



SEMIPACK® 1

Thyristor / Diode Modules

SKKH 140/16 E

Features*

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

Typical Applications

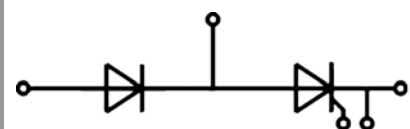
- Rectifier for motor drives
- Process control
- Rectifier for power supplies

Absolute Maximum Ratings

Symbol	Conditions		Values	Unit
Thyristor / diode				
$I_{F(AV)}/I_{T(AV)}$	sin. 180°	$T_c = 85\text{ °C}$	143	A
	$T_j = 130\text{ °C}$	$T_c = 100\text{ °C}$	108	A
I_{FSM}/I_{TSM}	$t_p = 10\text{ ms}$	$T_j = 25\text{ °C}$	2600	A
		$T_j = 130\text{ °C}$	2210	A
i^2t	$t_p = 10\text{ ms}$	$T_j = 25\text{ °C}$	33800	A²s
		$T_j = 130\text{ °C}$	24421	A²s
V_{RSM}	$T_j = 25\text{ °C}$, thyristor, diode		1700	V
V_{RRM}	$T_j = 25\text{ °C}$, thyristor, diode		1600	V
V_{DRM}	$T_j = 25\text{ °C}$, thyristor		1600	V
$(di/dt)_{cr}$	$T_j = 130\text{ °C}$, thyristor		200	A/μs
$(dv/dt)_{cr}$	$T_j = 130\text{ °C}$, 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	$T_j = 25\text{ °C}$, $I_T = 420\text{ A}$			1.85	V
$V_{T(TO)}$	$T_j = 130\text{ °C}$			0.90	V
r_T	$T_j = 130\text{ °C}$			2.6	mΩ
$I_{DD}; I_{RD}$	$T_j = 130\text{ °C}$, $V_{DD} = V_{DRM}$; $V_{RD} = V_{RRM}$			20	mA
t_{gd}	$I_G = 1\text{ A}$		$T_j = 25\text{ °C}$	1	μs
t_{gr}	$di_G/dt = 1\text{ A/μs}$		$T_j = 25\text{ °C}$	2	μs
	$V_D = 0.67 \cdot V_{DRM}$				
t_q	$T_j = 130\text{ °C}$		200		μs
I_H	$T_j = 25\text{ °C}$			220	mA
I_L	$T_j = 25\text{ °C}$, $R_G = 33\text{ Ω}$			550	mA
V_{GT}	$T_j = 25\text{ °C}$, d.c.	2.5			V
I_{GT}	$T_j = 25\text{ °C}$, d.c.	100			mA
V_{GD}	$T_j = 130\text{ °C}$, d.c.			0.25	V
I_{GD}	$T_j = 130\text{ °C}$, d.c.			4	mA
$R_{th(j-c)}$	cont., per chip			0.13	K/W
	sin. 180°, per chip			0.17	K/W
	rec. 120°, per chip			0.18	K/W
Diode					
V_F	$T_j = 25\text{ °C}$, $I_F = 420\text{ A}$			1.65	V
V_{F0}	$T_j = 130\text{ °C}$			0.85	V
r_F	$T_j = 130\text{ °C}$			2.05	mΩ
I_R	$T_j = 130\text{ °C}$, $V_{RD} = V_{RRM}$			3	mA
$R_{th(j-c)}$	cont., per chip			0.15	K/W
	sin. 180°, per chip			0.2	K/W
	rec. 120°, per chip			0.21	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

