

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

2SK2598

HIGH SPEED, HIGH VOLTAGE SWITCHING APPLICATIONS

CHOPPER REGULATOR, DC-DC CONVERTER AND MOTOR DRIVE APPLICATIONS

- Low Drain-Source ON Resistance : $R_{DS(ON)} = 0.18 \Omega$ (Typ.)
- High Forward Transfer Admittance : $|Y_{fs}| = 13 S$ (Typ.)
- Low Leakage Current : $I_{DSS} = 100 \mu A$ (Max.) ($V_{DS} = 250 V$)
- Enhancement-Mode : $V_{th} = 1.5 \sim 3.5 V$ ($V_{DS} = 10 V, I_D = 1 mA$)

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

CHARACTERISTIC	SYMBOL	RATING	UNIT
Drain-Source Voltage	V_{DSS}	250	V
Drain-Gate Voltage ($R_{GS} = 20 k\Omega$)	V_{DGR}	250	V
Gate-Source Voltage	V_{GSS}	± 20	V
Drain Current	DC	I_D	13
	Pulse	I_{DP}	52
Drain Power Dissipation ($T_c = 25^\circ C$)	P_D	60	W
Single Pulse Avalanche Energy**	E_{AS}	148	mJ
Avalanche Current	I_{AR}	13	A
Repetitive Avalanche Energy*	E_{AR}	6	mJ
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	$R_{th(ch-c)}$	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.

** $V_{DD} = 50 V$, Starting $T_{ch} = 25^\circ C$, $L = 1.48 mH$, $R_G = 25 \Omega$, $I_{AR} = 13 A$

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

INDUSTRIAL APPLICATIONS

TO-220FL

Unit in mm

JEDEC —

EIAJ —

TOSHIBA 2-10S1B

TO-220SM

Unit in mm

JEDEC —

EIAJ —

TOSHIBA 2-10S2B

Weight : 1.5 g

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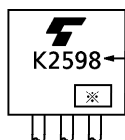
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		I_{GSS}	$V_{GS} = \pm 16\text{ V}, V_{DS} = 0\text{ V}$	—	—	± 10	μA
Drain Cut-off Current		I_{DSS}	$V_{DS} = 250\text{ V}, V_{GS} = 0\text{ V}$	—	—	100	μA
Drain-Source Breakdown Voltage		$V_{(BR)DSS}$	$I_D = 10\text{ mA}, V_{GS} = 0\text{ V}$	250	—	—	V
Gate Threshold Voltage		V_{th}	$V_{DS} = 10\text{ V}, I_D = 1\text{ mA}$	1.5	—	3.5	V
Drain-Source ON Resistance		$R_{DS(ON)}$	$V_{GS} = 10\text{ V}, I_D = 6.5\text{ A}$	—	0.18	0.25	Ω
Forward Transfer Admittance		$ Y_{fs} $	$V_{DS} = 10\text{ V}, I_D = 6.5\text{ A}$	6	13	—	S
Input Capacitance		C_{iss}	$V_{DS} = 10\text{ V}, V_{GS} = 0\text{ V},$ $f = 1\text{ MHz}$	—	1800	—	pF
Reverse Transfer Capacitance		C_{rss}		—	130	—	
Output Capacitance		C_{oss}		—	500	—	
Switching Time	Rise Time	t_r		—	15	—	ns
	Turn-on Time	t_{on}		—	25	—	
	Fall Time	t_f		—	10	—	
	Turn-off Time	t_{off}		—	70	—	
Total Gate Charge (Gate-Source Plus Gate-Drain)		Q_g	$V_{DD} \cong 200\text{ V}, V_{GS} = 10\text{ V},$ $I_D = 13\text{ A}$	—	40	—	nC
Gate-Source Charge		Q_{gs}		—	25	—	
Gate-Drain (“Miller”) Charge		Q_{gd}		—	15	—	

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

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current	I_{DR}	—	—	—	13	A
Pulse Drain Reverse Current	I_{DRP}	—	—	—	52	A
Diode Forward Voltage	V_{DSF}	$I_{DR} = 13\text{ A}, V_{GS} = 0\text{ V}$	—	—	-2.0	V
Reverse Recovery Time	t_{rr}	$I_{DR} = 13\text{ A}, V_{GS} = 0\text{ V}$	—	260	—	ns
Reverse Recovery Charge	Q_{rr}	$dI_{DR}/dt = 100\text{ A}/\mu\text{s}$	—	0.3	—	μC

