

TOSHIBA FIELD EFFECT TRANSISTOR SILICON N CHANNEL MOS TYPE (π -MOS ν)

2SK2837

HIGH SPEED, HIGH CURRENT SWITCHING APPLICATIONS

CHOPPER REGULATOR, DC-DC CONVERTER AND MOTOR DRIVE APPLICATIONS

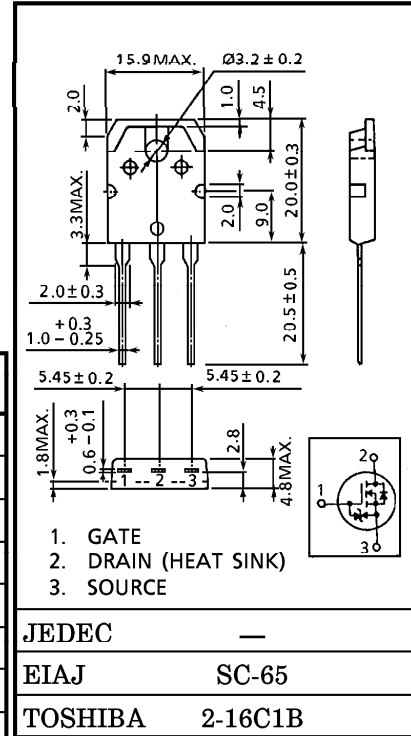
- Low Drain-Source ON Resistance : $R_{DS(ON)} = 0.21\Omega$ (Typ.)
- High Forward Transfer Admittance : $|Y_{fs}| = 17S$ (Typ.)
- Low Leakage Current : $I_{DSS} = 100\mu A$ (Max.) ($V_{DSS} = 500V$)
- Enhancement-Mode : $V_{th} = 2.0 \sim 4.0V$ ($V_{DS} = 10V, I_D = 1mA$)

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}	± 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}	$-55 \sim 150$	$^\circ C$

INDUSTRIAL APPLICATIONS

Unit in mm



Weight : 4.6g

HERMAL 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.

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

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

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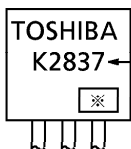
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		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 = 500V, VGS = 0V	—	—	100	μA
Drain-Source Breakdown Voltage		V(BR)DSS	ID = 10mA, VGS = 0V	500	—	—	V
Gate Threshold Voltage		Vth	VDS = 10V, ID = 1mA	2.0	—	4.0	V
Drain-Source ON Resistance		RDS(ON)	VGS = 10V, ID = 10A	—	0.21	0.27	Ω
Forward Transfer Admittance		Yfs	VDS = 10V, ID = 10A	10	17	—	S
Input Capacitance		Ciss	VDS = 10V, VGS = 0V, f = 1MHz	—	3720	—	pF
Reverse Transfer Capacitance		Crss		—	340	—	
Output Capacitance		Coss		—	1165	—	
Switching Time	Rise Time	tr	<p>VGS 10V 0V 50Ω ID = 10A VOUT RL = 20Ω VDD ≐ 200V</p>	—	30	—	ns
	Turn-on Time	ton		—	70	—	
	Fall Time	tf		—	50	—	
	Turn-off Time	t _{off}		VIN : tr, tf < 5ns, Duty ≤ 1%, tw = 10μs	—	290	
Total Gate Charge (Gate-Source Plus Gate-Drain)		Qg	VDD ≐ 400V, VGS = 10V, ID = 6A	—	80	—	nC
Gate-Source Charge		Qgs		—	48	—	
Gate-Drain (“Miller”) Charge		Qgd		—	32	—	

