

2SK3532-01MR

N-CHANNEL SILICON POWER MOSFET

200304

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

($T_c=25^\circ\text{C}$ unless otherwise specified)

Item	Symbol	Ratings	Unit
Drain-source voltage	V_{DS}	900	V
	V_{DSX}^*5	900	V
Continuous drain current	I_D	± 6	A
Pulsed drain current	$I_{D(puls)}$	± 24	A
Gate-source voltage	V_{GS}	± 30	V
Repetitive or non-repetitive	I_{AR}^*2	6	A
Maximum Avalanche Energy	E_{AS}^*1	244	mJ
Maximum Drain-Source dV/dt	dV_{DS}/dt^*4	40	kV/ μs
Peak Diode Recovery dV/dt	dV/dt^*3	5	kV/ μs
Max. power dissipation	P_D	$T_a=25^\circ\text{C}$	2.16
		$T_c=25^\circ\text{C}$	70
Operating and storage temperature range	T_{ch}	+150	$^\circ\text{C}$
	T_{stg}	-55 to +150	$^\circ\text{C}$
Isolation Voltage	V_{ISO}^*6	2	kVrms

*1 $L=12.4\text{mH}$, $V_{CC}=90\text{V}$, $T_{ch}=25^\circ\text{C}$ See to Avalanche Energy Graph *2 $T_{ch}\leq 150^\circ\text{C}$

*3 $I_F\leq -I_D$, $-di/dt=50\text{A}/\mu\text{s}$, $V_{CC}\leq BV_{DS}$, $T_{ch}\leq 150^\circ\text{C}$ *4 $V_{DS}\leq 900\text{V}$ *5 $V_{GS}=-30\text{V}$ *6 $t=60\text{sec}$, $f=60\text{Hz}$

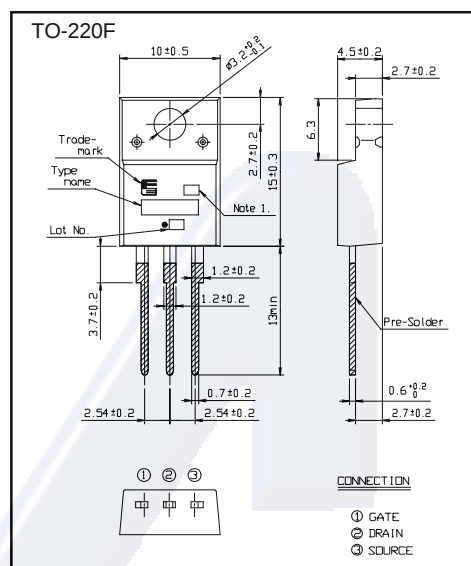
Electrical characteristics ($T_c=25^\circ\text{C}$ unless otherwise specified)

Item	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Drain-source breakdown voltage	$V_{(BR)DS}$	$I_D=250\mu\text{A}$ $V_{GS}=0\text{V}$	900			V
Gate threshold voltage	$V_{GS(th)}$	$I_D=250\mu\text{A}$ $V_{DS}=V_{GS}$	3.0		5.0	V
Zero gate voltage drain current	I_{DSS}	$V_{DS}=900\text{V}$ $V_{GS}=0\text{V}$			25	μA
		$V_{DS}=720\text{V}$ $V_{GS}=0\text{V}$			250	
Gate-source leakage current	I_{GSS}	$V_{GS}=\pm 30\text{V}$ $V_{DS}=0\text{V}$			100	nA
Drain-source on-state resistance	$R_{DS(on)}$	$I_D=3\text{A}$ $V_{GS}=10\text{V}$		1.92	2.50	Ω
Forward transconductance	g_{fs}	$I_D=3\text{A}$ $V_{DS}=25\text{V}$	3.7	7.4		S
Input capacitance	C_{iss}	$V_{DS}=25\text{V}$		750	1125	pF
Output capacitance	C_{oss}	$V_{GS}=0\text{V}$		100	150	
Reverse transfer capacitance	C_{rss}	$f=1\text{MHz}$		7	11	
Turn-on time t_{on}	$t_{d(on)}$	$V_{CC}=600\text{V}$ $I_D=3\text{A}$		21	32	ns
	t_r	$V_{GS}=10\text{V}$		8	12	
Turn-off time t_{off}	$t_{d(off)}$	$R_{GS}=10\Omega$		42	63	
	t_f			11	16.5	
Total Gate Charge	Q_G	$V_{CC}=450\text{V}$		21.5	32	nC
Gate-Source Charge	Q_{GS}	$I_D=6\text{A}$		3	4.5	
Gate-Drain Charge	Q_{GD}	$V_{GS}=10\text{V}$		7	10.5	
Avalanche capability	I_{AV}	$L=12.4\text{mH}$ $T_{ch}=25^\circ\text{C}$	6			A
Diode forward on-voltage	V_{SD}	$I_F=6\text{A}$ $V_{GS}=0\text{V}$ $T_{ch}=25^\circ\text{C}$		0.90	1.50	V
Reverse recovery time	t_{rr}	$I_F=6\text{A}$ $V_{GS}=0\text{V}$		1.1		μs
Reverse recovery charge	Q_{rr}	$-di/dt=100\text{A}/\mu\text{s}$ $T_{ch}=25^\circ\text{C}$		5.5		μC

