

TOSHIBA FIELD EFFECT TRANSISTOR SILICON N CHANNEL MOS TYPE (L^2 - π -MOS V)

2SK2201

HIGH SPEED, HIGH CURRENT SWITCHING APPLICATIONS

CHOPPER REGULATOR, DC-DC CONVERTER AND MOTOR DRIVE APPLICATIONS

INDUSTRIAL APPLICATIONS

Unit in mm

- 4V Gate Drive
- Low Drain-Source ON Resistance : $R_{DS(ON)} = 0.28\Omega$ (Typ.)
- High Forward Transfer Admittance : $|Y_{fs}| = 3.5S$ (Typ.)
- Low Leakage Current : $I_{DSS} = 100\mu A$ (Max.) ($V_{DS} = 100V$)
- Enhancement-Mode : $V_{th} = 0.8 \sim 2.0V$ ($V_{DS} = 10V$, $I_D = 1mA$)

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

CHARACTERISTIC		SYMBOL	RATING	UNIT
Drain-Source Voltage		V_{DSS}	100	V
Drain-Gate Voltage ($R_{GS} = 20k\Omega$)		V_{DGR}	100	V
Gate-Source Voltage		V_{GSS}	± 20	V
Drain Current	DC	I_D	3	A
	Pulse	I_{DP}	12	A
Drain Power Dissipation ($T_c = 25^\circ C$)		P_D	20	W
Single Pulse Avalanche Energy**		E_{AS}	140	mJ
Avalanche Current		I_{AR}	3	A
Repetitive Avalanche Energy*		E_{AR}	2	mJ
Channel Temperature		T_{ch}	150	$^\circ C$
Storage Temperature Range		T_{stg}	$-55 \sim 150$	$^\circ C$

THERMAL CHARACTERISTICS

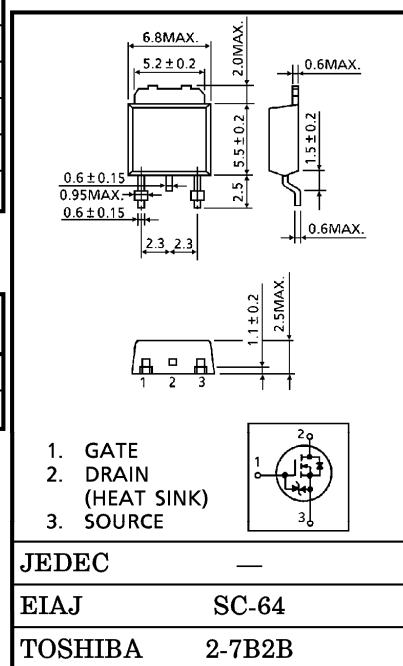
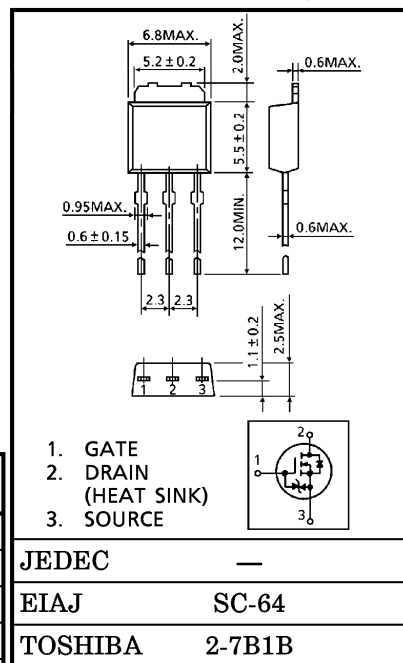
CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance, Channel To Case	$R_{th(ch-c)}$	6.25	$^\circ C / W$
Thermal Resistance, Channel To Ambient	$R_{th(ch-a)}$	125	$^\circ C / W$

Note ;