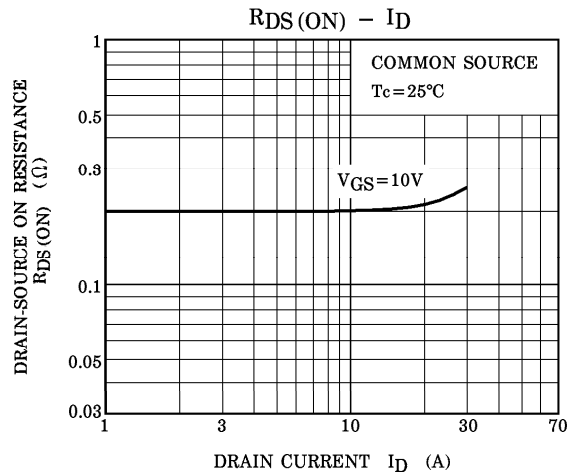
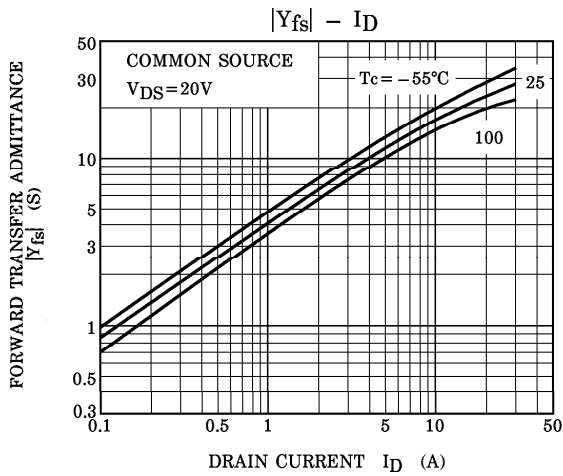
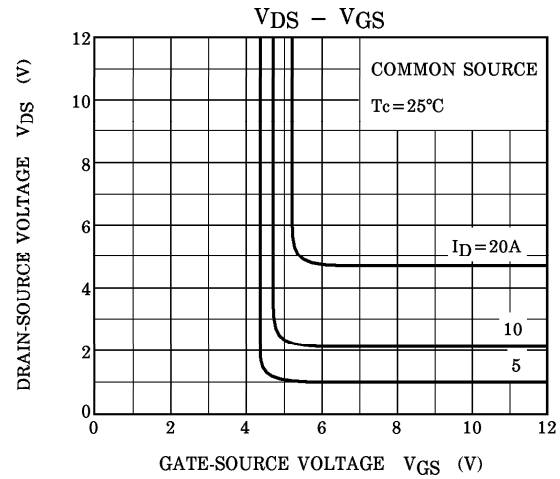
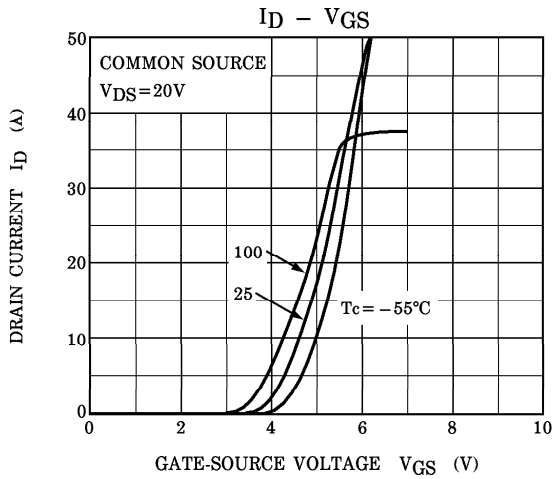
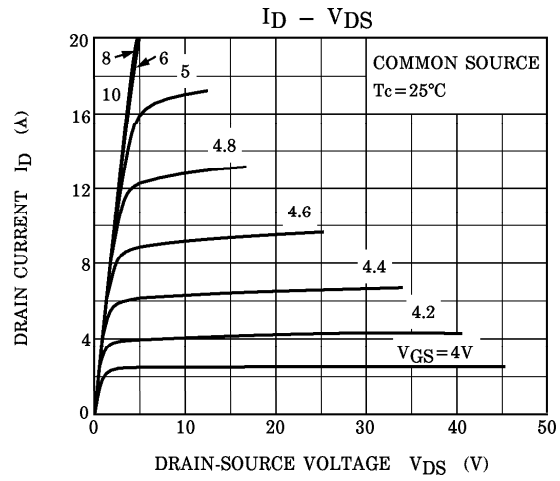
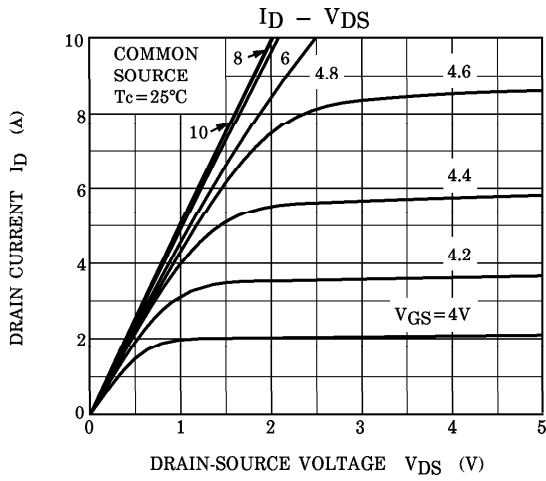
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (Ta = 25°C)

