

2SK2836

HIGH SPEED, HIGH CURRENT SWITCHING APPLICATIONS

CHOPPER REGULATOR, DC-DC CONVERTER AND MOTOR DRIVE APPLICATIONS

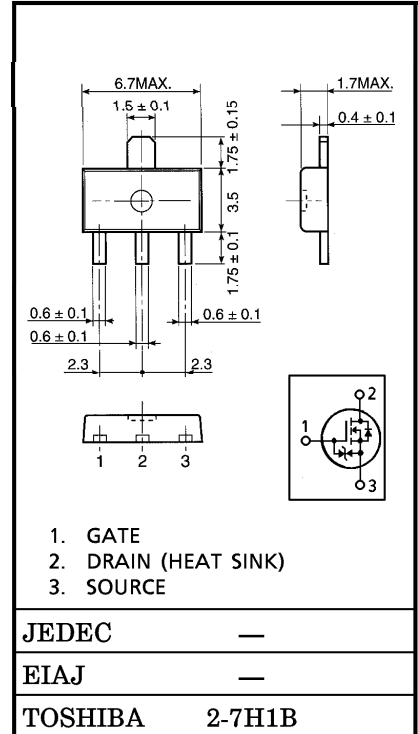
INDUSTRIAL APPLICATIONS

Unit in mm

- Low Drain-Source ON Resistance : $R_{DS(ON)} = 6.4\Omega$ (Typ.)
- High Forward Transfer Admittance : $|Y_{fs}| = 0.85S$ (Typ.)
- Low Leakage Current : $I_{DSS} = 100\mu A$ (Max) ($V_{DSS} = 600V$)
- Enhancement-Mode : $V_{th} = 2.0 \sim 4.0V$ ($V_{DS} = 10V, I_D = 1mA$)

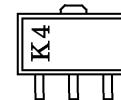
MAXIMUM RATINGS ($T_a = 25^\circ C$)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Drain-Source Voltage		V_{DSS}	600	V
Drain-Gate Voltage ($R_{GS} = 20k\Omega$)		V_{DGR}	600	V
Gate-Source Voltage		V_{GSS}	± 30	V
Drain Current	DC	I_D	1	A
	Pulse	I_{DP}	2	A
Drain Power Dissipation***		P_D	2.5	W
Single Pulse Avalanche Energy**		E_{AS}	56	mJ
Avalanche Current		I_{AR}	1	A
Repetitive Avalanche Energy*		E_{AR}	0.25	mJ
Channel Temperature		T_{ch}	150	$^\circ C$
Storage Temperature Range		T_{stg}	$-55 \sim 150$	$^\circ C$



Weight : 0.12g (Typ.)

MARKING



THERMAL CHARACTERISTICS

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

Note ;

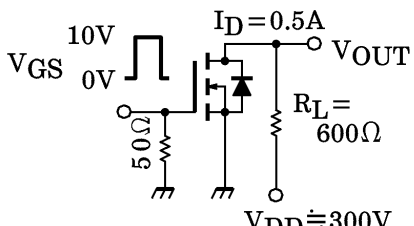
- * Repetitive rating ; Pulse Width Limited by Max. junction temperature.
- ** $V_{DD} = 90V$, Starting $T_{ch} = 25^\circ C$, $L = 100mH$, $R_G = 25\Omega$, $I_{AR} = 1A$
- *** Mounted on ceramic substrate ($1inch^2 \times 0.8t$)

