2SK2538

Silicon N-Channel Power F-MOS

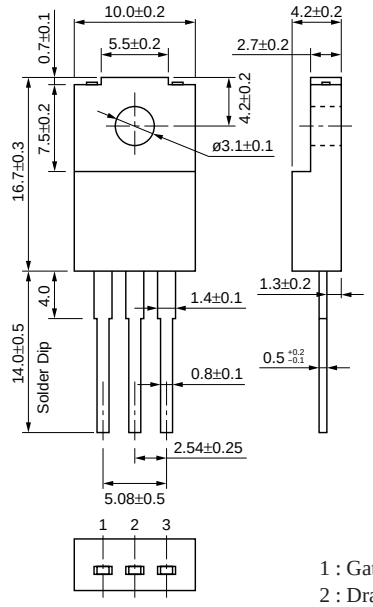
■ Features

- Avalanche energy capability guaranteed
- High-speed switching
- No secondary breakdown

■ Applications

- High-speed switching (switching mode regulator)
- For high-frequency power amplification

Unit : mm



1 : Gate
2 : Drain
3 : Source

TO-220 Full Pack Package (a)

■ Absolute Maximum Ratings (Tc = 25˚C)

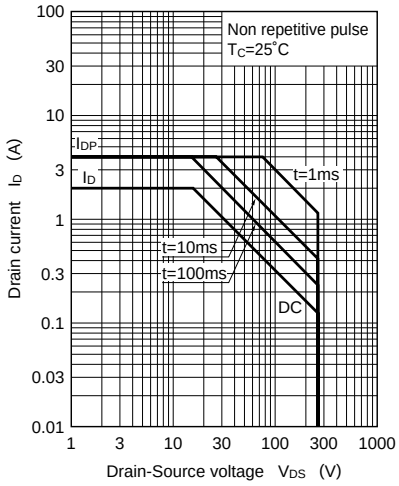
Parameter		Symbol	Rating	Unit
Drain-Source breakdown voltage		V_{DSS}	250	V
Gate-Source voltage		V_{GSS}	±30	V
Drain current	DC	I_D	±2	A
	Pulse	I_{DP}	±4	A
Avalanche energy capability		EAS *	10	mJ
Allowable power dissipation	T_C= 25˚C	P_D	30	W
	Ta= 25˚C		2	
Channel temperature		T_{ch}	150	˚C
Storage temperature		T_{stg}	–55 to +150	˚C

* L= 5mH, I_L= 2A, V_{DD}= 30V, 1 pulse

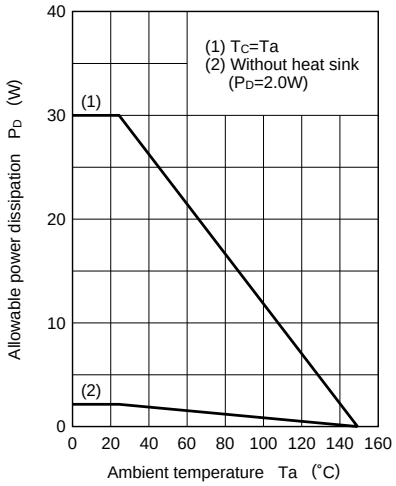
■ Electrical Characteristics (Tc = 25˚C)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Drain-Source cut-off current	I_{DSS}	V_{DS}= 200V, V_{GS}= 0			100	µA
Gate-Source leakage current	I_{GSS}	V_{GS}=±30V, V_{DS}= 0			±1	µA
Drain-Source breakdown voltage	V_{DSS}	I_D=1mA, V_{GS}= 0	250			V
Gate threshold voltage	V_{th}	V_{DS}=10V, I_D=1mA	1		5	V
Drain-Source ON-resistance	$R_{DS(on)}$	V_{GS}=10V, I_D=1A		1.2	2	Ω
Forward transadmittance	$\|Y_{fs}\|$	V_{DS}= 25V, I_D=1A	0.5	1		S
Diode forward voltage	V_{DSF}	I_{DR}= 2A, V_{GS}= 0			–1.6	V
Input capacitance	C_{iss}	V_{DS}=10V, V_{GS}= 0, f=1MHz		220		pF
Output capacitance	C_{oss}			60		pF
Feedback capacitance	C_{rss}			20		pF
Turn-on time (delay time)	$t_{d(on)}$	V_{DD}= 200V, I_D= 2A, V_{GS}=10V, R_L=100Ω		10		ns
Rise time	t_r			20		ns
Fall time	t_f			45		ns
Turn-off time (delay time)	$t_{d(off)}$			90		ns
Channel-Case heat resistance	$R_{th(ch-c)}$				4.17	˚C/W
Channel-Atmosphere heat resistance	$R_{th(ch-a)}$				62.5	˚C/W

