

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

2SK1542

HIGH SPEED SWITCHING APPLICATIONS.

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

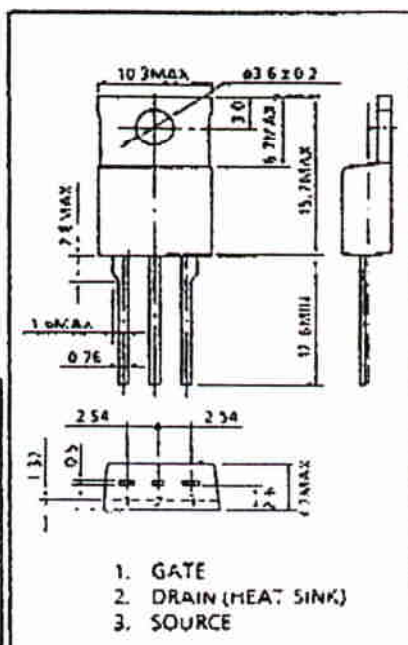
INDUSTRIAL APPLICATIONS

Unit in cups

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

MAXIMUM RATINGS (T_a = 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 ($T_c=25^\circ C$)	P_D	125	W
Channel Temperature	T_{ch}	150	$^\circ C$
Storage Temperature Range	T_{str}	-55-150	$^\circ C$



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

Weight : 2.0g

THERMAL CHARACTERISTICS

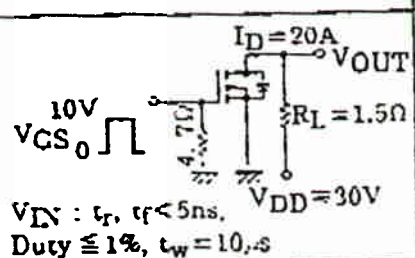
CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance, Channel to Case	$R_{th}(ch-c)$	1.0	$^{\circ}\text{C}/\text{W}$
Thermal Resistance, Channel to Ambient	$R_{th}(ch-a)$	83.3	$^{\circ}\text{C}/\text{W}$