MARKING

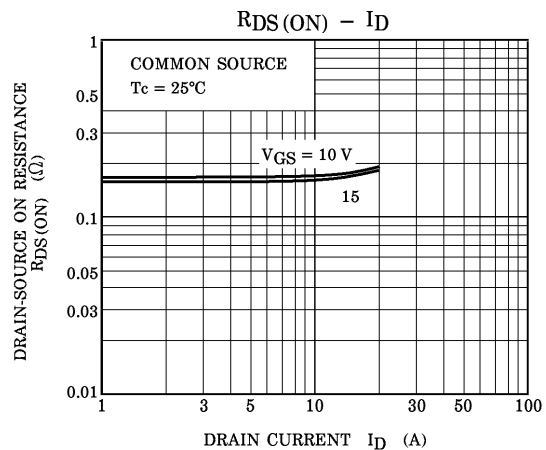
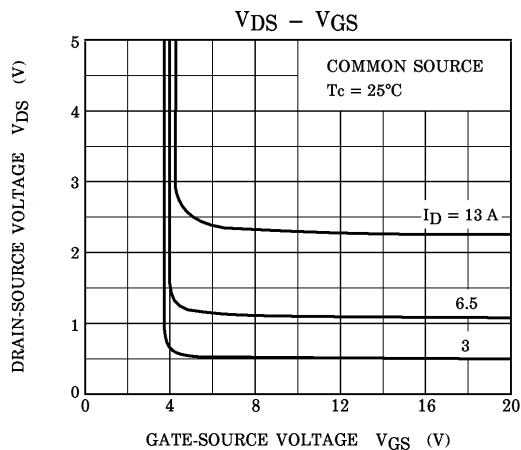
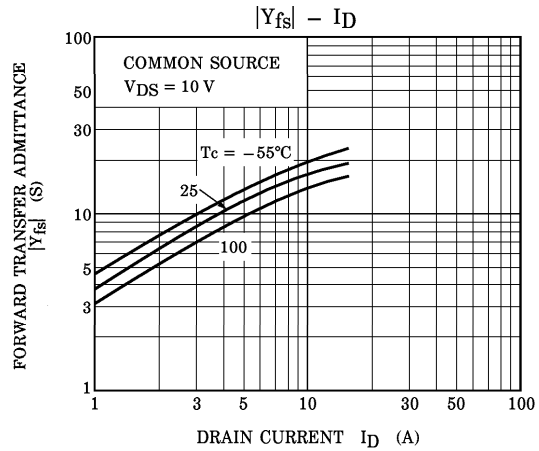
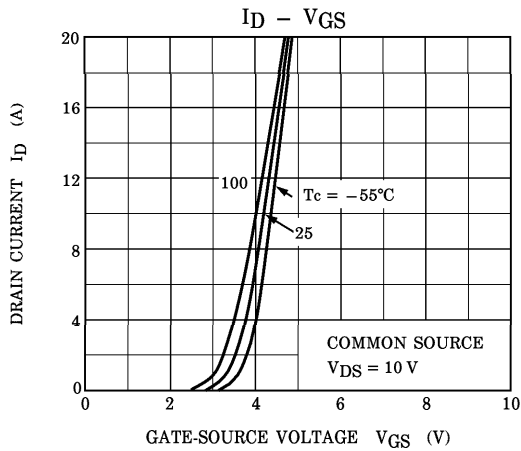
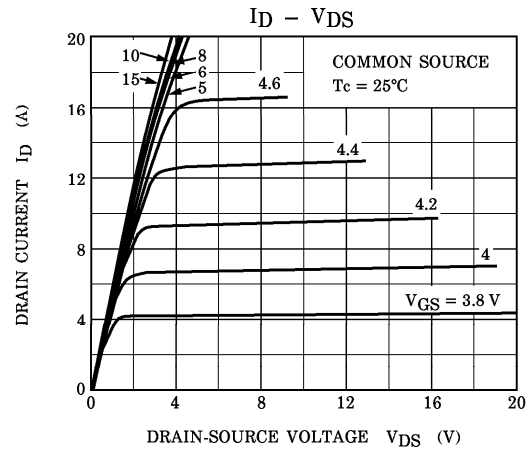
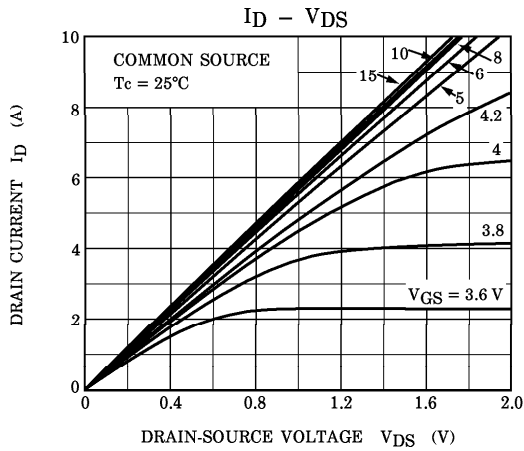


