

# 2SK3337-01

## 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 Absolute maximum ratings

(Tc=25°C unless otherwise specified)

Item	Symbol	Rating	Unit
Drain-source voltage	V <sub>DS</sub>	1000	V
Continuous drain current	I <sub>D</sub>	±7	A
Pulsed drain current	I <sub>D(puls)</sub>	±28	A
Gate-source voltage	V <sub>GS</sub>	±30	V
Repetitive or non-repetitive	IAR *2	7	A
Maximum Avalanche Energy	E <sub>AV</sub> *1	463	mJ
Max. power dissipation	P <sub>D</sub>	255	W
Operating and storage temperature range	T <sub>ch</sub> T <sub>stg</sub>	+150 -55 to +150	°C

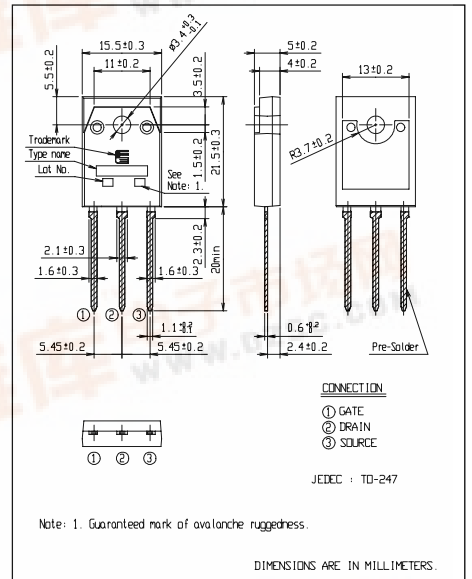
\*1 L=17.3mH, V<sub>CC</sub>=100V \*2 T<sub>ch</sub>≤150°C

#### Electrical characteristics (Tc =25°C unless otherwise specified)

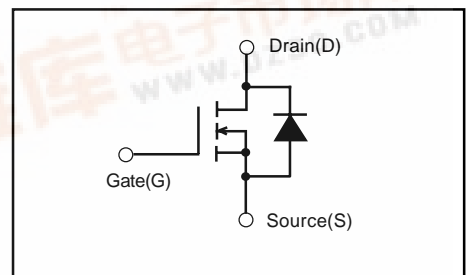
Item	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Drain-source breakdown voltage	V <sub>(BR)DSS</sub>	I <sub>D</sub> =1mA V <sub>GS</sub> =0V	100			V
Gate threshold voltage	V <sub>GS(th)</sub>	I <sub>D</sub> =1mA V <sub>DS</sub> =V <sub>GS</sub>	2.5	3.0	3.5	V
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> =1000V V <sub>GS</sub> =0V	T <sub>ch</sub> =25°C	10	500	μA
			T <sub>ch</sub> =125°C	0.2	1.0	mA
Gate-source leakage current	I <sub>GSS</sub>	V <sub>GS</sub> =±30V V <sub>DS</sub> =0V		10	100	nA
Drain-source on-state resistance	R <sub>DS(on)</sub>	I <sub>D</sub> =3.5A V <sub>GS</sub> =10V		1.54	2.0	Ω
Forward transconductance	g <sub>fs</sub>	I <sub>D</sub> =3.5A V <sub>DS</sub> =25V	2.7	5.5		S
Input capacitance	C <sub>iSS</sub>	V <sub>DS</sub> =25V		1480	2220	pF
Output capacitance	C <sub>oSS</sub>	V <sub>GS</sub> =0V		170	255	
Reverse transfer capacitance	C <sub>rSS</sub>	f=1MHz		75	113	
Turn-on time t <sub>on</sub>	td(on)	V <sub>CC</sub> =600V I <sub>D</sub> =7A		25	38	ns
	tr	V <sub>GS</sub> =10V		50	75	
Turn-off time t <sub>off</sub>	td(off)	R <sub>GS</sub> =10Ω		160	240	ns
	tr			70	105	
Total gate charge	Q <sub>G</sub>	V <sub>CC</sub> =500V		84	126	nC
Gate-Source charge	Q <sub>GS</sub>	I <sub>D</sub> =7A		23	35	
Gate-Drain charge	Q <sub>GD</sub>	V <sub>GS</sub> =10V		31	47	
Avalanche capability	I <sub>AV</sub>	L=17.3 mH T <sub>ch</sub> =25°C	7			A
Diode forward on-voltage	V <sub>SD</sub>	I <sub>F</sub> =2I <sub>DR</sub> V <sub>GS</sub> =0V T <sub>ch</sub> =25°C		1.00	1.50	V
Reverse recovery time	t <sub>rr</sub>	I <sub>F</sub> =I <sub>DR</sub> V <sub>GS</sub> =0V		1.6		μs
Reverse recovery charge	Q <sub>rr</sub>	-di/dt=100A/μs T <sub>ch</sub> =25°C		15.0		μC

