

2SK2902-01MR

FUJI POWER MOS-FET

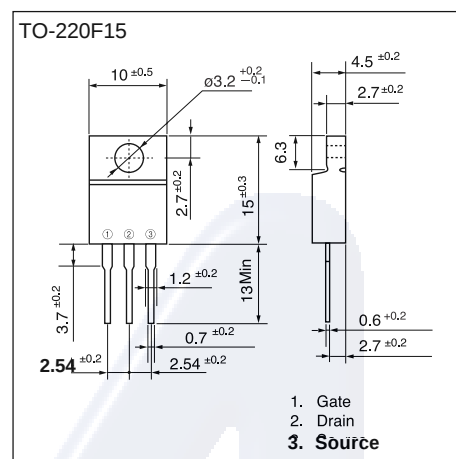
N-CHANNEL SILICON POWER MOS-FET

■ Features

- High speed switching
- Low on-resistance
- No secondary breakdown
- Low driving power
- Avalanche-proof

■ Applications

- Switching regulators
- UPS (Uninterruptible Power Supply)
- DC-DC converters



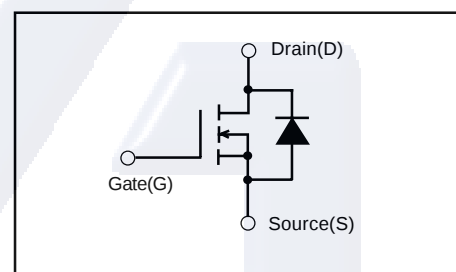
■ Maximum ratings and characteristic

● (Tc=25°C unless otherwise specified)

Item	Symbol	Rating	Unit
Drain-source voltage	V_{DS}	60	V
Continuous drain current	I_D	± 45	A
Pulsed drain current	$I_{D(puls)}$	± 180	A
Gate-source voltage	V_{GS}	± 30	V
Maximum Avalanche Energy	E_{AV}^{*1}	461.9	mJ
Max. power dissipation	P_D	40	W
Operating and storage temperature range	T_{ch}	+150	$^{\circ}C$
	T_{stg}	-55 to +150	$^{\circ}C$

*1 $L=0.304\text{mH}$, $V_{cc}=24\text{V}$

■ Equivalent circuit schematic



● Electrical characteristics (T_c =25°C unless otherwise specified)

Item	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Drain-source breakdown voltage	BV _{DSS}	I _D =1mA V _{GS} =0V	60			V
Gate threshold voltage	V _{GS(th)}	I _D =10mA V _{DS} =V _{GS}	2.5	3.0	3.5	V
Zero gate voltage drain current	I _{DSS}	V _{DS} =60V T _{ch} =25°C		10	500	μA
		V _{GS} =0V T _{ch} =125°C		0.2	1.0	mA
Gate-source leakage current	I _{GSS}	V _{GS} =±30V V _{DS} =0V		10	100	nA
Drain-source on-state resistance	R _{DS(on)}	I _D =22.5A V _{GS} =10V		12.0	14.5	mΩ
Forward transconductance	g _{fs}	I _D =22.5A V _{DS} =25V	10.0	25.0		S
Input capacitance	C _{iss}	V _{DS} =25V		2300	3450	pF
Output capacitance	C _{oss}	V _{GS} =0V		910	1370	
Reverse transfer capacitance	C _{rss}	f=1MHz		260	390	
Turn-on time t _{on}	td(on)	V _{CC} =30V I _D =45A		18	30	ns
	tr	V _{GS} =10V		55	80	
Turn-off time t _{off}	td(off)	R _G =10 Ω		70	120	
	tf			48	80	
Avalanche capability	I _{AV}	L=100 μH T _{ch} =25°C	45			A
Diode forward on-voltage	V _{SD}	I _F =45A V _{GS} =0V T _{ch} =25°C		1.0	1.5	V
Reverse recovery time	t _{rr}	I _F =45A V _{GS} =0V		60		ns
Reverse recovery charge	Q _{rr}	-di/dt=100A/μs T _{ch} =25°C		0.11		μC

