

# SKKT 520/16 E



SEMIPACK® 5

## Thyristor Modules

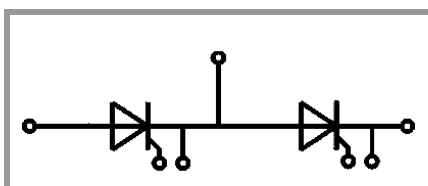
### SKKT 520/16 E

#### Features\*

- Heat transfer through aluminium nitride ceramic insulated metal baseplate
- Precious metal pressure contacts for high reliability
- Thyristor with amplifying gate
- 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
<b>Chip</b>				
$I_{T(AV)}$	sin. 180° $T_j = 135\text{ °C}$	$T_c = 85\text{ °C}$	506	A
		$T_c = 100\text{ °C}$	383	A
$I_{TSM}$	$t_p = 10\text{ ms}$	$T_j = 25\text{ °C}$	15000	A
		$T_j = 135\text{ °C}$	13000	A
$i^2t$	$t_p = 10\text{ ms}$	$T_j = 25\text{ °C}$	1125000	A <sup>2</sup> s
		$T_j = 135\text{ °C}$	845000	A <sup>2</sup> s
$V_{RSM}$	$T_j = 25\text{ °C}$		1700	V
$V_{RRM}$	$T_j = 25\text{ °C}$		1600	V
$V_{DRM}$	$T_j = 25\text{ °C}$		1600	V
$(di/dt)_{cr}$	$T_j = 135\text{ °C}$		250	A/μs
$(dv/dt)_{cr}$	$T_j = 135\text{ °C}$		1000	V/μs
$T_j$			-40 ... 135	°C
<b>Module</b>				
$T_{stg}$			-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
<b>Chip</b>						
$V_T$	$T_j = 25\text{ °C}$ , $I_T = 1560\text{ A}$ , 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
$t_{gd}$	$I_G = 1\text{ A}$	$T_j = 25\text{ °C}$		1		μs
$t_{gr}$	$di_G/dt = 1\text{ A/μs}$ $V_D = 0.67 * V_{DRM}$	$T_j = 25\text{ °C}$		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
		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
<b>Module</b>						
$R_{th(c-s)}$	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 <sup>2</sup>
$w$				1400		g

