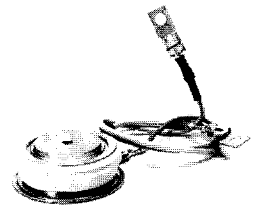
Fast Thyristors with Interdigitated Amplifying Gate

SKT 351 F
SKT 431 F

V_{DRM} V_{RRM}	t_q (T_{vj} = 125 °C)	I_{TRMS} (maximum values for continuous operation) 900 A	1100 A
		I_{TAV} (sin. 180; T_{case} = ... °C; 50 Hz; DSC) 350 A (84 °C)	430 A (82,5 °C)
V	µs		
400	15		**SKT 431 F 04 DS**
600	15		**SKT 431 F 06 DS**
	20		**SKT 431 F 06 DT**
800	15		**SKT 431 F 08 DS**
	20	**SKT 351 F 08 DT**	**SKT 431 F 08 DT**
	25	**SKT 351 F 08 DU**	
1000	15		**SKT 431 F 10 DS**
	20	**SKT 351 F 10 DT**	**SKT 431 F 10 DT**
	25	**SKT 351 F 10 DU**	
1200	20	**SKT 351 F 12 DT**	
	25	**SKT 351 F 12 DU**	
1400	30	**SKT 351 F 14 DV***	



Symbol	Conditions	SKT 351 F	SKT 431 F
I_{TM}	sin. 180; T_{case} = 60 °C; DSC; 50 Hz	1400 A	1800 A
I_{TSM}	T_{vj} = 25 °C	6500 A	8000 A
	T_{vj} = 125 °C	5500 A	7000 A
i^2t	T_{vj} = 25 °C	210 000 A^2s	320 000 A^2s
	T_{vj} = 125 °C	150 000 A^2s	245 000 A^2s
t_{gd}	T_{vj} = 25 °C; I_G = 1 A; di_G/dt = 1 A/µs	typ. 1 µs	
t_{gr}	V_D = 0,67 · V_{DRM}	typ. 1 µs	
$(di/dt)_{cr}$	non-repetitive	1000 A/µs	
	f = 50 ... 60 Hz	400 A/µs	
$(dv/dt)_{cr}$	T_{vj} = 125 °C	500 V/µs	
I_H	T_{vj} = 25 °C; typ./max.	200 mA/400 mA	
I_L	T_{vj} = 25 °C; R_G = 33 Ω; typ./max.	1 A/2 A	
V_T	T_{vj} = 25 °C; I_T = 1200 A; max.	2,4 V	2,0 V
$V_{T(TO)}$	T_{vj} = 125 °C	1,9 V	1,4 V
r_T	T_{vj} = 125 °C	0,4 mΩ	0,5 mΩ
I_{DD}, I_{RD}	T_{vj} = 125 °C; V_{DD} = V_{DRM}; V_{RD} = V_{RRM}	80mA	80 mA
V_{GT}	T_{vj} = 25 °C	4 V	
I_{GT}	T_{vj} = 25 °C	250 mA	
V_{GD}	T_{vj} = 125 °C	0,25 V	
I_{GD}	T_{vj} = 125 °C	10 mA	
R_{thjc}	cont.; DSC/SSC	0,045/0,092 °C/W	
R_{thch}	DSC/SSC	0,012/0,024 °C/W	
T_{vj}		−40 ... +125 °C	
T_{stg}		−40 ... +125 °C	
F	SI units	5,2 ... 7,5 kN	
	US units	1150 ... 1650 lbs.	
w		105 g	
Case	→ page B 4 – 21	B 11	

* Available in limited quantities

Features

- Capsule cases
- Hermetic ceramic to metal sealing
- Gold diffused silicon chips
- Amplifying interdigitated gate
- Precious metal pressure contact

Typical Applications

- Self-commutated inverters
- DC choppers
- Motor speed control
- Inductive heating
- Uninterruptible power supplies
- Electronic welders
- General power switching applications

