2SK2659

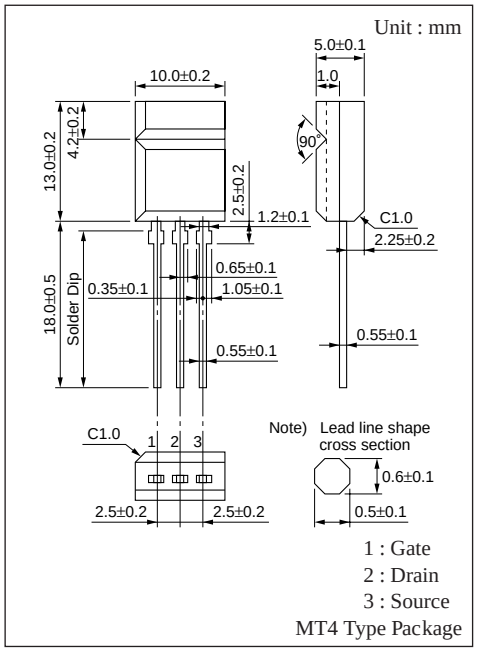
Silicon N-Channel Power F-MOS

■ Features

- Avalanche energy capability guaranteed
- High-speed switching
- Low ON-resistance
- No secondary breakdown
- Low-voltage drive
- Radial taping possible

■ Applications

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



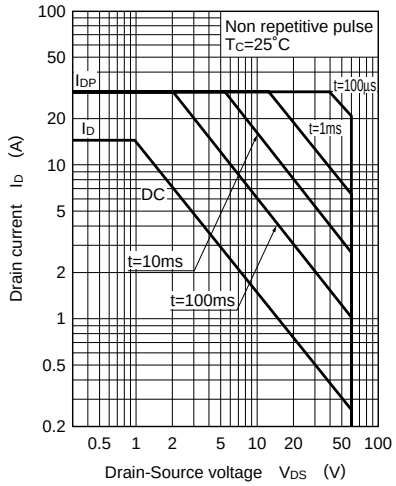
■ Absolute Maximum Ratings (Tc = 25˚C)

Parameter		Symbol	Rating	Unit
Drain-Source breakdown voltage		V_{DSS}	60	V
Gate-Source voltage		V_{GSS}	±20	V
Drain current	DC	I_D	±15	A
	Pulse	I_{DP}	±30	A
Allowable power dissipation	T_C= 25˚C	P_D	15	W
	Ta= 25˚C		2	
Channel temperature		T_{ch}	150	˚C
Storage temperature		T_{stg}	–55 to +150	˚C

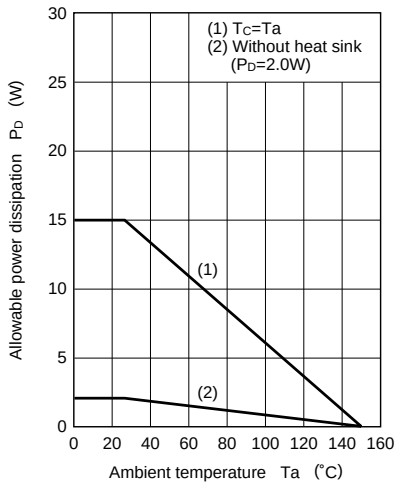
■ Electrical Characteristics (Tc = 25˚C)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Drain-Source cut-off current	I_{DSS}	V_{DS}= 40V, V_{GS}= 0			10	μA
Gate-Source leakage current	I_{GSS}	V_{GS}=±20V, V_{DS}= 0			±1	μA
Drain-Source breakdown voltage	V_{DSS}	I_D=1mA, 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=10A		45	70	mΩ
	$R_{DS(on)}2$	V_{GS}= 4V, I_D= 6A		65	100	mΩ
Forward transadmittance	$\|Y_{fs}\|$	V_{DS}=10V, I_D=10A	8	13		S
Diode forward voltage	V_{DSF}	I_{DR}=10A, V_{GS}= 0			–1.7	V
Input capacitance	C_{iss}	V_{DS}=10V, V_{GS}= 0, f=1MHz		1550		pF
Output capacitance	C_{oss}			680		pF
Feedback capacitance	C_{rss}			300		pF
Turn-on time	t_{on}	V_{DD}= 30V, I_D=10A V_{GS}=10V, R_L= 3Ω		90		ns
Fall time	t_f			180		ns
Turn-off time (delay time)	$t_{d(off)}$			360		ns
Channel-Case heat resistance	$R_{th(ch-c)}$				8.33	˚C/W
Channel-Atmosphere heat resistance	$R_{th(ch-a)}$				62.5	˚C/W

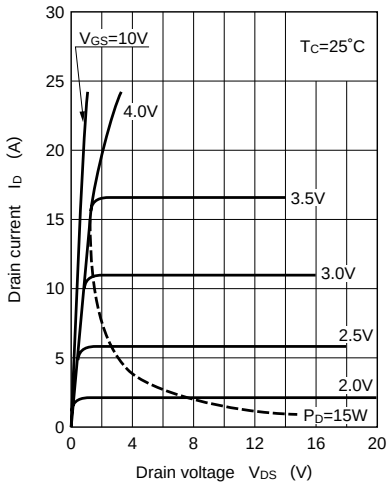
Area of safe operation (ASO)



