

# 2SK2128

## Silicon N-Channel Power F-MOS FET

### ■ Features

- Avalanche energy capacity guaranteed: EAS > 15mJ
- $V_{GSS} = \pm 20V$  guaranteed
- High-speed switching:  $t_f = 35ns$
- No secondary breakdown

### ■ Applications

- Contactless relay
- Driving circuit for a solenoid
- Driving circuit for a motor
- Control equipment
- Switching power supply

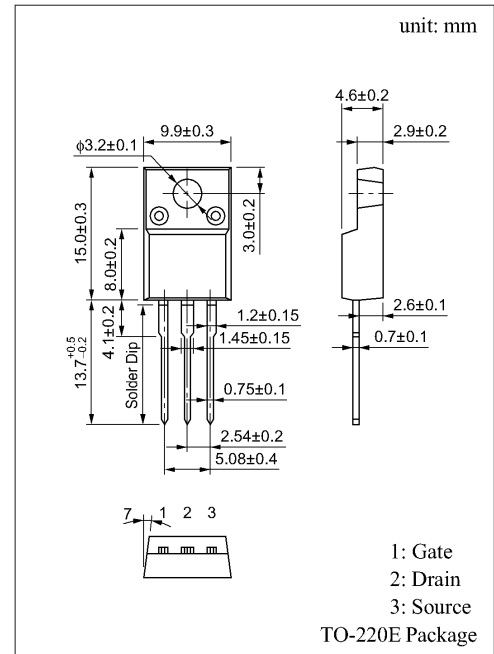
### ■ Absolute Maximum Ratings ( $T_C = 25^\circ C$ )

Parameter	Symbol	Rated	Unit	
Drain to Source breakdown voltage	$V_{DSS}$	800	V	
Gate to Source voltage	$V_{GSS}$	$\pm 30$	V	
Drain current	DC	$I_D$	$\pm 2$	A
	Pulse	$I_{DP}$	$\pm 4$	A
Avalanche energy capacity	EAS*	15	mJ	
Allowable power dissipation	$T_C = 25^\circ C$	$P_D$	40	W
	$T_a = 25^\circ C$		2	
Channel temperature	$T_{ch}$	150	$^\circ C$	
Storage temperature	$T_{stg}$	-55 to +150	$^\circ C$	

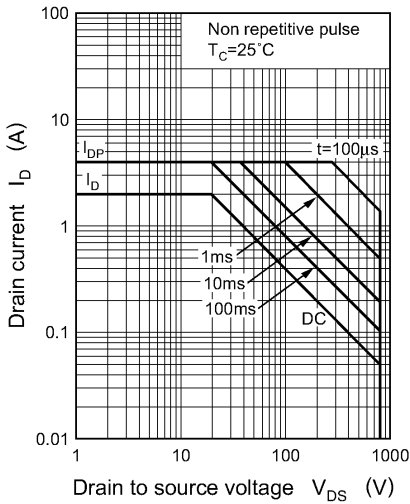
\*  $L = 5mH$ ,  $I_L = 2.45A$ ,  $V_{DD} = 50V$ , 1 pulse

### ■ Electrical Characteristics ( $T_C = 25^\circ C$ )

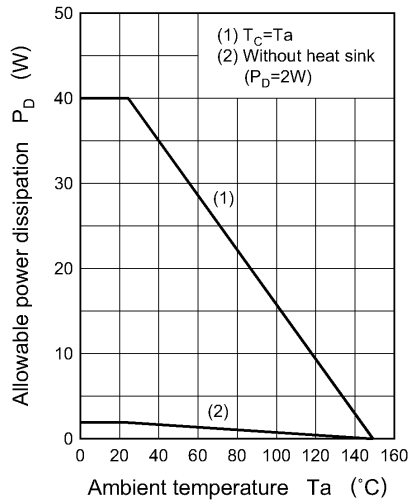
Parameter	Symbol	Conditions	min	typ	max	Unit	
Drain to Source cut-off current	$I_{DSS}$	$V_{DS} = 640V$ , $V_{GS} = 0$			0.1	mA	
Gate to Source leakage current	$I_{GSS}$	$V_{GS} = \pm 30V$ , $V_{DS} = 0$			$\pm 1$	$\mu A$	
Drain to Source breakdown voltage	$V_{DSS}$	$I_D = 1mA$ , $V_{GS} = 0$	800			V	
Gate threshold voltage	$V_{th}$	$V_{DS} = 25V$ , $I_D = 1mA$	2		5	V	
Drain to Source ON-resistance	$R_{DS(on)}$	$V_{GS} = 10V$ , $I_D = 1A$		4.8	7	$\Omega$	
Forward transfer admittance	$ Y_{fs} $	$V_{DS} = 25V$ , $I_D = 1A$	0.7	1.1		S	
Diode forward voltage	$V_{DSF}$	$I_{DR} = 2A$ , $V_{GS} = 0$			-1.3	V	
Input capacitance (Common Source)	$C_{iss}$	$V_{DS} = 20V$ , $V_{GS} = 0$ , $f = 1MHz$		350		pF	
Output capacitance (Common Source)	$C_{oss}$				60		pF
Reverse transfer capacitance (Common Source)	$C_{rss}$				25		pF
Turn-on time (delay time)	$t_{d(on)}$	$V_{GS} = 10V$ , $I_D = 1A$		15		ns	
Rise time	$t_r$		$V_{DD} = 200V$ , $R_L = 200\Omega$		20		ns
Fall time	$t_f$					25	
Turn-off time (delay time)	$t_{d(off)}$			60		ns	
Thermal resistance between channel and case	$R_{th(ch-c)}$				3.125	$^\circ C/W$	