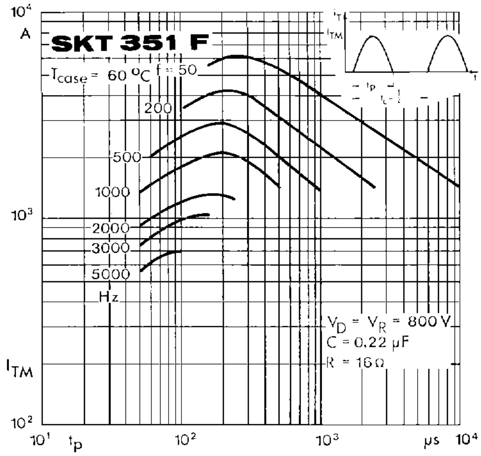


Fig. 1 a Rated peak on-state current vs. pulse duration

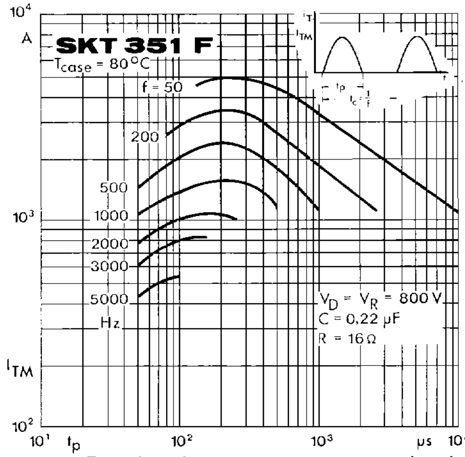


Fig. 1 b Rated peak on-state current vs. pulse duration

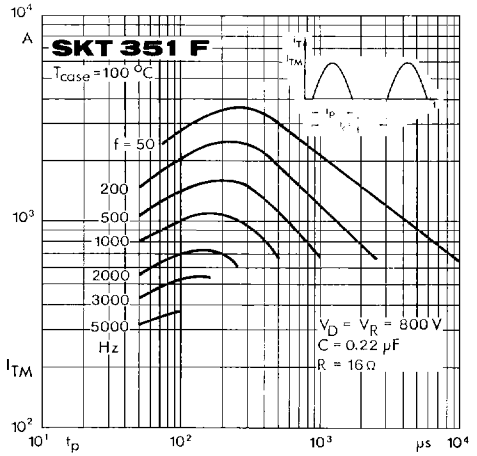


Fig. 1 c Rated peak on-state current vs. pulse duration

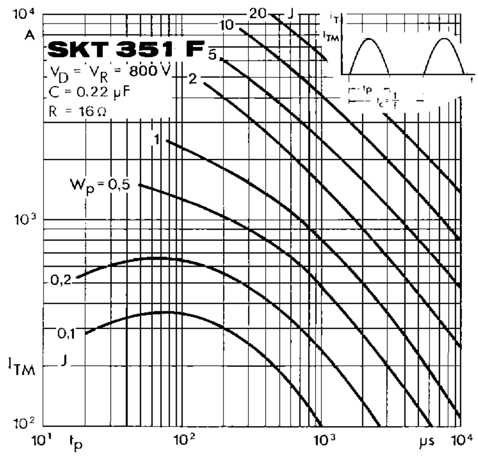


Fig. 2 Energy dissipation per pulse

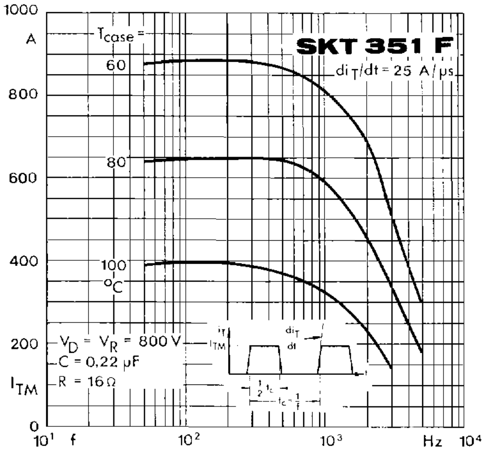