Thyristor / Diode Modules

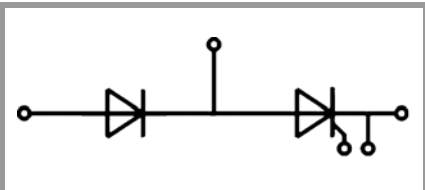
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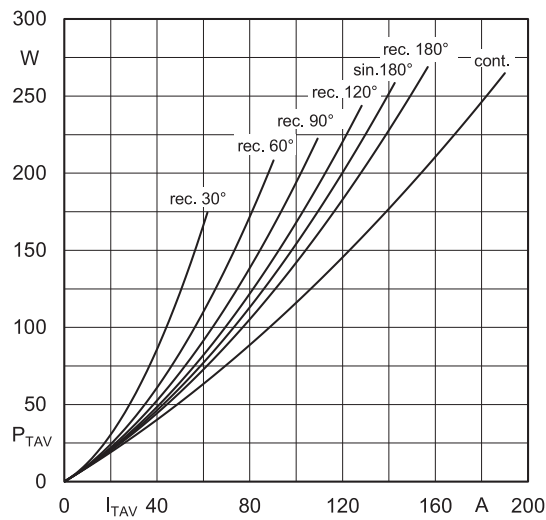


