

TOSHIBA FIELD EFFECT TRANSISTOR SILICON N CHANNEL MOS TYPE ( $\pi$ -MOS V)

# 2SK3342

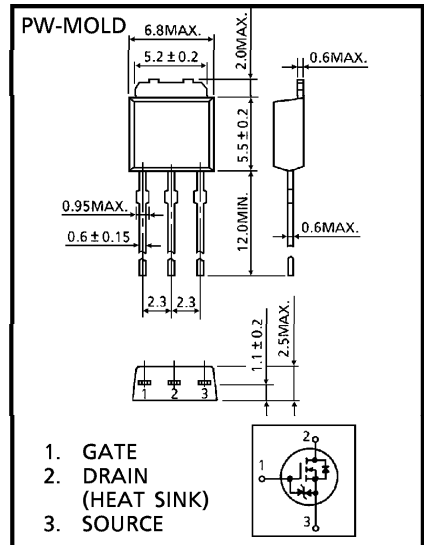
HIGH SPEED, HIGH VOLTAGE SWITCHING APPLICATIONS

SWITCHING REGULATOR APPLICATIONS, DC-DC CONVERTER AND MOTOR DRIVE APPLICATIONS

INDUSTRIAL APPLICATIONS

Unit in mm

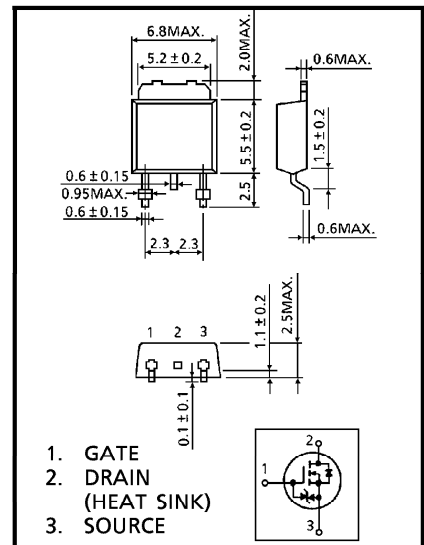
- Low Drain-Source ON Resistance :  $R_{DS(ON)} = 0.8 \Omega$  (Typ.)
- High Forward Transfer Admittance :  $|Y_{fs}| = 4.5 S$  (Typ.)
- Low Leakage Current :  $I_{DSS} = 100 \mu A$  (Max.) ( $V_{DS} = 250 V$ )
- Enhancement-Mode :  $V_{th} = 1.5 \sim 3.5 V$   
( $V_{DS} = 10 V, I_D = 1 mA$ )



JEDEC	—
EIAJ	SC-64
TOSHIBA	2-7B1B

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		$V_{GSS}$	$\pm 20$	V
Drain Current	DC	$I_D$	4.5	A
	Pulse	$I_{DP}$	18	A
Drain Power Dissipation ( $T_c = 25^\circ C$ )		$P_D$	20	W
Single Pulse Avalanche Energy**		$E_{AS}$	51	mJ
Avalanche Current		$I_{AR}$	4.5	A
Repetitive Avalanche Energy*		$E_{AR}$	2.0	mJ
Channel Temperature		$T_{ch}$	150	$^\circ C$
Storage Temperature Range		$T_{stg}$	$-55 \sim 150$	$^\circ C$



JEDEC	—
EIAJ	SC-64
TOSHIBA	2-7B2B

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.
- \*\*  $V_{DD} = 50 V, T_{ch} = 25^\circ C$  (initial),  $L = 4.28 mH, R_G = 25 \Omega, I_{AR} = 4.5 A$

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

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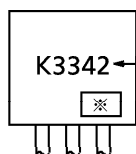
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Gate Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> = ±16 V, V <sub>DS</sub> = 0 V	—	—	±10	μA	
Drain Cut-off Current	I <sub>DSS</sub>	V <sub>DS</sub> = 250 V, V <sub>GS</sub> = 0 V	—	—	100	μA	
Drain-Source Breakdown Voltage	V <sub>(BR) DSS</sub>	I <sub>D</sub> = 10 mA, V <sub>GS</sub> = 0 V	250	—	—	V	
Gate Threshold Voltage	V <sub>th</sub>	V <sub>DS</sub> = 10 V, I <sub>D</sub> = 1 mA	1.5	—	3.5	V	
Drain-Source ON Resistance	R <sub>DS (ON)</sub>	V <sub>GS</sub> = 10 V, I <sub>D</sub> = 2.5 A	—	0.8	1.0	Ω	
Forward Transfer Admittance	Y <sub>fs</sub>	V <sub>DS</sub> = 10 V, I <sub>D</sub> = 2.5 A	2.0	4.5	—	S	
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> = 10 V, V <sub>GS</sub> = 0 V, f = 1 MHz	—	440	—	pF	
Reverse Transfer Capacitance	C <sub>rss</sub>		—	35	—		
Output Capacitance	C <sub>oss</sub>		—	120	—		
Switching Time	Rise Time	t <sub>r</sub>		—	15	—	ns
	Turn-on Time	t <sub>on</sub>		—	20	—	
	Fall Time	t <sub>f</sub>		—	15	—	
	Turn-off Time	t <sub>off</sub>		V <sub>IN</sub> : t <sub>r</sub> , t <sub>f</sub> < 5 ns, Duty ≤ 1%, t <sub>w</sub> = 10 μs	—	60	
Total Gate Charge (Gate-Source Plus Gate-Drain)	Q <sub>g</sub>	V <sub>DD</sub> ≐ 100 V, V <sub>GS</sub> = 10 V, I <sub>D</sub> = 4.5 A	—	10	—	nC	
Gate-Source Charge	Q <sub>gs</sub>		—	6	—		
Gate-Drain ("Miller") Charge	Q <sub>gd</sub>		—	4	—		

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

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current	I <sub>DR</sub>	—	—	—	4.5	A
Pulse Drain Reverse Current	I <sub>DRP</sub>	—	—	—	18	A
Diode Forward Voltage	V <sub>DSSF</sub>	I <sub>DR</sub> = 4.5 A, V <sub>GS</sub> = 0 V	—	—	-2.0	V
Reverse Recovery Time	t <sub>rr</sub>	I <sub>DR</sub> = 4.5 A, V <sub>GS</sub> = 0 V dI <sub>DR</sub> /dt = 100 A/μs	—	110	—	ns
Reverse Recovery Charge	Q <sub>rr</sub>		—	0.47	—	μC

MARKING



※ Lot Number



Month (Starting from Alphabet A)

Year (Last Number of the Christian Era)