

# 2SK3684-01L,S,SJ



200309

## FUJI POWER MOSFET Super FAP-G Series

## N-CHANNEL SILICON POWER MOSFET

### Features

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

### Applications

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

### Maximum ratings and characteristic Absolute maximum ratings

(Tc=25°C unless otherwise specified)

Item	Symbol	Ratings	Unit	Remarks
Drain-source voltage	V <sub>DS</sub>	500	V	
	V <sub>DSX</sub>	500	V	V <sub>GS</sub> =-30V
Continuous drain current	I <sub>D</sub>	±19	A	
Pulsed drain current	I <sub>D(puls)</sub>	±76	A	
Gate-source voltage	V <sub>GS</sub>	±30	V	
Non-Repetitive Maximum avalanche current	I <sub>AS</sub>	19	A	T <sub>ch</sub> ≤150°C
Non-Repetitive Maximum avalanche energy	E <sub>AS</sub>	245.3	mJ	L=1.25mH V <sub>CC</sub> =50V *2
Maximum Drain-Source dV/dt	dV <sub>DS</sub> /dt	20	kV/s	V <sub>DS</sub> ≤500V
Peak diode recovery dV/dt	dV/dt	5	kV/μs	*3
Max. power dissipation	P <sub>D</sub>	1.67	W	T <sub>a</sub> =25°C
		270	W	T <sub>c</sub> =25°C
Operating and storage temperature range	T <sub>ch</sub>	+150	°C	
	T <sub>stg</sub>	-55 to +150	°C	

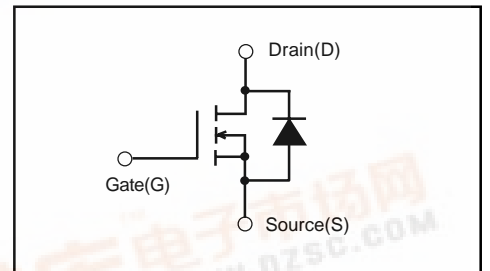
\*2 See to Avalanche Energy Graph

\*3 I<sub>F</sub>≤-I<sub>D</sub>, -di/dt=50A/μs, V<sub>CC</sub>≤BV<sub>DSS</sub>, T<sub>ch</sub>≤150°C

