

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

2SK2986

HIGH CURRENT SWITCHING APPLICATIONS

DC-DC CONVERTER, RELAY DRIVE AND MOTOR DRIVE APPLICATIONS

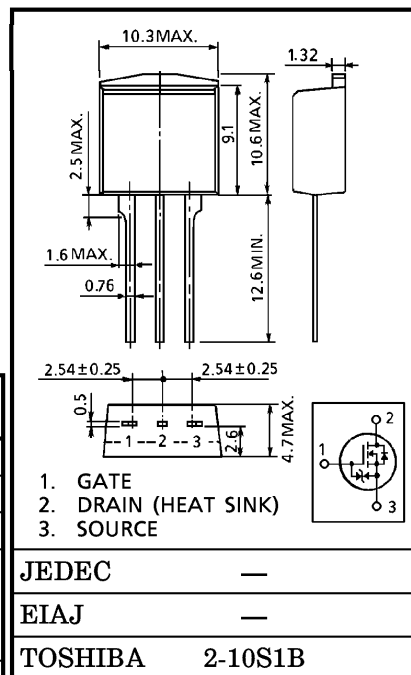
- Low Drain-Source ON Resistance : $R_{DS(ON)} = 4.5 \text{ m}\Omega$ (Typ.)
- High Forward Transfer Admittance : $|Y_{fs}| = 80 \text{ S}$ (Typ.)
- Low Leakage Current : $I_{DSS} = 100 \mu\text{A}$ (Max.) ($V_{DS} = 60 \text{ V}$)
- Enhancement-Mode : $V_{th} = 1.3 \sim 2.5 \text{ V}$ ($V_{DS} = 10 \text{ V}$, $I_D = 1 \text{ mA}$)

INDUSTRIAL APPLICATIONS

Unit in mm

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

CHARACTERISTIC		SYMBOL	RATING	UNIT
Drain-Source Voltage		V_{DSS}	60	V
Drain-Gate Voltage ($R_{GS} = 20 \text{ k}\Omega$)		V_{DGR}	60	V
Gate-Source Voltage		V_{GSS}	± 20	V
Drain Current	DC	I_D	55	A
	Pulse ($t \leq 10 \text{ s}$)	I_{DP}	70	
	Pulse ($t \leq 1 \text{ ms}$)		280	
Drain Power Dissipation ($T_c = 25^\circ\text{C}$)		P_D	100	W
Single Pulse Avalanche Energy**		E_{AS}	525	mJ
Avalanche Current		I_{AR}	55	A
Repetitive Avalanche Energy*		E_{AR}	10	mJ
Channel Temperature		T_{ch}	150	$^\circ\text{C}$
Storage Temperature Range		T_{stg}	$-55 \sim 150$	$^\circ\text{C}$



THERMAL CHARACTERISTICS

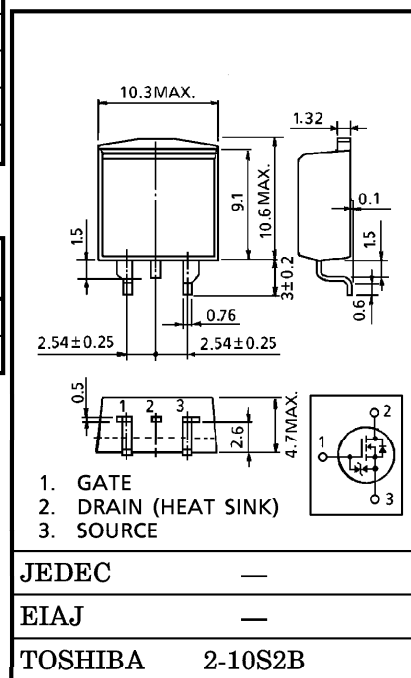
CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance, Channel To Case	$R_{th(ch-c)}$	1.25	$^\circ\text{C/W}$
Thermal Resistance, Channel To Ambient	$R_{th(ch-a)}$	83.3	$^\circ\text{C/W}$

