

(2SK2611)

HIGH SPEED, HIGH VOLTAGE SWITCHING APPLICATIONS

DC-DC CONVERTER, RELAY DRIVE AND MOTOR DRIVE APPLICATIONS

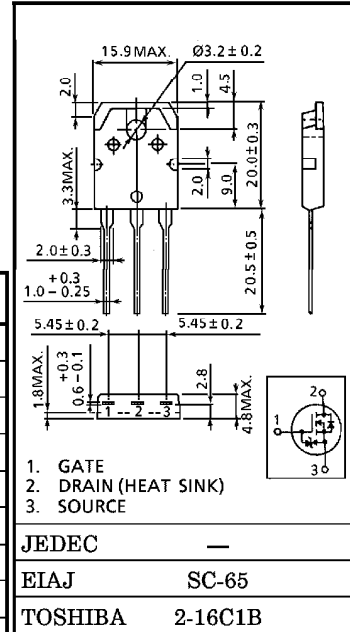
- Low Drain-Source ON Resistance : $R_{DS(ON)} = 1.1\Omega$ (Typ.)
- High Forward Transfer Admittance : $|Y_{fs}| = 7.0S$ (Typ.)
- Low Leakage Current : $I_{DSS} = 100\mu A$ (Max.) ($V_{DS} = 720V$)
- Enhancement-Mode : $V_{th} = 2.0 \sim 4.0V$ ($V_{DS} = 10V, I_D = 1mA$)

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

CHARACTERISTIC		SYMBOL	RATING	UNIT
Drain-Source Voltage		V_{DSS}	900	V
Drain-Gate Voltage ($R_{GS} = 20k\Omega$)		V_{DGR}	900	V
Gate-Source Voltage		V_{GSS}	± 30	V
Drain Current	DC	I_D	9	A
	Pulse	I_{DP}	27	A
Drain Power Dissipation ($T_c = 25^\circ C$)		P_D	150	W
Single Pulse Avalanche Energy**		E_{AS}	663	mJ
Avalanche Current		I_{AR}	9	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

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.

** $V_{DD} = 90V, T_{ch} = 25^\circ C, L = 15mH$
 $R_G = 25\Omega, I_{AR} = 9A$

THIS TRANSISTOR IS AN ELECTROSTATIC SENSITIVE DEVICE. PLEASE HANDLE WITH CAUTION.

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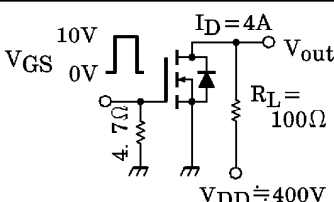
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ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		IGSS	VGS = ±30V, VDS = 0V	—	—	±10	μA
Gate-Source Breakdown Voltage		V(BR)GSS	IG = ±10μA, VDS = 0V	±30	—	—	V
Drain Cut-off Current		IDSS	VDS = 720V, VGS = 0V	—	—	100	μA
Drain-Source Breakdown Voltage		V(BR)DSS	ID = 10mA, VGS = 0V	900	—	—	V
Gate Threshold Voltage		Vth	VDS = 10V, ID = 1mA	2.0	—	4.0	V
Drain-Source ON Resistance		RDS(ON)	VGS = 10V, ID = 4A	—	1.1	1.4	Ω
Forward Transfer Admittance		Yfs	VDS = 15V, ID = 4A	3.0	7.0	—	S
Input Capacitance		Ciss	VDS = 25V, VGS = 0V, f = 1MHz	—	2040	—	pF
Reverse Transfer Capacitance		Crss		—	45	—	
Output Capacitance		Coss		—	190	—	
Switching Time	Rise Time	tr	 <p> V_{GS} 10V V_{GS} 0V $I_D = 4A$ $R_L = 100\Omega$ $V_{DD} \doteq 400V$ </p>	—	25	—	ns
	Turn-on Time	ton		—	60	—	
	Fall Time	tf		—	20	—	
	Turn-off Time	toff		$V_{IN} : t_r, t_f < 5ns,$ $Duty \leq 1\%, t_w = 10\mu s$	—	95	
Total Gate Charge (Gate-Source Plus Gate-Drain)		Qg	VDD ≐ 400V, VGS = 10V, ID = 9A	—	58	—	nC
Gate-Source Charge		Qgs		—	32	—	
Gate-Drain ("Miller") Charge		Qgd		—	26	—	