### Outline Drawings [mm]



### Equivalent circuit schematic



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

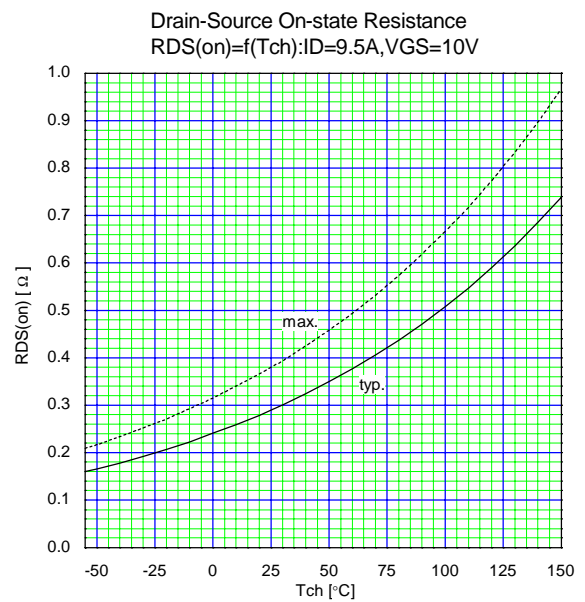
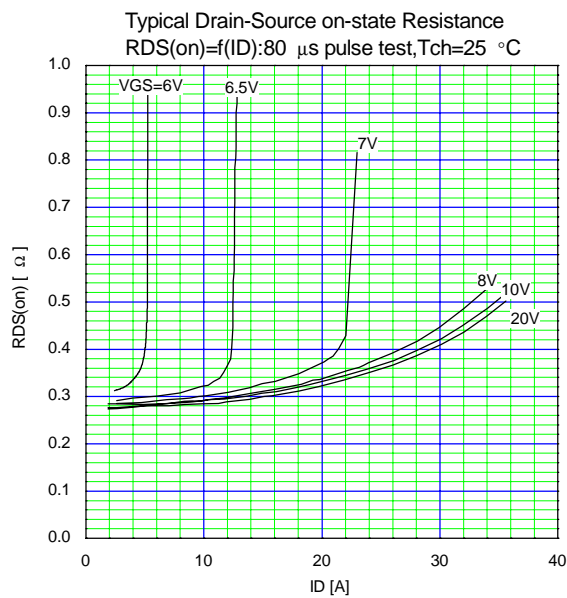
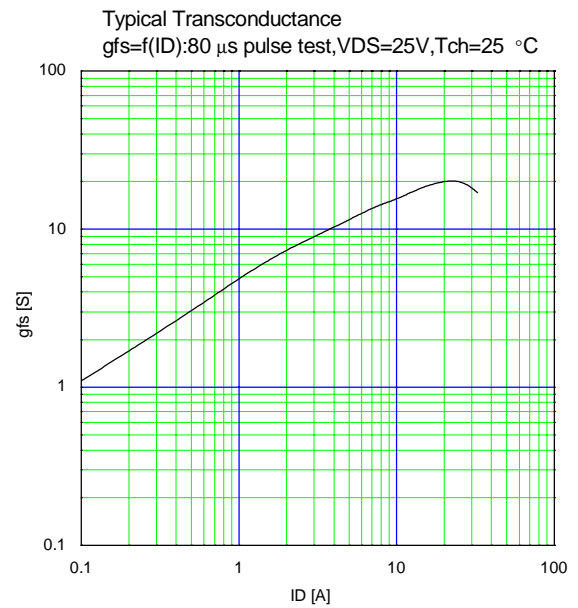
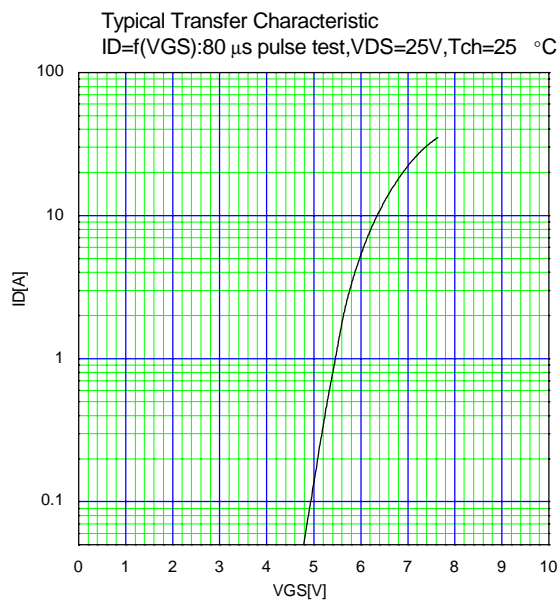
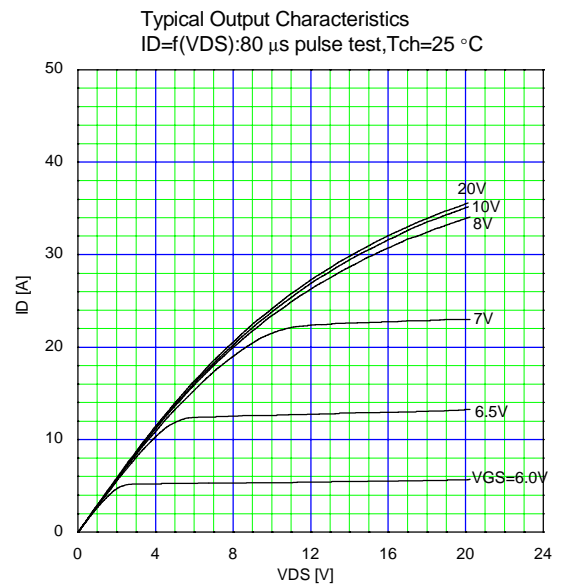
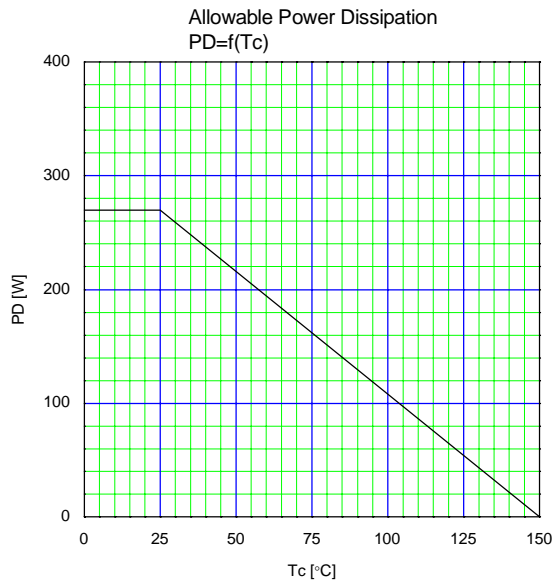
Item	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Drain-source breakdown voltage	V <sub>(BR)DSS</sub>	I <sub>D</sub> = 250μA V <sub>GS</sub> =0V	500			V
Gate threshold voltage	V <sub>GS(th)</sub>	I <sub>D</sub> = 250μA V <sub>DS</sub> =V <sub>GS</sub>	3.0		5.0	V
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> =500V V <sub>GS</sub> =0V T <sub>ch</sub> =25°C			25	μA
		V <sub>DS</sub> =400V V <sub>GS</sub> =0V T <sub>ch</sub> =125°C			250	μA
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> =9.5A V <sub>GS</sub> =10V		0.29	0.38	Ω
Forward transconductance	g <sub>fs</sub>	I <sub>D</sub> =9.5A V <sub>DS</sub> =25V	7.5	15		S
Input capacitance	C <sub>iss</sub>	V <sub>DS</sub> =25V		1560	2340	pF
Output capacitance	C <sub>oss</sub>	V <sub>GS</sub> =0V		230	345	pF
Reverse transfer capacitance	C <sub>rss</sub>	f=1MHz		8	12	pF
Turn-on time t <sub>on</sub>	t <sub>d(on)</sub>	V <sub>CC</sub> =300V I <sub>D</sub> =9.5A		29	43.5	ns
		V <sub>GS</sub> =10V		13	19.5	ns
Turn-off time t <sub>off</sub>	t <sub>d(off)</sub>	R <sub>GS</sub> =10Ω		56	84	ns
				8	12	ns
Total Gate Charge	Q <sub>G</sub>	V <sub>CC</sub> =250V		34	51	nC
Gate-Source Charge	Q <sub>GS</sub>	I <sub>D</sub> =19A		13	19.5	nC
Gate-Drain Charge	Q <sub>GD</sub>	V <sub>GS</sub> =10V		10	15	nC
Avalanche capability	I <sub>AV</sub>	L=1.25mH T <sub>ch</sub> =25°C	19			A
Diode forward on-voltage	V <sub>SD</sub>	I <sub>F</sub> =19A V <sub>GS</sub> =0V T <sub>ch</sub> =25°C		1.20	1.50	V
Reverse recovery time	t <sub>rr</sub>	I <sub>F</sub> =19A V <sub>GS</sub> =0V		0.57		μs
Reverse recovery charge	Q <sub>rr</sub>	-di/dt=100A/μs T <sub>ch</sub> =25°C		7.0		μC