Note ;

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

** $V_{DD} = 25 \text{ V}$, $T_{ch} = 25^\circ\text{C}$ (initial), $L = 236 \mu\text{H}$, $I_{AR} = 55 \text{ A}$, $R_G = 25 \Omega$

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



Weight : 1.5 g

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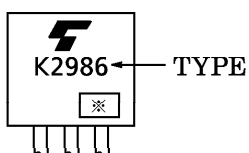
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		IGSS	VGS = ±16 V, VDS = 0 V	—	—	±10	μA
Drain Cut-off Current		IDSS	VDS = 60 V, VGS = 0 V	—	—	100	μA
Drain-Source Breakdown Voltage		V(BR)DSS	ID = 10 mA, VGS = 0 V	60	—	—	V
		V(BR)DSX	ID = 10 mA, VGS = -20 V	40	—	—	
Gate Threshold Voltage		Vth	VDS = 10 V, ID = 1 mA	1.3	—	2.5	V
Drain-Source ON Resistance		RDS(ON)	VGS = 10 V, ID = 35 A	—	4.5	5.8	mΩ
			VGS = 4 V, ID = 35 A	—	5.8	10	
Forward Transfer Admittance		Yfs	VDS = 10 V, ID = 35 A	40	80	—	S
Input Capacitance		Ciss	VDS = 10 V, VGS = 0 V, f = 1 MHz	—	9300	—	pF
Reverse Transfer Capacitance		Crss		—	910	—	
Output Capacitance		Coss		—	1435	—	
Switching Time	Rise Time	tr		—	18	—	ns
	Turn-on Time	ton		—	50	—	
	Fall Time	tf		—	110	—	
	Turn-off Time	toff		VIN : tr, tf < 5 ns Duty ≦ 1%, tw = 10 μs	—	480	
Total Gate Charge (Gate-Source Plus Gate-Drain)		Qg	VDD ≐ 48 V, VGS = 10 V, ID = 55 A	—	210	—	nC
Gate-Source Charge		Qgs		—	145	—	
Gate-Drain ("Miller") Charge		Qgd		—	65	—	

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

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current	IDR	—	—	—	55	A
Pulse Drain Reverse Current	IDRP	t ≦ 10 s	—	—	70	A
		t ≦ 1 ms	—	—	280	
Diode Forward Voltage	VDSF	IDR = 55 A, VGS = 0 V	—	—	-1.5	V
Reverse Recovery Time	trr	IDR = 55 A, VGS = 0 V	—	60	—	ns
Reverse Recovery Charge	Qrr	dIDR / dt = 50 A / μs	—	50	—	nC