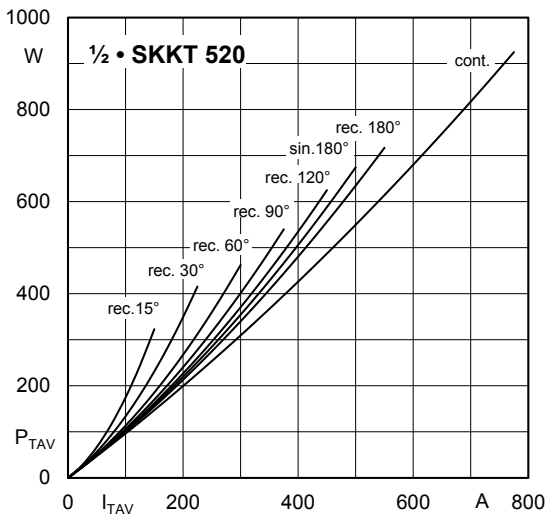


Fig. 1L: Power dissipation per thyristor vs. on-state current

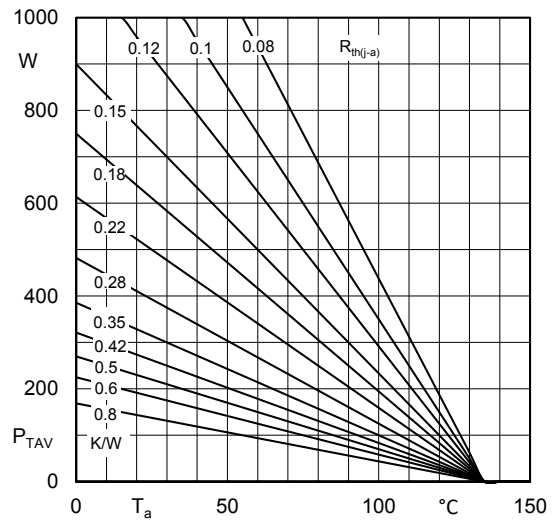


Fig. 1R: Power dissipation per thyristor vs. ambient temperature

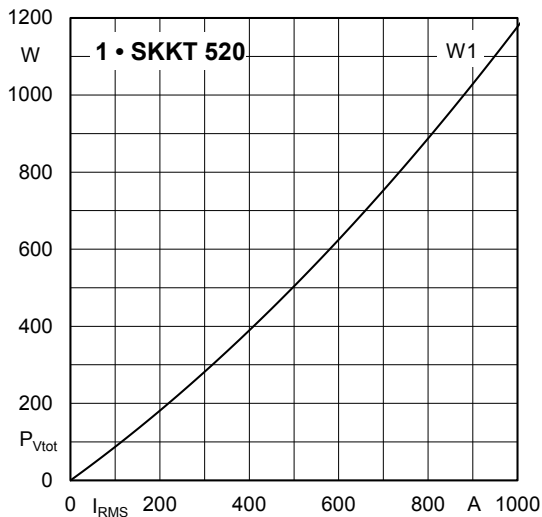


Fig. 2L: Power dissipation of one module vs. rms current

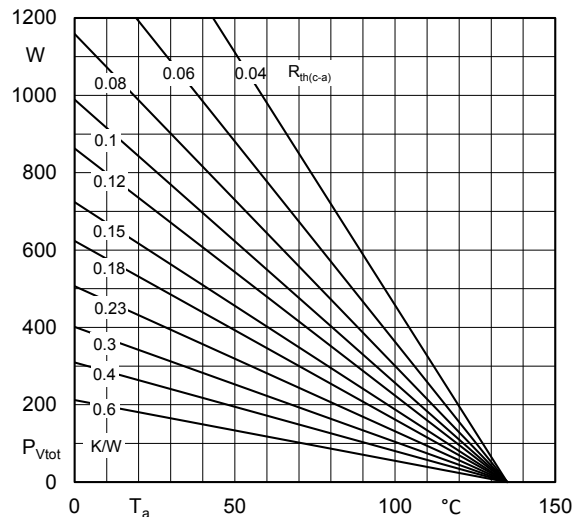


