

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

2 S K 2 7 3 3

HIGH SPEED, HIGH CURRENT SWITCHING APPLICATIONS

CHOPPER REGULATOR, DC-DC CONVERTER AND MOTOR DRIVE APPLICATIONS

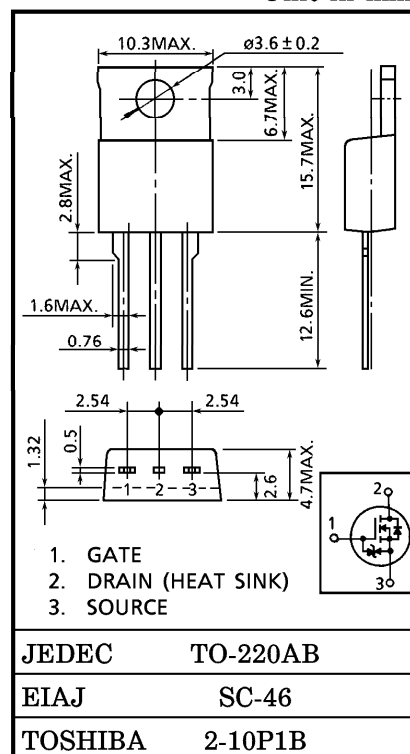
INDUSTRIAL APPLICATIONS

Unit in mm

- Low Drain-Source ON Resistance : $R_{DS(ON)} = 8.0 \, \Omega$ (Typ.)
- High Forward Transfer Admittance : $|Y_{fs}| = 0.9 \, S$ (Typ.)
- Low Leakage Current : $I_{DSS} = 100 \, \mu A$ (Max.) ($V_{DS} = 720 \, V$)
- Enhancement-Mode : $V_{th} = 2.0 \sim 4.0 \, V$
($V_{DS} = 10 \, V$, $I_D = 1 \, mA$)

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Drain-Source Voltage		V_{DSS}	900	V
Drain-Gate Voltage ($R_{GS} = 20\text{ k}\Omega$)		V_{DGR}	900	V
Gate-Source Voltage		V_{GSS}	± 30	V
Drain Current	DC	I_D	1	A
	Pulse	I_{DP}	3	
Drain Power Dissipation ($T_c = 25^\circ\text{C}$)		P_D	60	W
Single Pulse Avalanche Energy**		E_{AS}	324	mJ
Avalanche Current		I_{AR}	1	A
Repetitive Avalanche Energy*		E_{AR}	6.0	mJ
Channel Temperature		T_{ch}	150	$^\circ\text{C}$
Storage Temperature Range		T_{stg}	$-55\sim 150$	$^\circ\text{C}$



Weight : 2.0 g

THERMAL CHARACTERISTICS

CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance, Channel to Case	$R_{th(ch-c)}$	2.08	$^{\circ}C/W$
Thermal Resistance, Channel to Ambient	$R_{th(ch-a)}$	83.3	$^{\circ}C/W$

Note :

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

** $V_{DD} = 90$ V, $T_{ch} = 25^\circ\text{C}$ (initial), $L = 594$ mH, $R_G = 25\ \Omega$, $I_{AB} = 1$ A

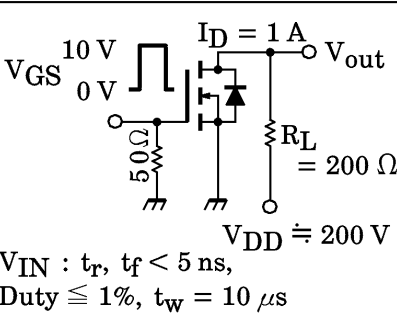
This transistor is an electrostatic sensitive device.

Please handle with caution.

