

# 2SK2642-01MR

FUJI POWER MOS-FET

## N-CHANNEL SILICON POWER MOS-FET

### ■ Features

- High speed switching
- Low on-resistance
- No secondary breakdown
- Low driving power
- High voltage
- V<sub>GS</sub>=±35V Guarantee
- Avalanche-proof

### ■ Applications

- Switching regulators
- UPS
- DC-DC converters
- General purpose power amplifier

### ■ Maximum ratings and characteristic Absolute maximum ratings

● (T<sub>c</sub>=25°C unless otherwise specified)

Item	Symbol	Rating	Unit
Drain-source voltage	V <sub>DS</sub>	500	V
Continuous drain current	I <sub>D</sub>	±15	A
Pulsed drain current	I <sub>D(puls)</sub>	±60	A
Gate-source voltage	V <sub>GS</sub>	±35	V
Maximum Avalanche Energy	E <sub>AV*1</sub>	88.7	mJ
Max. power dissipation	P <sub>D</sub>	50	W
Operating and storage temperature range	T <sub>ch</sub> T <sub>stg</sub>	+150 -55 to +150	°C

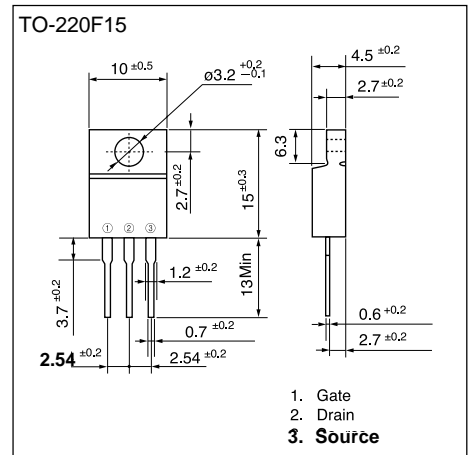
\*1 L=0.72mH, V<sub>cc</sub>=50V

### ● Electrical characteristics (T<sub>c</sub> =25°C unless otherwise specified)

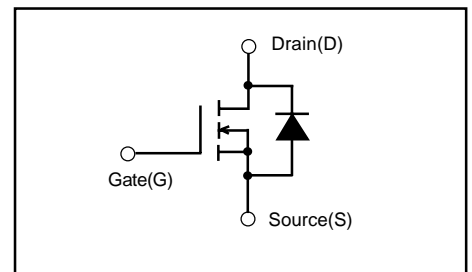
Item	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Drain-source breakdown voltage	V <sub>(BR)DSS</sub>	I <sub>D</sub> =1mA V <sub>GS</sub> =0V	500			V
Gate threshold voltage	V <sub>GS(th)</sub>	I <sub>D</sub> =1mA V <sub>DS</sub> =V <sub>GS</sub>	3.5	4.0	4.5	V
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> =500V V <sub>GS</sub> =0V		10	500	μA
		V <sub>GS</sub> =0V		0.2	1.0	mA
Gate-source leakage current	I <sub>GSS</sub>	V <sub>GS</sub> =±35V V <sub>DS</sub> =0V		10	100	nA
Drain-source on-state resistance	R <sub>DS(on)</sub>	I <sub>D</sub> =7.5A V <sub>GS</sub> =10V		0.44	0.55	Ω
Forward transconductance	g <sub>fs</sub>	I <sub>D</sub> =7.5A V <sub>DS</sub> =25V	4.5	9.0		S
Input capacitance	C <sub>iss</sub>	V <sub>DS</sub> =25V		1400	2100	pF
Output capacitance	C <sub>oss</sub>	V <sub>GS</sub> =0V		250	380	
Reverse transfer capacitance	C <sub>rss</sub>	f=1MHz		110	170	
Turn-on time t <sub>on</sub>	td(on)	V <sub>CC</sub> =300V I <sub>D</sub> =15A		30	50	ns
	t <sub>r</sub>	V <sub>GS</sub> =10V		110	170	
Turn-off time t <sub>off</sub>	td(off)	R <sub>GS</sub> =10 Ω		90	140	
	t <sub>f</sub>			55	90	
Avalanche capability	I <sub>AV</sub>	L=100μH T <sub>ch</sub> =25°C	15			A
Diode forward on-voltage	V <sub>SD</sub>	I <sub>F</sub> =2I <sub>D</sub> V <sub>GS</sub> =0V T <sub>ch</sub> =25°C		1.1	1.65	V
Reverse recovery time	t <sub>rr</sub>	I <sub>F</sub> =I <sub>D</sub> V <sub>GS</sub> =0V		500		ns
Reverse recovery charge	Q <sub>rr</sub>	-di/dt=100A/μs T <sub>ch</sub> =25°C		8.0		μC