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

** $V_{DD} = 50V$, Starting $T_{ch} = 25^\circ C$, $L = 25mH$, $R_G = 25\Omega$, $I_{AR} = 3A$

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

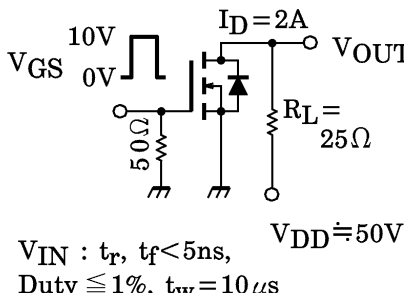


Weight : 0.36g

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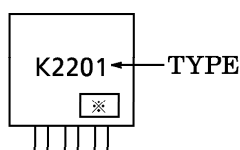
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		I _{GSS}	V _{GS} =±16V, V _{DS} =0V	—	—	±10	μA
Drain Cut-off Current		I _{DSS}	V _{DS} =100V, V _{GS} =0V	—	—	100	μA
Drain-Source Breakdown Voltage		V _{(BR) DSS}	I _D =10mA, V _{GS} =0V	100	—	—	V
Gate Threshold Voltage		V _{th}	V _{DS} =10V, I _D =1mA	0.8	—	2.0	V
Drain-Source ON Resistance		R _{DS (ON)}	V _{GS} =4V, I _D =2A	—	0.36	0.45	Ω
			V _{GS} =10V, I _D =2A	—	0.28	0.35	
Forward Transfer Admittance		Y _{fs}	V _{DS} =10V, I _D =2A	1.5	3.5	—	S
Input Capacitance		C _{iss}	V _{DS} =10V, V _{GS} =0V f=1MHz	—	280	—	pF
Reverse Transfer Capacitance		C _{rss}		—	50	—	
Output Capacitance		C _{oss}		—	105	—	
Switching Time	Rise Time	t _r		—	20	—	ns
	Turn-on Time	t _{on}		—	50	—	
	Fall Time	t _f		—	40	—	
	Turn-off Time	t _{off}		—	170	—	
Total Gate Charge (Gate-Source Plus Gate-Drain)		Q _g	V _{DD} ≐80V, V _{GS} =10V I _D =3A	—	13.5	—	nC
Gate-Source Charge		Q _{gs}		—	8.5	—	
Gate-Drain (“Miller”) Charge		Q _{gd}		—	5	—	

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

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current	I_{DR}	—	—	—	3	A
Pulse Drain Reverse Current	I_{DRP}	—	—	—	12	A
Diode Forward Voltage	V_{DSF}	$I_{DR} = 3A, V_{GS} = 0V$	—	—	—1.5	V
Reverse Recovery Time	t_{rr}	$I_{DR} = 3A, V_{GS} = 0V$	—	100	—	ns
Reverse Recovery Charge	Q_{rr}	$dI_{DR} / dt = 50A / \mu s$	—	0.2	—	μC

