

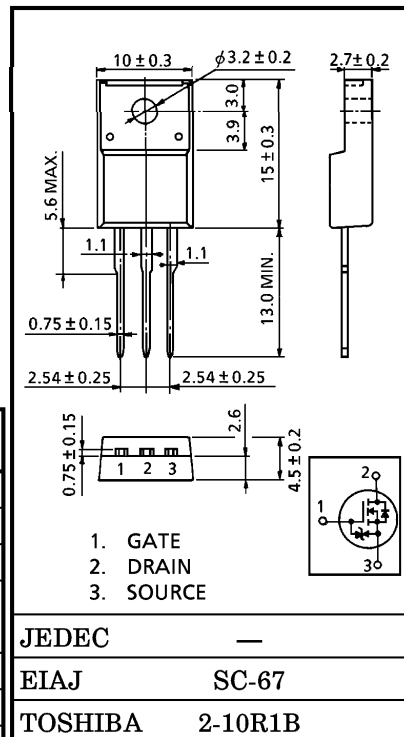
TOSHIBA FIELD EFFECT TRANSISTOR SILICON N CHANNEL MOS TYPE (L<sup>2</sup>-π-MOSV)

# 2SK2507

HIGH SPEED, HIGH VOLTAGE SWITCHING APPLICATIONS  
 CHOPPER REGULATOR, DC-DC CONVERTER AND MOTOR DRIVE APPLICATIONS

INDUSTRIAL APPLICATIONS  
 Unit in mm

- 4V Gate Drive
- Low Drain-Source ON Resistance :  $R_{DS(ON)} = 0.034\Omega$  (Typ.)
- High Forward Transfer Admittance :  $|Y_{fs}| = 16S$  (Typ.)
- Low Leakage Current :  $I_{DSS} = 100\mu A$  (Max.) ( $V_{DS} = 50V$ )
- 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	$V_{DSS}$	50	V
Drain-Gate Voltage ( $R_{GS} = 20k\Omega$ )	$V_{DGR}$	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

Weight : 1.9g

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.
- \*\*  $V_{DD} = 25V$ , Starting  $T_{ch} = 25^\circ C$ ,  $L = 272\mu H$ ,  $R_G = 25\Omega$ ,  $I_{AR} = 25A$

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

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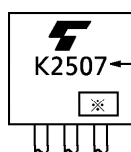
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		$I_{GSS}$	$V_{GS} = \pm 16V, V_{DS} = 0V$	—	—	$\pm 10$	$\mu A$
Drain Cut-off Current		$I_{DSS}$	$V_{DS} = 50V, V_{GS} = 0V$	—	—	100	$\mu A$
Drain-Source Breakdown Voltage		$V_{(BR) DSS}$	$I_D = 10mA, V_{GS} = 0V$	50	—	—	V
Gate Threshold Voltage		$V_{th}$	$V_{DS} = 10V, I_D = 1mA$	0.8	—	2.0	V
Drain-Source ON Resistance		$R_{DS(ON)}$	$V_{GS} = 4V, I_D = 6A$	—	0.058	0.08	$\Omega$
			$V_{GS} = 10V, I_D = 12A$	—	0.034	0.046	
Forward Transfer Admittance		$ Y_{fs} $	$V_{DS} = 10V, I_D = 12A$	8.0	16	—	S
Input Capacitance		$C_{iss}$	$V_{DS} = 10V, V_{GS} = 0V, f = 1MHz$	—	900	—	pF
Reverse Transfer Capacitance		$C_{rss}$		—	130	—	
Output Capacitance		$C_{oss}$		—	370	—	
Switching Time	Rise Time	$t_r$		—	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)		$Q_g$	$V_{DD} = 40V, V_{GS} = 10V, I_D = 25A$	—	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	$V_{DSF}$	$I_{DR} = 25A, V_{GS} = 0V$	—	—	-1.6	ns
Reverse Recovery Time	$t_{rr}$	$I_{DR} = 25A, V_{GS} = 0V$ $dI_{DR} / dt = 50A / \mu s$	—	60	—	$\mu C$
Reverse Recovery Charge	$Q_{rr}$		—	45	—	

