

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

2SK1542

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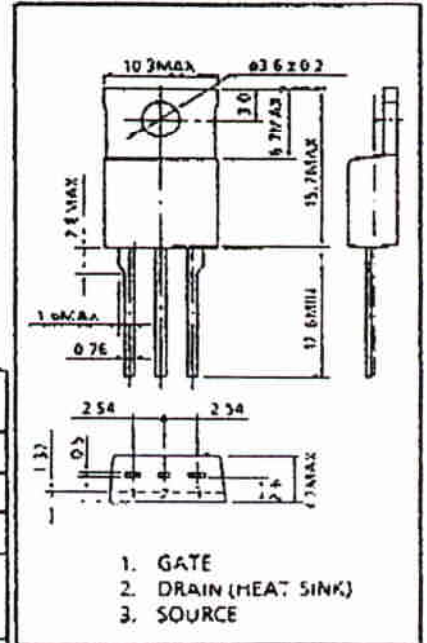
HIGH SPEED SWITCHING APPLICATIONS.
RELAY DRIVE, MOTOR DRIVE AND DC-DC CONVERTER APPLICATIONS.

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 (Ta = 25°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	°C
Storage Temperature Range	T_{stg}	-55~150	°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	°C/W
Thermal Resistance, Channel to Ambient	$R_{th(ch-a)}$	83.3	°C/W

THIS TRANSISTOR IS AN ELECTROSTATIC SENSITIVE DEVICE.
PLEASE HANDLE WITH CAUTION.

