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

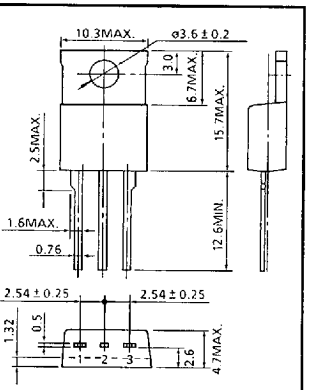
2SK1643

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

INDUSTRIAL APPLICATIONS

- Low Drain-Source ON Resistance : $R_{DS\,(ON)} = 2.5\Omega$ (Typ.)
- High Forward Transfer Admittance : $|Y_{fs}| = 2.0S$ (Typ.)
- Low Leakage Current : $I_{DSS} = 300\mu A$ (Max.) @$V_{DS} = 720V$
- Enhancement-Mode : $V_{th} = 1.5 \sim 3.5V$ @$V_{DS} = 10V$, $I_D = 1mA$

Unit in mm



JEDEC	TO-220AB
EIAJ	SC-46
TOSHIBA	2-10P1B

Weight : 2.0g

MAXIMUM RATINGS (Ta = 25°C)

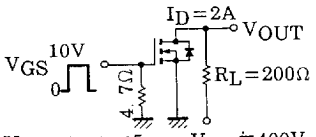
CHARACTERISTIC		SYMBOL	RATING	UNIT
Drain-Source Voltage		V_{DSS}	900	V
Drain-Gate Voltage ($R_{GS} = 20k\Omega$)		V_{DGR}	900	V
Gate-Source Voltage		V_{GSS}	±30	V
Drain Current	DC	I_D	5	A
	Pulse	I_{DP}	15	
Drain Power Dissipation (Tc = 25°C)		P_D	125	W
Channel Temperature		T_{ch}	150	°C
Storage Temperature Range		T_{stg}	−55~150	°C

THERMAL CHARACTERISTICS

CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance, Channel to Case	$R_{th\,(ch-c)}$	1.0	°C / W
Thermal Resistance, Channel to Ambient	$R_{th\,(ch-a)}$	83.3	°C / W

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

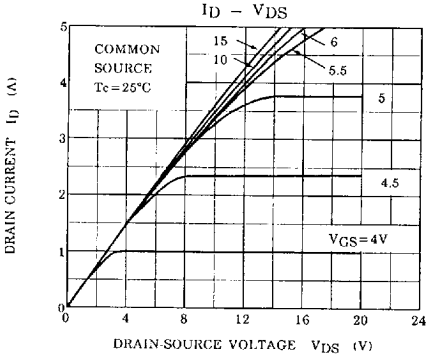
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

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}	$V_{DS} = 720V$, $V_{GS} = 0V$	—	—	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		$R_{DS(ON)}$	$V_{GS} = 10V$, $I_D = 2A$	—	2.5	2.8	Ω
Forward Transfer Admittance		$\|Y_{fs}\|$	$V_{DS} = 20V$, $I_D = 2A$	1.0	2.0	—	S
Input Capacitance		C_{iss}	$V_{DS} = 25V$, $V_{GS} = 0V$, f = 1MHz	—	700	1000	pF
Reverse Transfer Capacitance		C_{rss}		—	55	90	
Output Capacitance		C_{oss}		—	100	150	
Switching Time	Rise Time	t_r	 V_{IN} : t_r, $t_f < 5ns$, $V_{DD} \fallingdotseq 400V$ Duty ≦ 1%, $t_w = 10\mu s$	—	18	35	ns
	Turn-on Time	t_{on}		—	30	60	
	Fall Time	t_f		—	12	25	
	Turn-off Time	t_{off}		—	70	140	
Total Gate Charge (Gate-Source Plus Gate-Drain)		Q_g	$V_{DD} \fallingdotseq 400V$, $V_{GS} = 10V$, $I_D = 4A$	—	60	120	nC
Gate-Source Charge		Q_{gs}		—	35	—	
Gate-Drain ("Miller") Charge		Q_{gd}		—	25	—	

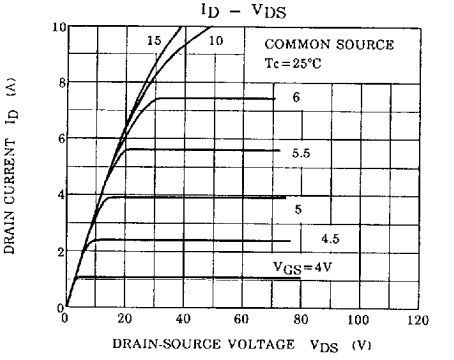
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (Ta = 25°C)

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}	$I_{DR} = 4A$, $V_{GS} = 0V$	—	—	−1.9	V
Reverse Recovery Time	t_{rr}	$I_{DR} = 4A$, $V_{GS} = 0V$ $dI_{DR}/dt = 100A/\mu s$	—	1000	—	ns
Reverse Recovered Charge	Q_{rr}		—	0.13	—	μC