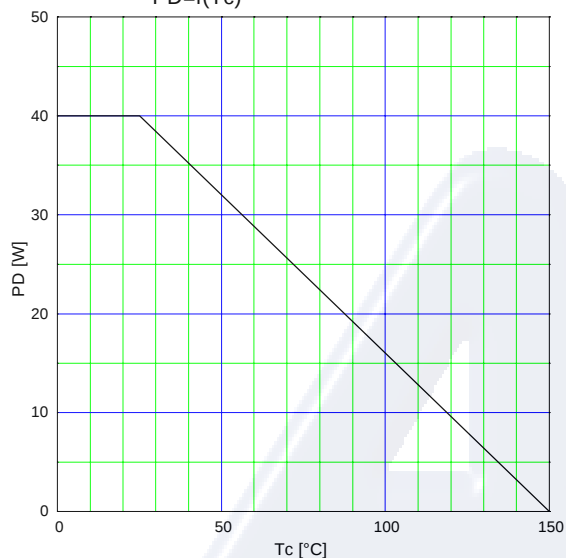
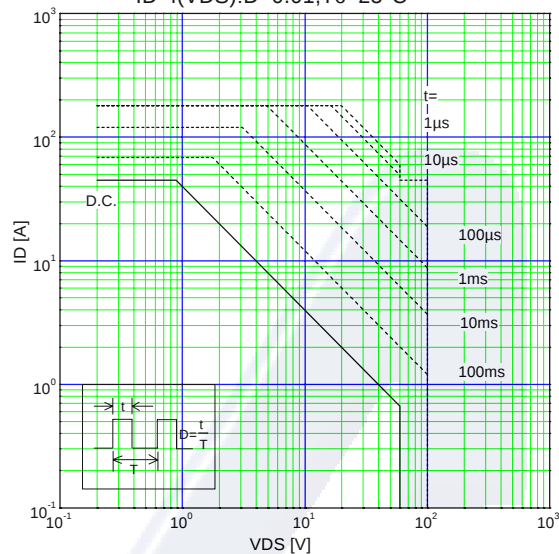
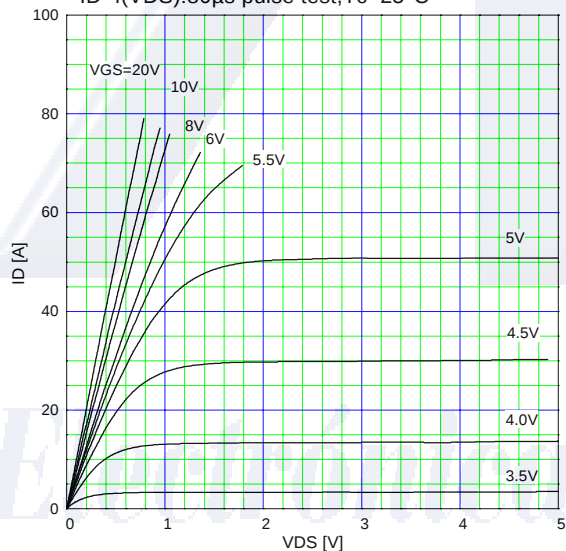
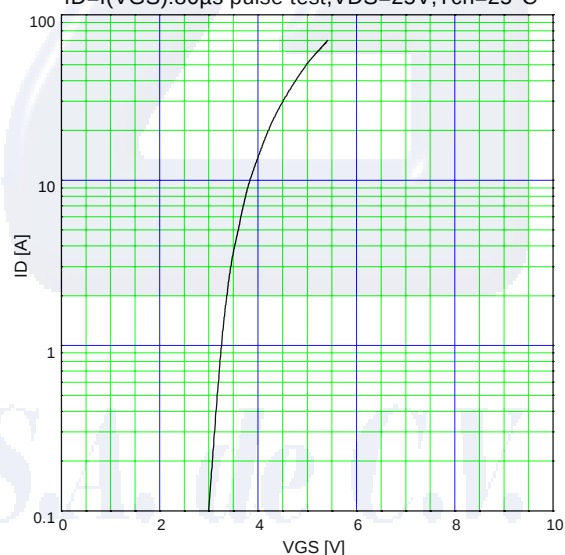
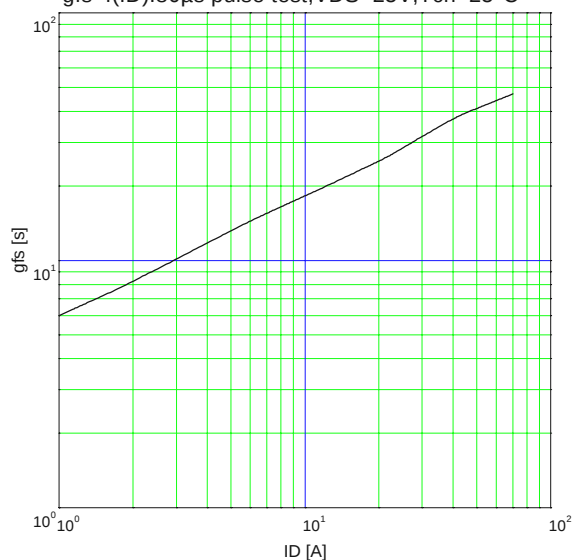
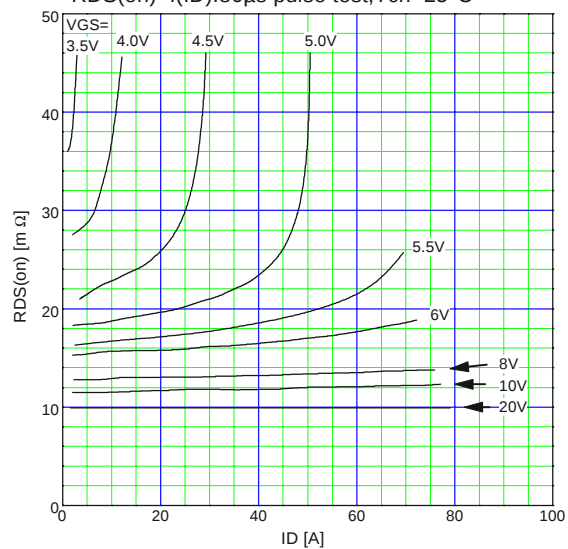
● Thermal characteristics

