

TOSHIBA FIELD EFFECT TRANSISTOR SILICON N CHANNEL MOS TYPE (L²-π-MOS²V)

2SK1542

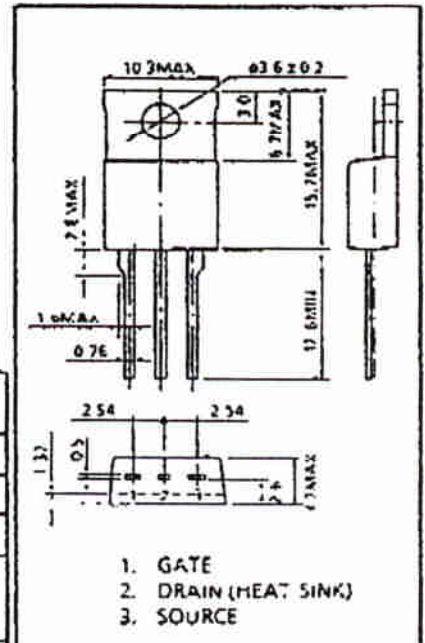
HIGH SPEED SWITCHING APPLICATIONS.
RELAY DRIVE, MOTOR DRIVE AND DC-DC CONVERTER APPLICATIONS.

INDUSTRIAL APPLICATIONS
Unit in mm

- 4-Volt Gate Drive
- Low Drain-Source ON Resistance : $R_{DS(ON)} = 15m\Omega$ (Typ.)
- High Forward Transfer Admittance : $|Y_{fs}| = 26S$ (Typ.)
- Low Leakage Current : $I_{DSS} = 100\mu A$ (Max.) @ $V_{DS} = 60V$
- Enhancement-Mode : $V_{th} = 0.8 \sim 2.0V$ @ $V_{DS} = 10V, I_D = 1mA$

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

CHARACTERISTIC	SYMBOL	RATING	UNIT
Drain-Source Voltage	V_{DS}	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	45
	Pulse	I_{DP}	180
Drain Power Dissipation ($T_c = 25^\circ C$)	P_D	125	W
Channel Temperature	T_{ch}	150	$^\circ C$
Storage Temperature Range	T_{stg}	-55-150	$^\circ C$



JEDEC	TO-220AB
EIAJ	SC-46
TOSHIBA	2-10P1B

Weight : 2.0g

THERMAL CHARACTERISTICS

CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance, Channel to Case	$R_{th(ch-c)}$	1.0	$^\circ C/W$
Thermal Resistance, Channel to Ambient	$R_{th(ch-a)}$	83.3	$^\circ C/W$

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	IGSS	VGS = ±20V, VDS = 0V	—	—	±100	nA	
Drain Cut-off Current	IDSS	VDS = 60V, VGS = 0V	—	—	100	μA	
Drain-Source Breakdown Voltage	V(BR)DSS	ID = 10mA, VGS = 0V	60	—	—	V	
Gate Threshold Voltage	Vth	VDS = 10V, ID = 1mA	0.8	—	2.0	V	
Drain-Source ON Resistance	RDS(ON)	VGS = 4V, ID = 20A	—	22	35	mΩ	
		VGS = 10V, ID = 20A	—	15	20		
Forward Transfer Admittance	Yfs	VDS = 10V, ID = 20A	18	26	—	S	
Input Capacitance	Ciss	VDS = 10V, VGS = 0V, f = 1MHz	—	2750	3500	pF	
Reverse Transfer Capacitance	Crss		—	600	1000		
Output Capacitance	Coss		—	1500	2200		
Switching Time	Rise Time	tr	<p> $I_D = 20A$ $V_{GS} = 10V$ V_{GS0} V_{OUT} $R_L = 1.5\Omega$ $V_{DD} = 30V$ $V_{IN} : t_r, t_f < 5ns$ Duty $\leq 1\%$, $t_w = 10\mu s$ </p>	—	20	40	ns
	Furn-on Time	ton		—	60	120	
	Fall Time	tf		—	50	160	
	Turn-off Time	toff		—	210	400	
Total Gate Charge (Gate-Source Plus Gate-Drain)	Qg	VDD = 48V, VGS = 10V, ID = 45A	—	200	400	nC	
Gate-Source Charge	Qgs		—	65	—		
Gate-Drain ("Miller") Charge	Qgd		—	135	—		

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

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current	IDR	—	—	—	45	A
Pulse Drain Reverse Current	IDRP	—	—	—	130	A
Diode Forward Voltage	VDSF	IDR = 45A, VGS = 0V	—	—	~2.0	V
Reverse Recovery Time	trr	IDR = 45A, VGS = 0V	—	160	—	ns
Reverse Recovered Charge	Qrr	dIDR / dt = 50A / μs	—	0.2	—	μC