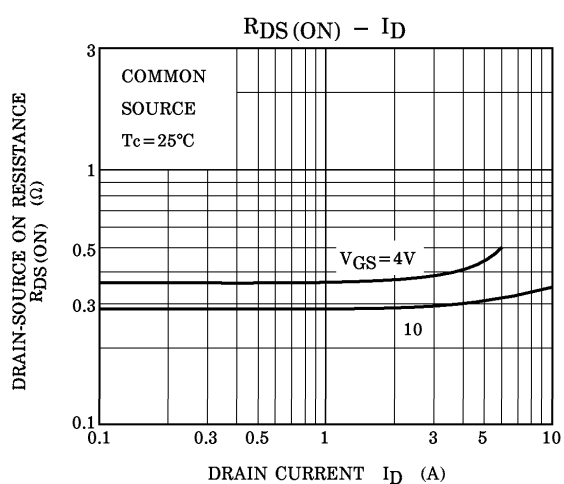
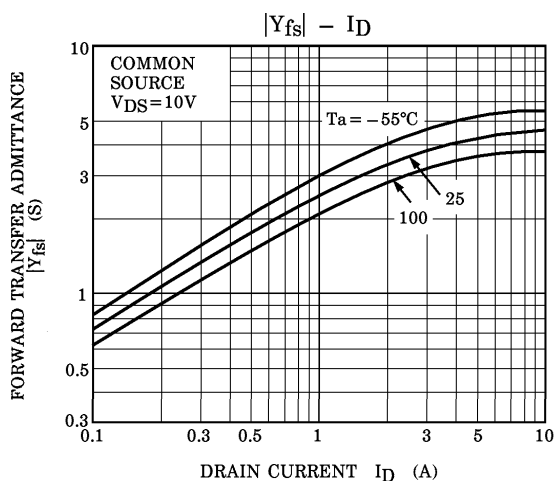
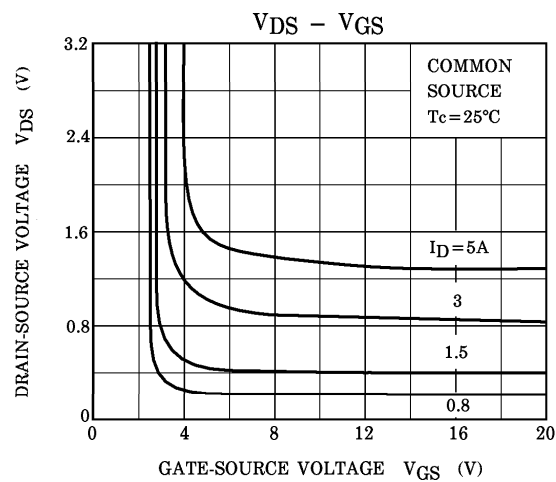
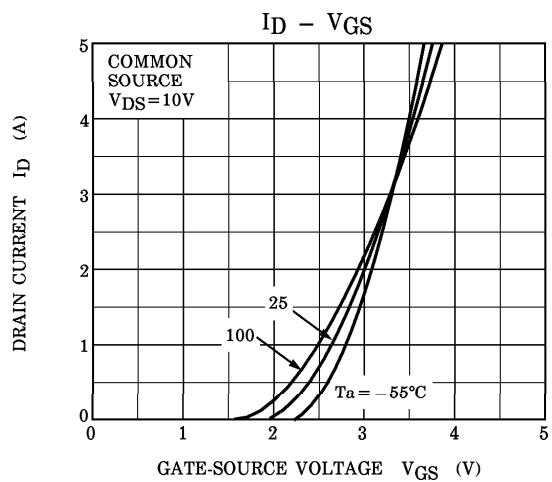
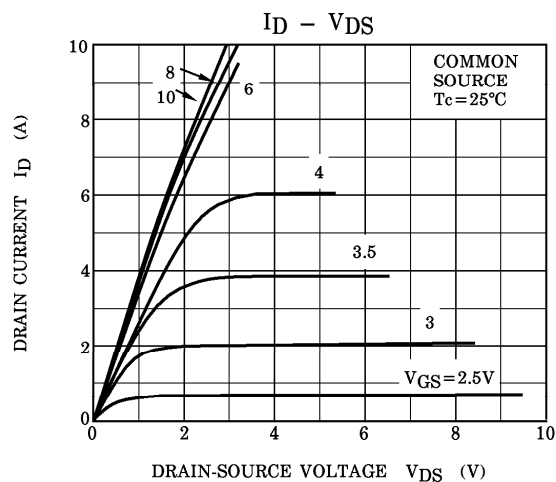
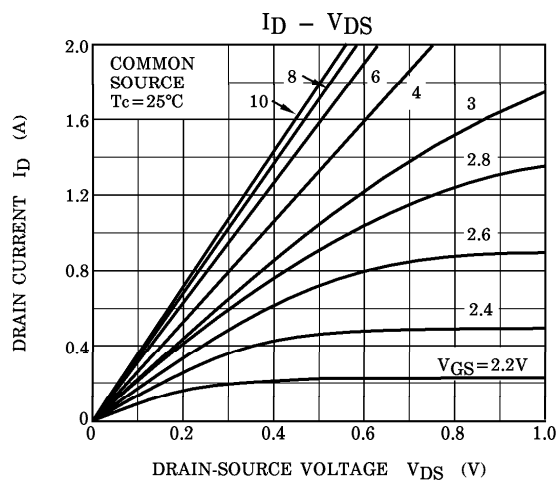
MARKING

