

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

2SK2507

HIGH SPEED, HIGH VOLTAGE SWITCHING APPLICATIONS

CHOPPER REGULATOR, DC-DC CONVERTER AND MOTOR DRIVE APPLICATIONS

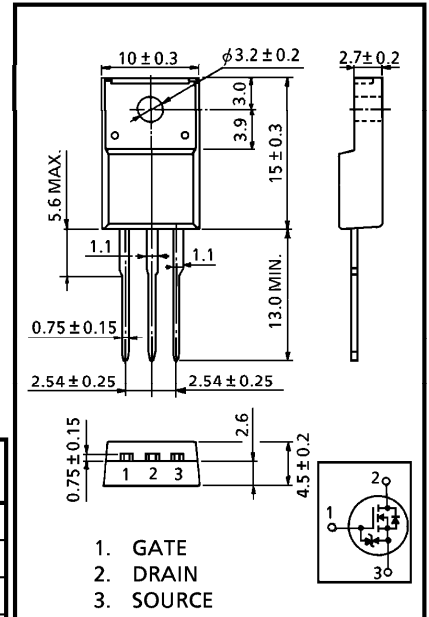
INDUSTRIAL APPLICATIONS

Unit in mm

- 4 V Gate Drive
- Low Drain-Source ON Resistance : $R_{DS(ON)} = 0.034 \Omega$ (Typ.)
- High Forward Transfer Admittance : $|Y_{fs}| = 16 S$ (Typ.)
- Low Leakage Current : $I_{DSS} = 100 \mu A$ (Max.) ($V_{DS} = 50 V$)
- Enhancement-Mode : $V_{th} = 0.8 \sim 2.0 V$
($V_{DS} = 10 V, I_D = 1mA$)

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Drain-Source Voltage	V_{DSS}	50	V
Drain-Gate Voltage ($R_{GS} = 20 k\Omega$)	V_{DGR}	50	V
Gate-Source Voltage	V_{GSS}	± 20	V
Drain Current	DC	I_D	25
	Pulse	I_{DP}	75
Drain Power Dissipation ($T_c = 25^\circ C$)	P_D	30	W
Single Pulse Avalanche Energy**	E_{AS}	138	mJ
Avalanche Current	I_{AR}	25	A
Repetitive Avalanche Energy*	E_{AR}	3	mJ
Channel Temperature	T_{ch}	150	°C
Storage Temperature Range	T_{stg}	-55~150	°C



JEDEC	—
EIAJ	SC-67
TOSHIBA	2-10R1B

Weight : 1.9 g

THERMAL CHARACTERISTICS

CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance, Channel to Case	$R_{th(ch-c)}$	4.17	°C/W
Thermal Resistance, Channel to Ambient	$R_{th(ch-a)}$	62.5	°C/W

Note ;

- * Repetitive rating ; Pulse Width Limited by Max. junction temperature.
- ** $V_{DD} = 25 V, T_{ch} = 25^\circ C$ (initial), $L = 272 \mu H, R_G = 25 \Omega, I_{AR} = 25 A$

**This transistor is an electrostatic sensitive device.
Please handle with caution.**

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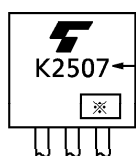
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		I_{GSS}	$V_{GS} = \pm 16\text{ V}, V_{DS} = 0\text{ V}$	—	—	± 10	μA
Drain Cut-off Current		I_{DSS}	$V_{DS} = 50\text{ V}, V_{GS} = 0\text{ V}$	—	—	100	μA
Drain-Source Breakdown Voltage		$V_{(BR)DSS}$	$I_D = 10\text{ mA}, V_{GS} = 0\text{ V}$	50	—	—	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		$R_{DS(ON)}$	$V_{GS} = 4\text{ V}, I_D = 6\text{ A}$	—	0.058	0.08	Ω
			$V_{GS} = 10\text{ V}, I_D = 12\text{ A}$	—	0.034	0.046	
Forward Transfer Admittance		$ Y_{fs} $	$V_{DS} = 10\text{ V}, I_D = 12\text{ A}$	8.0	16	—	S
Input Capacitance		C_{iss}	$V_{DS} = 10\text{ V}, V_{GS} = 0\text{ V},$ $f = 1\text{ MHz}$	—	900	—	pF
Reverse Transfer Capacitance		C_{rss}		—	130	—	
Output Capacitance		C_{oss}		—	370	—	
Switching Time	Rise Time	t_r	<p>$I_D = 12\text{ A}$ $V_{GS} = 10\text{ V}$ $V_{DS} = 10\text{ V}$ $R_L = 2.5\ \Omega$ $V_{DD} \approx 30\text{ V}$</p> <p>$V_{IN} : t_r, t_f < 5\text{ ns},$ $\text{Duty} \leq 1\%, t_w = 10\ \mu\text{s}$</p>	—	15	—	ns
	Turn-on Time	t_{on}		—	25	—	
	Fall Time	t_f		—	30	—	
	Turn-off Time	t_{off}		—	110	—	
Total Gate Charge (Gate-Source Plus Gate-Drain)		Q_g	$V_{DD} \approx 40\text{ V}, V_{GS} = 10\text{ V},$ $I_D = 25\text{ A}$	—	25	—	nC
Gate-Source Charge		Q_{gs}		—	19	—	
Gate-Drain (“Miller”) Charge		Q_{gd}		—	6	—	