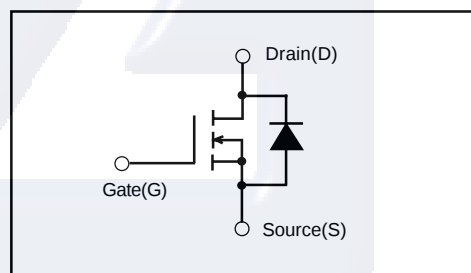
Thermal characteristics

Item	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Thermal resistance	$R_{th(ch-c)}$	channel to case			1.560	$^\circ\text{C}/\text{W}$
	$R_{th(ch-a)}$	channel to ambient			58.0	$^\circ\text{C}/\text{W}$

Outline Drawings [mm]



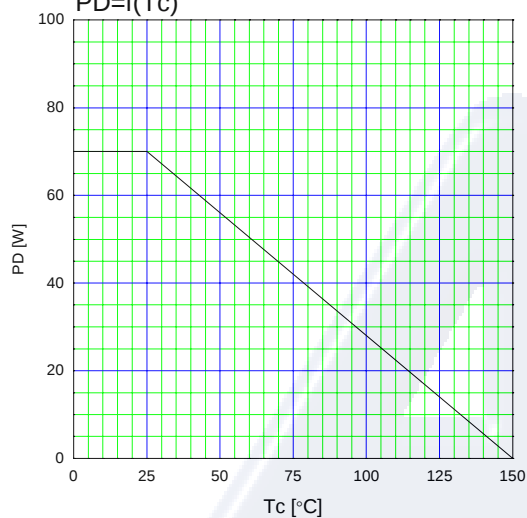
Equivalent circuit schematic



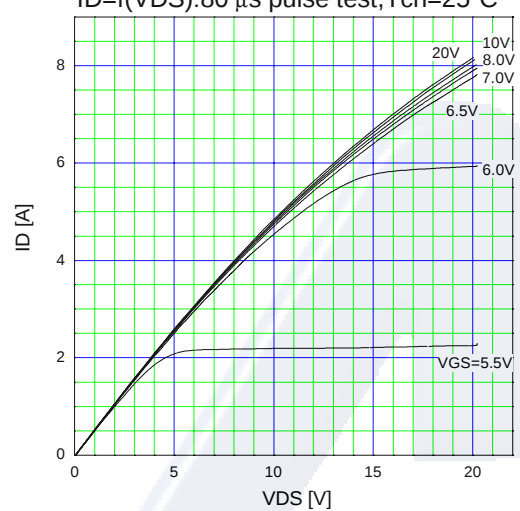
2SK3532-01MR

■ Characteristics

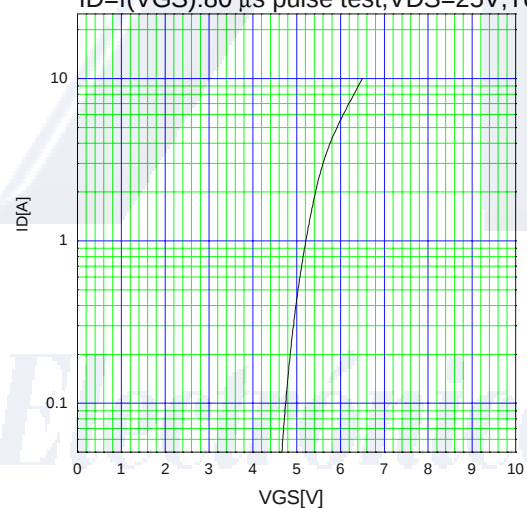
Allowable Power Dissipation
 $PD=f(T_c)$



