

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

# 2SK2844

HIGH SPEED, HIGH CURRENT SWITCHING APPLICATIONS

CHOPPER REGULATOR, DC-DC CONVERTER AND MOTOR DRIVE APPLICATIONS

- 4V Gate Drive
- Low Drain-Source ON Resistance :  $R_{DS(ON)} = 16m\Omega$  (Typ.)
- High Forward Transfer Admittance :  $|Y_{fs}| = 26S$  (Typ.)
- Low Leakage Current :  $I_{DSS} = 100\mu A$  (Max.) ( $V_{DS} = 30V$ )
- 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		$V_{DSS}$	30	V
Drain-Gate Voltage ( $R_{GS} = 20k\Omega$ )		$V_{DGR}$	30	V
Gate-Source Voltage		$V_{GSS}$	±20	V
Drain Current	DC	$I_D$	35	A
	Pulse	$I_{DP}$	140	A
Drain Power Dissipation (Tc = 25°C)		$P_D$	60	W
Single Pulse Avalanche Energy**		$E_{AS}$	259	mJ
Avalanche Current		$I_{AR}$	35	A
Repetitive Avalanche Energy*		$E_{AR}$	6	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 Case	$R_{th(ch-c)}$	2.08	°C/W
Thermal Resistance, Channel to Ambient	$R_{th(ch-a)}$	83.3	°C/W

Note ;

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

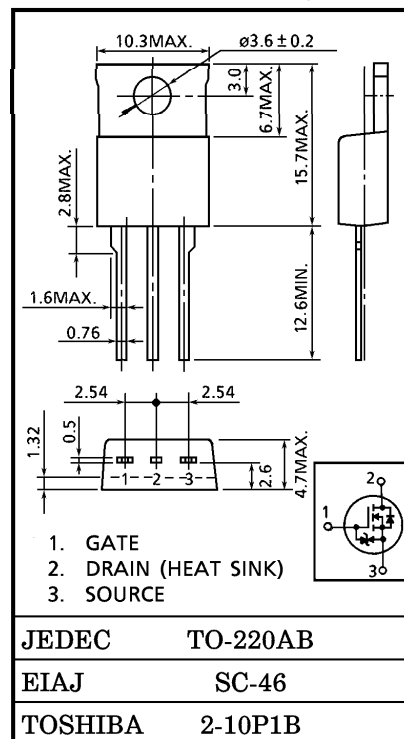
\*\*  $V_{DD} = 25V$ , Starting  $T_{ch} = 25°C$ ,  $L = 152\mu H$ ,  $R_G = 25\Omega$ ,  $I_{AR} = 35A$

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

**Please handle with caution.**

INDUSTRIAL APPLICATIONS

Unit in mm

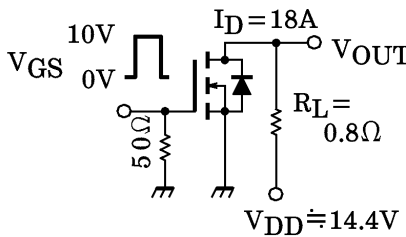


Weight : 2.0g (Typ.)

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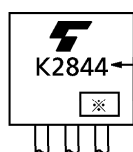
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Gate Leakage Current	IGSS	VGS = ±16V, VDS = 0V	—	—	±10	μA	
Drain Cut-off Current	IDSS	VDS = 30V, VGS = 0V	—	—	100	μA	
Drain-Source Breakdown Voltage	V(BR)DSS	ID = 10mA, VGS = 0V	30	—	—	V	
Gate Threshold Voltage	Vth	VDS = 10V, ID = 1mA	0.8	—	2.0	V	
Drain-Source ON Resistance	RDS(ON)	VGS = 4V, ID = 18A	—	26	35	mΩ	
		VGS = 10V, ID = 18A	—	16	20		
Forward Transfer Admittance	Yfs	VDS = 10V, ID = 18A	13	26	—	S	
Input Capacitance	Ciss	VDS = 10V, VGS = 0V f = 1MHz	—	980	—	pF	
Reverse Transfer Capacitance	Crss		—	270	—		
Output Capacitance	Coss		—	580	—		
Switching Time	Rise Time	tr		—	14	—	ns
	Turn-on Time	ton		—	23	—	
	Fall Time	tf		—	64	—	
	Turn-off Time	t <sub>off</sub>		VIN : tr, tf < 5ns, Duty ≤ 1%, tW = 10μs	—	190	
Total Gate Charge (Gate-Source Plus Gate-Drain)	Qg	VDD = 24V, VGS = 10V	—	40	—	nC	
Gate-Source Charge	Qgs	ID = 35A	—	32	—		
Gate-Drain ("Miller") Charge	Qgd		—	8	—		

