

Field Effect Transistor

Silicon N Channel MOS Type (L^2 - π -MOS IV)

High Speed, High Current DC-DC Converter,
Relay Drive and Motor Drive Applications

Features

- 4-Volt Gate Drive
- Low Drain-Source ON Resistance
 - $R_{DS(ON)} = 0.28\Omega$ (Typ.)
- High Forward Transfer Admittance
 - $|Y_{fs}| = 1.6S$ (Typ.)
- Low Leakage Current
 - $I_{DSS} = 100\mu A$ (Max.) @ $V_{DS} = 60V$
- Enhancement-Mode
 - $V_{th} = 0.8 \sim 2.0V$ @ $V_{DS} = 10V, I_D = 1mA$

Absolute Maximum Ratings ($T_a = 25^\circ C$)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Drain-Source Voltage	V_{DSS}	60	V
Drain-Gate Voltage ($R_{GS} = 20k\Omega$)	V_{DGR}	60	V
Gate-Source Voltage	V_{GSS}	± 20	V
Drain Current	DC	I_D	2
	Pulse	I_{DP}	6
Drain Power Dissipation ($T_a = 25^\circ C$)	P_D	0.5	W
Drain Power Dissipation	P_D^*	1.5	W
Channel Temperature	T_{ch}	150	$^\circ C$
Storage Temperature Range	T_{stg}	-55 ~ 150	$^\circ C$

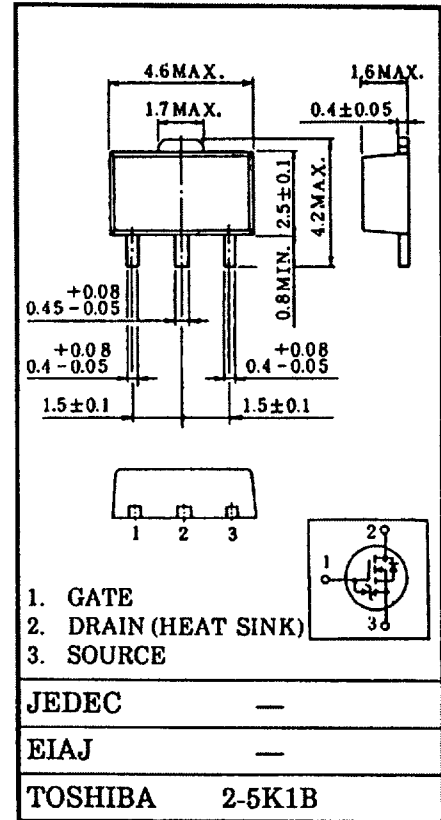
P_D^* : Mounted on ceramic substrate (600 mm² x 0.8t)

Thermal Characteristics

CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance, Channel to Ambient	$R_{th(ch-a)}$	250	$^\circ C/W$

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

Industrial Applications Unit in mm



1. GATE
2. DRAIN (HEAT SINK)
3. SOURCE

JEDEC	—
EIAJ	—
TOSHIBA	2-5K1B

Weight : 0.05g

Marking



Electrical Characteristics (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		I_{GSS}	$V_{GS} = \pm 16V, V_{DS} = 0V$	-	-	± 10	μA
Drain Cut-off Current		I_{DSS}	$V_{DS} = 60V, V_{GS} = 0V$	-	-	100	μA
Drain-Source Breakdown Voltage		$V_{(BR)DSS}$	$I_D = 10mA, V_{GS} = 0V$	60	-	-	V
Gate Threshold Voltage		V_{th}	$V_{DS} = 10V, I_D = 1mA$	0.8	-	2.0	V
Drain-Source ON Resistance		$R_{DS(ON)}$	$V_{GS} = 4V, I_D = 1A$	-	0.39	0.53	Ω
			$V_{GS} = 10V, I_D = 1A$	-	0.28	0.37	
Forward Transfer Admittance		$ Y_{fs} $	$V_{DS} = 10V, I_D = 1A$	1.0	1.6	-	S
Input Capacitance		C_{iss}	$V_{DS} = 10V, V_{GS} = 0V,$ $f = 1MHz$	-	125	180	μF
Reverse Transfer Capacitance		C_{rss}		-	30	60	
Output Capacitance		C_{oss}		-	85	130	
Switching Time	Rise Time	t_r	<p>$I_D = 1A$ $V_{GS} = 10V$ $V_{DS} = 10V$ $V_{IN} : t_r, t_f < 5ns, V_{DD} = 30V$ Duty $\leq 1\%$, $t_w = 10\mu s$</p>	-	30	60	ns
	Turn-on Time	t_{on}		-	60	120	
	Fall Time	t_f		-	40	80	
	Turn-off Time	t_{off}		-	135	270	
Total Gate Charge (Gate-Source Plus Gate-Drain)		Q_g	$V_{DD} = 48V, V_{GS} = 10V,$ $I_D = 2A$	-	6.5	13	nC
Gate-Source Charge		Q_{gs}		-	4.5	-	
Gate-Drain ("Miller") Charge		Q_{gd}		-	2.0	-	

Source-Drain Diode Ratings and Characteristics (Ta = 25°C)

CHARACTERISTICS	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current	I_{DR}	-	-	-	2	A
Pulse Drain Reverse Current	I_{DRP}	-	-	-	6	A
Diode Forward Voltage	V_{DSF}	$I_{DR} = 2A, V_{GS} = 0V$	-	-	-1.5	V
Reverse Recovery Time	t_{rr}	$I_{DR} = 2A, V_{GS} = 0V$	-	75	-	ns
Reverse Recovered Charge	Q_{rr}	$dI_{DR}/dt = 50A/\mu s$	-	75	-	μC