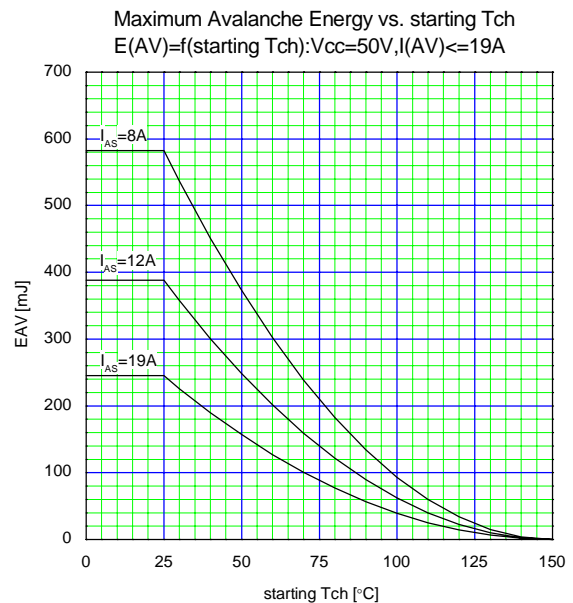
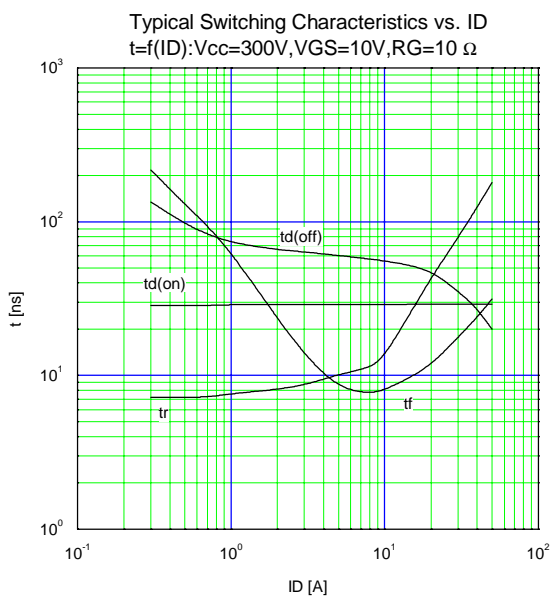
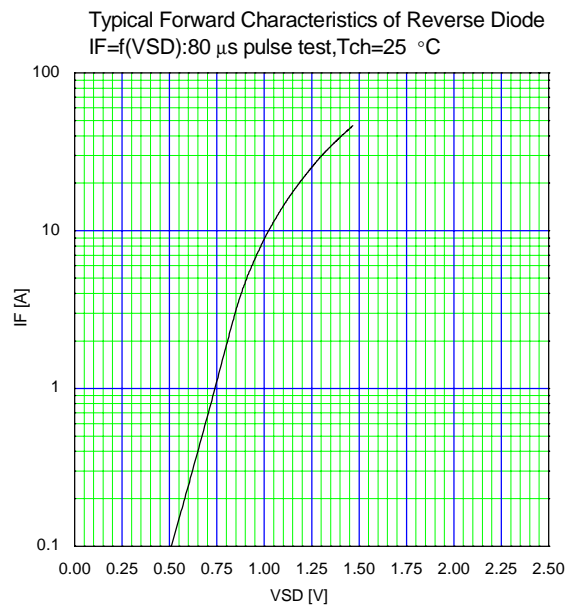
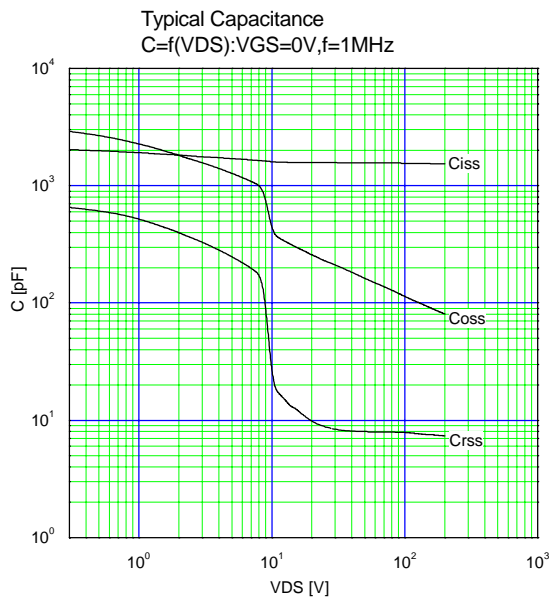
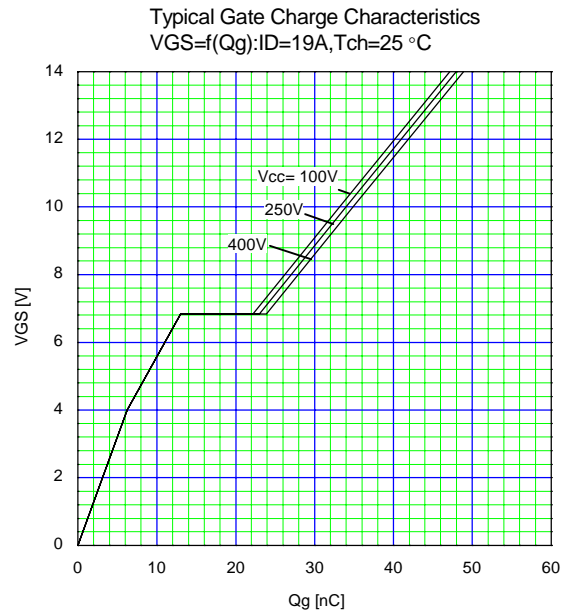
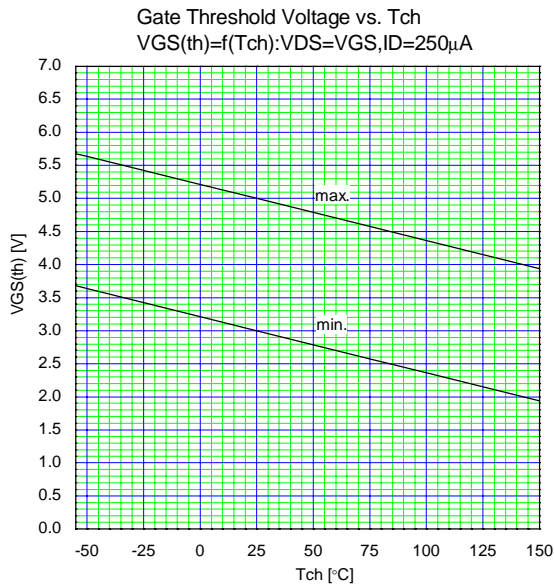
### Thermal characteristics

