

TOSHIBA FIELD EFFECT TRANSISTOR SILICON N CHANNEL MOS TYPE (L<sup>2</sup>-π-MOSIII)

# 2SK1381

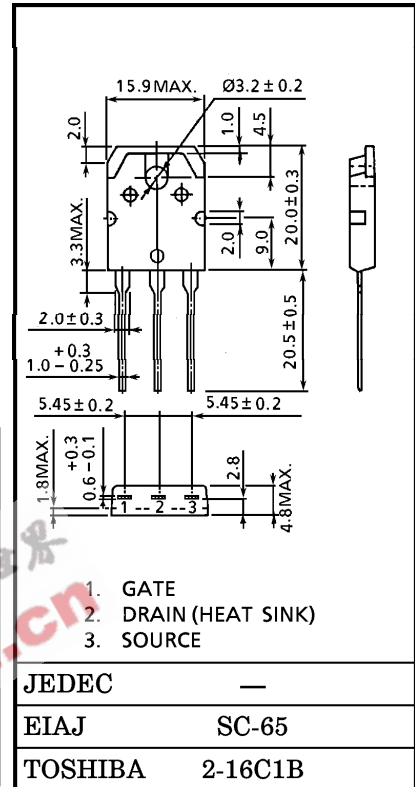
HIGH SPEED SWITCHING APPLICATIONS  
RELAY DRIVE, MOTOR DRIVE AND DC-DC CONVERTER APPLICATIONS

INDUSTRIAL APPLICATIONS  
Unit in mm

- 4V Gate Drive
- Low Drain-Source ON Resistance :  $R_{DS(ON)} = 25m\Omega$  (Typ.)
- High Forward Transfer Admittance :  $|Y_{fs}| = 33S$  (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	$I_D$	50
	Pulse	$I_{DP}$	200
Drain Power Dissipation (Tc = 25°C)	$P_D$	150	W
Channel Temperature	$T_{ch}$	150	°C
Storage Temperature Range	$T_{stg}$	-55~150	°C



Weight : 4.6g

THERMAL CHARACTERISTICS

CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance, Channel to Case	$R_{th(ch-c)}$	0.833	°C/W
Thermal Resistance, Channel to Ambient	$R_{th(ch-a)}$	50	°C/W

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

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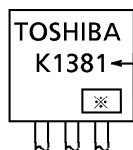
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current	$I_{GSS}$	$V_{GS} = \pm 20V, V_{DS} = 0V$	—	—	$\pm 10$	nA
Drain Cut-off Current	$I_{DSS}$	$V_{DS} = 100V, V_{GS} = 0V$	—	—	100	$\mu A$
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	$R_{DS(ON)}$	$V_{GS} = 4V, I_D = 25A$	—	31	46	m $\Omega$
		$V_{GS} = 10V, I_D = 25A$	—	25	32	
Forward Transfer Admittance	$ Y_{fs} $	$V_{DS} = 10V, I_D = 25A$	20	33	—	S
Input Capacitance	$C_{iss}$	$V_{DS} = 10V, V_{GS} = 0V, f = 1MHz$	—	3700	—	pF
Reverse Transfer Capacitance	$C_{rss}$		—	580	—	
Output Capacitance	$C_{oss}$		—	1500	—	
Switching Time	Rise Time	$t_r$		—	16	ns
	Turn-on Time	$t_{on}$		—	46	
	Fall Time	$t_f$		—	60	
	Turn-off Time	$t_{off}$		$V_{IN} : t_r, t_f < 5ns, V_{DD} = 50V$ $Duty \leq 1\%, t_w = 10\mu s$	—	
Total Gate Charge (Gate-Source Plus Gate-Drain)	$Q_g$	$V_{DD} = 80V, V_{GS} = 10V, I_D = 50A$	—	88	—	nC
Gate-Source Charge	$Q_{gs}$		—	62	—	
Gate-Drain ("Miller") Charge	$Q_{gd}$		—	26	—	

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

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current	$I_{DR}$	—	—	—	50	A
Pulse Drain Reverse Current	$I_{DRP}$	—	—	—	200	A
Diode Forward Voltage	$V_{DSF}$	$I_{DR} = 50A, V_{GS} = 0V$	—	—	-1.6	V
Reverse Recovery Time	$t_{rr}$	$I_{DR} = 50A, V_{GS} = 0V$	—	280	—	ns
Reverse Recovered Charge	$Q_{rr}$	$dI_{DR} / dt = 50A / \mu s$	—	0.56	—	$\mu C$

MARKING



TYPE

※ Lot Number

□ □ — Month (Starting from Alphabet A)

— Year (Last Number of the Christian Era)

