



SEMIPACK® 5

Thyristor Modules

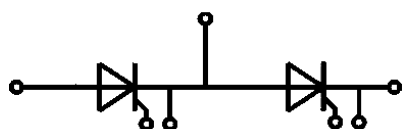
SKKT 520/18 E

Features*

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

Typical Applications

- Fully controlled rectifiers
- Motor soft starters
- AC power regulation
- AC switch



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Absolute Maximum Ratings

Symbol	Conditions		Values	Unit
Chip				
I _{T(AV)}	sin. 180°	T _c = 85 °C	506	A
	T _j = 135 °C	T _c = 100 °C	383	A
I _{TSM}	t _p = 10 ms	T _j = 25 °C	15000	A
		T _j = 135 °C	13000	A
i ² t	t _p = 10 ms	T _j = 25 °C	1125000	A ² s
		T _j = 135 °C	845000	A ² s
V _{RSM}	T _j = 25 °C		1900	V
V _{RRM}	T _j = 25 °C		1800	V
V _{DRM}	T _j = 25 °C		1800	V
(di/dt) _{cr}	T _j = 135 °C		250	A/μs
(dv/dt) _{cr}	T _j = 135 °C		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
Chip					
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
$R_{th(j-c)}$	continuous DC	per chip		0.069	K/W
		per module		0.035	K/W
$R_{th(j-c)}$	sin. 180°	per chip		0.073	K/W
		per module		0.037	K/W
$R_{th(j-c)}$	rec. 120°	per chip		0.076	K/W
		per module		0.038	K/W
Module					
$R_{th(c-s)}$	chip, P12 (reference)		0.01		K/W
	module, P12 (reference)		0.006		K/W
$R_{CC'+EE'}$	measured per switch	$T_c = 25\text{ °C}$	0.04		mΩ
		$T_c = 125\text{ °C}$	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

