

TOSHIBA FIELD EFFECT TRANSISTOR SILICON N CHANNEL MOS TYPE ( $\pi$ -MOSV)

# 2SK2839

HIGH SPEED, HIGH CURRENT SWITCHING APPLICATIONS

INDUSTRIAL APPLICATIONS

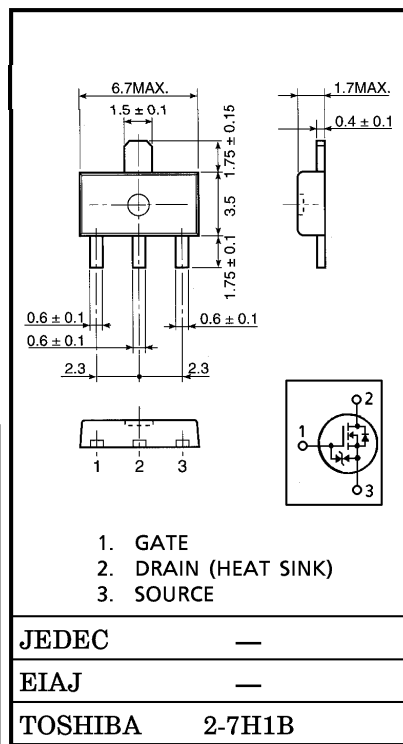
CHOPPER REGULATOR, DC-DC CONVERTER AND MOTOR DRIVE APPLICATIONS

Unit in mm

- 4V Gate Drive
- Low Drain-Source ON Resistance :  $R_{DS(ON)} = 30m\Omega$  (Typ.)
- High Forward Transfer Admittance :  $|Y_{fs}| = 11S$  (Typ.)
- Low Leakage Current :  $I_{DSS} = 100\mu A$  (Max.) ( $V_{DS} = 30V$ )
- Enhancement-Mode :  $V_{th} = 0.8 \sim 2.0V$  ( $V_{DS} = 10V, I_D = 1mA$ )

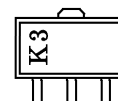
MAXIMUM RATINGS ( $T_a = 25^\circ C$ )

CHARACTERISTIC		SYMBOL	RATING	UNIT
Drain-Source Voltage		$V_{DSS}$	30	V
Drain-Gate Voltage ( $R_{GS} = 20k\Omega$ )		$V_{DGR}$	30	V
Gate-Source Voltage		$V_{GSS}$	$\pm 20$	V
Drain Current	DC	$I_D$	10	A
	Pulse	$I_{DP}$	40	A
Drain Power Dissipation ( $T_a = 25^\circ C$ )		$P_D$ (Note)	2.5	W
Single Pulse Avalanche Energy**		$E_{AS}$	282	mJ
Avalanche Current		$I_{AR}$	10	A
Repetitive Avalanche Energy*		$E_{AR}$	0.25	mJ
Channel Temperature		$T_{ch}$	150	$^\circ C$
Storage Temperature Range		$T_{stg}$	$-55 \sim 150$	$^\circ C$



Weight : 0.12g

MARKING



Note : Mounted on ceramic substrate (1inch<sup>2</sup>×0.8t)

THERMAL CHARACTERISTICS

CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance, Channel to Ambient	$R_{th(ch-a)}$	50	$^\circ C / W$

Note ;

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

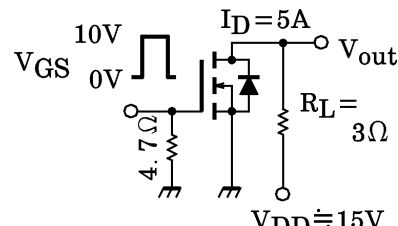
\*\*  $V_{DD} = 25V$ , Starting  $T_{ch} = 25^\circ C$ ,  $L = 2mH$ ,  $R_G = 25\Omega$ ,  $I_{AR} = 10A$

**This transistor is an electrostatic sensitive device. Please handle with caution.**

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ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		IGSS	VGS = ±16V, VDS = 0V	—	—	±10	μA
Drain Cut-off Current		IDSS	VDS = 30V, VGS = 0V	—	—	100	μA
Drain-Source Breakdown Voltage		V(BR)DSS	ID = 10mA, VGS = 0V	30	—	—	V
Gate Threshold Voltage		Vth	VDS = 10V, ID = 1mA	0.8	—	2.0	V
Drain-Source ON Resistance		RDS(ON)	VGS = 4V, ID = 5A	—	45	60	mΩ
			VGS = 10V, ID = 5A	—	30	40	
Forward Transfer Admittance		Yfs	VDS = 10V, ID = 5A	5	11	—	S
Input Capacitance		Ciss	VDS = 10V, VGS = 0V f = 1MHz	—	700	—	pF
Reverse Transfer Capacitance		Crss		—	150	—	
Output Capacitance		Coss		—	360	—	
Switching Time	Rise Time	tr		—	20	—	ns
	Turn-on Time	ton		—	25	—	
	Fall Time	tf		—	100	—	
	Turn-off Time	toff		VIN : tr, tf < 5ns, Duty ≤ 1%, tw = 10μs	—	300	
Total Gate Charge (Gate-Source Plus Gate-Drain)		Qg	VDD = 24V, VGS = 10V, ID = 10A	—	26	—	nC
Gate-Source Charge		Qgs		—	20	—	
Gate-Drain ("Miller") Charge		Qgd		—	6	—	

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

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current	IDR	—	—	—	10	A
Pulse Drain Reverse Current	IDRP	—	—	—	40	A
Diode Forward Voltage	VDSF	IDR = 10A, VGS = 0V	—	—	-2.0	V
Reverse Recovery Time	trr	IDR = 10A, VGS = 0V	—	120	—	ns
Reverse Recovery Charge	Qrr	dIDR / dt = 50A / μs	—	140	—	nC