TOSHIBA FIELD EFFECT TRANSISTOR SILICON N CHANNEL MOS TYPE (π-MOSⅥ)

2SK3089

HIGH SPEED, HIGH CURRENT SWITCHING APPLICATIONS

CHOPPER REGULATOR, DC-DC CONVERTER AND MOTOR DRIVE APPLICATIONS

INDUSTRIAL APPLICATIONS

- Low Drain-Source ON Resistance : $R_{DS\,(ON)}$ = 25 mΩ (Typ.)
- High Forward Transfer Admittance : $|Y_{fs}|$ = 20 S (Typ.)
- Low Leakage Current : I_{DSS} = 100 μA (Max.) (V_{DS} = 30 V)
- Enhancement-Mode : V_{th} = 1.5~3.0 V (V_{DS} = 10 V, I_D = 1 mA)

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Drain-Source Voltage		V_{DSS}	30	V
Drain-Gate Voltage (R_{GS} = 20 kΩ)		V_{DGR}	30	V
Gate-Source Voltage		V_{GSS}	±20	V
Drain Current	DC	I_D	40	A
	Pulse	I_{DP}	80	
Drain Power Dissipation (Tc = 25°C)		P_D	50	W
Single Pulse Avalanche Energy**		E_{AS}	134	mJ
Avalanche Current		I_{AR}	40	A
Repetitive Avalanche Energy*		E_{AR}	5	mJ
Channel Temperature		T_{ch}	150	°C
Storage Temperature Range		T_{stg}	−55~150	°C

THERMAL CHARACTERISTICS

CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance, Channel to Case	$R_{th\,(ch\text{-}c)}$	2.5	°C / W
Thermal Resistance, Channel to Ambient	$R_{th\,(ch\text{-}a)}$	83.3	°C / W

Note ;

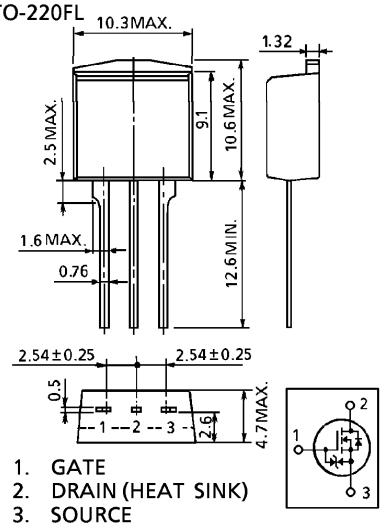
* Repetitive rating ; Pulse Width Limited by Max. junction temperature.

** V_{DD} = 25 V, T_{ch} = 25°C (initial), L = 60 μH, R_G = 25 Ω, I_{AR} = 40 A

This transistor is an electrostatic sensetive device. Please handle with caution.

Unit in mm

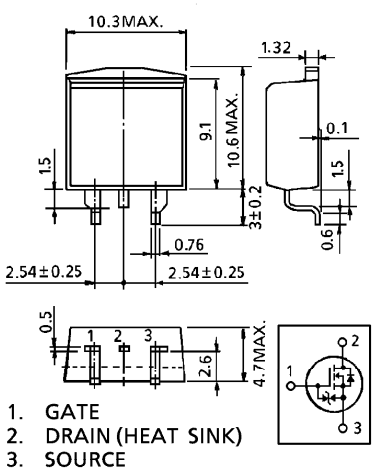
TO-220FL



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

JEDEC	—
EIAJ	—
TOSHIBA	2-10S1B

TO-220SM

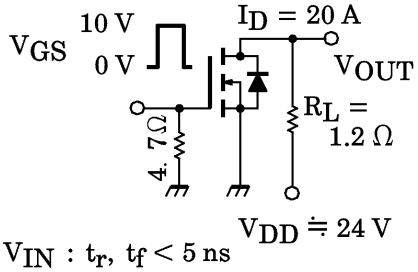


1. GATE
2. DRAIN (HEAT SINK)
3. SOURCE

JEDEC	—
EIAJ	—
TOSHIBA	2-10S2B

961001EAA2

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		I_{GSS}	V_{GS} = ±16 V, V_{DS} = 0 V	—	—	±10	μA
Drain Cut-off Current		I_{DSS}	V_{DS} = 30 V, V_{GS} = 0 V	—	—	100	μA
Drain-Source Breakdown Voltage		$V_{(BR)\,DSS}$	I_D = 10 mA, V_{GS} = 0 V	30	—	—	V
Gate Threshold Voltage		V_{th}	V_{DS} = 10 V, I_D = 1 mA	1.5	—	3.0	V
Drain-Source ON Resistance		$R_{DS\,(ON)}$	V_{GS} = 10 V, I_D = 20 A	—	25	30	mΩ
Forward Transfer Admittance		$\|Y_{fs}\|$	V_{DS} = 10 V, I_D = 20 A	10	20	—	S
Input Capacitance		C_{iss}	V_{DS} = 10 V, V_{GS} = 0 V, f = 1 MHz	—	920	—	pF
Reverse Transfer Capacitance		C_{rss}		—	290	—	
Output Capacitance		C_{oss}		—	420	—	
Switching Time	Rise Time	t_r		—	10	—	ns
	Turn-on Time	t_{on}		—	17	—	
	Fall Time	t_f		—	40	—	
	Turn-off Time	t_{off}		—	80	—	
Total Gate Charge (Gate-Source Plus Gate-Drain)		Q_g	V_{DD} ≒ 24 V, V_{GS} = 10 V, I_D = 40 A	—	23	—	nC
Gate-Source Charge		Q_{gs}		—	15	—	
Gate-Drain ("Miller") Charge		Q_{gd}		—	8	—	

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

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current	I_{DR}	—	—	—	40	A
Pulse Drain Reverse Current	I_{DRP}	—	—	—	80	A
Diode Forward Voltage	V_{DSF}	I_{DR} = 40 A, V_{GS} = 0 V	—	—	−1.7	V
Reverse Recovery Time	t_{rr}	I_{DR} = 40 A, V_{GS} = 0 V, dI_{DR}/dt = 50 A/μs	—	80	—	ns
Reverse Recovery Charge	Q_{rr}		—	130	—	nC

MARKING