

SEMICONDUCTOR
TOSHIBA TECHNICAL DATA

TOSHIBA FIELD EFFECT TRANSISTOR
2SK2039
SILICON N CHANNEL MOS TYPE
(π -MOS II.5)

317-5431

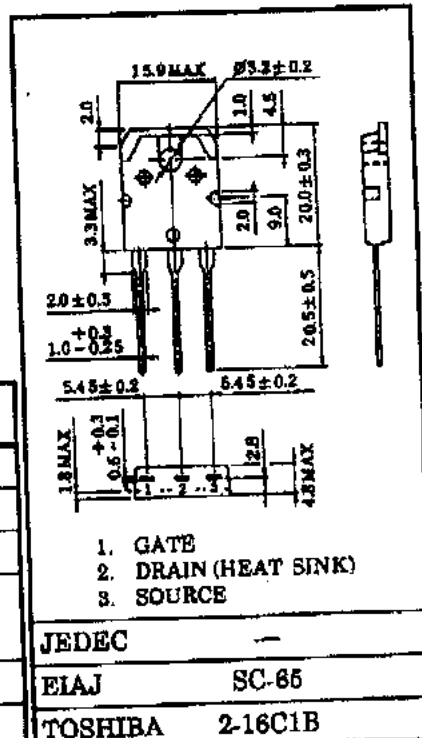
HIGH SPEED, HIGH CURRENT SWITCHING APPLICATIONS.
DC-DC CONVERTER AND MOTOR DRIVE APPLICATIONS.

INDUSTRIAL APPLICATIONS
Unit in mm

- Low Drain-Source ON Resistance : $R_{DS(ON)} = 1.9\Omega$ (Typ.)
- High Forward Transfer Admittance : $|Y_{fs}| = 1.7S$ (Typ.)
- Low Leakage Current : $I_{DSS} = 300\mu A$ (Max.) @ $V_{DS} = 720V$
- Enhancement-Mode : $V_{th} = 1.5 - 3.5V$ @ $V_{DS} = 10V, I_D = 1mA$

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

CHARACTERISTIC		SYMBOL	RATING	UNIT
Drain-Source Voltage		V_{DSS}	900	V
Drain-Gate Voltage ($R_{GS} = 20k\Omega$)		V_{DGR}	900	V
Gate-Source Voltage		V_{GSS}	± 30	V
Drain Current	DC	I_D	5	A
	Pulse	I_{DP}	15	
Drain Power Dissipation ($T_c = 25^\circ C$)		P_D	150	W
Channel Temperature		T_{ch}	150	$^\circ C$
Storage Temperature Range		T_{stg}	-55~150	$^\circ C$



THERMAL CHARACTERISTICS

CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance, Channel to Case	$R_{th(ch-c)}$	0.833	$^\circ C/W$
Thermal Resistance, Channel to Ambient	$R_{th(ch-a)}$	50	$^\circ C/W$

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

© The information contained herein is presented only as a guide for the applications of our products. No responsibility is assumed by TOSHIBA CORPORATION for any infringements of intellectual property or other rights of the third parties which may result from its use. No license is granted by implication or otherwise under any intellectual property or other rights of TOSHIBA CORPORATION or others.

2SK2039 - 1
1992 - 6 - 24
TOSHIBA CORPORATION

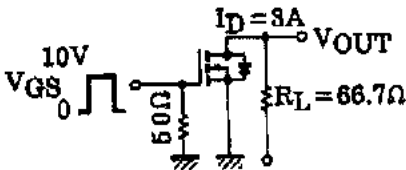
SEMICONDUCTOR

TOSHIBA

TECHNICAL DATA

2SK2039

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 = 720V, VGS = 0V	—	—	900	μA
Drain-Source Breakdown Voltage		V(BR)DSS	ID = 10mA, VGS = 0V	900	—	—	V
Gate Threshold Voltage		Vth	VDS = 10V, ID = 1mA	1.5	—	3.5	V
Drain-Source ON Resistance		RDS(ON)	VGS = 10V, ID = 3A	—	1.9	2.5	Ω
Forward Transfer Admittance		Yfs	VDS = 20V, ID = 3A	1.0	3.0	—	S
Input Capacitance		Ciss	VDS = 25V, VGS = 0V, f = 1MHz	—	690	980	pF
Reverse Transfer Capacitance		Crss		—	65	110	
Output Capacitance		Coss		—	120	180	
Switching Time	Rise Time	tr	 <p> $I_D = 3A$ $V_{GS} = 10V$ $R_L = 66.7\Omega$ $V_{IN} : t_r, t_f < 5ns, V_{DD} \approx 200V$ $Duty \leq 1\%, t_w = 10\mu s$ </p>	—	30	60	ns
	Turn-on Time	ton		—	70	140	
	Fall Time	tf		—	40	80	
	Turn-off Time	t _{off}		—	210	420	
Total Gate Charge (Gate-Source Plus Gate-Drain)		QG	VDD ≈ 400V, VGS = 10V, ID = 5A	—	55	110	nC
Gate-Source Charge		Qgs		—	25	—	
Gate-Drain ("Miller") Charge		Qgd		—	30	—	

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

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current	IDR	—	—	—	5	A
Pulse Drain Reverse Current	IDRF	—	—	—	15	A
Diode Forward Voltage	VDSF	IDR = 5A, VGS = 0V	—	—	-1.9	V
Reverse Recovery Time	trr	IDR = 5A, VGS = 0V	—	1450	—	ns
Reverse Recovered Charge	Qrr	dIDR/dt = 100A/μs	—	20	—	μC

2SK2039 - 2

1992 - 6 - 24

TOSHIBA CORPORATION