

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

2SK2398

HIGH SPEED, HIGH VOLTAGE SWITCHING APPLICATIONS

DC-DC CONVERTER AND MOTOR DRIVE APPLICATIONS

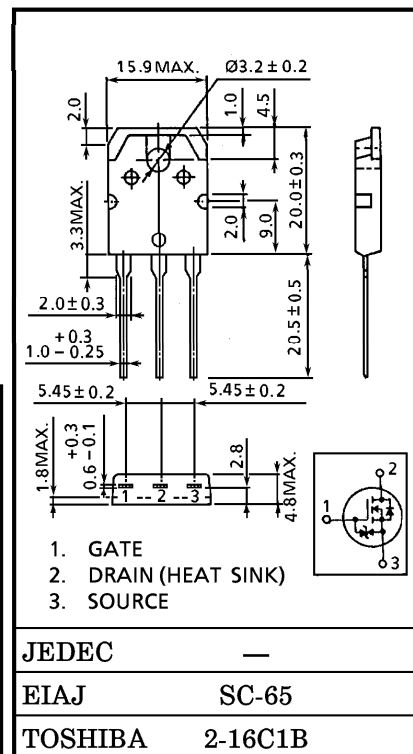
INDUSTRIAL APPLICATIONS

Unit in mm

- Low Drain-Source ON Resistance : $R_{DS(ON)} = 22 \text{ m}\Omega$ (Typ.)
- High Forward Transfer Admittance : $|Y_{fs}| = 27 \text{ S}$ (Typ.)
- Low Leakage Current : $I_{DSS} = 100 \mu\text{A}$ (Max.) ($V_{DS} = 60 \text{ V}$)
- Enhancement-Mode : $V_{th} = 1.5 \sim 3.0 \text{ V}$
($V_{DS} = 10 \text{ V}$, $I_D = 1 \text{ mA}$)

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	45
	Pulse	I_{DP}	180
Drain Power Dissipation ($T_c = 25^\circ\text{C}$)	P_D	100	W
Single Pulse Avalanche Energy**	E_{AS}	246	mJ
Avalanche Current	I_{AR}	45	A
Repetitive Avalanche Energy*	E_{AR}	10	mJ
Channel Temperature	T_{ch}	150	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	$-55 \sim 150$	$^\circ\text{C}$



Weight : 4.6 g

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	$R_{th(ch-a)}$	50	$^\circ\text{C/W}$

Note ;

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

** $V_{DD} = 25 \text{ V}$, $T_{ch} = 25^\circ\text{C}$ (initial), $L = 165 \mu\text{H}$, $R_G = 25 \Omega$, $I_{AR} = 45 \text{ A}$

This transistor is an electrostatic sensitive device.

Please handle with caution.

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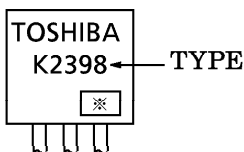
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		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
Gate Threshold Voltage		Vth	VDS = 10 V, ID = 1 mA	1.5	—	3.0	V
Drain-Source ON Resistance		RDS(ON)	VGS = 10 V, ID = 25 A	—	22	30	mΩ
Forward Transfer Admittance		Yfs	VDS = 10 V, ID = 25 A	15	27	—	S
Input Capacitance		Ciss	VDS = 10 V, VGS = 0 V, f = 1 MHz	—	1800	—	pF
Reverse Transfer Capacitance		Crss		—	350	—	
Output Capacitance		Coss		—	900	—	
Switching Time	Rise Time	tr	<p> V_{GS} 10 V 0 V $I_D = 25$ A $R_L = 1.2$ Ω $V_{DD} \approx 30$ V $V_{IN} : t_r, t_f < 5$ ns, Duty $\leq 1\%$, $t_w = 10$ μs </p>	—	20	—	ns
	Turn-on Time	ton		—	30	—	
	Fall Time	tf		—	40	—	
	Turn-off Time	toff		—	130	—	
Total Gate Charge (Gate-Source Plus Gate-Drain)		Qg	VDD ≈ 48 V, VGS = 10 V ID = 45 A	—	60	—	nC
Gate-Source Charge		Qgs		—	40	—	
Gate-Drain ("Miller") Charge		Qgd		—	20	—	