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

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current	IDR	—	—	—	50	A
Pulse Drain Reverse Current	IDRP	—	—	—	200	A
Diode Forward Voltage	VDSF	IDR = 35A, VGS = 0V	—	—	-1.7	V
Reverse Recovery Time	t <sub>rr</sub>	IDR = 35A, VGS = 0V	—	120	—	ns
Reverse Recovery Charge	Q <sub>rr</sub>	dIDR / dt = 50A / μs	—	180	—	nC

MARKING

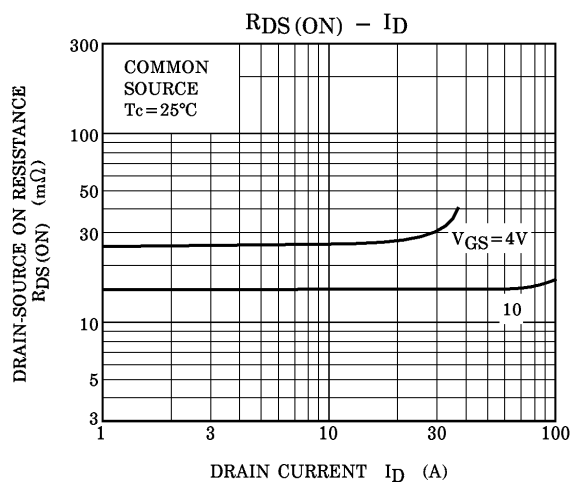
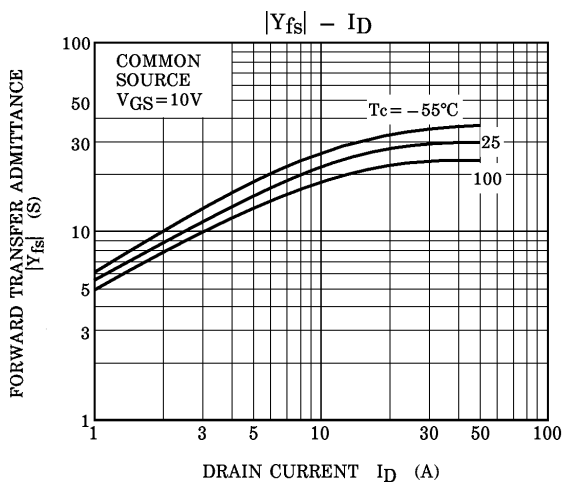
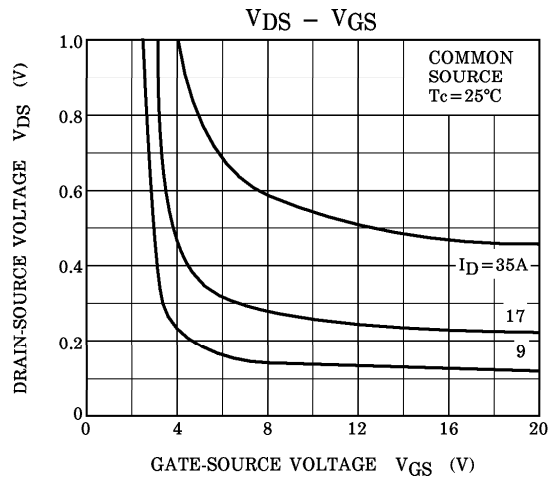
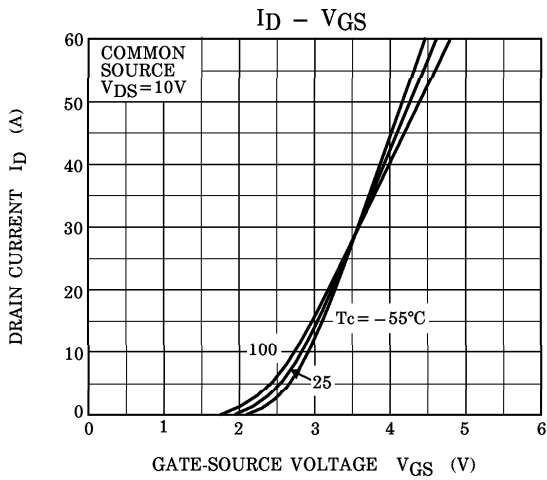
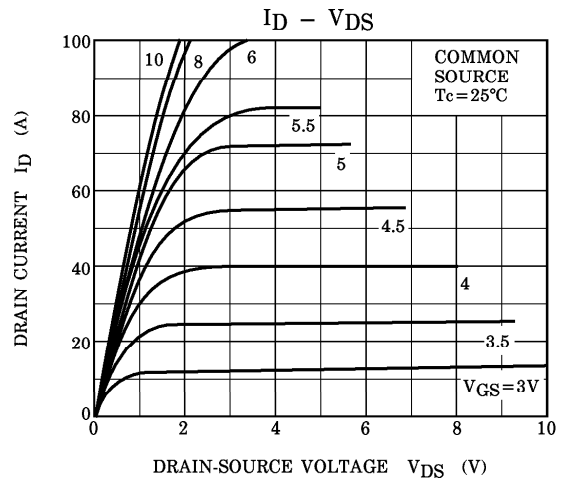
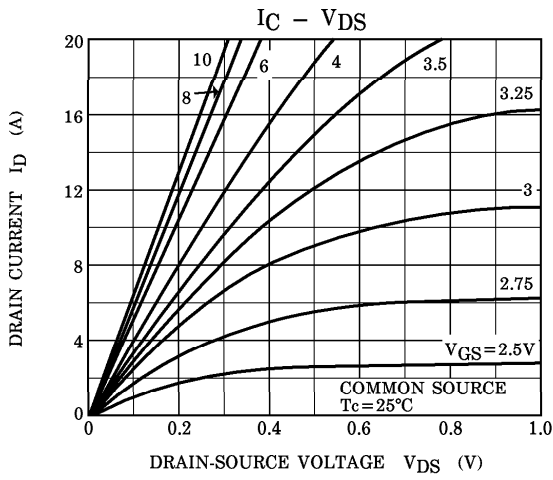


