

MOS FIELD EFFECT TRANSISTOR

2SK2137

SWITCHING N-CHANNEL POWER MOS FET INDUSTRIAL USE

DESCRIPTION

The 2SK2137 is N-Channel MOS Field Effect Transistor designed for high voltage switching applications.

FEATURES

- Low On-Resistance
2SK2137: $R_{DS(on)} = 2.4 \Omega$ ($V_{GS} = 10 \text{ V}$, $I_D = 2.0 \text{ A}$)
- Low C_{iss} $C_{iss} = 550 \text{ pF TYP.}$
- High Avalanche Capability Ratings
- Isolate TO-220 Package

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

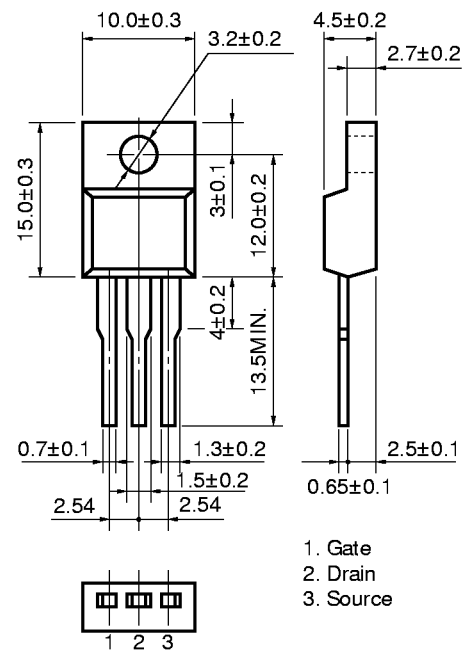
Drain to Source Voltage	V_{DSS}	600	V
Gate to Source Voltage	V_{GSS}	± 30	V
Drain Current (DC)	$I_{D(DC)}$	± 4.0	A
Drain Current (pulse)*	$I_{D(pulse)}$	± 16	A
Total Power Dissipation ($T_c = 25^\circ\text{C}$)	P_{T1}	30	W
Total Power Dissipation ($T_A = 25^\circ\text{C}$)	P_{T2}	2.0	W
Channel Temperature	T_{ch}	150	$^\circ\text{C}$
Storage Temperature	T_{stg}	-55 to $+150$	$^\circ\text{C}$
Single Avalanche Current**	I_{AS}	4.0	A
Single Avalanche Energy**	E_{AS}	5.3	mJ

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

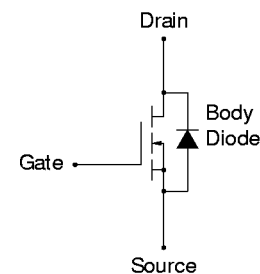
** Starting $T_{ch} = 25^\circ\text{C}$, $R_G = 25 \Omega$, $V_{GS} = 20 \text{ V} \rightarrow 0$

PACKAGE DIMENSIONS

(in millimeters)



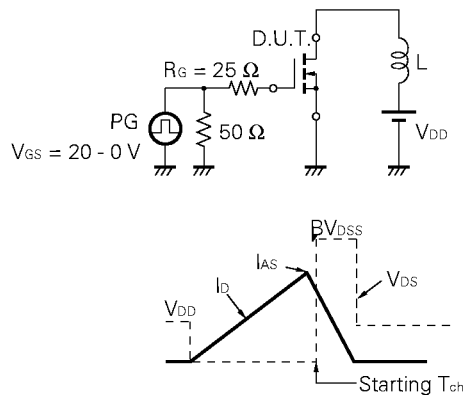
MP-45F (ISOLATED TO-220)



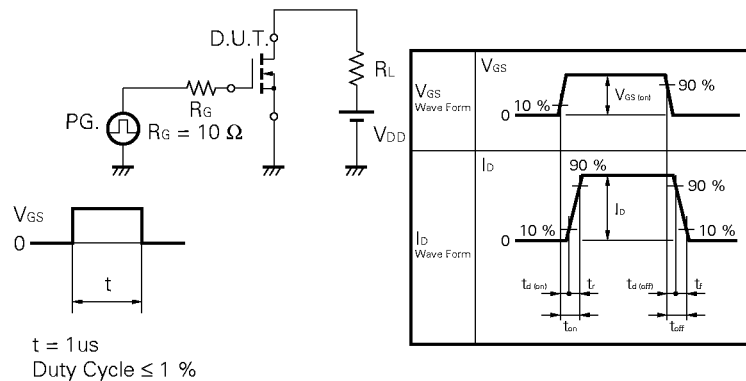
ELECTRICAL CHARACTERISTICS (T_A = 25 °C)