Fig. 3 a Rated peak on-state current vs. pulse duration

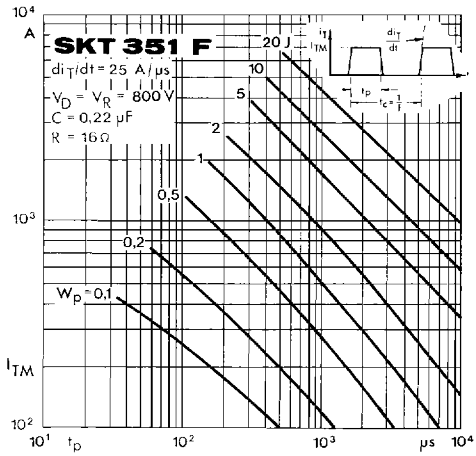


Fig. 4 a Energy dissipation per pulse

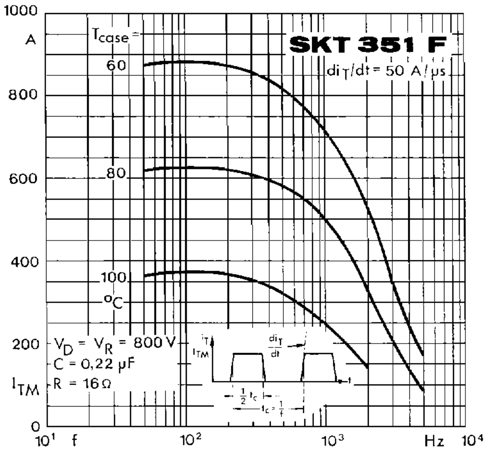


Fig. 3 c Rated peak on-state current vs. pulse duration

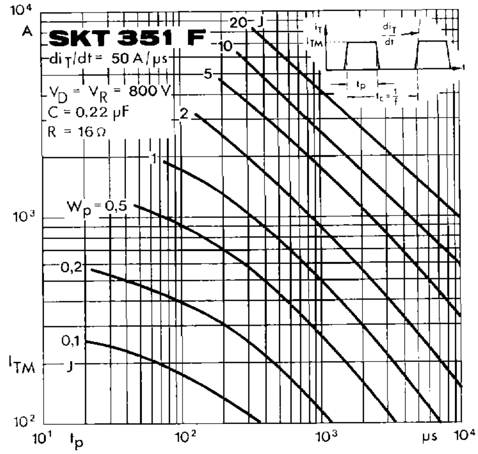


Fig. 4 c Energy dissipation per pulse

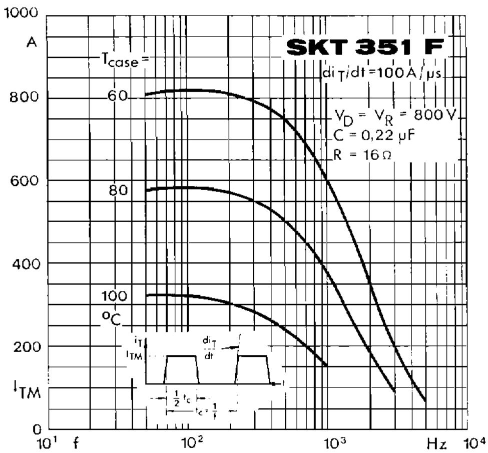
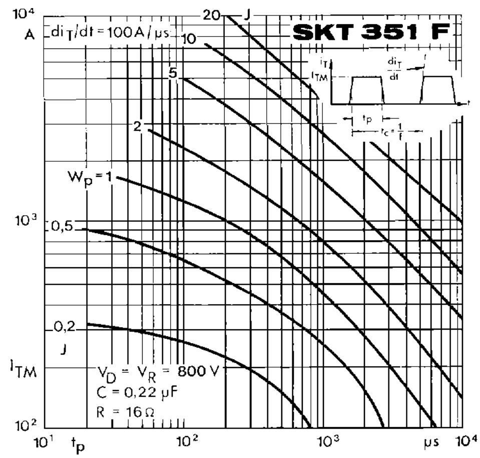