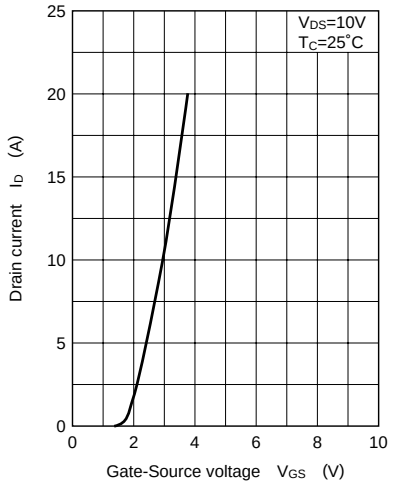
P_D – Ta



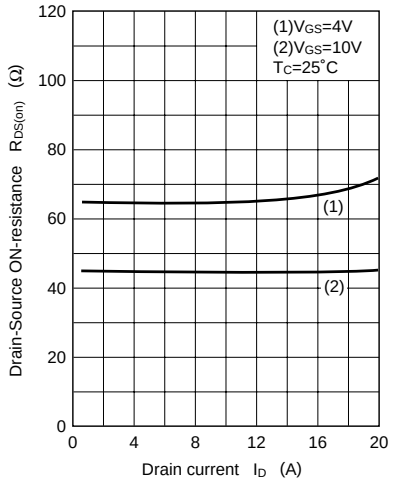
I_D – V_{GS}



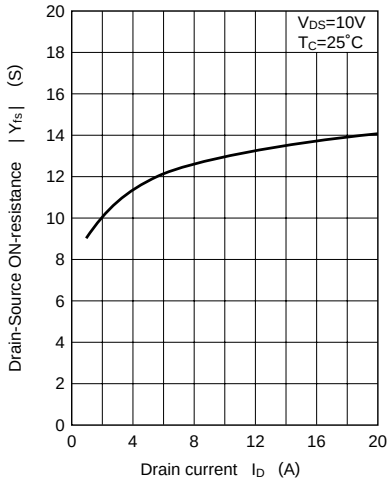
$R_{DS(on)}$ – I_D



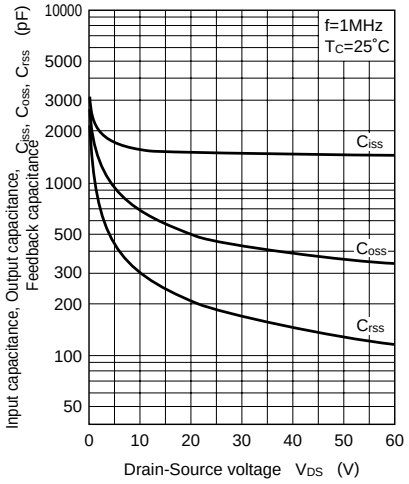
$R_{DS(on)}$ – I_D



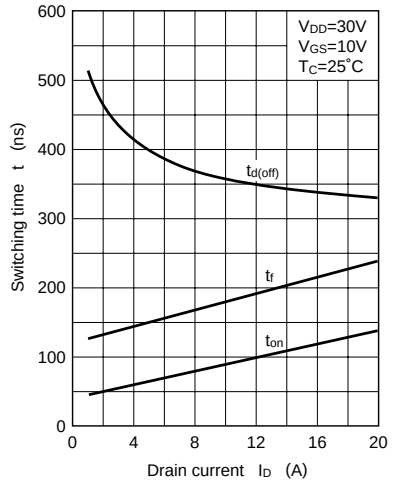
$|Y_{fs}|$ – I_D



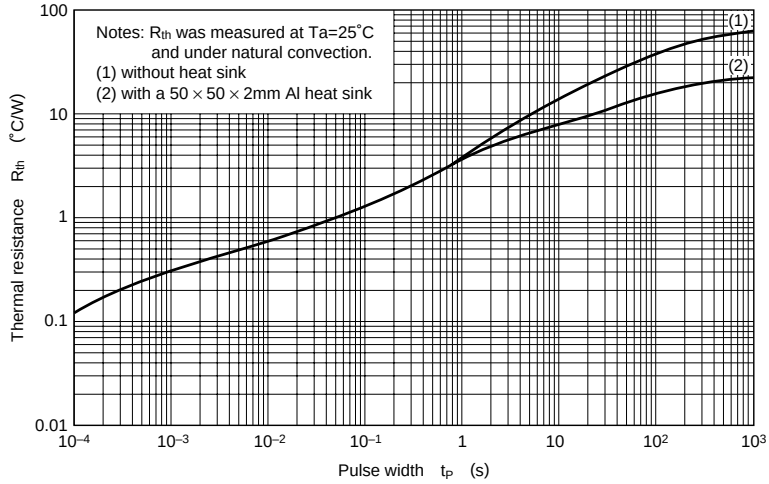
C_{iss}, C_{oss}, C_{rss} – V_{DS}



t_{on}, t_f, $t_{d(off)}$ – I_D



$R_{th} - t$


Notes: Rth was measured at Ta=25°C
and under natural convection.
(1) without heat sink
(2) with a 50 × 50 × 2mm Al heat sink
(1)
(2)
100
10
1
0.1
0.01
Thermal resistance Rth (°C/W)
10–4
10–3
10–2
10–1
1
10
102
103
Pulse width tP (s)