

TOSHIBA FIELD EFFECT TRANSISTOR SILICON N CHANNEL MOS TYPE ( $\pi$ -MOSV)

# 2SK2545

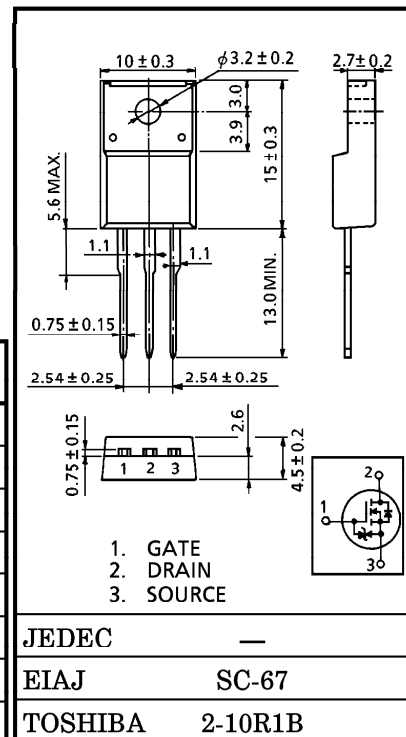
HIGH SPEED, HIGH VOLTAGE SWITCHING APPLICATIONS  
DC-DC CONVERTER, RELAY DRIVE AND MOTOR DRIVE APPLICATIONS

INDUSTRIAL APPLICATIONS  
Unit in mm

- Low Drain-Source ON Resistance :  $R_{DS(ON)} = 0.9\Omega$  (Typ.)
- High Forward Transfer Admittance :  $|Y_{fs}| = 5.5S$  (Typ.)
- Low Leakage Current :  $I_{DSS} = 100\mu A$  (Max.) ( $V_{DS} = 600V$ )
- Enhancement-Mode :  $V_{th} = 2.0 \sim 4.0V$  ( $V_{DS} = 10V, I_D = 1mA$ )

**MAXIMUM RATINGS ( $T_a = 25^\circ C$ )**

CHARACTERISTIC		SYMBOL	RATING	UNIT
Drain-Source Voltage		$V_{DSS}$	600	V
Drain-Gate Voltage ( $R_{GS} = 20k\Omega$ )		$V_{DGR}$	600	V
Gate-Source Voltage		$V_{GSS}$	$\pm 30$	V
Drain Current	DC	$I_D$	6	A
	Pulse	$I_{DP}$	24	A
Drain Power Dissipation ( $T_c = 25^\circ C$ )		$P_D$	40	W
Single Pulse Avalanche Energy**		$E_{AS}$	345	mJ
Avalanche Current		$I_{AR}$	6	A
Repetitive Avalanche Energy*		$E_{AR}$	4	mJ
Channel Temperature		$T_{ch}$	150	$^\circ C$
Storage Temperature Range		$T_{stg}$	$-55 \sim 150$	$^\circ C$



Weight : 1.9g

**THERMAL CHARACTERISTICS**

CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance, Channel to Case	$R_{th(ch-c)}$	3.125	$^\circ C / W$
Thermal Resistance, Channel to Ambient	$R_{th(ch-a)}$	62.5	$^\circ C / W$

- Note ;
- \* Repetitive rating ; Pulse Width Limited by Max. junction temperature.
  - \*\*  $V_{DD} = 90V, T_{ch} = 25^\circ C, L = 16.8mH, R_G = 25\Omega, I_{AR} = 6A$

