

TOSHIBA FIELD EFFECT TRANSISTOR SILICON N CHANNEL MOS TYPE (π -MOSIII.5)

2SK1865

HIGH SPEED, HIGH CURRENT SWITCHING APPLICATIONS.

CHOPPER REGULATOR, DC-DC CONVERTER AND MOTOR DRIVE APPLICATIONS.

- Low Drain-Source ON Resistance : $R_{DS(ON)} = 0.55\Omega$ (Typ.)
- High Forward Transfer Admittance : $|Y_{fs}| = 5.6S$ (Typ.)
- Low Leakage Current : $I_{DSS} = 300\mu A$ (Max.) ($V_{DS} = 500V$)
- 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}	500	V
Drain-Gate Voltage ($R_{GS} = 20k\Omega$)		V_{DGR}	500	V
Gate-Source Voltage		V_{GSS}	± 30	V
Drain Current	DC	I_D	12	A
	Pulse	I_{DP}	48	
Drain Power Dissipation ($T_c = 25^\circ C$)		P_D	100	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	$R_{th(ch-c)}$	1.25	$^\circ C / W$
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.

INDUSTRIAL APPLICATIONS

TO-220FL Unit in mm

1. GATE
2. DRAIN (HEAT SINK)
3. SOURCE

JEDEC	—
EIAJ	—
TOSHIBA	2-10S1B

TO-220SM

1. GATE
2. DRAIN (HEAT SINK)
3. SOURCE

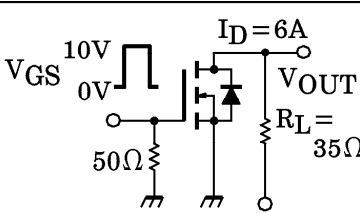
JEDEC	—
EIAJ	—
TOSHIBA	2-10S2B

Weight : 1.5g

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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 = 500V, VGS = 0V	—	—	300	μA
Drain-Source Breakdown Voltage		V(BR)DSS	ID = 10mA, VGS = 0V	500	—	—	V
Gate Threshold Voltage		Vth	VDS = 10V, ID = 1mA	2.0	—	4.0	V
Drain-Source ON Resistance		RDS(ON)	VGS = 10V, ID = 6A	—	0.55	0.70	Ω
Forward Transfer Admittance		Yfs	VDS = 10V, ID = 6A	4.0	5.6	—	S
Input Capacitance		Ciss	VDS = 10V, VGS = 0V, f = 1MHz	—	1100	—	pF
Reverse Transfer Capacitance		Crss		—	120	—	
Output Capacitance		Coss		—	310	—	
Switching Time	Rise Time	tr	 <p>VIN : tr, tf < 5ns, Duty ≤ 1%, tw = 10μs</p>	—	45	—	ns
	Turn-on Time	ton		—	90	—	
	Fall Time	tf		—	50	—	
	Turn-off Time	toff		—	140	—	
Total Gate Charge (Gate-Source Plus Gate-Drain)		Qg	VDD ≈ 400V, VGS = 10V, ID = 12A	—	40	—	nC
Gate-Source Charge		Qgs		—	15	—	
Gate-Drain ("Miller") Charge		Qgd		—	25	—	

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

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current	IDR	—	—	—	12	A
Pulse Drain Reverse Current	IDRP	—	—	—	48	A
Diode Forward Voltage	VDSF	IDR = 12A, VGS = 0V	—	—	-1.7	V
Reverse Recovery Time	trr	IDR = 12A, VGS = 0V	—	400	—	ns
Reverse Recovered Charge	Qrr	dIDR / dt = 100A / μs	—	4.4	—	μC

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