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

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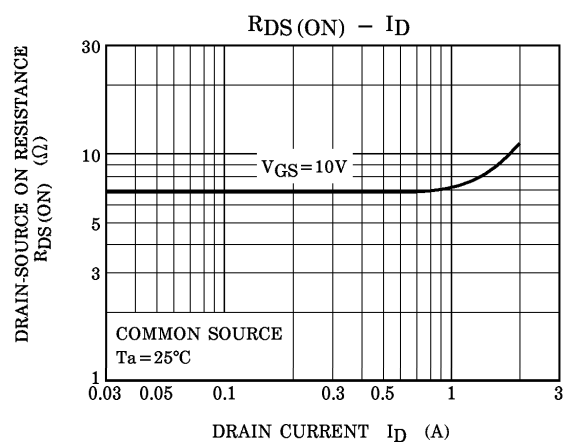
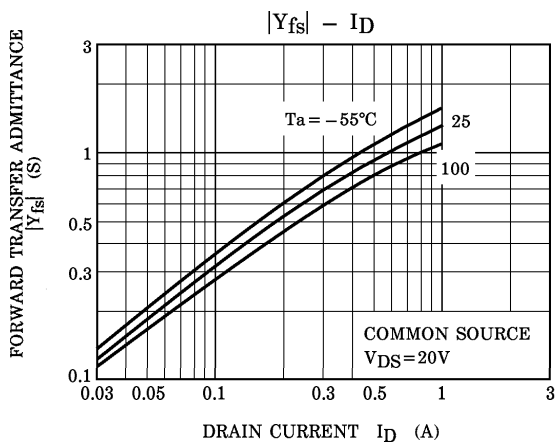
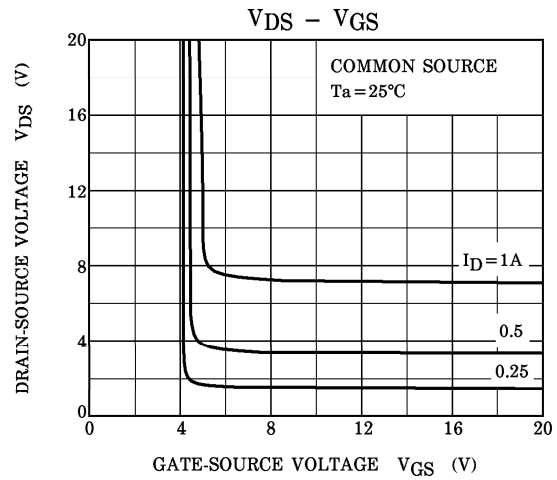
