



SEMIPACK® 5

Thyristor / Diode Modules

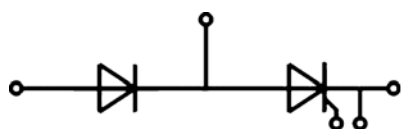
SKKH 520/16 E

Features*

- Heat transfer through aluminium nitride ceramic isolated metal baseplate
- Pressure contacts for high reliability
- UL recognized, file no. E 63 532

Typical Applications

- Rectifiers for motor drives
- Process controll
- Rectifiers for power supplies



SKKH

Absolute Maximum Ratings

Symbol	Conditions		Values	Unit
Thyristor / diode				
$I_{F(AV)}/I_{T(AV)}$	sin. 180°	$T_c = 85\text{ °C}$	506	A
	$T_j = 135\text{ °C}$	$T_c = 100\text{ °C}$	383	A
I_{FSM}/I_{TSM}	$t_p = 10\text{ ms}$	$T_j = 25\text{ °C}$	15000	A
		$T_j = 135\text{ °C}$	13000	A
i^2t	$t_p = 10\text{ ms}$	$T_j = 25\text{ °C}$	1125000	A²s
		$T_j = 135\text{ °C}$	845000	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
$(di/dt)_{cr}$	$T_j = 135\text{ °C}$, thyristor		250	A/μs
$(dv/dt)_{cr}$	$T_j = 135\text{ °C}$, thyristor		1000	V/μs
T_j			-40 ... 135	°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	$T_j = 25\text{ °C}$, $I_T = 1560\text{ A}$, chiplevel		1.38	1.53	V
$V_{T(TO)}$	$T_j = 135\text{ °C}$, chiplevel		0.84	0.93	V
r_T	$T_j = 135\text{ °C}$, chiplevel		0.31	0.34	mΩ
$I_{DD}; I_{RD}$	$T_j = 135\text{ °C}$, $V_{DD} = V_{DRM}$; $V_{RD} = V_{RRM}$			180	mA
t_{gd}	$I_G = 1\text{ A}$		1		μs
	$di_G/dt = 1\text{ A/μs}$				
t_{gr}	$V_D = 0.67 \cdot V_{DRM}$		2		μs
t_q	$T_j = 135\text{ °C}$		200		μs
I_H	$T_j = 25\text{ °C}$		150	500	mA
I_L	$T_j = 25\text{ °C}$, $R_G = 33\text{ Ω}$		300	2000	mA
V_{GT}	$T_j = 25\text{ °C}$, d.c.	3			V
I_{GT}	$T_j = 25\text{ °C}$, d.c.	200			mA
V_{GD}	$T_j = 135\text{ °C}$, d.c.			0.25	V
I_{GD}	$T_j = 135\text{ °C}$, d.c.			10	mA
$R_{th(j-c)}$	cont., per chip			0.069	K/W
	sin. 180°, per chip			0.073	K/W
	rec. 120°, per chip			0.076	K/W
Diode					
V_F	$T_j = 25\text{ °C}$, $I_F = 1560\text{ A}$, chiplevel		1.07	1.19	V
V_{F0}	$T_j = 135\text{ °C}$, chiplevel		0.72	0.80	V
r_F	$T_j = 135\text{ °C}$, chiplevel		0.15	0.17	mΩ
I_R	$T_j = 135\text{ °C}$, $V_{RD} = V_{RRM}$			6	mA
$R_{th(j-c)}$	cont., per chip			0.069	K/W
	sin. 180°, per chip			0.073	K/W
	rec. 120°, per chip			0.076	K/W

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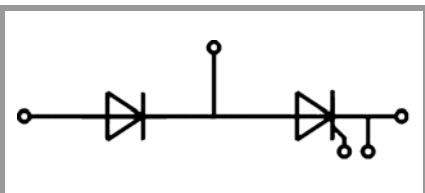
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Characteristics						
Symbol	Conditions		min.	typ.	max.	Unit
Module						
R _{th(c-s)}	thyristor, P12 (reference)			0.01		K/W
	diode, P12 (reference)			0.01		K/W
	module, P12 (reference)			0.006		K/W
R _{CC'+EE'}	measured per	T _C = 25 °C		0.04		mΩ
	switch	T _C = 125 °C		0.053		mΩ
M _s	to heatsink M6		4.25		5.75	Nm
M _t	to terminals M10		10.2		13.8	Nm
a					5 * 9.81	m/s ²
w				1400		g