Fig. 1L: Power dissipation per thyristor vs. on-state current

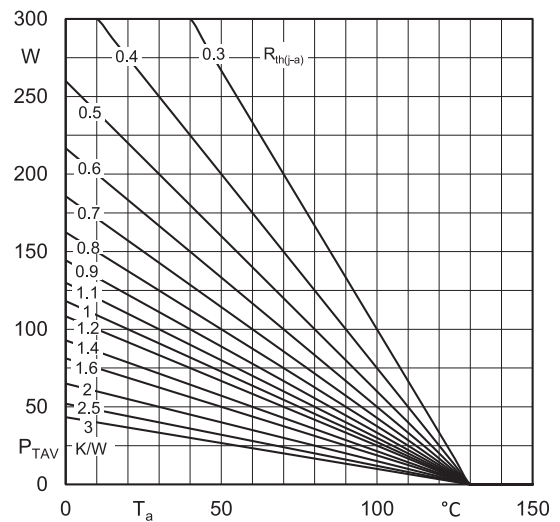


Fig. 1R: Max. power dissipation per thyristor vs. ambient temperature

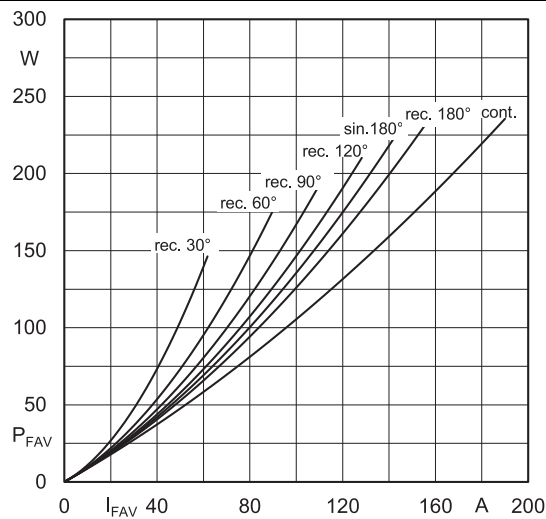


Fig. 2L: Power dissipation per diode vs. forward current

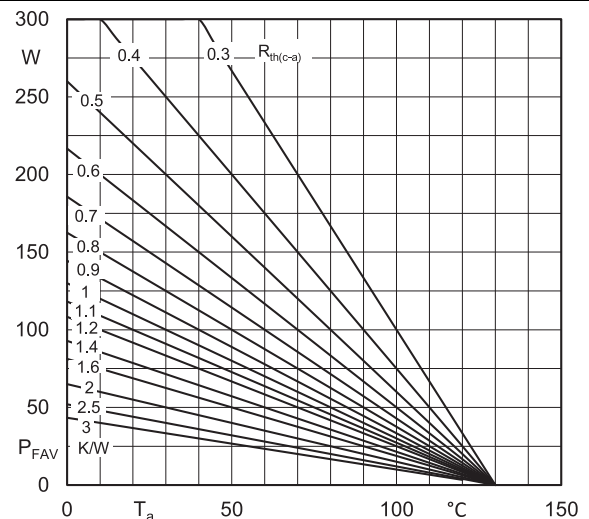


Fig. 2R: Max. power dissipation per diode vs. ambient temperature

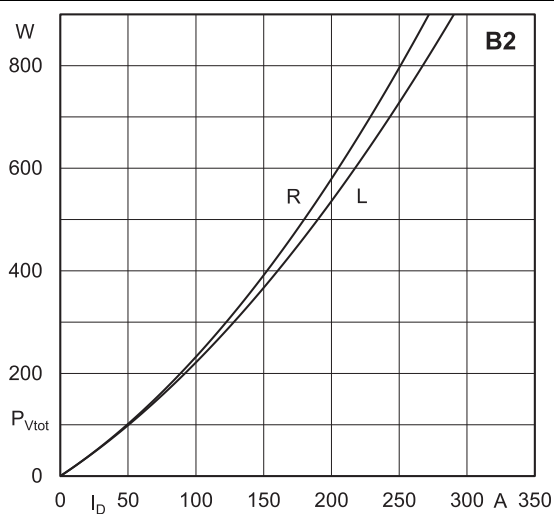


Fig. 3L: Max. power dissipation of two modules vs. direct current

