TOSHIBA FIELD EFFECT TRANSISTOR

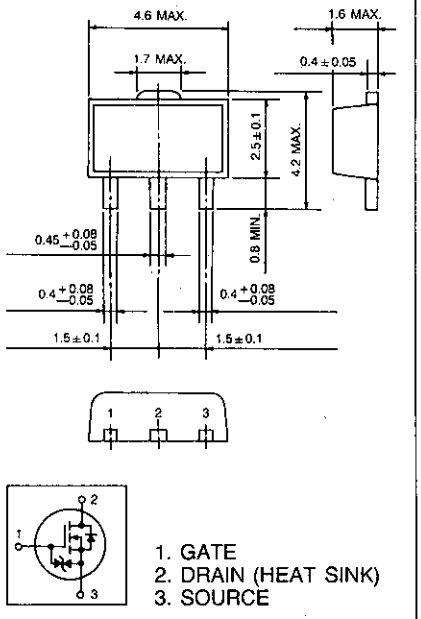
2SK1717

SILICON N CHANNEL MOS TYPE ($L^2-\pi-$MOS IV)

HIGH SPEED, HIGH CURRENT SWITCHING APPLICATIONS CHOPPER REGULATOR, DC-DC CONVERTER AND MOTOR DRIVE APPLICATIONS

INDUSTRIAL APPLICATIONS

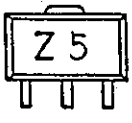
Unit in mm



JEDEC	—
EIAJ	SC-62
TOSHIBA	2-5K1B

Weight: 0.05 g

Marking



FEATURES:

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

MAXIMUM RATINGS (Ta = 25 °C)

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

P_D*: mounted on cermic substrate (600 mm^2x0.8 t)

THERMAL CHARACTERISTIC

CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance, Channel to Case	$R_{th(ch-c)}$	250	°C/W

THIS TRANISISTOR IS AN ELECTROSTATIC DEVICE. PLEASE HANDLE WITH CAUTION.

TOSHIBA FIELD EFFECT TRANSISTOR
2SK1717
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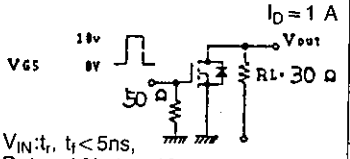
ELECTRICAL CHARACTERISTICS (Ta = 25 °C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		I_{GSS}	V_{GS} = ±16 V, V_{DS} = 0 V	—	—	±10	μA
Drain Cut-off Current		I_{DSS}	V_{DS} = 60 V, V_{GS} = 0 V	—	—	100	μA
Drain-Source Breakdown Voltage		$V_{(BR)DSS}$	I_D = 10 mA, V_{GS} = 0 V	60	—	—	V
Gate Threshold Voltage		V_{th}	V_{DS} = 10 V, I_D = 1 mA	0.8	—	2.0	V
Drain-Source ON Resistance		$R_{DS(ON)}$	V_{GS} = 4 V, I_D = 1 A	—	0.39	0.53	Ω
			V_{GS} = 10 V, I_D = 1 A	—	0.28	0.37	
Forward Transfer Admittance		$\|Y_{fs}\|$	V_{DS} = 10 V, I_D = 1 A	1.0	1.6	—	S
Input Capacitance		C_{iss}	V_{DS} = 10 V, V_{GS} = 0 V, f = 1 MHz	—	125	180	pF
Reverse Transfer Capacitance		C_{rss}		—	30	60	
Output Capacitance		C_{oss}		—	85	130	
Switching Time	Rise Time	t_r	I_D = 1 A  V_{IN}: t_r, t_f < 5ns, Duty ≦ 1 %, t_w = 10 μs V_{DD} = 30 V	—	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} = 48 V, V_{GS} = 10 V, I_D = 2 A	—	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)

CHARACTERISTIC	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} = 2 A, V_{GS} = 0 V	—	—	−1.5	V
Reverse Recovery Time	t_{rr}	I_{DR} = 2 A, V_{GS} = 0 V	—	75	—	nS
Reverse Recovery Charge	Q_{rr}	dI_{DR}/dt = 50 A/μs	—	75	—	μC