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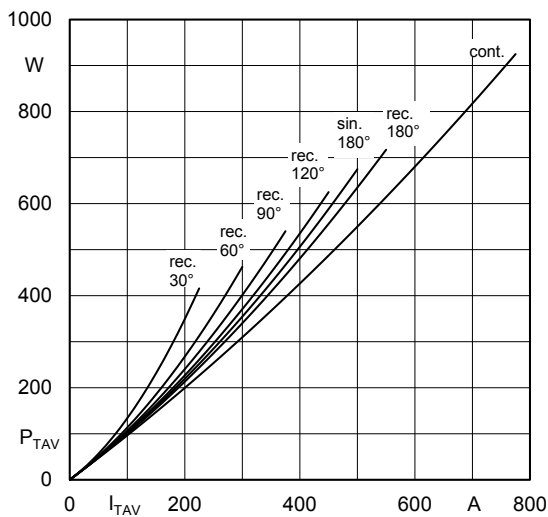


Fig. 1L: Power dissipation per thyristor vs. on-state current

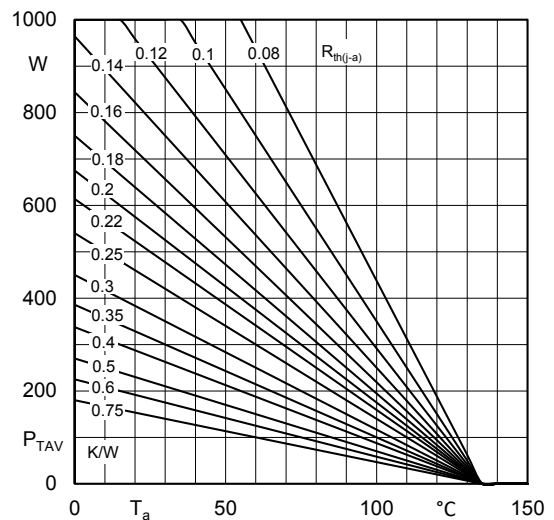


Fig. 1R: Max. power dissipation per thyristor vs. ambient temperature

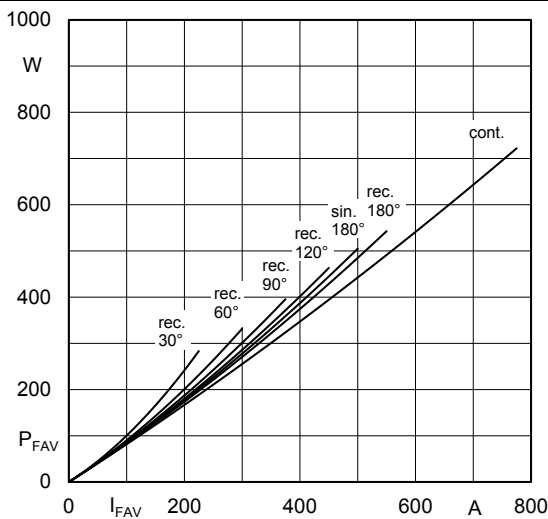


Fig. 2L: Power dissipation per diode vs. forward current

