

TOSHIBA FIELD EFFECT TRANSISTOR SILICON N CHANNEL MOS TYPE ( $\pi$ -MOSII<sup>5</sup>)

# 2SK1930

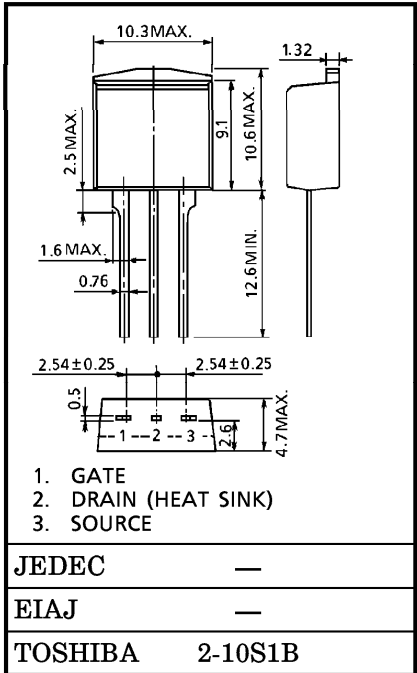
HIGH SPEED, HIGH CURRENT SWITCHING APPLICATIONS  
 CHOPPER REGULATOR, DC-DC CONVERTER AND MOTOR DRIVE APPLICATIONS

INDUSTRIAL APPLICATIONS  
 TO-220FL Unit in mm

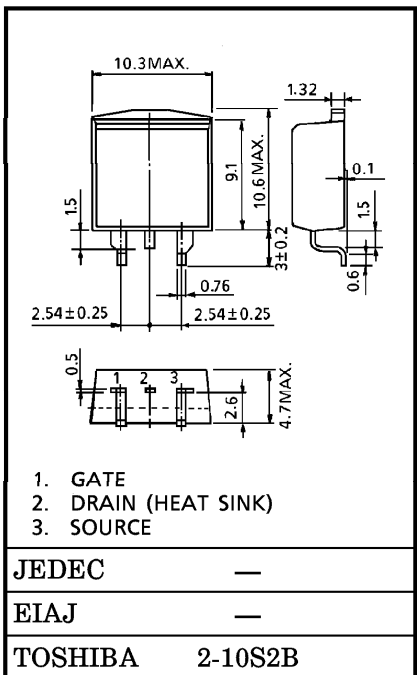
- Low Drain-Source ON Resistance :  $R_{DS(ON)} = 3.0 \Omega$  (Typ.)
- High Forward Transfer Admittance :  $|Y_{fs}| = 2.0 S$  (Typ.)
- Low Leakage Current :  $I_{DSS} = 300 \mu A$  (Max.) ( $V_{DS} = 800 V$ )
- Enhancement-Mode :  $V_{th} = 1.5 \sim 3.5 V$   
 ( $V_{DS} = 10 V, I_D = 1 mA$ )

MAXIMUM RATINGS ( $T_a = 25^\circ C$ )

CHARACTERISTIC		SYMBOL	RATING	UNIT
Drain-Source Voltage		$V_{DSS}$	1000	V
Drain-Gate Voltage ( $R_{GS} = 20 k\Omega$ )		$V_{DGR}$	1000	V
Gate-Source Voltage		$V_{GSS}$	$\pm 20$	V
Drain Current	DC	$I_D$	4	A
	Pulse	$I_{DP}$	12	
Drain Power Dissipation ( $T_c = 25^\circ C$ )		$P_D$	80	W
Channel Temperature		$T_{ch}$	150	$^\circ C$
Storage Temperature Range		$T_{stg}$	$-55 \sim 150$	$^\circ C$



TO-220SM



Weight : 1.5 g

THERMAL CHARACTERISTICS

CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance, Channel to Case	$R_{th(ch-c)}$	1.56	$^\circ C / W$
Thermal Resistance, Channel to Ambient	$R_{th(ch-a)}$	83.3	$^\circ C / W$

**This transistor is an electrostatic sensitive device.  
 Please handle with caution.**

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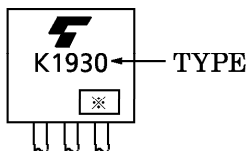
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		$I_{GSS}$	$V_{GS} = \pm 20\text{ V}, V_{DS} = 0\text{ V}$	—	—	$\pm 100$	nA
Drain Cut-off Current		$I_{DSS}$	$V_{DS} = 800\text{ V}, V_{GS} = 0\text{ V}$	—	—	300	$\mu\text{A}$
Drain-Source Breakdown Voltage		$V_{(BR)DSS}$	$I_D = 10\text{ mA}, V_{GS} = 0\text{ V}$	1000	—	—	V
Gate Threshold Voltage		$V_{th}$	$V_{DS} = 10\text{ V}, I_D = 1\text{ mA}$	1.5	—	3.5	V
Drain-Source ON Resistance		$R_{DS(ON)}$	$V_{GS} = 10\text{ V}, I_D = 2\text{ A}$	—	3.0	3.8	$\Omega$
Forward Transfer Admittance		$ Y_{fs} $	$V_{DS} = 20\text{ V}, I_D = 2\text{ A}$	1.0	2.0	—	S
Input Capacitance		$C_{iss}$	$V_{DS} = 25\text{ V}, V_{GS} = 0\text{ V},$ $f = 1\text{ MHz}$	—	700	—	pF
Reverse Transfer Capacitance		$C_{rss}$		—	55	—	
Output Capacitance		$C_{oss}$		—	100	—	
Switching Time	Rise Time	$t_r$	<p><math>V_{GS} = 10\text{ V}</math> <math>V_{GS} = 0\text{ V}</math> <math>I_D = 2\text{ A}</math> <math>V_{OUT}</math> <math>R_L = 200\ \Omega</math> <math>V_{DD} = 400\text{ V}</math></p>	—	18	—	ns
	Turn-on Time	$t_{on}$		—	30	—	
	Fall Time	$t_f$		—	12	—	
	Turn-off Time	$t_{off}$		$V_{IN} : t_r, t_f < 5\text{ ns},$ $Duty \leq 1\%, t_w = 10\ \mu\text{s}$	—	70	
Total Gate Charge (Gate-Source Plus Gate-Drain)		$Q_g$	$V_{DD} = 400\text{ V}, V_{GS} = 10\text{ V},$ $I_D = 4\text{ A}$	—	60	—	nC
Gate-Source Charge		$Q_{gs}$		—	35	—	
Gate-Drain ("Miller") Charge		$Q_{gd}$		—	25	—	

SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current	$I_{DR}$	—	—	—	4	A
Pulse Drain Reverse Current	$I_{DRP}$	—	—	—	12	A
Diode Forward Voltage	$V_{DSF}$	$I_{DR} = 4\text{ A}, V_{GS} = 0\text{ V}$	—	—	-1.9	V

MARKING



※ Lot Number

□ □ — Month (Starting from Alphabet A)

— Year (Last Number of the Christian Era)