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Drain to Source On-State Resistance	R _{DS(on)}		1.7	2.4	Ω	V _{GS} = 10 V, I _D = 2.0 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} = 10 V, I _D = 2.0 A
Drain Leakage Current	I _{DSS}			100	μA	V _{DS} = V _{DSS} , V _{GS} = 0
Gate to Source Leakage Current	I _{GSS}			±100	nA	V _{GS} = ±30 V, V _{DS} = 0
Input Capacitance	C _{iss}		550		pF	V _{DS} = 10 V
Output Capacitance	C _{oss}		130		pF	V _{GS} = 0
Reverse Transfer Capacitance	C _{rss}		25		pF	f = 1 MHz
Turn-On Delay Time	t _{d(on)}		11		ns	I _D = 2.0 A
Rise Time	t _r		6		ns	V _{GS(on)} = 10 V
Turn-Off Delay Time	t _{d(off)}		45		ns	V _{DD} = 150 V
Fall Time	t _f		7		ns	R _G = 10 Ω R _L = 75 Ω
Total Gate Charge	Q _G		20		nC	I _D = 4.0 A
Gate to Source Charge	Q _{GS}		4		nC	V _{DD} = 480 V
Gate to Drain Charge	Q _{GD}		10		nC	V _{GS} = 10 V
Body Diode Forward Voltage	V _{F(S-D)}		1.0		V	I _F = 4.0 A, V _{GS} = 0
Reverse Recovery Time	t _{rr}		320		ns	I _F = 4.0 A, V _{GS} = 0
Reverse Recovery Charge	Q _{rr}		1.2		μC	di/dt = 50 A/μs

