

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

# 2SK2846

HIGH SPEED, HIGH CURRENT SWITCHING APPLICATIONS

CHOPPER REGULATOR, DC-DC CONVERTER AND MOTOR DRIVE APPLICATIONS

- Low Drain-Source ON Resistance :  $R_{DS(ON)} = 4.2\Omega$  (Typ.)
- High Forward Transfer Admittance :  $|Y_{fs}| = 1.7S$  (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 (Ta = 25°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	$I_D$	2 A
	Pulse (t = 1ms)	$I_{DP}$	5 A
	Pulse (t = 100μs)	$I_{DP}$	8 A
Drain Power Dissipation (Ta = 25°C)	$P_D$	1.3	W
Single Pulse Avalanche Energy**	$E_{AS}$	93	mJ
Avalanche Current	$I_{AR}$	2	A
Repetitive Avalanche Energy*	$E_{AR}$	0.13	mJ
Channel Temperature	$T_{ch}$	150	°C
Storage Temperature Range	$T_{stg}$	-55~150	°C

THERMAL CHARACTERISTICS

CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance, Channel to Ambient	$R_{th(ch-a)}$	96.1	°C/W

Note ;

\* Repetitive rating ; Pulse Width Limited by Max. junction temperature.

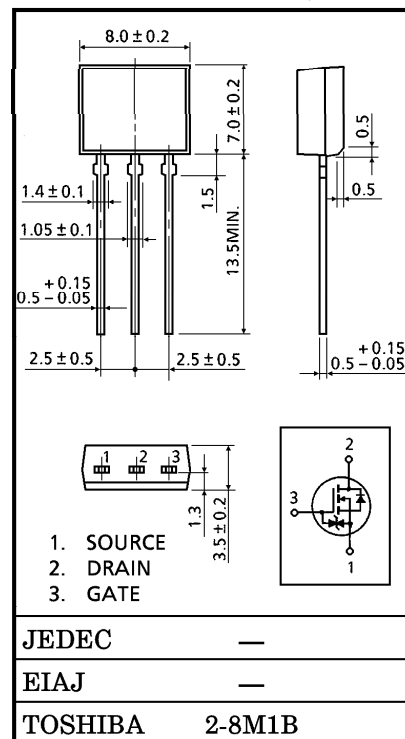
$V_{DD} = 90V$ , Starting  $T_{ch} = 25°C$ ,  $L = 41mH$ ,  $R_G = 25\Omega$ ,  $I_{AR} = 2A$

**This transistor is an electrostatic sensitive device.**

**Please handle with caution.**

INDUSTRIAL APPLICATIONS

Unit in mm



Weight : 0.54g (Typ.)

961001EAA1

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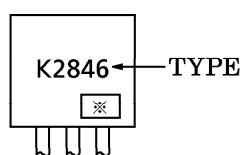
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

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	ID = 10μA, VGS = 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 = 1A	—	4.2	5.0	Ω
Forward Transfer Admittance		Yfs	VDS = 10V, ID = 1A	0.8	1.7	—	S
Input Capacitance		Ciss	VDS = 10V, VGS = 0V f = 1MHz	—	380	—	pF
Reverse Transfer Capacitance		Crss		—	40	—	
Output Capacitance		Coss		—	120	—	
Switching Time	Rise Time	tr	<p>VGS = 10V, 0V ID = 1A RL = 200Ω VDD = 200V</p>	—	15	—	ns
	Turn-on Time	ton		—	25	—	
	Fall Time	tf		—	20	—	
	Turn-off Time	t <sub>off</sub>		VIN : tr, tf < 5ns, Duty ≤ 1%, tw = 10μs	—	80	
Total Gate Charge (Gate-Source Plus Gate-Drain)		Qg	VDD = 480V, VGS = 10V ID = 2A	—	9	—	nC
Gate-Source Charge		Qgs		—	5	—	
Gate-Drain ("Miller") Charge		Qgd		—	4	—	

