

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

2SK2837

HIGH SPEED, HIGH CURRENT SWITCHING APPLICATIONS

CHOPPER REGULATOR, DC-DC CONVERTER AND MOTOR DRIVE APPLICATIONS

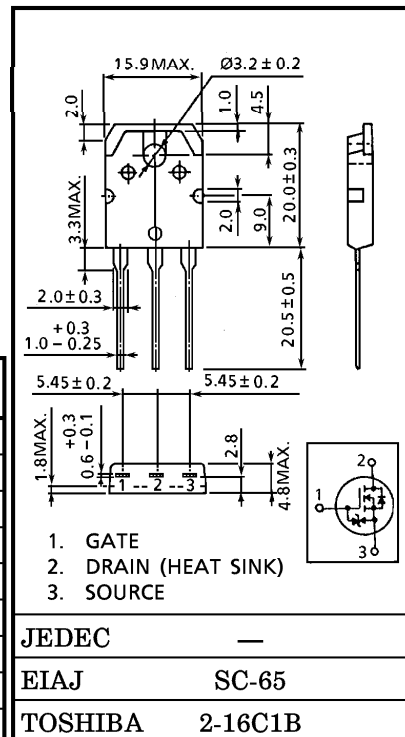
INDUSTRIAL APPLICATIONS

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}	± 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}	$-55 \sim 150$	$^\circ C$



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.

** $V_{DD} = 90V$, 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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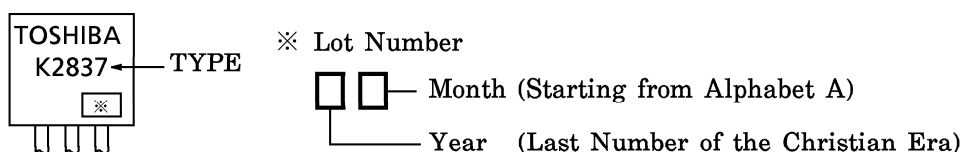
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