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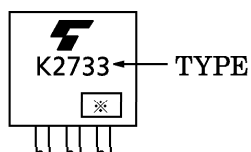
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		I_{GSS}	$V_{GS} = \pm 30 \text{ V}, V_{DS} = 0 \text{ V}$	—	—	± 10	μA
Gate-Source Breakdown Voltage		$V_{(BR)GSS}$	$I_G = \pm 10 \mu\text{A}, V_{DS} = 0 \text{ V}$	± 30	—	—	V
Drain Cut-off Current		I_{DSS}	$V_{DS} = 720 \text{ V}, V_{GS} = 0 \text{ V}$	—	—	100	μA
Drain-Source Breakdown Voltage		$V_{(BR)DSS}$	$I_D = 10 \text{ mA}, V_{GS} = 0 \text{ V}$	900	—	—	V
Gate Threshold Voltage		V_{th}	$V_{DS} = 10 \text{ V}, I_D = 1 \text{ mA}$	2.0	—	4.0	V
Drain-Source ON Resistance		$R_{DS(ON)}$	$V_{GS} = 10 \text{ V}, I_D = 0.5 \text{ A}$	—	8.0	9.0	Ω
Forward Transfer Admittance		$ Y_{fs} $	$V_{DS} = 20 \text{ V}, I_D = 0.5 \text{ A}$	0.2	0.9	—	S
Input Capacitance		C_{iss}	$V_{DS} = 25 \text{ V}, V_{GS} = 0 \text{ V},$ $f = 1 \text{ MHz}$	—	370	—	pF
Reverse Transfer Capacitance		C_{rss}		—	5	—	
Output Capacitance		C_{oss}		—	40	—	
Switching Time	Rise Time	t_r	 $V_{DD} \doteq 200 \text{ V}$ $V_{IN} : t_r, t_f < 5 \text{ ns},$ $\text{Duty} \leq 1\%, t_w = 10 \mu\text{s}$	—	20	—	ns
	Turn-on Time	t_{on}		—	70	—	
	Fall Time	t_f		—	30	—	
	Turn-off Time	t_{off}		—	95	—	
Total Gate Charge (Gate-Source Plus Gate-Drain)		Q_g	$V_{DD} \doteq 400 \text{ V}, V_{GS} = 10 \text{ V},$ $I_D = 1 \text{ A}$	—	15	—	nC
Gate-Source Charge		Q_{gs}		—	6	—	
Gate-Drain ("Miller") Charge		Q_{gd}		—	9	—	

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

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current	I_{DR}	—	—	—	1	A
Pulse Drain Reverse Current	I_{DRP}	—	—	—	3	A
Diode Forward Voltage	V_{DSF}	$I_{DR} = 1 \text{ A}, V_{GS} = 0 \text{ V}$	—	—	—1.9	V
Reverse Recovery Time	t_{rr}	$I_{DR} = 1 \text{ A}, V_{GS} = 0 \text{ V}$ $dI_{DR}/dt = 100 \text{ A}/\mu\text{s}$	—	750	—	ns
Reverse Recovery Charge	Q_{rr}		—	3	—	μC