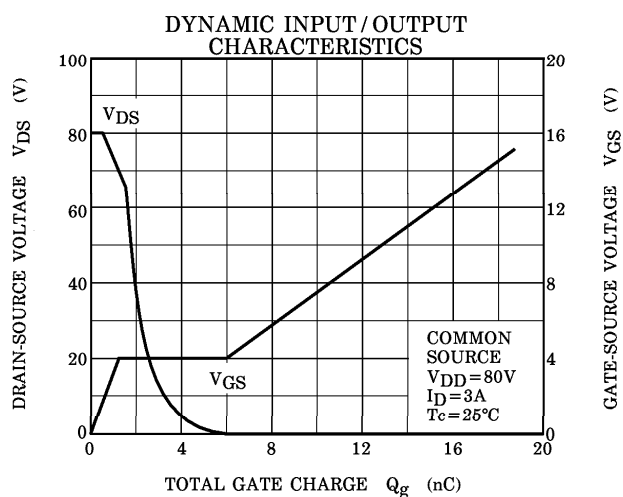
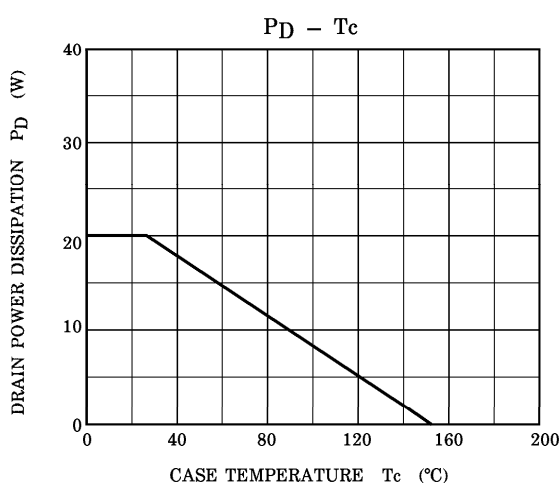
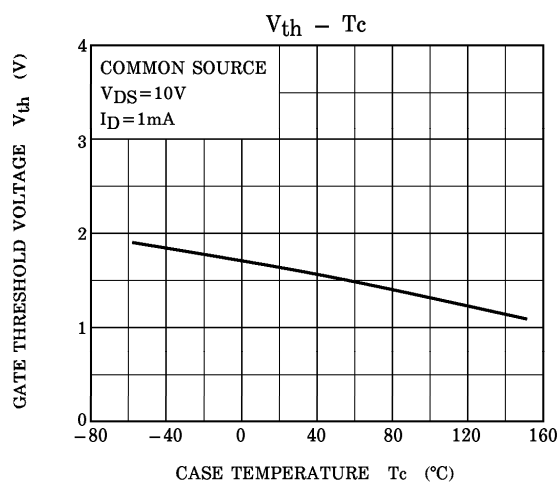
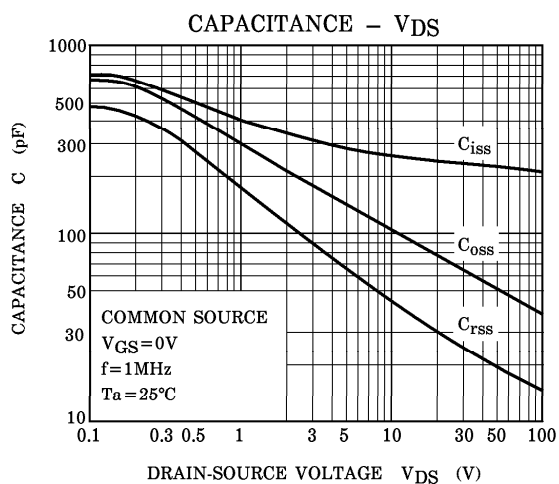
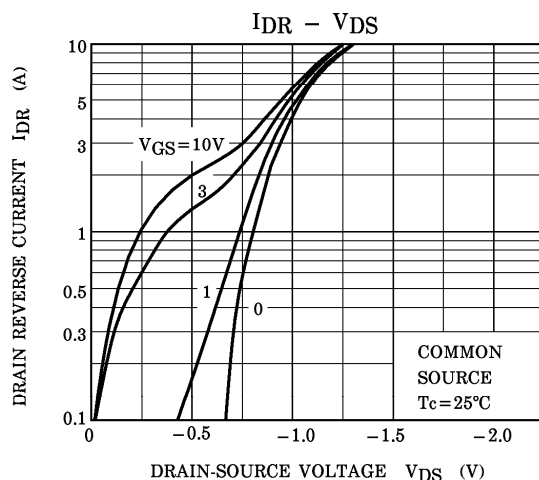
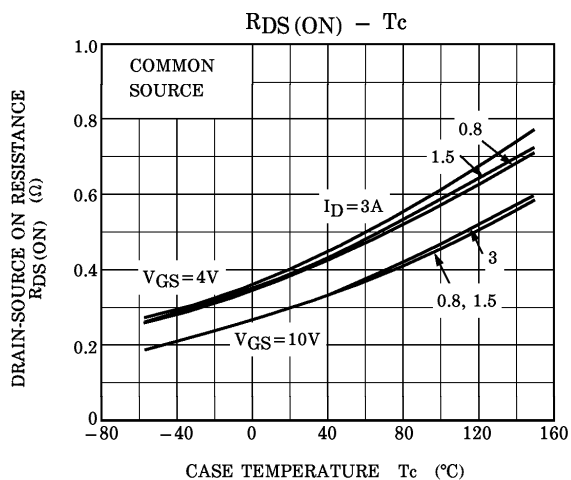


