0.25	V
I_{GD}	T_j = 130 °C, d.c.				4	mA
$R_{th(j-c)}$	cont., per chip				0.32	K/W
	sin. 180°, per chip				0.42	K/W
	rec. 120°, per chip				0.44	K/W
Diode						
V_F	T_j = 25 °C, I_F = 180 A				1.55	V
V_{F0}	T_j = 130 °C				0.85	V
r_F	T_j = 130 °C				3.90	mΩ
I_R	T_j = 130 °C, V_{RD} = V_{RRM}				1.7	mA
$R_{th(j-c)}$	cont., per chip				0.3	K/W
	sin. 180°, per chip				0.38	K/W
	rec. 120°, per chip				0.4	K/W

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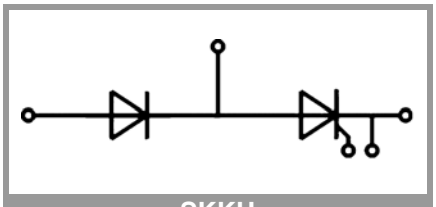
Characteristics					
Symbol	**Conditions**	**min.**	**typ.**	**max.**	**Unit**
Module					
$R_{th(c-s)}$	thyristor, P12 (reference)		0.09		K/W
	diode, P12 (reference)		0.09		K/W
	module, P12 (reference)		0.05		K/W
M_s	to heatsink M5	4.25		5.75	Nm
M_t	to terminals M5	2.55		3.45	Nm
a				5 * 9.81	m/s^2
w			75		g



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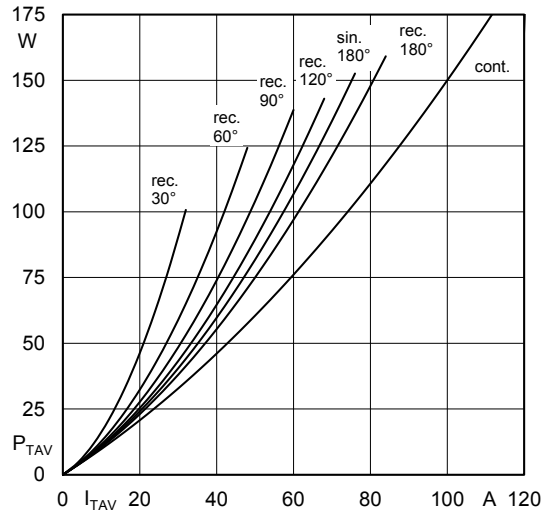


