

## 2SK3685-01 (500V/0.38Ω/19A)

1) Package TO-247

## 2) Absolute Maximum Ratings (Tc=25°C unless otherwise specified)

Items	Symbols	Ratings	Units
Drain-Source Voltage	V <sub>DS</sub>	500	V
Continuous Drain Current	I <sub>D</sub>	±19	A
Pulsed Drain Current	I <sub>D(pulse)</sub>	±76	A
Gate-Source Voltage	V <sub>GS</sub>	±30	V
Repetitive and Non-Repetitive Maximum Avalanche Current	I <sub>AR</sub>	19	A
Non-Repetitive Maximum Avalanche Energy	E <sub>AS</sub>	245.3	mJ *1
Maximum Drain-Source dV/dt	dV <sub>DS</sub> /dt	20	kV/us
Peak Diode recovery dV/dt	dV/dt	5	kV/us *2
Maximum Power Dissipation	P <sub>D @Tc=25°C</sub>	235	W
	P <sub>D @Ta=25°C</sub>	2.50	W
Operating and Storage Temperature range	T <sub>ch</sub> T <sub>stg</sub>	150 -55 ~ +150	

## 3) Electrical Characteristics (Tch=25°C unless otherwise specified)

Items	Symbols	Test Conditions	min.	typ.	max.	Units
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	I <sub>D</sub> =250uA V <sub>GS</sub> =0V	500	---	---	V
Gate Threshold Voltage	V <sub>GS(th)</sub>	I <sub>D</sub> =250uA 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 T <sub>ch</sub> =25	---	---	25	μA
		V <sub>GS</sub> =0V T <sub>ch</sub> =125	---	---	250	μA
Gate-Source Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±30V V <sub>DS</sub> =0V	---	---	100	μA
Drain-Source On-State Resistance	R <sub>DS(on)</sub>	I <sub>D</sub> =9.5A V <sub>GS</sub> =10V	---	---	0.38	Ω
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =25V	---	1580	2370	pF
Output Capacitance	C <sub>oss</sub>	V <sub>GS</sub> =0V	---	240	360	
Reverse Transfer Capacitance	C <sub>rss</sub>	f=1MHz	---	12	18	
Total Gate Charge	Q <sub>g</sub>	V <sub>CC</sub> =250V	---	32	48	nC
Gate to Source Charge	Q <sub>gs</sub>	I <sub>D</sub> =19A	---	16	24	
Gate to Drain (Miller) Charge	Q <sub>gd</sub>	V <sub>GS</sub> =10V	---	12	18	
Avalanche Capability	I <sub>AV</sub>	L=1.25mH Tch=25	19	---	---	A
Diode Forward On-Voltage	V <sub>SD</sub>	I <sub>F</sub> =19A, V <sub>GS</sub> =0V, Tch=25°C	---	1.0	1.5	V

## 4) Thermal Characteristics

Items	Symbols	Test Conditions	min.	typ.	max.	Units
Channel to Case	R <sub>th(ch-c)</sub>				0.532	/W
Channel to Ambient	R <sub>th(ch-a)</sub>				50.0	/W

\*1 L=1.25mH, V<sub>CC</sub>=50V\*2 I<sub>F</sub> ≤ -I<sub>D</sub>, -di/dt=50A/μs, V<sub>CC</sub> ≤ BV<sub>DSS</sub>, Tch ≤ 150°C

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