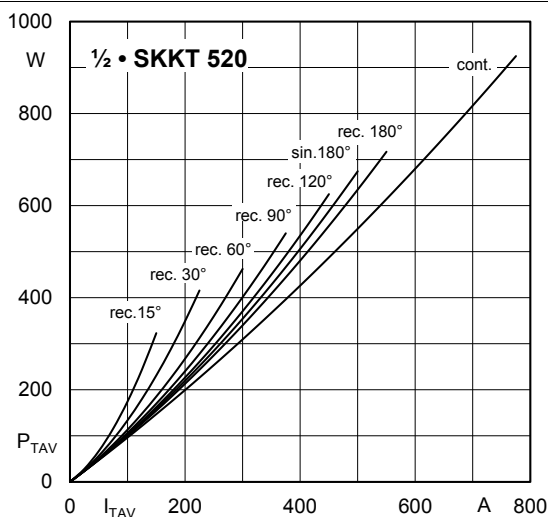


Fig. 1L: Power dissipation per thyristor vs. on-state current

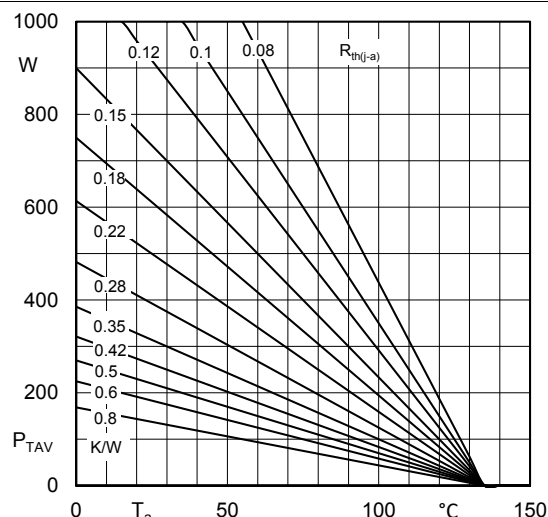


Fig. 1R: Power dissipation per thyristor vs. ambient temperature

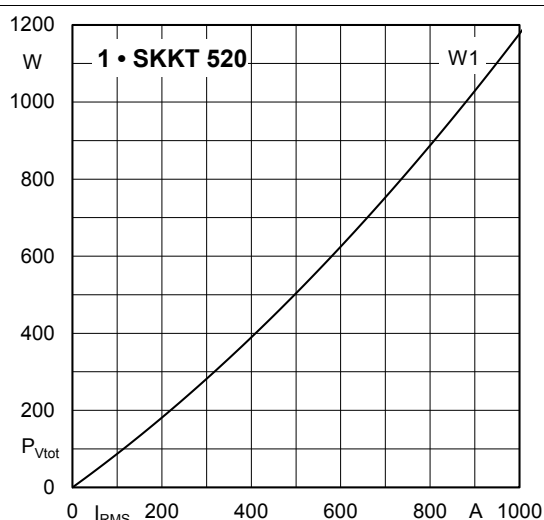


Fig. 2L: Power dissipation of one module vs. rms current

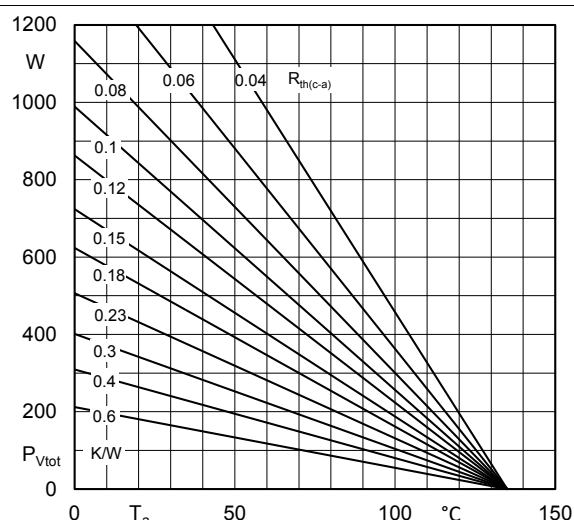


Fig. 2R: Max. power dissipation of one module vs. ambient temperature

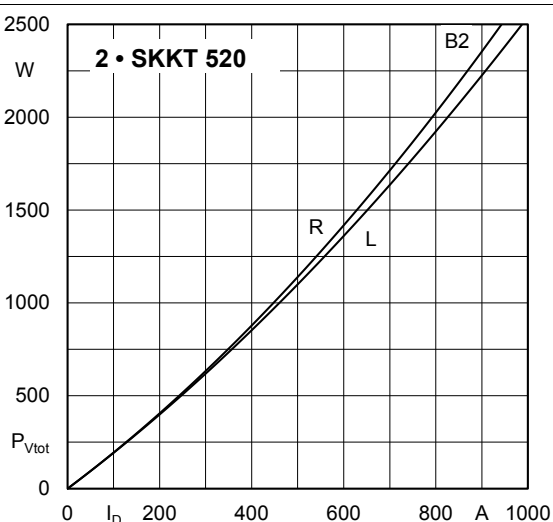