#### Thermal characteristics

Item	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Thermal resistance	R <sub>th(ch-c)</sub>	channel to case			0.490	°C/W
	R <sub>th(ch-a)</sub>	channel to ambient			50.0	°C/W

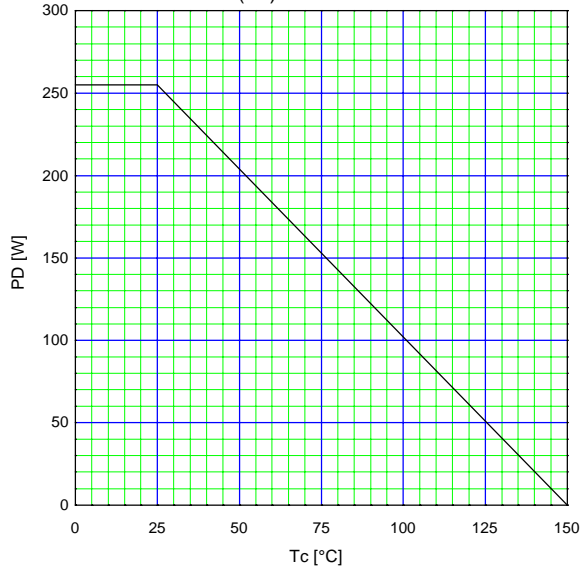


#### Equivalent circuit schematic

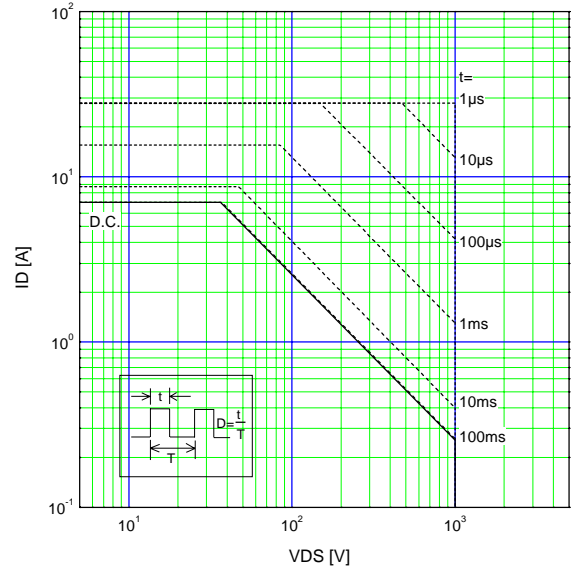


Characteristics

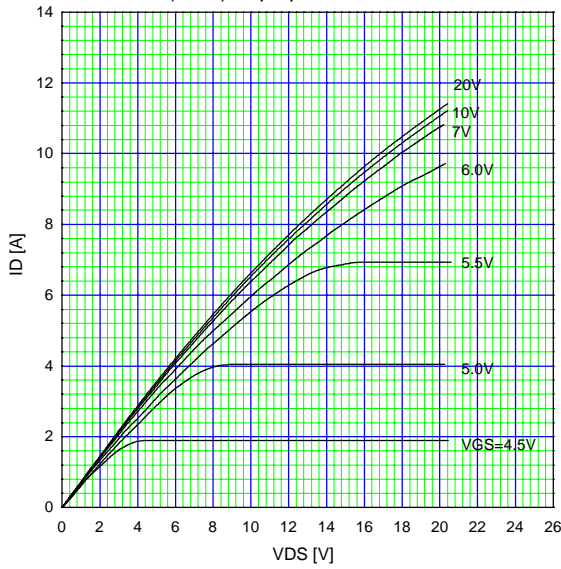
Allowable Power Dissipation  
 $PD=f(T_c)$



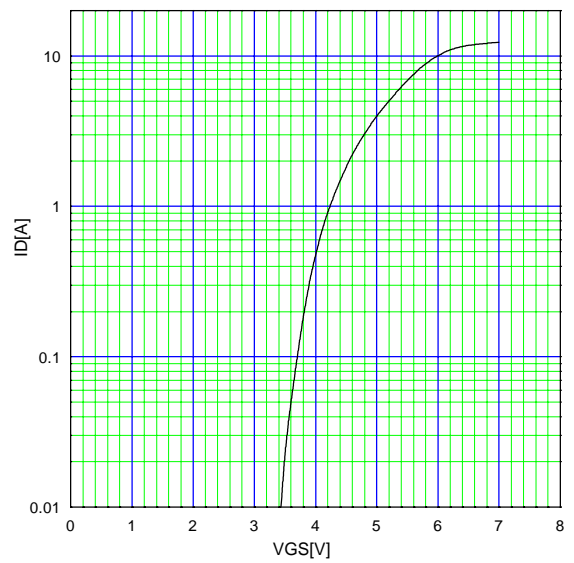
Safe operating area  
 $ID=f(V_{DS}):$  Single Pulse,  $T_c=25^\circ\text{C}$



