

TOSHIBA FIELD EFFECT TRANSISTOR SILICON N CHANNEL MOS TYPE (π -MOSII)**2SK1746**

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

- Low Drain-Source ON Resistance : $R_{DS(ON)} = 3.0\Omega$ (Typ.)
- High Forward Transfer Admittance : $|Y_{fs}| = 1.5S$ (Typ.)
- Low Leakage Current : $I_{DSS} = 300\mu A$ (Max.) @ $V_{DS} = 600V$
- Enhancement-Mode : $V_{th} = 2.0 \sim 4.0V$ @ $V_{DS} = 10V$, $I_D = 1mA$

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

CHARACTERISTIC		SYMBOL	RATING	UNIT
Drain-Source Voltage		V_{DS}	600	V
Drain-Gate Voltage ($R_{GS} = 20k\Omega$)		V_{DGR}	600	V
Gate-Source Voltage		V_{GSS}	± 30	V
Drain Current	DC	I_D	2	A
	Pulse	I_{DP}	8	
Drain Power Dissipation ($T_c = 25^\circ C$)		P_D	40	W
Channel Temperature		T_{ch}	150	$^\circ C$
Storage Temperature Range		T_{stg}	$-55 \sim 150$	$^\circ C$

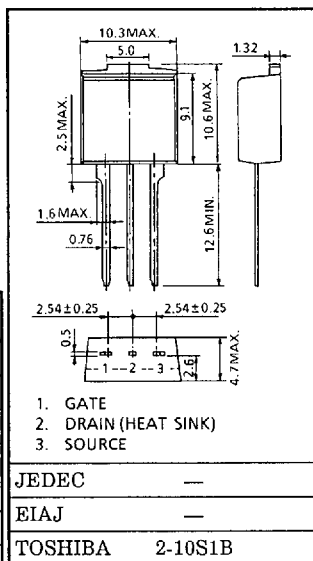
THERMAL CHARACTERISTICS

CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance, Channel to Case	$R_{th(ch-c)}$	3.12	$^\circ C/W$
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.

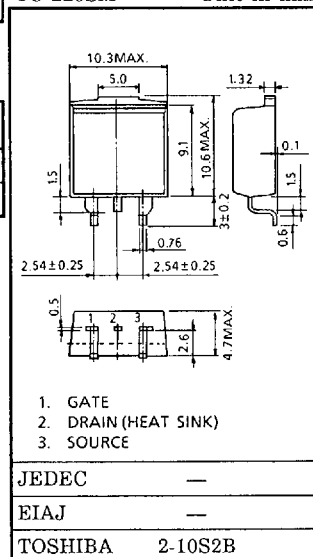
TO-220FL

Unit in mm



TO-220SM

Unit in mm

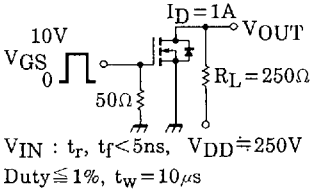


Weight : 1.5g

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ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		I_{GSS}	$V_{GS} = \pm 25\text{V}$, $V_{DS} = 0\text{V}$	—	—	± 100	nA
Drain Cut-off Current		I_{DSS}	$V_{DS} = 600\text{V}$, $V_{GS} = 0\text{V}$	—	—	300	μA
Drain-Source Breakdown Voltage		$V_{(BR)DSS}$	$I_D = 10\text{mA}$, $V_{GS} = 0\text{V}$	600	—	—	V
Gate Threshold Voltage		V_{th}	$V_{DS} = 10\text{V}$, $I_D = 1\text{mA}$	2.0	—	4.0	V
Drain-Source ON Resistance		$R_{DS(ON)}$	$I_D = 1\text{A}$, $V_{GS} = 10\text{V}$	—	3.0	4.0	Ω
Forward Transfer Admittance		$ Y_{fs} $	$V_{DS} = 10\text{V}$, $I_D = 1\text{A}$	1.0	1.5	—	S
Input Capacitance		C_{iss}	$V_{DS} = 10\text{V}$, $V_{GS} = 0\text{V}$, $f = 1\text{MHz}$	—	410	—	pF
Reverse Transfer Capacitance		C_{rss}		—	80	—	
Output Capacitance		C_{oss}		—	180	—	
Switching Time	Rise Time	t_r	 V_{GS} 10V 0V 50Ω $I_D = 1\text{A}$ V_{OUT} $R_L = 250\Omega$ V_{IN} : t_r, $t_f < 5\text{ns}$, $V_{DD} = 250\text{V}$ Duty $\leq 1\%$, $t_w = 10\mu\text{s}$	—	12	—	ns
	Turn-on Time	t_{on}		—	23	—	
	Fall Time	t_f		—	20	—	
	Turn-off Time	t_{off}		—	80	—	
Total Gate Charge (Gate-Source Plus Gate-Drain)		Q_g	$V_{DD} = 480\text{V}$, $V_{GS} = 10\text{V}$, $I_D = 2\text{A}$	—	12	—	nC
Gate-Source Charge		Q_{gs}		—	6	—	
Gate-Drain ("Miller") Charge		Q_{gd}		—	6	—	

SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current	I_{DR}	—	—	—	2	A
Pulse Drain Reverse Current	I_{DRP}	—	—	—	8	A
Diode Forward Voltage	V_{DSF}	$I_{DR} = 2\text{A}$, $V_{GS} = 0\text{V}$	—	—	-1.6	V
Reverse Recovery Time	t_{rr}	$I_{DR} = 2\text{A}$, $V_{GS} = 0\text{V}$	—	550	—	ns
Reverse Recovered Charge	Q_{rr}	$dI_{DR}/dt = 100\text{A}/\mu\text{s}$	—	1.1	—	μC