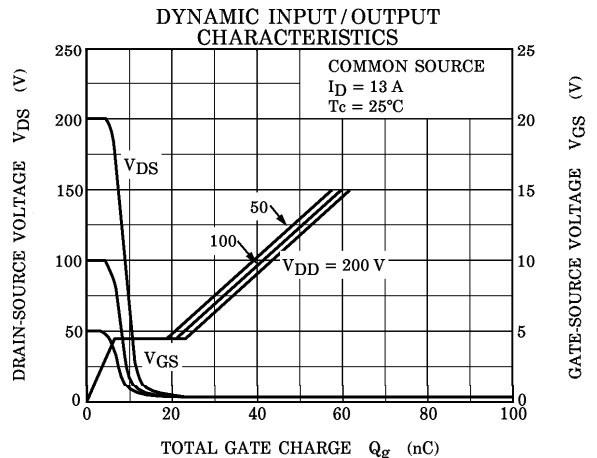
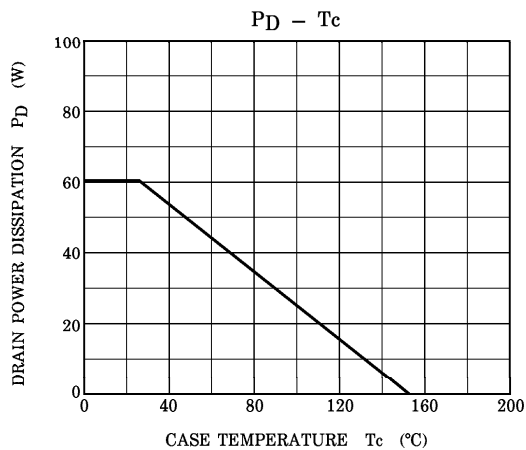
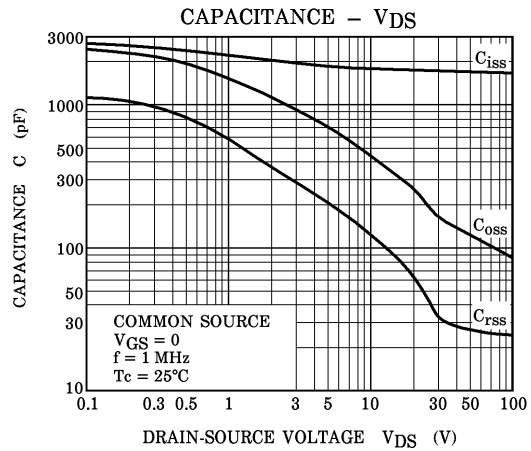
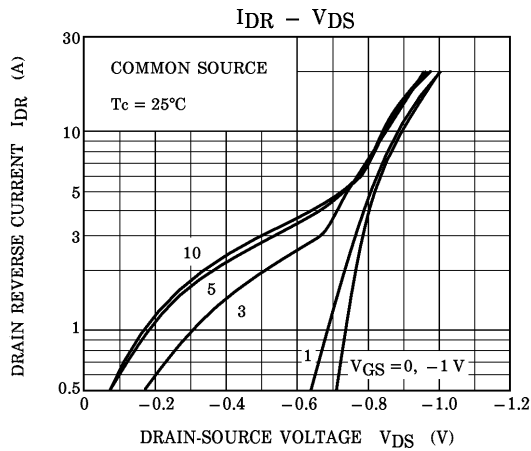
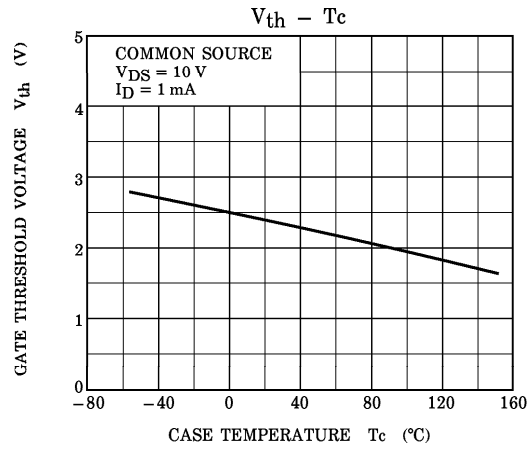
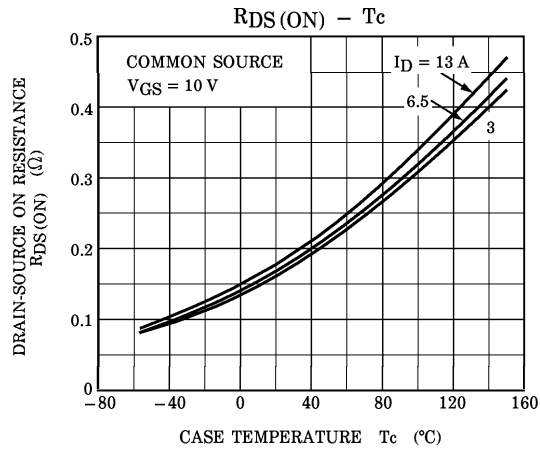
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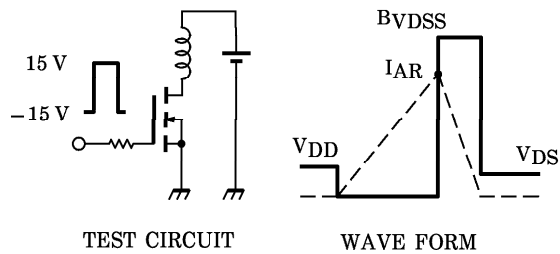
