

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

# 2SK2837

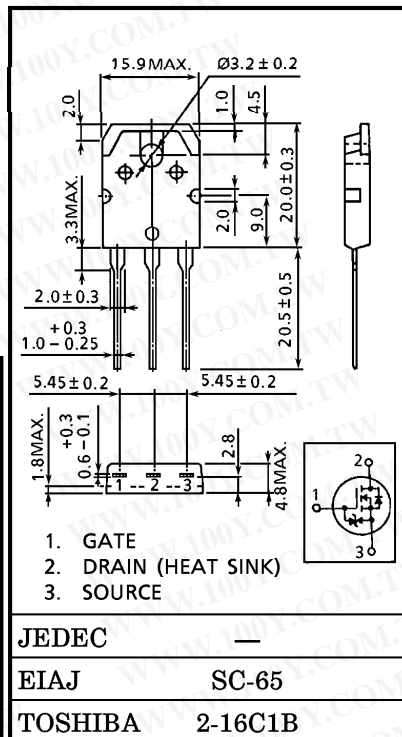
HIGH SPEED, HIGH CURRENT SWITCHING APPLICATIONS

INDUSTRIAL APPLICATIONS

CHOPPER REGULATOR, DC-DC CONVERTER AND MOTOR DRIVE APPLICATIONS

Unit in mm

- Low Drain-Source ON Resistance :  $R_{DS(ON)} = 0.21\Omega$  (Typ.)
- High Forward Transfer Admittance :  $|Y_{fs}| = 17S$  (Typ.)
- Low Leakage Current :  $I_{DSS} = 100\mu A$  (Max.) ( $V_{DSS} = 500V$ )
- 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		$V_{DSS}$	500	V
Drain-Gate Voltage ( $R_{GS} = 20k\Omega$ )		$V_{DGR}$	500	V
Gate-Source Voltage		$V_{GSS}$	$\pm 30$	V
Drain Current	DC	$I_D$	20	A
	Pulse	$I_{DP}$	80	A
Drain Power Dissipation ( $T_c = 25^\circ C$ )		$P_D$	150	W
Single Pulse Avalanche Energy**		$E_{AS}$	960	mJ
Avalanche Current		$I_{AR}$	20	A
Repetitive Avalanche Energy*		$E_{AR}$	15	mJ
Channel Temperature		$T_{ch}$	150	$^\circ C$
Storage Temperature Range		$T_{stg}$	$-55 \sim 150$	$^\circ C$

JEDEC —

EIAJ SC-65

TOSHIBA 2-16C1B

Weight : 4.6g

THERMAL CHARACTERISTICS

CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance, Channel to Case	$R_{th(ch-c)}$	0.833	$^\circ C/W$
Thermal Resistance, Channel to Ambient	$R_{th(ch-a)}$	50	$^\circ C/W$

Note ;

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

\*\*  $V_{DD} = 90V$ , Starting  $T_{ch} = 25^\circ C$ ,  $L = 4.08mH$   
 $R_G = 25\Omega$ ,  $I_{AR} = 20A$

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

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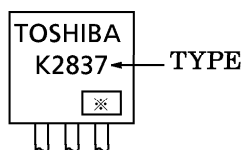
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Gate Leakage Current	$I_{GSS}$	$V_{GS} = \pm 25V, V_{DS} = 0V$	—	—	$\pm 10$	$\mu A$	
Gate-Source Breakdown Voltage	$V_{(BR)GSS}$	$I_G = \pm 10\mu A, V_{DS} = 0V$	$\pm 30$	—	—	V	
Drain Cut-off Current	$I_{DSS}$	$V_{DS} = 500V, V_{GS} = 0V$	—	—	100	$\mu A$	
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D = 10mA, V_{GS} = 0V$	500	—	—	V	
Gate Threshold Voltage	$V_{th}$	$V_{DS} = 10V, I_D = 1mA$	2.0	—	4.0	V	
Drain-Source ON Resistance	$R_{DS(ON)}$	$V_{GS} = 10V, I_D = 10A$	—	0.21	0.27	$\Omega$	
Forward Transfer Admittance	$ Y_{fs} $	$V_{DS} = 10V, I_D = 10A$	10	17	—	S	
Input Capacitance	$C_{iss}$	$V_{DS} = 10V, V_{GS} = 0V,$ $f = 1MHz$	—	3720	—	pF	
Reverse Transfer Capacitance	$C_{rss}$		—	340	—		
Output Capacitance	$C_{oss}$		—	1165	—		
Switching Time	Rise Time	$t_r$		—	30	—	ns
	Turn-on Time	$t_{on}$		—	70	—	
	Fall Time	$t_f$		—	50	—	
	Turn-off Time	$t_{off}$		—	290	—	
Total Gate Charge (Gate-Source Plus Gate-Drain)	$Q_g$	$V_{DD} = 400V, V_{GS} = 10V,$ $I_D = 6A$	—	80	—	nC	
Gate-Source Charge	$Q_{gs}$		—	48	—		
Gate-Drain ("Miller") Charge	$Q_{gd}$		—	32	—		