Item	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Thermal resistance	R _{th(ch-c)}	channel to case			3.125	°C/W
	R _{th(ch-a)}	channel to ambient			62.5	°C/W

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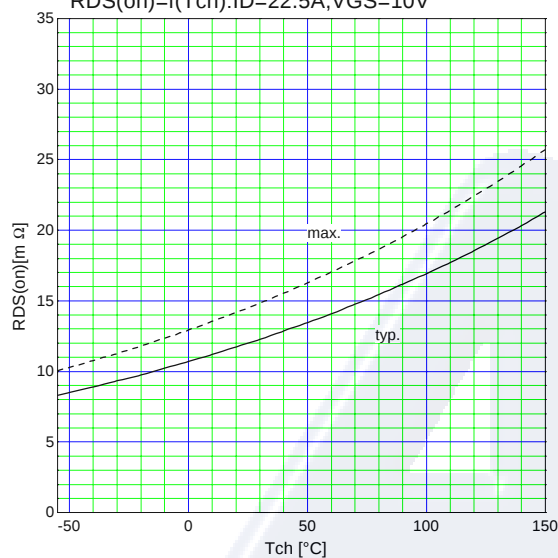
■ Characteristics

Power Dissipation
 $PD=f(T_c)$ Safe operating area
 $ID=f(V_{DS}): D=0.01, T_c=25^\circ\text{C}$ Typical output characteristics
 $ID=f(V_{DS}): 80\mu\text{s pulse test}, T_c=25^\circ\text{C}$ Typical transfer characteristics
 $ID=f(V_{GS}): 80\mu\text{s pulse test}, V_{DS}=25\text{V}, T_{ch}=25^\circ\text{C}$ Typical forward transconductance
 $g_{fs}=f(ID): 80\mu\text{s pulse test}, V_{DS}=25\text{V}, T_{ch}=25^\circ\text{C}$ Typical Drain-Source on-State Resistance
 $R_{DS(on)}=f(ID): 80\mu\text{s pulse test}, T_{ch}=25^\circ\text{C}$ 

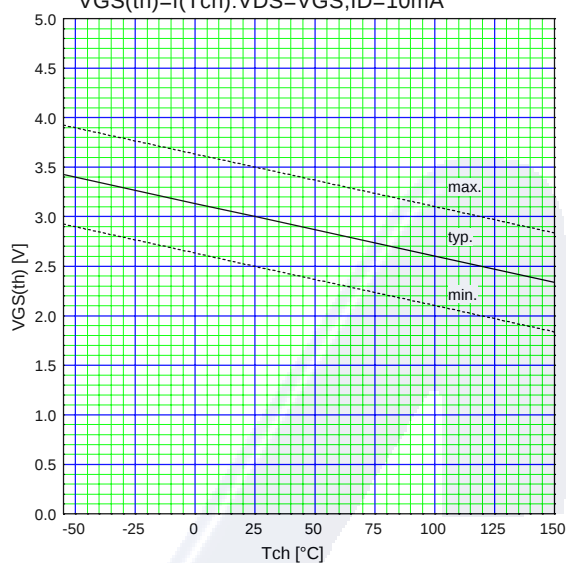
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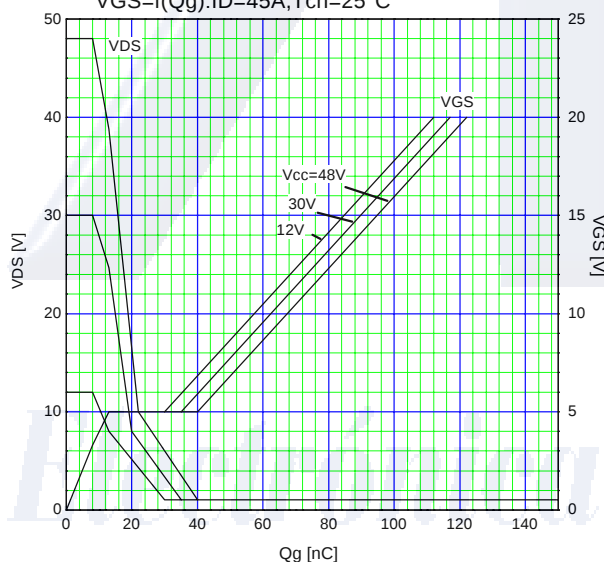
Drain-source on-state resistance
 $R_{DS(on)} = f(T_{ch}) : I_D = 22.5A, V_{GS} = 10V$