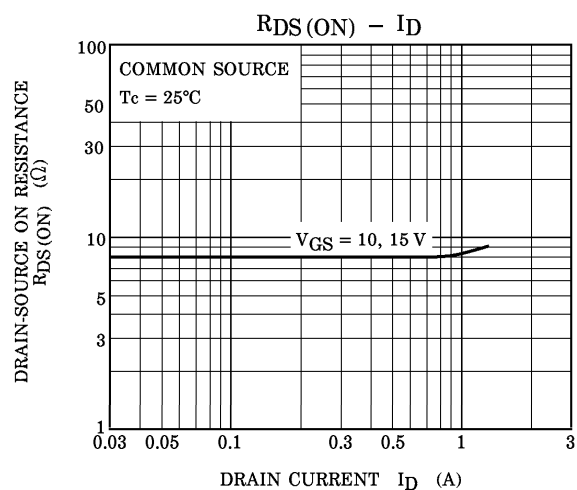
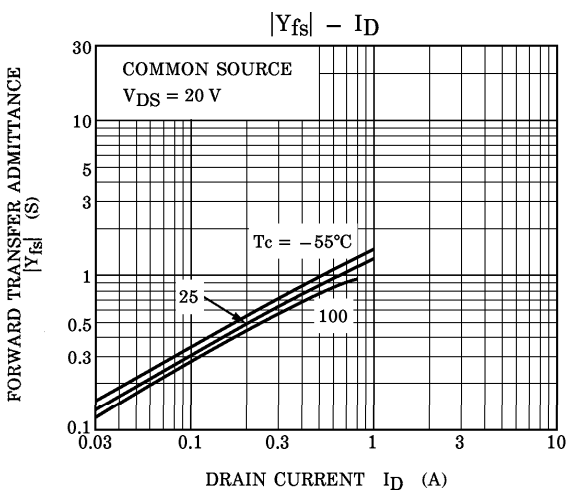
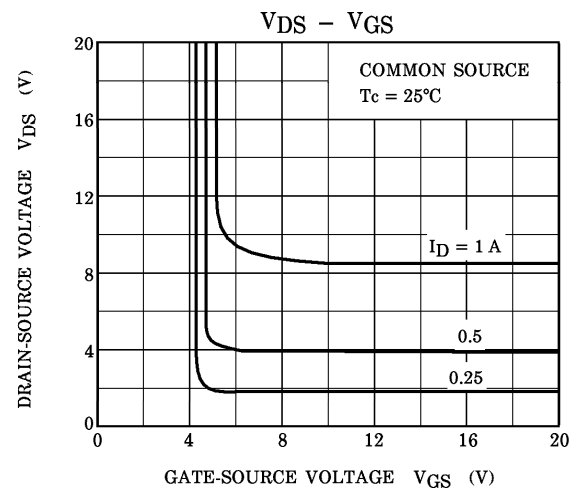
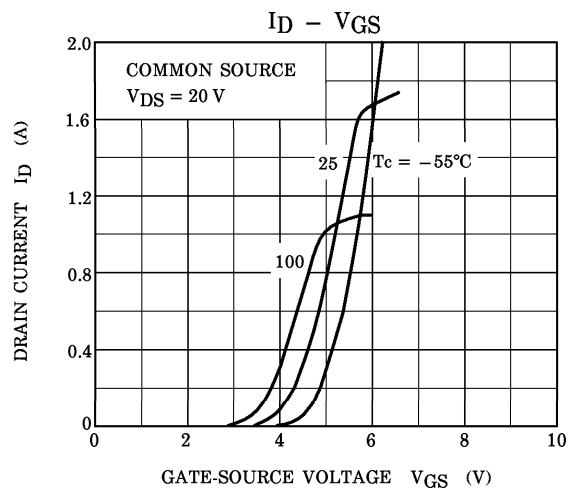
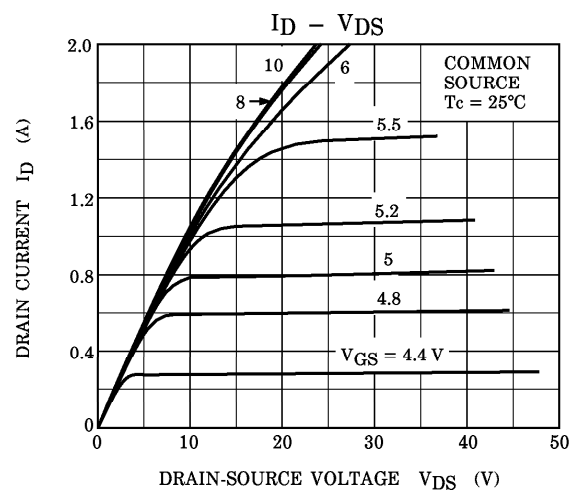
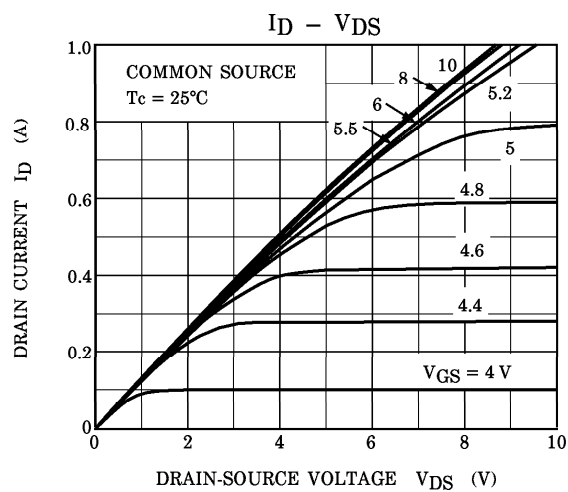