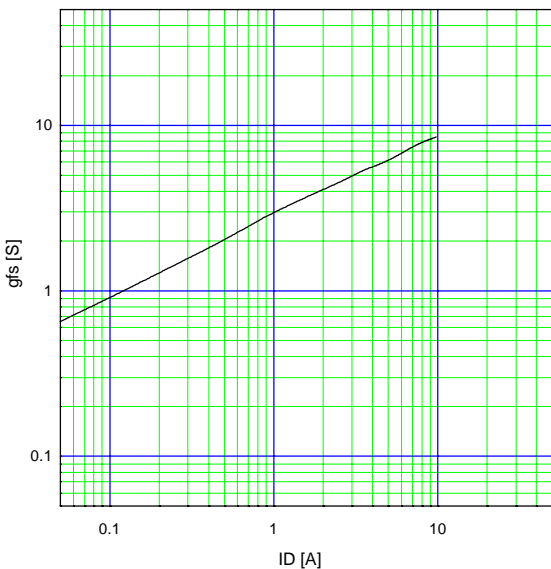
Typical Output Characteristics  
 $ID=f(V_{DS}):$  80µs pulse test,  $T_{ch}=25^\circ\text{C}$



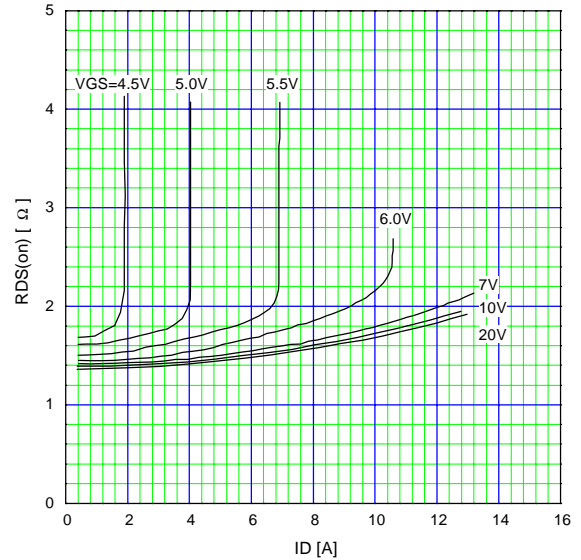
Typical Transfer Characteristic  
 $ID=f(V_{GS}):$  80µs pulse test,  $V_{DS}=25\text{V}$ ,  $T_{ch}=25^\circ\text{C}$



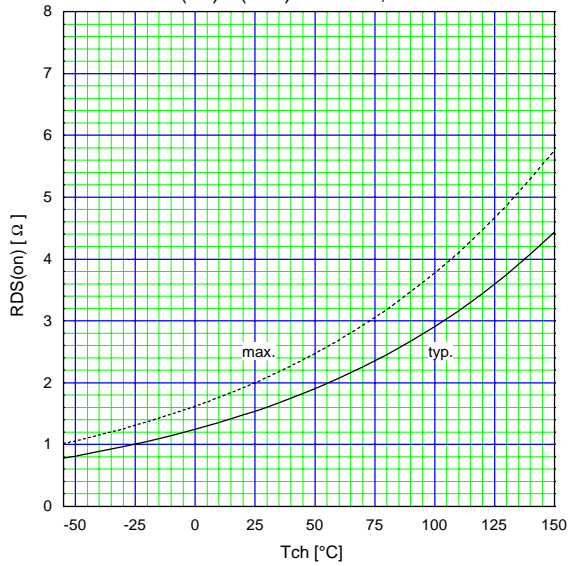
Typical Transconductance  
 $g_{fs}=f(ID):$  80µs pulse test,  $V_{DS}=25\text{V}$ ,  $T_{ch}=25^\circ\text{C}$



