

# 2SK2377

## 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

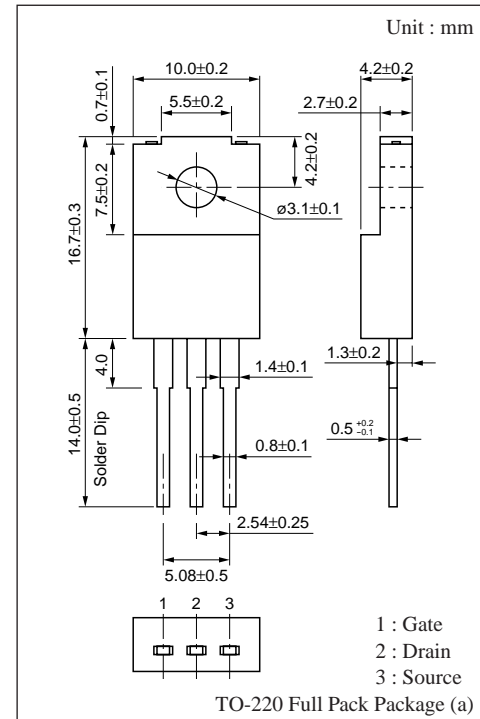
### ■ Absolute Maximum Ratings (T<sub>c</sub> = 25°C)

Parameter	Symbol	Rating	Unit	
Drain-Source breakdown voltage	V <sub>DSS</sub>	170	V	
Gate-Source voltage	V <sub>GS</sub>	±20	V	
Drain current	DC	I <sub>D</sub>	±20	A
	Pulse	I <sub>DP</sub>	±40	A
Avalanche energy capability	EAS*	200	mJ	
Allowable power dissipation	T <sub>c</sub> = 25°C	P <sub>D</sub>	50	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	

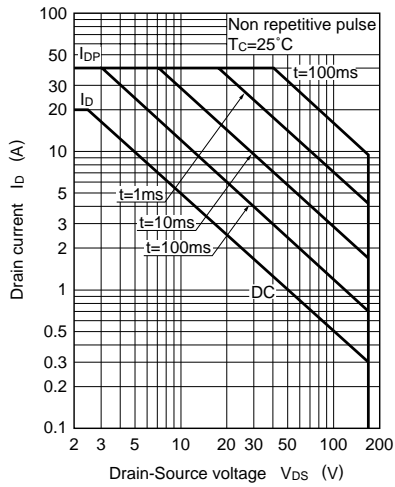
\* L=1mH, I<sub>L</sub>= 20A, 1 pulse

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

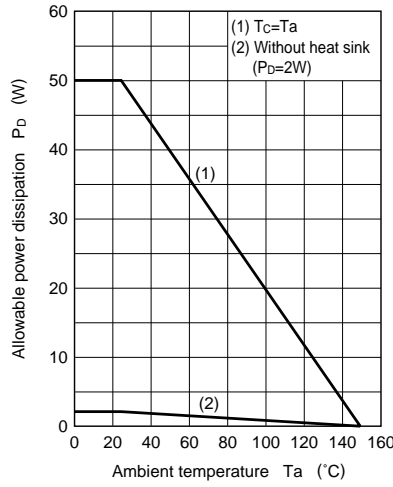
Parameter	Symbol	Condition	Min	Typ	Max	Unit
Drain-Source cut-off current	I <sub>DSS</sub>	V <sub>DS</sub> =140V, V <sub>GS</sub> = 0			10	μA
Gate-Source leakage current	I <sub>GS</sub>	V <sub>GS</sub> =±20V, V <sub>DS</sub> = 0			±1	μA
Drain-Source breakdown voltage	V <sub>DSS</sub>	I <sub>D</sub> =1mA, V <sub>GS</sub> = 0	170			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> =10A		95	145	mΩ
	R <sub>DS(on)2</sub>	V <sub>GS</sub> = 4V, I <sub>D</sub> =10A		105	160	mΩ
Forward transadmittance	Y <sub>fs</sub>	V <sub>DS</sub> =10V, I <sub>D</sub> =10A	10	17		S
Diode forward voltage	V <sub>DSF</sub>	I <sub>DR</sub> =20A, V <sub>GS</sub> = 0			-1.6	V
Input capacitance	C <sub>iss</sub>	V <sub>DS</sub> =10V, V <sub>GS</sub> = 0, f=1MHz		1650		pF
Output capacitance	C <sub>oss</sub>			400		pF
Feedback capacitance	C <sub>rss</sub>			130		pF
Turn-on time (delay time)	t <sub>d(on)</sub>			10		ns
Rise time	t <sub>r</sub>	V <sub>DD</sub> =100V, I <sub>D</sub> =10A		60		ns
Fall time	t <sub>f</sub>	V <sub>GS</sub> =10V, R <sub>L</sub> =10Ω		280		ns
Turn-off time (delay time)	t <sub>d(off)</sub>			1500		ns
Channel-Case heat resistance	R <sub>th(ch-c)</sub>				2.5	°C/W
Channel-Atmosphere heat resistance	R <sub>th(ch-a)</sub>				62.5	°C/W