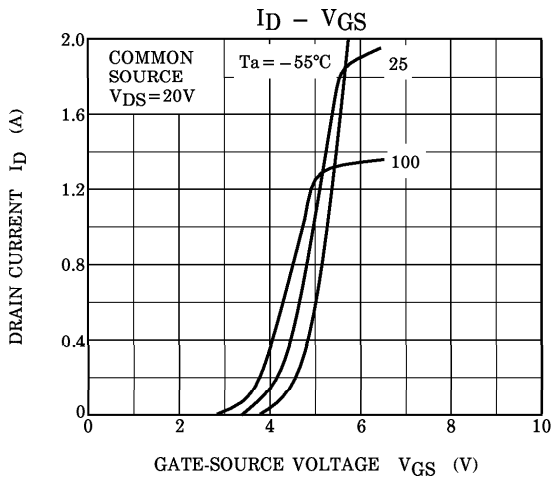
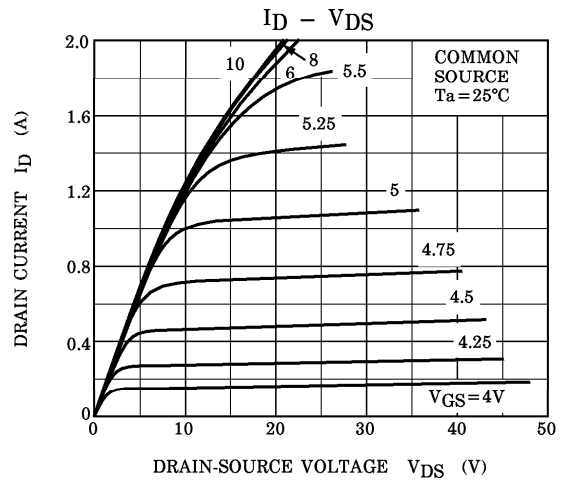
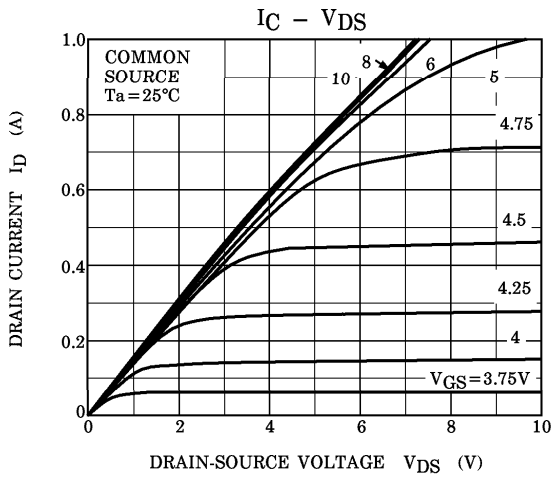
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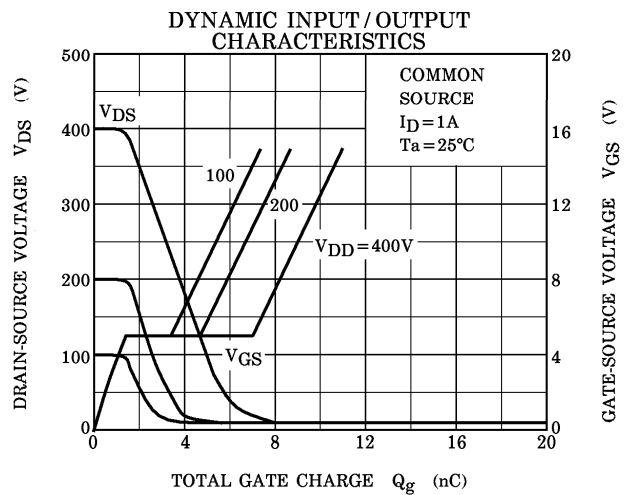
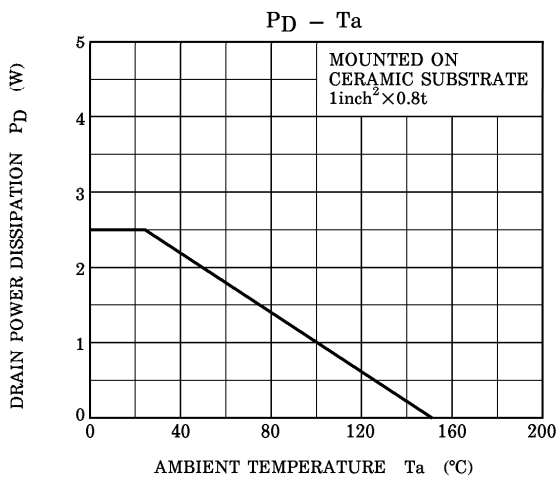