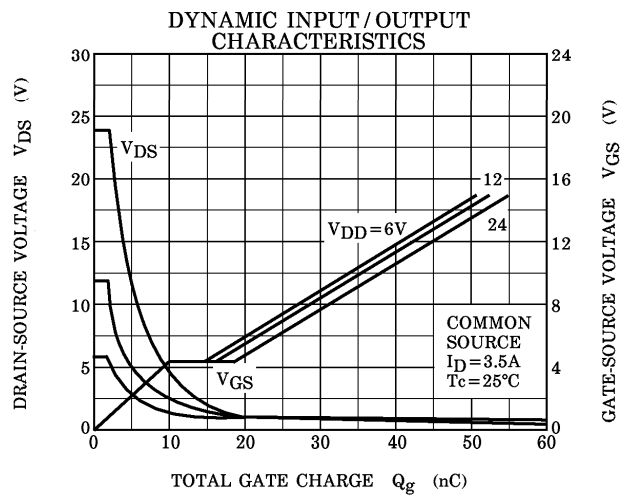
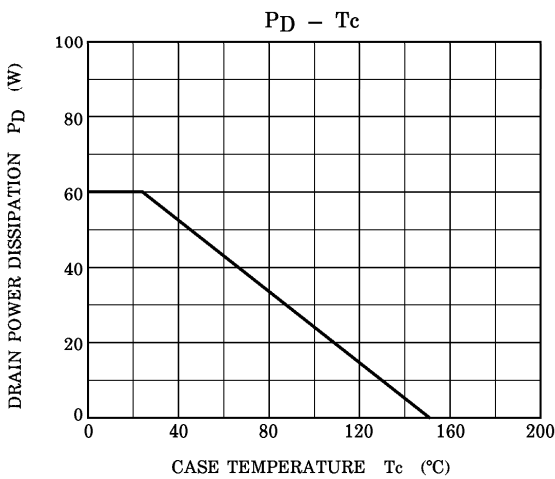
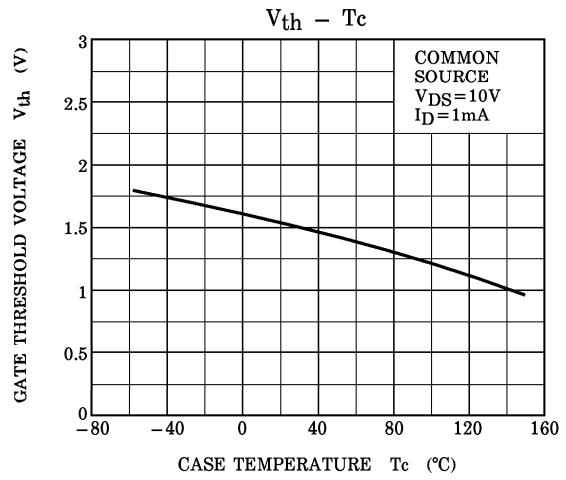
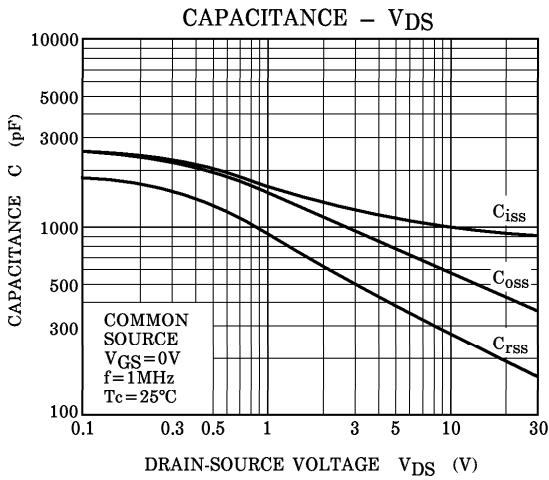
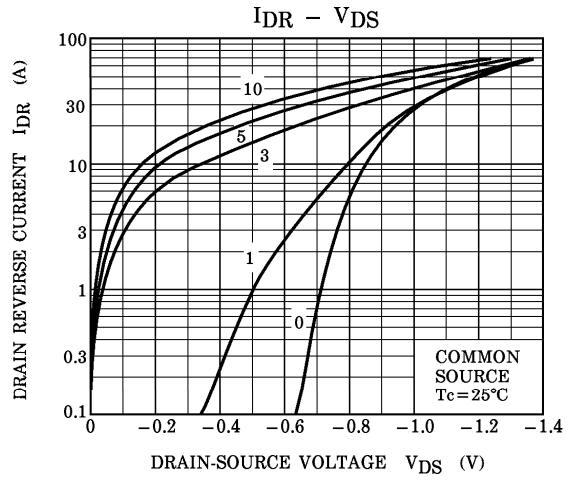
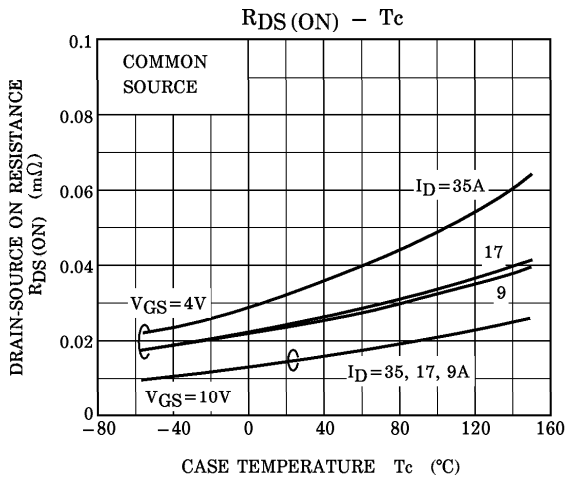
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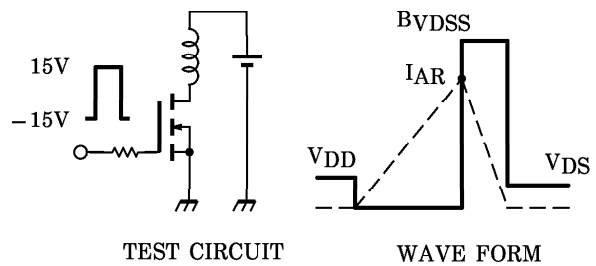