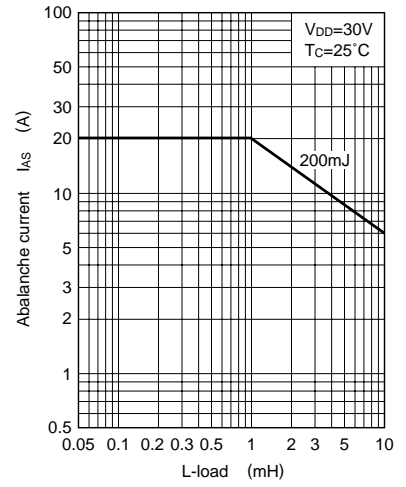
Area of safe operation (ASO)



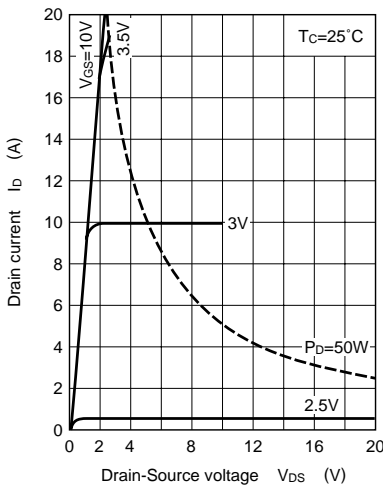
$P_D - T_a$



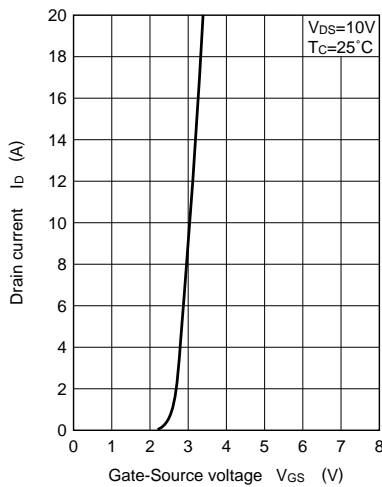
IAS - L-load



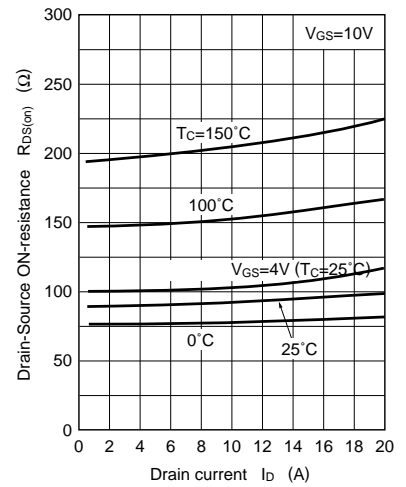
$I_D - V_{DS}$



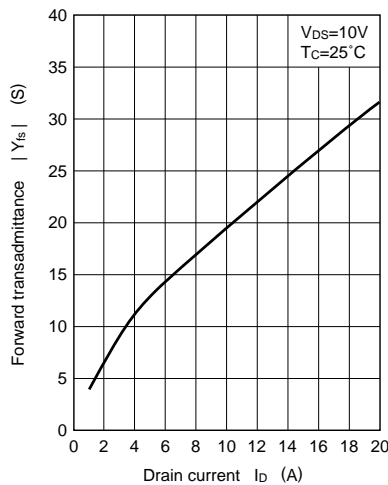
$I_D - V_{GS}$



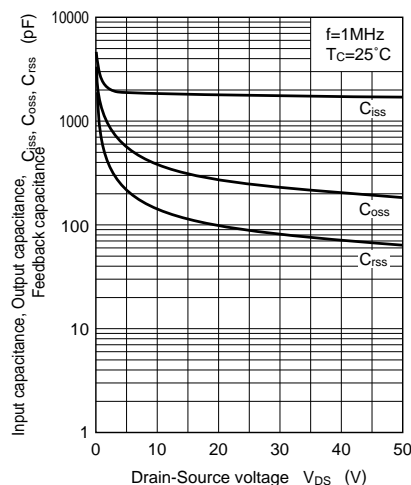
$R_{DS(on)} - I_D$



$|Y_{fs}| - I_D$



$C - V_{DS}$



$I_{GSS} - T_a$