### ● Thermal characteristics

Item	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Thermal resistance	R <sub>th(ch-c)</sub>	channel to case			2.50	°C/W
	R <sub>th(ch-a)</sub>	channel to ambient			62.5	°C/W

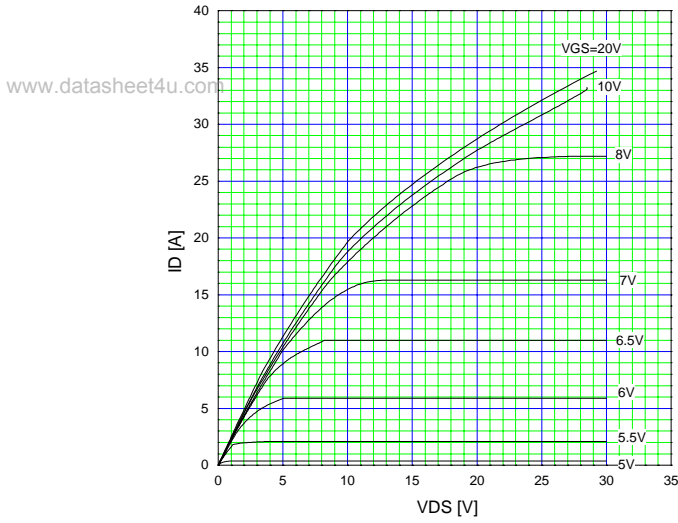


### ■ Equivalent circuit schematic

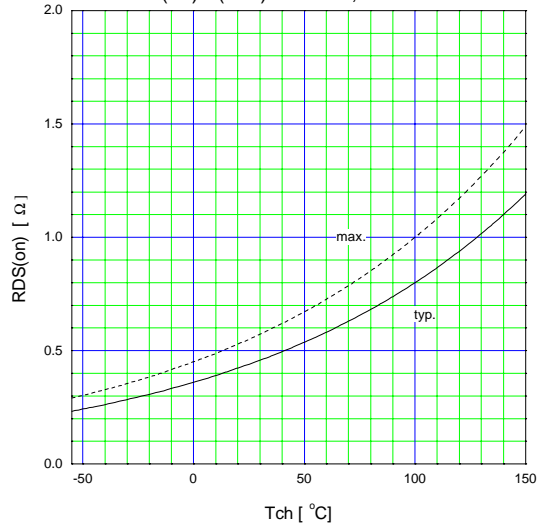


Characteristics

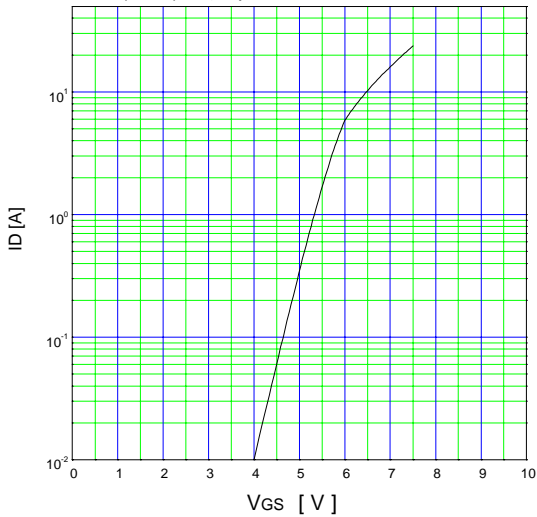
Typical output characteristics  
 $I_D=f(V_{DS})$ :80 $\mu$ s pulse test,  $T_c=25^\circ\text{C}$