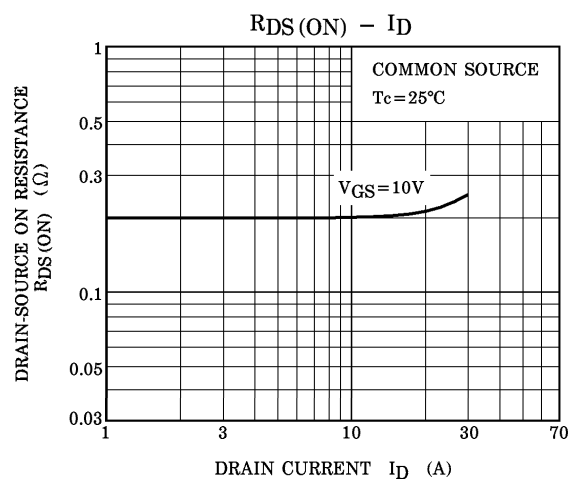
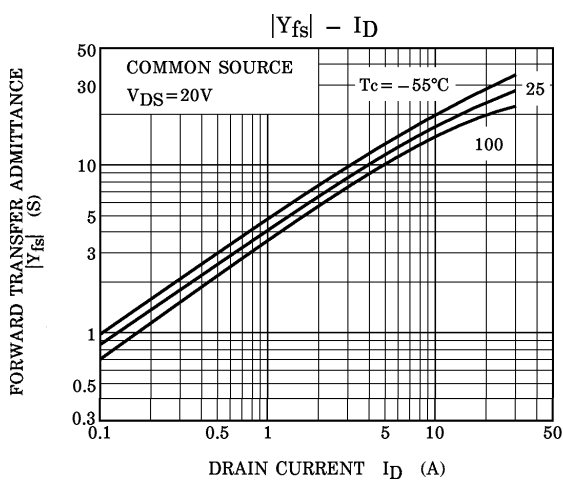
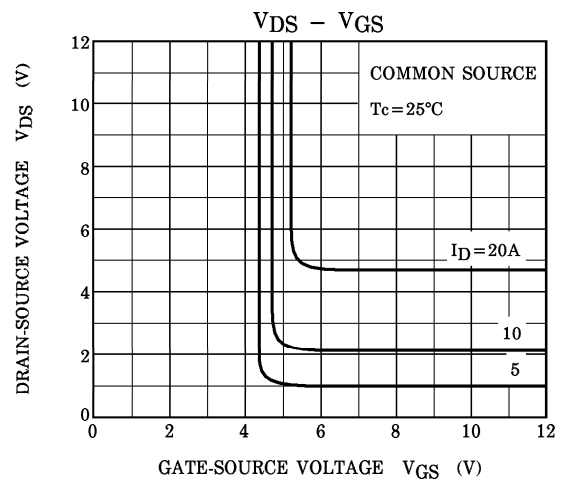
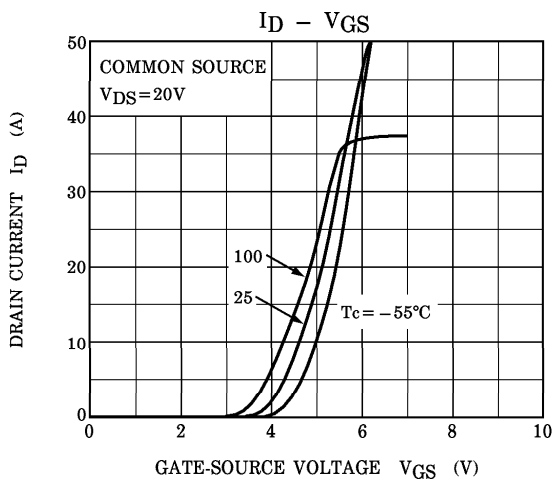
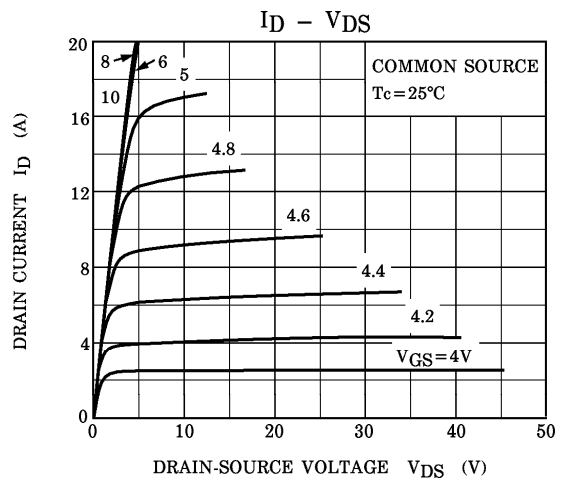
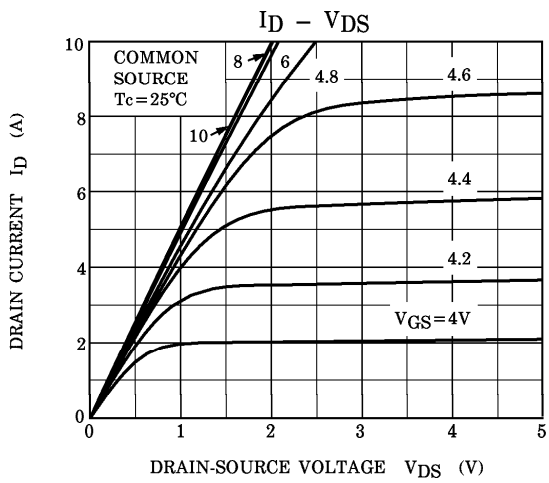
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Gate Leakage Current	I_{GSS}	$V_{GS} = \pm 25V, V_{DS} = 0V$	—	—	± 10	μA	
Gate-Source Breakdown Voltage	$V_{(BR)GSS}$	$I_G = \pm 10\mu A, V_{DS} = 0V$	± 30	—	—	V	
Drain Cut-off Current	I_{DSS}	$V_{DS} = 500V, V_{GS} = 0V$	—	—	100	μA	
Drain-Source 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	Ω	
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	—		