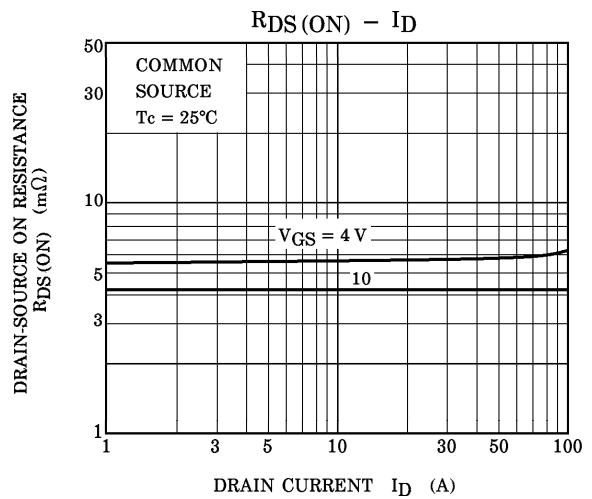
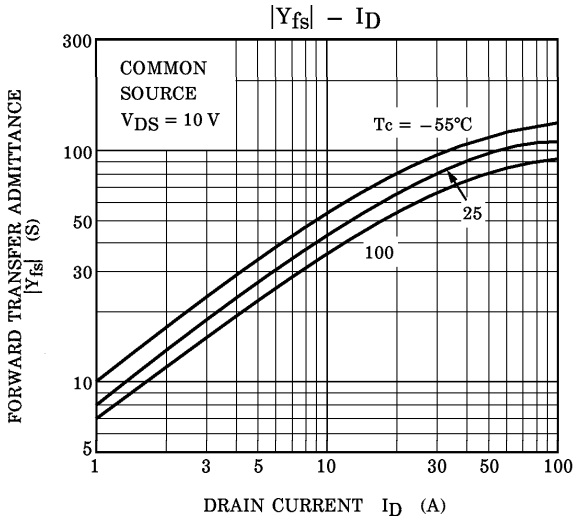
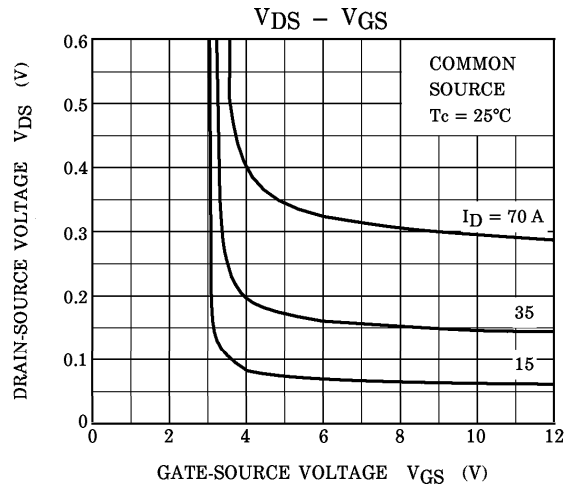