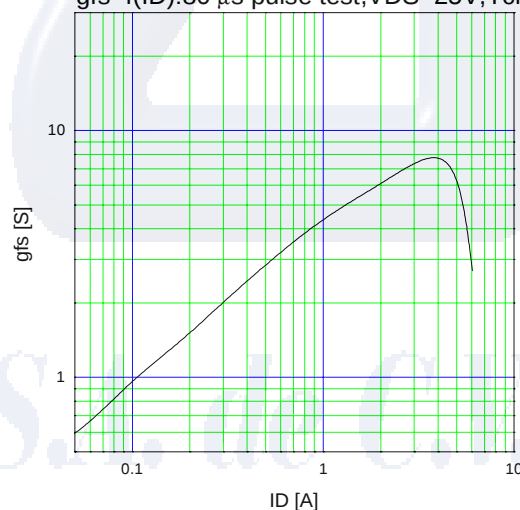
Typical Output Characteristics
 $ID=f(V_{DS}): 80 \mu s$ pulse test, $T_{ch}=25^\circ C$



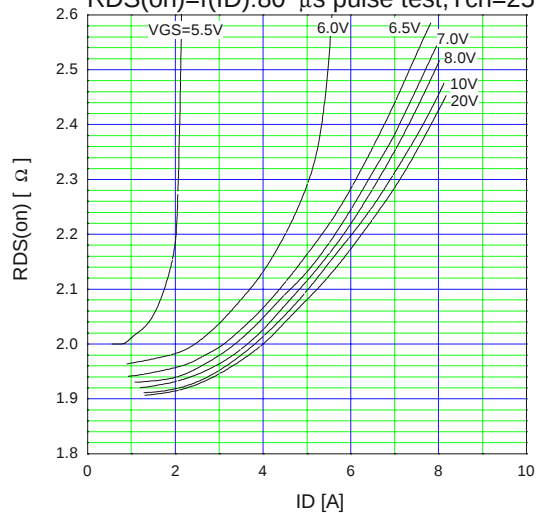
Typical Transfer Characteristic
 $ID=f(V_{GS}): 80 \mu s$ pulse test, $V_{DS}=25V$, $T_{ch}=25^\circ C$



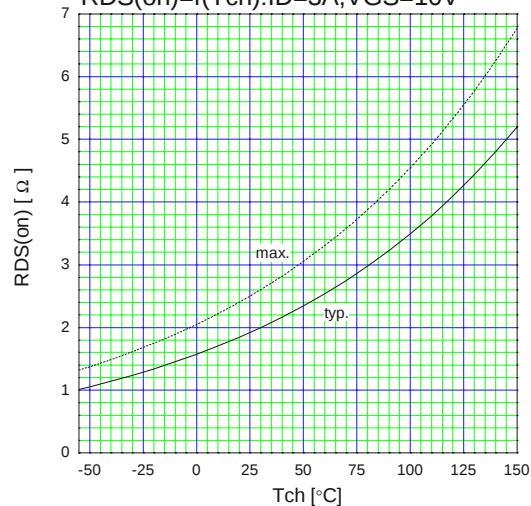
Typical Transconductance
 $g_{fs}=f(ID): 80 \mu s$ pulse test, $V_{DS}=25V$, $T_{ch}=25^\circ C$