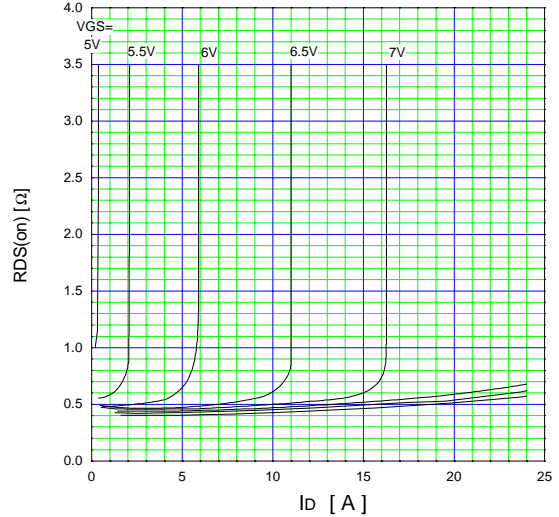
Drain-source on-state resistance  
 $R_{DS(on)}=f(T_{ch})$ : $I_D=7.5\text{A}$ ,  $V_{GS}=10\text{V}$



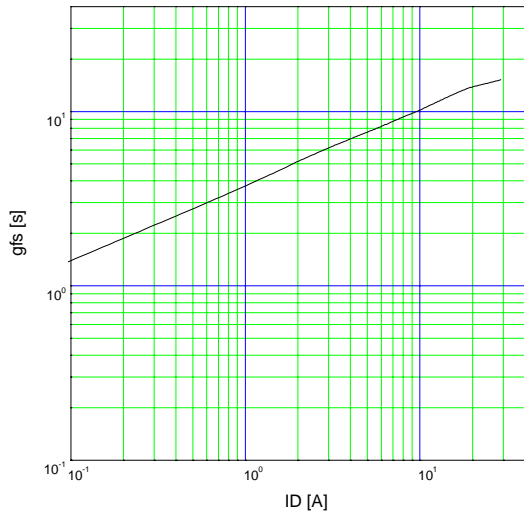
Typical transfer characteristic  
 $I_D=f(V_{GS})$ :80 $\mu$ s pulse test,  $V_{DS}=25\text{V}$ ,  $T_{ch}=25^\circ\text{C}$



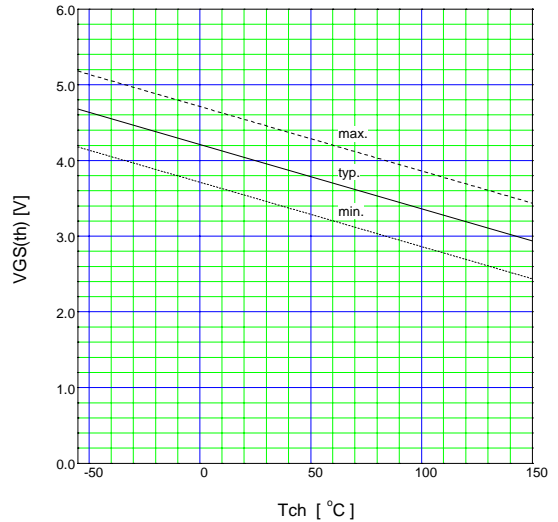
Typical drain-source on-state resistance  
 $R_{DS(on)}=f(I_D)$ :80 $\mu$ s pulse test,  $T_c=25^\circ\text{C}$