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

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current	IDR	—	—	—	45	A
Pulse Drain Reverse Current	IDRP	—	—	—	180	A
Diode Forward Voltage	VDSF	IDR = 45 A, VGS = 0 V	—	—	-1.8	V
Reverse Recovery Time	trr	IDR = 45 A, VGS = 0 V	—	60	—	ns
Reverse Recovery Charge	Qrr	dIDR / dt = 50 A / μs	—	51	—	nC

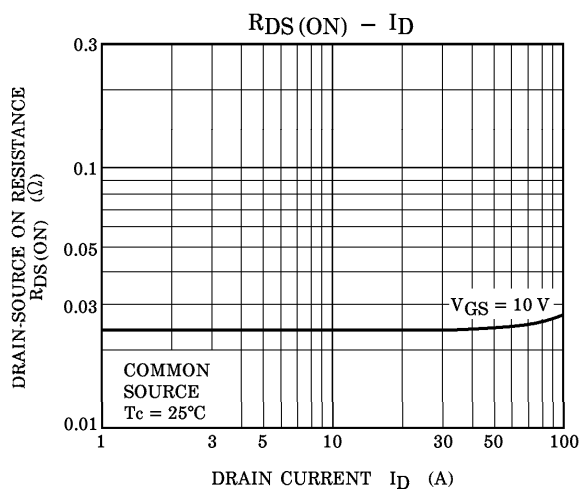
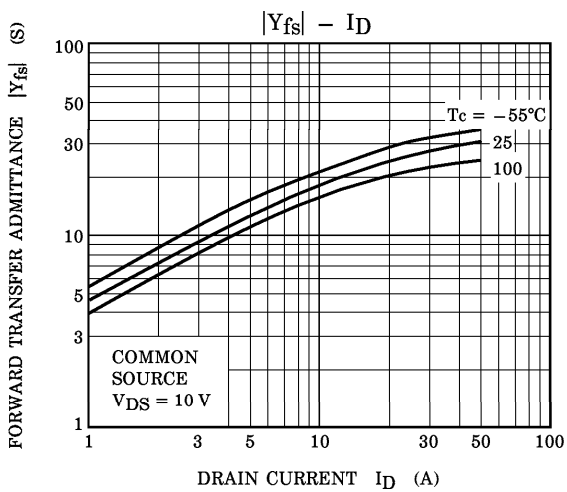
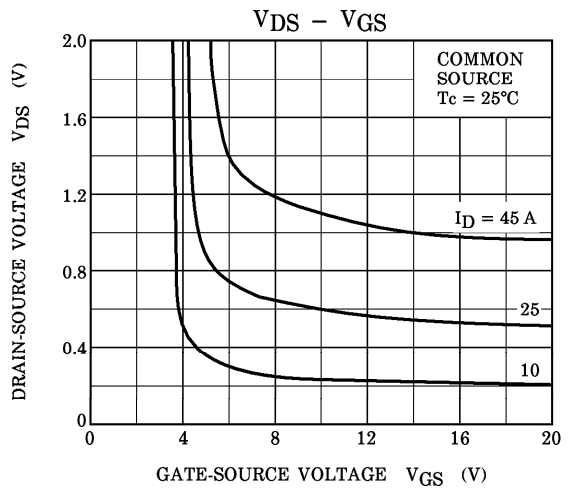
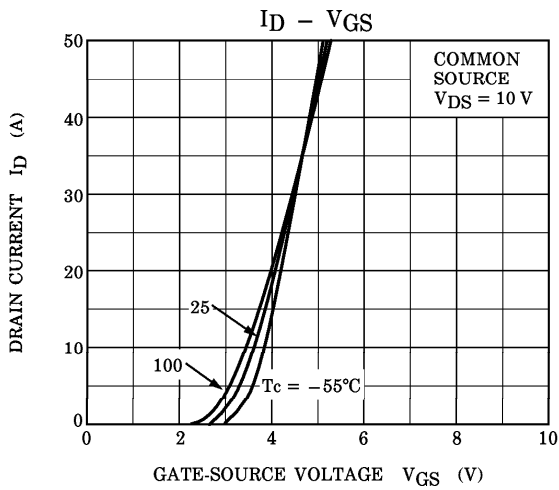
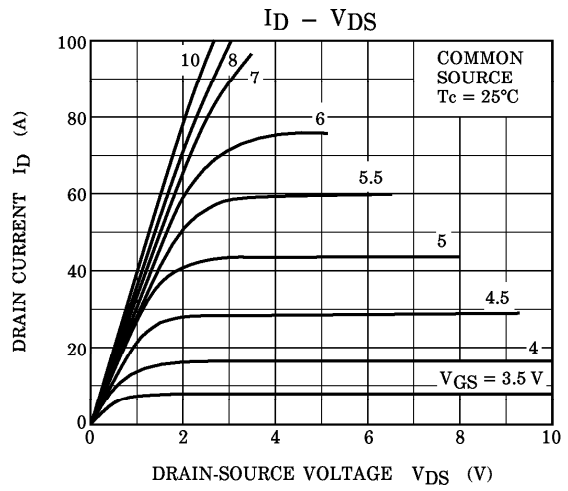
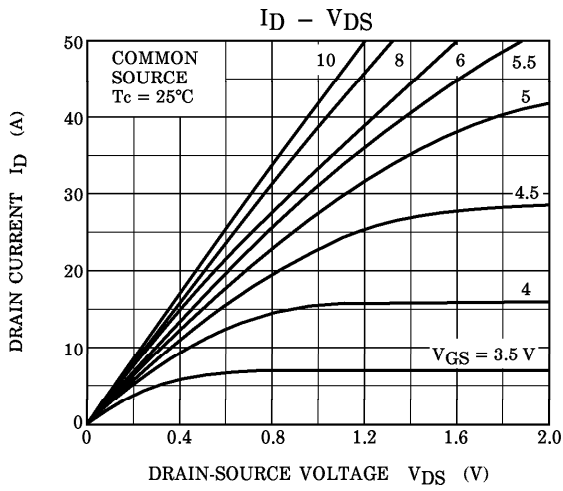
MARKING

