

**TOSHIBA**

**2SK1542**

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

# 2SK1542

HIGH SPEED SWITCHING APPLICATIONS.

RELAY DRIVE, MOTOR DRIVE AND DC-DC CONVERTER APPLICATIONS.

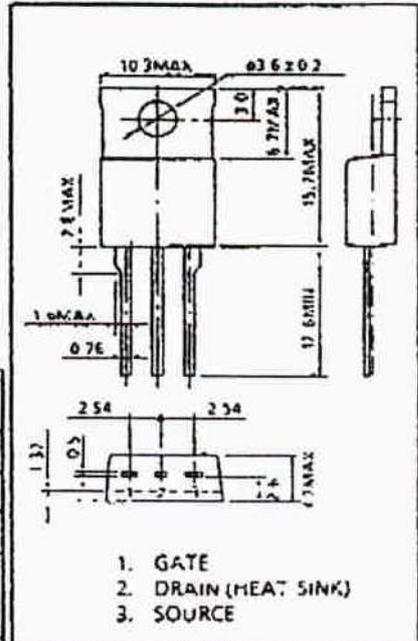
INDUSTRIAL APPLICATIONS

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 (Ta = 25°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	$I_D$	45
	Pulse	$I_{DP}$	180
Drain Power Dissipation (Tc = 25°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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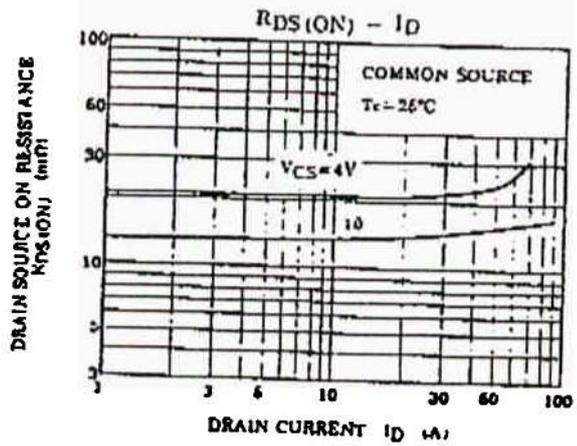
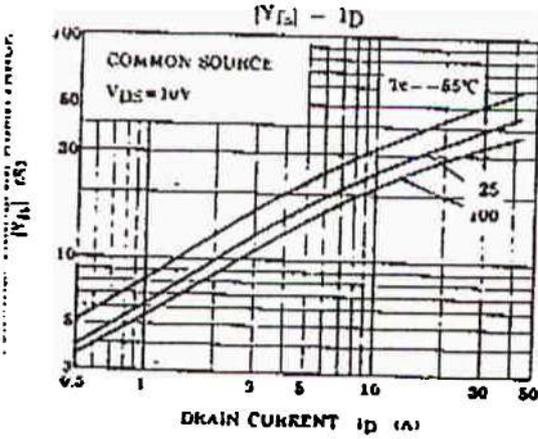
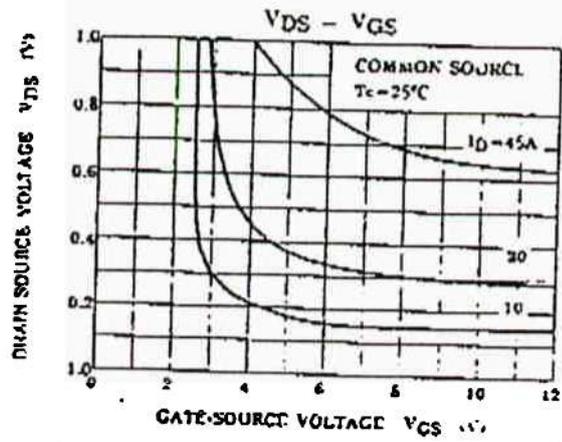
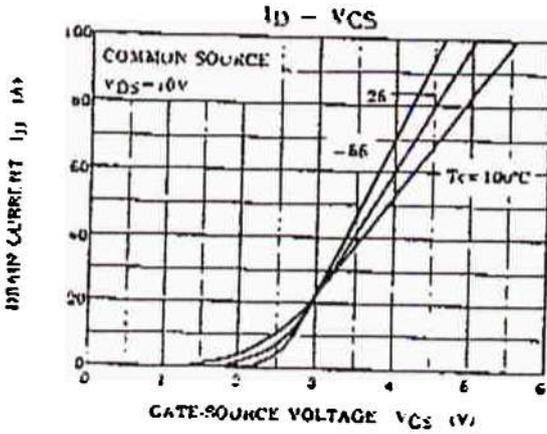
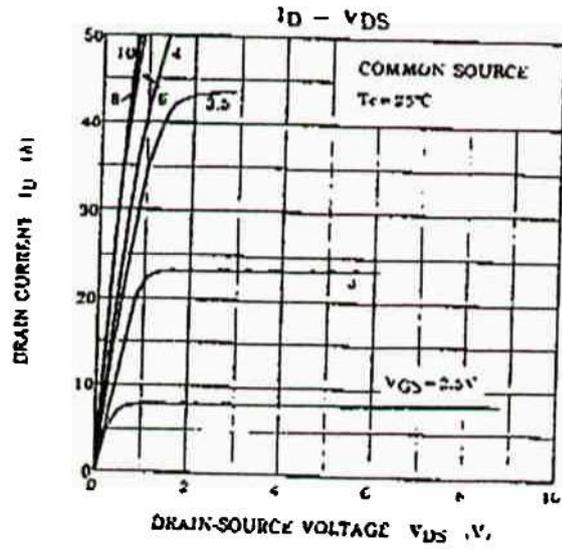
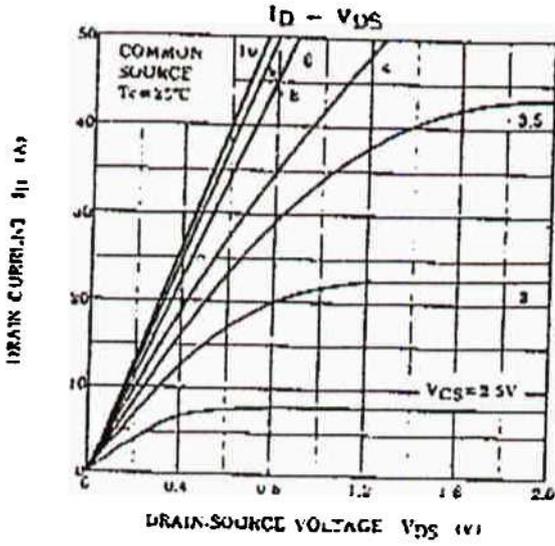
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**ELECTRICAL CHARACTERISTICS (Ta = 25°C)**

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> <math>I_D = 20A</math>  <math>V_{GS} = 10V</math>  <math>R_L = 1.5\Omega</math>  <math>V_{DD} = 30V</math>  <math>V_{IN} : t_r, t_f &lt; 5ns</math>                      Duty <math>\leq 1\%</math>, <math>t_w = 10\mu s</math> </p>	—	20	40	ns
	Turn-on Time	ton		—	60	120	
	Fall Time	tf		—	30	160	
	Turn-off Time	t <sub>off</sub>		—	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



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