

TOSHIBA FIELD EFFECT TRANSISTOR SILICON N CHANNEL MOS TYPE (L²-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 (Ta = 25°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 (Tc = 25°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	°C
Storage Temperature Range		T_{stg}	-55~150	°C

THERMAL CHARACTERISTICS

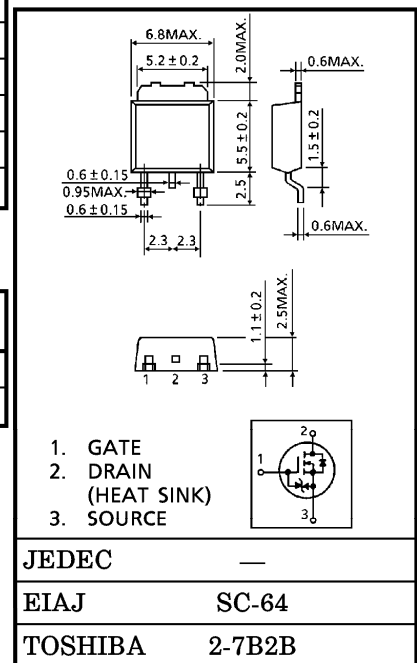
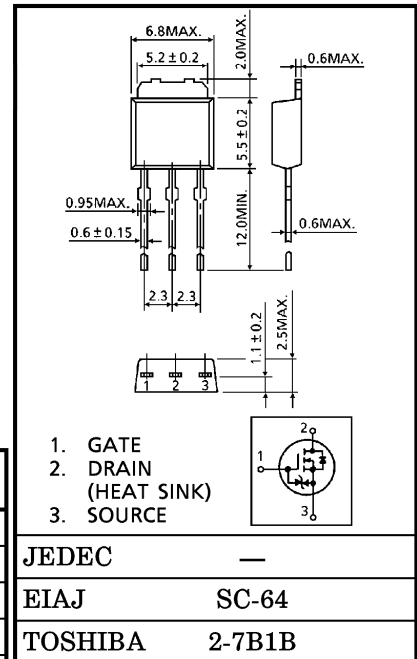
CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance, Channel To Case	$R_{th(ch-c)}$	6.25	°C/W
Thermal Resistance, Channel To Ambient	$R_{th(ch-a)}$	125	°C/W

Note ;

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

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

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

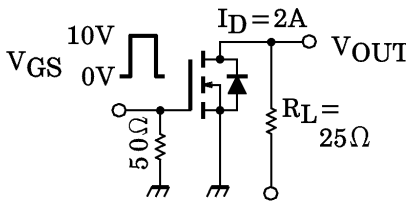


Weight : 0.36g

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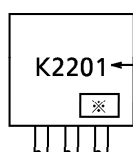
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

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}		V _{IN} : t _r , t _f < 5ns, Duty ≤ 1%, t _w = 10μs	—	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	—		

