

2SK1406

Silicon N-Channel Power F-MOS

■ Features

- Low ON-resistance $R_{DS(on)}$: $R_{DS(on)} = 0.32\Omega$ (typ)
- High-speed switching : $t_f = 140\text{ns}$ (typ)
- No secondary breakdown
- High breakdown voltage, large allowable power dissipation

■ Applications

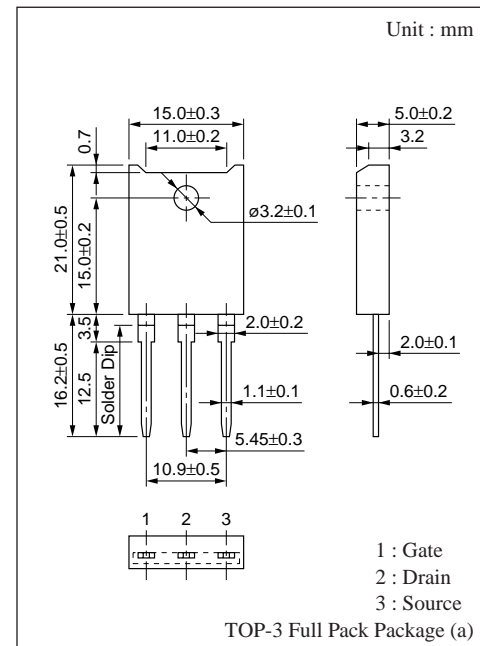
- Non-contact relay
- Solenoid drive
- Motor drive
- Control equipment
- Switching mode regulator

■ Absolute Maximum Ratings ($T_c = 25^\circ\text{C}$)

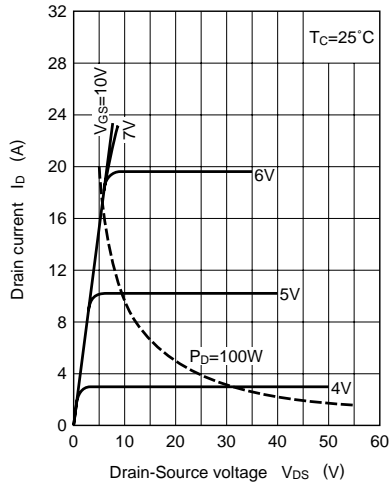
Parameter	Symbol	Rating	Unit	
Drain-Source breakdown voltage	V_{DSS}	500	V	
Gate-Source voltage	V_{GSS}	± 20	V	
Drain current	DC	I_D	± 20	A
	Pulse	I_{DP}	± 40	A
Allowable power dissipation	$T_c = 25^\circ\text{C}$	P_D	100	W
	$T_a = 25^\circ\text{C}$		3	
Channel temperature	T_{ch}	150	$^\circ\text{C}$	
Storage temperature	T_{stg}	-55 to +150	$^\circ\text{C}$	

■ Electrical Characteristics ($T_c = 25^\circ\text{C}$)

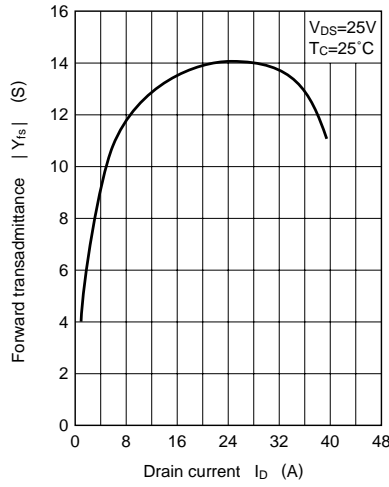
Parameter	Symbol	Condition	Min	Typ	Max	Unit
Drain-Source cut-off current	I_{DSS}	$V_{DS} = 400\text{V}, V_{GS} = 0$			0.1	mA
Gate-Source leakage current	I_{GSS}	$V_{GS} = \pm 20\text{V}, V_{DS} = 0$			± 1	μA
Drain-Source breakdown voltage	V_{DSS}	$I_D = 1\text{mA}, V_{GS} = 0$	500			V
Gate threshold voltage	V_{th}	$V_{DS} = 25\text{V}, I_D = 1\text{mA}$	1		5	V
Drain-Source ON-resistance	$R_{DS(on)}$	$V_{GS} = 10\text{V}, I_D = 10\text{A}$		0.32	0.4	Ω
Drain-Source on voltage	$V_{DS(on)}$	$V_{GS} = 10\text{V}, I_D = 20\text{A}$			9	V
Forward transadmittance	$ Y_{fs} $	$V_{DS} = 25\text{V}, I_D = 10\text{A}$	7.2	12		S
Input capacitance	C_{iss}	$V_{DS} = 20\text{V}, V_{GS} = 0, f = 1\text{MHz}$		3000		pF
Output capacitance	C_{oss}				430	pF
Feedback capacitance	C_{rss}				175	pF
Turn-on time	t_{on}	$V_{GS} = 10\text{V}, I_D = 10\text{A}$ $V_{DS} = 150\text{V}, R_L = 15\Omega$		150		ns
Fall time	t_f				140	ns
Turn-off time (delay time)	$t_{d(off)}$				480	ns