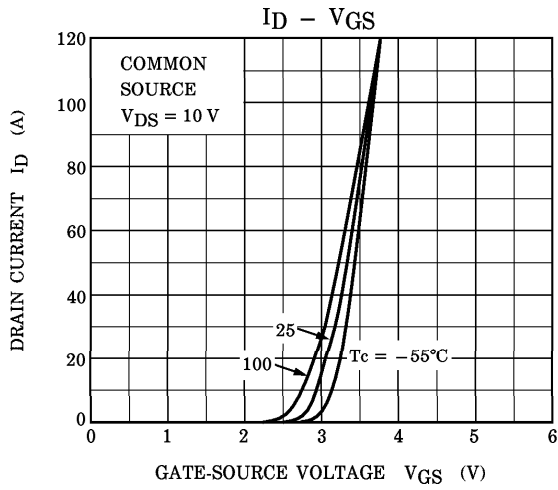
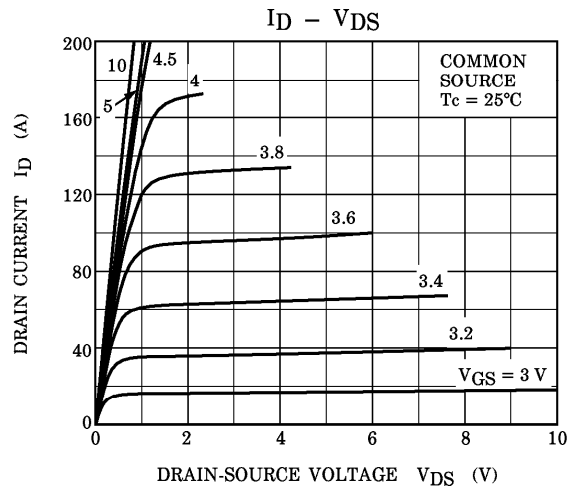
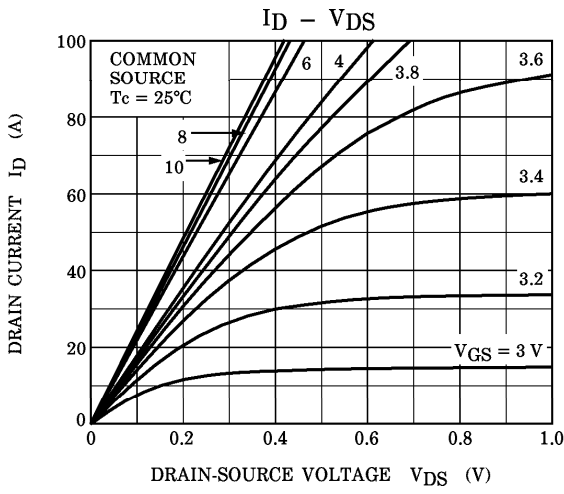
MARKING