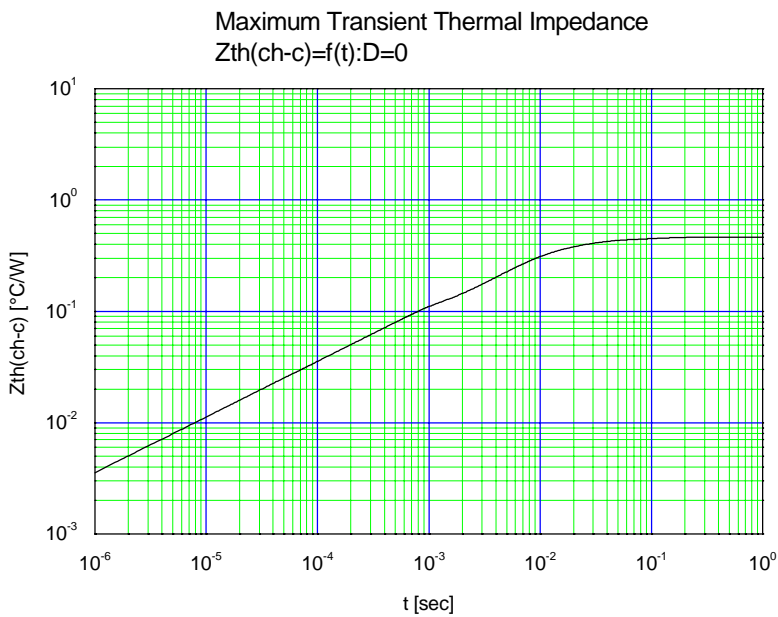
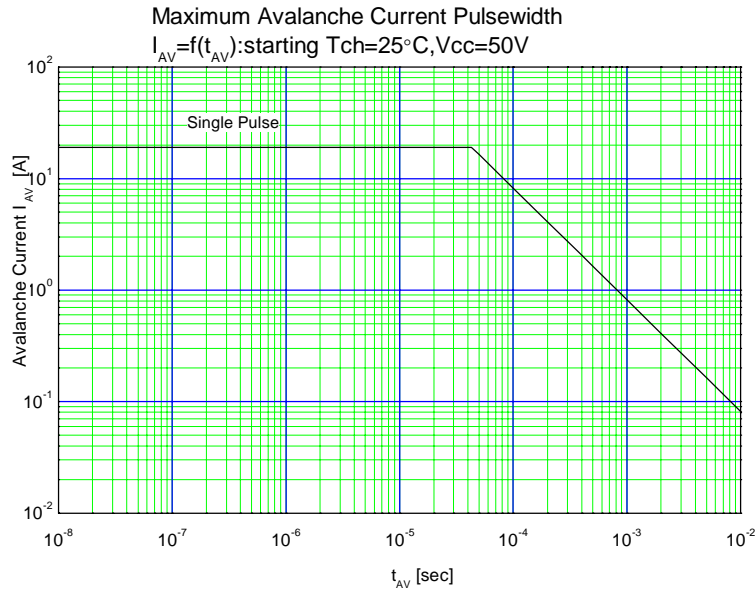
Item	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Thermal resistance	R <sub>th(ch-c)</sub>	channel to case			0.463	°C/W