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

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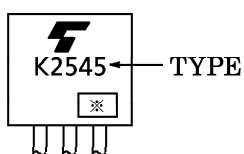
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Gate Leakage Current	IGSS	VGS = ±25V, VDS = 0V	—	—	±10	μA	
Gate-Source Breakdown Voltage	V(BR)GSS	IG = ±10μA, VDS = 0V	±30	—	—	V	
Drain Cut-off Current	IDSS	VDS = 600V, VGS = 0V	—	—	100	μA	
Drain-Source Breakdown Voltage	V(BR)DSS	ID = 10mA, VGS = 0V	600	—	—	V	
Gate Threshold Voltage	Vth	VDS = 10V, ID = 1mA	2.0	—	4.0	V	
Drain-Source ON Resistance	RDS(ON)	VGS = 10V, ID = 3A	—	0.9	1.25	Ω	
Forward Transfer Admittance	Yfs	VDS = 10V, ID = 3A	2.0	5.5	—	S	
Input Capacitance	Ciss	VDS = 10V, VGS = 0V, f = 1MHz	—	1300	—	pF	
Reverse Transfer Capacitance	Crss		—	130	—		
Output Capacitance	Coss		—	400	—		
Switching Time	Rise Time	tr		—	25	—	ns
	Turn-on Time	ton		—	45	—	
	Fall Time	tf		—	40	—	
	Turn-off Time	t <sub>off</sub>		VIN : tr, tf < 5ns, Duty ≤ 1%, tw = 10μs	—	150	
Total Gate Charge (Gate-Source Plus Gate-Drain)	Qg	VDD ≐ 400V, VGS = 10V, ID = 6A	—	30	—	nC	
Gate-Source Charge	Qgs		—	18	—		
Gate-Drain ("Miller") Charge	Qgd		—	12	—		

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

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current	IDR	—	—	—	6	A
Pulse Drain Reverse Current	IDRP	—	—	—	24	A
Diode Forward Voltage	VDSF	IDR = 6A, VGS = 0V	—	—	-1.7	V
Reverse Recovery Time	t <sub>rr</sub>	IDR = 6A, VGS = 0V	—	1000	—	ns
Reverse Recovery Charge	Q <sub>rr</sub>	dIDR / dt = 100A / μs	—	7.0	—	μC