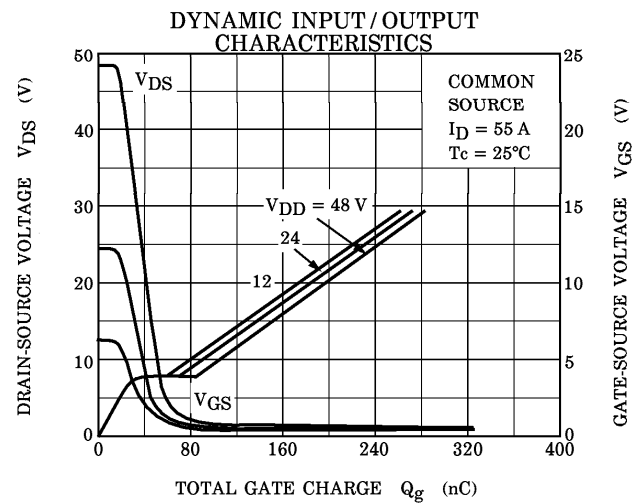
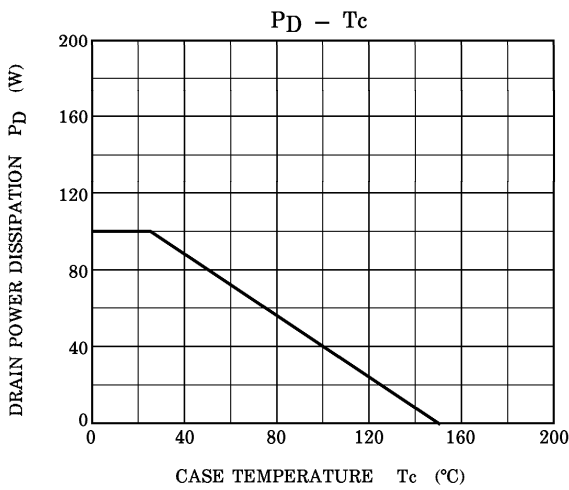
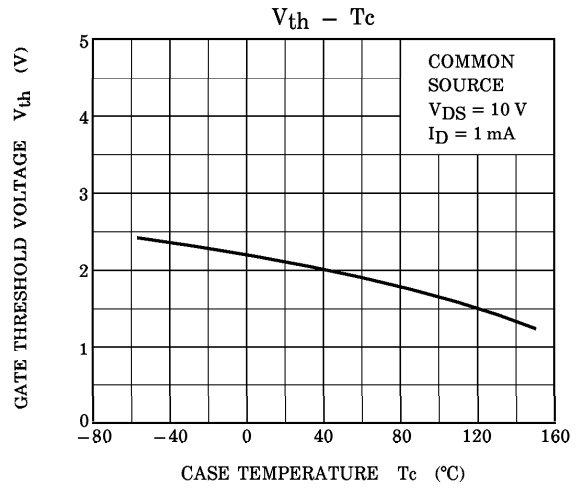
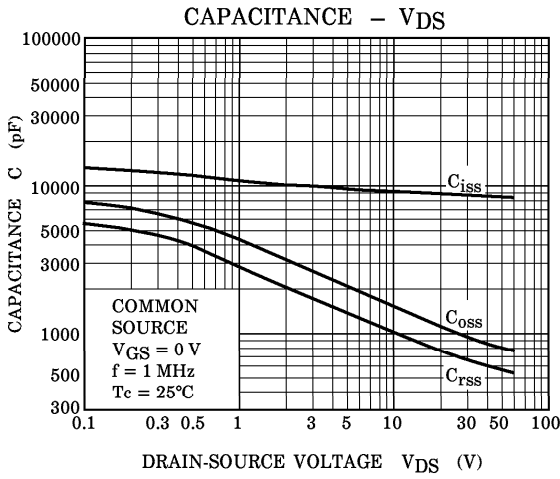
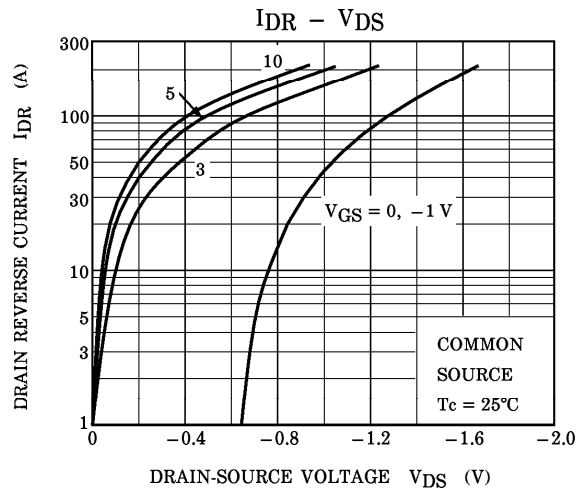
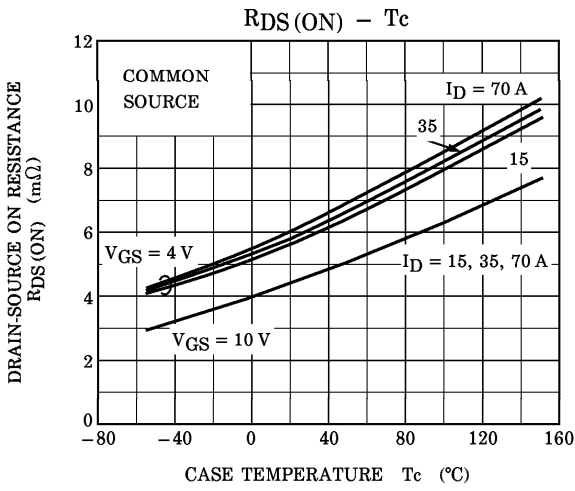


