

SEMICONDUCTOR

TOSHIBA

TECHNICAL DATA

TOSHIBA FIELD EFFECT TRANSISTOR

2SK2039

SILICON N CHANNEL MOS TYPE

(π -MOS II.5)

317-5431

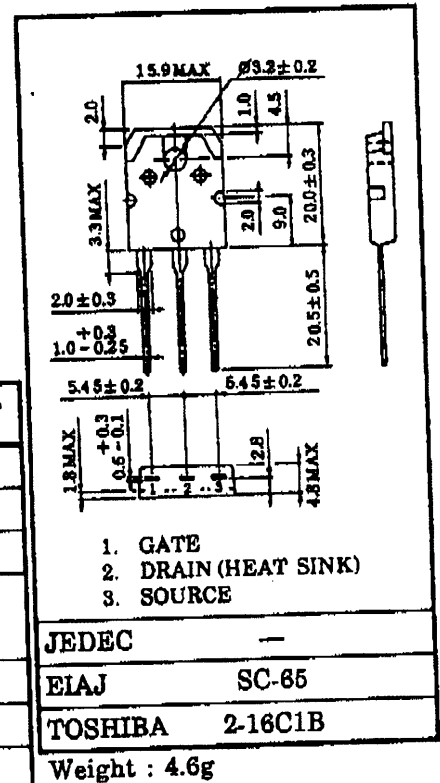
HIGH SPEED, HIGH CURRENT SWITCHING APPLICATIONS.
DC-DC CONVERTER AND MOTOR DRIVE APPLICATIONS.

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 : $V_{th} = 1.5 \sim 3.5V$ @ $V_{DS} = 10V$, $I_D = 1mA$

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

CHARACTERISTIC		SYMBOL	RATING	UNIT
Drain-Source Voltage		V_{DSS}	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}	$-55 \sim 150$	$^\circ C$



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.

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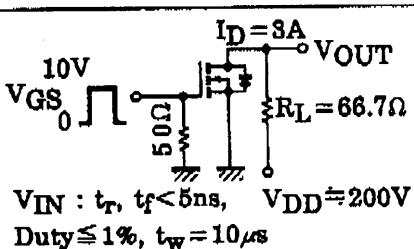
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2SK2039**ELECTRICAL CHARACTERISTICS (Ta = 25°C)**

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		I_{GSS}	$V_{GS} = \pm 30V, V_{DS} = 0V$	—	—	± 100	nA
Drain Cut-off Current		I_{DSS}	$V_{DS} = 720V, V_{GS} = 0V$	—	—	300	μA
Drain-Source Breakdown Voltage		$V_{(BR)DSS}$	$I_D = 10mA, V_{GS} = 0V$	900	—	—	V
Gate Threshold Voltage		V_{th}	$V_{DS} = 10V, I_D = 1mA$	1.5	—	3.5	V
Drain-Source ON Resistance		$R_{DS(ON)}$	$V_{GS} = 10V, I_D = 3A$	—	1.9	2.5	Ω
Forward Transfer Admittance		$ Y_{fs} $	$V_{DS} = 20V, I_D = 3A$	1.0	3.0	—	S
Input Capacitance		C_{iss}	$V_{DS} = 25V, V_{GS} = 0V, f = 1MHz$	—	690	980	pF
Reverse Transfer Capacitance		C_{rss}		—	65	110	
Output Capacitance		C_{oss}		—	120	180	
Switching Time	Rise Time	t_r		—	30	60	ns
	Turn-on Time	t_{on}		—	70	140	
	Fall Time	t_f		—	40	80	
	Turn-off Time	t_{off}		—	210	420	
Total Gate Charge (Gate-Source Plus Gate-Drain)		Q_g	$V_{DD} = 400V, V_{GS} = 10V, I_D = 5A$	—	55	110	nC
Gate-Source Charge		Q_{gs}		—	25	—	
Gate-Drain ("Miller") Charge		Q_{gd}		—	30	—	

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

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current	I_{DR}	—	—	—	5	A
Pulse Drain Reverse Current	I_{DRP}	—	—	—	15	A
Diode Forward Voltage	V_{DSF}	$I_{DR} = 5A, V_{GS} = 0V$	—	—	-1.9	V
Reverse Recovery Time	t_{rr}	$I_{DR} = 5A, V_{GS} = 0V$	—	1450	—	ns
Reverse Recovered Charge	Q_{rr}	$dI_{DR}/dt = 100A/\mu s$	—	20	—	μC