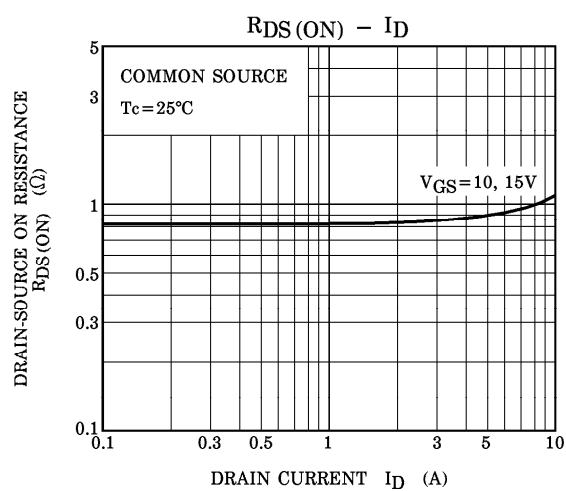
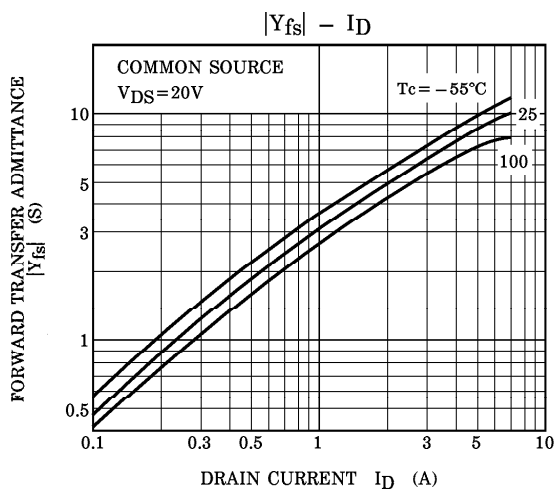
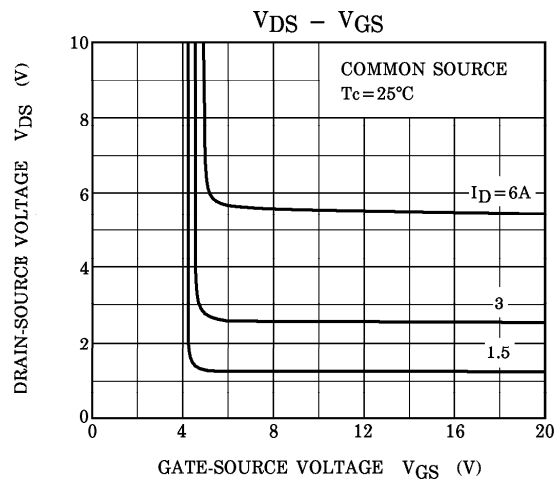
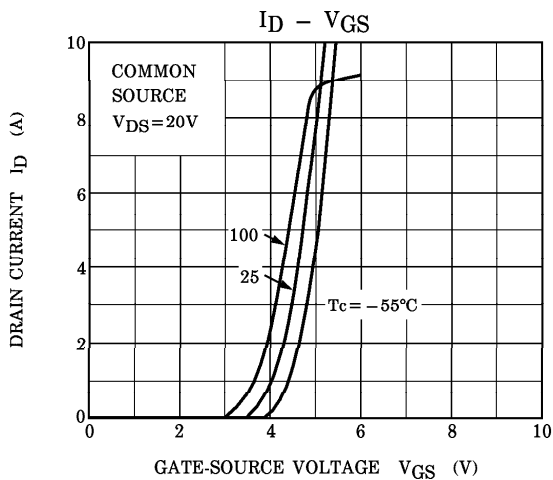
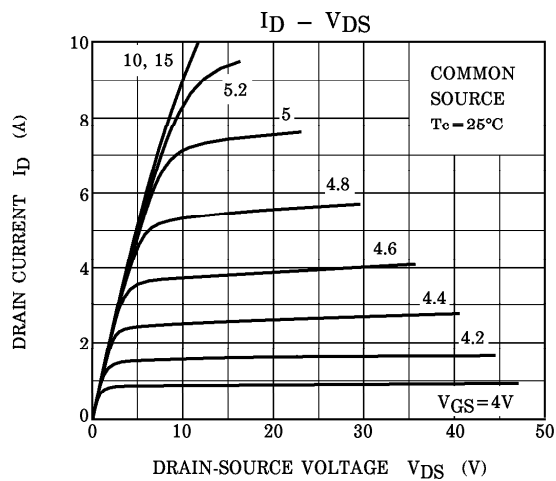
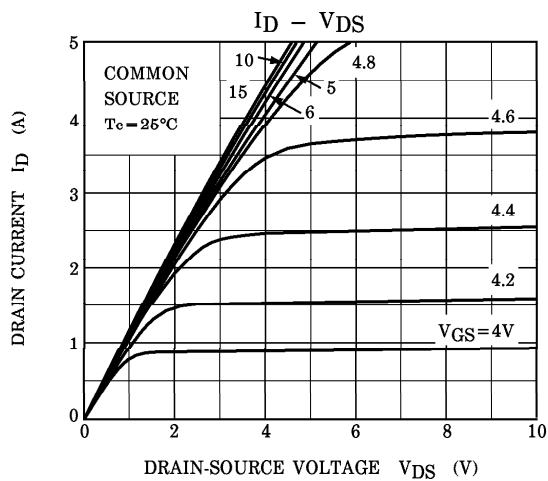
