

TOSHIBA

2SK2391

TOSHIBA FIELD EFFECT TRANSISTOR SILICON N CHANNEL MOS TYPE (L²-π-MOSV)

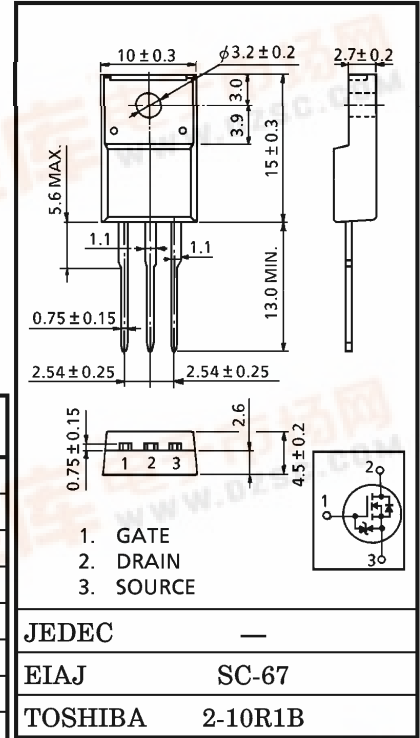
2SK2391

HIGH SPEED, HIGH CURRENT SWITCHING APPLICATIONS
CHOPPER REGULATOR, DC-DC CONVERTER AND MOTOR DRIVE APPLICATIONS

INDUSTRIAL APPLICATIONS

Unit in mm

- 4V Gate Drive
- Low Drain-Source ON Resistance : R_{DS(ON)} = 66mΩ (Typ.)
- High Forward Transfer Admittance : |Y_{fs}| = 16S (Typ.)
- Low Leakage Current : I_{DSS} = 100μA (Max.) (V_{DS} = 100V)
- Enhancement-Mode : V_{th} = 0.8~2.0V (V_{DS} = 10V, I_D = 1mA)



MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Drain-Source Voltage	V _{DSS}	100	V
Drain-Gate Voltage (R _{GS} = 20kΩ)	V _{DGR}	100	V
Gate-Source Voltage	V _{GSS}	±20	V
Drain Current	DC	I _D	20
	Pulse	I _{DP}	80
Drain Power Dissipation (Tc = 25°C)	P _D	35	W
Single Pulse Avalanche Energy**	E _{AS}	208	mJ
Avalanche Current	I _{AR}	20	A
Repetitive Avalanche Energy*	E _{AR}	3.5	mJ
Channel Temperature	T _{ch}	150	°C
Storage Temperature Range	T _{stg}	-55~150	°C

Weight : 1.9g

THERMAL CHARACTERISTICS

CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance, Channel to Case	R _{th(ch-c)}	3.57	°C/W
Thermal Resistance, Channel to Ambient	R _{th(ch-a)}	62.5	°C/W

Note ;

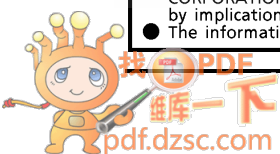
* Repetitive rating ; Pulse Width Limited by Max. junction temperature.

** V_{DD} = 25V, Starting T_{ch} = 25°C, L = 840μH, R_G = 25Ω, I_{AR} = 20A

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

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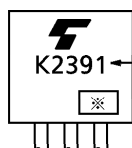
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		IGSS	VGS = ±16V, VDS = 0V	—	—	±10	μA
Drain Cut-off Current		IDSS	VDS = 100V, VGS = 0V	—	—	100	μA
Drain-Source Breakdown Voltage		V (BR) DSS	ID = 10mA, VGS = 0V	100	—	—	V
Gate Threshold Voltage		Vth	VDS = 10V, ID = 1mA	0.8	—	2.0	V
Drain-Source ON Resistance		RDS (ON)	VGS = 4V, ID = 10A	—	0.09	0.13	Ω
			VGS = 10V, ID = 10A	—	0.066	0.085	
Forward Transfer Admittance		Yfs	VDS = 10V, ID = 10A	8	16	—	S
Input Capacitance		Ciss	VDS = 10V, VGS = 0V, f = 1MHz	—	1100	—	pF
Reverse Transfer Capacitance		Crss					
Output Capacitance		Coss					
Switching Time	Rise Time	tr	<p> V_{GS} 10V 0V $I_D = 15A$ V_{OUT} $R_L = 3.3\Omega$ $V_{DD} \approx 50V$ </p>	—	20	—	ns
	Turn-on Time	ton		—	30	—	
	Fall Time	tf		—	50	—	
	Turn-off Time	t _{off}		$V_{IN} : t_r, t_f < 5ns,$ $Duty \leq 1\%, t_w = 10\mu s$	—	140	
Total Gate Charge (Gate-Source Plus Gate-Drain)		Qg	VDD ≈ 80V, VGS = 10V ID = 27A	—	50	—	nC
Gate-Source Charge		Qgs		—	34	—	
Gate-Drain (“Miller”) Charge		Qgd		—	16	—	