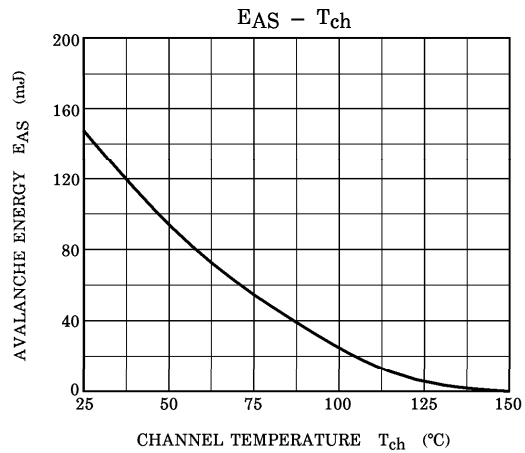
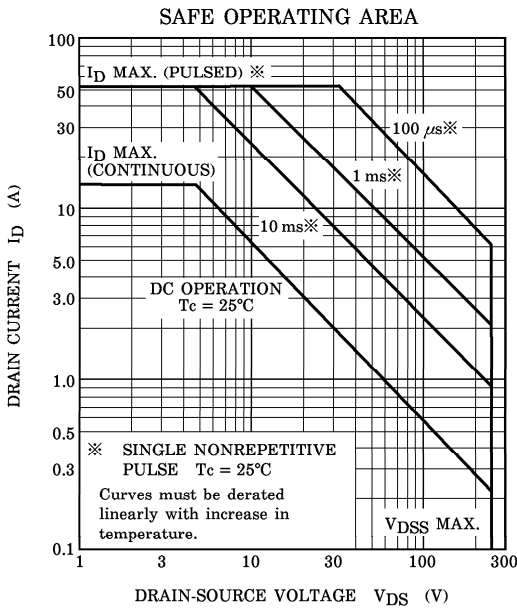
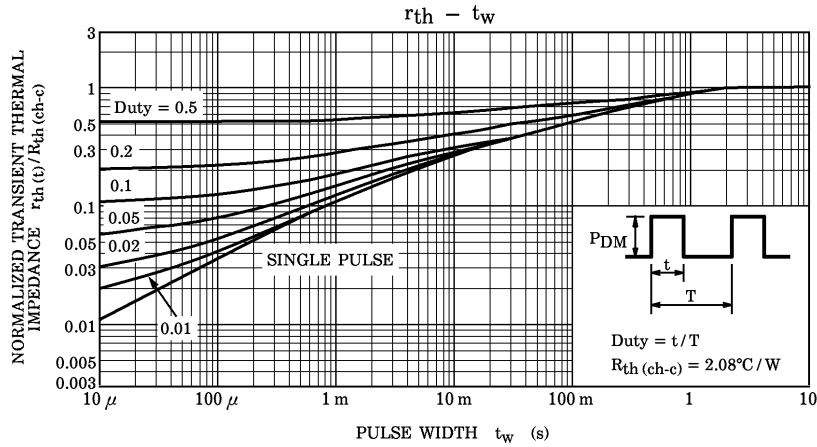
※ Lot Number

□ □ — Month (Starting from Alphabet A)

— Year (Last Number of the Christian Era)







Peak $I_{AR} = 13 A$, $R_G = 25 \Omega$

$V_{DD} = 50 V$, $L = 1.48 mH$

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