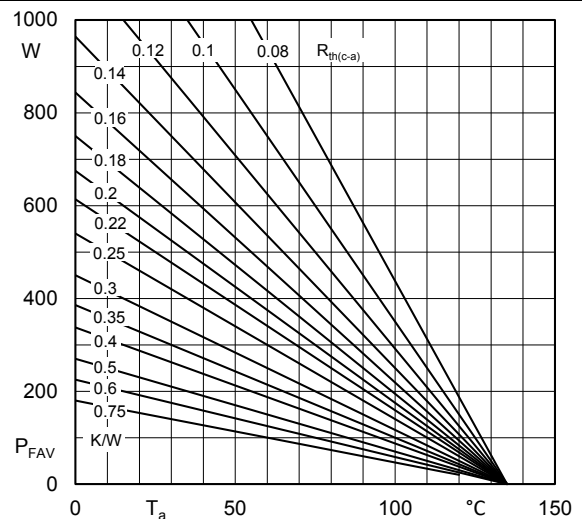


Fig. 2R: Max. power dissipation per diode vs. ambient temperature

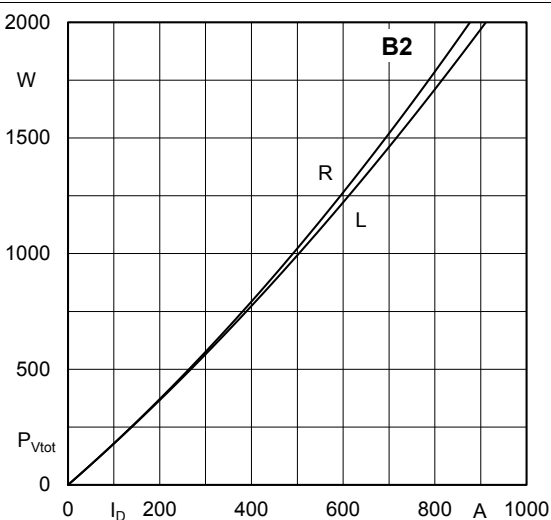


Fig. 3L: Power dissipation of two modules vs. direct current

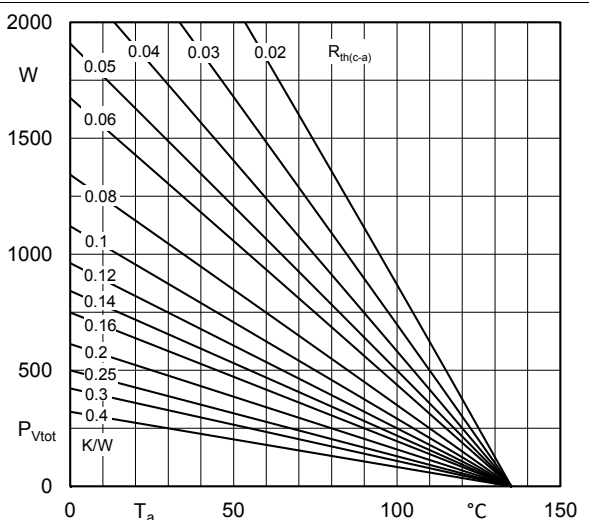


Fig. 3R: Max. power dissipation of two modules vs. ambient temperature

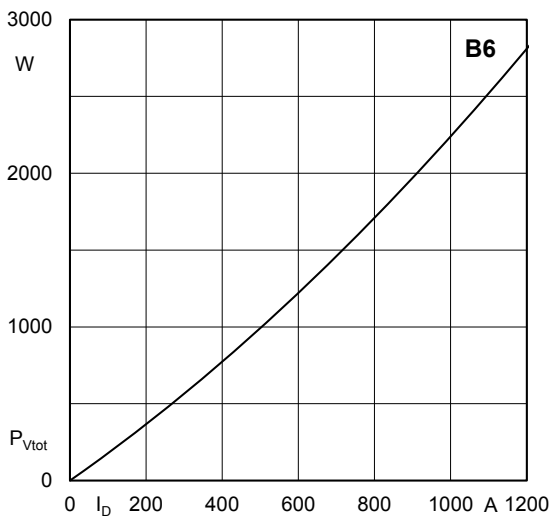


Fig. 4L: Power dissipation of three modules vs. direct current