MARKING

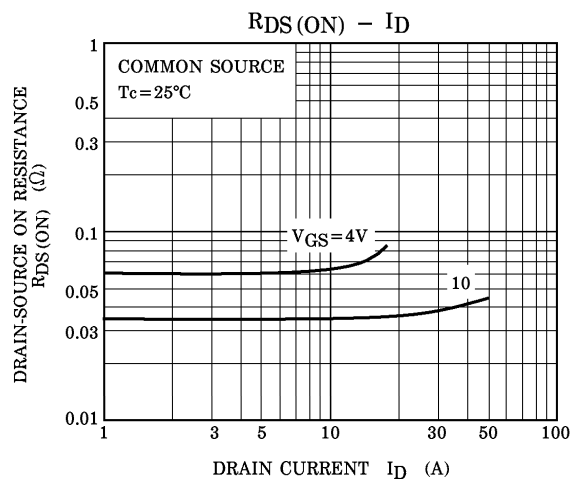
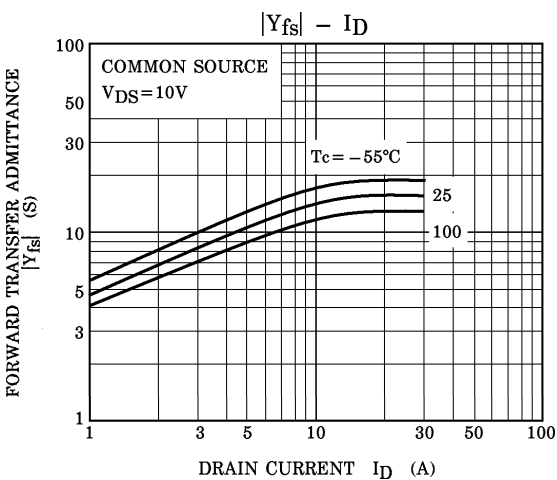
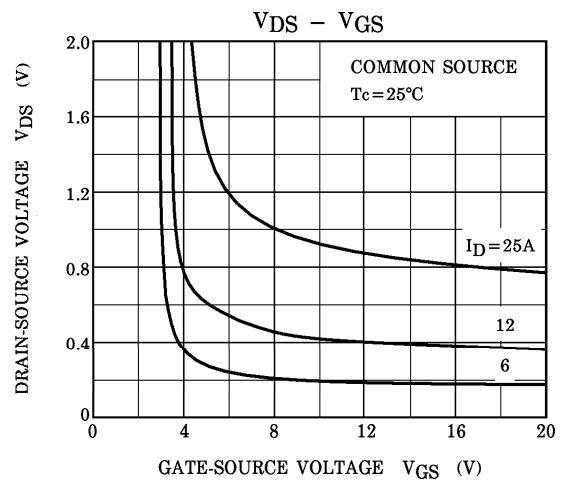
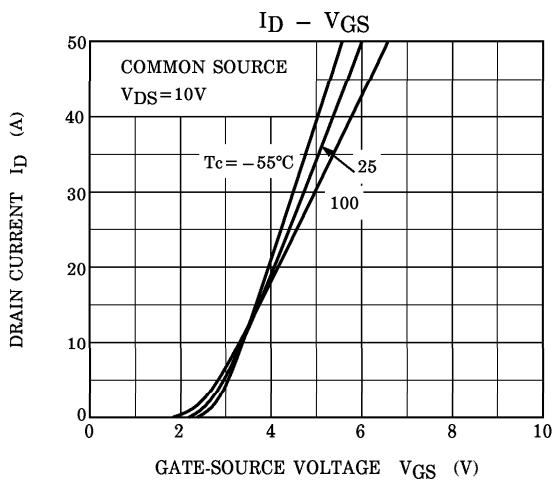
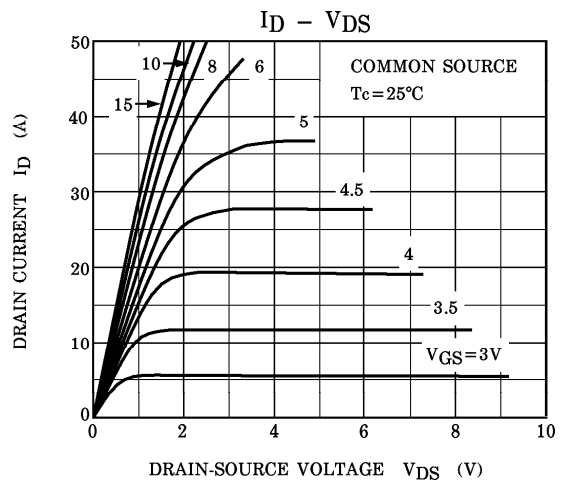
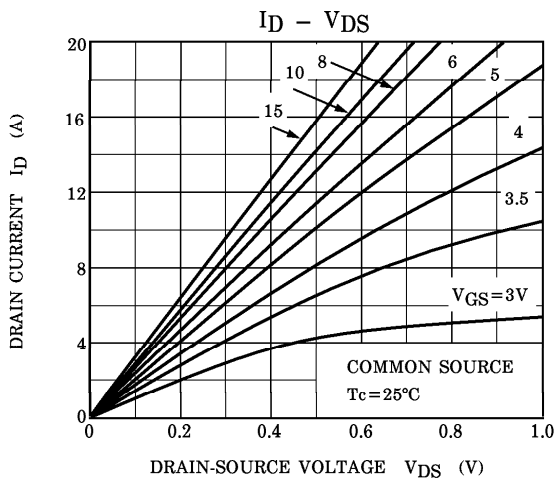


