2SK1257

Silicon N-channel Power F-MOS FET

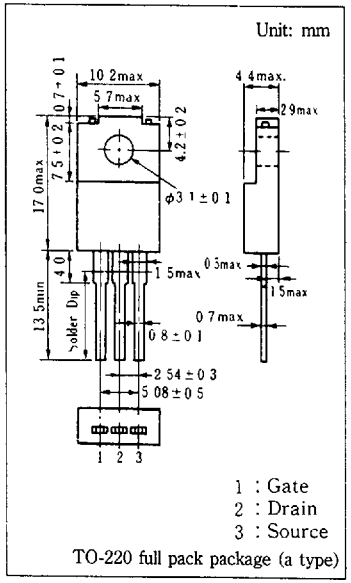
■ Features

- Low ON resistance R_{DS} (on) : R_{DS} (on) 1 = 0.024Ω (typ.)
- High switching rate : t_f = 320ns (typ.)
- No secondary breakdown
- Low voltage drive is possible (V_{GS} = 4V).

■ Application

- DC-DC converter
- No contact relay
- Solenoid drive
- Motor drive

■ Package Dimensions



TO-220 full pack package (a type)

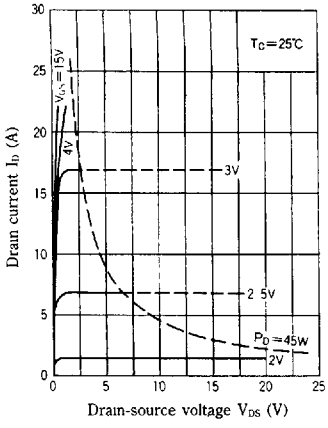
■ Absolute Maximum Ratings (Tc=25°C)

Item		Symbol	Value	Unit
Drain-source voltage		V_{DSS}	60	V
Gate-source voltage		V_{GSS}	±20	V
Drain current	At 4V driving	I_D	20	A
	DC	I_D	40	
	Peak-to-peak value	I_{DP}	80	
Power dissipation	Tc=25℃	P_D	45	W
	Ta=25℃		2.0	
Channel temperature		T_{ch}	150	℃
Storage temperature		T_{stg}	−55~+150	℃

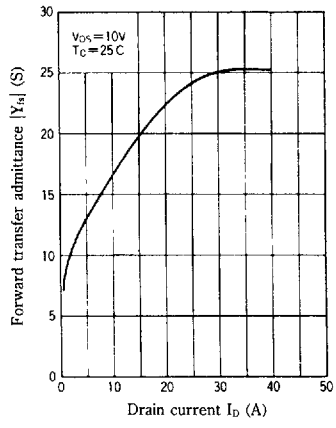
■ Electrical Characteristics (Tc=25°C)

Item	Symbol	Condition	min.	typ.	max.	Unit
Drain current	I_{DSS}	V_{DS}=40V, V_{GS}=0			10	μA
Gate-source current	I_{GSS}	V_{GS}=±20V, V_{DS}=0			±1	μA
Drain-source voltage	V_{DSS}	I_D= 1 mA, V_{GS}=0	60			V
Gate threshold voltage	V_{th}	V_{DS}=10V, I_D=1mA	1		2.5	V
Drain-source ON resistance	R_{DS}(on)1	V_{GS}=10V, I_D=20A		0.024	0.035	Ω
Drain-source ON resistance	R_{DS}(on)2	V_{GS}=4V, I_D=10A		0.033	0.05	Ω
Forward transfer admittance	| Yfs |	V_{DS}=10V, I_D=20A	13	22		S
Input capacitance	C_{iss}	V_{DS}=10V, V_{GS}=0, f=1MHz		3200		pF
Output capacitance	C_{oss}			1400		pF
Reverse transfer capacitance	C_{rss}			600		pF
Turn-on time	t_{on}	V_{GS}=10V, I_D=20A V_{DD}≒30V, R_L=1.5Ω		200		ns
Fall time	t_f			320		ns
Delay time	$t_{d(off)}$			690		ns

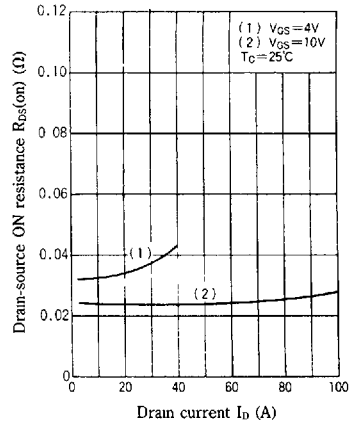
$I_D - V_{DS}$



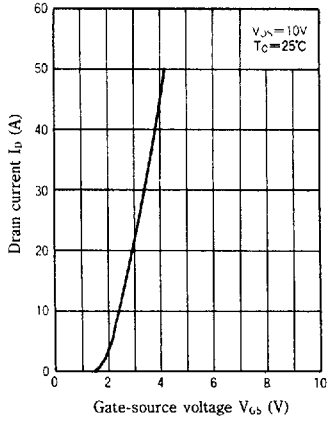
$|Y_{fs}| - I_D$



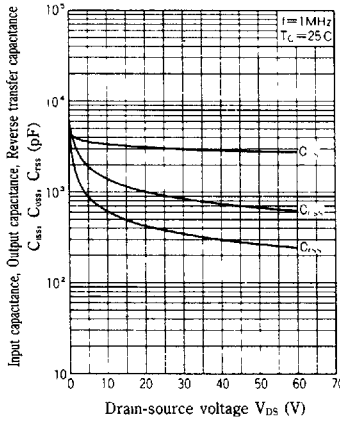
$R_{DS}(on) - I_D$



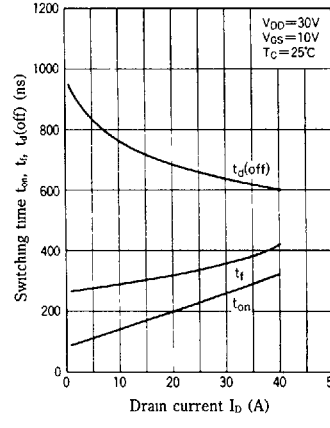
$I_D - V_{GS}$



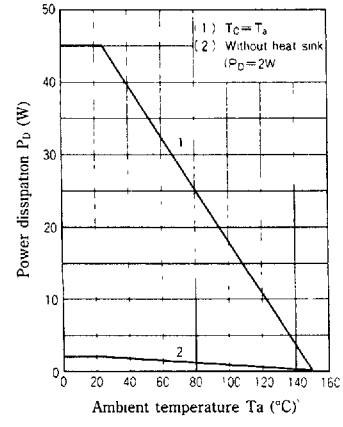
$C_{iss}, C_{oss}, C_{rss} - V_{DS}$



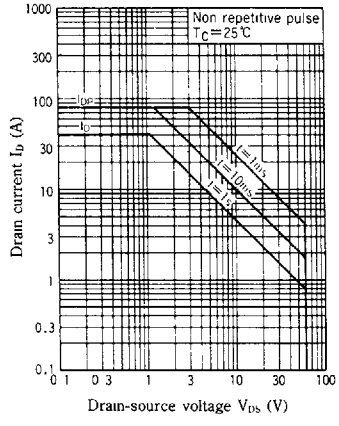
$t_{on}, t_f, t_d(off) - I_D$



$P_D - Ta$



Safety operation area (ASO)



$R_{DS}(on) - I_D$