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

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current	IDR	—	—	—	2	A
Pulse Drain Reverse Current	IDRP	t = 1ms	—	—	5	A
	IDRP	t = 100μs	—	—	8	A
Diode Forward Voltage	VDSF	IDR = 2A, VGS = 0V	—	—	-1.5	V
Reverse Recovery Time	t <sub>rr</sub>	IDR = 2A, VGS = 0V	—	1000	—	ns
Reverse Recovery Charge	Q <sub>rr</sub>	dIDR / dt = 100A / μs	—	3.5	—	μC

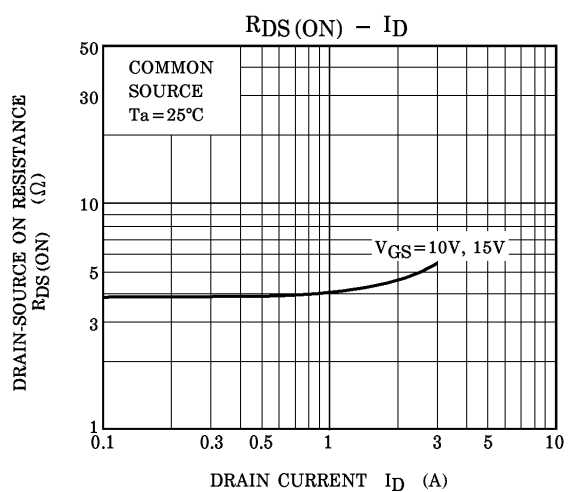
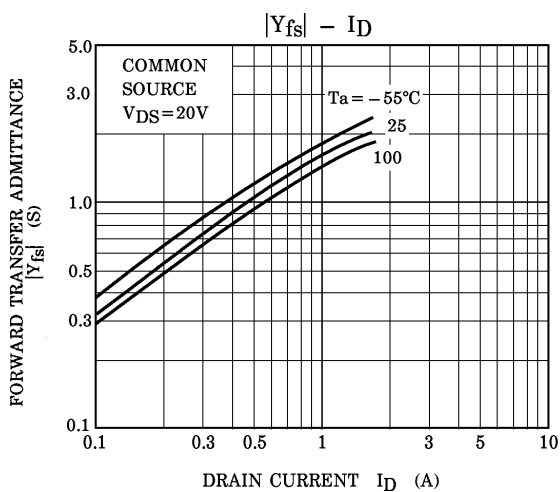
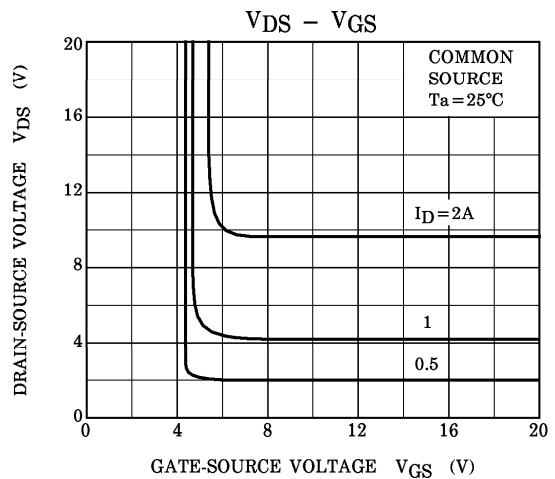
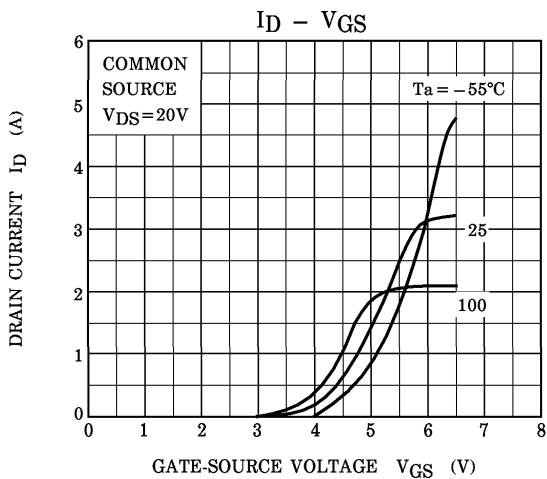
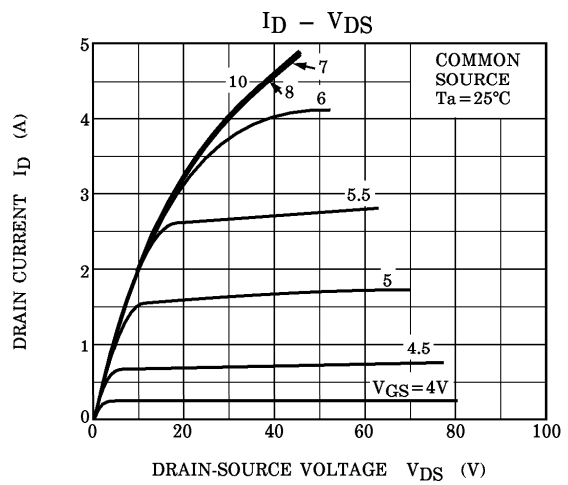
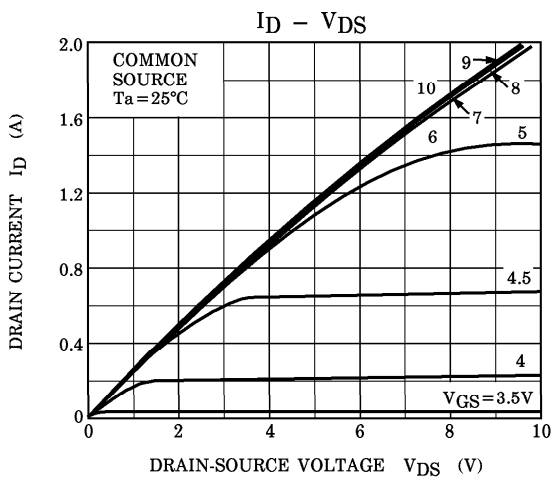
MARKING