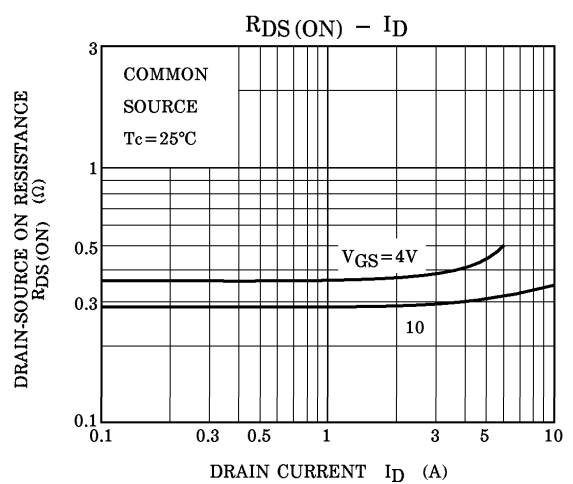
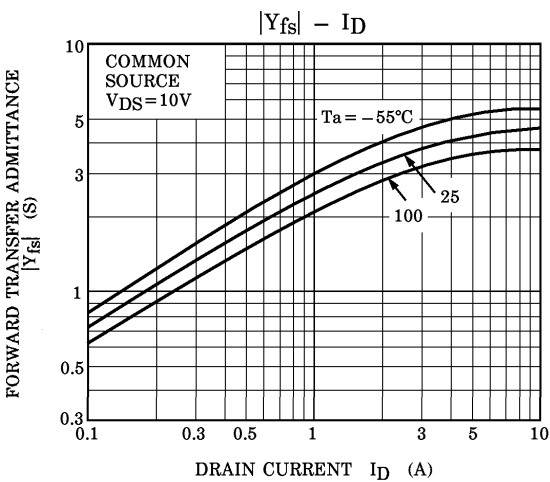
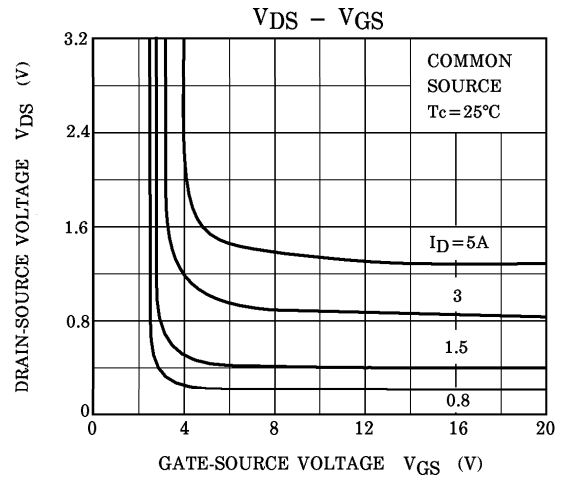
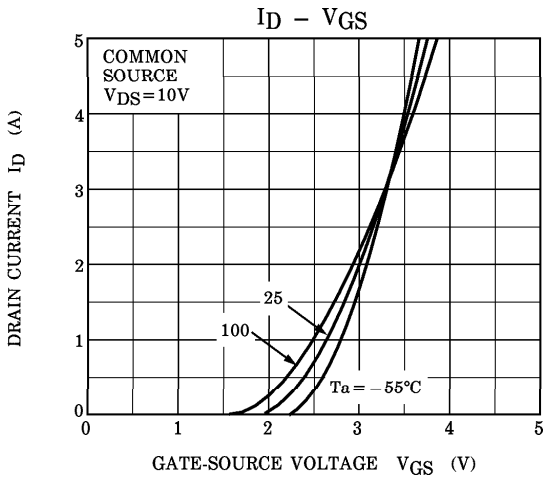
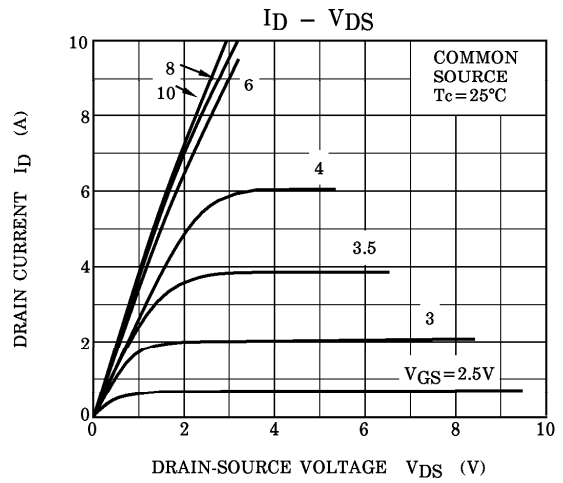
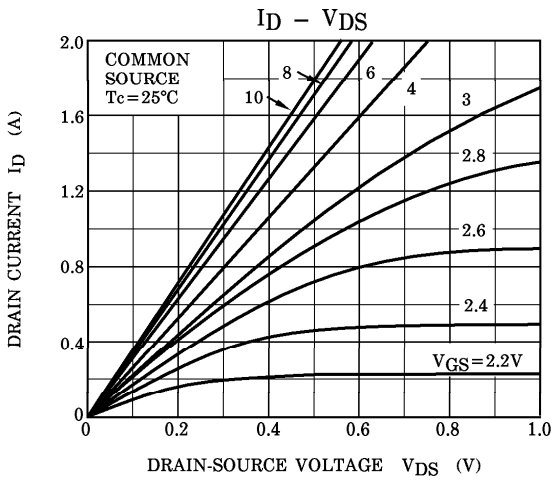
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (Ta = 25°C)

