

## MOS Field Effect Transistor

### 2SK3641

#### ■ Features

- Low on-state resistance  
 $R_{DS(on)1} = 14 \text{ m}\Omega \text{ MAX. (} V_{GS} = 10 \text{ V, } I_D = 18 \text{ A)}$   
 $R_{DS(on)2} = 25 \text{ m}\Omega \text{ MAX. (} V_{GS} = 4.5 \text{ V, } I_D = 15 \text{ A)}$
- Low  $C_{iss}$ :  $C_{iss} = 930 \text{ pF TYP.}$

#### ■ Absolute Maximum Ratings $T_a = 25^\circ\text{C}$

Parameter	Symbol	Rating	Unit
Drain to source voltage	$V_{DS}$	30	V
Gate to source voltage	$V_{GS}$	$\pm 20$	V
Drain current	$I_D$	$\pm 36$	A
	$I_{dp}^*$	$\pm 140$	A
Power dissipation	$P_D$	$T_c=25^\circ\text{C}$	29
		$T_a=25^\circ\text{C}$	1.0
Channel temperature	$T_{ch}$	150	$^\circ\text{C}$
Storage temperature	$T_{stg}$	-55 to +150	$^\circ\text{C}$

\*  $PW \leq 10 \mu\text{s}$ , Duty Cycle  $\leq 1\%$

#### ■ Electrical Characteristics $T_a = 25^\circ\text{C}$

Parameter	Symbol	Testconditions	Min	Typ	Max	Unit
Drain cut-off current	$I_{DSS}$	$V_{DS}=30\text{V}, V_{GS}=0$			10	$\mu\text{A}$
Gate leakage current	$I_{GSS}$	$V_{GS}=\pm 20\text{V}, V_{DS}=0$			$\pm 10$	$\mu\text{A}$
Gate cut off voltage	$V_{GS(off)}$	$V_{DS}=10\text{V}, I_D=1\text{mA}$	1.5		2.5	V
Forward transfer admittance	$ Y_{fs} $	$V_{DS}=10\text{V}, I_D=18\text{A}$	5.5	11		S
Drain to source on-state resistance	$R_{DS(on)1}$	$V_{GS}=10\text{V}, I_D=18\text{A}$		11	14	$\text{m}\Omega$
	$R_{DS(on)2}$	$V_{GS}=4.5\text{V}, I_D=15\text{A}$		17	25	$\text{m}\Omega$
Input capacitance	$C_{iss}$	$V_{DS}=10\text{V}, V_{GS}=0, f=1\text{MHz}$		930		pF
Output capacitance	$C_{oss}$		250		pF	
Reverse transfer capacitance	$C_{rss}$		160		pF	
Turn-on delay time	$t_{on}$	$I_D=18\text{A}, V_{GS(on)}=15\text{V}, R_G=10\Omega, V_{DD}=10\text{V}$		9.4		ns
Rise time	$t_r$		8.6		ns	
Turn-off delay time	$t_{off}$		34		ns	
Fall time	$t_f$		11		ns	
Total Gate Charge	$Q_G$	$V_{DD} = 24\text{V}$		22		nC
Gate to Source Charge	$Q_{GS}$	$V_{GS} = 10 \text{ V}$		3.6		nC
Gate to Drain Charge	$Q_{GD}$	$I_D = 36\text{A}$		7.4		nC
Body Diode Forward Voltage Note	$V_{F(S-D)}$	$I_F = 36 \text{ A, } V_{GS} = 0 \text{ V}$		1.0		V
Reverse Recovery Time	$t_{rr}$	$I_F = 36 \text{ A, } V_{GS} = 0 \text{ V}$		24		ns
Reverse Recovery Charge	$Q_{rr}$	$di/dt = 100 \text{ A}/\mu\text{s}$		15		nC