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

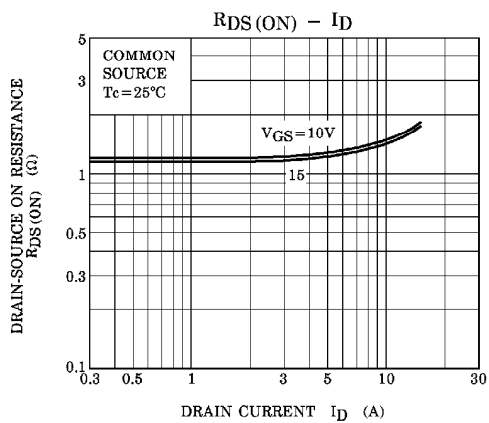
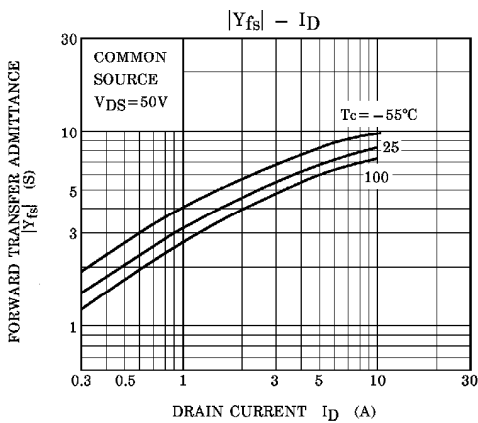
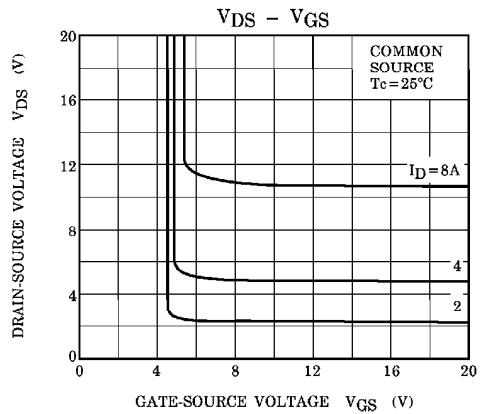
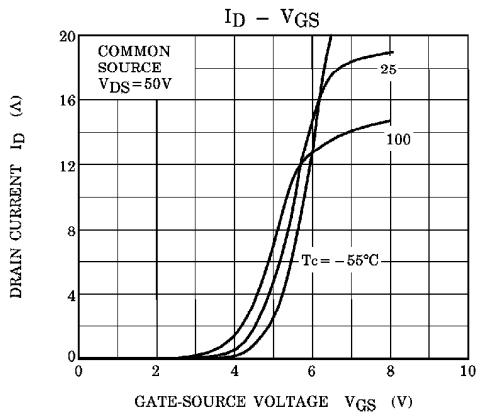
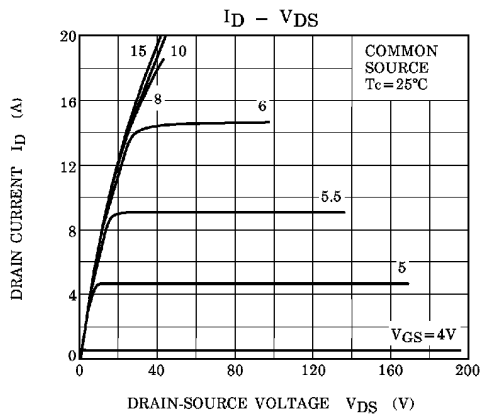
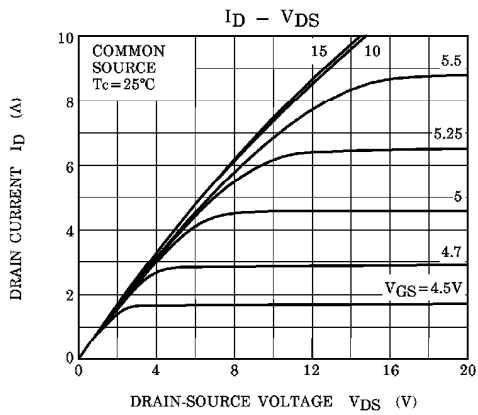
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current	IDR	—	—	—	9	A
Pulse Drain Reverse Current	IDRP	—	—	—	27	A
Diode Forward Voltage	VDSF	IDR = 9A, VGS = 0V	—	—	-1.9	V
Reverse Recovery Time	t _{rr}	IDR = 9A, VGS = 0V	—	1.6	—	μs
Reverse Recovery Charge	Q _{rr}	dIDR / dt = 100A / μs	—	20	—	μC