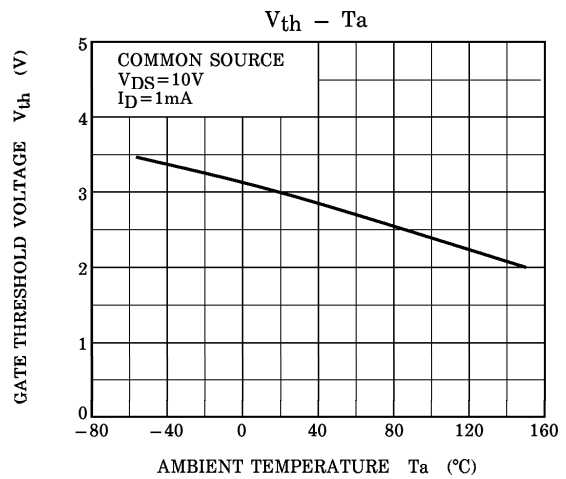
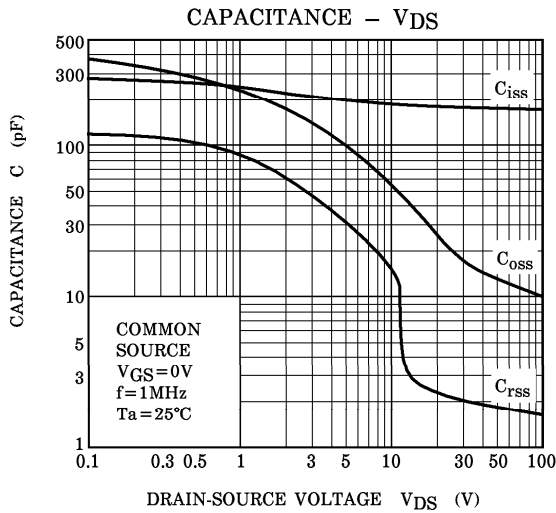
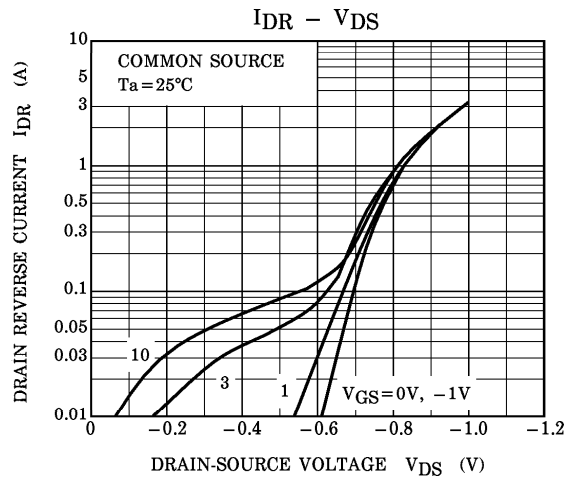
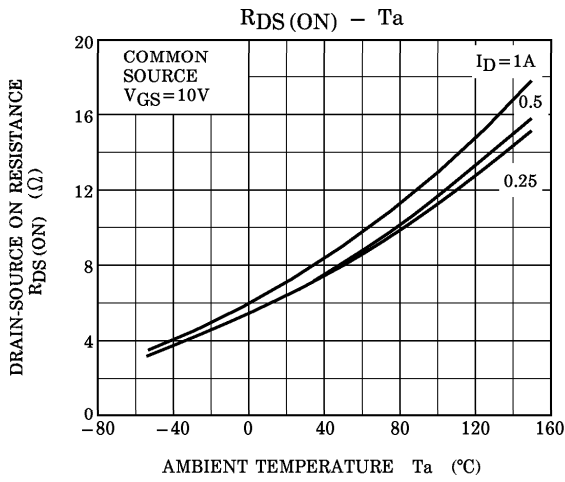
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