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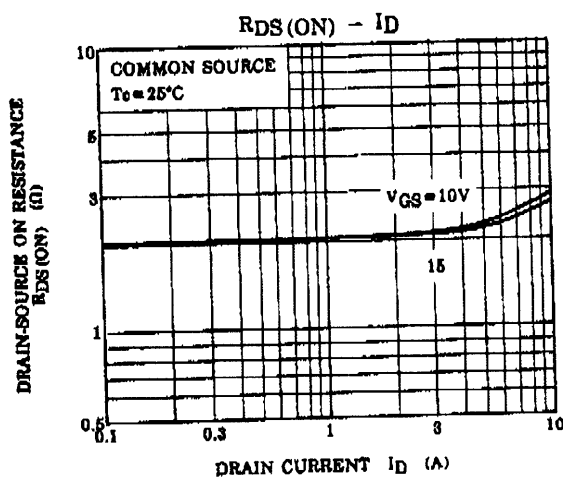
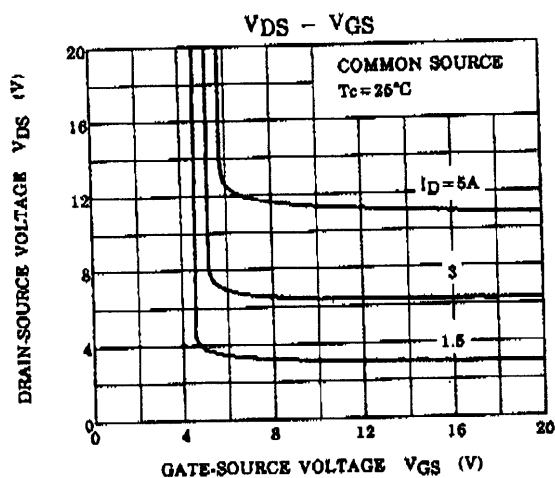
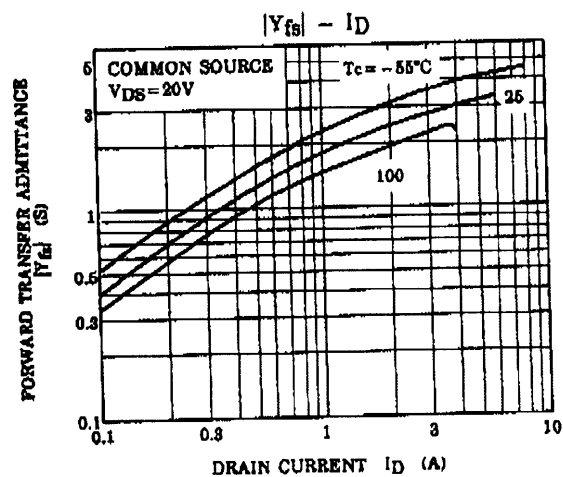
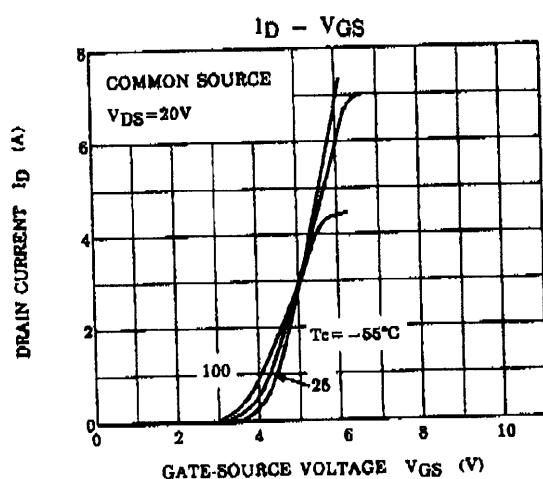
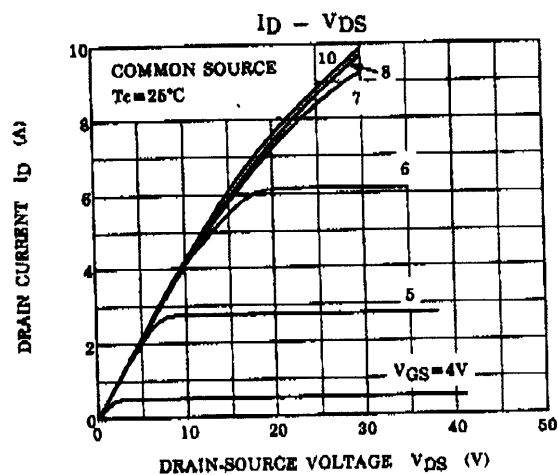