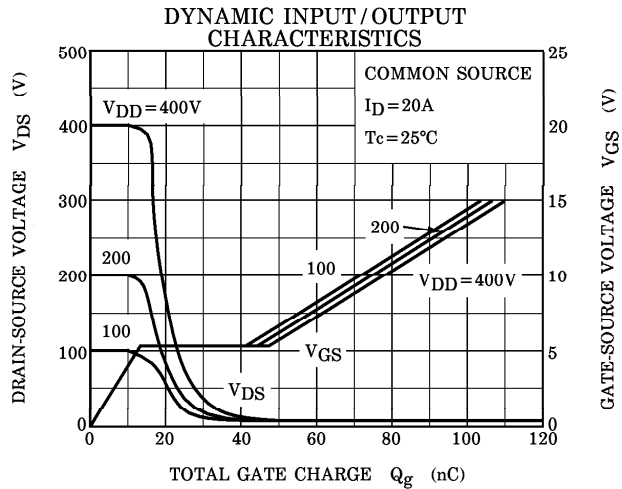
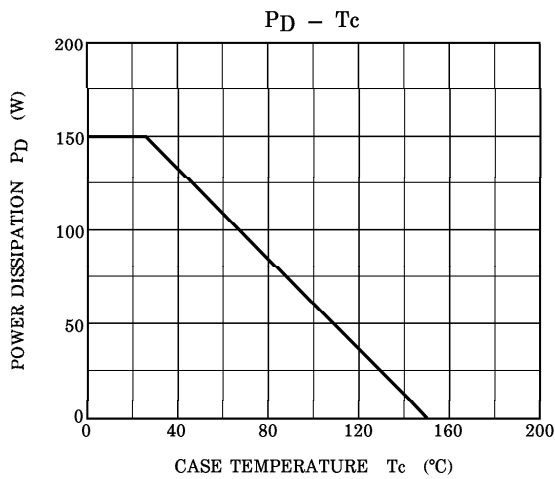
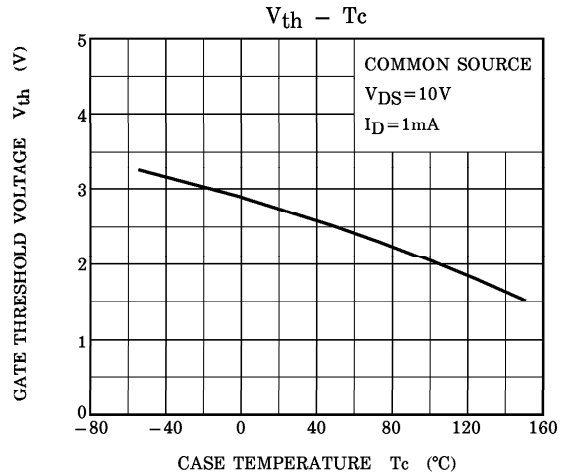
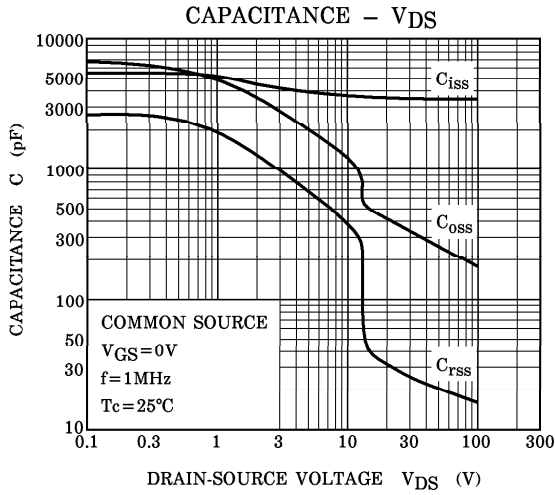
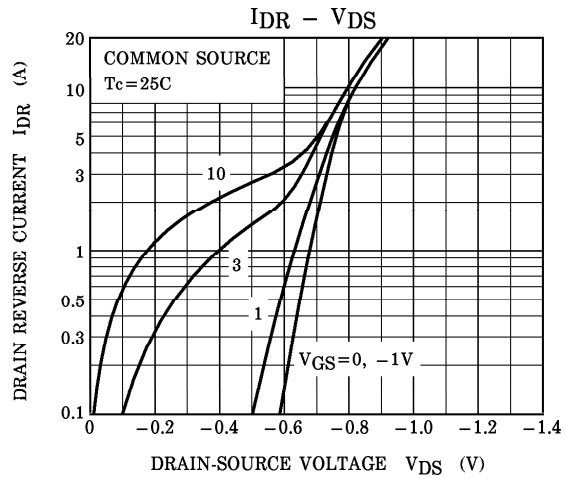
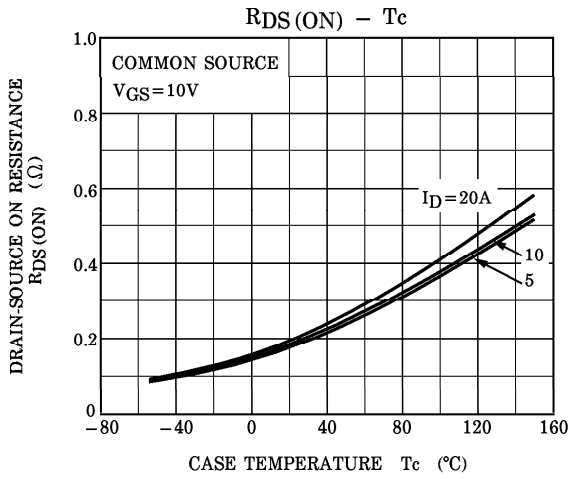
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current	IDR	—	—	—	20	A
Pulse Drain Reverse Current	IDRP	—	—	—	80	A
Diode Forward Voltage	VDSF	IDR = 20A, VGS = 0V	—	—	-1.7	V
Reverse Recovery Time	t _{rr}	IDR = 20A, VGS = 0V	—	540	—	ns
Reverse Recovery Charge	Q _{rr}	dIDR / dt = 100A / μs	—	5.4	—	μC