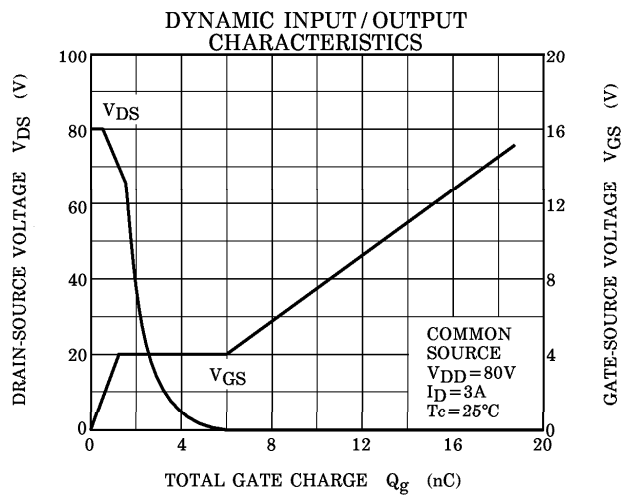
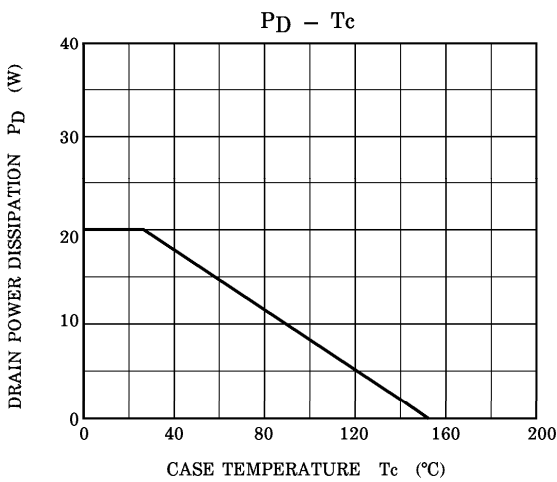
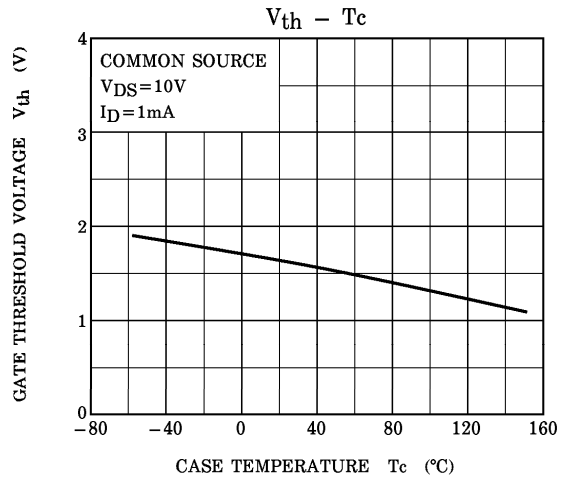
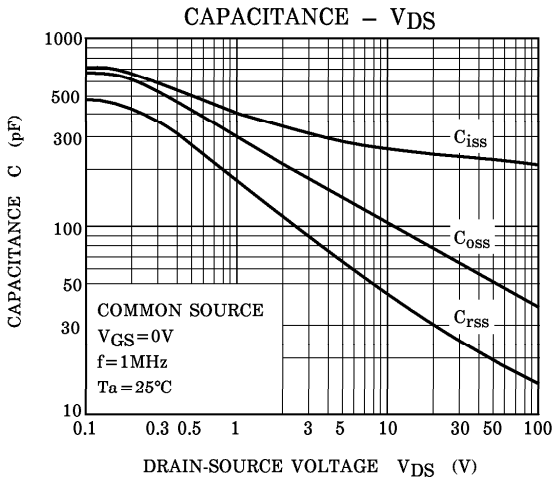
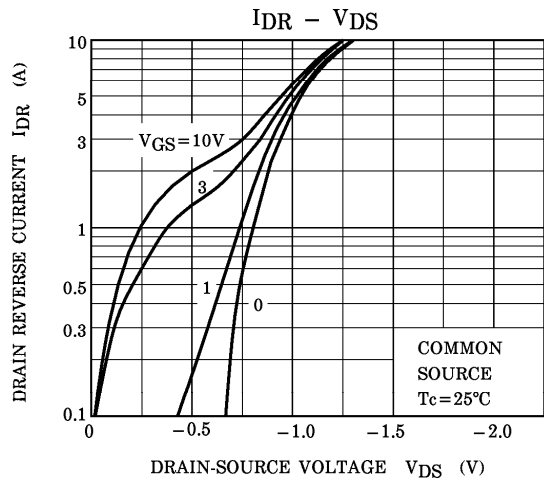
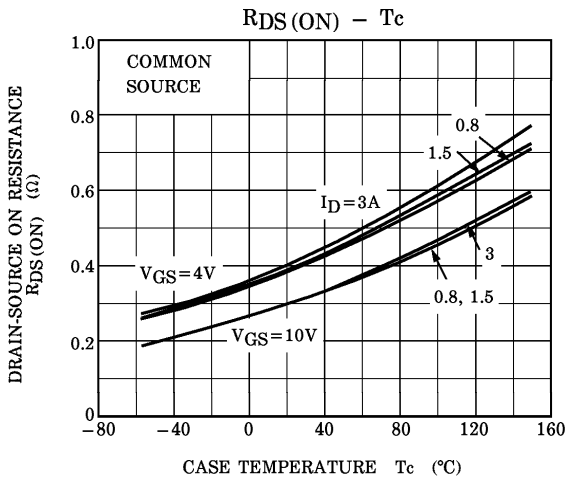
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current	I _{DR}	—	—	—	3	A
Pulse Drain Reverse Current	I _{DRP}	—	—	—	12	A
Diode Forward Voltage	V _{DSF}	I _{DR} = 3A, V _{GS} = 0V	—	—	-1.5	V
Reverse Recovery Time	t _{rr}	I _{DR} = 3A, V _{GS} = 0V	—	100	—	ns
Reverse Recovery Charge	Q _{rr}	dI _{DR} / dt = 50A / μs	—	0.2	—	μC

