

MOS FIELD EFFECT TRANSISTOR

2SK2415, 2SK2415-Z

SWITCHING N-CHANNEL POWER MOS FET INDUSTRIAL USE

DESCRIPTION

The 2SK2415 is N-Channel MOS Field Effect Transistor designed for high voltage switching applications.

FEATURES

- Low On-Resistance
 $R_{DS(on)1} = 0.10 \Omega \text{ MAX. (@ } V_{GS} = 10 \text{ V, } I_D = 4.0 \text{ A)}$
 $R_{DS(on)2} = 0.15 \Omega \text{ MAX. (@ } V_{GS} = 4 \text{ V, } I_D = 4.0 \text{ A)}$
- Low C_{iss} $C_{iss} = 570 \text{ pF TYP.}$

QUALITY GRADE

Standard

Please refer to "Quality grade on NEC Semiconductor Devices" (Document number IEI-1209) published by NEC Corporation to know the specification of quality grade on the devices and its recommended applications.

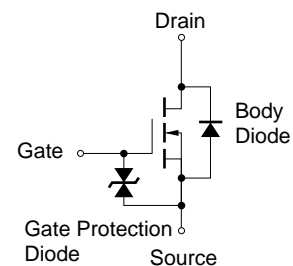
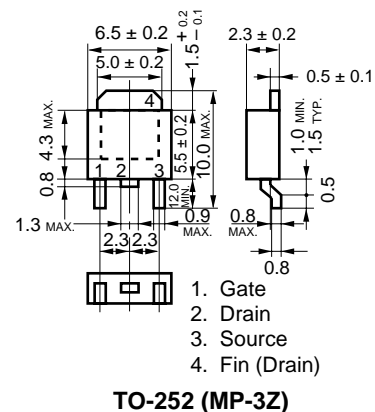
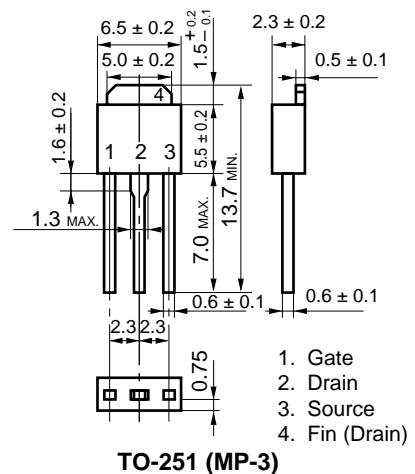
ABSOLUTE MAXIMUM RATINGS ($T_A = 25 \text{ }^\circ\text{C}$)

Drain to Source Voltage	V_{DSS}	60	V
Gate to Source Voltage	V_{GSS}	± 20	V
Drain Current (DC)	$I_{D(DC)}$	± 8.0	A
Drain Current (pulse)*	$I_{D(pulse)}$	± 32	A
Total Power Dissipation ($T_c = 25 \text{ }^\circ\text{C}$)	P_{T1}	20	W
Total Power Dissipation ($T_a = 25 \text{ }^\circ\text{C}$)	P_{T2}	1.0	W
Channel Temperature	T_{ch}	150	$^\circ\text{C}$
Storage Temperature	T_{stg}	-55 to +150	$^\circ\text{C}$
Single Avalanche Current**	I_{AS}	8.0	A
Single Avalanche Energy**	E_{AS}	6.4	mJ

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

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

PACKAGE DIMENSIONS (in millimeters)

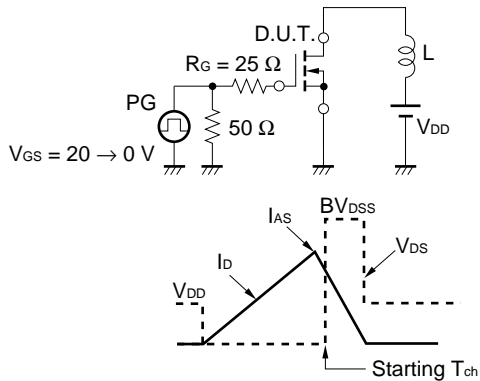


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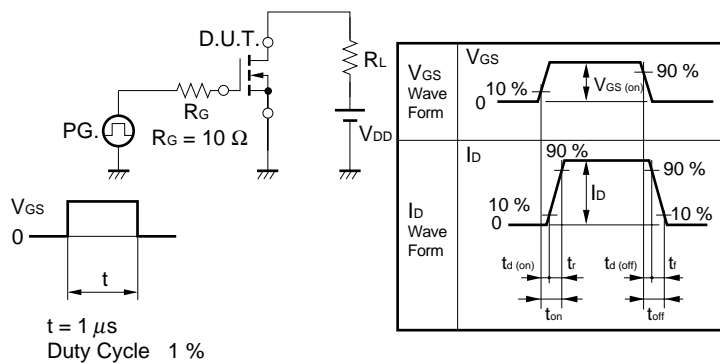
ELECTRICAL CHARACTERISTICS (Ta = 25 °C)

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Drain to Source On-State Resistance	$R_{DS(on)1}$		0.07	0.10	Ω	$V_{GS} = 10\text{ V}, I_D = 4.0\text{ A}$
Drain to Source On-State Resistance	$R_{DS(on)2}$		0.10	0.15	Ω	$V_{GS} = 4\text{ V}, I_D = 4.0\text{ A}$
Gate to Source Cutoff Voltage	$V_{GS(off)}$	1.0	1.6	2.0	V	$V_{DS} = 10\text{ V}, I_D = 1\text{ mA}$
Forward Transfer Admittance	$ y_{fs} $	5.0	8.4		S	$V_{DS} = 10\text{ V}, I_D = 4.0\text{ A}$
Drain Leakage Current	I_{DSS}			10	μA	$V_{DS} = 60\text{ V}, V_{GS} = 0$
Gate to Source Leakage Current	I_{GSS}			± 10	μA	$V_{GS} = \pm 20\text{ V}, V_{DS} = 0$
Input Capacitance	C_{iss}		570		pF	$V_{DS} = 10\text{ V}$
Output Capacitance	C_{oss}		290		pF	$V_{GS} = 0$
Reverse Transfer Capacitance	C_{rss}		75		pF	$f = 1\text{ MHz}$
Turn-On Delay Time	$t_{d(on)}$		5		ns	$I_D = 4.0\text{ A}$
Rise Time	t_r		60		ns	$V_{GS(on)} = 10\text{ V}$
Turn-Off Delay Time	$t_{d(off)}$		75		ns	$V_{DD} = 30\text{ V}$
Fall Time	t_f		40		ns	$R_G = 10\ \Omega$
Total Gate Charge	Q_G		21		nC	$I_D = 8.0\text{ A}$
Gate to Source Charge	Q_{GS}		2.0		nC	$V_{DD} = 48\text{ V}$
Gate to Drain Charge	Q_{GD}		6.5		nC	$V_{GS} = 10\text{ V}$
Body Diode Forward Voltage	$V_{F(S-D)}$		1.0		V	$I_F = 8.0\text{ A}, V_{GS} = 0$
Reverse Recovery Time	t_{rr}		85		ns	$I_F = 8.0\text{ A}, V_{GS} = 0$
Reverse Recovery Charge	Q_{rr}		200		nC	$di/dt = 100\text{ A}/\mu\text{s}$

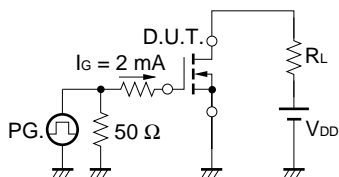
Test Circuit 1 Avalanche Capability



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.