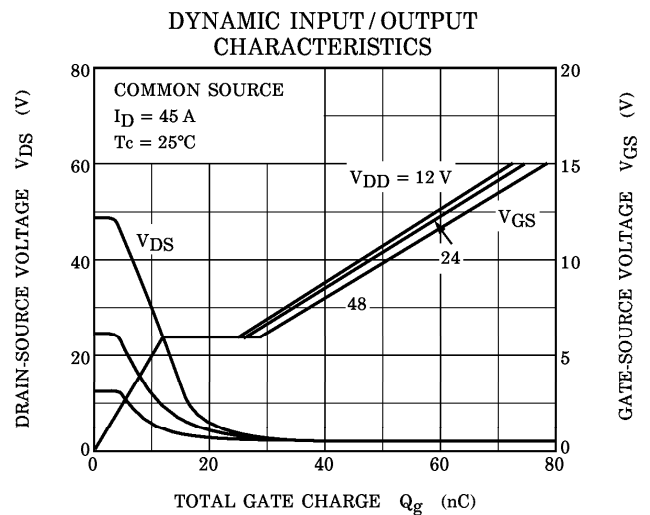
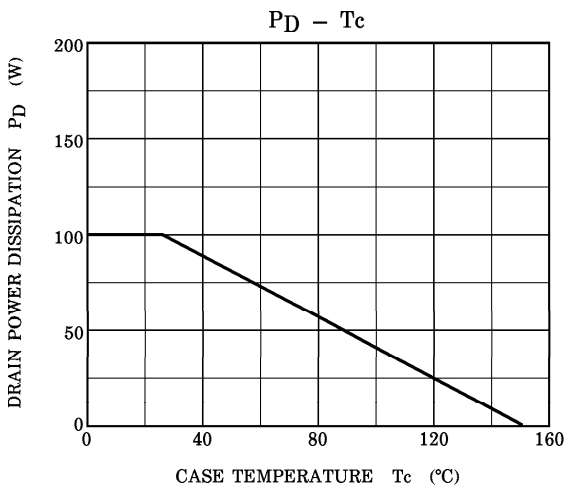
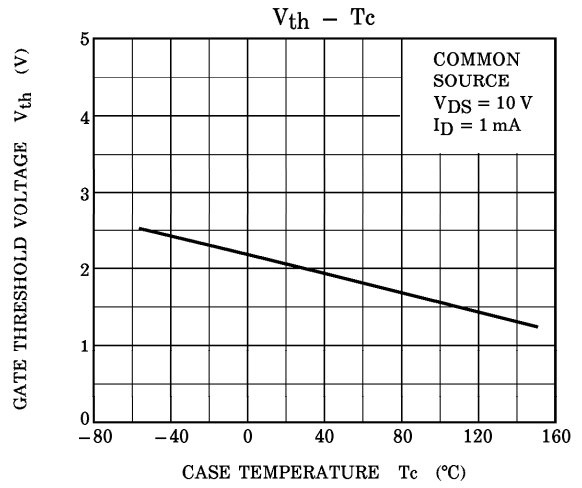
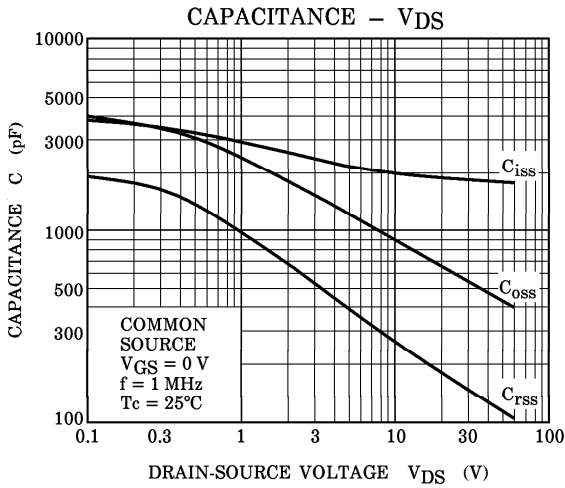
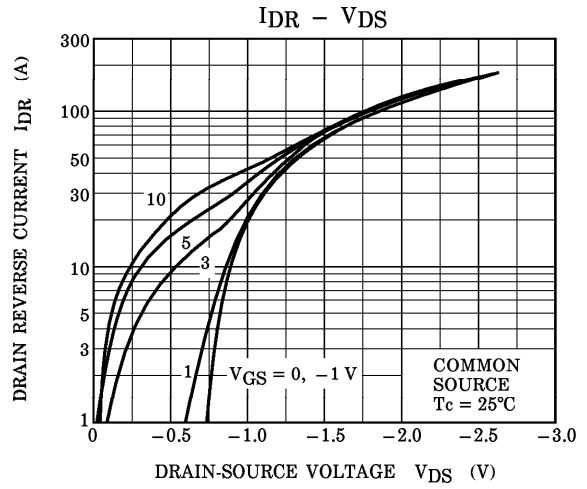
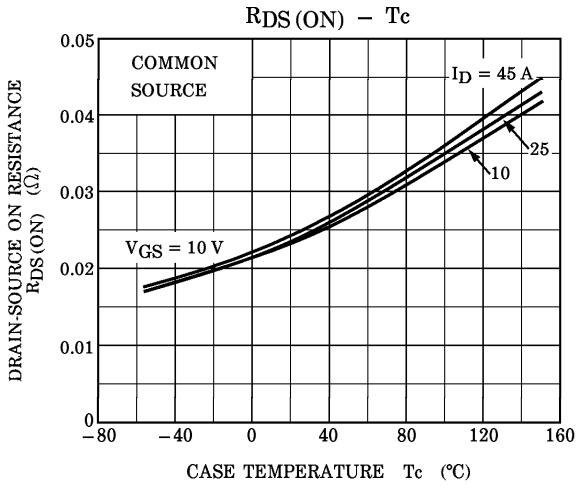