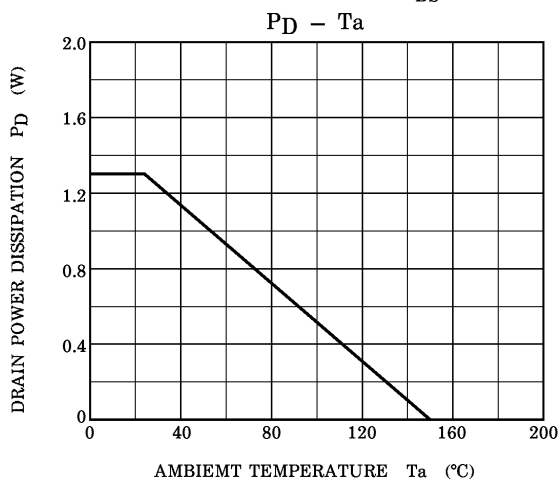
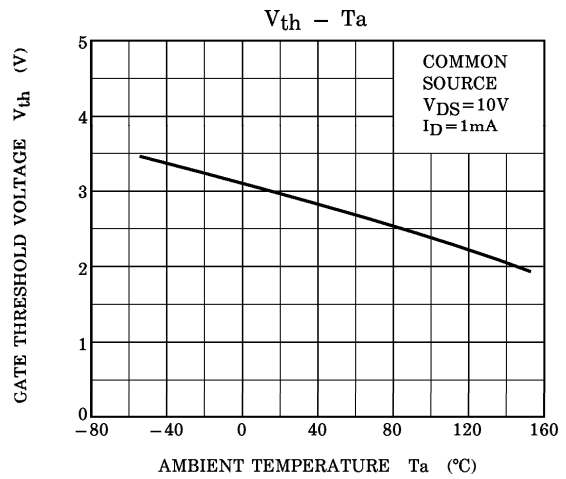
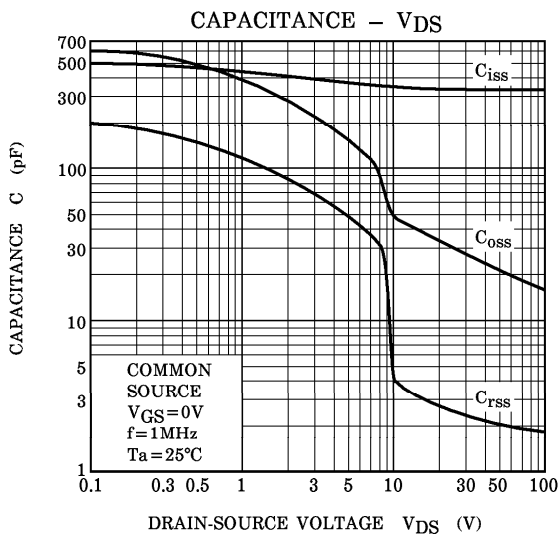
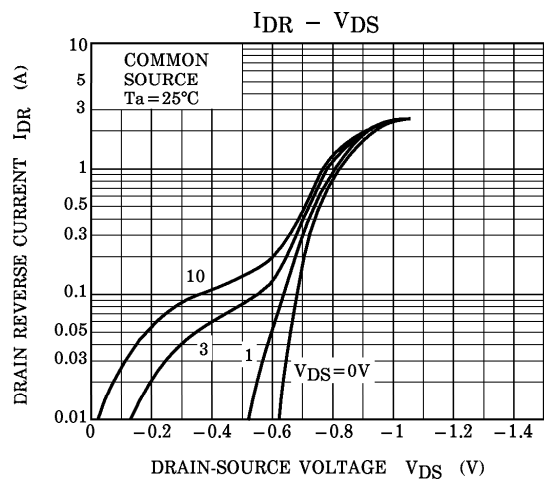
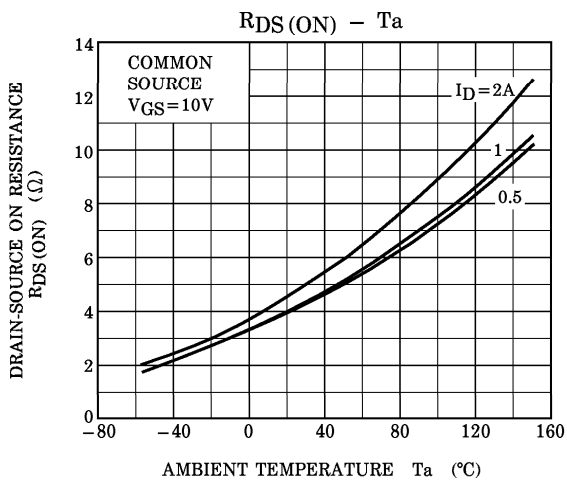


