

SWITCHING
N-CHANNEL POWER MOS FET
INDUSTRIAL USE

DESCRIPTION

The 2SK2275 is N-channel Power MOS Field Effect Transistor designed for high voltage switching applications.

FEATURES

- Low On-state Resistance
 $R_{DS(on)} = 2.8 \Omega \text{ MAX. (} V_{GS} = 10 \text{ V, } I_D = 2.0 \text{ A)}$
- Low C_{iss} $C_{iss} = 1\ 000 \text{ pF TYP.}$
- High Avalanche Capability Ratings

ABSOLUTE MAXIMUM RATINGS ($T_A = 25 \text{ }^\circ\text{C}$)

Drain to Source Voltage	V_{DSS}	900	V
Gate to Source Voltage	V_{GSS}	± 30	V
Drain Current (DC)	$I_D \text{ (DC)}$	± 3.5	A
Drain Current (pulse)	$I_D \text{ (pulse)}^*$	± 14	A
Total Power Dissipation ($T_C = 25 \text{ }^\circ\text{C}$)	P_{T1}	35	W
Total Power Dissipation ($T_a = 25 \text{ }^\circ\text{C}$)	P_{T2}	2.0	W
Storage Temperature	T_{stg}	-55 to +150	$^\circ\text{C}$
Channel Temperature	T_{ch}	150	$^\circ\text{C}$
Single Avalanche Current	I_{AS}^{**}	3.5	A
Single Avalanche Energy	E_{AS}^{**}	22	mJ

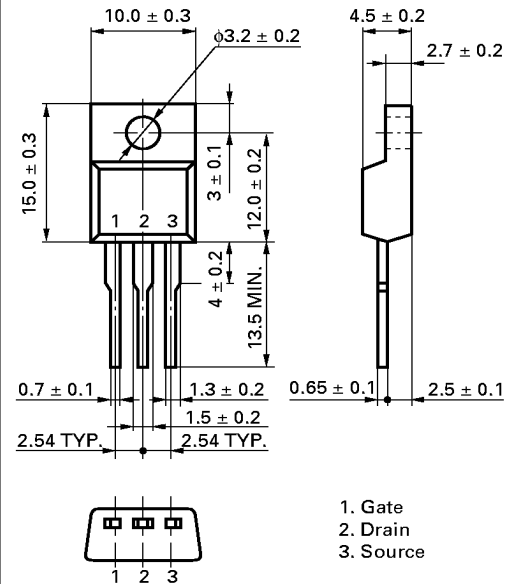
* $PW \leq 10 \mu\text{s}$, Duty Cycle $\leq 1\%$

**Starting $T_{ch} = 25 \text{ }^\circ\text{C}$, $R_G = 25 \Omega$, $V_{GS} = 20 \text{ V} \rightarrow 0$

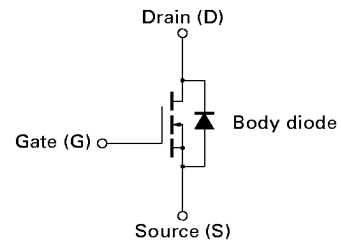
The diode connected between the gate and source of the transistor serves as a protector against ESD. When this device is actually used, an additional protection circuit is externally required if a voltage exceeding the rated voltage may be applied to this device.

PACKAGE DIMENSIONS

(in millimeters)



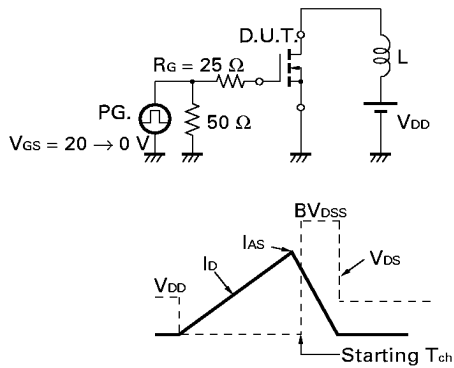
MP-45F (ISOLATED TO-220)