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

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current	I_{DR}	—	—	—	25	A
Pulse Drain Reverse Current	I_{DRP}	—	—	—	75	A
Diode Forward Voltage	V_{DSF}	$I_{DR} = 25\text{ A}, V_{GS} = 0\text{ V}$	—	—	-1.6	V
Reverse Recovery Time	t_{rr}	$I_{DR} = 25\text{ A}, V_{GS} = 0\text{ V}$ $dI_{DR}/dt = 50\text{ A}/\mu\text{s}$	—	60	—	μs
Reverse Recovery Charge	Q_{rr}		—	45	—	

MARKING

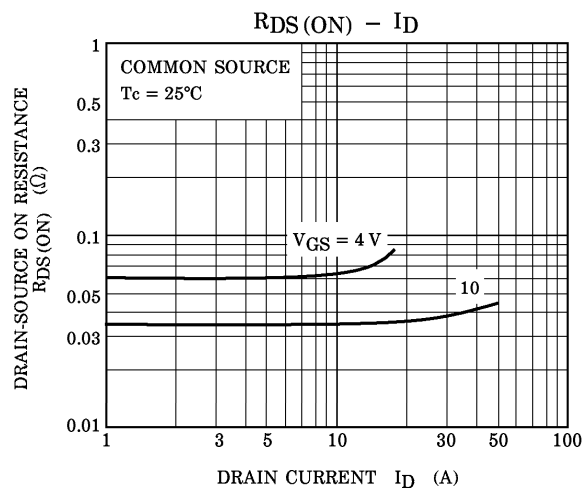
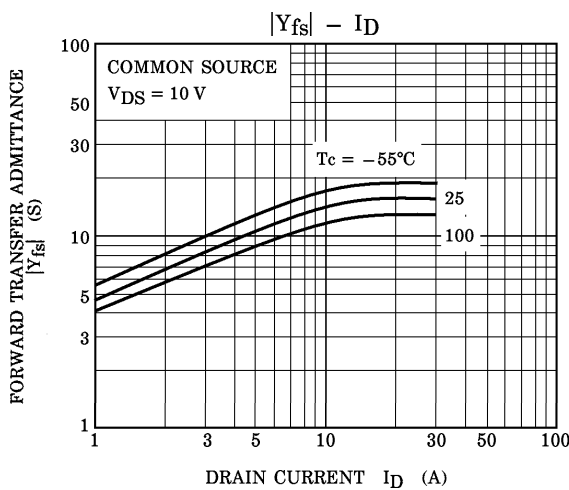
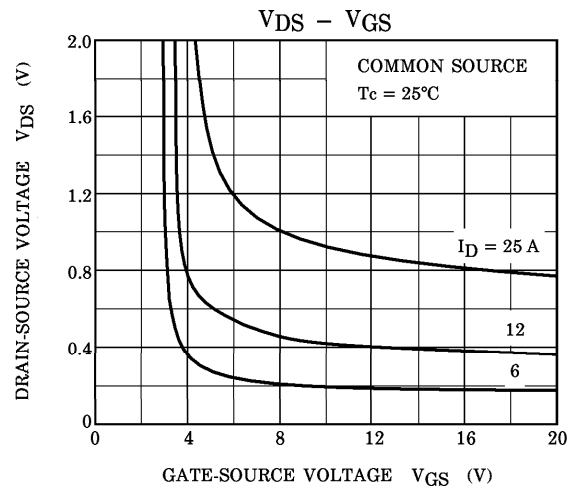
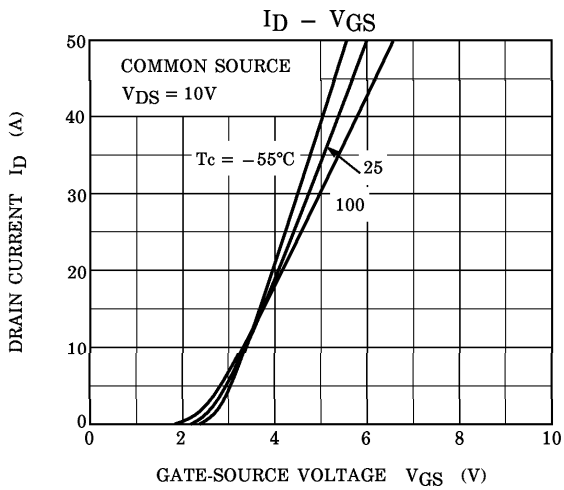
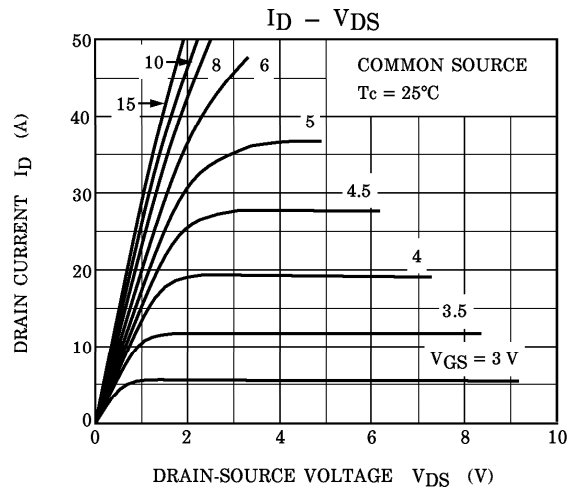
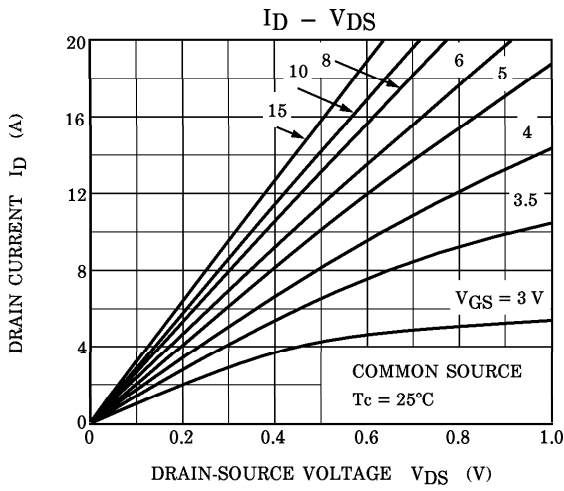