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

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current	$I_{DR}$	—	—	—	20	A
Pulse Drain Reverse Current	$I_{DRP}$	—	—	—	80	A
Diode Forward Voltage	$V_{DSF}$	$I_{DR} = 20A, V_{GS} = 0V$	—	—	-1.7	V
Reverse Recovery Time	$t_{rr}$	$I_{DR} = 20A, V_{GS} = 0V$ $dI_{DR}/dt = 100A/\mu s$	—	540	—	ns
Reverse Recovery Charge	$Q_{rr}$		—	5.4	—	$\mu C$

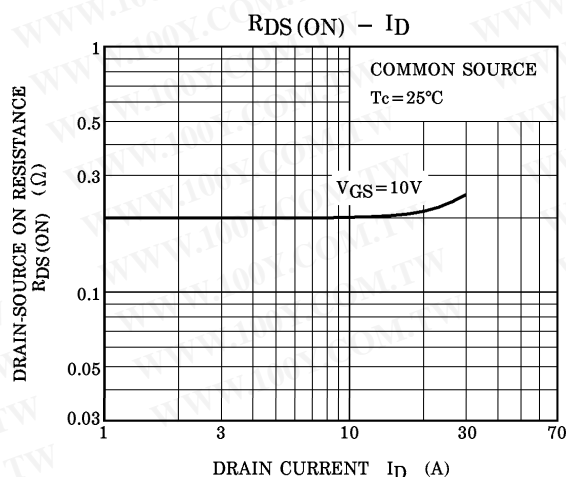
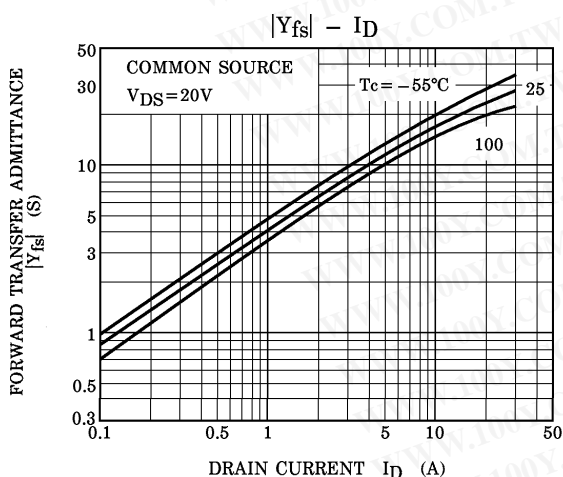
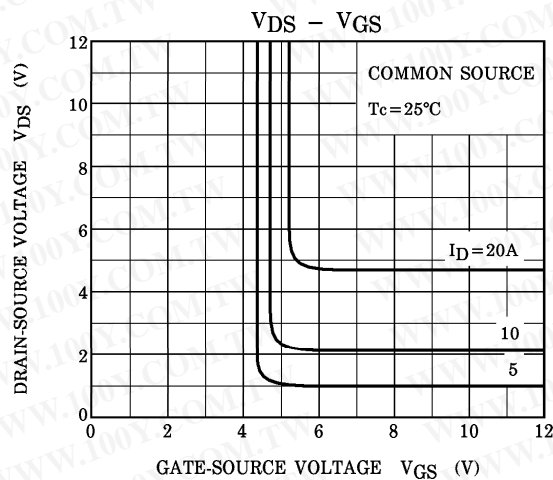
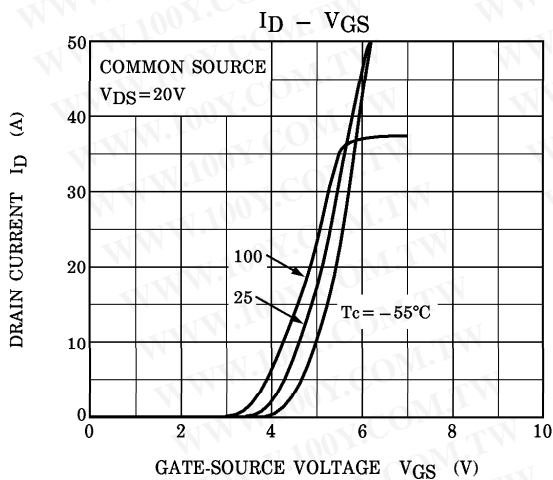
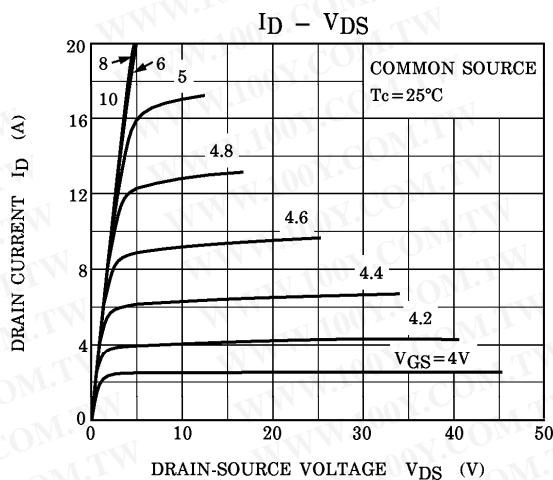
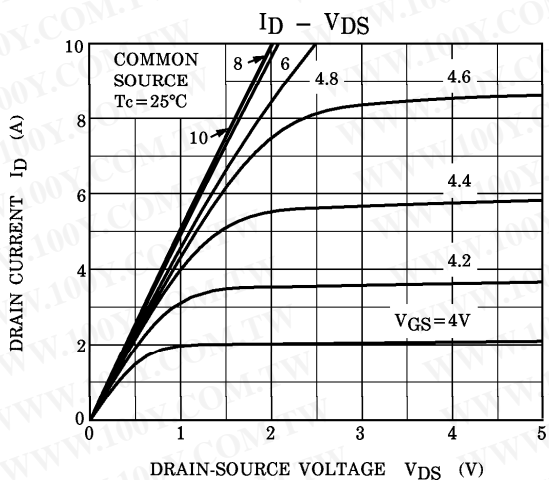