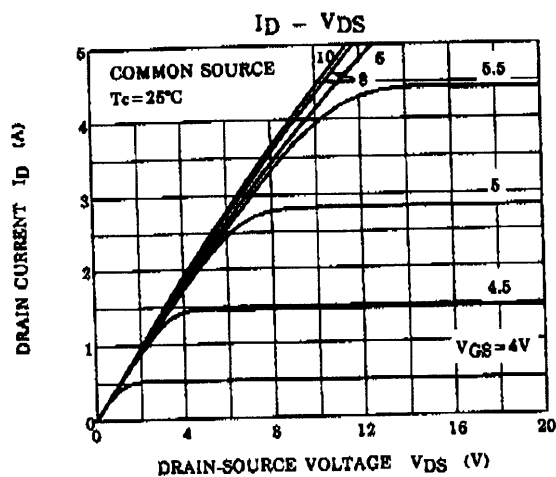
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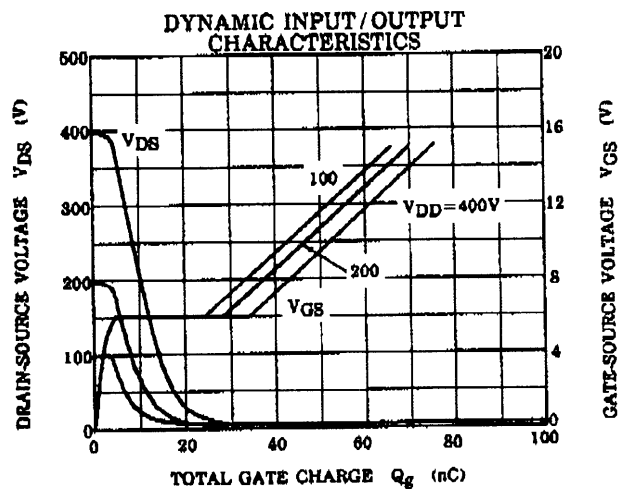
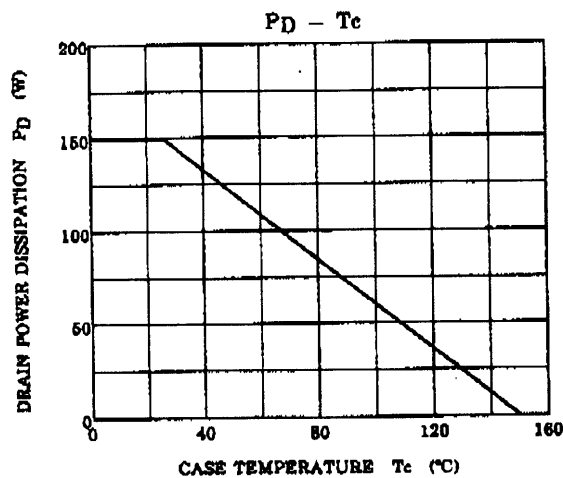
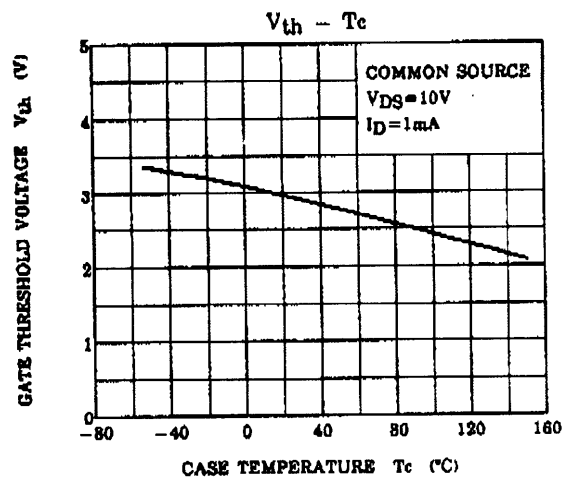
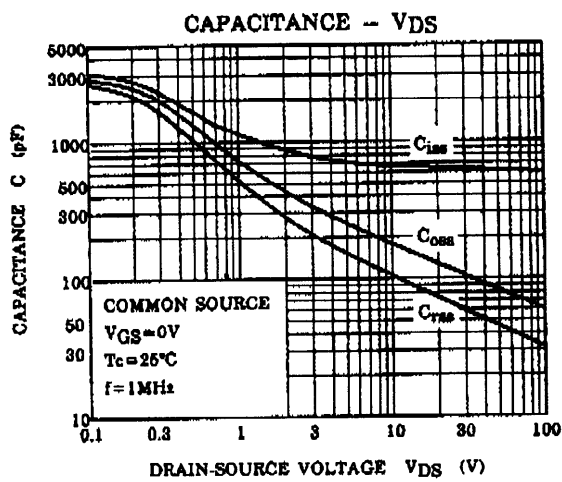