Fig. 2R: Max. power dissipation of one module vs. ambient temperature

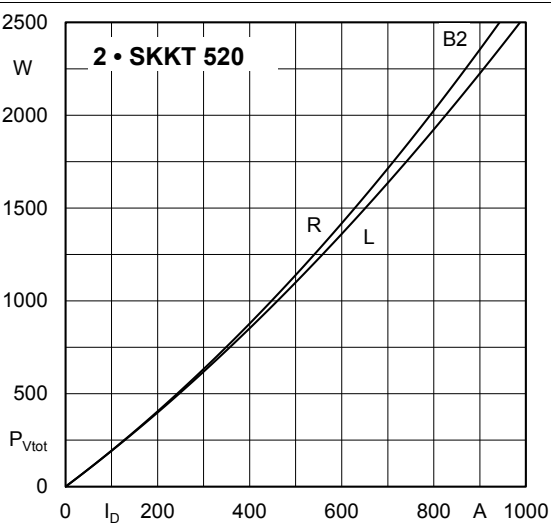


Fig. 3L: Power dissipation of two modules vs. direct current

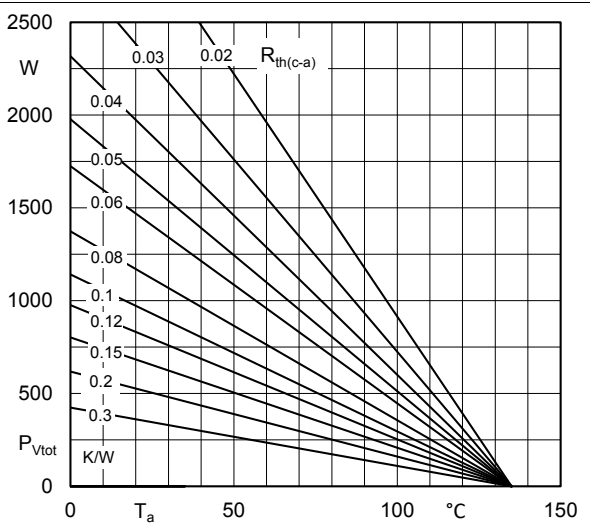


Fig. 3R: Max. power dissipation of two modules vs. ambient temperature

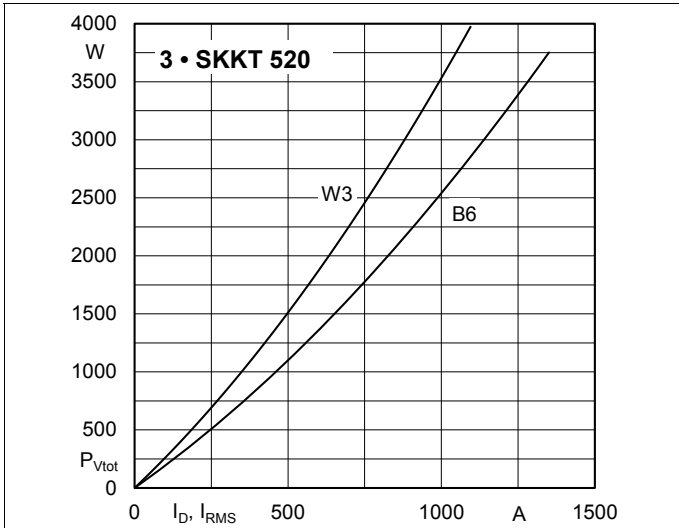


Fig. 4L: Power dissipation of three modules vs. direct and rms current

