

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

2SK3301

SWITCHING REGULATOR, DC-DC CONVERTER APPLICATIONS

- Low Drain-Source ON Resistance : $R_{DS(ON)} = 15 \Omega$ (Typ.)
- High Forward Transfer Admittance : $|Y_{fs}| = 0.65 \text{ S}$ (Typ.)
- Low Leakage Current : $I_{DSS} = 100 \mu\text{A}$ (Max.) ($V_{DS} = 720 \text{ V}$)
- Enhancement-Mode : $V_{th} = 2.4 \sim 3.4 \text{ V}$
($V_{DS} = 10 \text{ V}, I_D = 1 \text{ mA}$)

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

CHARACTERISTIC	SYMBOL	RATING	UNIT
Drain-Source Voltage	V_{DSS}	900	V
Drain-Gate Voltage ($R_{GS} = 20 \text{ k}\Omega$)	V_{DGR}	900	V
Gate-Source Voltage	V_{GSS}	± 30	V
DC Drain Current	DC (Note 1)	I_D	1 A
	Pulse (Note 1)	I_{DP}	2 A
Drain Power Dissipation ($T_c = 25^\circ\text{C}$)	P_D	20	W
Single Pulse Avalanche Energy (Note 2)	E_{AS}	140	mJ
Avalanche Current	I_{AR}	1	A
Repetitive Avalanche Energy (Note 3)	E_{AR}	2.0	mJ
Channel Temperature	T_{ch}	150	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	$-55 \sim 150$	$^\circ\text{C}$

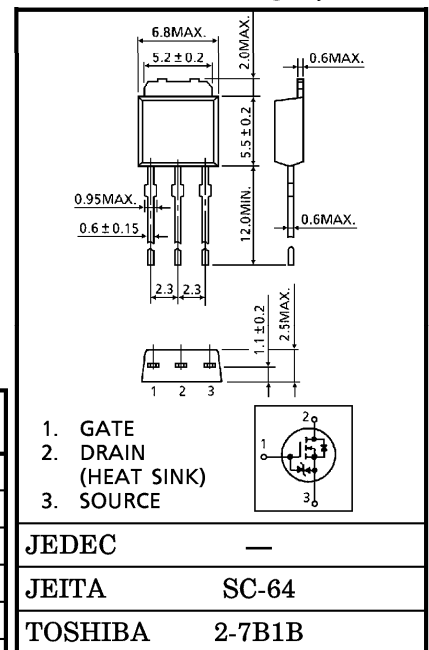
THERMAL CHARACTERISTICS

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

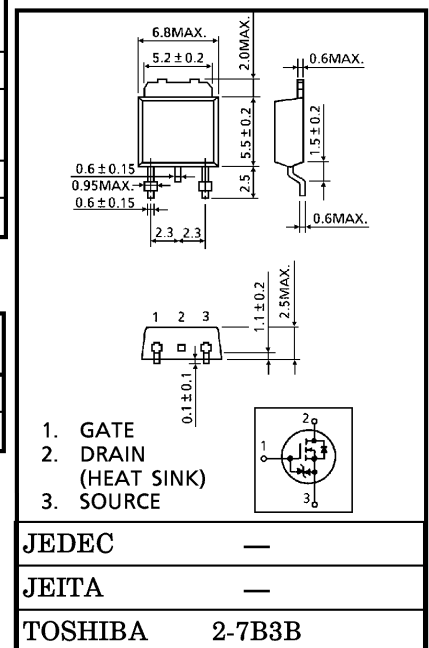
- (Note 1) : Please use devices on condition that the channel temperature is below 150°C .
- (Note 2) : $V_{DD} = 90 \text{ V}$, $T_{ch} = 25^\circ\text{C}$ (initial), $L = 257 \text{ mH}$
 $R_G = 25 \Omega$, $I_{AR} = 1 \text{ A}$
- (Note 3) : Repetitive rating ; Pulse Width Limited by Max. junction temperature.

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

Unit in mm



Weight : 0.36g (Typ.)



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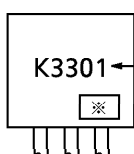
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Gate Leakage Current	I _{GSS}	V _{GS} = ±30 V, V _{DS} = 0 V	—	—	±10	μA	
Gate-Source Breakdown Voltage	V _{(BR)GSS}	I _G = ±10 μA, V _{DS} = 0 V	±30	—	—	V	
Drain Cut-off Current	I _{DSS}	V _{DS} = 720 V, V _{GS} = 0 V	—	—	100	μA	
Drain-Source Breakdown Voltage	V _{(BR)DSS}	I _D = 10 mA, V _{GS} = 0 V	900	—	—	V	
Gate Threshold Voltage	V _{th}	V _{DS} = 10 V, I _D = 1 mA	2.4	—	3.4	V	
Drain-Source ON Resistance	R _{DS(ON)}	V _{GS} = 10 V, I _D = 0.5 A	—	15	20	Ω	
Forward Transfer Admittance	Y _{fs}	V _{DS} = 10 V, I _D = 0.5 A	0.3	0.65	—	S	
Input Capacitance	C _{iss}	V _{DS} = 25 V, V _{GS} = 0 V, f = 1 MHz	—	165	—	pF	
Reverse Transfer Capacitance	C _{rss}		—	6	—		
Output Capacitance	C _{oss}		—	21	—		
Switching Time	Rise Time	t _r		—	15	—	ns
	Turn-on Time	t _{on}		—	60	—	
	Fall Time	t _f		—	40	—	
	Turn-off Time	t _{off}		Duty ≤ 1%, t _w = 10 μs	—	110	
Total Gate Charge (Gate-Source Plus Gate-Drain)	Q _g	V _{DD} ≐ 400 V, V _{GS} = 10 V, I _D = 1 A	—	6	—	nC	
Gate-Source Charge	Q _{gs}		—	3	—		
Gate-Drain ("Miller") Charge	Q _{gd}		—	3	—		

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

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current (Note 1)	I _{IDR}	—	—	—	1	A
Pulse Drain Reverse Current (Note 1)	I _{IDRP}	—	—	—	2	A
Forward Voltage (Diode)	V _{DSSF}	I _{IDR} = 1 A, V _{GS} = 0 V	—	—	-1.7	V
Reverse Recovery Time	t _{rr}	I _{IDR} = 1 A, V _{GS} = 0 V	—	1300	—	ns
Reverse Recovery Charge	Q _{rr}	dI _{IDR} / dt = 100 A / μs	—	1.95	—	μC

MARKING



※ Lot Number



Month (Starting from Alphabet A)

Year (Last Number of the Christian Era)

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