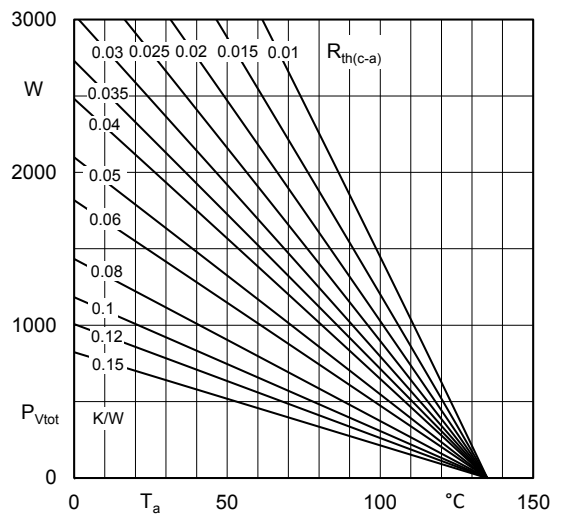


Fig. 4R: Max. power dissipation of three modules vs. ambient temperature

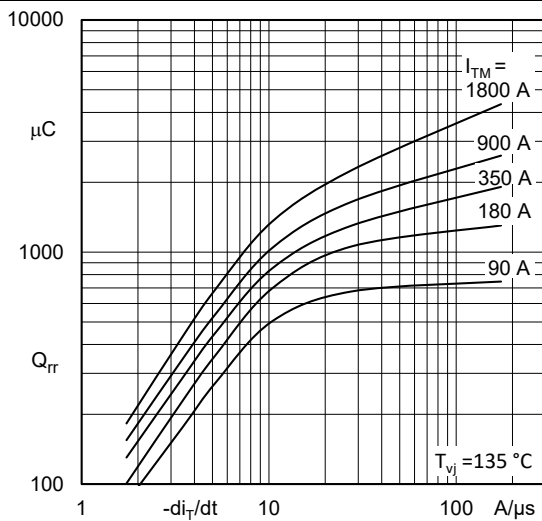


Fig. 5: Recovered charge vs. current decrease

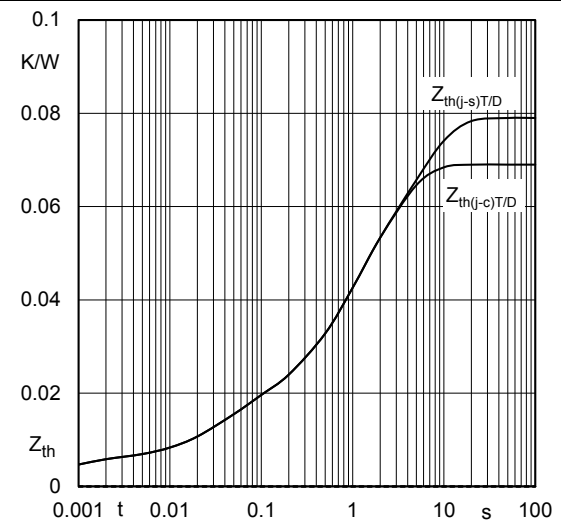


Fig. 6: Transient thermal impedance vs. time

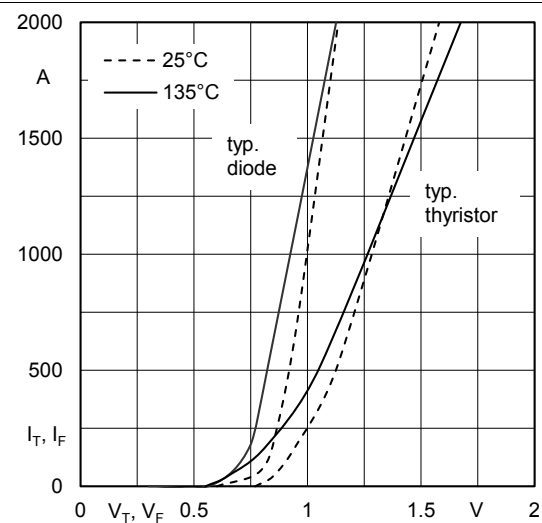


Fig. 7: On-state characteristics

