

# 2SK2577(Tentative)

## Silicon N-Channel Power F-MOS

### ■ Features

- Avalanche energy capability guaranteed
- High-speed switching
- Low ON-resistance
- No secondary breakdown
- Low-voltage drive

### ■ Applications

- Non-contact relay
- Solenoid drive
- Motor drive
- Control equipment
- Switching mode regulator

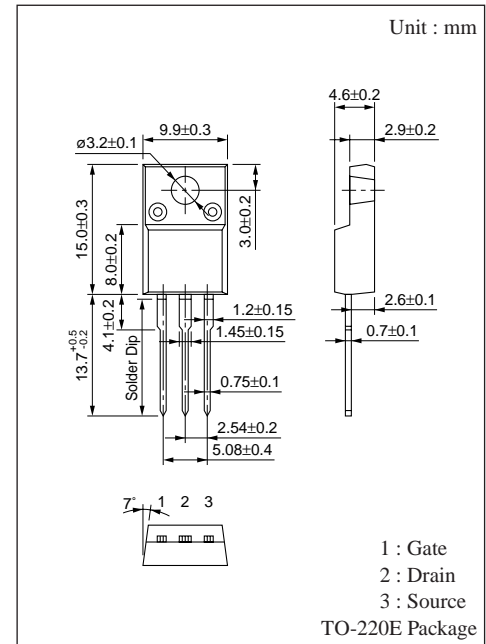
### ■ Absolute Maximum Ratings (T<sub>c</sub> = 25°C)

Parameter	Symbol	Rating	Unit	
Drain-Source breakdown voltage	V <sub>DSS</sub>	100	V	
Gate-Source voltage	V <sub>GSS</sub>	±20	V	
Drain current	DC	I <sub>D</sub>	±30	A
	Pulse	I <sub>DP</sub>	±60	A
Avalanche energy capability	EAS*	20	mJ	
Allowable power dissipation	T <sub>c</sub> = 25°C	P <sub>D</sub>	45	W
	T <sub>a</sub> = 25°C		2	
Channel temperature	T <sub>ch</sub>	150	°C	
Storage temperature	T <sub>stg</sub>	-55 to +150	°C	

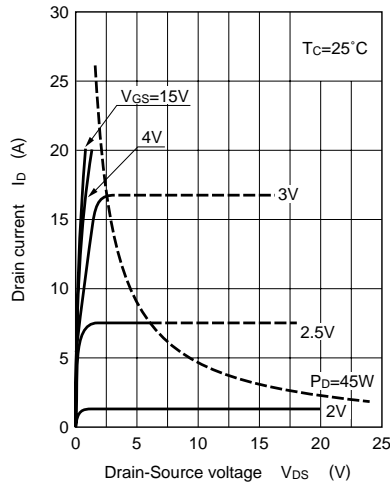
\* L= 0.1mH, I<sub>L</sub>= 20A, 1 pulse

### ■ Electrical Characteristics (T<sub>c</sub> = 25°C)

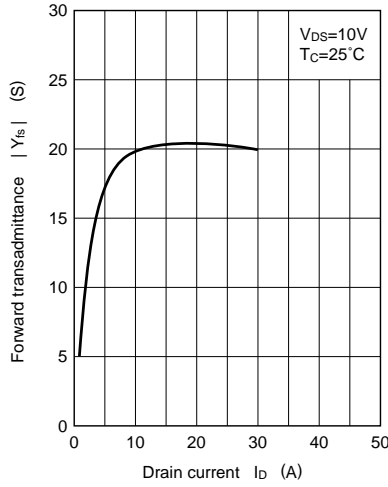
Parameter	Symbol	Condition	Min	Typ	Max	Unit
Drain-Source cut-off current	I <sub>DSS</sub>	V <sub>DS</sub> = 80V, V <sub>GS</sub> = 0			10	μA
Gate-Source leakage current	I <sub>GSS</sub>	V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0			±1	μA
Drain-Source breakdown voltage	V <sub>DSS</sub>	I <sub>D</sub> =1mA, V <sub>GS</sub> = 0	100			V
Gate threshold voltage	V <sub>th</sub>	V <sub>DS</sub> =10V, I <sub>D</sub> =1mA	1		2.5	V
Drain-Source ON-resistance	R <sub>DS(on)1</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =15A		48	70	mΩ
	R <sub>DS(on)2</sub>	V <sub>GS</sub> = 4V, I <sub>D</sub> =10A		56	85	mΩ
Forward transadmittance	Y <sub>fs</sub>	V <sub>DS</sub> =10V, I <sub>D</sub> =15A	12	20		S
Diode forward voltage	V <sub>DSF</sub>	I <sub>DR</sub> = 30A, V <sub>GS</sub> = 0			-1.7	V
Input capacitance	C <sub>iss</sub>	V <sub>DS</sub> =10V, V <sub>GS</sub> = 0, f=1MHz		3350		pF
Output capacitance	C <sub>oss</sub>			800		pF
Feedback capacitance	C <sub>rss</sub>			230		pF
Turn-on time	t <sub>on</sub>	V <sub>DD</sub> = 30V, I <sub>D</sub> =15A V <sub>GS</sub> =10V, R <sub>L</sub> =2Ω		130		ns
Fall time	t <sub>f</sub>			190		ns
Turn-off time (delay time)	t <sub>d(off)</sub>			700		ns
Channel-Case heat resistance	R <sub>th(ch-c)</sub>				2.78	°C/W
Channel-Atmosphere heat resistance	R <sub>th(ch-a)</sub>				62.5	°C/W