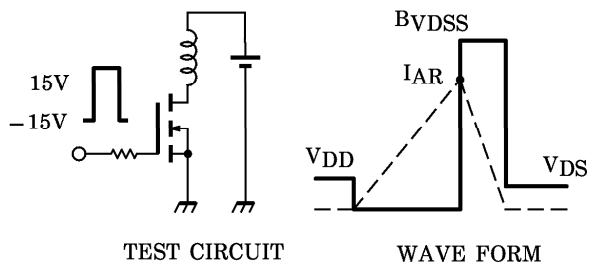
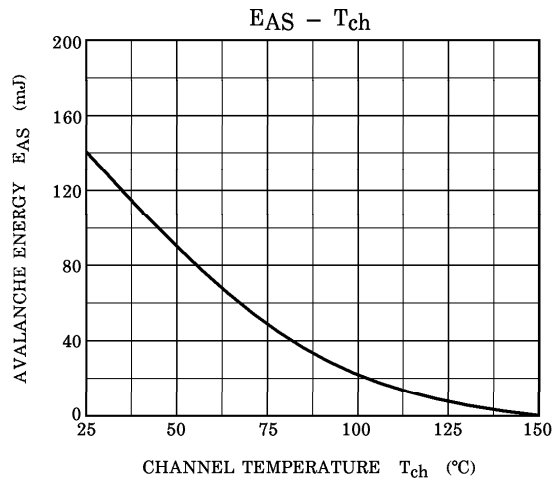
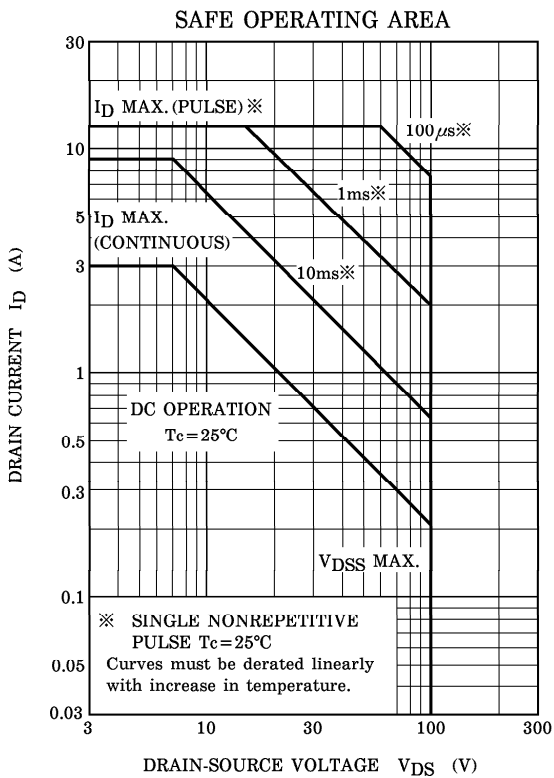
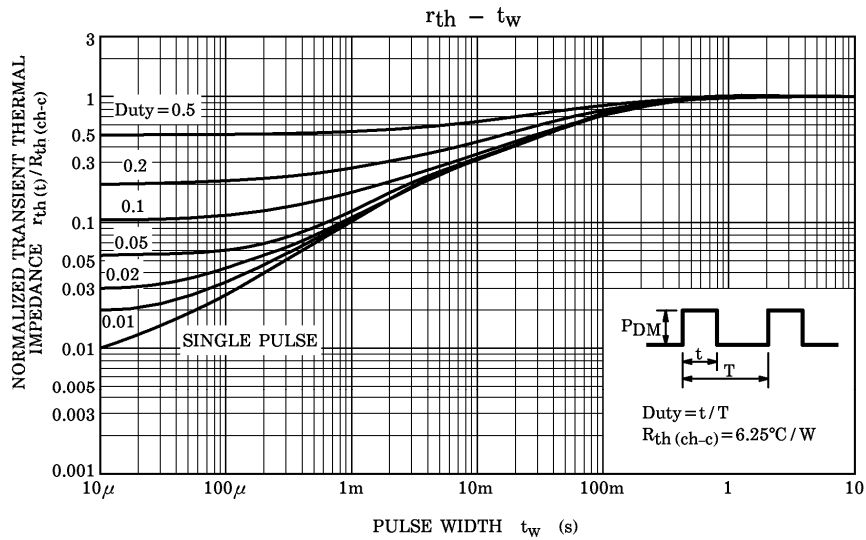
MARKING



K2201 ← TYPE
 ※ Lot Number
 □ □ — Month (Starting from Alphabet A)
 — Year (Last Number of the Christian Era)







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

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