Fig. 3L: Power dissipation of two modules vs. direct current

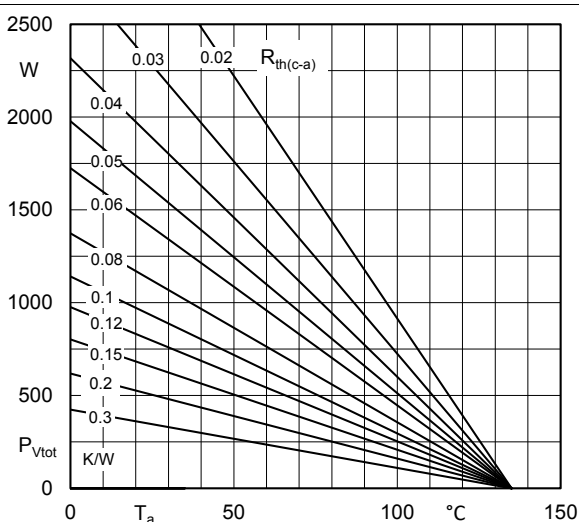


Fig. 3R: Max. power dissipation of two modules vs. ambient temperature

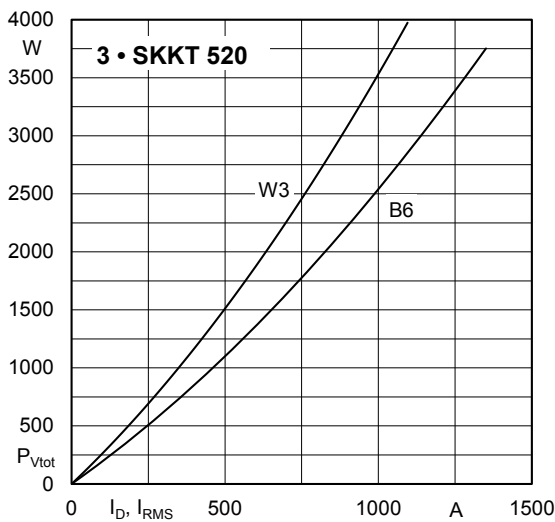


Fig. 4L: Power dissipation of three modules vs. direct and rms current

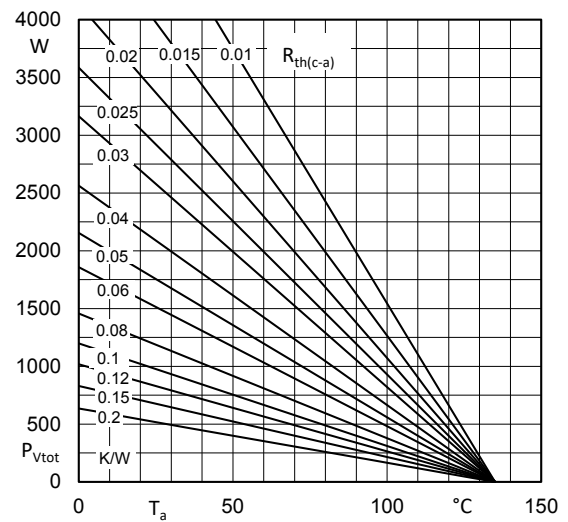


Fig. 4R: Max. power dissipation of three modules vs. ambient temperature

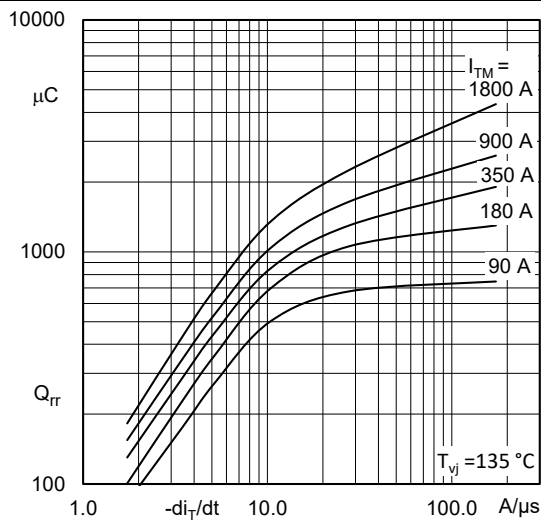


Fig. 5: Recovered charge vs. current decrease

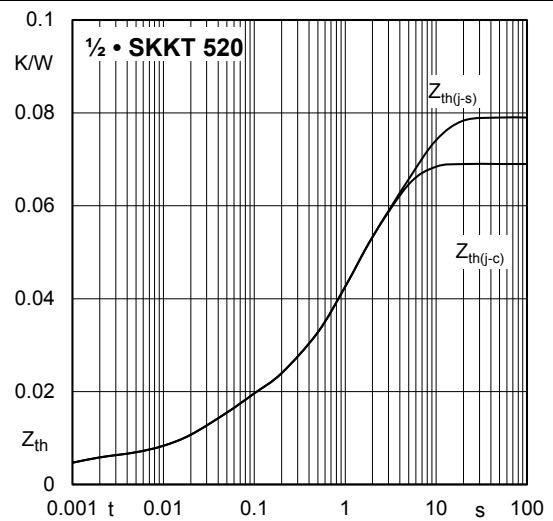