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	—	155	—	ns
Reverse Recovery Charge	Q _{rr}	dIDR / dt = 50A / μs	—	0.31	—	μC

MARKING

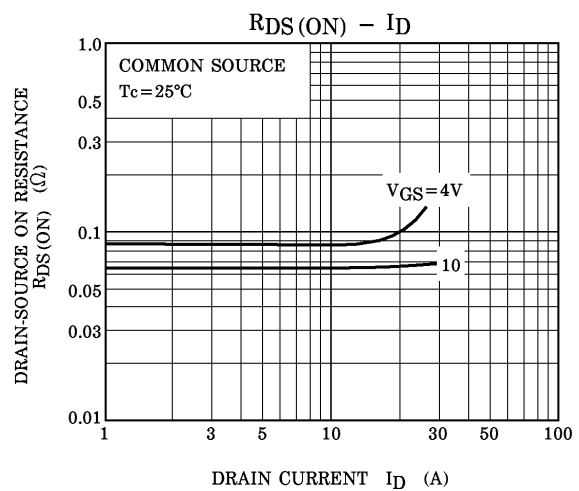
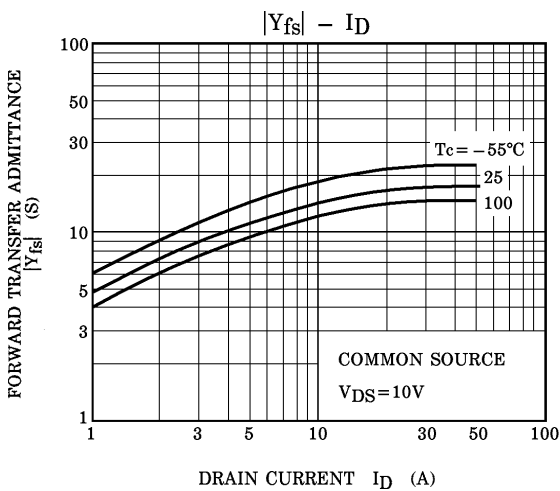
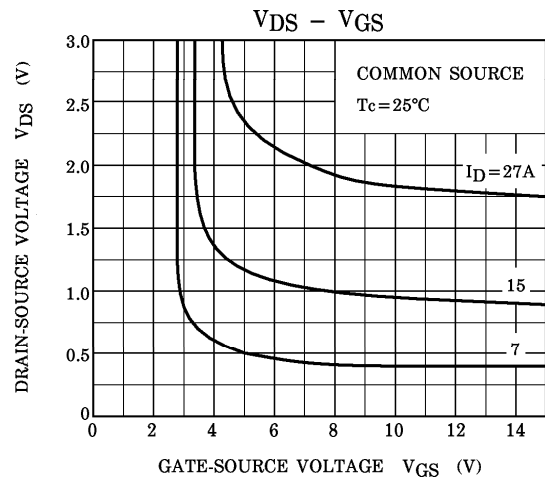
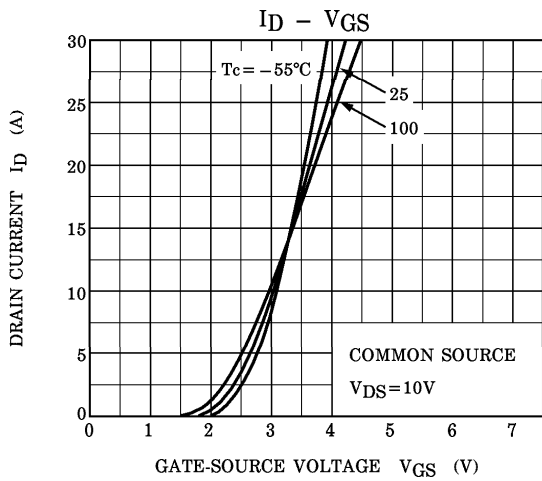
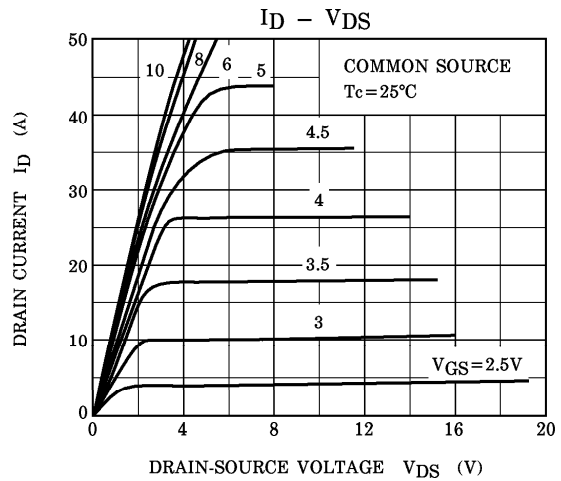
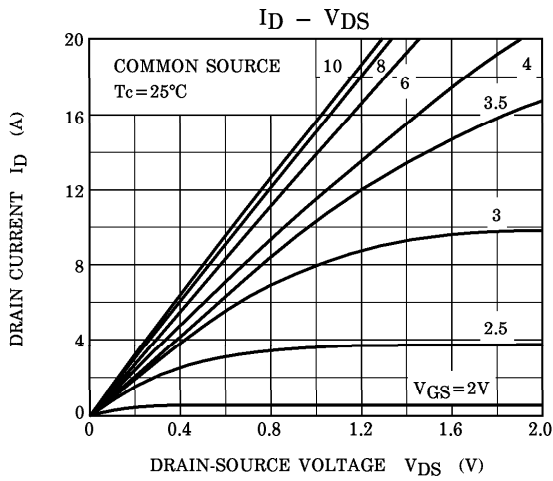