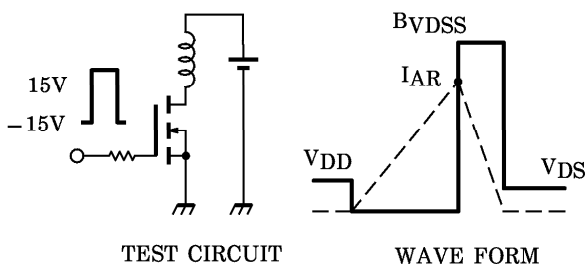
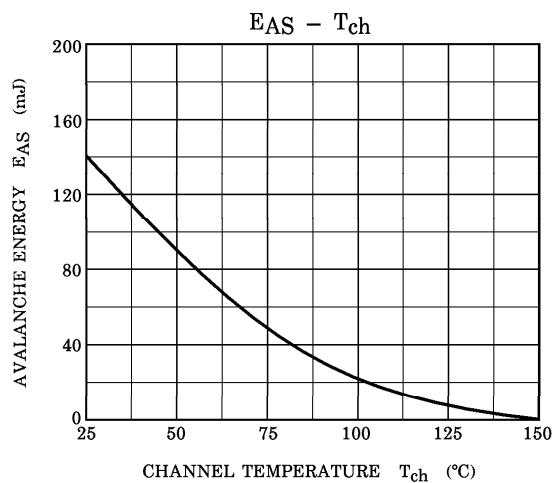
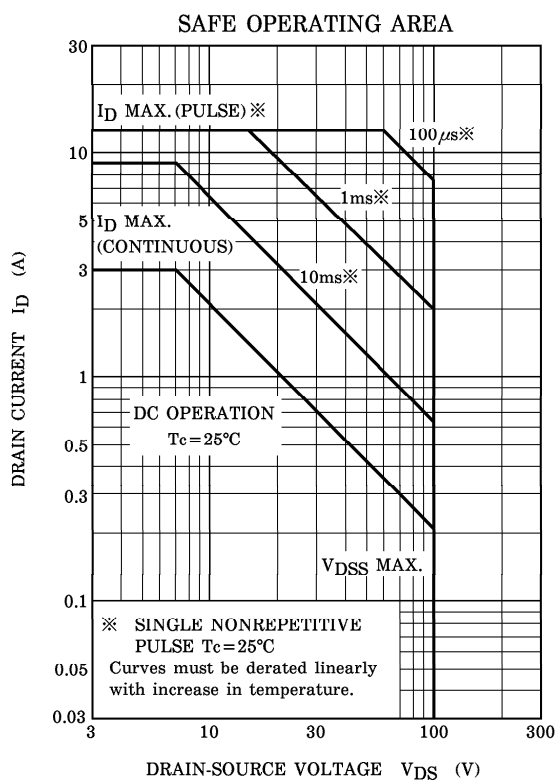
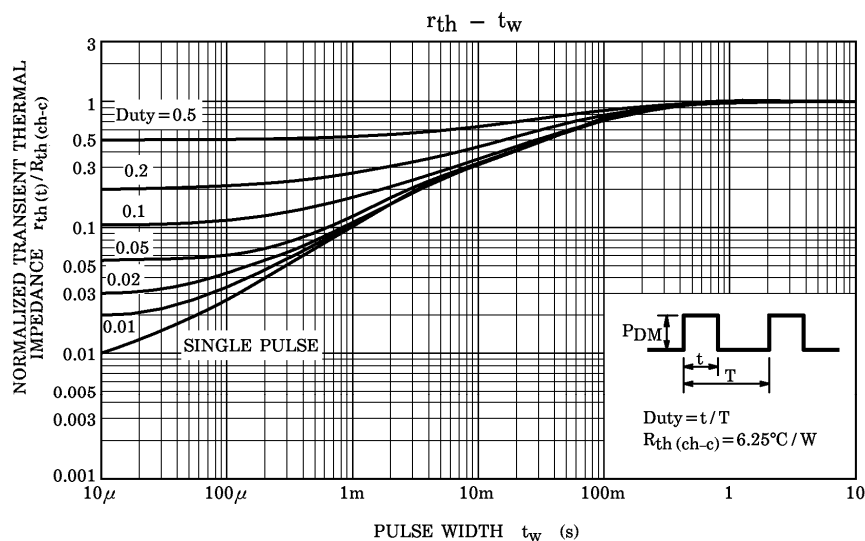
※ Lot Number


 Month (Starting from Alphabet A)


 Year (Last Number of the Christian Era)







Peak $I_{AR} = 3A$, $R_G = 25\Omega$
 $V_{DD} = 25V$, $L = 25mH$

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