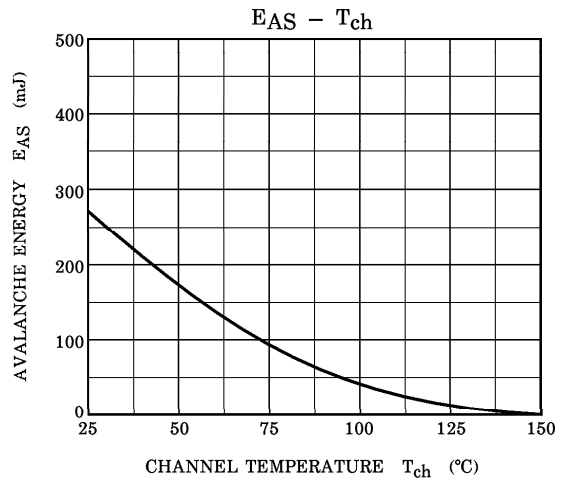
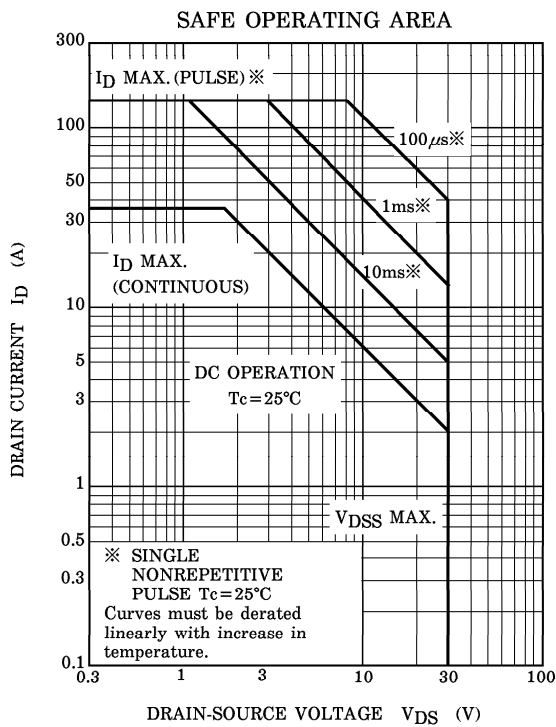
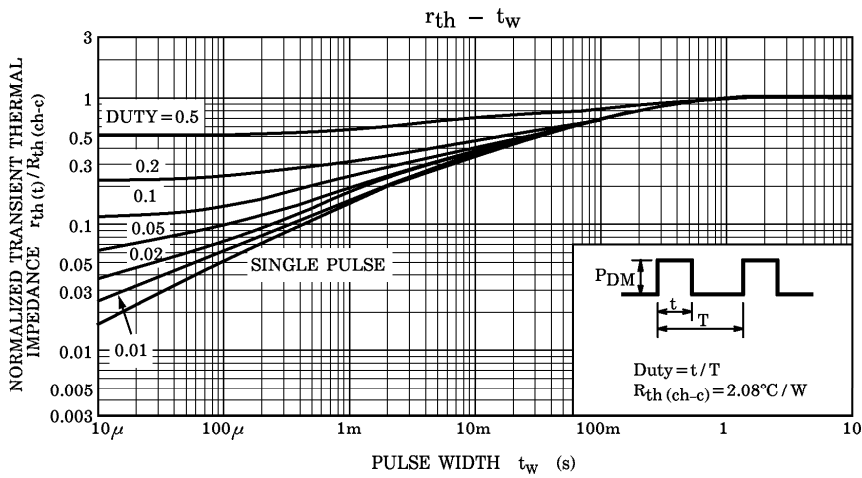
※ Lot Number

□ □ — Month (Starting from Alphabet A)

— Year (Last Number of the Christian Era)







Peak  $I_{AR} = 35A$ ,  $R_G = 25\Omega$   
 $V_{DD} = 25V$ ,  $L = 152\mu H$

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