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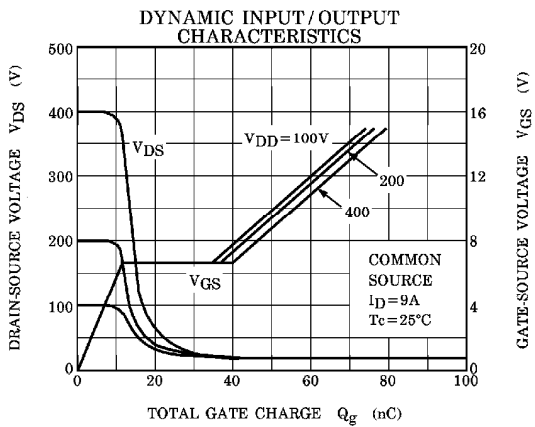
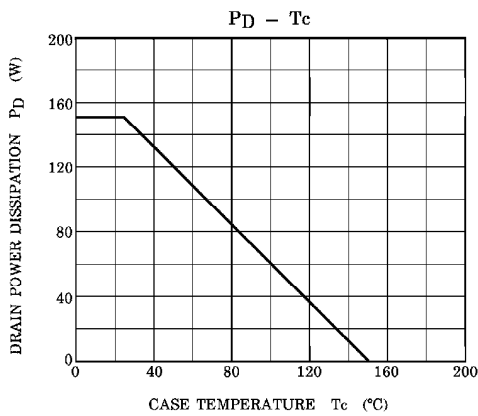
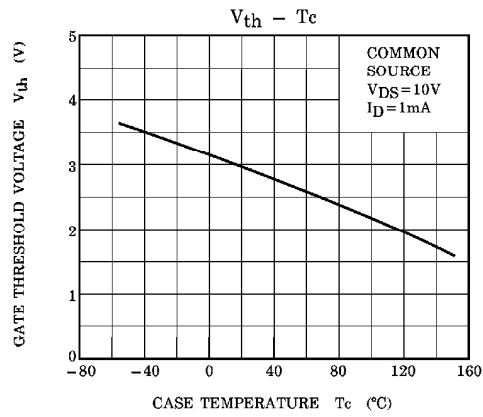
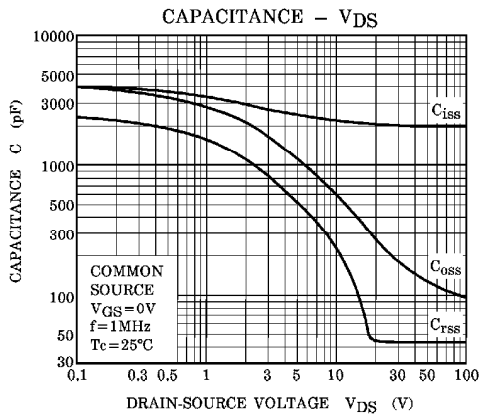
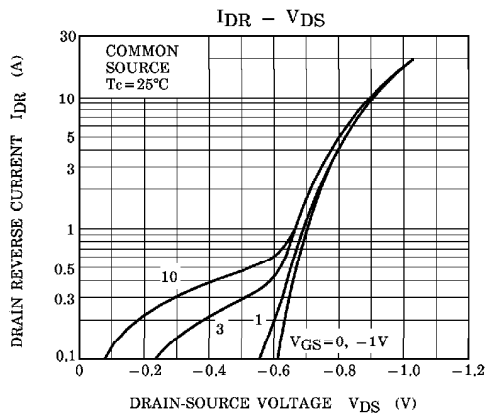
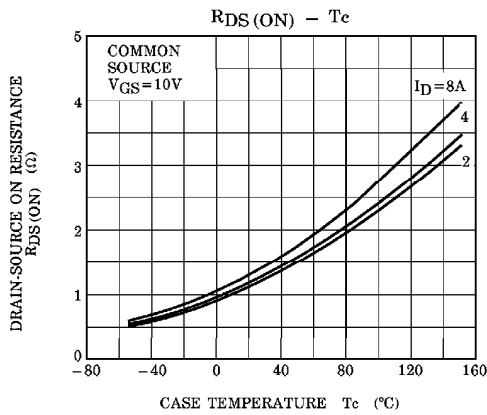