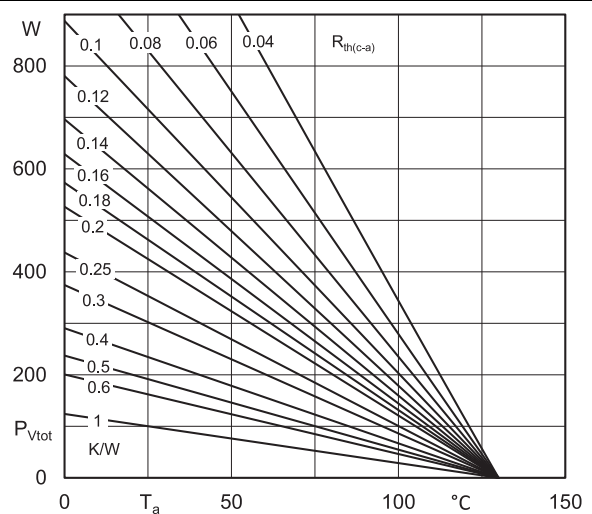


Fig. 3R: Max. power dissipation of two modules vs. ambient temperature

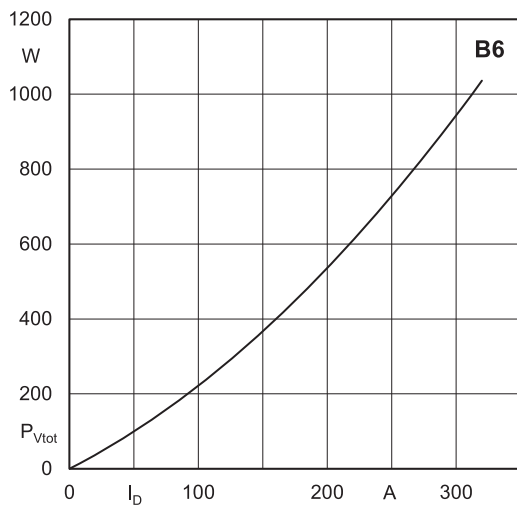


Fig. 4L: Max. power dissipation of three modules vs. direct current

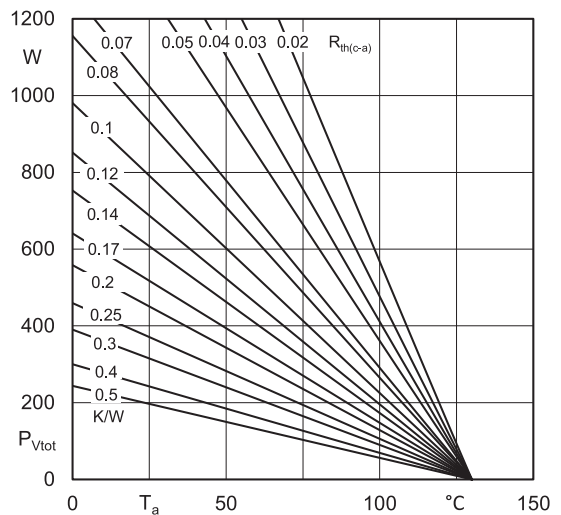


Fig. 4R: Max. power dissipation of three modules vs. ambient temperature

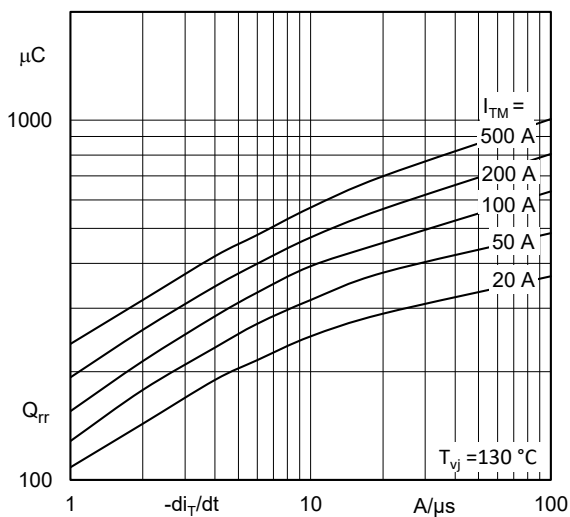


Fig. 5: Recovered charge vs. current decrease

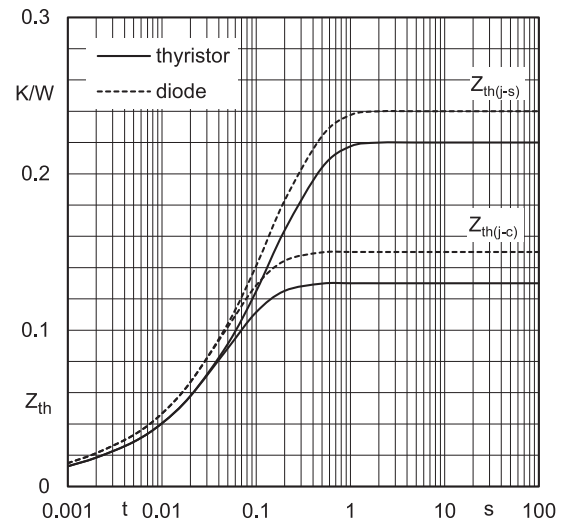


Fig. 6: Transient thermal impedance vs. time