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

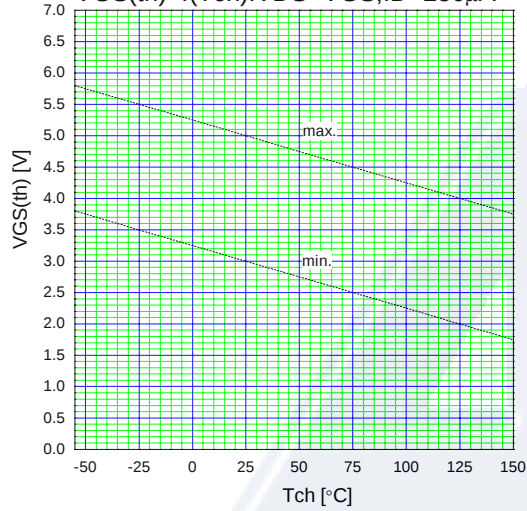


Drain-Source On-state Resistance
 $R_{DS(on)}=f(T_{ch}): ID=3A$, $V_{GS}=10V$

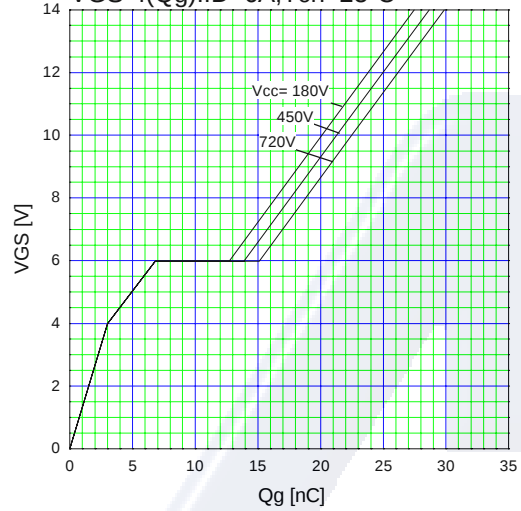


2SK3532-01MR

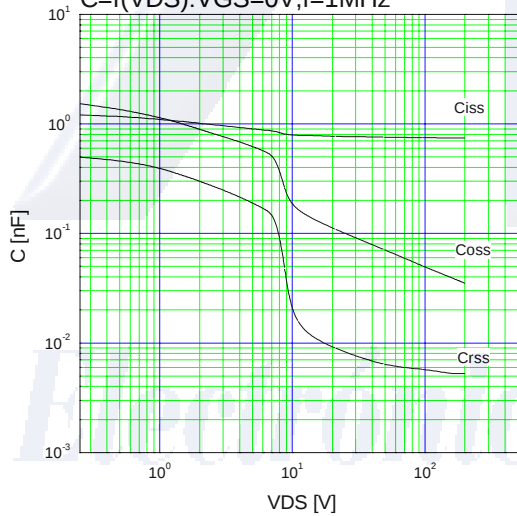
Gate Threshold Voltage vs. T_{ch}
 $V_{GS(th)} = f(T_{ch})$: $V_{DS} = V_{GS}$, $I_D = 250 \mu A$



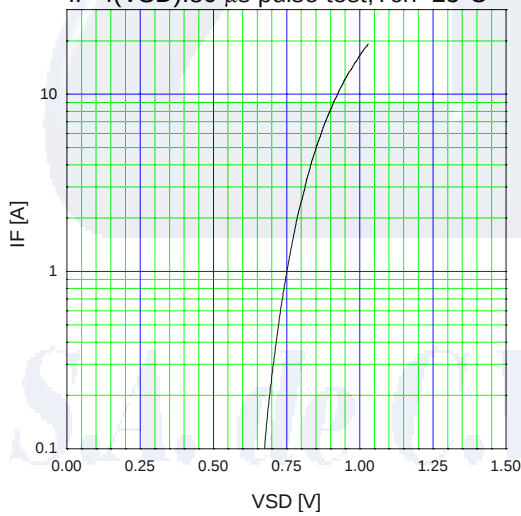
Typical Gate Charge Characteristics
 $V_{GS} = f(Q_g)$: $I_D = 6A$, $T_{ch} = 25^\circ C$



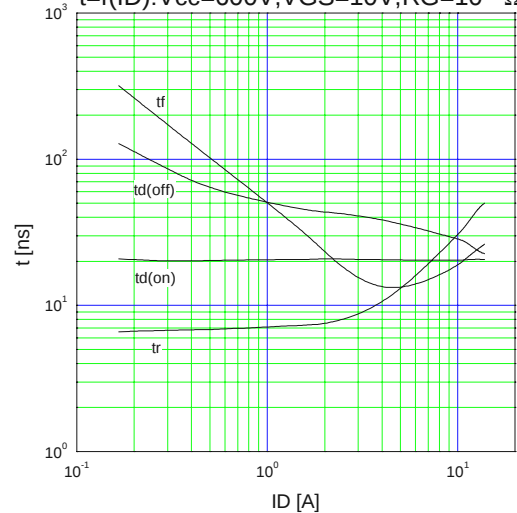
Typical Capacitance
 $C = f(V_{DS})$: $V_{GS} = 0V$, $f = 1MHz$



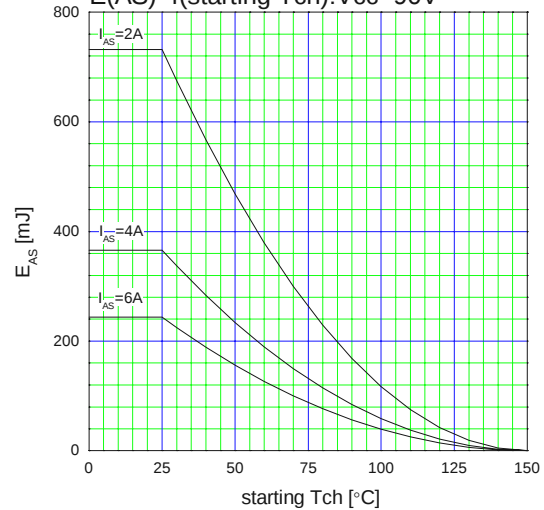
Typical Forward Characteristics of Reverse Diode
 $I_F = f(V_{SD})$: 80 μs pulse test, $T_{ch} = 25^\circ C$



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



Maximum Avalanche Energy vs. starting T_{ch}
 $E_{AS} = f(\text{starting } T_{ch})$: $V_{CC} = 90V$



2SK3532-01MR