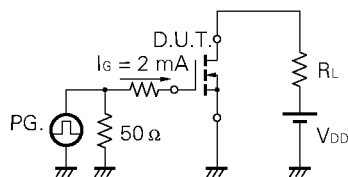
Test Circuit 1 Avalanche Capability



Test Circuit 2 Switching Time

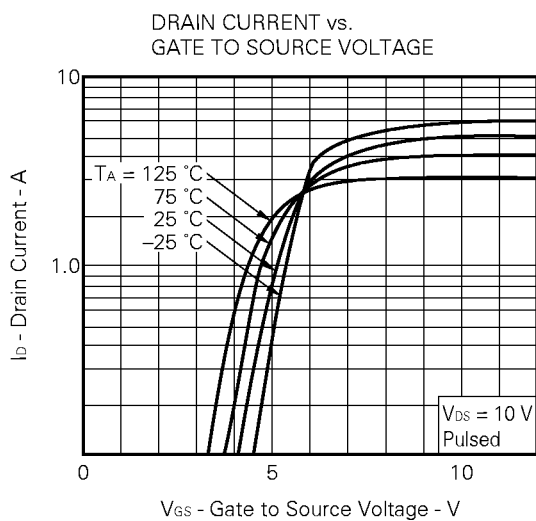
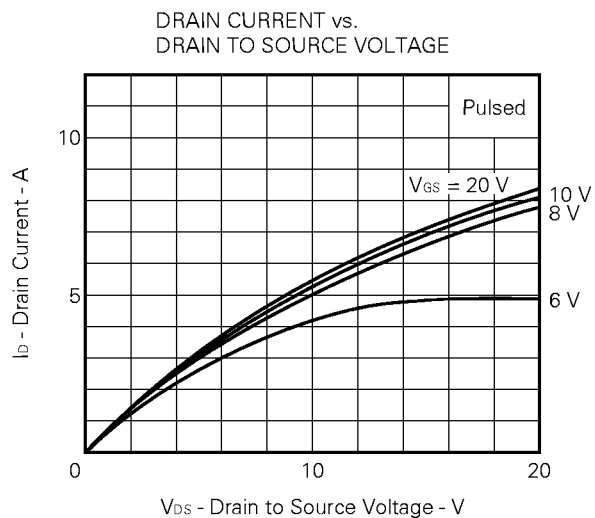
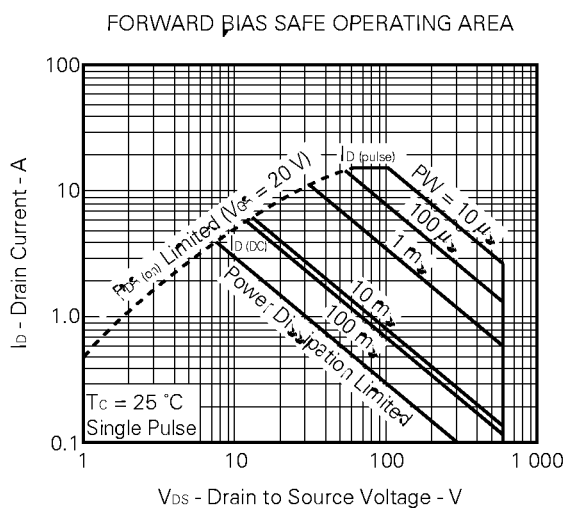
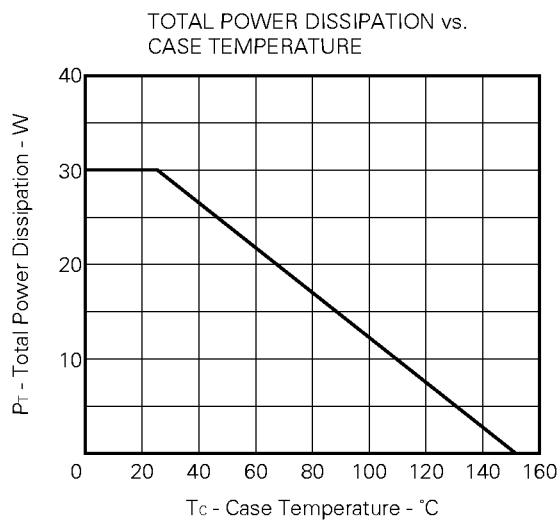
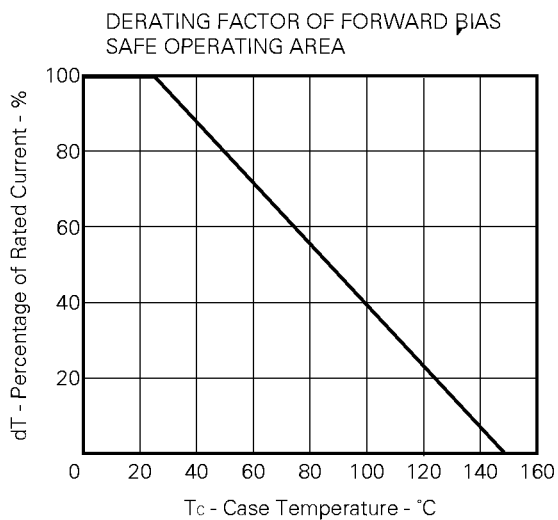