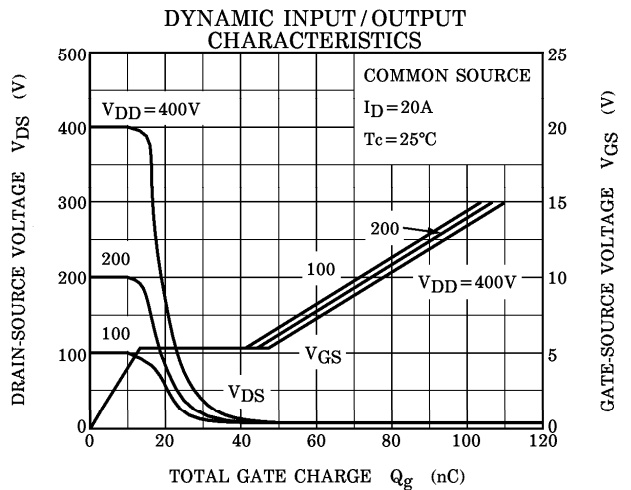
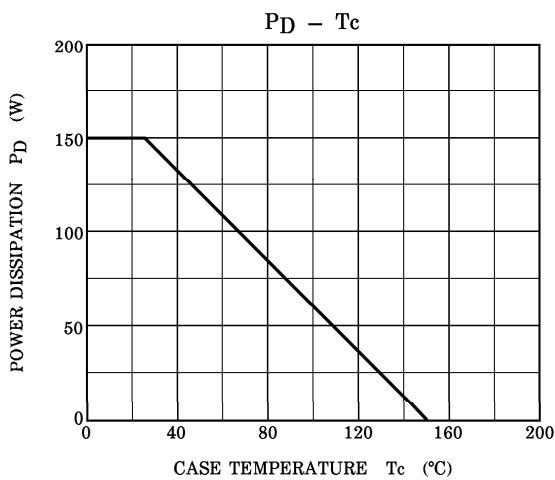
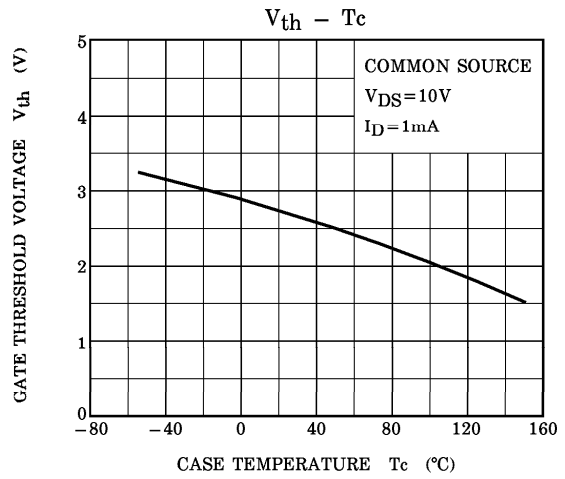
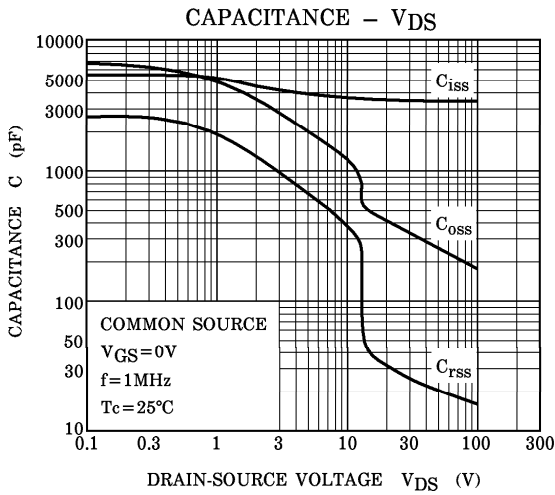
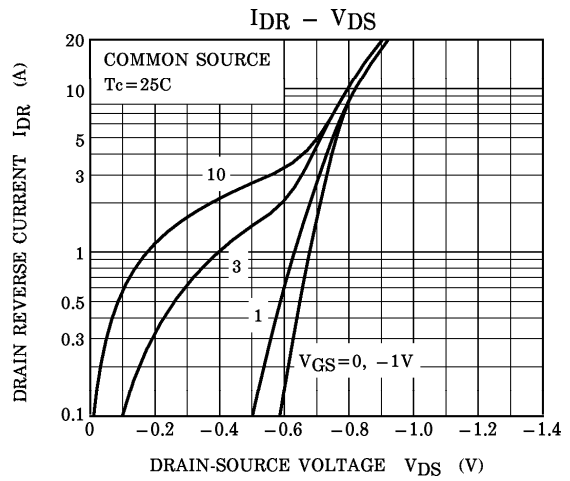
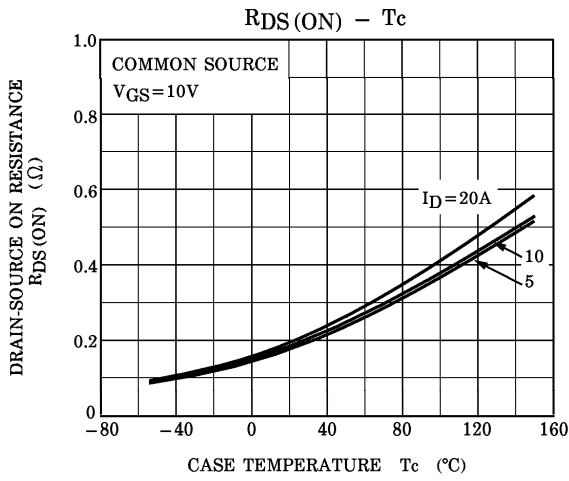
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (Ta = 25°C)