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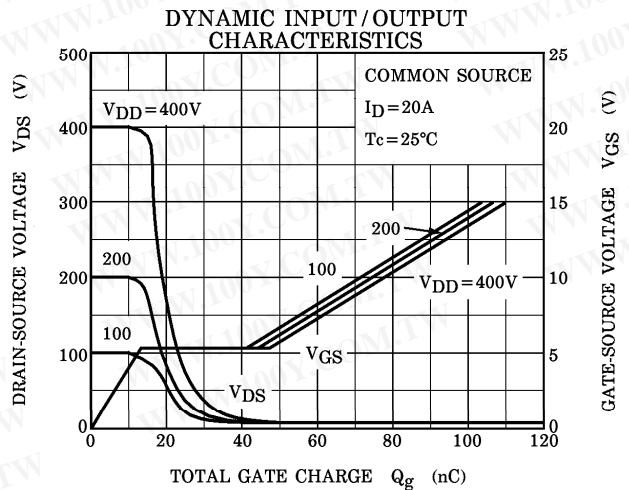
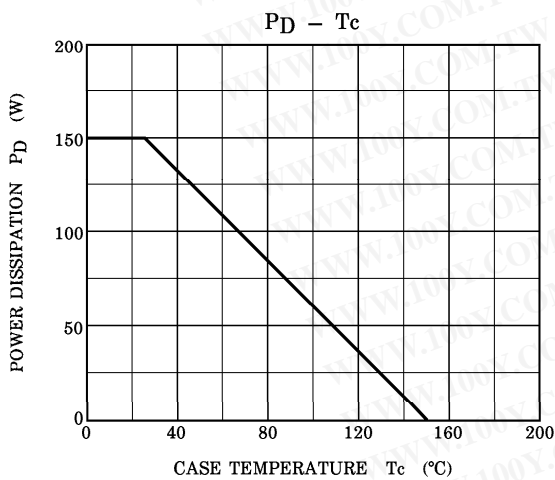
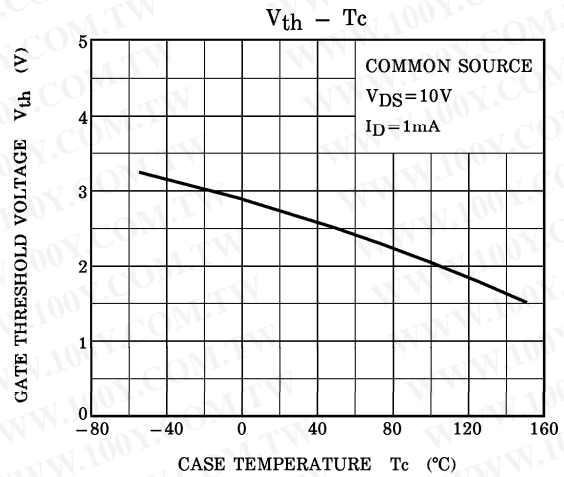
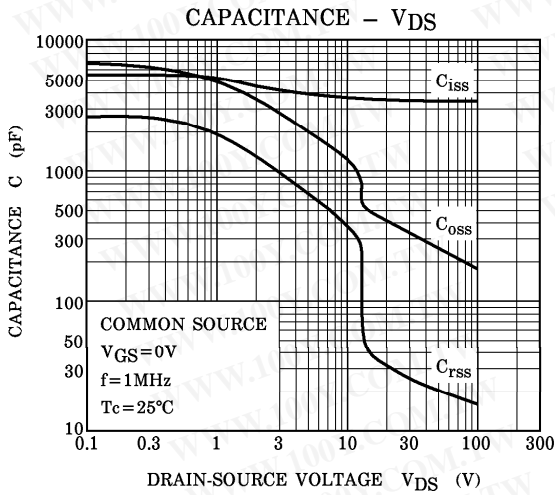
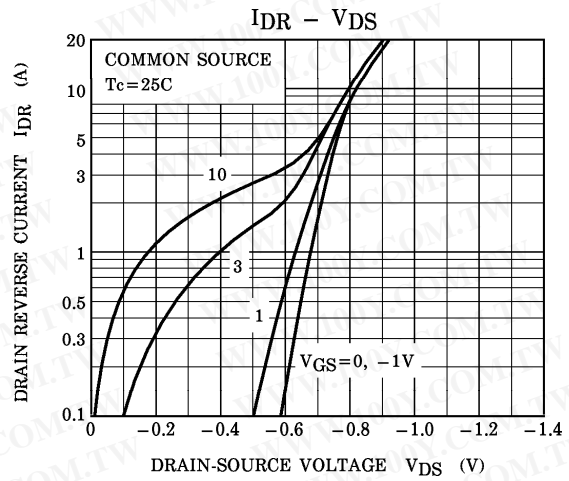
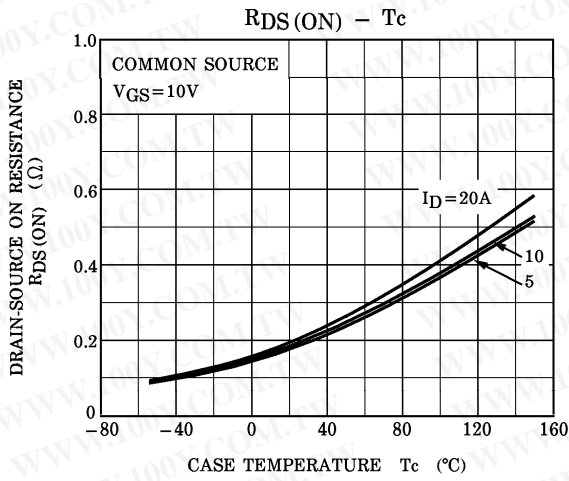