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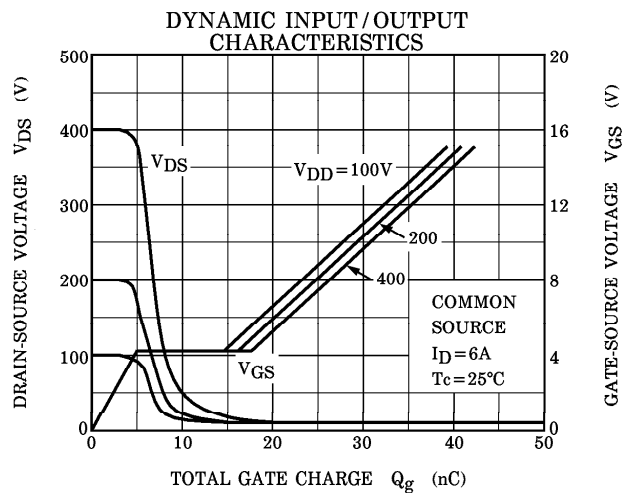
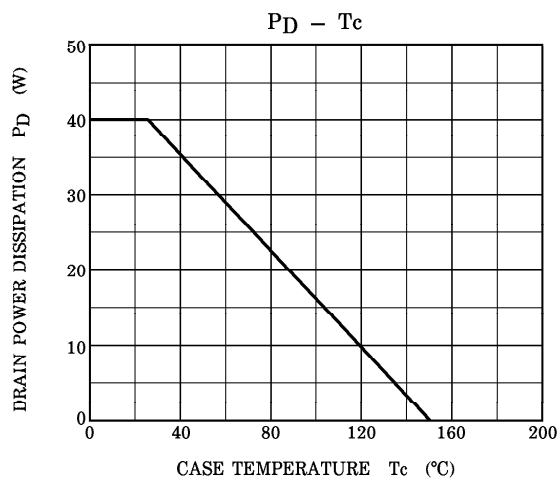
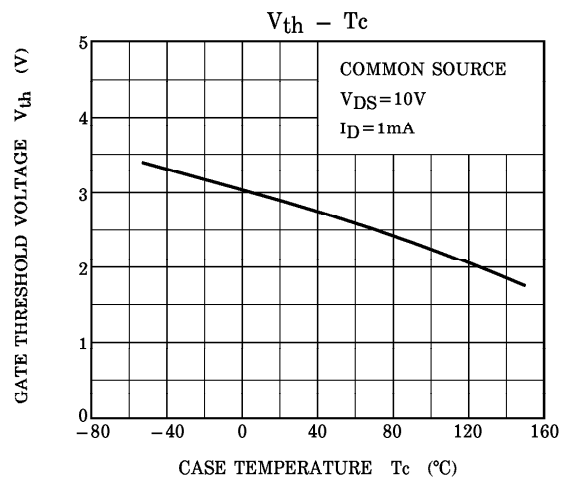
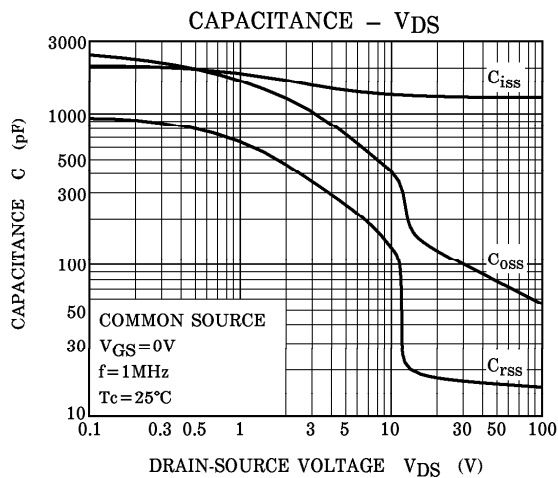
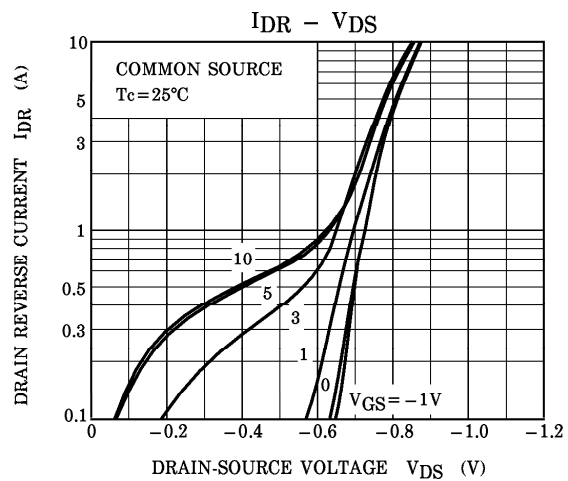
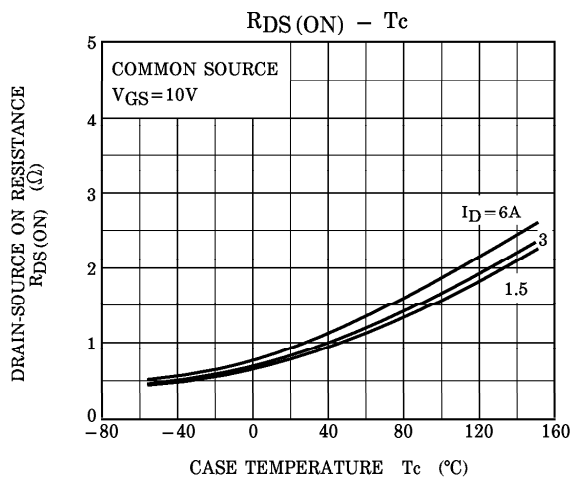