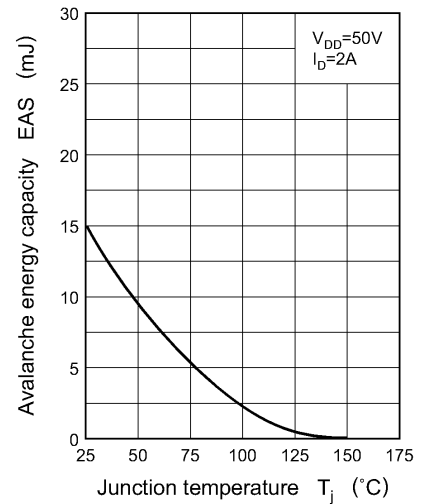
Area of safe operation (ASO)



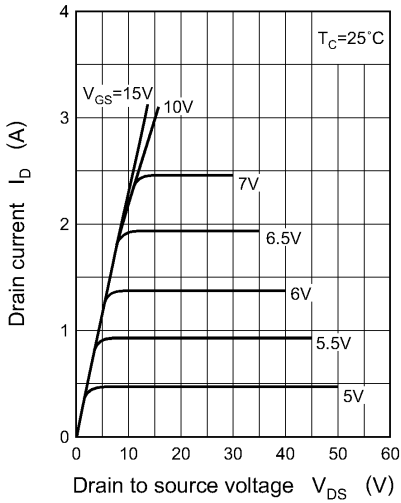
$P_D$  —  $T_a$



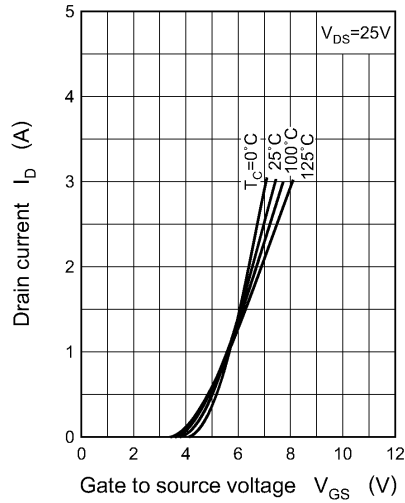
EAS —  $T_j$



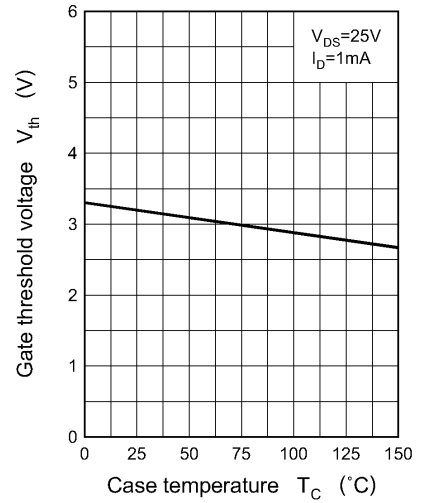
$I_D$  —  $V_{DS}$



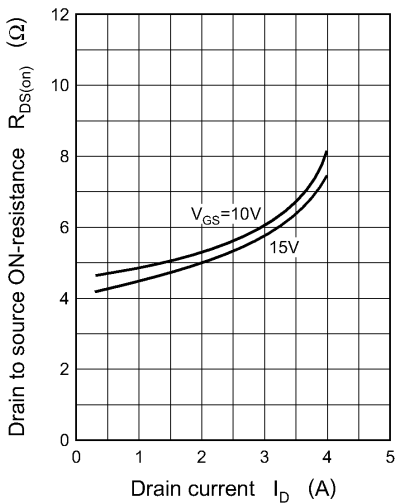
$I_D$  —  $V_{GS}$



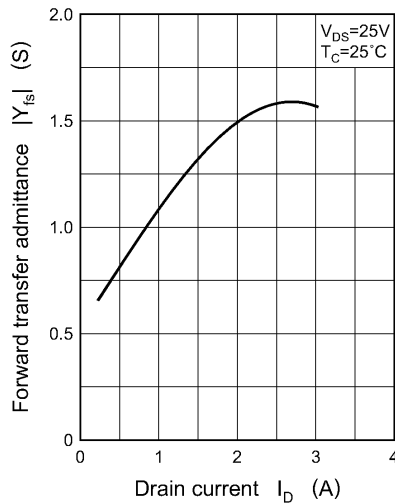
$V_{th}$  —  $T_C$



$R_{DS(on)}$  —  $I_D$



$|Y_{fs}|$  —  $I_D$



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