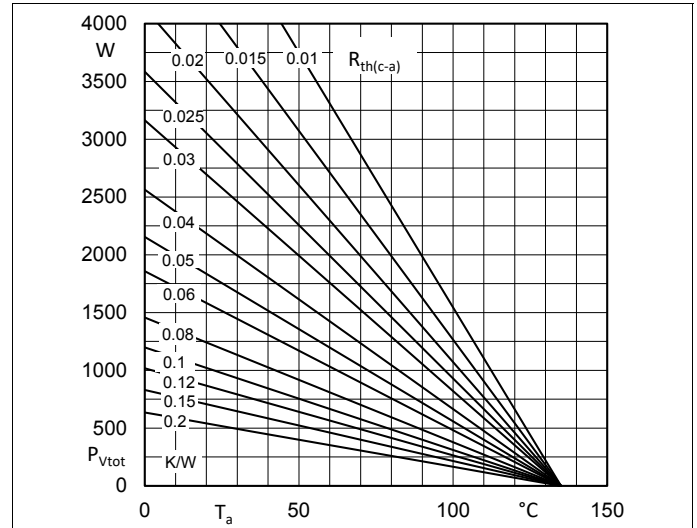


Fig. 4R: Max. power dissipation of three modules vs. ambient temperature

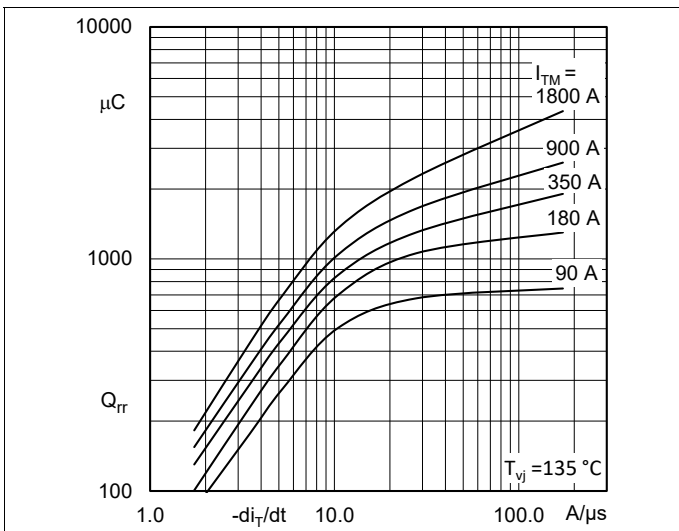


Fig. 5: Recovered charge vs. current decrease

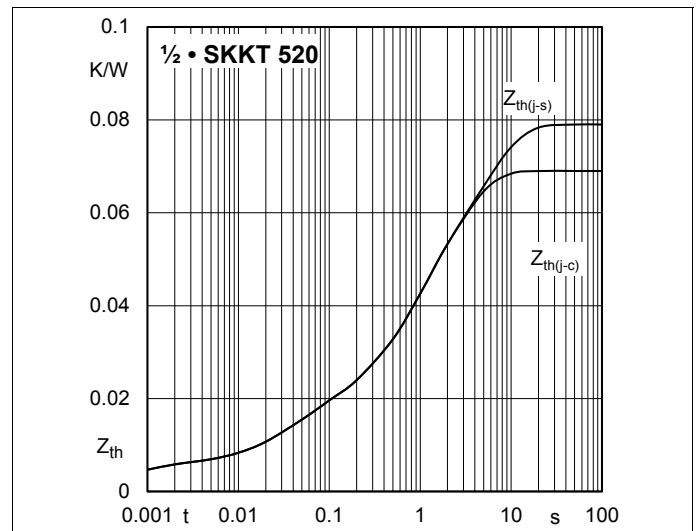


Fig. 6: Transient thermal impedance vs. time

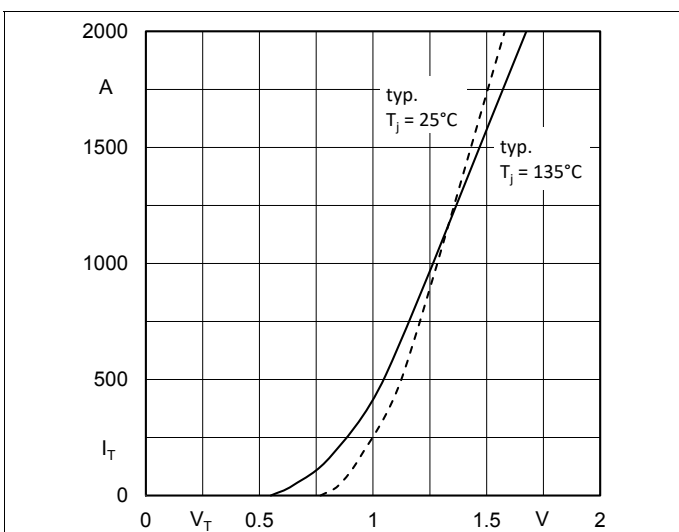


Fig. 7: On-state characteristics