Fig. 3 b Rated peak on-state current vs. pulse duration



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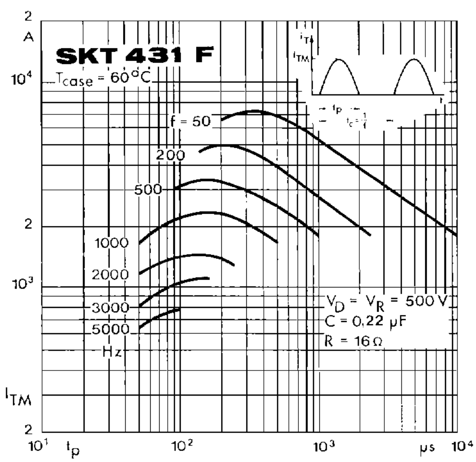

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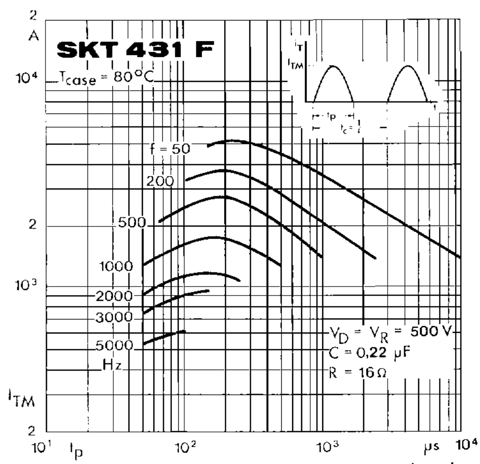

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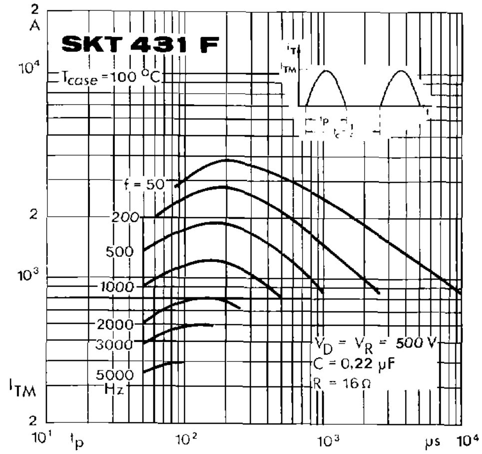

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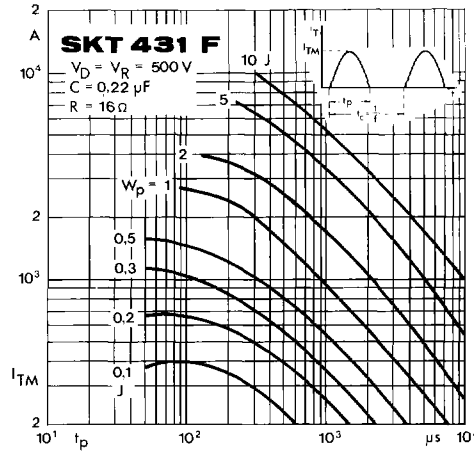

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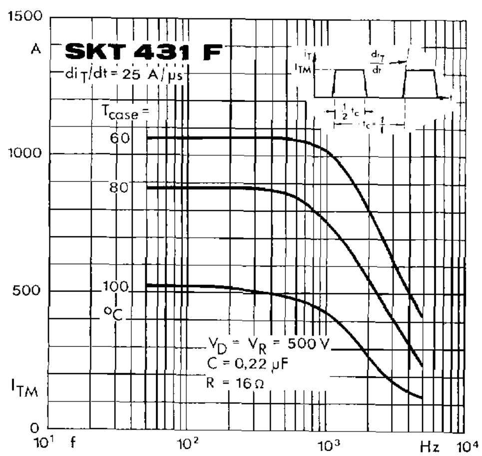