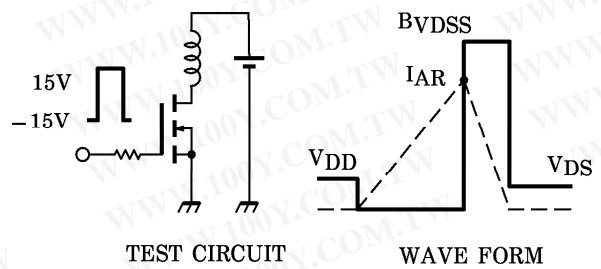
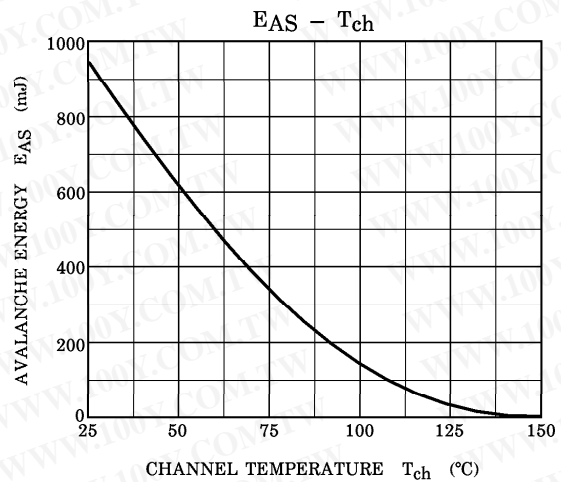
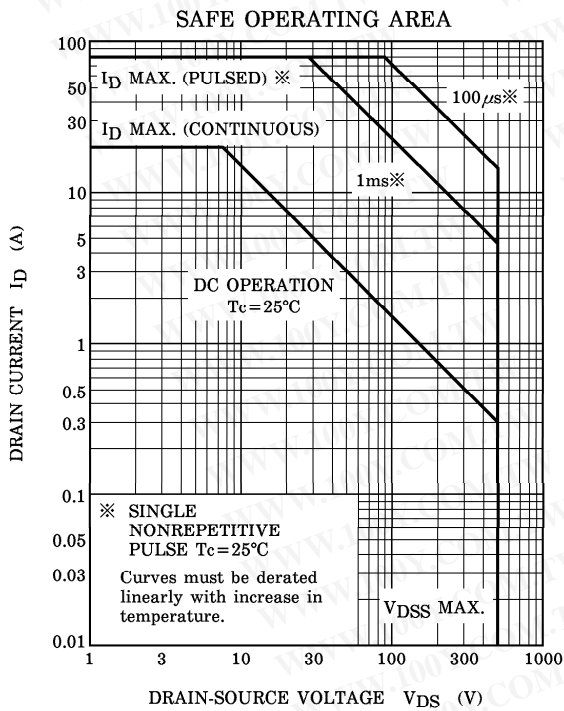
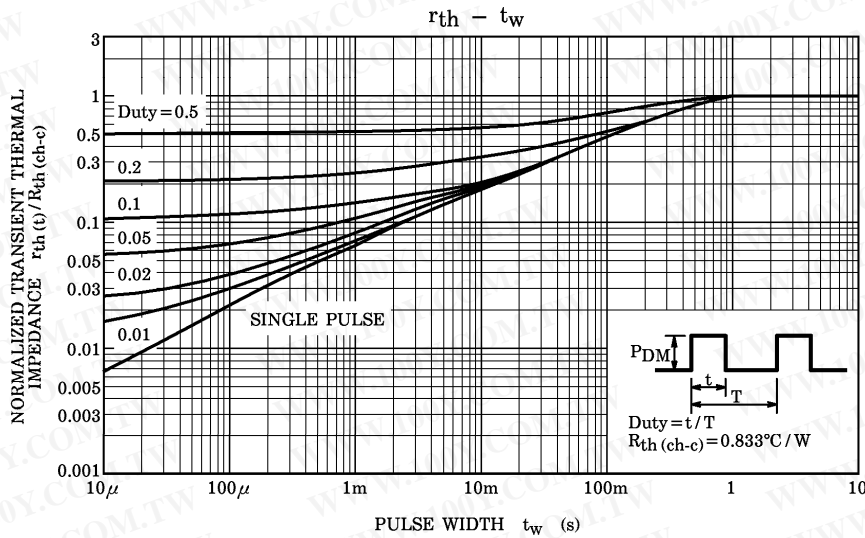
※ Lot Number

□ □ — Month (Starting from Alphabet A)

— Year (Last Number of the Christian Era)







Peak  $I_{AR} = 20A$ ,  $R_G = 25\Omega$ ,  $V_{DD} = 90V$ ,  $L = 4.08mH$

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