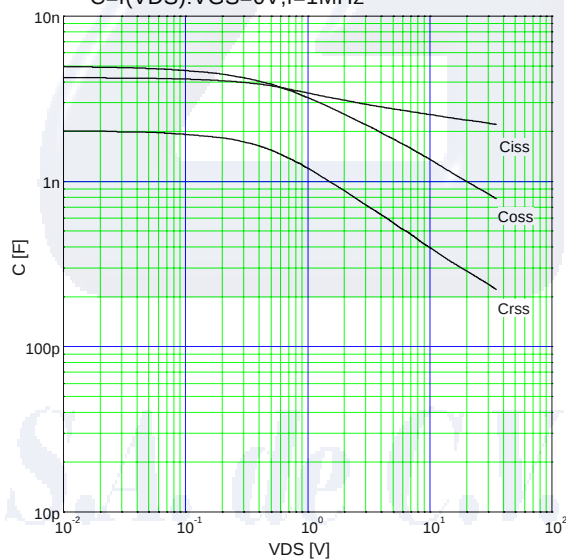
Gate Threshold Voltage vs. Tch
 $V_{GS(th)} = f(T_{ch}) : V_{DS} = V_{GS}, I_D = 10mA$



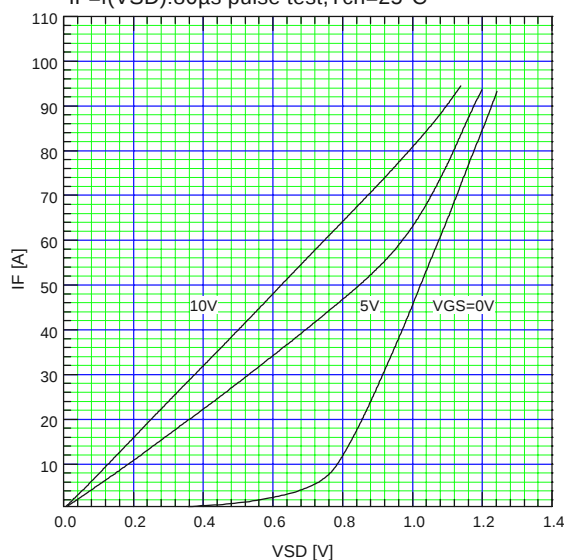
Typical Gate Charge Characteristics
 $V_{GS} = f(Q_g) : I_D = 45A, T_{ch} = 25^\circ C$



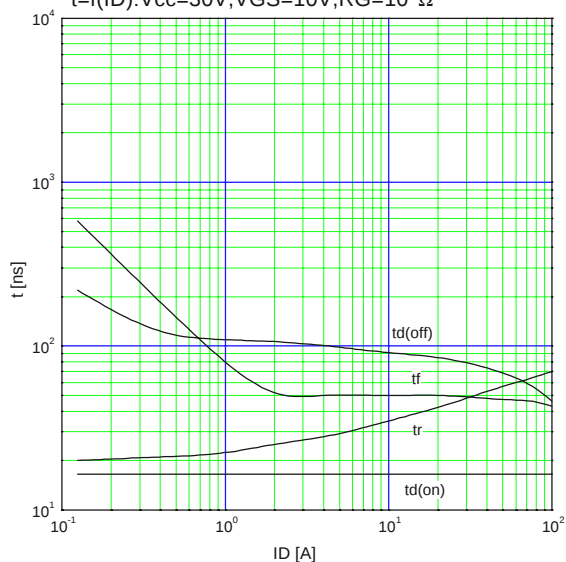
Typical capacitances
 $C = f(V_{DS}) : V_{GS} = 0V, f = 1MHz$



Typical Forward Characteristics of Reverse Diode
 $I_F = f(V_{SD}) : 80\mu s \text{ pulse test}, T_{ch} = 25^\circ C$



Typical Switching Characteristics vs. ID
 $t = f(I_D) : V_{cc} = 30V, V_{GS} = 10V, R_G = 10 \Omega$



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