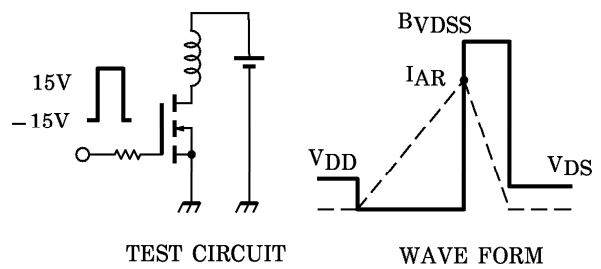
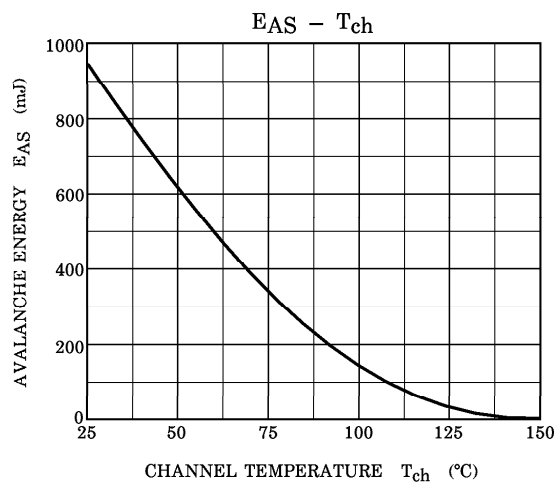
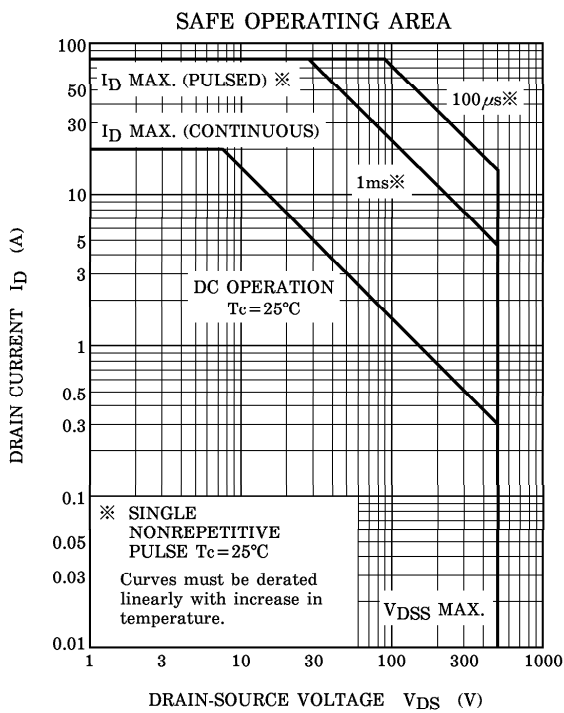
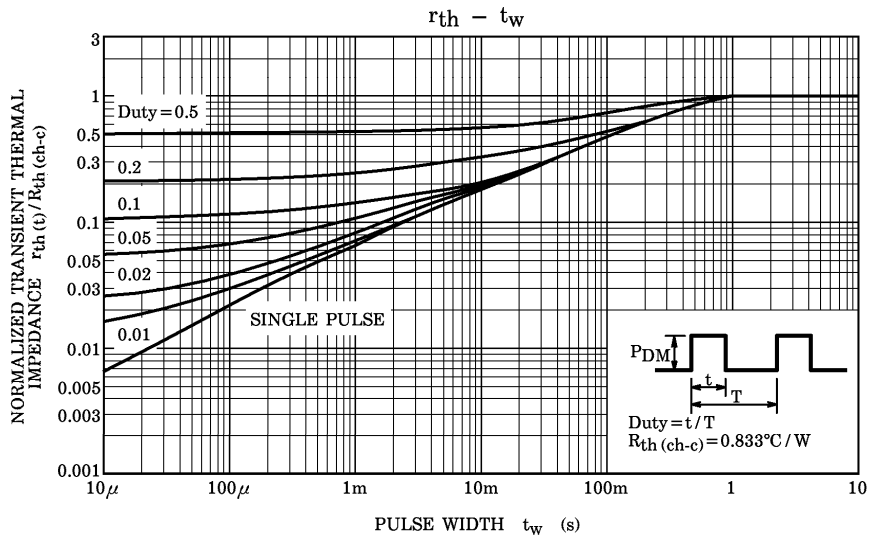
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current	I_{DR}	—	—	—	20	A
Pulse Drain Reverse Current	I_{DRP}	—	—	—	80	A
Diode Forward Voltage	V_{DSF}	$I_{DR} = 20A, V_{GS} = 0V$	—	—	-1.7	V
Reverse Recovery Time	t_{rr}	$I_{DR} = 20A, V_{GS} = 0V$ $dI_{DR} / dt = 100A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

MARKING









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

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