

MOS FIELD EFFECT TRANSISTOR

2SK3430

SWITCHING N-CHANNEL POWER MOS FET INDUSTRIAL USE

DESCRIPTION

The 2SK3430 is N-channel MOS Field Effect Transistor designed for high current switching applications.

FEATURES

- Super low on-state resistance:
- $R_{DS(on)1} = 7.3 \, m\Omega \, MAX. \, (V_{GS} = 10 \, V, \, I_{D} = 40 \, A)$
- $R_{DS(on)2} = 15 \, m\Omega \, MAX. \, (V_{GS} = 4 \, V, \, I_{D} = 40 \, A)$
- Low Ciss: Ciss = 2800 pF TYP.
 - Built-in gate protection diode

ABSOLUTE MAXIMUM RATINGS ($T_A = 25$ °C)

	Drain to Source Voltage	VDSS	40	V
	Gate to Source Voltage	Vgss	±20	V
	Drain Current (DC)	I _{D(DC)}	±80	Α
	Drain Current (pulse) Note1	D(pulse)	±200	Α
	Total Power Dissipation (Tc = 25°C)	PT	84	W
	Total Power Dissipation (T _A = 25°C)	PT	1.5	W
	Channel Temperature	T_ch	150	°C
	Storage Temperature	T_{stg}	-55 to +150	°C
*	Single Avalanche Current Note2	las	37	Α
*	Single Avalanche Energy Note2	Eas	137	mJ

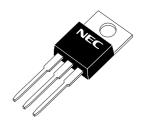
Notes 1. PW \leq 10 μ s, Duty cycle \leq 1 %

2. Starting T_{ch} = 25 °C, R_G = 25 Ω , V_{GS} = 20 V \rightarrow 0 V

ORDERING INFORMATION

PART NUMBER	PACKAGE		
2SK3430	TO-220AB		
2SK3430-S	TO-262		
2SK3430-Z	TO-220SMD		

(TO-220AB)



(TO-262)



(TO-220SMD)



THERMAL RESISTANCE

Channel to Case	Rth(ch-C)	1.49	°C/W
Channel to Ambient	Rth(ch-A)	83.3	°C/W

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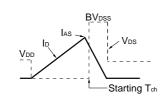


ELECTRICAL CHARACTERISTICS (TA = 25 °C)

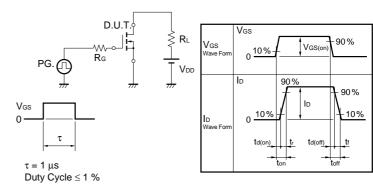
	CHARACTERISTICS	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
*	Drain to Source On-state Resistance	RDS(on)1	Vgs = 10 V, Ib = 40 A		5.9	7.3	mΩ
*		RDS(on)2	Vgs = 4 V, ID = 40 A		10.5	15	mΩ
	Gate to Source Cut-off Voltage	V _{GS(off)}	V _{DS} = 10 V, I _D = 1 mA	1.5	2.0	2.5	V
	Forward Transfer Admittance	yfs	V _{DS} = 10 V, I _D = 40 A	20	40		S
	Drain Leakage Current	Ioss	V _{DS} = 40 V, V _{GS} = 0 V			10	μΑ
	Gate to Source Leakage Current	Igss	Vgs = ±20 V, Vps = 0 V			±10	μΑ
*	Input Capacitance	Ciss	V _{DS} = 10 V, V _{GS} = 0 V, f = 1 MHz		2800		pF
	Output Capacitance	Coss			730		pF
*	Reverse Transfer Capacitance	Crss			320		pF
*	Turn-on Delay Time	td(on)	$I_D = 40 \text{ A}, V_{GS(on)} = 10 \text{ V}, V_{DD} = 20 \text{ V},$		110		ns
*	Rise Time	tr	R _G = 10 Ω		1800		ns
*	Turn-off Delay Time	td(off)			170		ns
*	Fall Time	t f			350		ns
	Total Gate Charge	Q _G	$I_D = 80 A$, $V_{DD} = 32 V$, $V_{GS} = 10 V$		50		nC
*	Gate to Source Charge	Qgs			10		nC
*	Gate to Drain Charge	Q _{GD}			14		nC
	Body Diode Forward Voltage	V _{F(S-D)}	IF = 80 A, VGS = 0 V		1.0		V
*	Reverse Recovery Time	trr	IF = 80 A, VGS = 0 V,		50		ns
*	Reverse Recovery Charge	Qrr	$di/dt = 100 A/\mu s$		77		nC

TEST CIRCUIT 1 AVALANCHE CAPABILITY

$\begin{array}{c|c} D.U.T. \\ \hline R_G = 25 \ \Omega \\ \hline V_{GS} = 20 \rightarrow 0 \ V \end{array} \begin{array}{c} D.U.T. \\ \hline \\ \hline \\ V_{DD} \end{array}$



TEST CIRCUIT 2 SWITCHING TIME

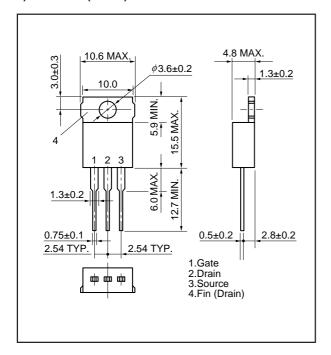


TEST CIRCUIT 3 GATE CHARGE

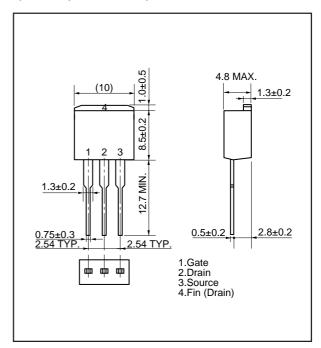


PACKAGE DRAWINGS (Unit: mm)

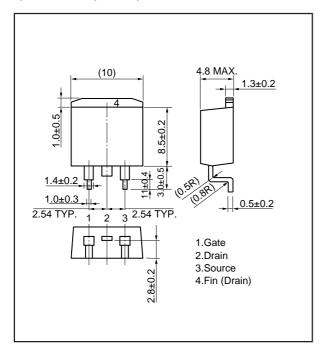
1) TO-220AB (MP-25)



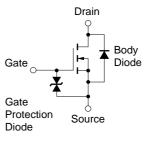
2) TO-262 (MP-25 Fin Cut)



3) TO-220SMD (MP-25Z)



EQUIVALENT CIRCUIT



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

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