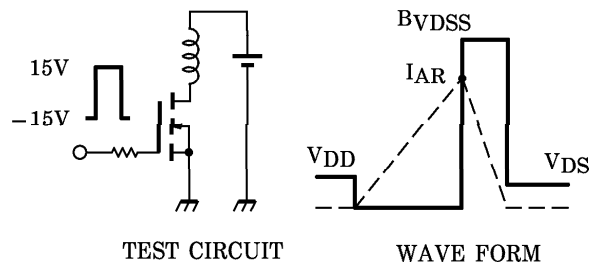
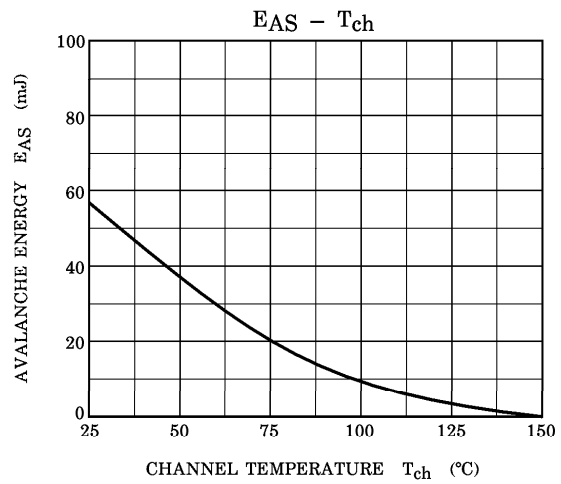
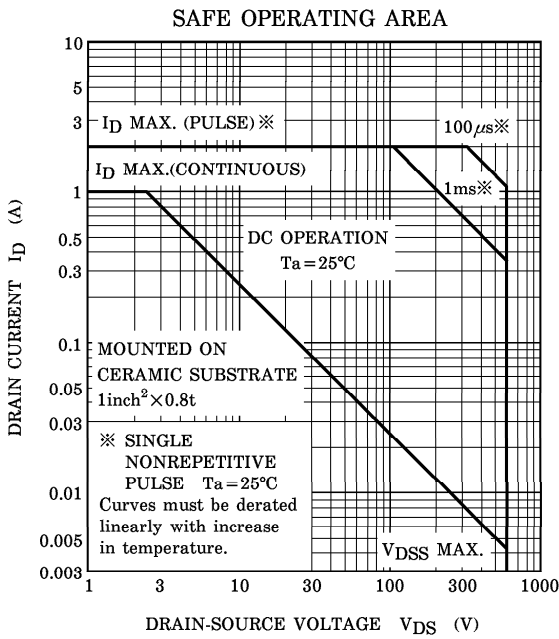
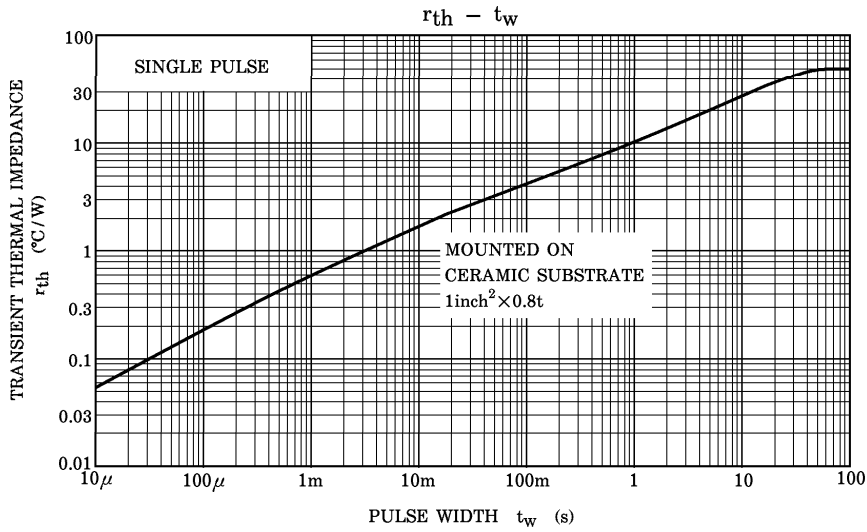
CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		I _{GSS}	V _{GS} = ±25V, V _{DS} = 0V	—	—	±10	μA
Gate-Source Breakdown Voltage		V (BR) GSS	I _G = ±10μA, V _{DS} = 0V	±30	—	—	V
Drain Cut-off Current		I _{DSS}	V _{DS} = 600V, V _{GS} = 0V	—	—	100	μA
Drain-Source Breakdown Voltage		V (BR) DSS	I _D = 10mA, V _{GS} = 0V	600	—	—	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 = 0.5A	—	6.4	9.0	Ω
Forward Transfer Admittance		Y _{fs}	V _{DS} = 10V, I _D = 0.5A	0.4	0.85	—	S
Input Capacitance		C _{iss}	V _{DS} = 10V, V _{GS} = 0V f = 1MHz	—	190	—	pF
Reverse Transfer Capacitance		C _{rss}		—	15	—	
Output Capacitance		C _{oss}		—	55	—	
Switching Time	Rise Time	t _r	 <p>V_{GS} 10V 0V 50Ω I_D = 0.5A V_{OUT} R_L = 600Ω V_{DD} ≐ 300V</p>	—	12	—	ns
	Turn-on Time	t _{on}		—	55	—	
	Fall Time	t _f		—	40	—	
	Turn-off Time	t _{off}		V _{IN} : t _r , t _f < 5ns, Duty ≤ 1%, t _w = 10μs	—	90	
Total Gate Charge (Gate-Source Plus Gate-Drain)		Q _g	V _{DD} ≐ 400V, V _{GS} = 10V	—	9	—	nC
Gate-Source Charge		Q _{gs}	I _D = 1A	—	3.5	—	
Gate-Drain ("Miller") Charge		Q _{gd}		—	5.5	—	

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

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current	I _{DR}	—	—	—	1	A
Pulse Drain Reverse Current	I _{DRP}	—	—	—	2	A
Diode Forward Voltage	V _{DSF}	I _{DR} = 1A, V _{GS} = 0V	—	—	-1.7	V
Reverse Recovery Time	t _{rr}	I _{DR} = 1A, V _{GS} = 0V	—	145	—	ns
Reverse Recovery Charge	Q _{rr}	dI _{DR} / dt = 100A / μs	—	0.46	—	μC







Peak $I_{AR} = 1A$, $R_G = 25\Omega$
 $V_{DD} = 90V$, $L = 100mH$

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