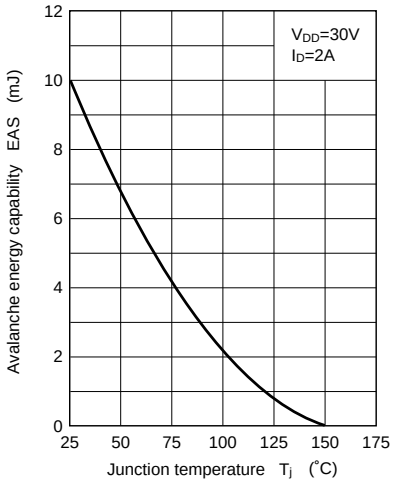
Area of safe operation (ASO)



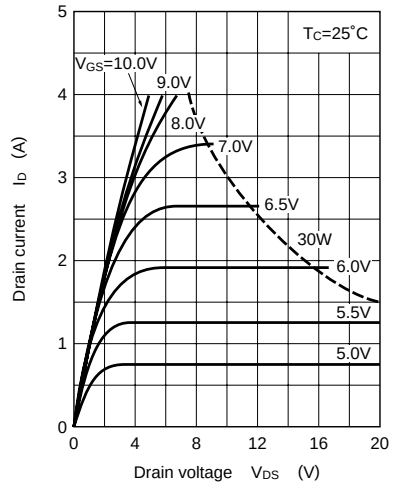
P_D – Ta



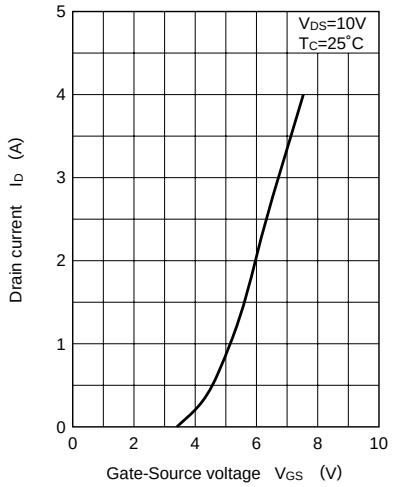
EAS – T_j



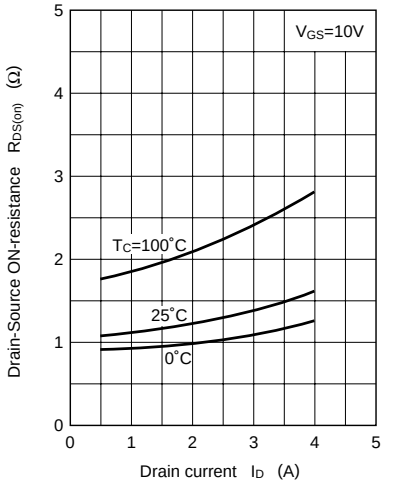
I_D – V_{DS}



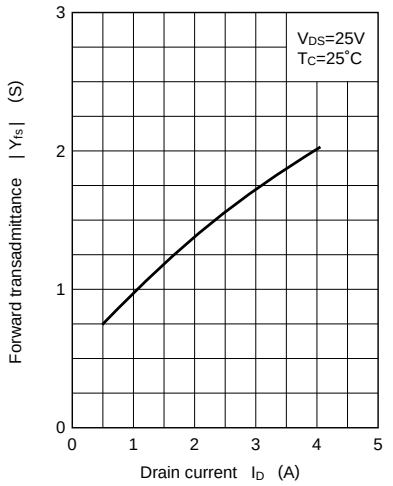
I_D – V_{GS}



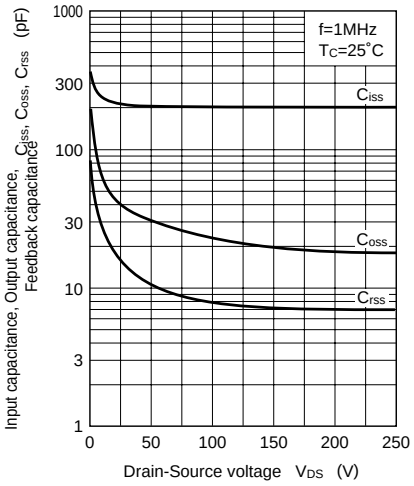
$R_{DS(on)}$ – I_D



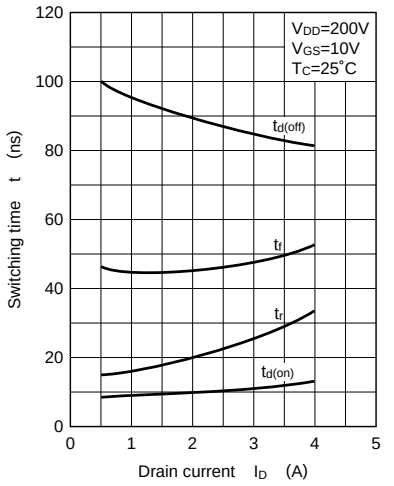
| Y_{fs} | – I_D