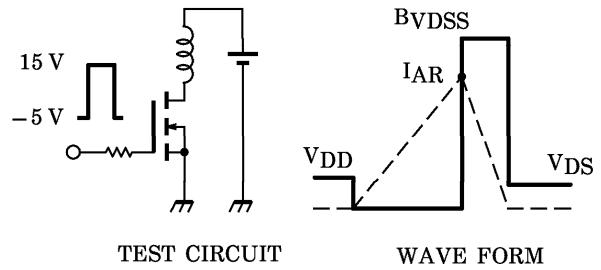
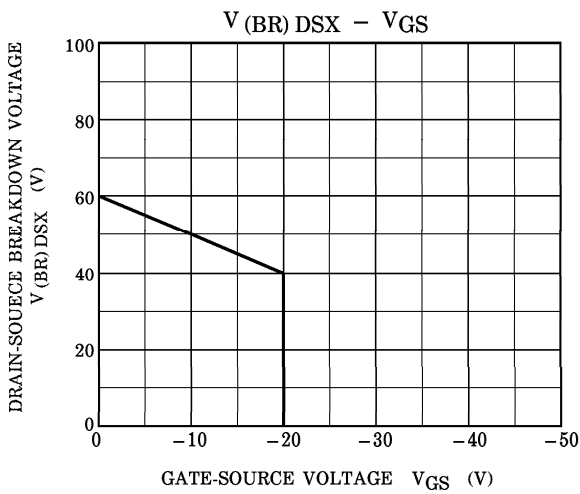
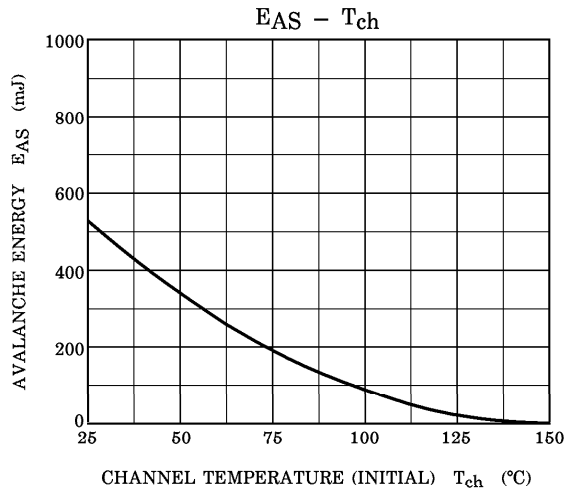
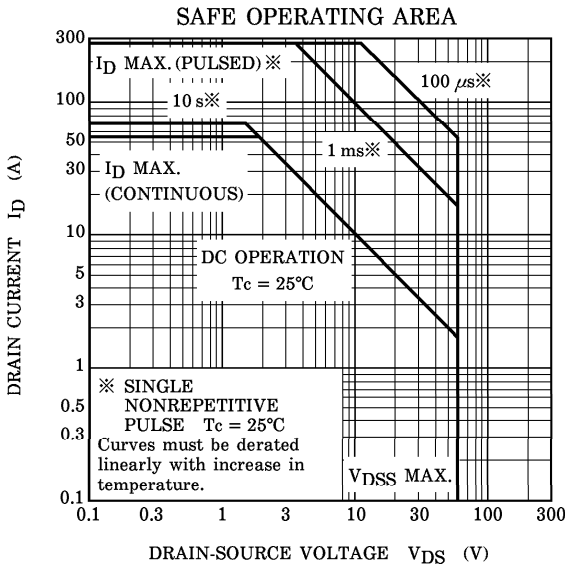
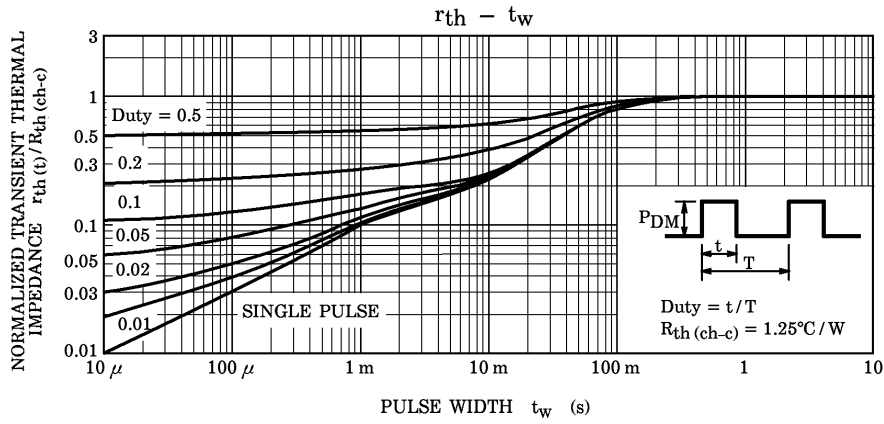
※ Lot Number

□ □ — Month (Starting from Alphabet A)

— Year (Last Number of the Christian Era)







Peak $I_{AR} = 55 A$, $R_G = 25 \Omega$
 $V_{DD} = 25 V$, $L = 236 \mu H$
 $E_{AS} = \frac{1}{2} \cdot L \cdot I^2 \cdot \left(\frac{B_{VDSS}}{B_{VDSS} - V_{DD}} \right)$