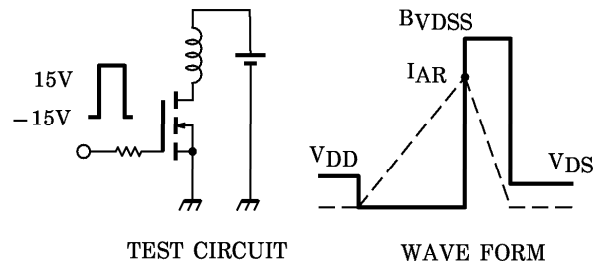
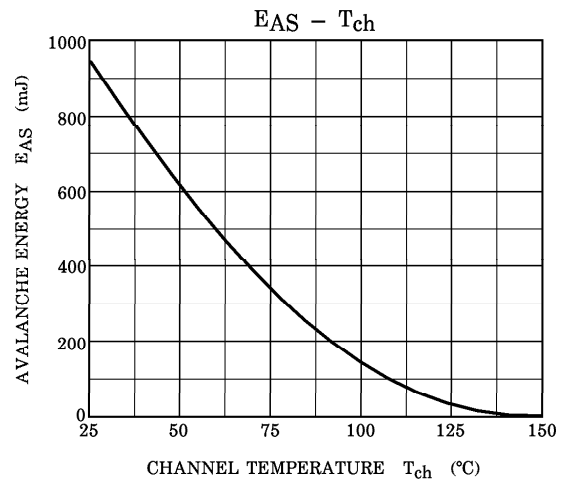
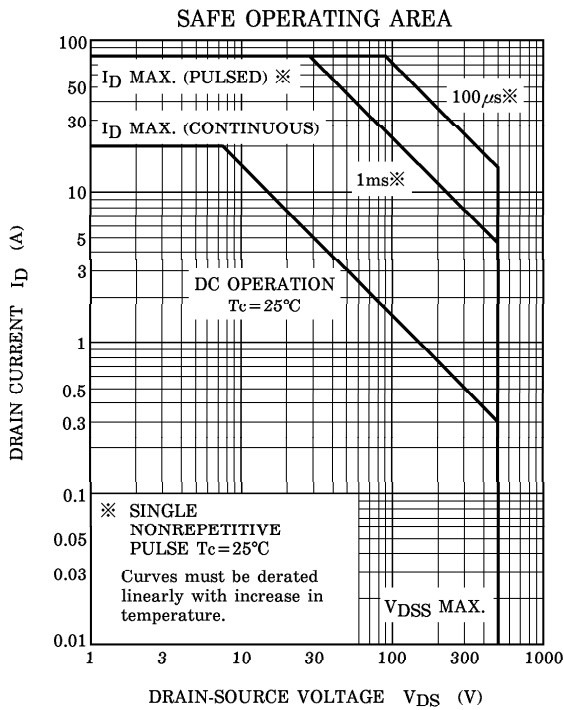
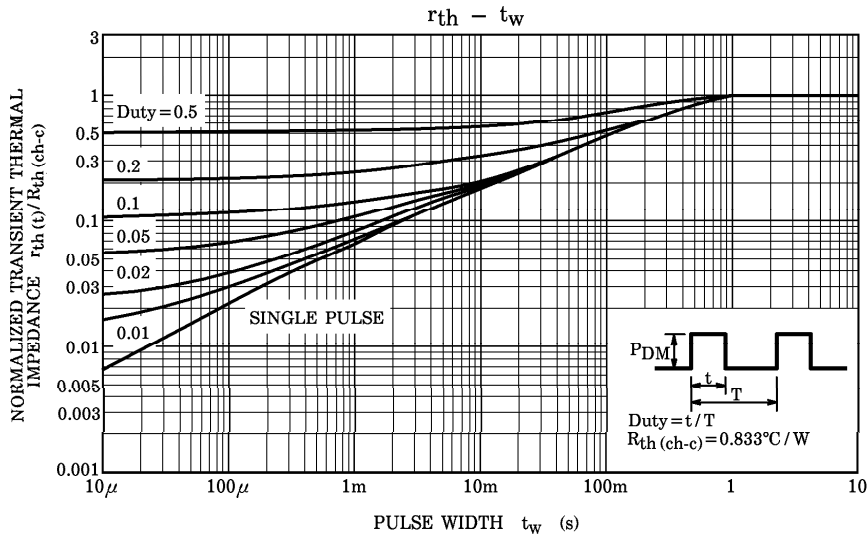
MARKING



TYPE ※ Lot Number
 □ □ — Month (Starting from Alphabet A)
 — Year (Last Number of the Christian Era)







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

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