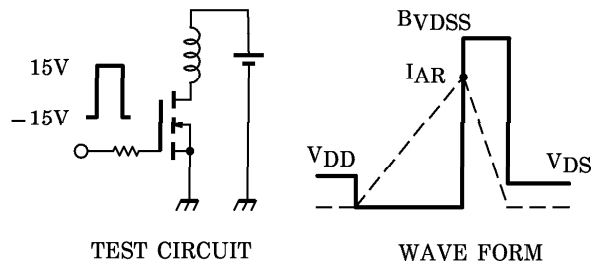
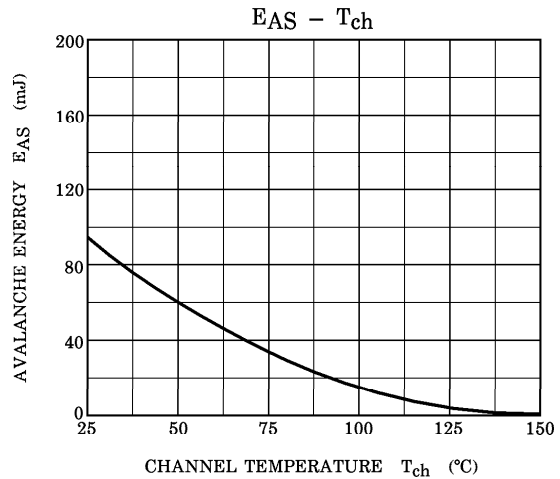
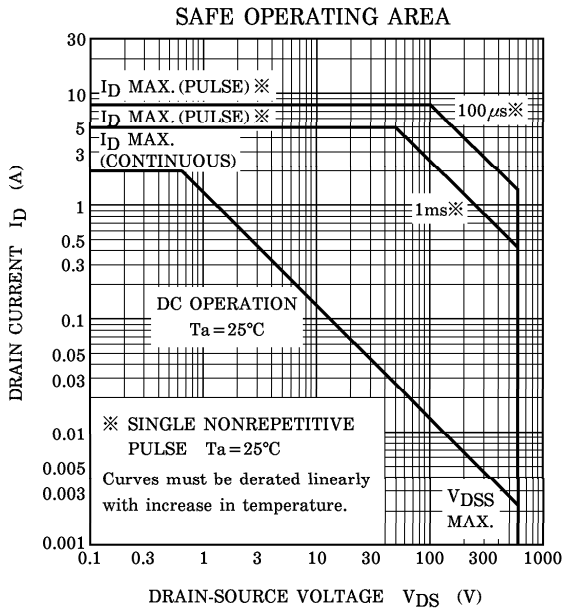
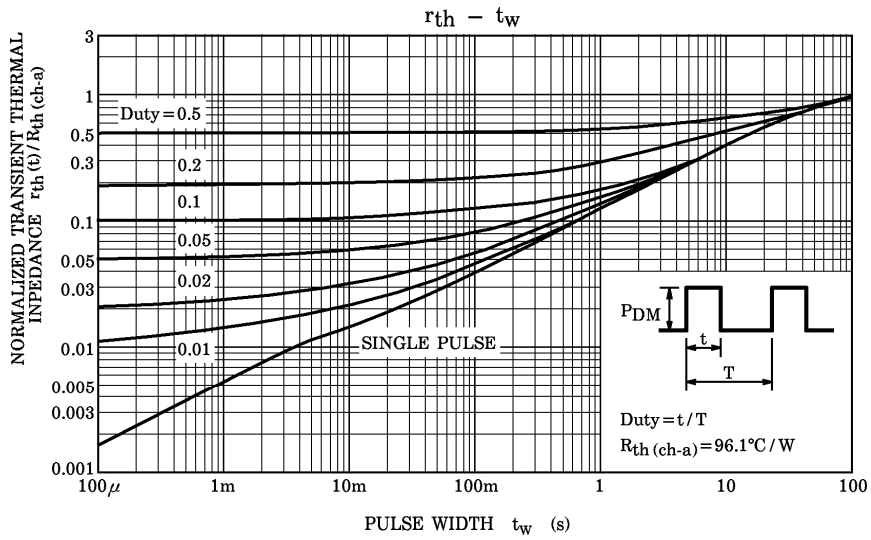
※ Lot Number

□ □ — Month (Starting from Alphabet A)

— Year (Last Number of the Christian Era)







Peak  $I_{AR} = 2A$ ,  $R_G = 25\Omega$ ,  $V_{DD} = 90V$ ,  $L = 41mH$

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