

# 2SK2659

## Silicon N-Channel Power F-MOS

### ■ Features

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

### ■ Applications

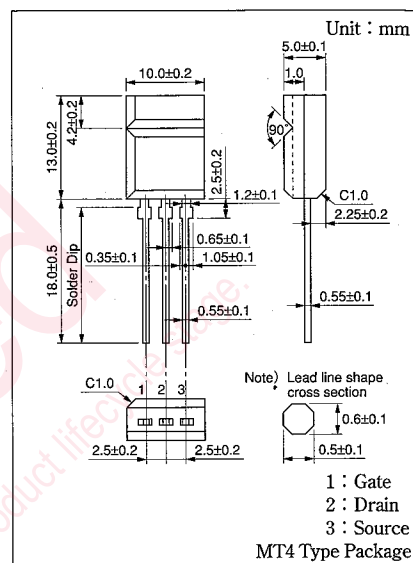
- Non-contact relay
- Solenoid drive
- Motor drive
- Control equipment
- Switching mode regulator

### ■ Absolute Maximum Ratings ( $T_C=25^\circ\text{C}$ )

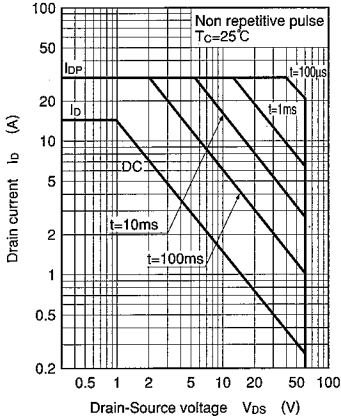
Parameter	Symbol	Rating	Unit
Drain-Source breakdown voltage	$V_{DSS}$	60	V
Gate-Source voltage	$V_{GSS}$	$\pm 20$	V
Drain current	DC	$I_D$	$\pm 15$ A
	Pulse	$I_{DP}$	$\pm 30$ A
Allowable power dissipation	$T_C=25^\circ\text{C}$	$P_D$	15 W
	$T_a=25^\circ\text{C}$		2 W
Channel temperature	$T_{ch}$	150	$^\circ\text{C}$
Storage temperature	$T_{stg}$	-55 to +150	$^\circ\text{C}$

### ■ Electrical Characteristics ( $T_C=25^\circ\text{C}$ )

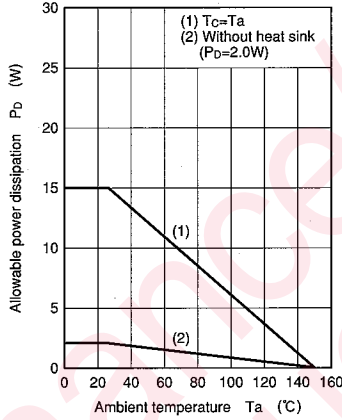
Parameter	Symbol	Condition	Min	Typ	Max	Unit
Drain-Source cut-off current	$I_{DSS}$	$V_{DS}=40\text{V}, V_{GS}=0$			10	$\mu\text{A}$
Gate-Source leakage current	$I_{GSS}$	$V_{GS}=\pm 20\text{V}, V_{DS}=0$			$\pm 1$	$\mu\text{A}$
Drain-Source breakdown voltage	$V_{DSS}$	$I_D=1\text{mA}, V_{GS}=0$	60			V
Gate threshold voltage	$V_{th}$	$V_{DS}=10\text{V}, I_D=1\text{mA}$	1		2.5	V
Drain-Source ON-resistance	$R_{DS(on)1}$	$V_{GS}=10\text{V}, I_D=10\text{A}$		45	70	$\text{m}\Omega$
	$R_{DS(on)2}$	$V_{GS}=4\text{V}, I_D=6\text{A}$		65	100	$\text{m}\Omega$
Forward transadmittance	$ Y_{fs} $	$V_{DS}=10\text{V}, I_D=10\text{A}$	8	13		S
Diode forward voltage	$V_{DSF}$	$I_{DR}=10\text{A}, V_{GS}=0$			-1.7	V
Input capacitance	$C_{iss}$	$V_{DS}=10\text{V}, V_{GS}=0, f=1\text{MHz}$		1550		pF
Output capacitance	$C_{oss}$			680		pF
Feedback capacitance	$C_{rss}$			300		pF
Turn-on time	$t_{on}$		$V_{DD}=30\text{V}, I_D=10\text{A}$ $V_{GS}=10\text{V}, R_L=3\Omega$		90	
Fall time	$t_f$			180		ns
Turn-off time (delay time)	$t_{d(off)}$			360		ns
Channel-Case heat resistance	$R_{th(ch-c)}$				8.33	$^\circ\text{C}/\text{W}$
Channel-Atmosphere heat resistance	$R_{th(ch-a)}$				62.5	$^\circ\text{C}/\text{W}$