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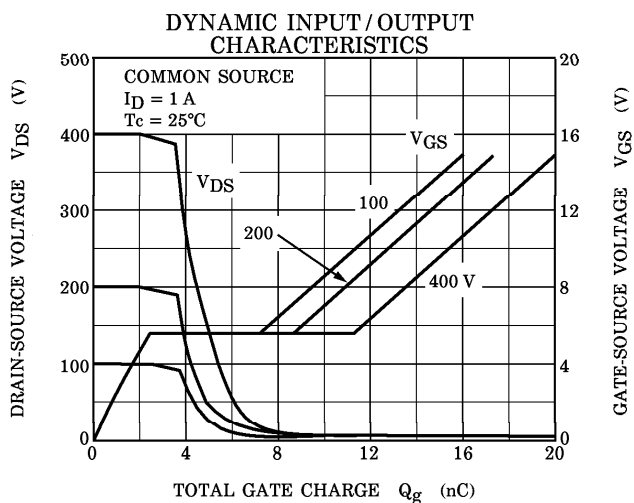
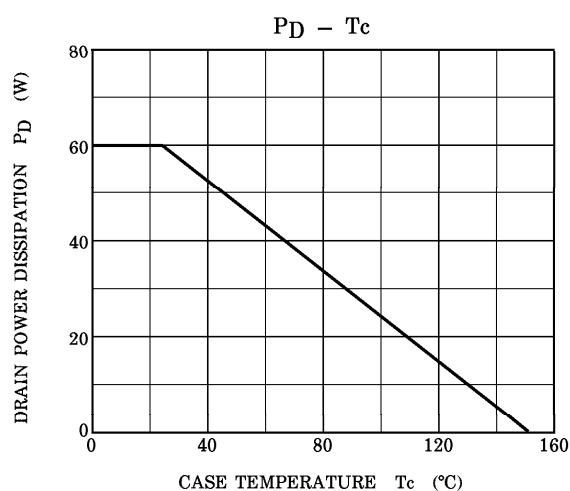
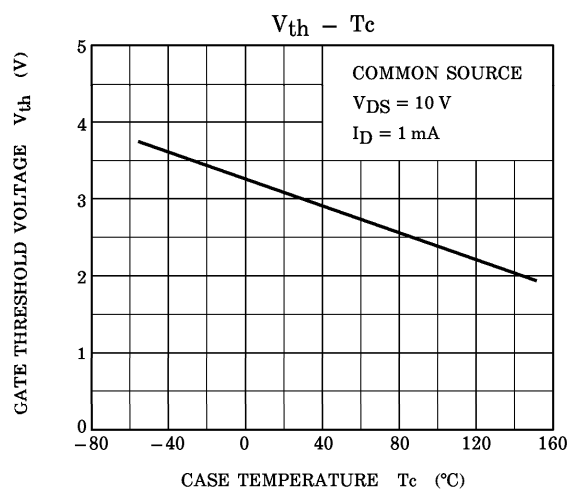
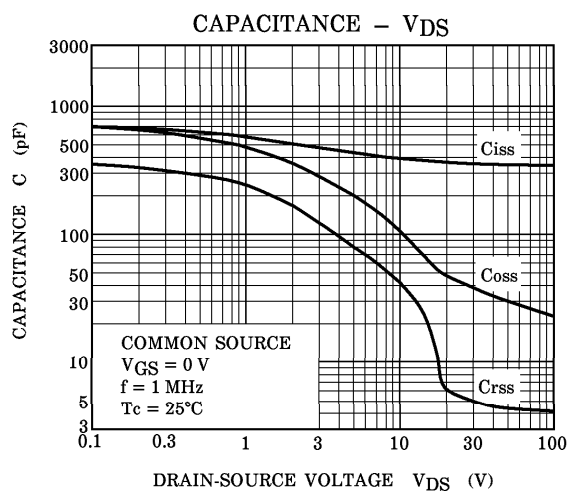
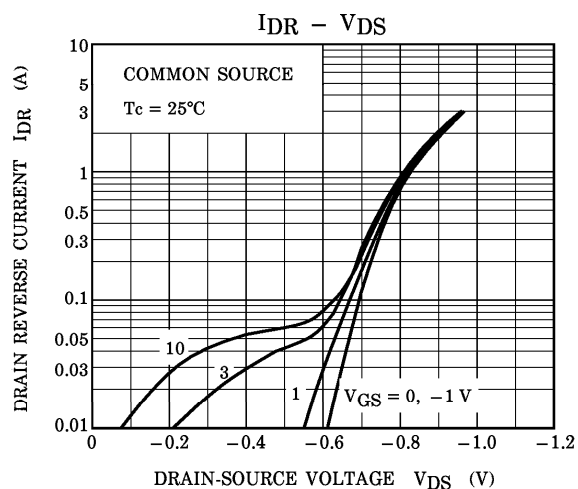
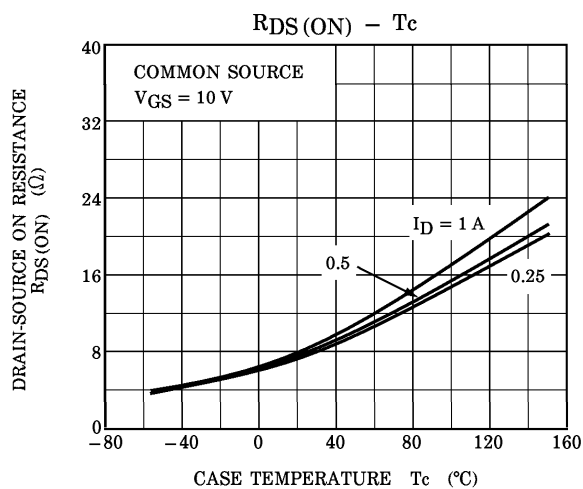