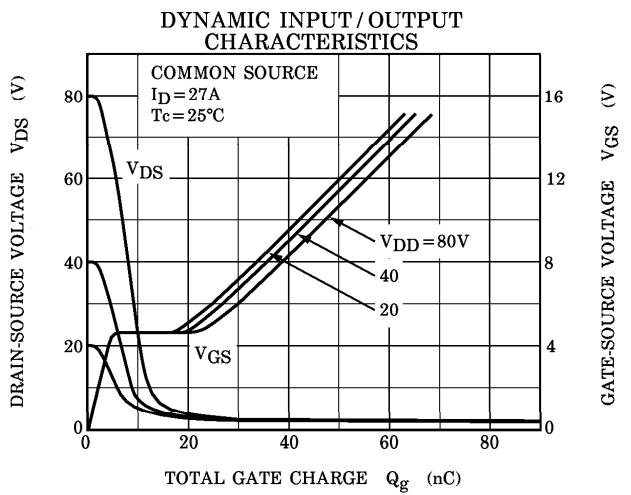
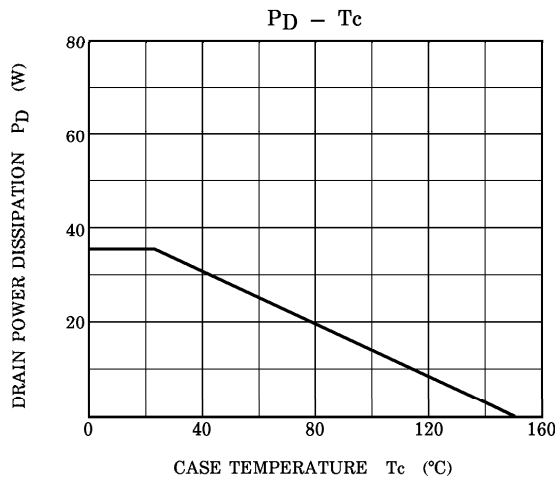
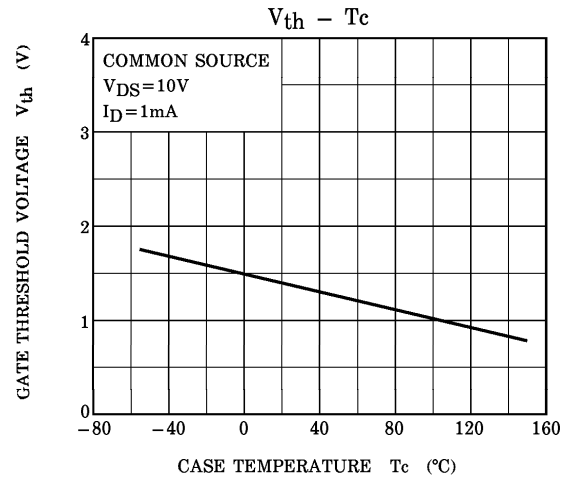
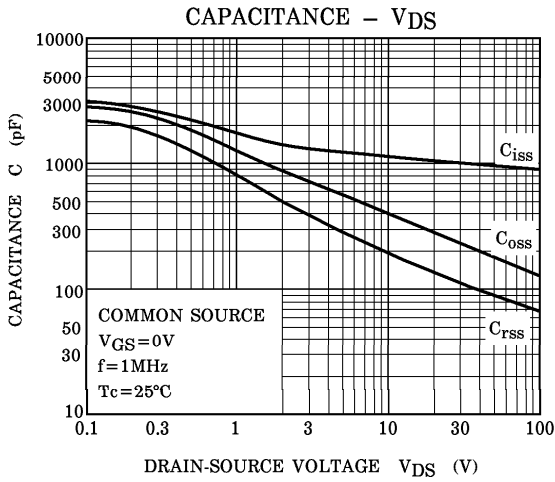
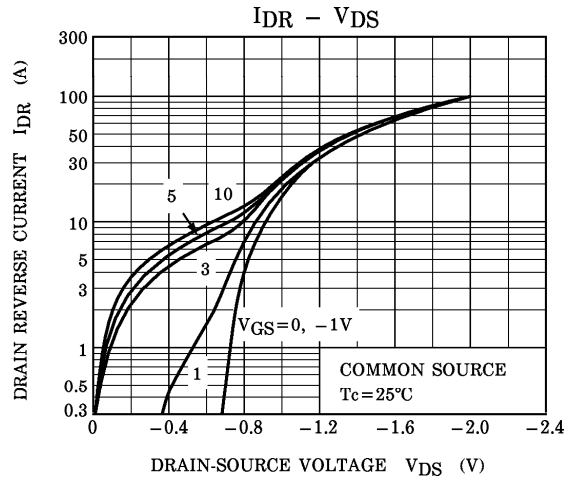