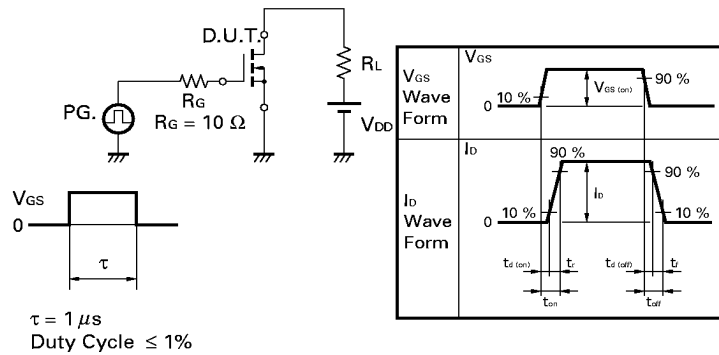
ELECTRICAL CHARACTERISTICS (T_A = 25 °C)

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Drain to Source On-state Resistance	R _{DS(on)}		2.2	2.8	Ω	V _{GS} = 10 V, I _D = 2 A
Gate to Source Cutoff Voltage	V _{GS(off)}	2.5		3.5	V	V _{DS} = 10 V, I _D = 1 mA
Forward Transfer Admittance	y _{fs}	1.0			S	V _{DS} = 20 V, I _D = 2 A
Drain Leakage Current	I _{DSS}			100	μA	V _{DS} = 900 V, V _{GS} = 0
Gate to Source Leakage Current	I _{GSS}			±10	μA	V _{GS} = ±30 V, V _{DS} = 0
Input Capacitance	C _{iss}		1 000		pF	V _{DS} = 10 V
Output Capacitance	C _{oss}		170		pF	V _{GS} = 0
Reverse Transfer Capacitance	C _{rss}		60		pF	f = 1 MHz
Turn-On Delay Time	t _{d(on)}		20		ns	V _{GS} = 10 V
Rise Time	t _r		20		ns	V _{DD} = 150 V
Turn-Off Delay Time	t _{d(off)}		90		ns	I _D = 2 A, R _G = 10 Ω
Fall Time	t _f		20		ns	R _L = 75 Ω
Total Gate Charge	Q _G		42		nC	V _{GS} = 10 V
Gate to Source Charge	Q _{GS}		6.0		nC	I _D = 3.5 A
Gate to Drain Charge	Q _{GD}		20		nC	V _{DD} = 450 V
Diode Forward Voltage	V _{F(S-D)}		0.9		V	I _F = 3.5 A, V _{GS} = 0
Reverse Recovery Time	t _{rr}		480		ns	I _F = 3.5 A
Reverse Recovery Charge	Q _{rr}		2.5		μC	di/dt = 50 A/μs

