

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

2SK1858

HIGH SPEED, HIGH CURRENT SWITCHING APPLICATIONS.

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

- Low Drain-Source ON Resistance : $R_{DS(ON)}=4.3\Omega$ (Typ.)
- High Forward Transfer Admittance : $|Y_{fs}|=1.7S$ (Typ.)
- Low Leakage Current : $I_{DSS}=100\mu A$ (Max.) ($V_{DS}=640V$)
- Enhancement-Mode : $V_{th}=1.5\sim 3.5V$
($V_{DS}=10V, I_D=1mA$)

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

CHARACTERISTIC		SYMBOL	RATING	UNIT
Drain-Source Voltage		V_{DSS}	800	V
Drain-Gate Voltage ($R_{GS}=20k\Omega$)		V_{DGR}	800	V
Gate-Source Voltage		V_{GSS}	± 30	V
Drain Current	DC	I_D	3	A
	Pulse	I_{DP}	9	
Drain Power Dissipation ($T_c=25^\circ C$)		P_D	60	W
Channel Temperature		T_{ch}	150	$^\circ C$
Storage Temperature Range		T_{stg}	$-55\sim 150$	$^\circ C$

THERMAL CHARACTERISTICS

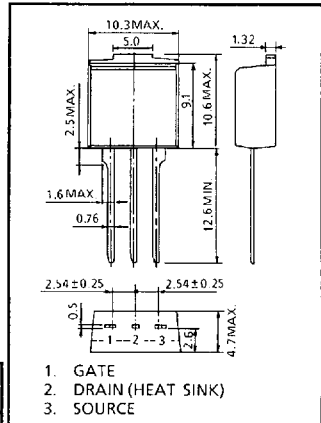
CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance, Channel to Case	$R_{th(ch-c)}$	2.08	$^\circ C / W$
Thermal Resistance, Channel to Ambient	$R_{th(ch-a)}$	83.3	$^\circ C / W$

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

INDUSTRIAL APPLICATIONS

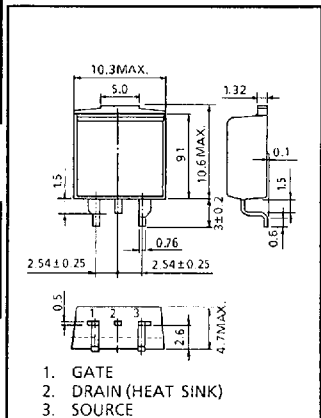
TO-220FL

Unit in mm



JEDEC	—
EIAJ	—
TOSHIBA	2-10S1B

TO-220SM



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		I_{GSS}	$V_{GS} = \pm 25V, V_{DS} = 0V$	—	—	± 100	nA
Drain Cut-off Current		I_{DSS}	$V_{DS} = 640V, V_{GS} = 0V$	—	—	100	μA
Drain-Source Breakdown Voltage		$V_{(BR)DSS}$	$I_D = 10mA, V_{GS} = 0V$	800	—	—	V
Gate Threshold Voltage		V_{th}	$V_{DS} = 10V, I_D = 1mA$	1.5	—	3.5	V
Drain-Source ON Resistance		$R_{DS(ON)}$	$I_D = 1.5A, V_{GS} = 10V$	—	4.3	5.0	Ω
Forward Transfer Admittance		$ Y_{fs} $	$V_{DS} = 20V, I_D = 1.5A$	1.0	1.7	—	S
Input Capacitance		C_{iss}	$V_{DS} = 25V, V_{GS} = 0V,$ $f = 1MHz$	—	360	—	pF
Reverse Transfer Capacitance		C_{rss}		—	30	—	
Output Capacitance		C_{oss}		—	60	—	
Switching Time	Rise Time	t_r	<p>$I_D = 1.5A$ $V_{GS} \text{ 10V}$ $0V$ 50Ω V_{OUT} $R_L = 267\Omega$ $V_{DD} \approx 400V$ $V_{IN} : t_r, t_f < 5ns,$ $Duty \leq 1\%, t_w = 10\mu s$</p>	—	25	—	ns
	Turn-on Time	t_{on}		—	40	—	
	Fall Time	t_f		—	40	—	
	Turn-off Time	t_{off}		—	150	—	
Total Gate Charge (Gate-Source Plus Gate-Drain)		Q_g	$V_{DD} \approx 400V, V_{GS} = 10V,$ $I_D = 3A$	—	26	—	nC
Gate-Source Charge		Q_{gs}		—	16	—	
Gate-Drain ("Miller") Charge		Q_{gd}		—	10	—	

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

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current	I_{DR}	—	—	—	3	A
Pulse Drain Reverse Current	I_{DRP}	—	—	—	9	A
Diode Forward Voltage	V_{DSF}	$I_{DR} = 3A, V_{GS} = 0V$	—	—	-2.0	V
Reverse Recovery Time	t_{rr}	$I_{DR} = 3A, V_{GS} = 0V$	—	600	—	ns
Reverse Recovered Charge	Q_{rr}	$dI_{DR} / dt = 100A / \mu s$	—	12	—	μC