Fig. 6: Transient thermal impedance vs. time

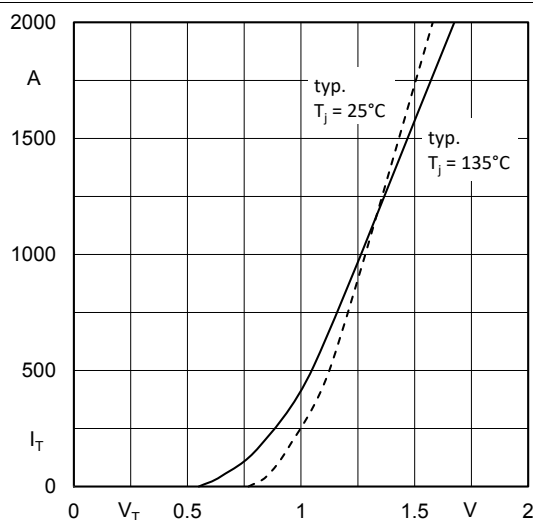


Fig. 7: On-state characteristics

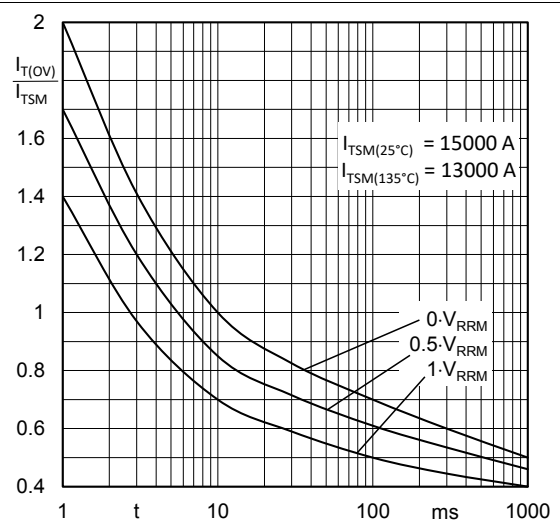


Fig. 8: Surge overload current vs. time

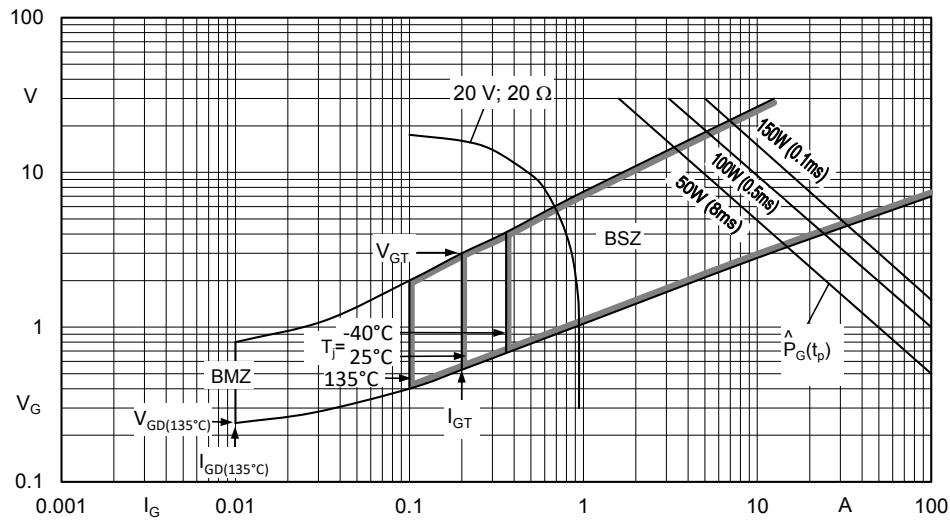
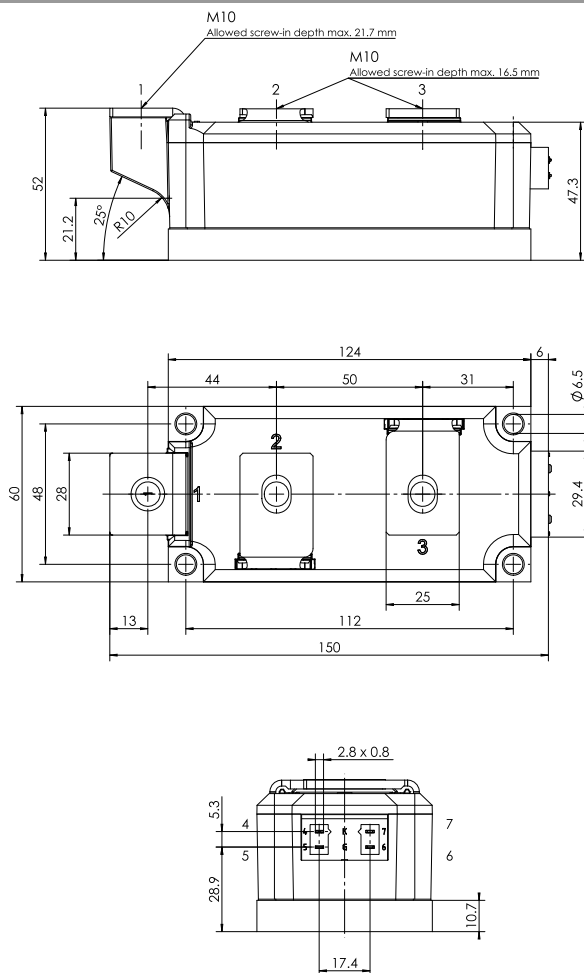
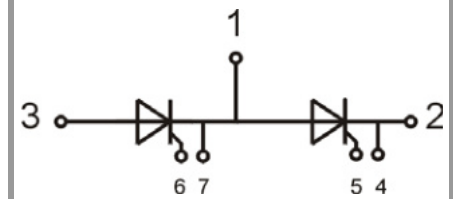


Fig. 9: Gate trigger characteristics



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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