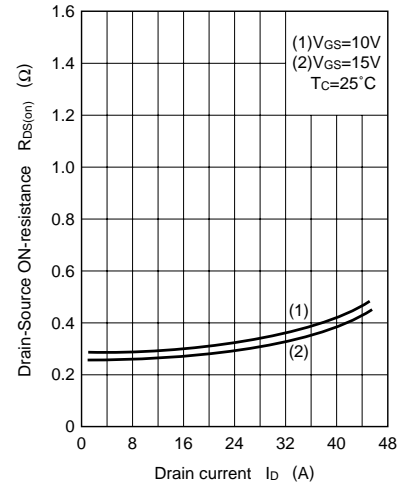
$I_D - V_{DS}$



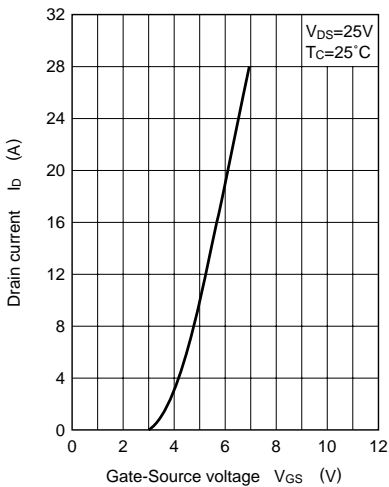
$|Y_{fs}| - I_D$



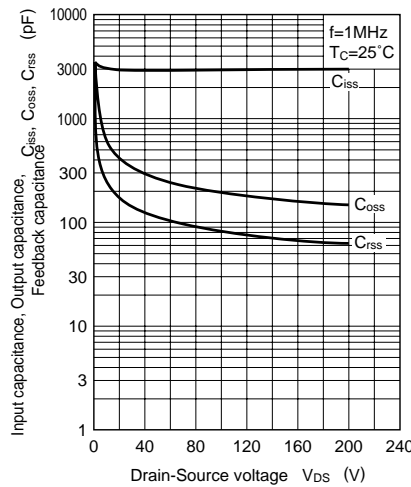
$R_{DS(on)} - I_D$



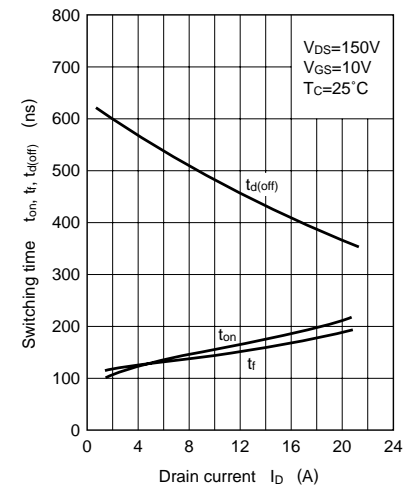
$I_D - V_{GS}$



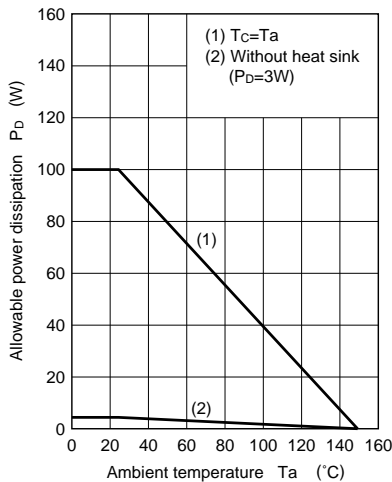
$C_{iss}, C_{oss}, C_{rss} - V_{DS}$



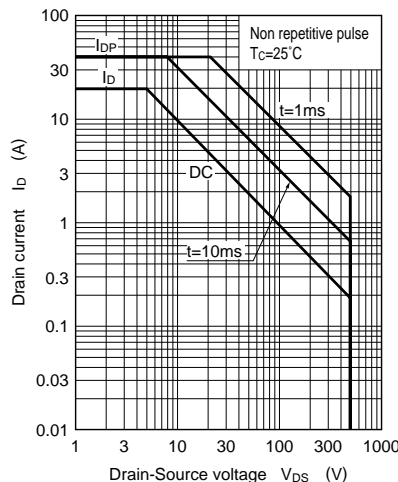
$t_{on}, t_f, t_d(off) - I_D$



$P_D - T_a$



Area of safe operation (ASO)



$R_{DS(on)} - I_D$