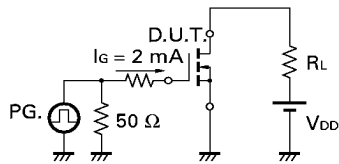
Test Circuit 1: Avalanche Capability



Test Circuit 2: Switching Time

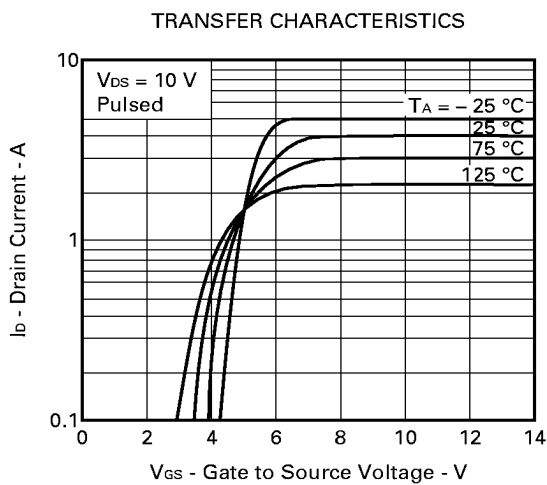
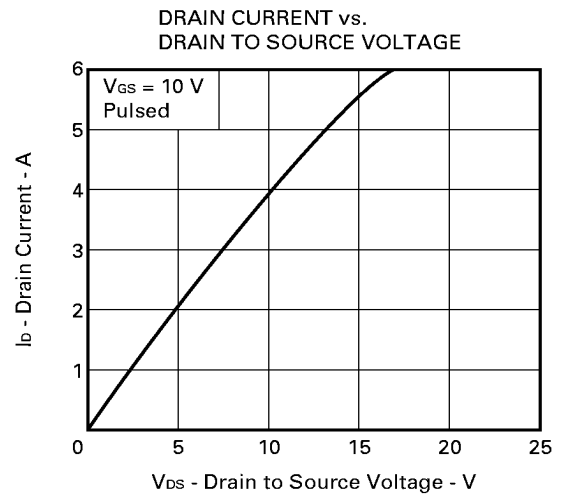
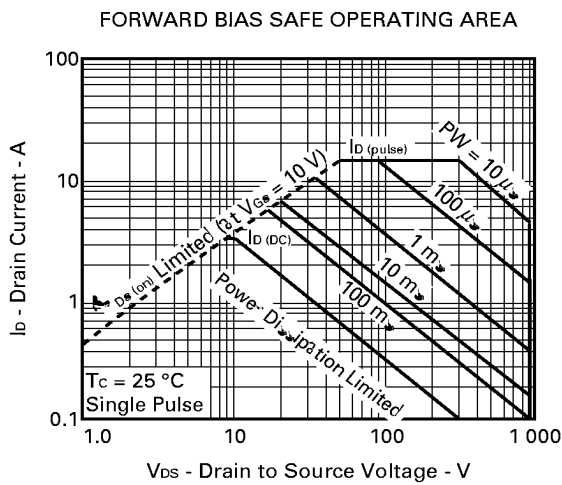
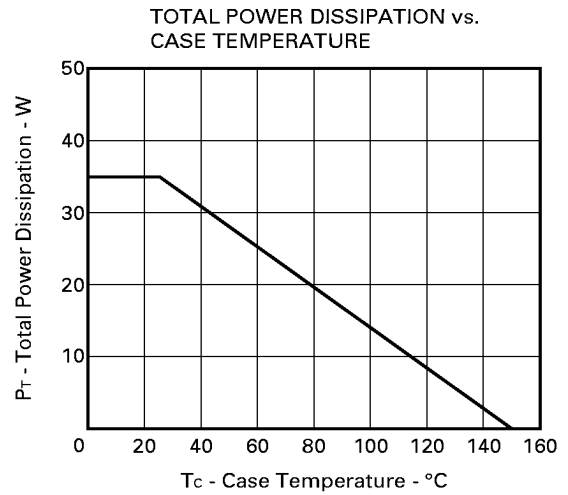
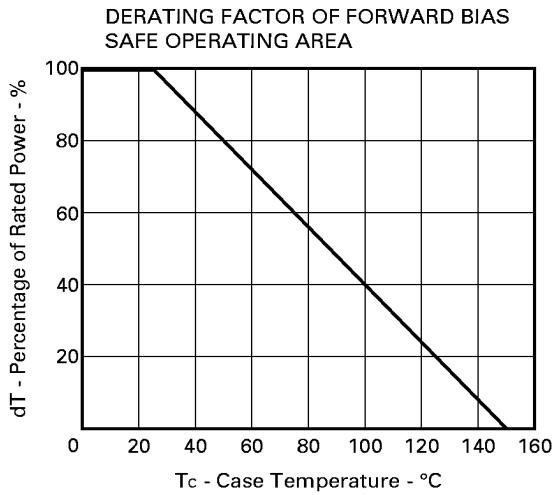