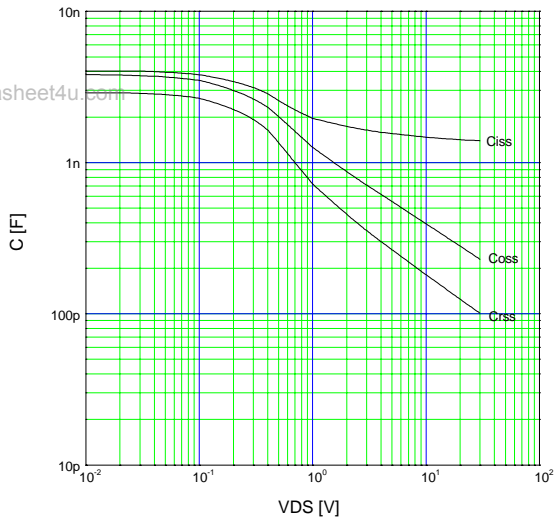
Typical forward transconductance  
 $g_{fs}=f(I_D)$ :80 $\mu$ s pulse test,  $V_{DS}=25\text{V}$ ,  $T_{ch}=25^\circ\text{C}$



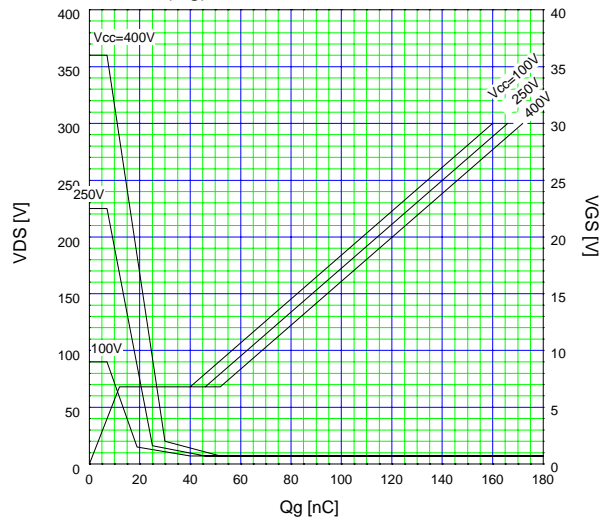
Gate threshold voltage  
 $V_{GS(th)}=f(T_{ch})$ : $I_D=1\text{mA}$ ,  $V_{DS}=V_{GS}$



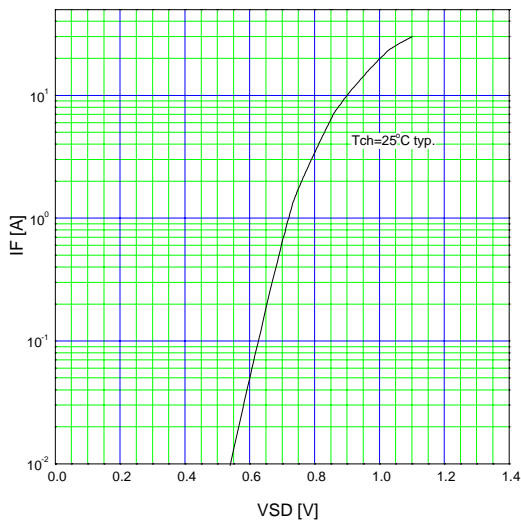
Typical capacitances  
 $C=f(V_{DS}): V_{GS}=0V, f=1MHz$



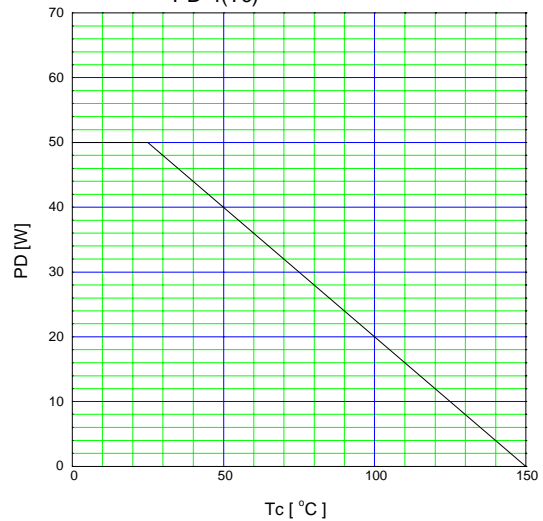
Typical gate charge characteristic  
 $V_{GS}=f(Q_g): I_D=15A, T_c=25^\circ C$