Fig. 1L: Power dissipation per thyristor vs. on-state current

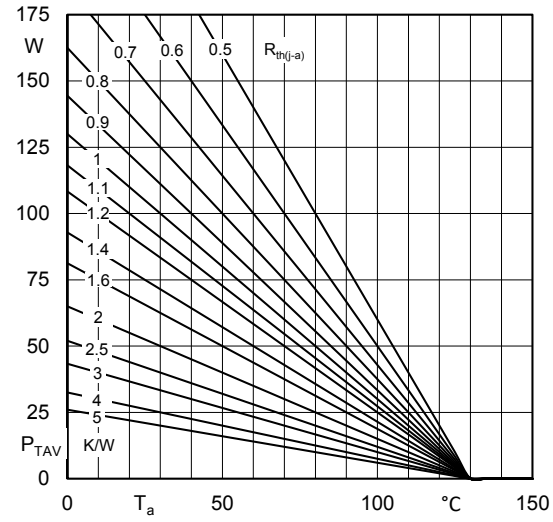


Fig. 1R: Max. power dissipation per thyristor vs. ambient temperature

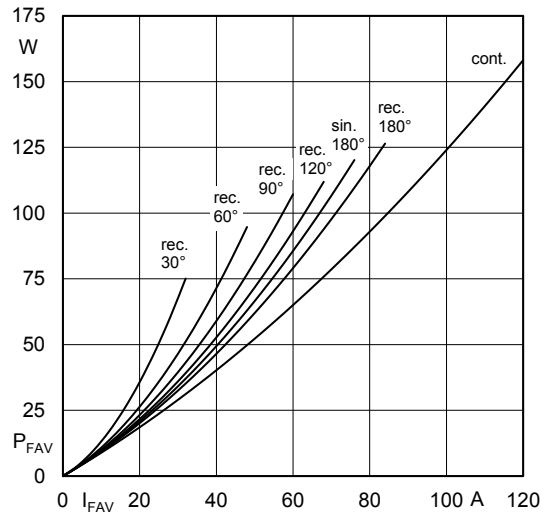


Fig. 2L: Power dissipation per diode vs. forward current

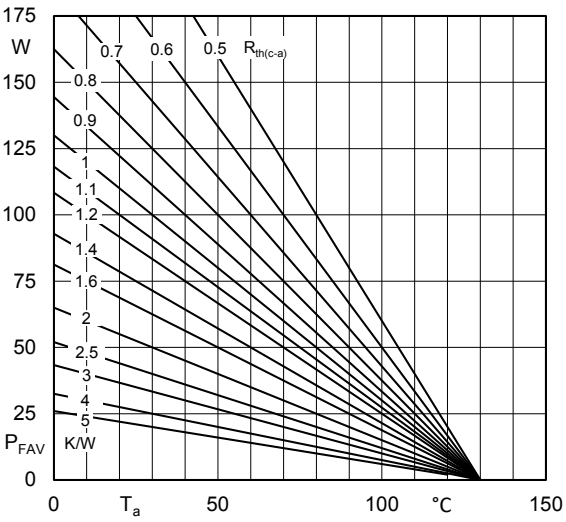


Fig. 2R: Max power dissipation per diode vs. ambient temperature

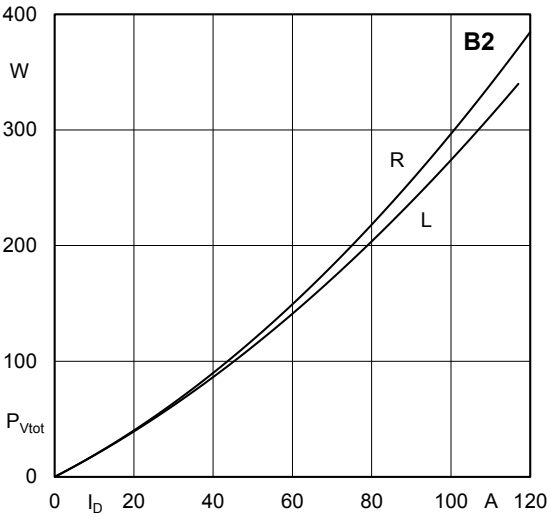


Fig. 3L: Max. power dissipation of two modules vs. direct current

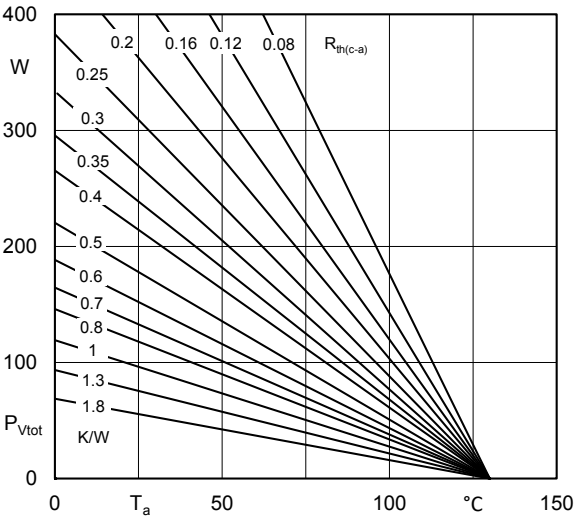