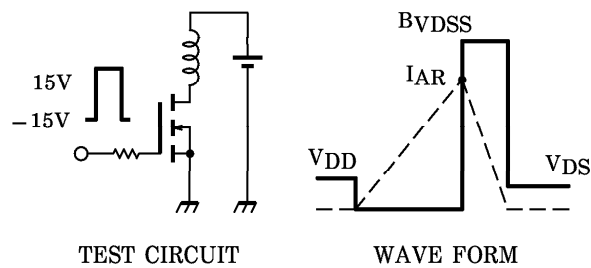
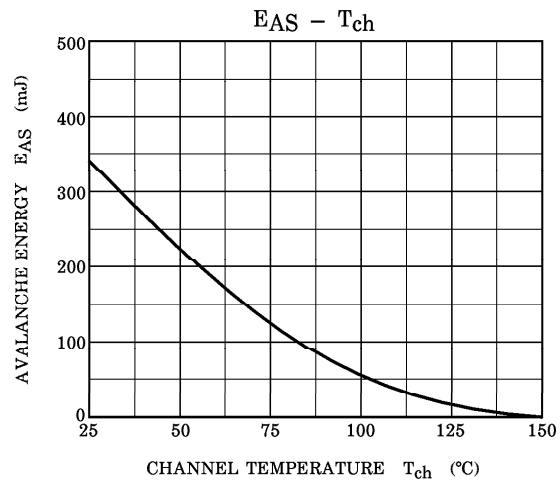
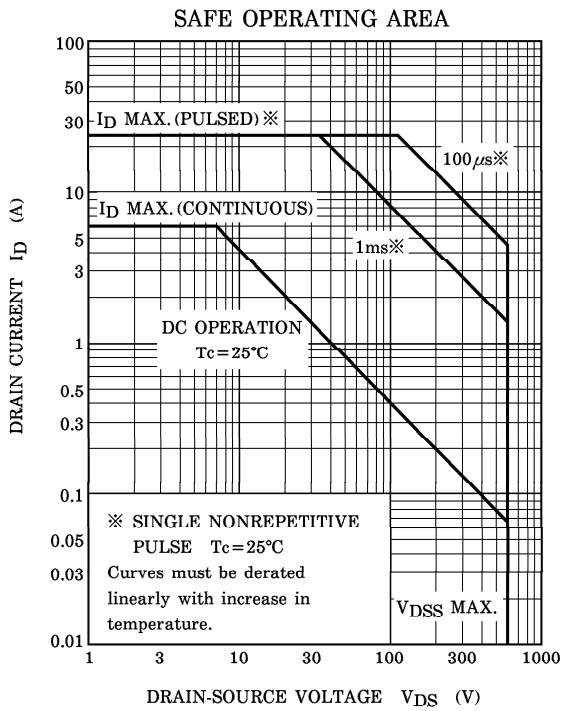
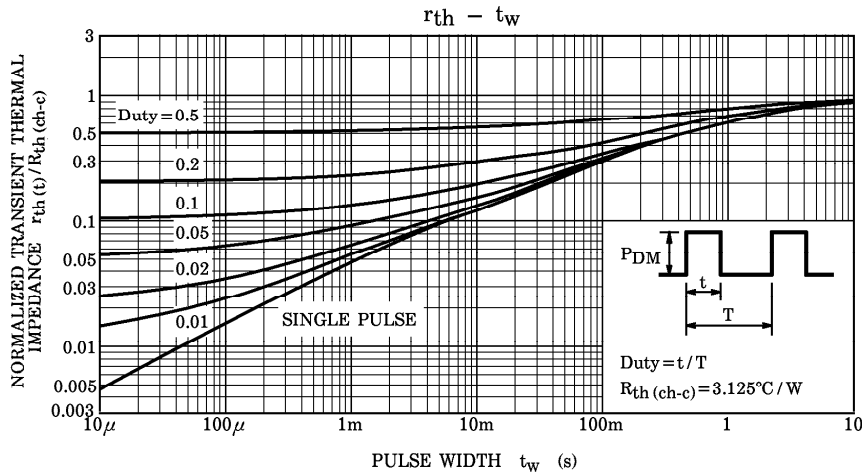
※ Lot Number

□ □ — Month (Starting from Alphabet A)

— Year (Last Number of the Christian Era)







Peak  $I_{AR} = 6A$ ,  $R_G = 25\Omega$   
 $V_{DD} = 90V$ ,  $L = 16.8mH$

$$E_{AS} = \frac{1}{2} \cdot L \cdot I^2 \cdot \left( \frac{BVDSS}{BVDSS - V_{DD}} \right)$$