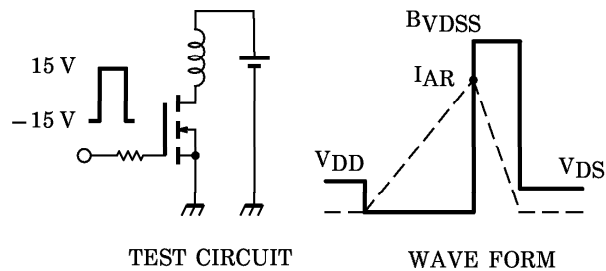
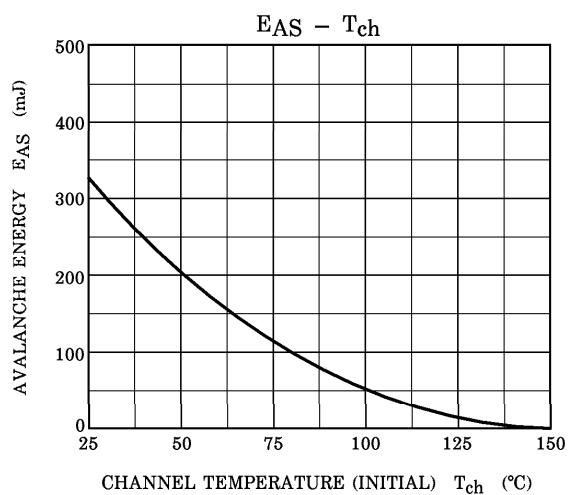
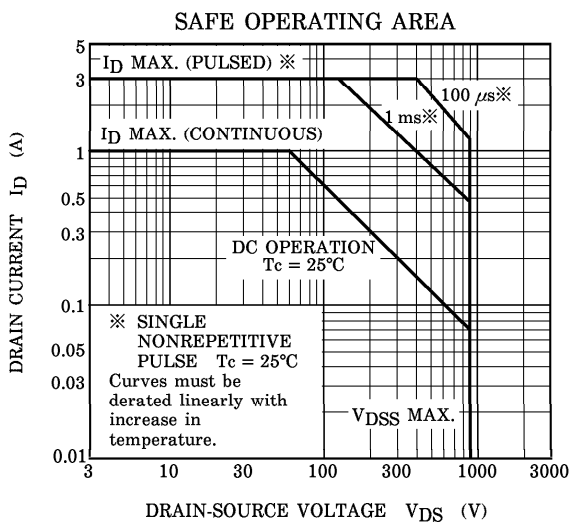
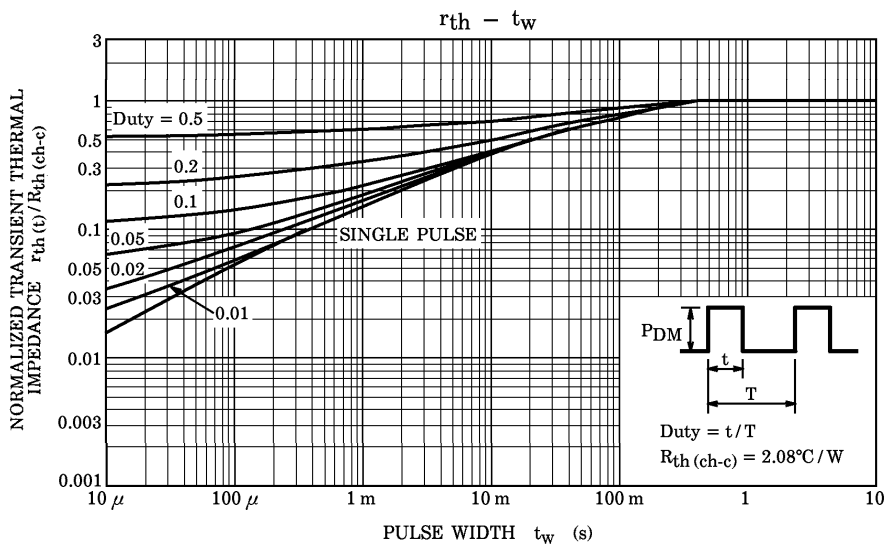
※ Lot Number

□ □ — Month (Starting from Alphabet A)

— Year (Last Number of the Christian Era)







Peak $I_{AR} = 1\text{ A}$, $R_G = 25\ \Omega$ $E_{AS} = \frac{1}{2} \cdot L \cdot I^2 \cdot \left(\frac{B_{VDSS}}{B_{VDSS} - V_{DD}} \right)$
 $V_{DD} = 90\text{ V}$, $L = 594\text{ mH}$