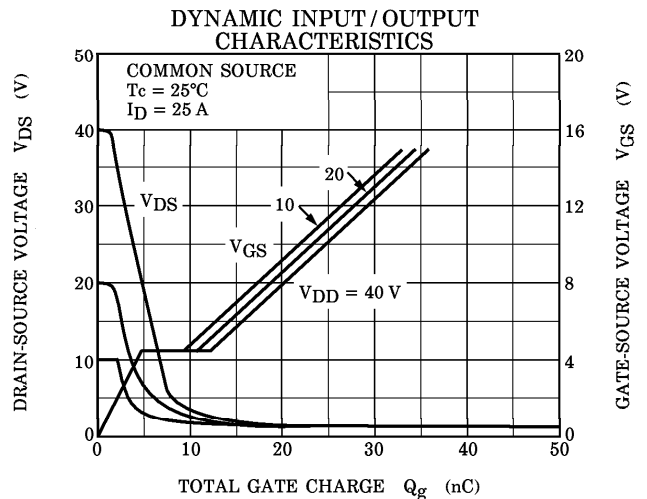
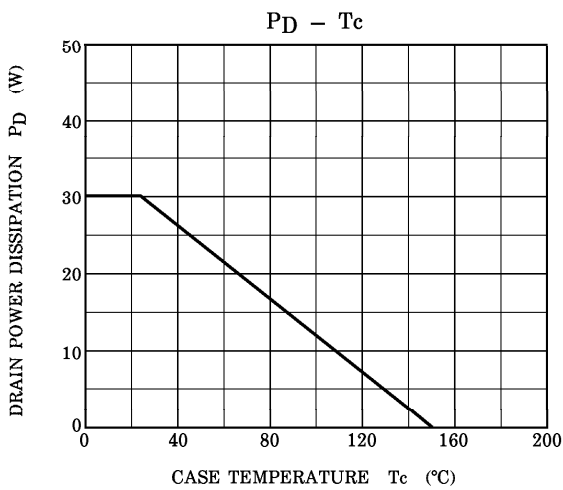
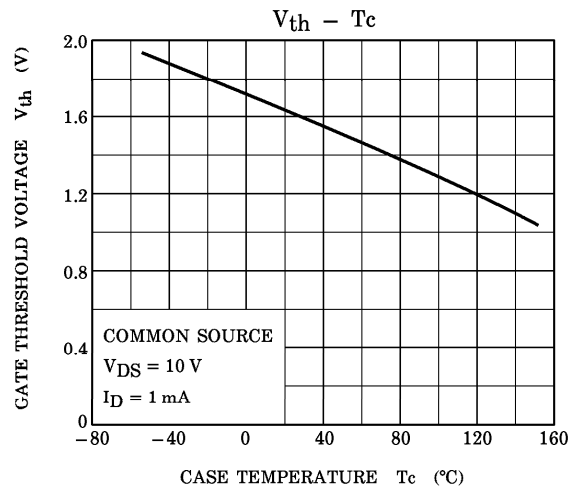
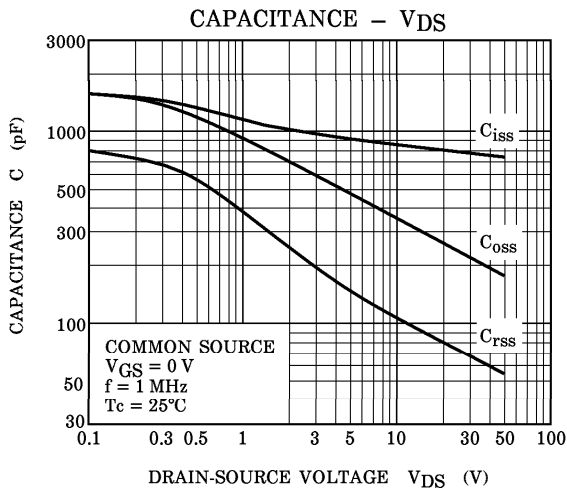
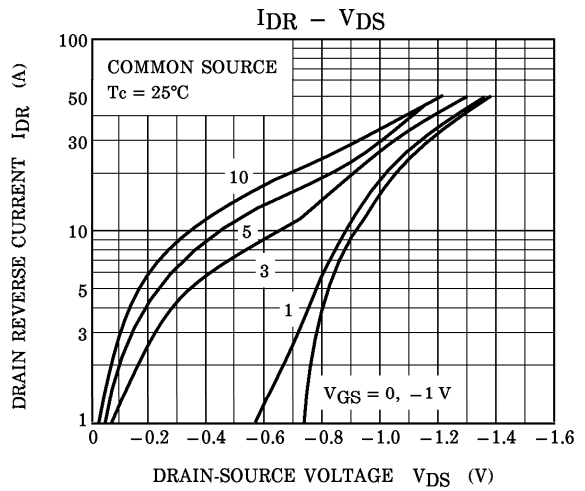
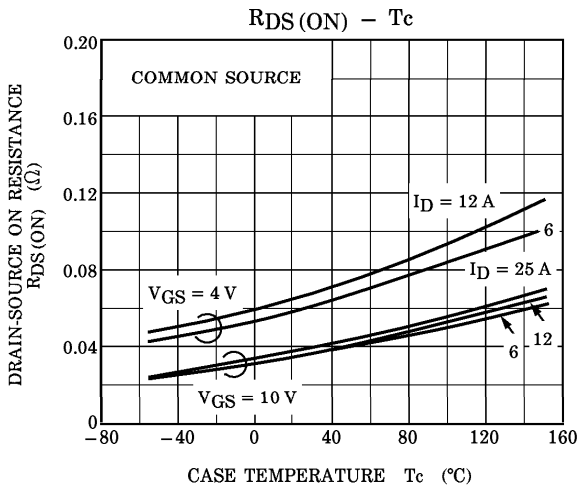
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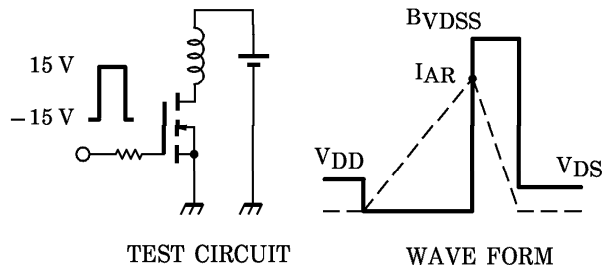
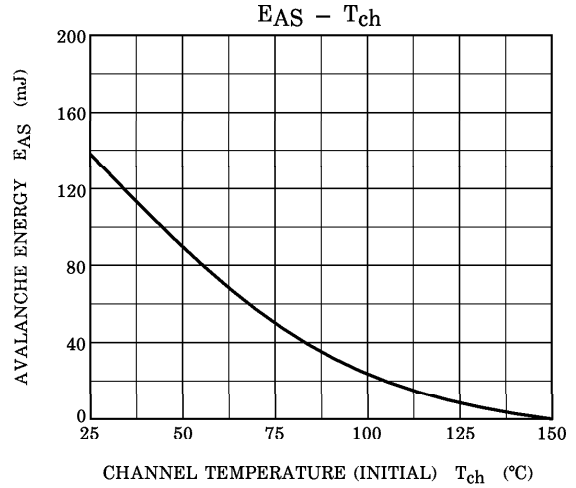