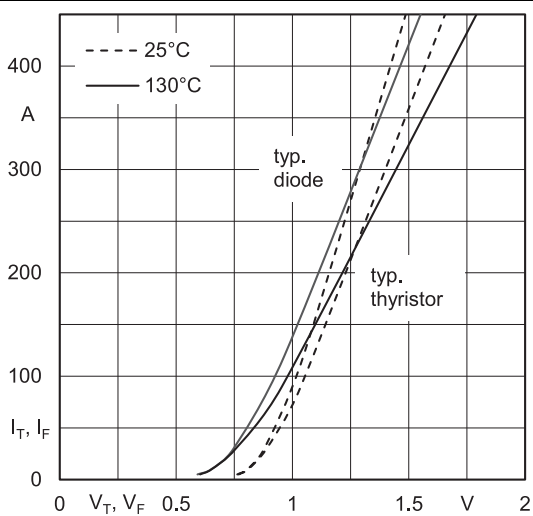


Fig. 7: On-state characteristics

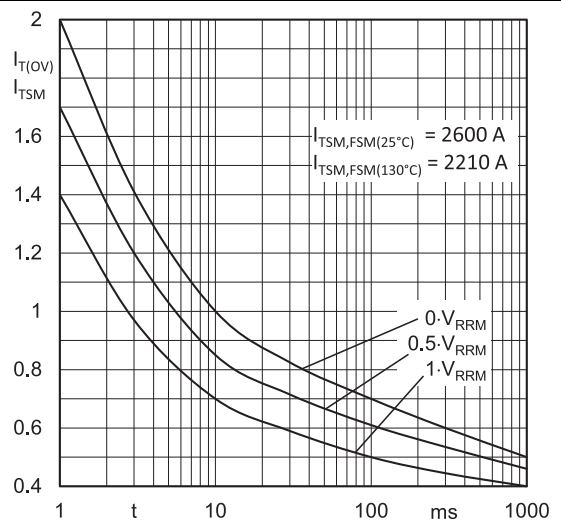


Fig. 8: Surge overload current vs. time

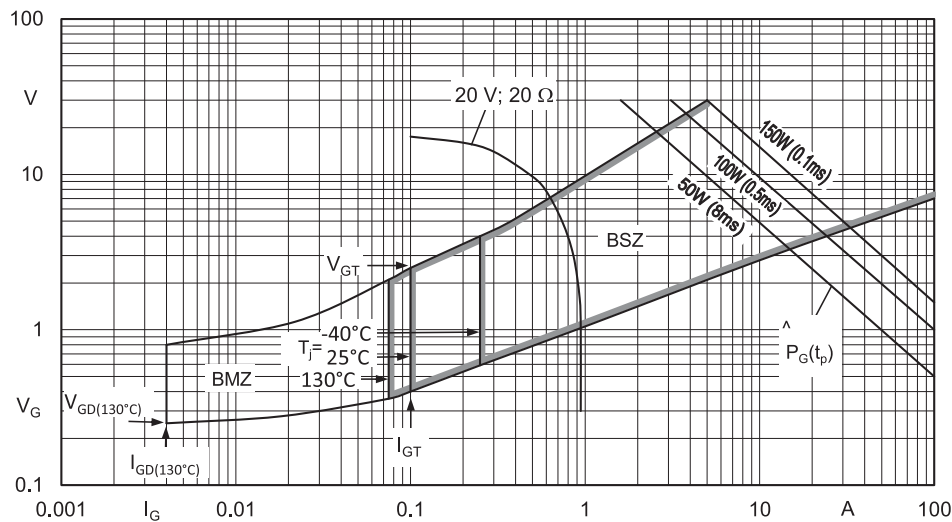
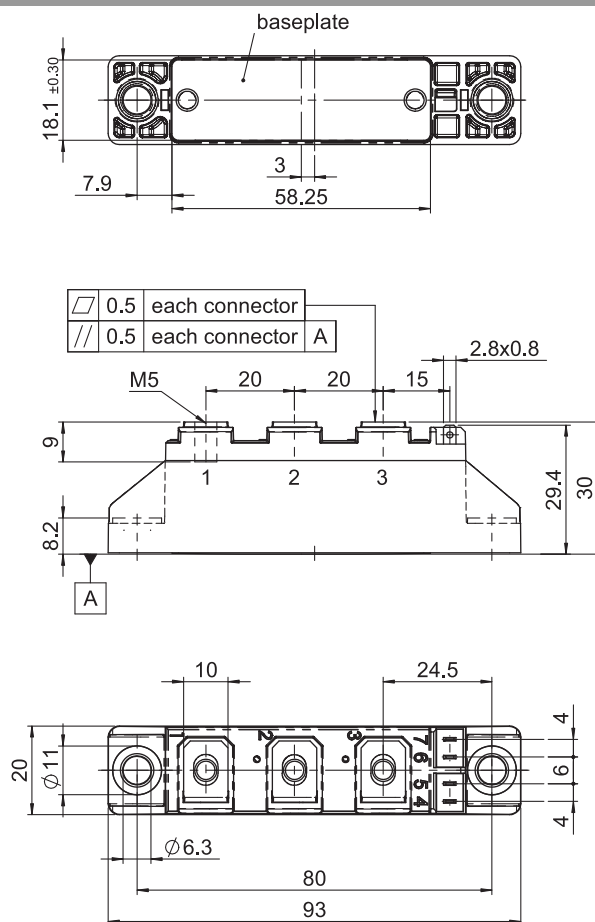
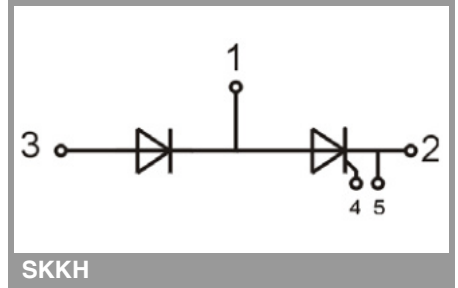


Fig. 9: Gate trigger characteristics



general tolerance $\pm 0.5\text{mm}$

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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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