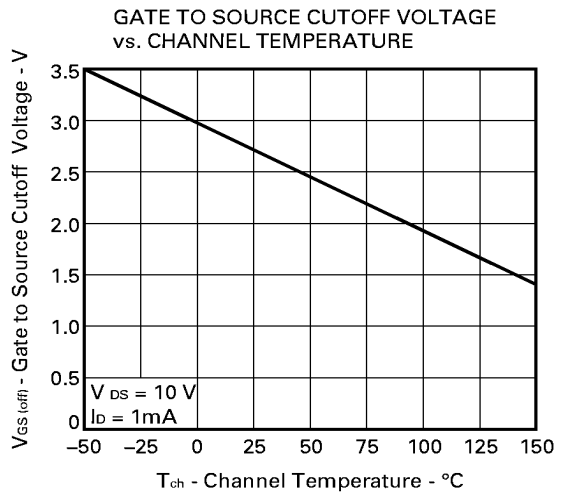
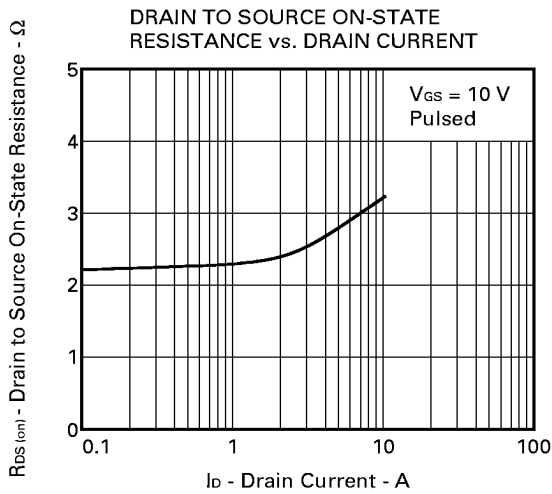
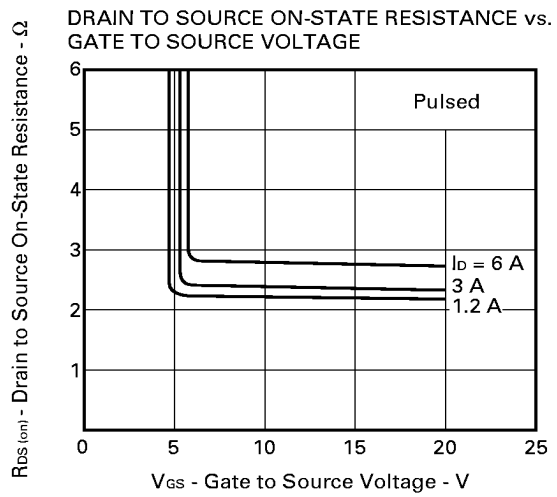
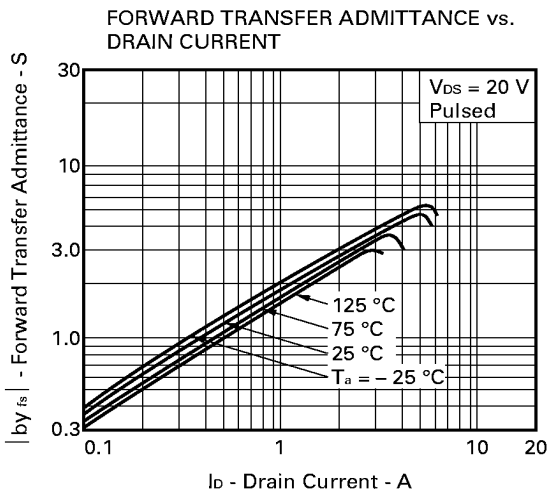
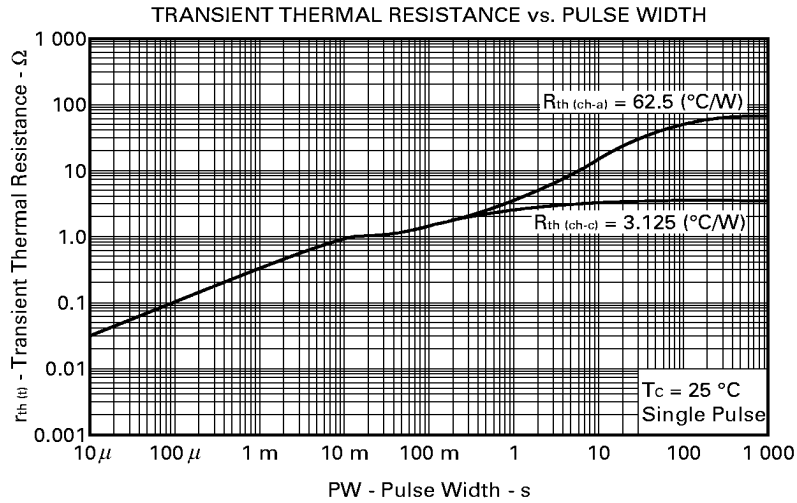
Test Circuit 3: Gate Charge