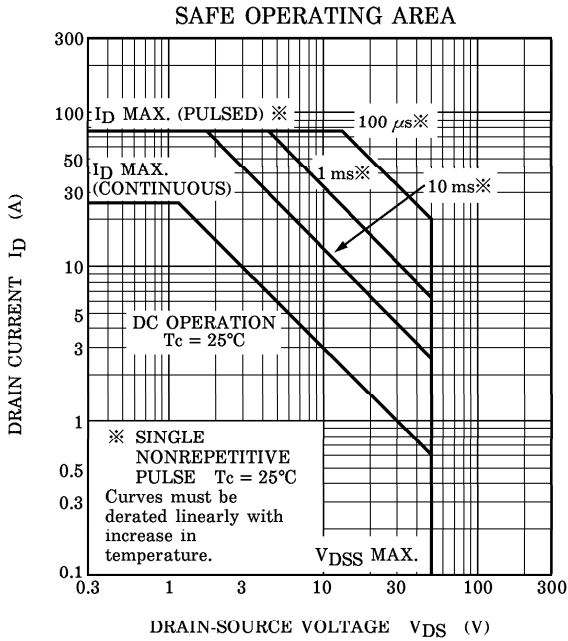
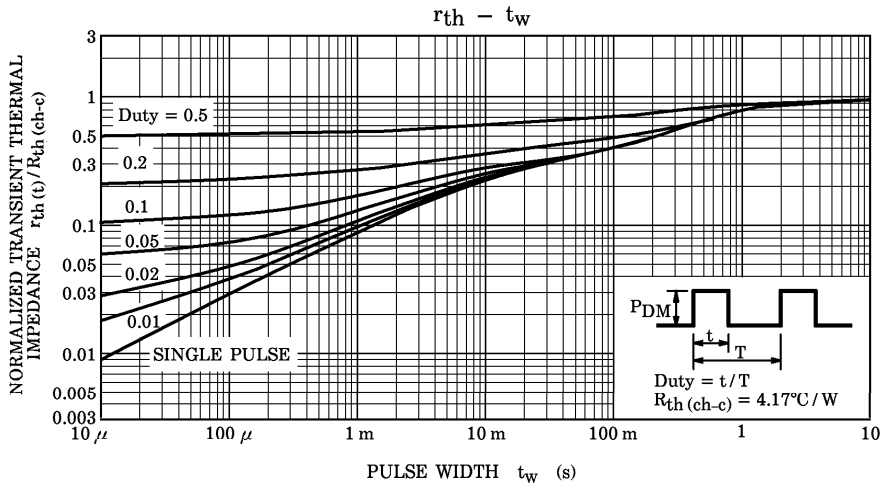
※ Lot Number

□ □ — Month (Starting from Alphabet A)

— Year (Last Number of the Christian Era)







Peak $I_{AR} = 25 \text{ A}$, $R_G = 25 \Omega$, $E_{AS} = \frac{1}{2} \cdot L \cdot I^2 \cdot \left(\frac{BVDSS}{BVDSS - V_{DD}} \right)$
 $V_{DD} = 25 \text{ V}$, $L = 272 \mu\text{H}$