Fig. 3R: Max. power dissipation of two modules vs. case temperature

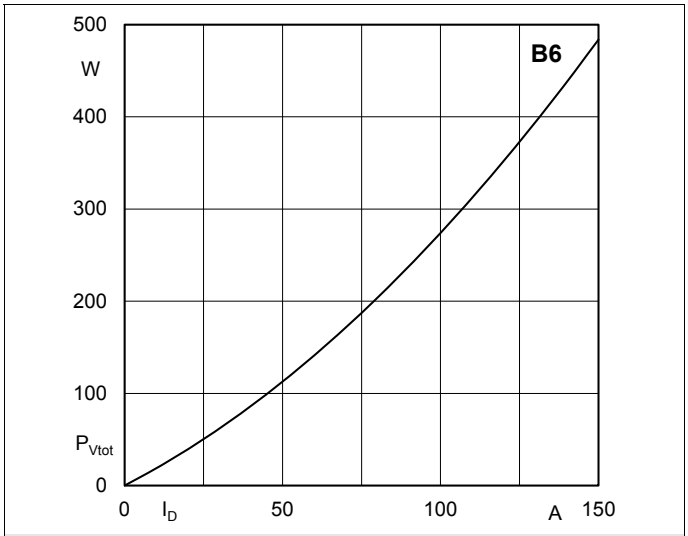


Fig. 4L: Max. power dissipation of three modules vs. direct current

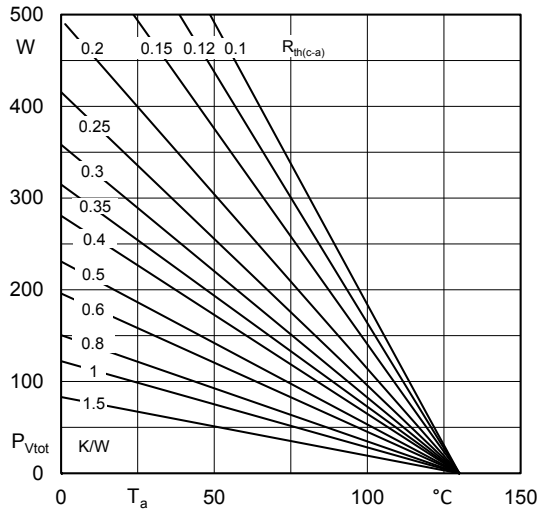


Fig. 4R: Max. power dissipation of three modules vs. ambient temperature

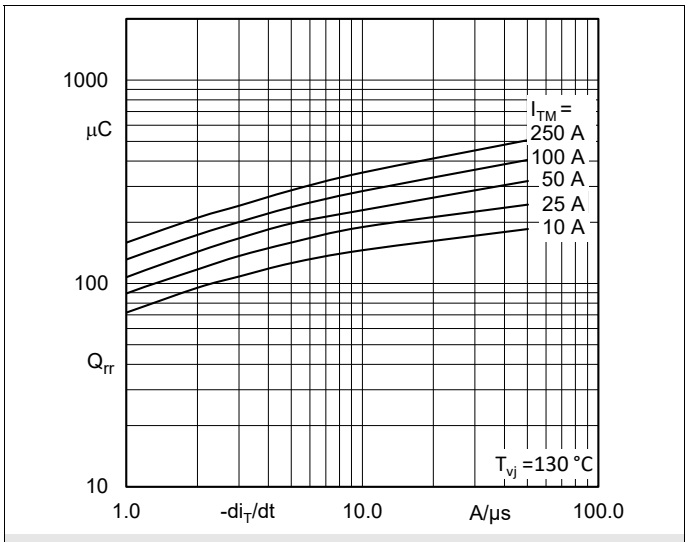


Fig. 5: Recovered charge vs. current decrease

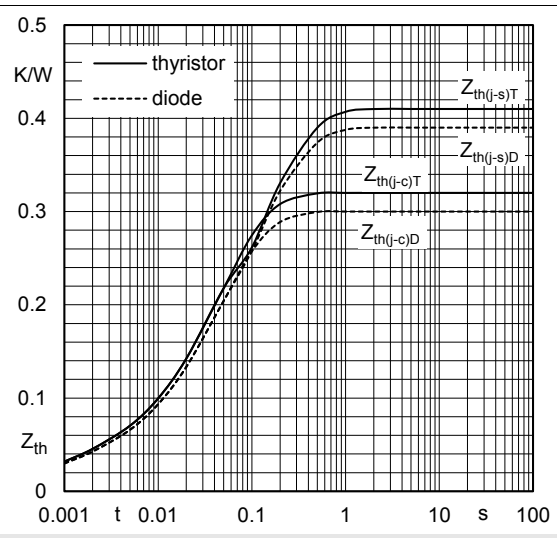


Fig. 6: Transient thermal impedance vs. time

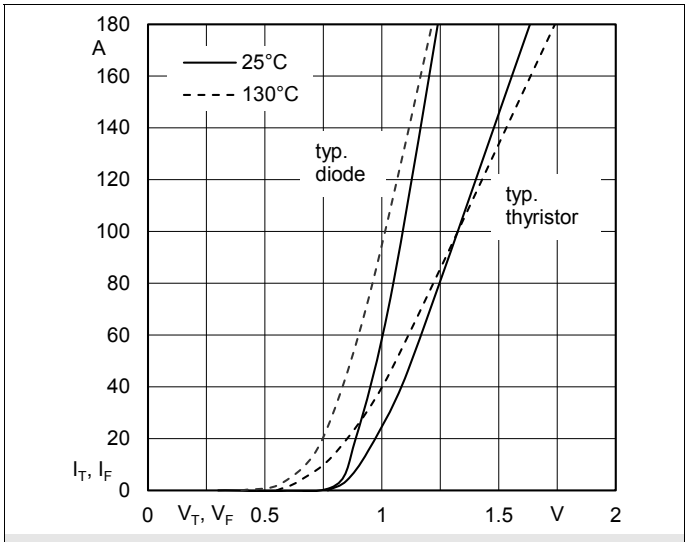


Fig. 7: On-state characteristics