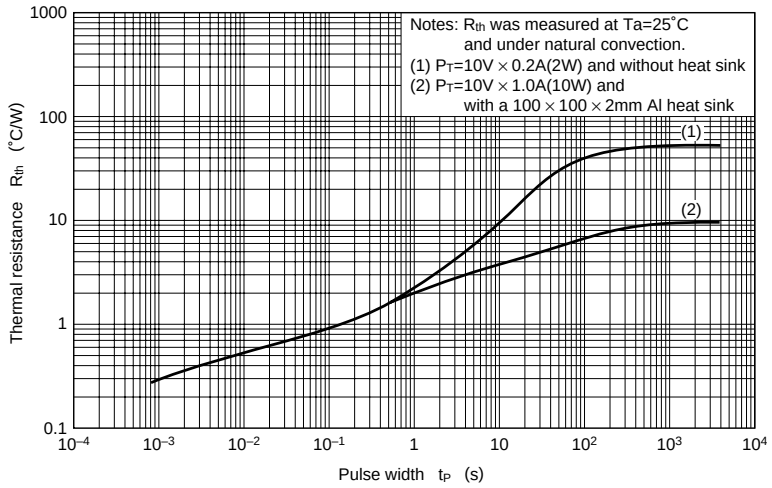
C_{iss}, C_{oss}, C_{rss} – V_{DS}



$t_{d(on)}$, t_r, t_f, $t_{d(off)}$ – I_D



$R_{th} - t_P$


Notes: Rth was measured at Ta=25°C
and under natural convection.
(1) PT=10V × 0.2A(2W) and without heat sink
(2) PT=10V × 1.0A(10W) and
with a 100 × 100 × 2mm Al heat sink
(1)
(2)
Thermal resistance Rth (°C/W)
1000
100
10
1
0.1
10−4
10−3
10−2
10−1
1
10
10²
10³
10⁴
Pulse width tP (s)