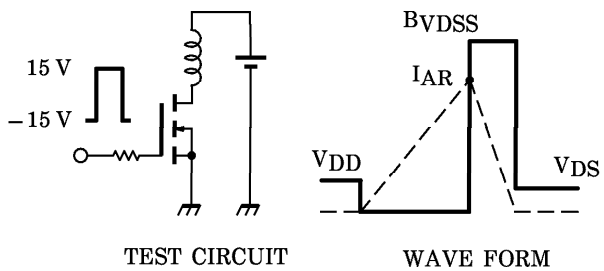
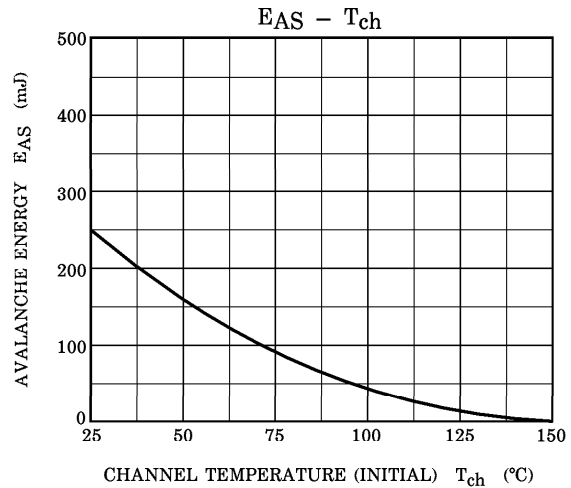
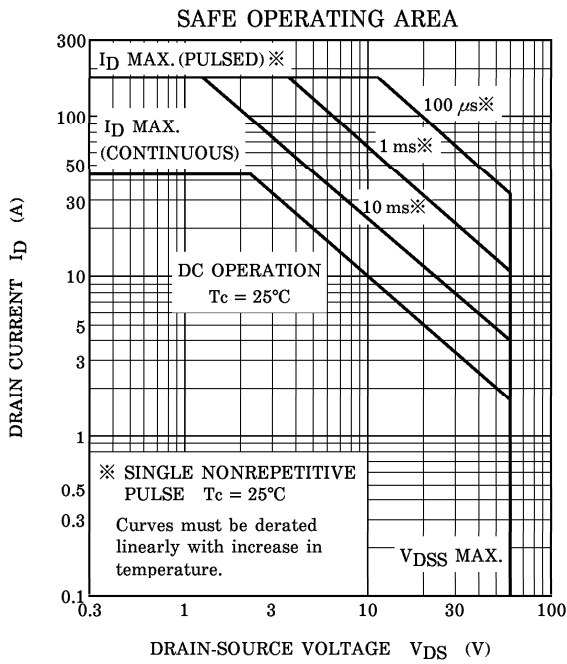
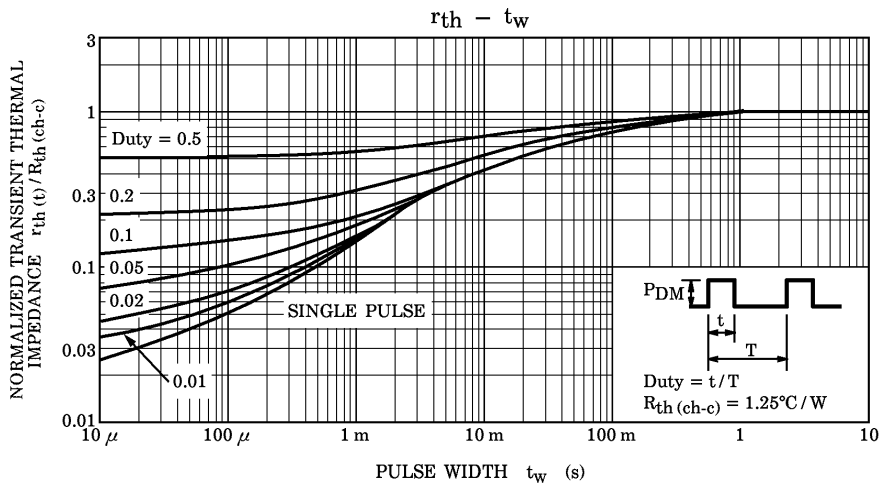
※ Lot Number

□ □ — Month (Starting from Alphabet A)

— Year (Last Number of the Christian Era)







Peak $I_{AR} = 45 \text{ A}$, $R_G = 25 \Omega$, $V_{DD} = 25 \text{ V}$, $L = 165 \mu\text{H}$

$$E_{AS} = \frac{1}{2} \cdot L \cdot I^2 \cdot \left(\frac{BV_{DSS}}{BV_{DSS} - V_{DD}} \right)$$