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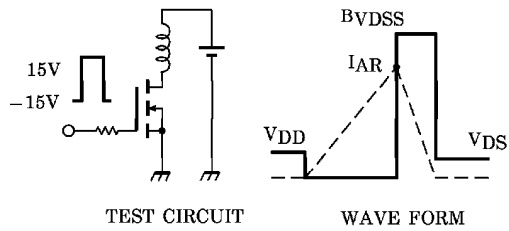
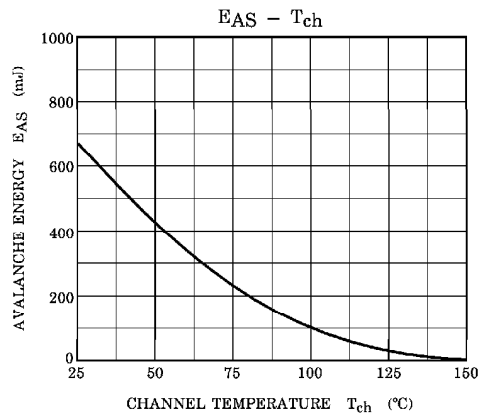
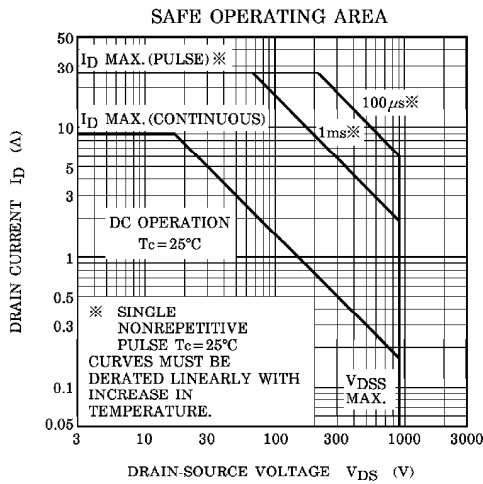
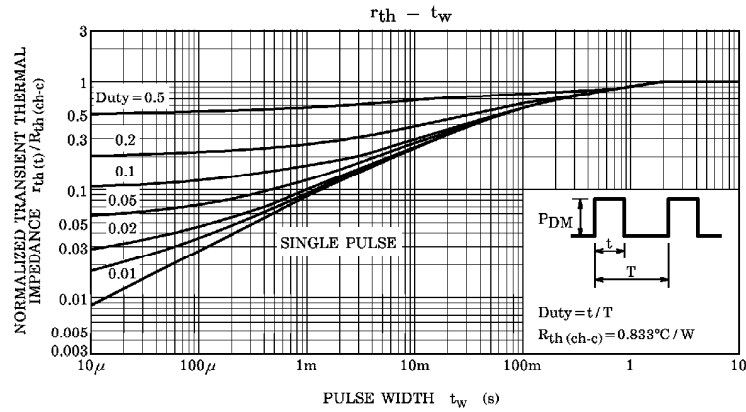
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Peak $I_{AR} = 9A$, $R_G = 25\Omega$
 $V_{DD} = 90V$, $L = 15mH$

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