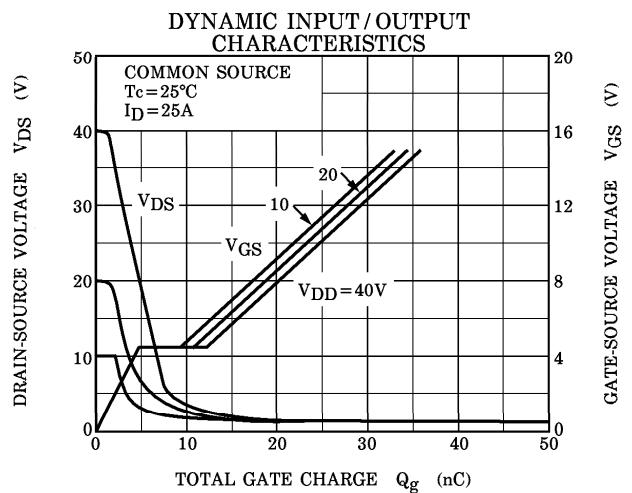
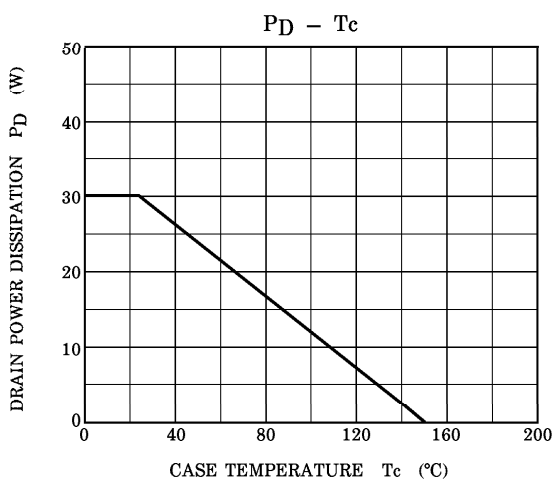
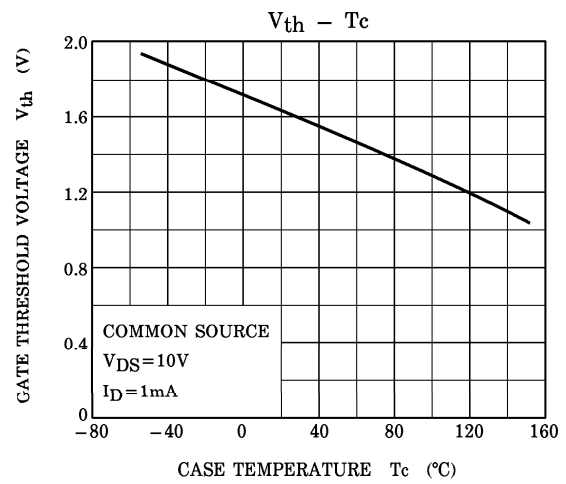
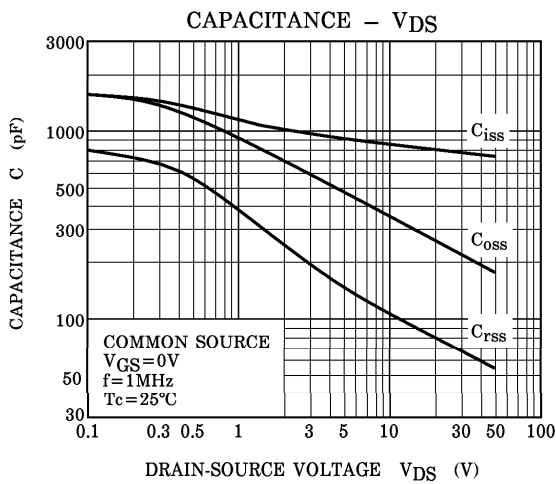
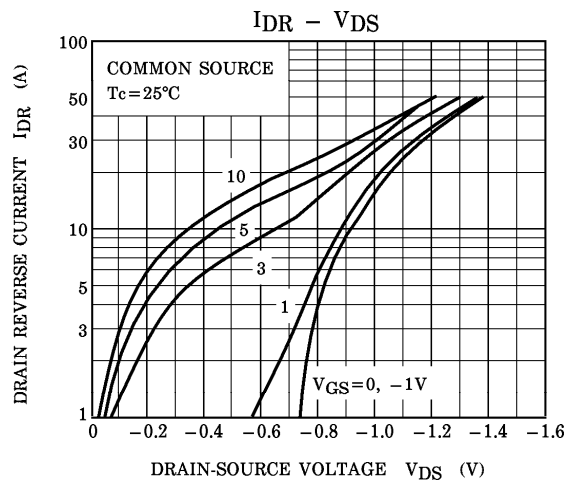
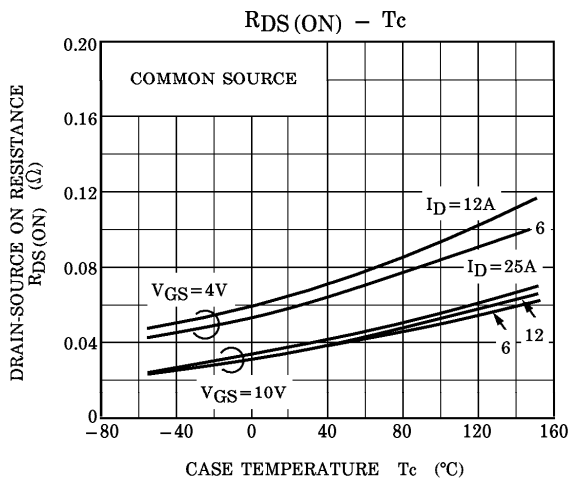