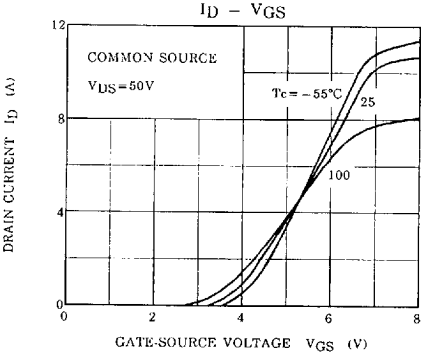
$I_D - V_{DS}$



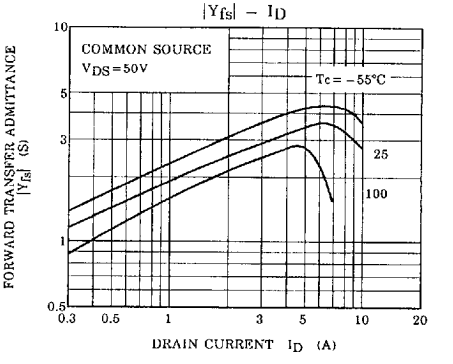
$I_D - V_{DS}$



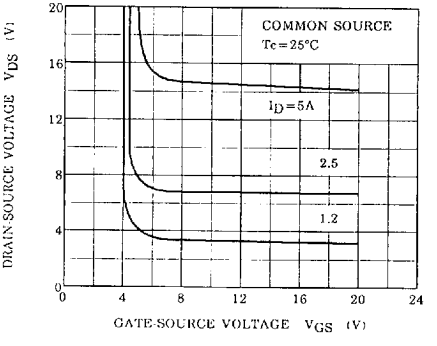
$I_D - V_{GS}$



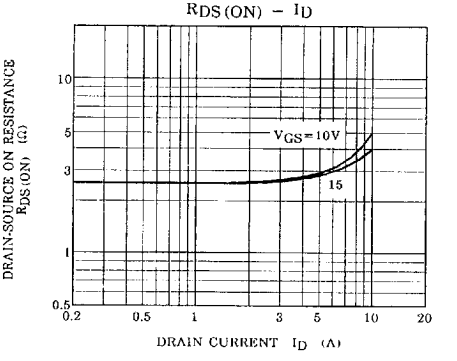
$|Y_{fs}| - I_D$



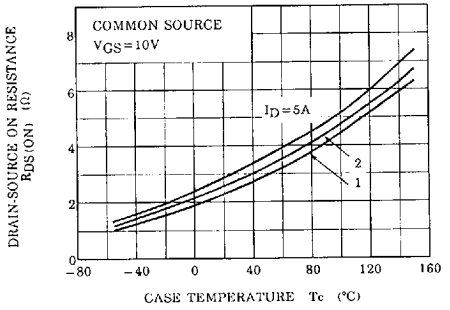
$V_{DS} - V_{GS}$



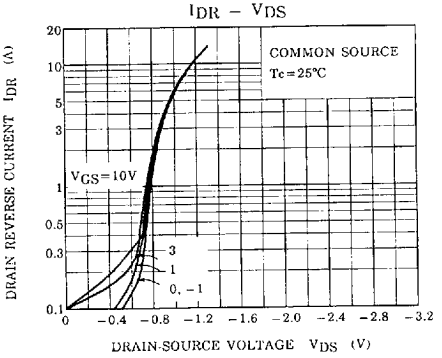
$R_{DS(ON)} - I_D$



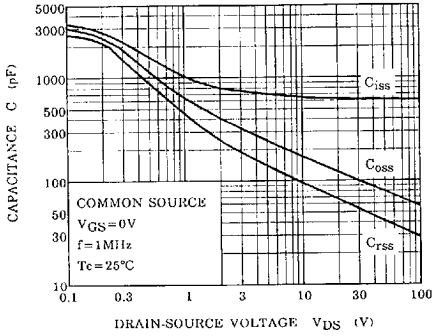
$R_{DS(ON)}$ – Tc



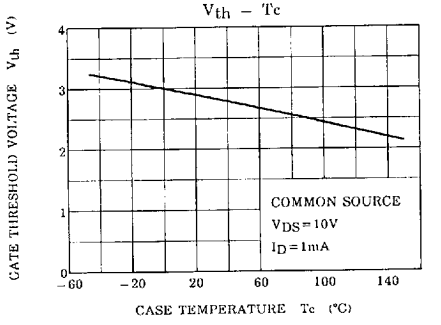
I_{DR} – V_{DS}



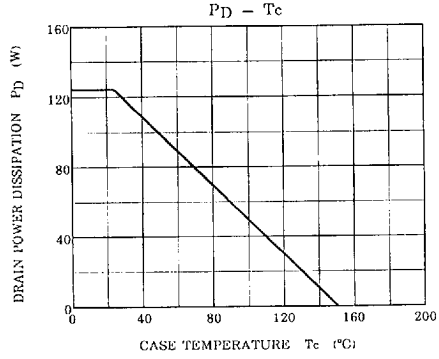
CAPACITANCE – V_{DS}



V_{th} – Tc



P_D – Tc



DYNAMIC INPUT/OUTPUT CHARACTERISTICS