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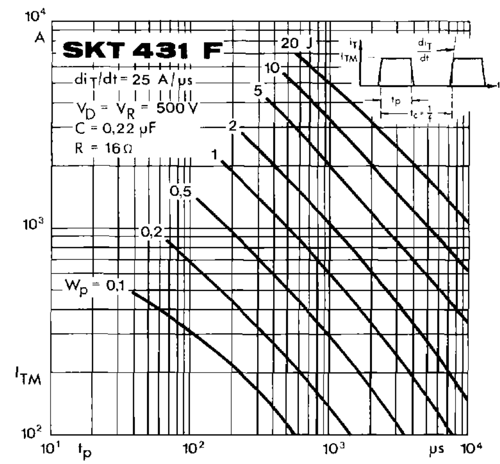


Fig. 4 a Energy dissipation per pulse

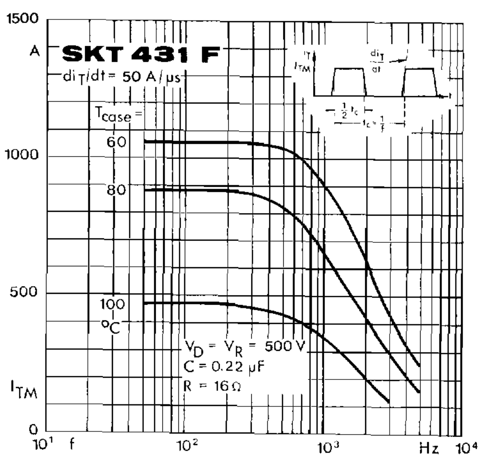


Fig. 3 b Rated peak on-state current vs. pulse duration

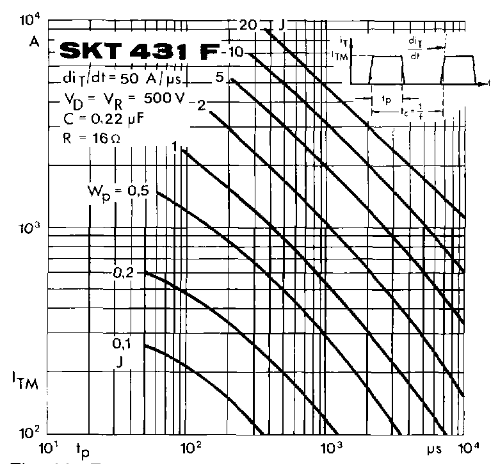


Fig. 4 b Energy dissipation per pulse

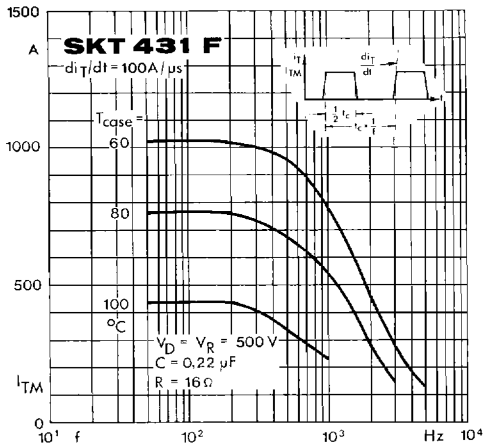


Fig. 3 c Rated peak on-state current vs. pulse duration