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

S61001EAA2

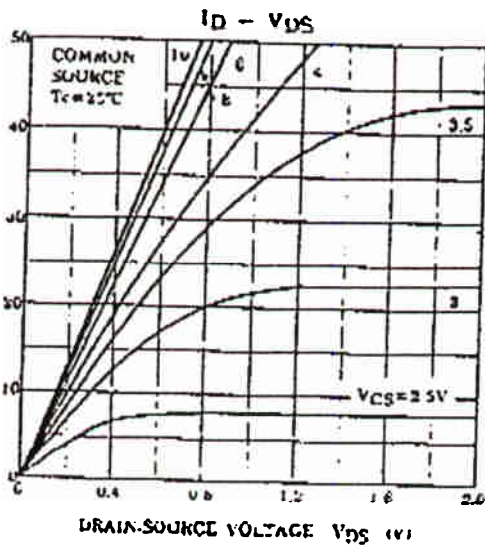
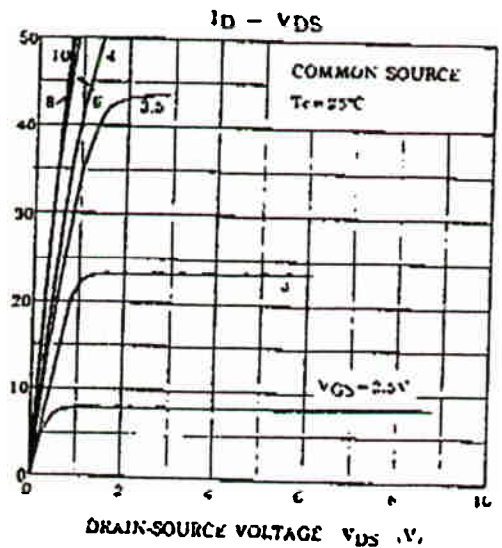
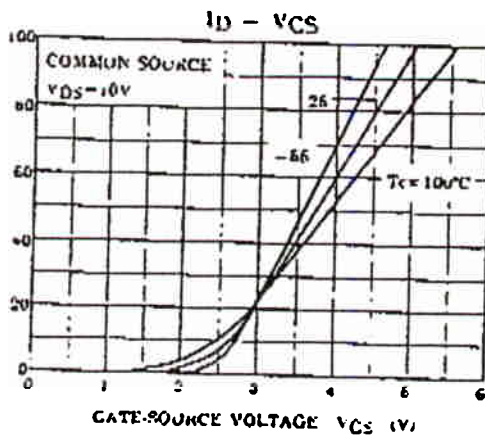
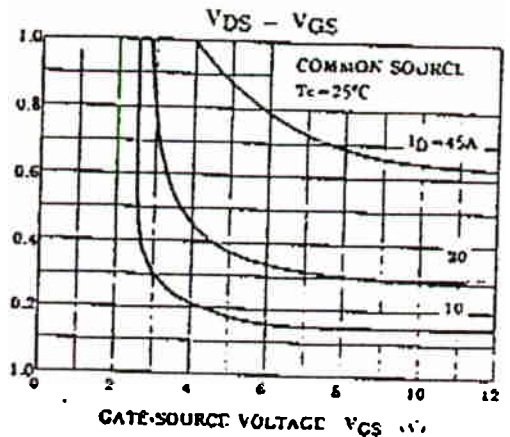
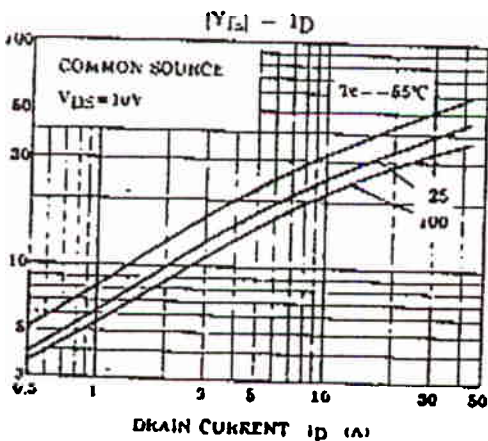
- TOSHIBA is continually working to improve the quality and the reliability of its products. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing TOSHIBA products, to observe standards of safety, and to avoid situations in which a malfunction or failure of a TOSHIBA product could cause loss of human life, bodily injury or damage to property. In developing new designs, please ensure that TOSHIBA products are used within specified operating and rating conditions in the latest current product specifications. Also, please keep in mind the precautions and conditions set forth in the TOSHIBA Semiconductor Reliability Handbooks.
- The information contained herein is presented only as a guide for the applications of our products. No responsibility is assumed by TOSHIBA CORPORATION for any arrangements of intellectual property or other rights of the third parties which may result from its use. No license is granted by implication or otherwise under any intellectual property or other rights of TOSHIBA CORPORATION or others.
- The information contained herein is subject to change without notice.

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	$\text{m}\Omega$
		$V_{GS} = 10\text{V}$, $I_D = 20\text{A}$	—	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	3900	pF
Reverse Transfer Capacitance	C_{rss}		—	600	1000	
Output Capacitance	C_{oss}		—	1500	2200	
Switching Time	Rise Time	 <p> $I_D = 20\text{A}$ $V_{GS0} = 10\text{V}$ $R_L = 1.5\Omega$ $V_{DD} = 30\text{V}$ $V_{IN}: t_r, t_f < 5\text{ns}$ $\text{Duty} \leq 1\%$, $t_w = 10\mu\text{s}$ </p>	—	20	40	ns
	Furn-on Time		—	60	120	
	Fall Time		—	30	160	
	Turn-off Time		—	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

DRAIN CURRENT I_D (A)DRAIN CURRENT I_D (A)DRAIN CURRENT I_D (A)DRAIN-SOURCE VOLTAGE V_{DS} (V)DRAIN-SOURCE RESISTANCE $R_{DS(ON)}$ (mΩ)DRAIN-SOURCE RESISTANCE $R_{DS(ON)}$ (mΩ)