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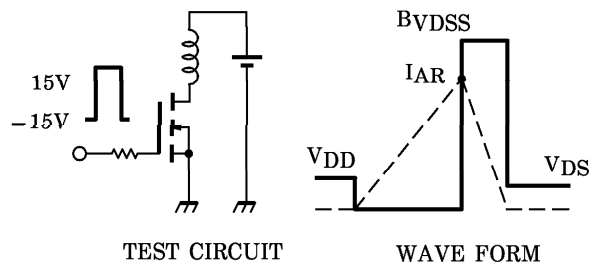
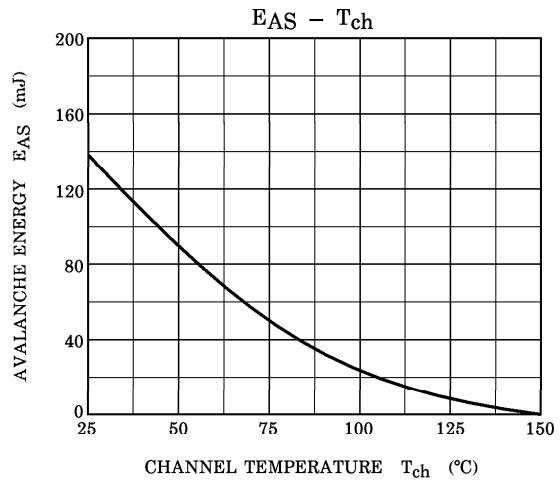
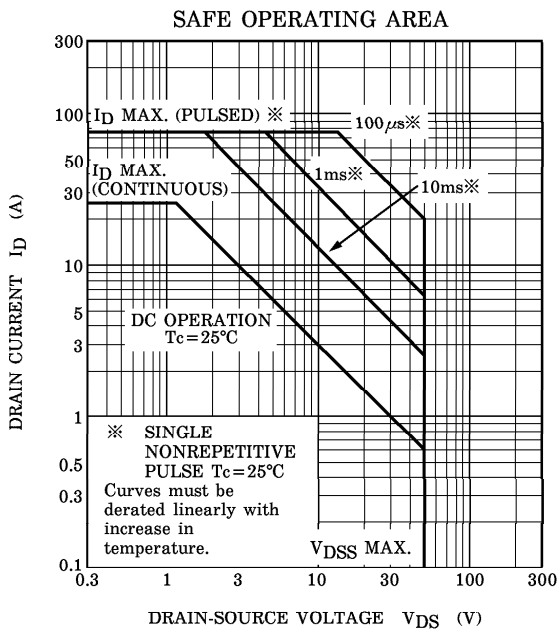
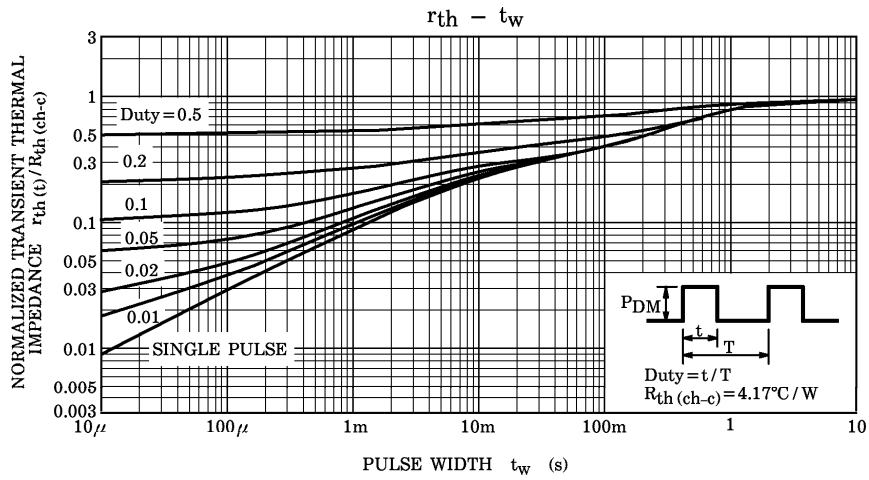
※ Lot Number

□ □ — Month (Starting from Alphabet A)

— Year (Last Number of the Christian Era)







Peak  $I_{AR} = 25A$ ,  $R_G = 25\Omega$ ,  $V_{DD} = 25V$ ,  $L = 272\mu H$

$$EAS = \frac{1}{2} \cdot L \cdot I^2 \cdot \left( \frac{BV_{DSS}}{BV_{DSS} - V_{DD}} \right)$$