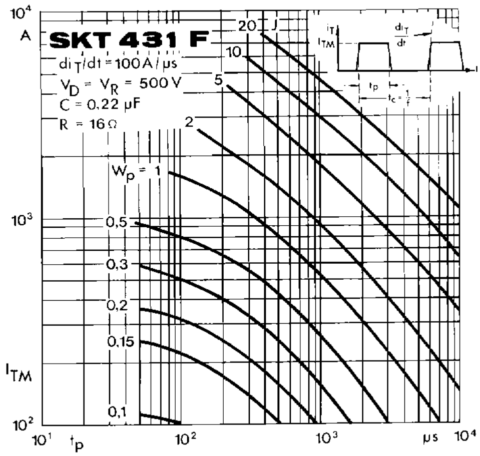


Fig. 4 c Energy dissipation per pulse

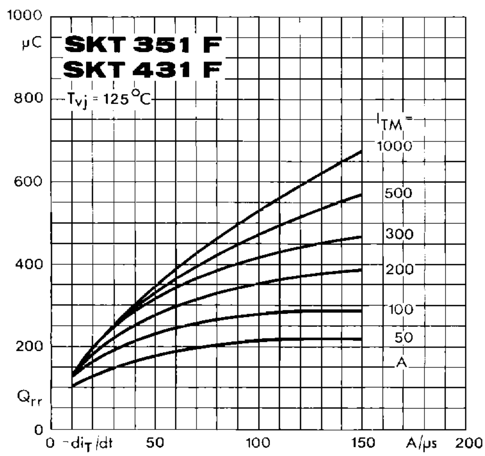


Fig. 5 Recovered charge vs. current decrease

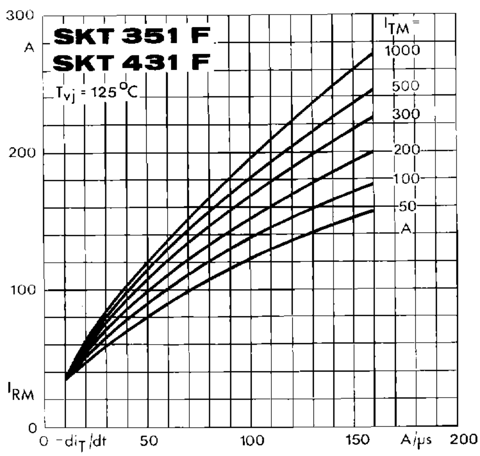
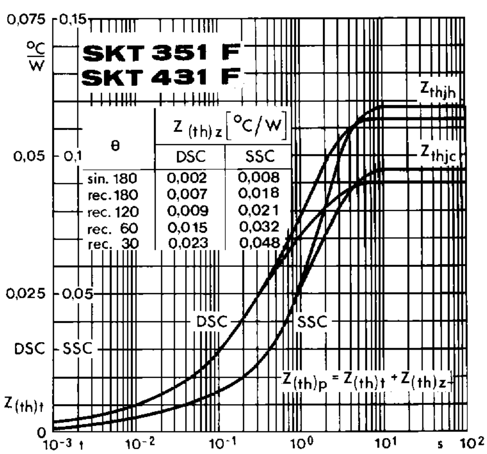


Fig. 6 Peak recovery current vs. current decrease



θ	$Z_{(th)z}$ [°C/W] DSC	SSC
sin. 180	0,002	0,008
rec. 180	0,007	0,018
rec. 120	0,009	0,021
rec. 60	0,015	0,032
rec. 30	0,023	0,048