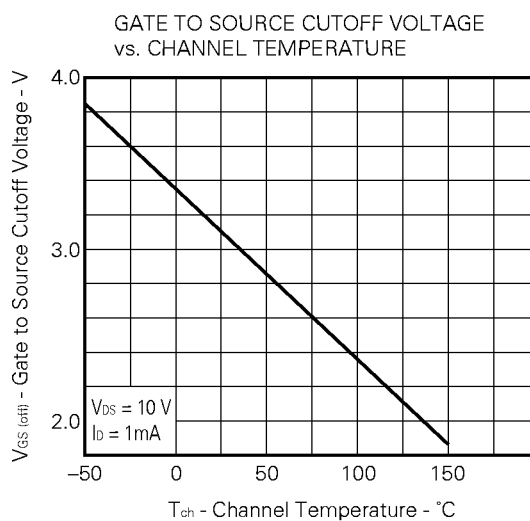
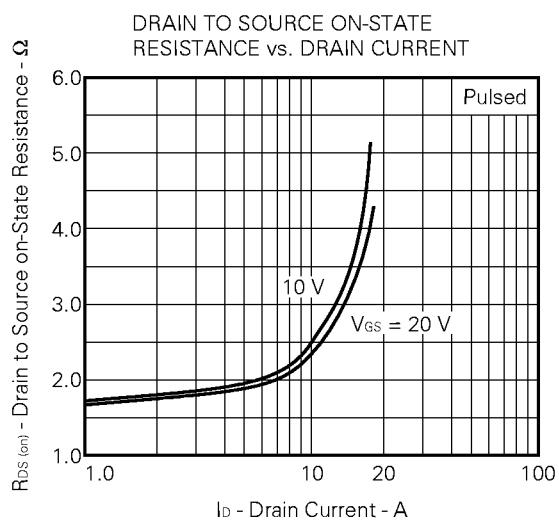
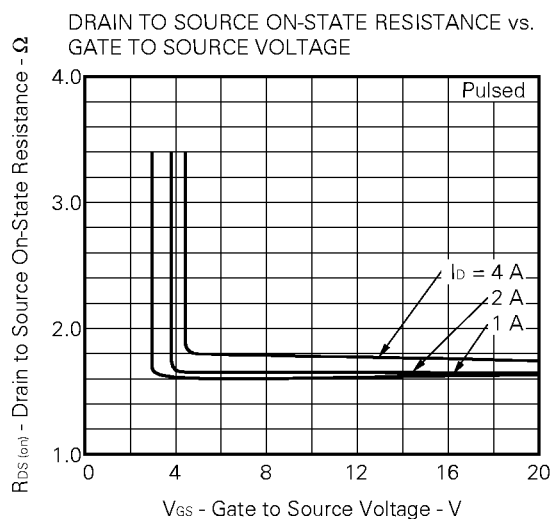
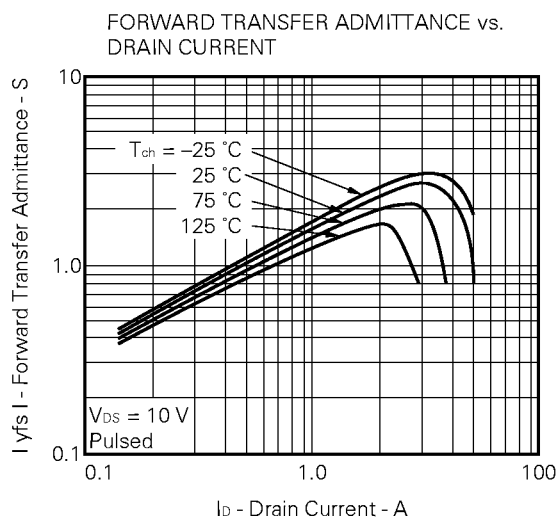
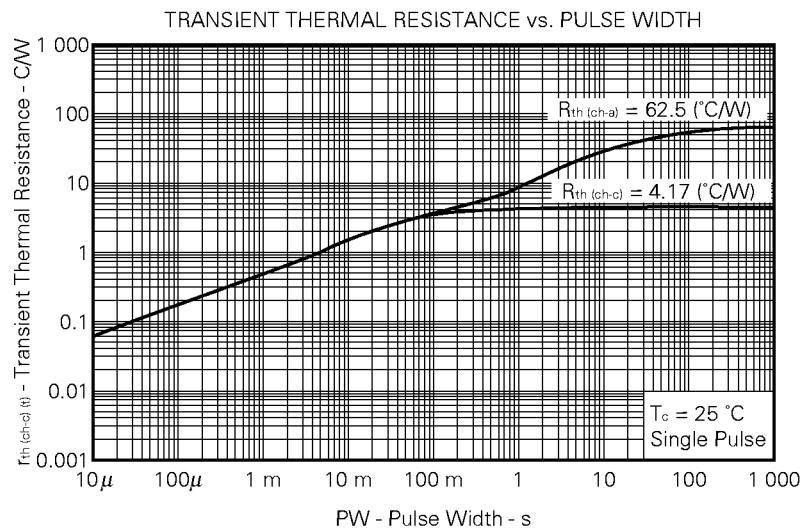
Test Circuit 3 Gate Charge



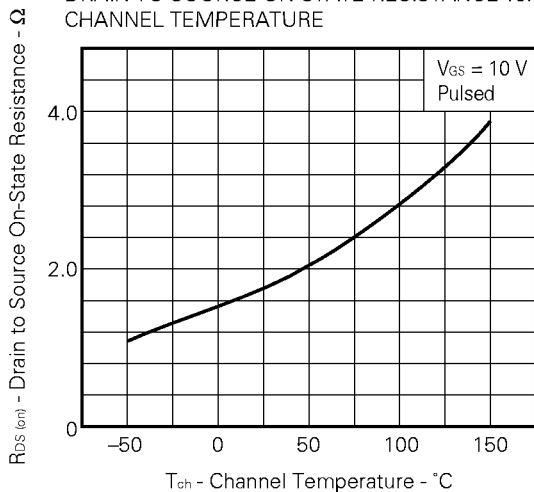
The application circuits and their parameters are for references only and are not intended for use in actual design-in's.

TYPICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$)

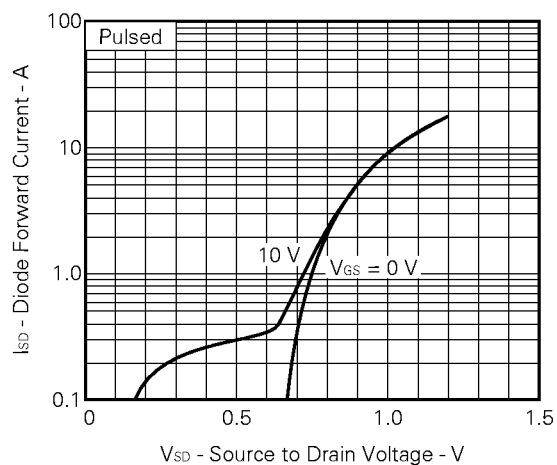




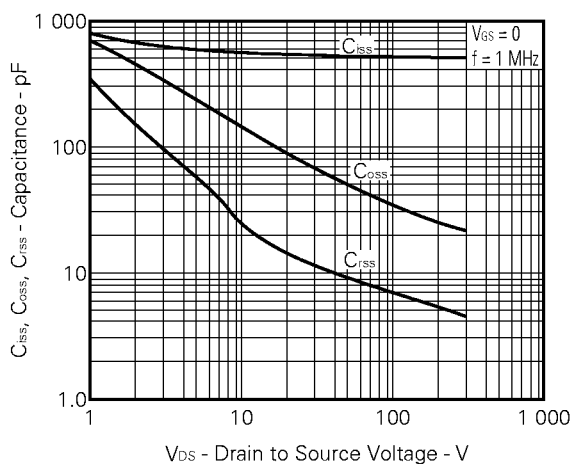
DRAIN TO SOURCE ON-STATE RESISTANCE vs. CHANNEL TEMPERATURE



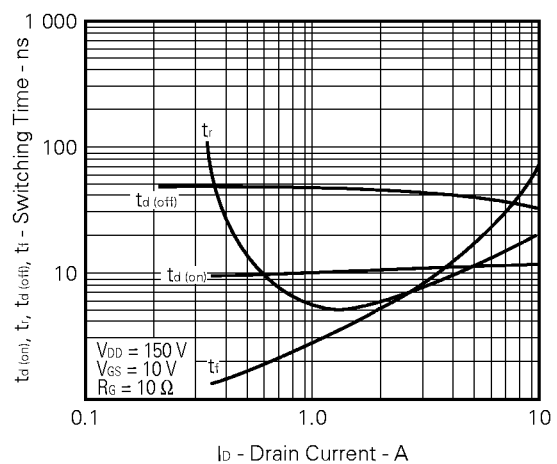
SOURCE TO DRAIN DIODE FORWARD VOLTAGE



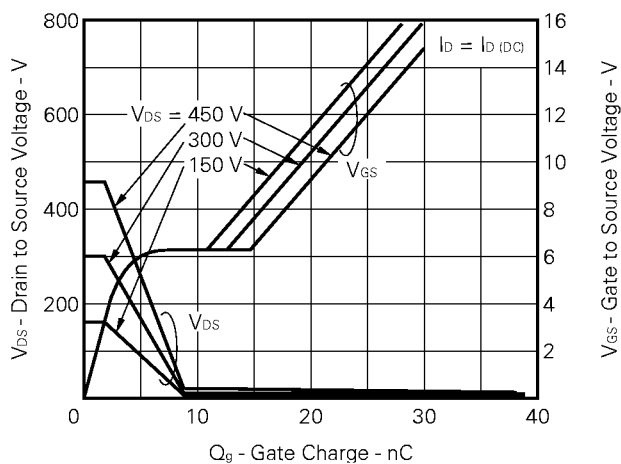
CAPACITANCE vs. DRAIN TO SOURCE VOLTAGE



SWITCHING CHARACTERISTICS



DYNAMIC INPUT CHARACTERISTICS



REVERSE RECOVERY TIME vs. DRAIN CURRENT