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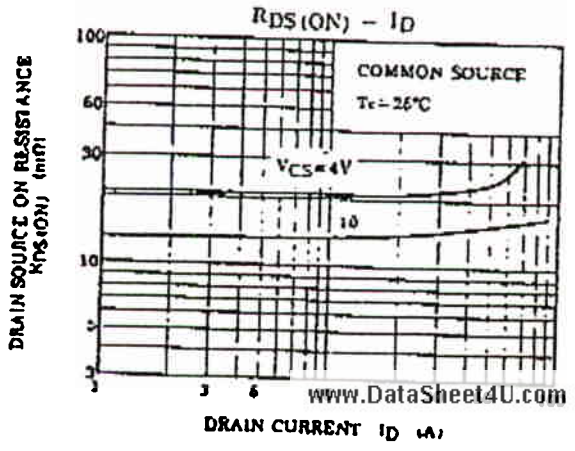
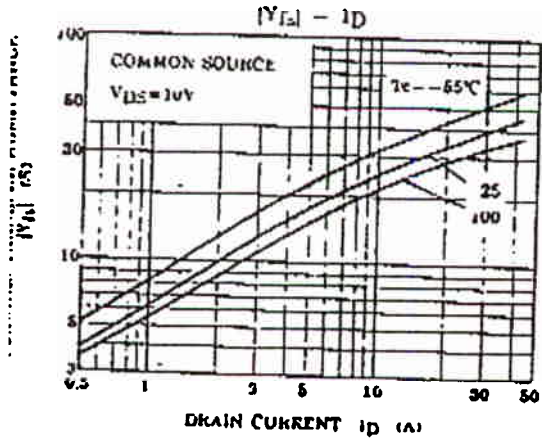
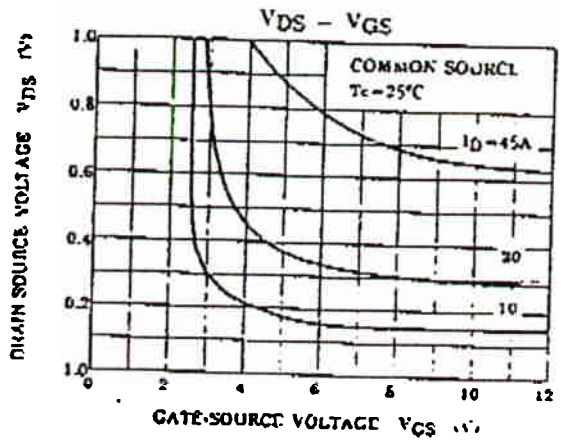
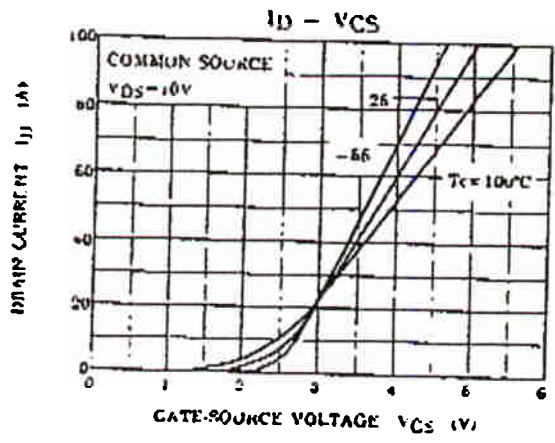
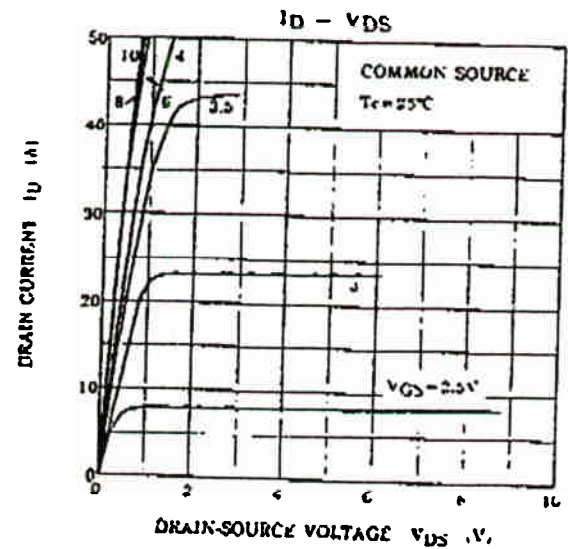
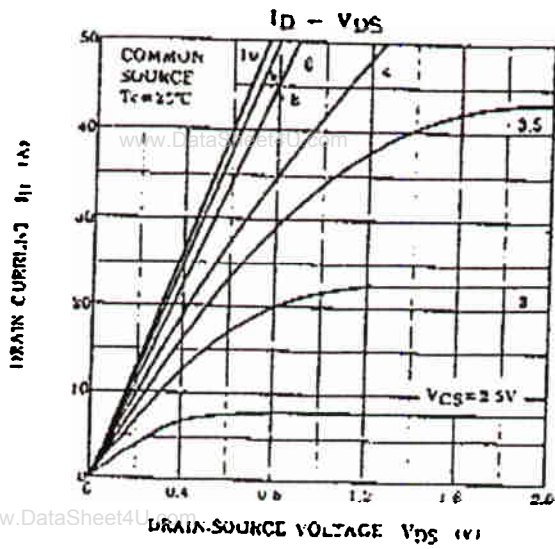
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ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Gate Leakage Current	I_{GSS}	$V_{GS} = \pm 20\text{V}$, $V_{DS} = 0\text{V}$	—	—	± 100	nA	
Drain Cut-off Current	I_{DSS}	$V_{DS} = 60\text{V}$, $V_{GS} = 0\text{V}$	—	—	100	μA	
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D = 10\text{mA}$, $V_{GS} = 0\text{V}$	60	—	—	V	
Gate Threshold Voltage	V_{th}	$V_{DS} = 10\text{V}$, $I_D = 1\text{mA}$	0.8	—	2.0	V	
Drain-Source ON Resistance	$R_{DS(ON)}$	$V_{GS} = 4\text{V}$, $I_D = 20\text{A}$	—	22	35	m Ω	
		$V_{GS} = 10\text{V}$, $I_D = 20\text{A}$	—	15	20		
Forward Transfer Admittance	$ Y_{fs} $	$V_{DS} = 10\text{V}$, $I_D = 20\text{A}$	18	26	—	S	
Input Capacitance	C_{iss}	$V_{DS} = 10\text{V}$, $V_{GS} = 0\text{V}$, $f = 1\text{MHz}$	—	2750	3500	pF	
Reverse Transfer Capacitance	C_{rss}		—	600	1000		
Output Capacitance	C_{oss}		—	1500	2200		
Switching Time	Rise Time	t_r	<p>$I_D = 20\text{A}$, V_{OUT} 10V V_{GS} 4.7V V_{GD} $R_L = 1.5\Omega$ $V_{DD} = 30\text{V}$</p> <p>$V_{IN} : t_r, t_f < 5\text{ns}$, Duty $\leq 1\%$, $t_w = 10\mu\text{s}$</p>	—	20	40	ns
	Furn-on Time	t_{on}		—	60	120	
	Fall Time	t_f		—	30	160	
	Turn-off Time	t_{off}		—	210	400	
Total Gate Charge (Gate-Source Plus Gate-Drain)	Q_g	$V_{DD} = 48\text{V}$, $V_{GS} = 10\text{V}$, $I_D = 45\text{A}$	—	200	400	nC	
Gate-Source Charge	Q_{gs}		—	65	—		
Gate-Drain ("Miller") Charge	Q_{gd}		—	135	—		

SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current	I_{DR}	—	—	—	45	A
Pulse Drain Reverse Current	I_{DRP}	—	—	—	130	A
Diode Forward Voltage	V_{DSF}	$I_{DR} = 45\text{A}$, $V_{GS} = 0\text{V}$	—	—	-2.0	V
Reverse Recovery Time	t_{rr}	$I_{DR} = 45\text{A}$, $V_{GS} = 0\text{V}$ $dI_{DR}/dt = 50\text{A}/\mu\text{s}$	—	160	—	ns
Reverse Recovered Charge	Q_{rr}		—	0.2	—	μC



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