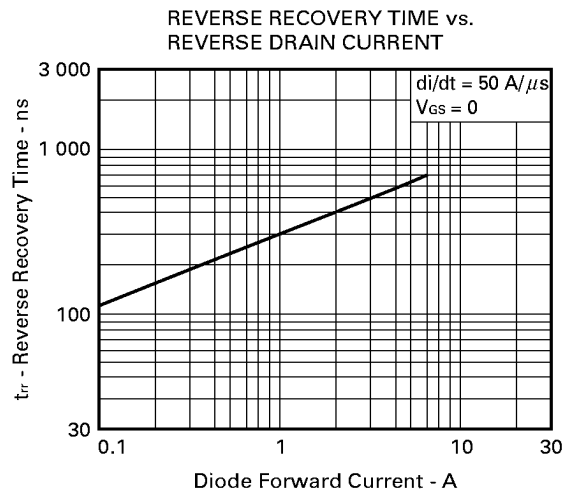
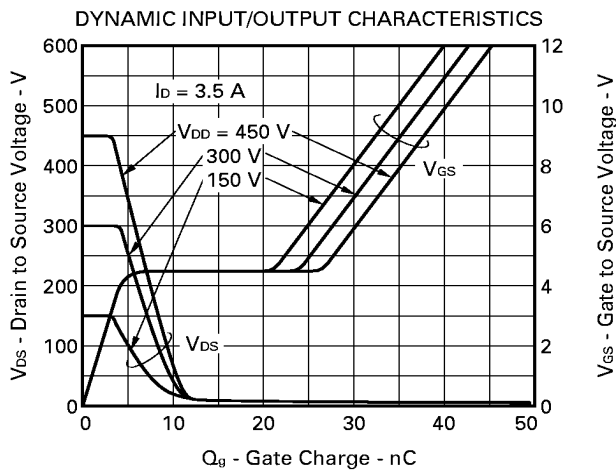
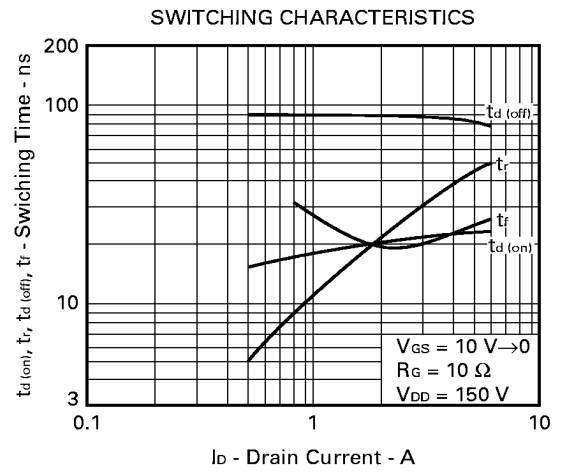
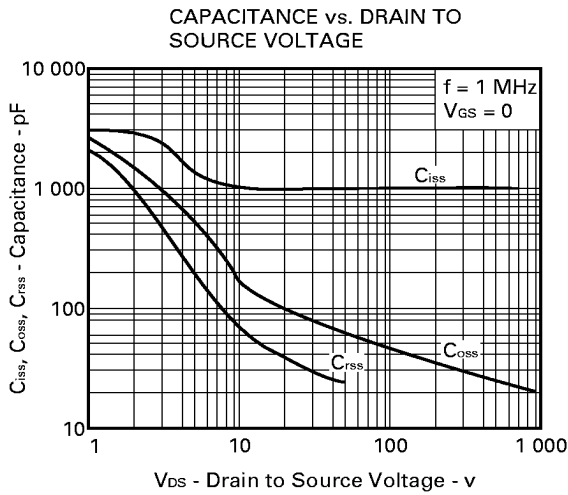
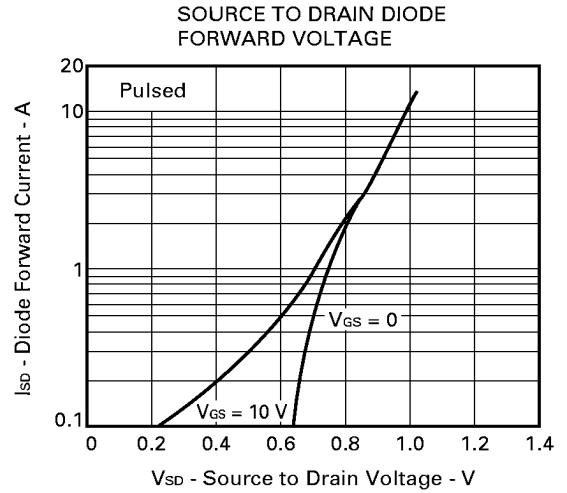
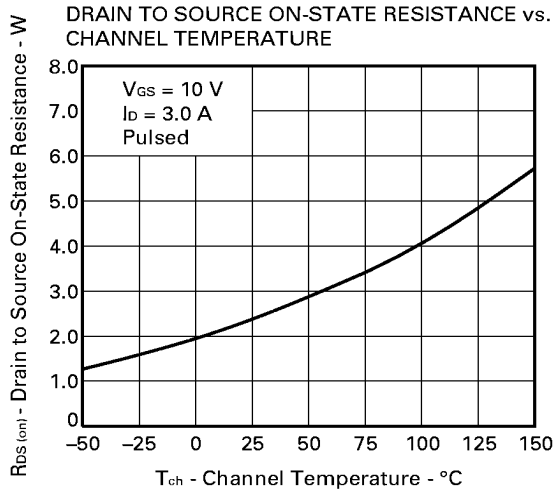


The application circuits and their parameters are for references only and are not intended for use in actual design-in's.

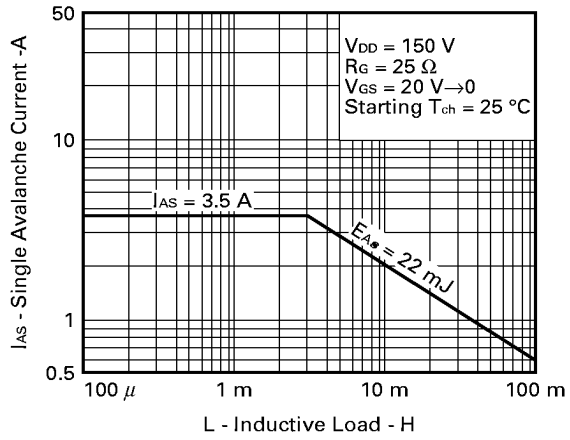
TYPICAL CHARACTERISTICS (T_A = 25 °C)







SINGLE AVALANCHE CURRENT vs. INDUCTIVE LOAD



SINGLE AVALANCHE ENERGY vs. STARTING CHANNEL TEMPERATURE