Fig. 7 Transient thermal impedance vs. time

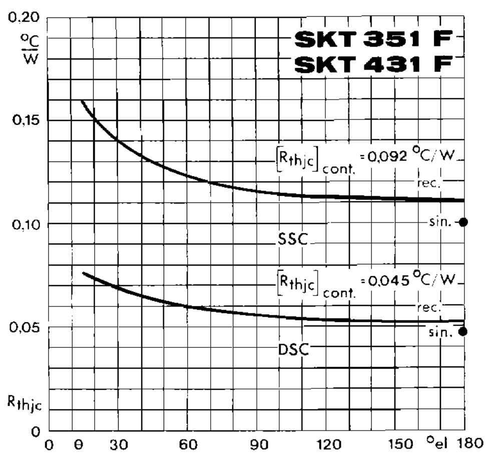


Fig. 8 Thermal resistance vs. conduction angle

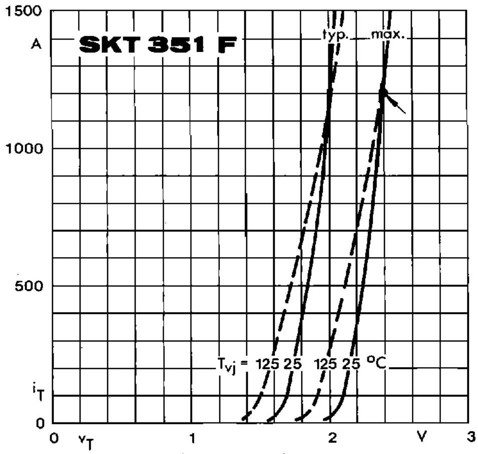


Fig. 9 a On-state characteristics

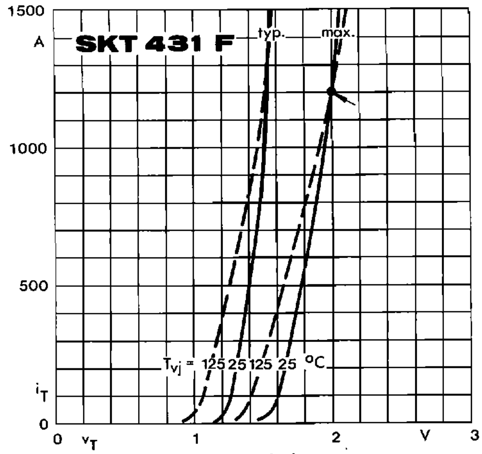
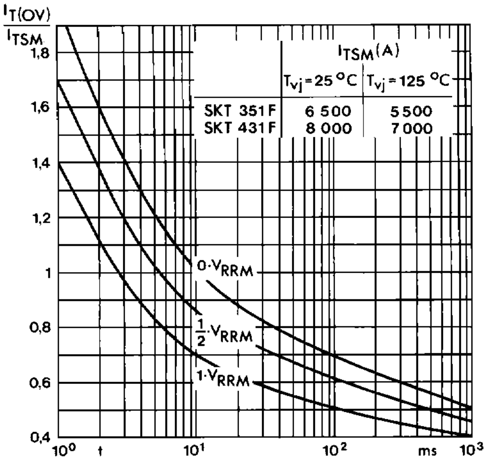


Fig. 9 b On-state characteristics



	I_{TSM} (A)	
	T_{vj} = 25 °C	T_{vj} = 125 °C
SKT 351 F	6 500	5 500
SKT 431 F	8 000	7 000

Fig. 10 Surge overload current vs. time

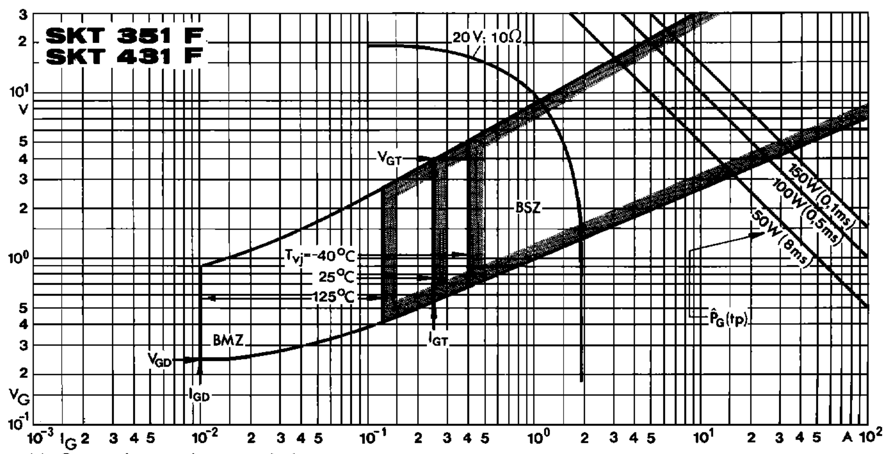


Fig. 11 Gate trigger characteristics