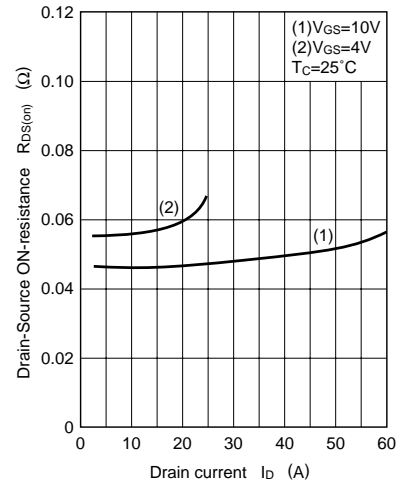
$I_D - V_{DS}$



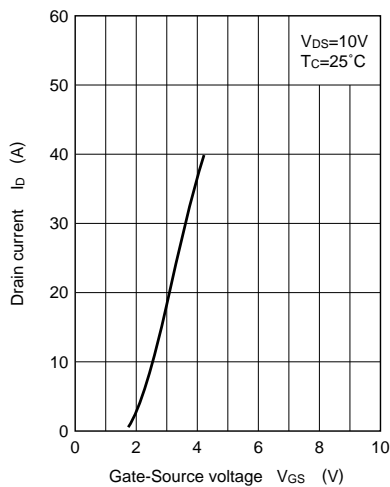
$|Y_{fs}| - I_D$



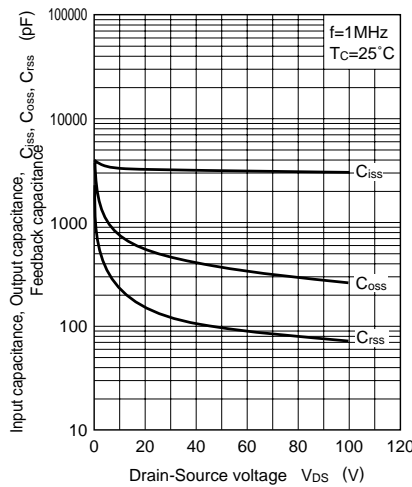
$R_{DS(on)} - I_D$



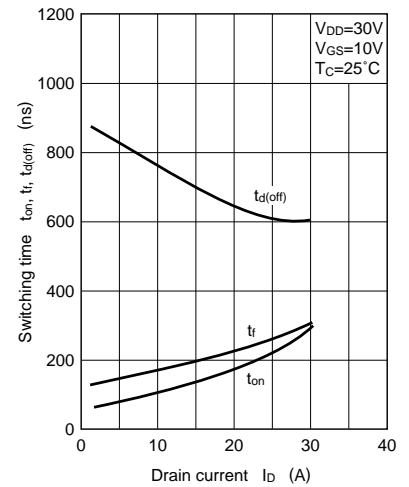
$I_D - V_{GS}$



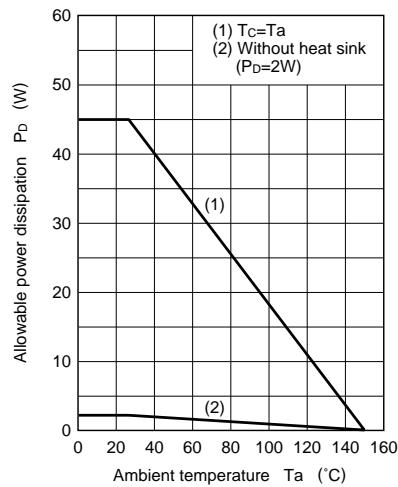
$C_{iss}, C_{oss}, C_{rss} - V_{DS}$



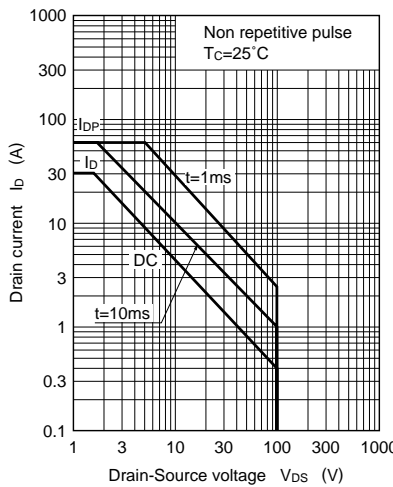
$t_{on}, t_r, t_f, t_{d(off)} - I_D$



$P_D - T_a$



Area of safe operation (ASO)



$R_{DS(on)} - I_D$