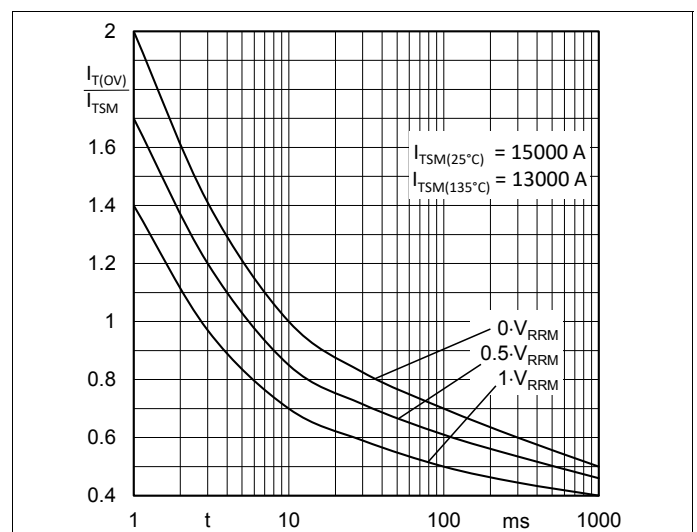


Fig. 8: Surge overload current vs. time

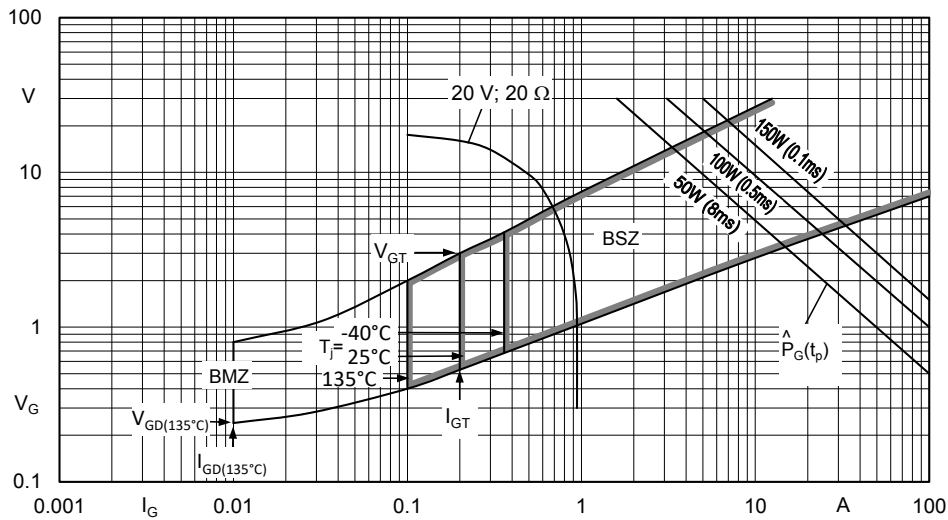
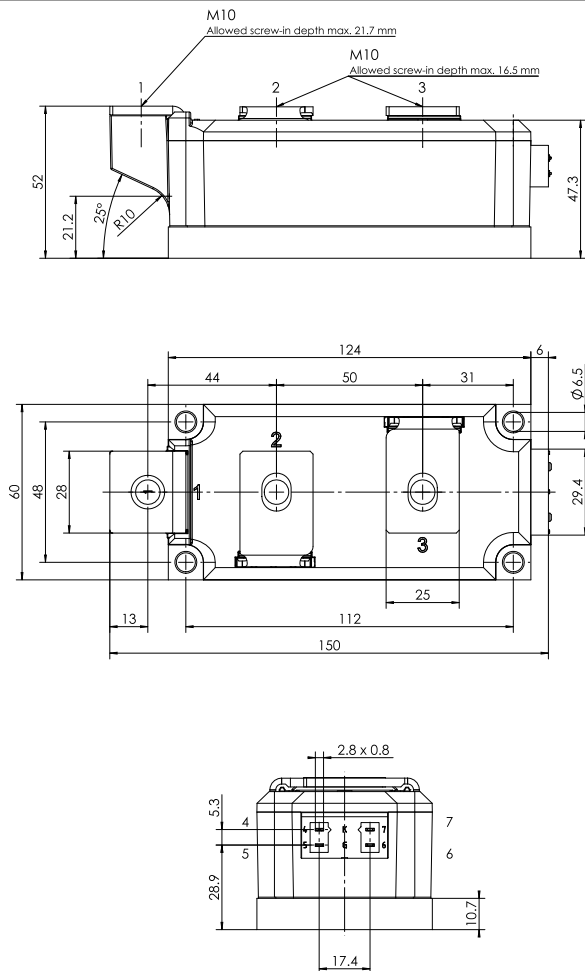
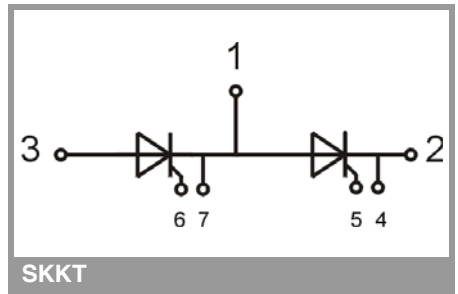


Fig. 9: Gate trigger characteristics



General tolerance  $\pm 0.5$  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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