

# 2SK2538

## Silicon N-Channel Power F-MOS

### ■ Features

- Avalanche energy capability guaranteed
- High-speed switching
- No secondary breakdown

### ■ Applications

- High-speed switching (switching mode regulator)
- For high-frequency power amplification

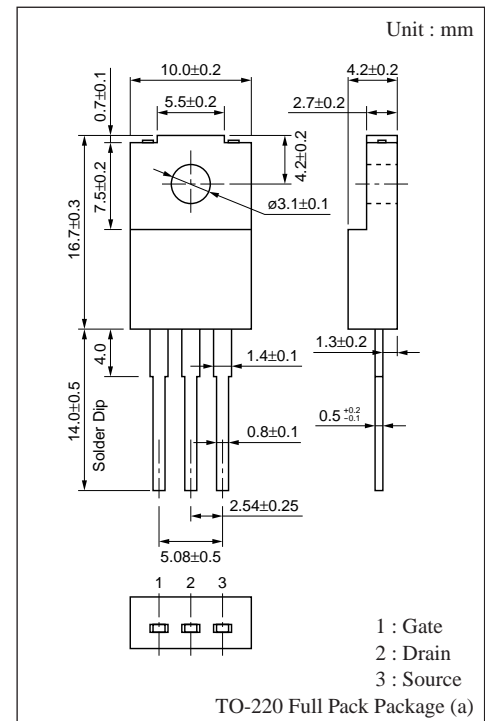
### ■ Absolute Maximum Ratings (T<sub>c</sub> = 25°C)

Parameter	Symbol	Rating	Unit	
Drain-Source breakdown voltage	V <sub>DSS</sub>	250	V	
Gate-Source voltage	V <sub>GS</sub>	±30	V	
Drain current	DC	I <sub>D</sub>	±2	A
	Pulse	I <sub>DP</sub>	±4	A
Avalanche energy capability	EAS*	10	mJ	
Allowable power dissipation	T <sub>C</sub> = 25°C	P <sub>D</sub>	30	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	

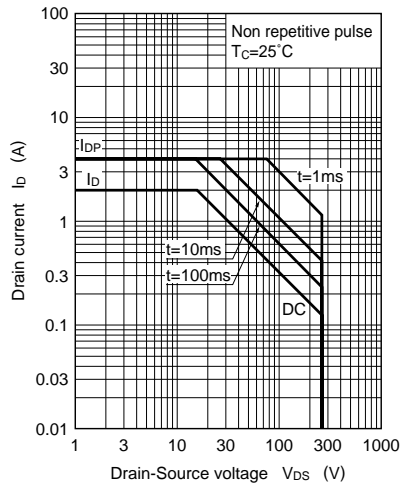
\* L= 5mH, I<sub>L</sub>= 2A, V<sub>DD</sub>= 30V, 1 pulse

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

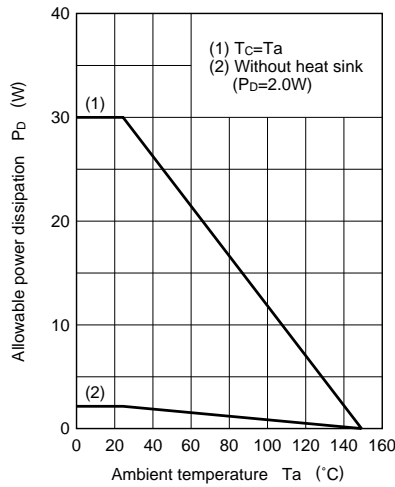
Parameter	Symbol	Condition	Min	Typ	Max	Unit
Drain-Source cut-off current	I <sub>DSS</sub>	V <sub>DS</sub> = 200V, V <sub>GS</sub> = 0			100	μA
Gate-Source leakage current	I <sub>GS</sub>	V <sub>GS</sub> =±30V, V <sub>DS</sub> = 0			±1	μA
Drain-Source breakdown voltage	V <sub>DSS</sub>	I <sub>D</sub> =1mA, V <sub>GS</sub> = 0	250			V
Gate threshold voltage	V <sub>th</sub>	V <sub>DS</sub> =10V, I <sub>D</sub> =1mA	1		5	V
Drain-Source ON-resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =1A		1.2	2	Ω
Forward transadmittance	Y <sub>fs</sub>	V <sub>DS</sub> = 25V, I <sub>D</sub> =1A	0.5	1		S
Diode forward voltage	V <sub>DSF</sub>	I <sub>DR</sub> = 2A, 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		220		pF
Output capacitance	C <sub>oss</sub>			60		pF
Feedback capacitance	C <sub>rss</sub>			20		pF
Turn-on time (delay time)	t <sub>d(on)</sub>	V <sub>DD</sub> = 200V, I <sub>D</sub> = 2A V <sub>GS</sub> =10V, R <sub>L</sub> =100Ω		10		ns
Rise time	t <sub>r</sub>			20		ns
Fall time	t <sub>f</sub>			45		ns
Turn-off time (delay time)	t <sub>d(off)</sub>			90		ns
Channel-Case heat resistance	R <sub>th(ch-c)</sub>				4.17	°C/W
Channel-Atmosphere heat resistance	R <sub>th(ch-a)</sub>				62.5	°C/W



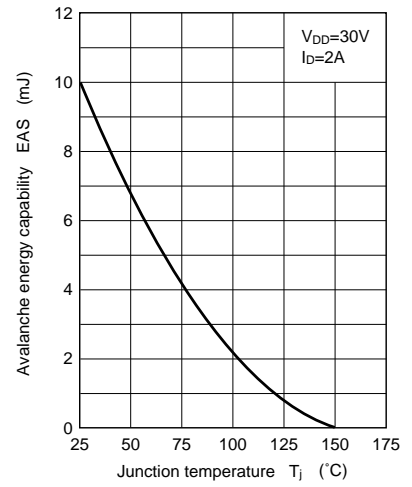
Area of safe operation (ASO)