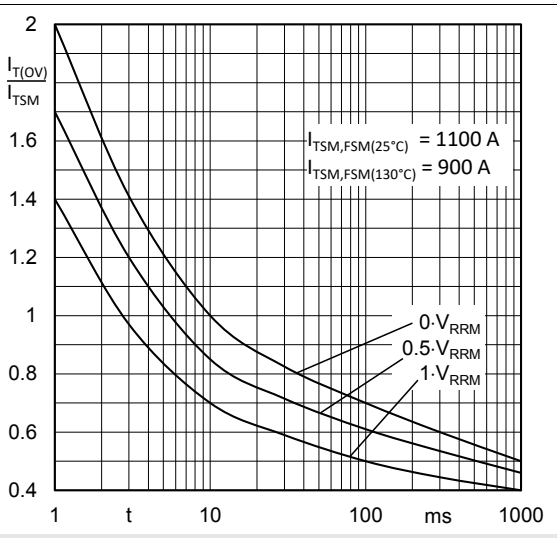


Fig. 8: Surge overload current vs. time

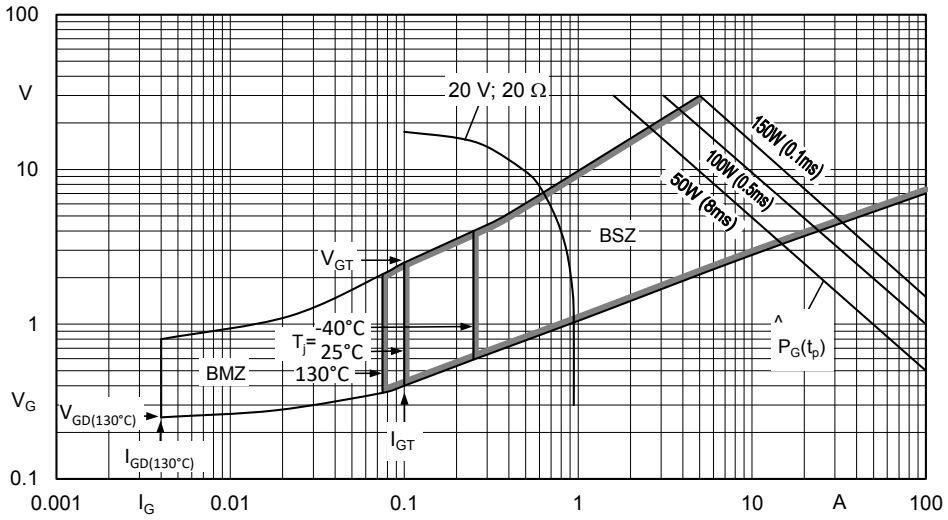
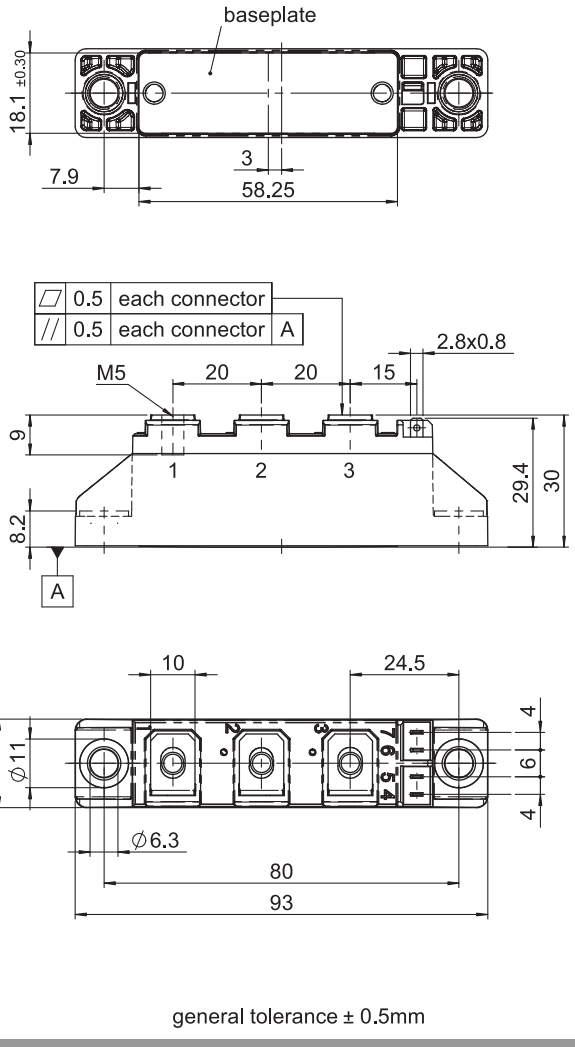


Fig. 9: Gate trigger characteristics



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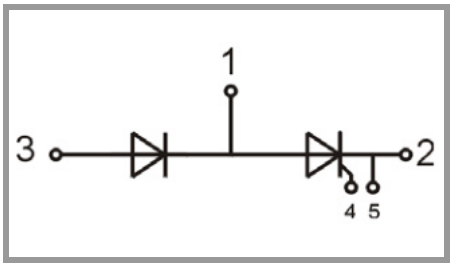

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IMPORTANT INFORMATION AND WARNINGS

This is an electrostatic discharge sensitive device (ESDS) according to international standard IEC 61340.

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