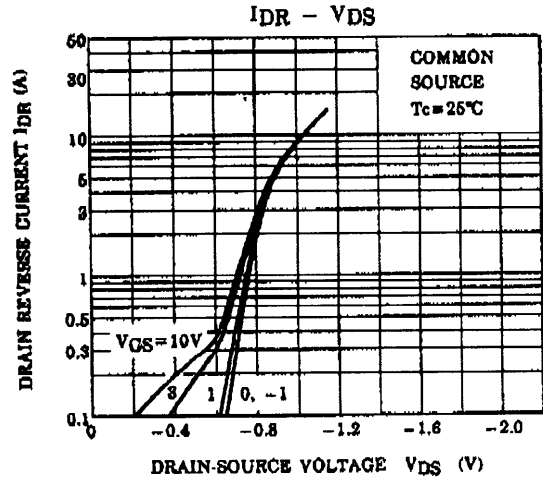
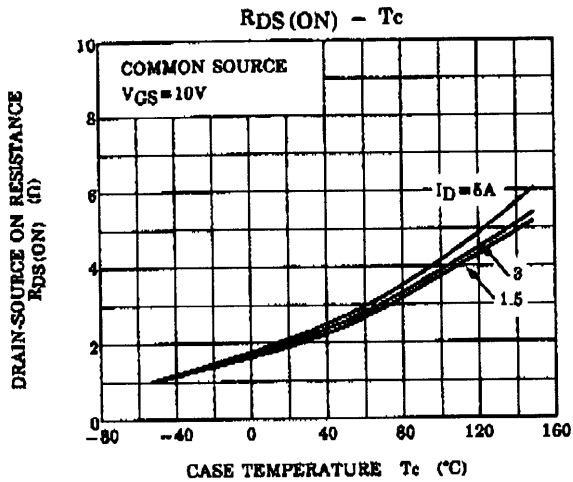
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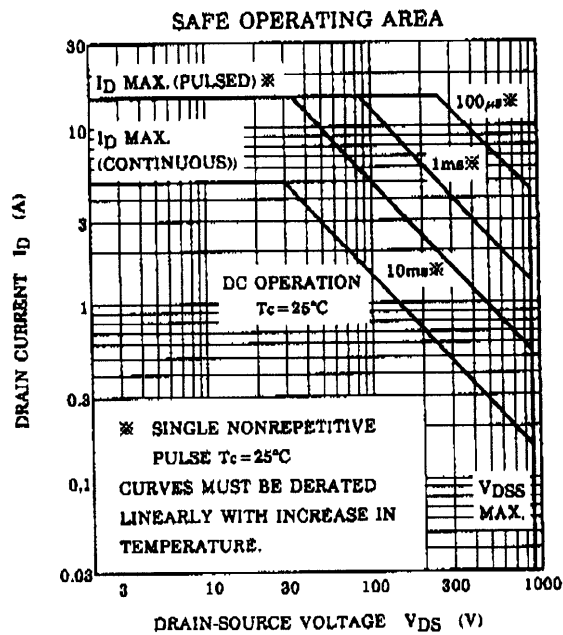
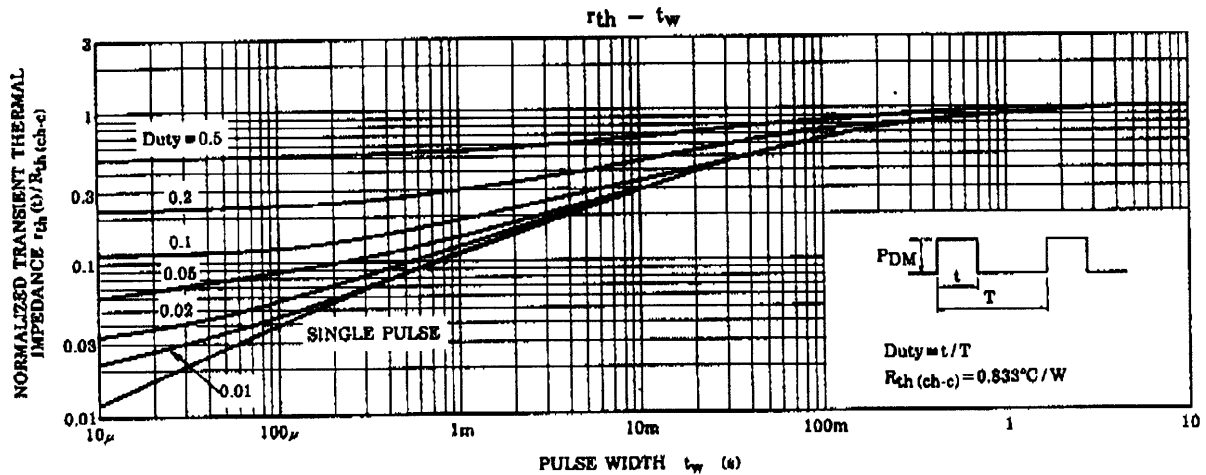
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