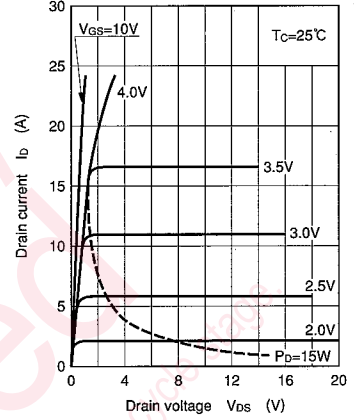
Area of safe operation (ASO)



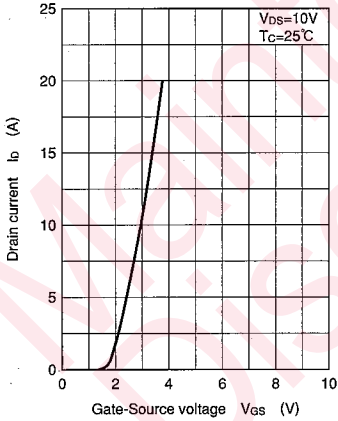
$P_D - T_a$



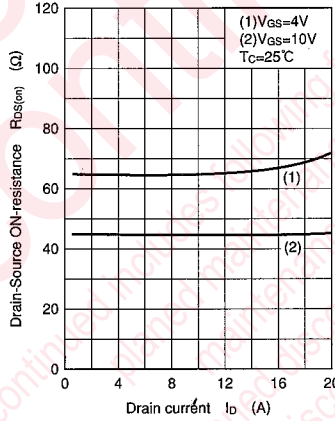
$I_D - V_{DS}$



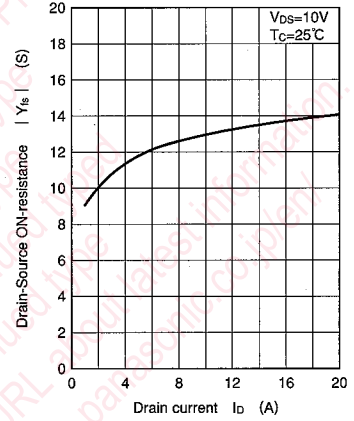
$I_D - V_{GS}$



$R_{DS(on)} - I_D$

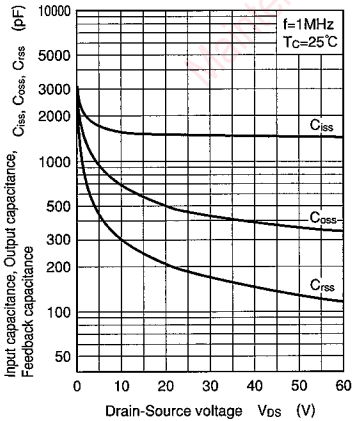


$|Y_{fs}| - I_D$

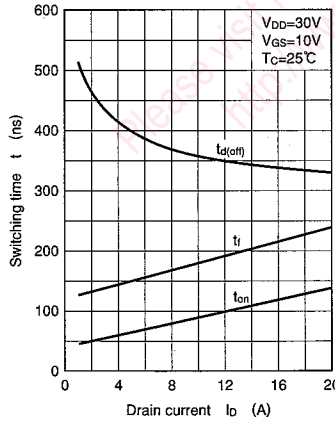


Power F-MOS FET

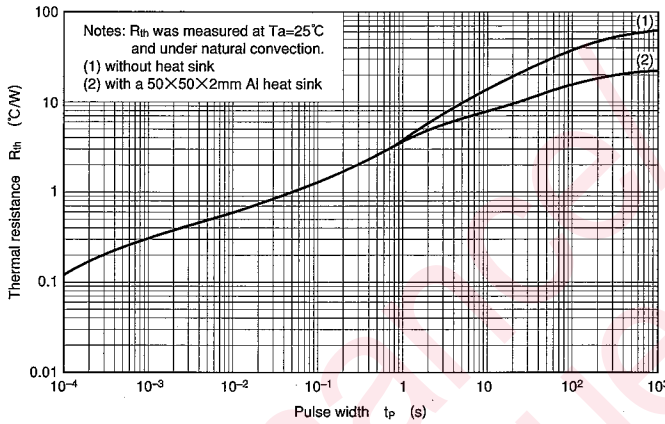
$C_{iss}, C_{oss}, C_{rss} - V_{DS}$



$t - I_D$



$R_{th-t}$



Maintenance/Discontinued includes following four Product lifecycle stage.  
 Discontinued type  
 planned maintenance type  
 maintenance type  
 planned discontinued type  
 discontinued type  
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