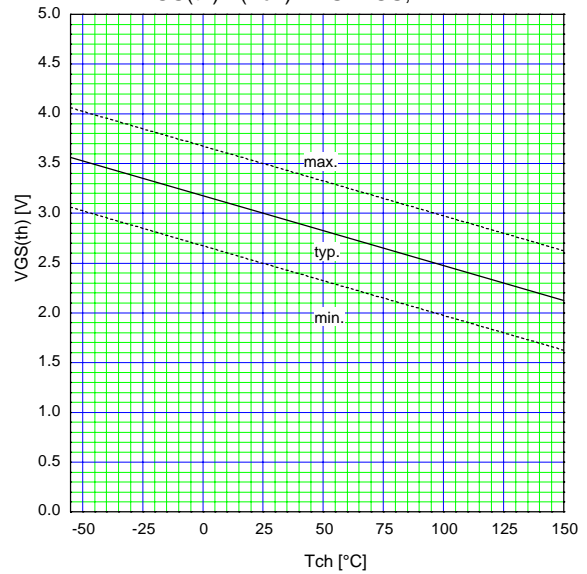
Typical Drain-Source on-state Resistance  
 $R_{DS(on)}=f(ID):$  80µs pulse test,  $T_{ch}=25^\circ\text{C}$



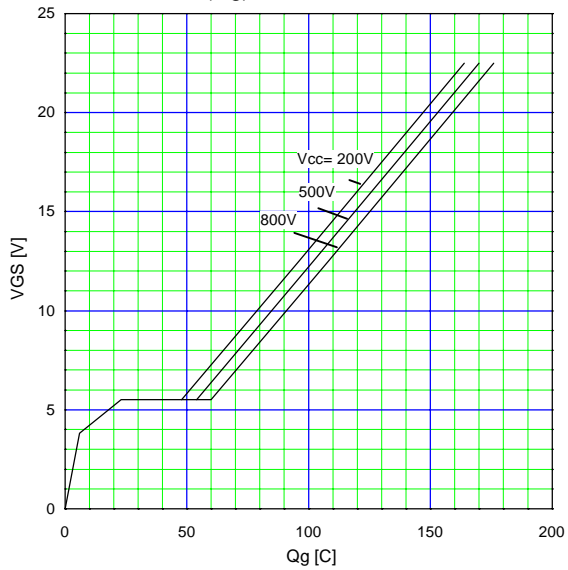
Drain-Source On-state Resistance  
 $R_{DS(on)} = f(T_{ch}) : I_D = 3.5A, V_{GS} = 10V$



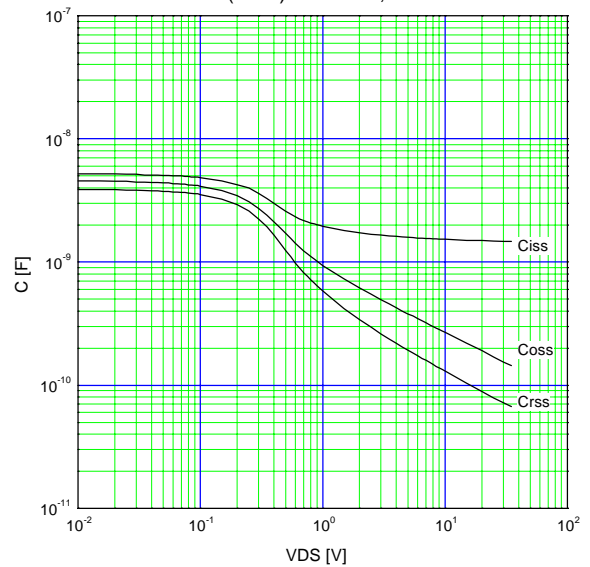
Gate Threshold Voltage vs. Tch  
 $V_{GS(th)} = f(T_{ch}) : V_{DS} = V_{GS}, I_D = 1mA$



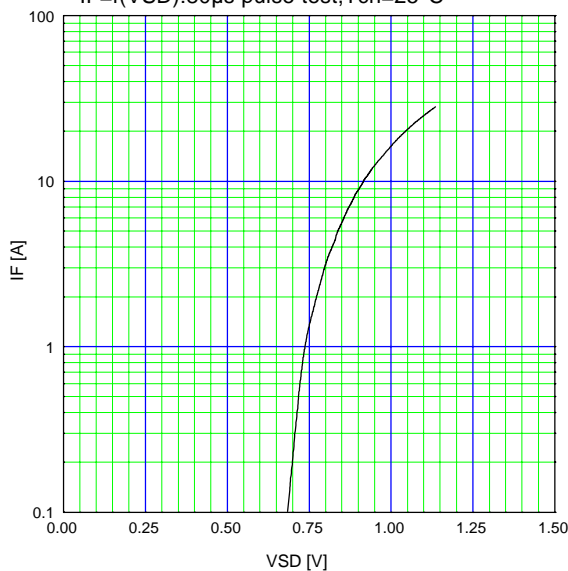
Typical Gate Charge Characteristics  
 $V_{GS} = f(Q_g) : I_D = 7A, T_{ch} = 25°C$



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



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



Typical Switching Characteristics vs. ID  
 $t = f(I_D) : V_{CC} = 600V, V_{GS} = 10V, R_G = 10\Omega$