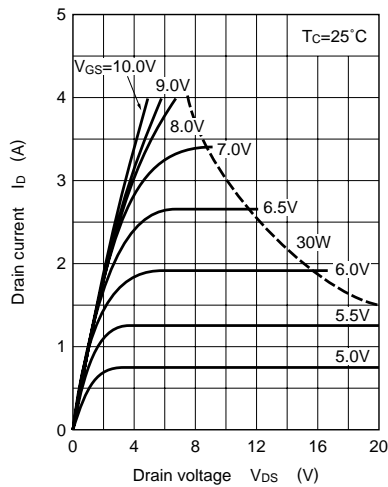
$P_D - T_a$



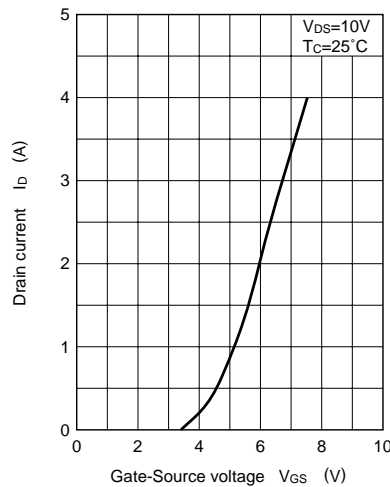
$EAS - T_j$



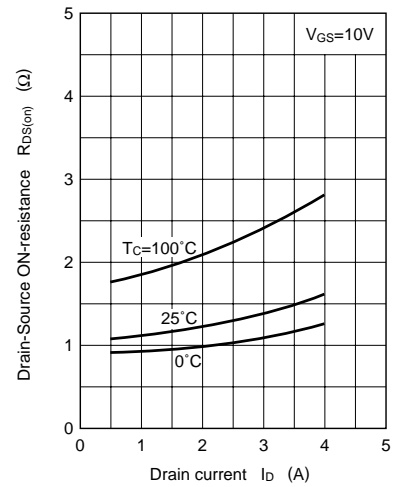
$I_D - V_{DS}$



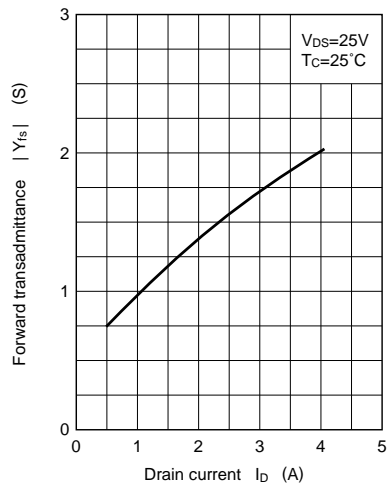
$I_D - V_{GS}$



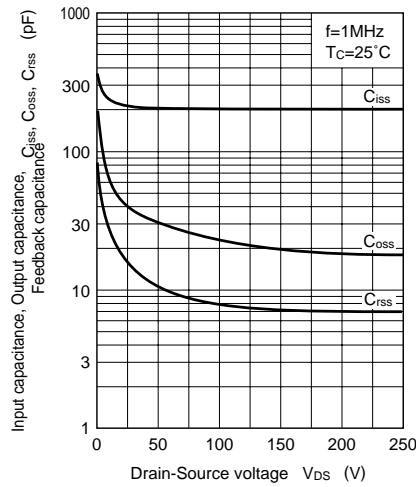
$R_{DS(on)} - I_D$



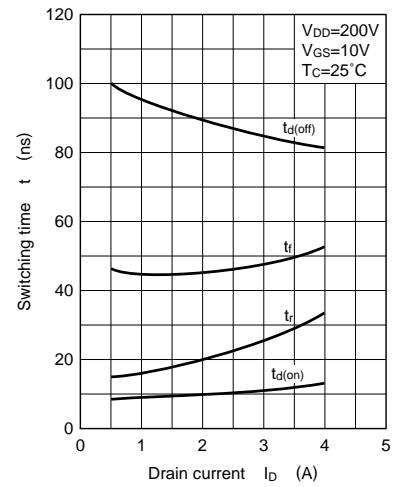
$|Y_{fs}| - I_D$



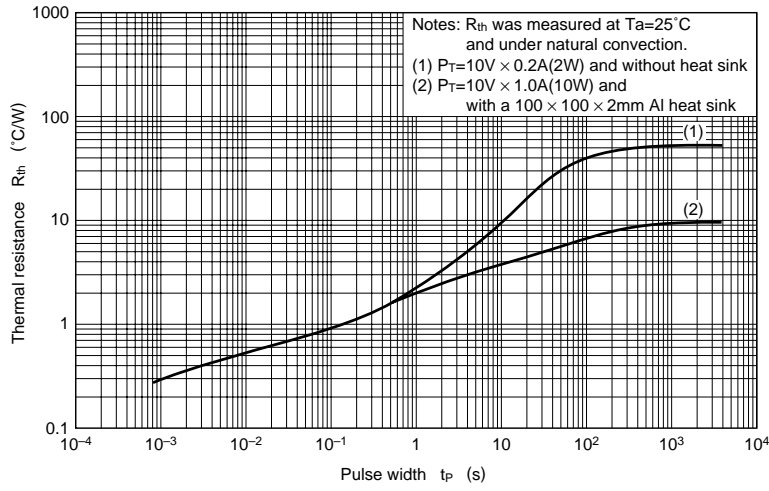
$C_{iss}, C_{oss}, C_{rss} - V_{DS}$



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



$R_{th} - t_p$



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