Characteristics

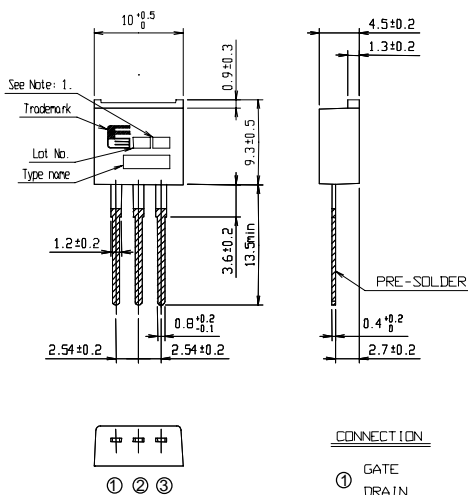




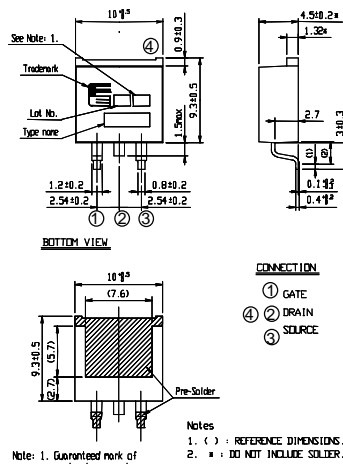


■ Outline Drawings (mm)

Type(L)



Type(S)



Type(SJ)