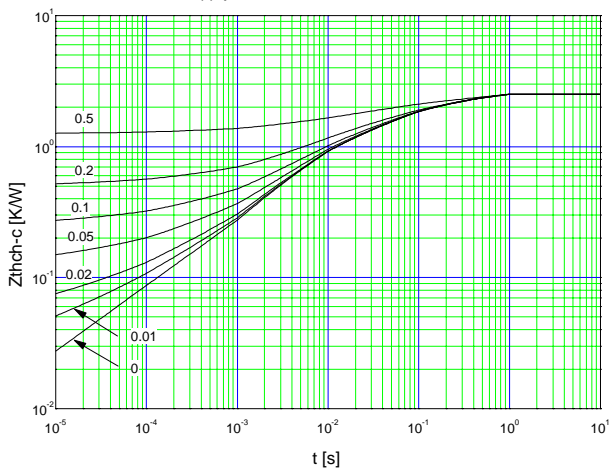
Forward characteristic of reverse of diode  
 $I_F=f(V_{SD}): 80\mu s \text{ pules test}, V_{GS}=0V$



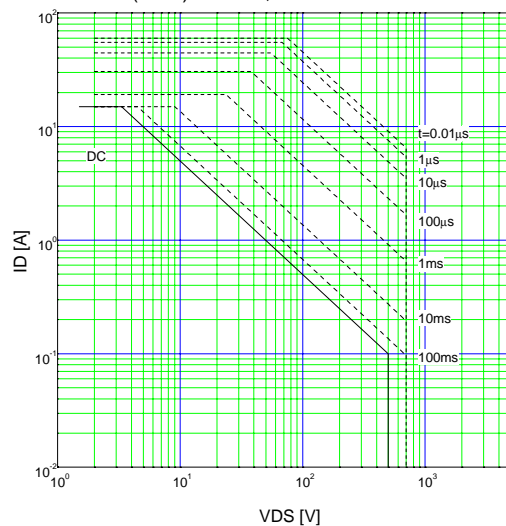
Power Dissipation  
 $PD=f(T_c)$



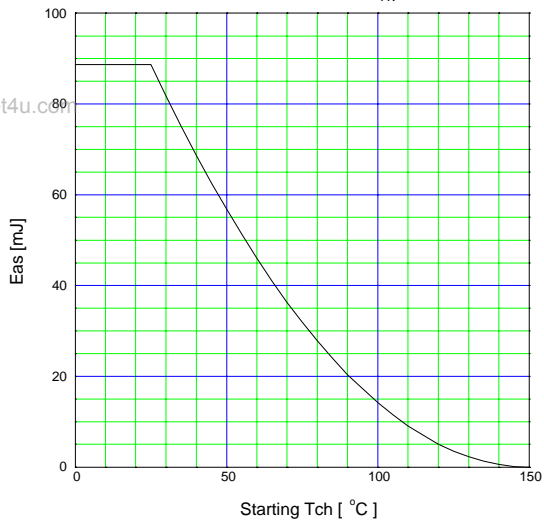
Transient thermal impedande  
 $Z_{thc}=f(t) \text{ parameter: } D=t/T$



Safe operating area  
 $I_D=f(V_{DS}): D=0.01, T_c=25^\circ C$



Avalanche energy derating  
 $E_{as}=f(\text{starting } T_{ch}): V_{cc}=50V, I_{AV}=15A$



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