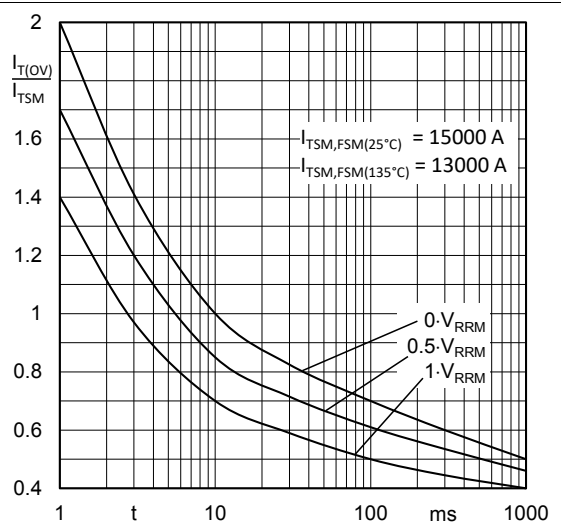


Fig. 8: Surge overload current vs. time

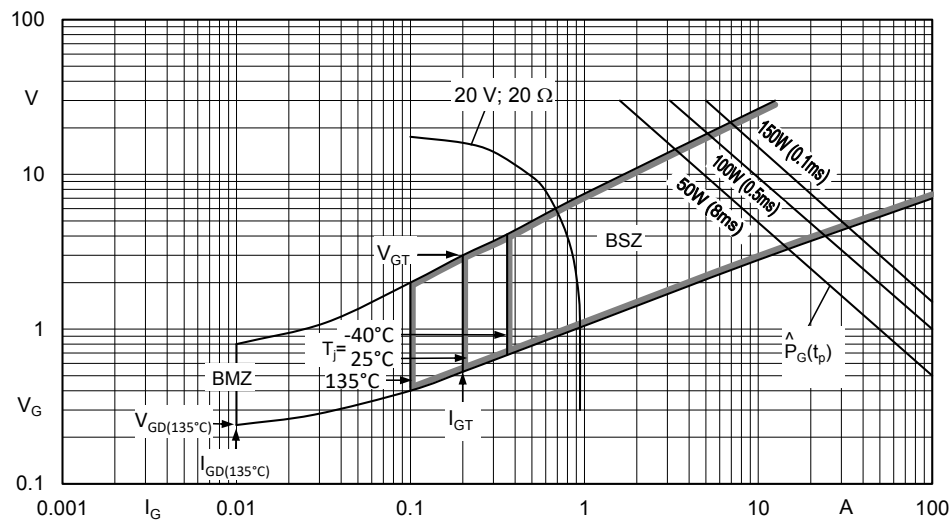
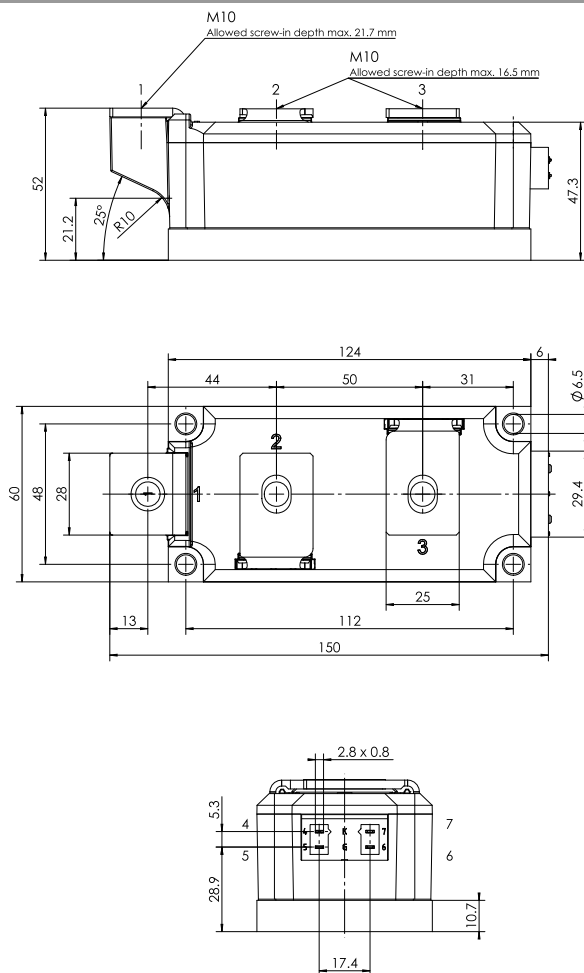
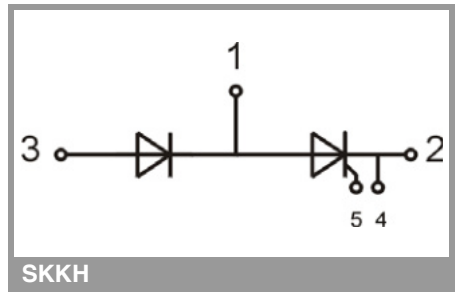


Fig. 9: Gate trigger characteristics



General tolerance ± 0.5 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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