

TOSHIBA FIELD EFFECT TRANSISTOR SILICON N CHANNEL MOS TYPE ( $\pi$ -MOSIII.5)

# 2SK2146

HIGH SPEED, HIGH CURRENT SWITCHING APPLICATIONS

CHOPPER REGULATOR, DC-DC CONVERTER AND MOTOR DRIVE APPLICATIONS

- Low Drain-Source ON Resistance :  $R_{DS(ON)}=1.2\Omega$  (Typ.)
- High Forward Transfer Admittance :  $|Y_{fs}|=1.4S$  (Typ.)
- Low Leakage Current :  $I_{DSS}=300\mu A$  (Max.) ( $V_{DS}=250V$ )
- 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		$V_{DSS}$	250	V
Drain-Gate Voltage ( $R_{GS}=20k\Omega$ )		$V_{DGR}$	250	V
Gate-Source Voltage		$V_{GSS}$	$\pm 30$	V
Drain Current	DC	$I_D$	2	A
	Pulse ( $t=1ms$ )	$I_{DP}$	5	A
	Pulse ( $t=100\mu s$ )		12	A
Drain Power Dissipation ( $T_c=25^\circ C$ )		$P_D$	25	W
Channel Temperature		$T_{ch}$	150	$^\circ C$
Storage Temperature Range		$T_{stg}$	$-55\sim 150$	$^\circ C$

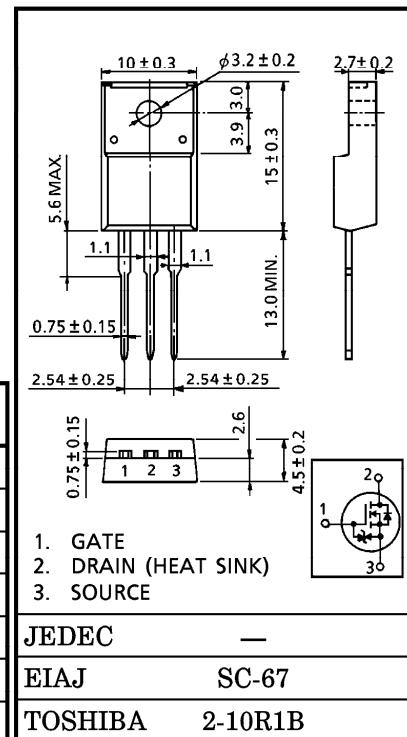
THERMAL CHARACTERISTICS

CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance, Channel to Case	$R_{th(ch-c)}$	5.0	$^\circ C/W$
Thermal Resistance, Channel to Ambient	$R_{th(ch-a)}$	62.5	$^\circ C/W$

THIS TRANSISTOR IS AN ELECTROSTATIC SENSITIVE DEVICE.  
PLEASE HANDLE WITH CAUTION.

INDUSTRIAL APPLICATIONS

Unit in mm



Weight : 1.9g

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ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		IGSS	VGS = ±30V, VDS = 0V	—	—	±100	nA
Drain Cut-off Current		IDSS	VDS = 250V, VGS = 0V	—	—	300	μA
Drain-Source Breakdown Voltage		V (BR) DSS	ID = 10mA, VGS = 0V	250	—	—	V
Gate Threshold Voltage		Vth	VDS = 10V, ID = 1mA	2.0	—	4.0	V
Drain-Source ON Resistance		RDS (ON)	VGS = 10V, ID = 1A	—	1.2	2.0	Ω
Forward Transfer Admittance		Yfs	VDS = 10V, ID = 1A	0.5	1.1	—	S
Input Capacitance		Ciss	VDS = 10V, VGS = 0V, f = 1MHz	—	220	—	pF
Reverse Transfer Capacitance		Crss		—	35	—	
Output Capacitance		Coss		—	80	—	
Switching Time	Rise Time	tr	<p>                     ID = 1A                      VGS = 10V, 0V                      RL = 150Ω                      VDD ≐ 150V                 </p>	—	25	—	ns
	Turn-on Time	ton		—	40	—	
	Fall Time	tf		—	30	—	
	Turn-off Time	t <sub>off</sub>		VIN : tr, tf < 5ns, Duty ≤ 1%, tw = 10μs	—	90	
Total Gate Charge (Gate-Source Plus Gate-Drain)		Qg	VDD ≐ 200V, VGS = 10V, ID = 2A	—	8	—	nC
Gate-Source Charge		Qgs		—	4	—	
Gate-Drain (“Miller”) Charge		Qgd		—	4	—	

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

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current	IDR	—	—	—	2	A
Pulse Drain Reverse Current	IDRP	t = 1ms	—	—	5	A
		t = 100μs	—	—	12	A
Diode Forward Voltage	VDSF	IDR = 2A, VGS = 0V	—	—	-1.5	V
Reverse Recovery Time	t <sub>rr</sub>	IDR = 2A, VGS = 0V	—	180	—	ns
Reverse Recovered Charge	Q <sub>rr</sub>	dIDR / dt = 100A / μs	—	0.61	—	μC

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