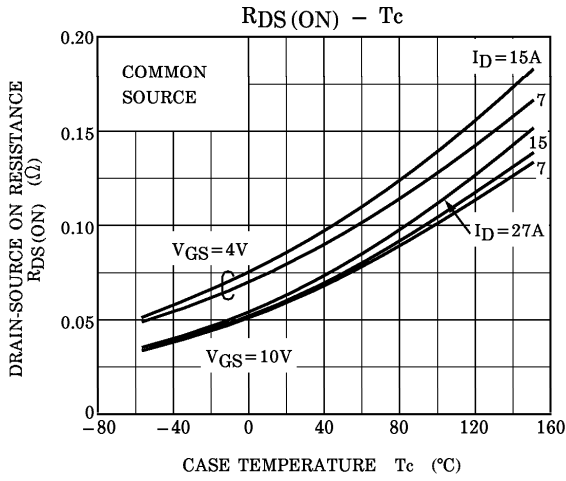
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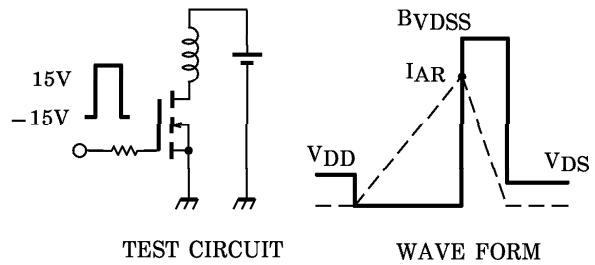
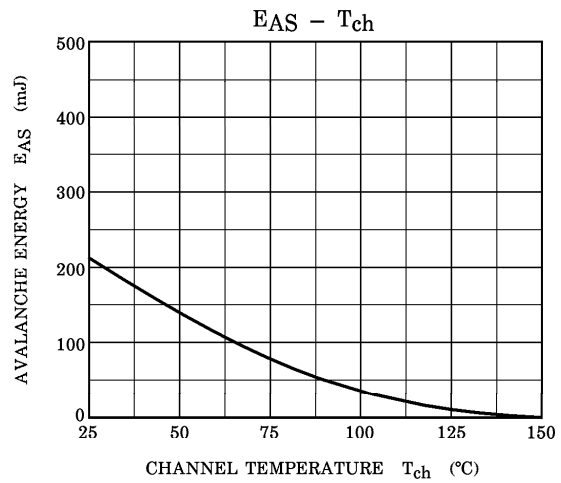
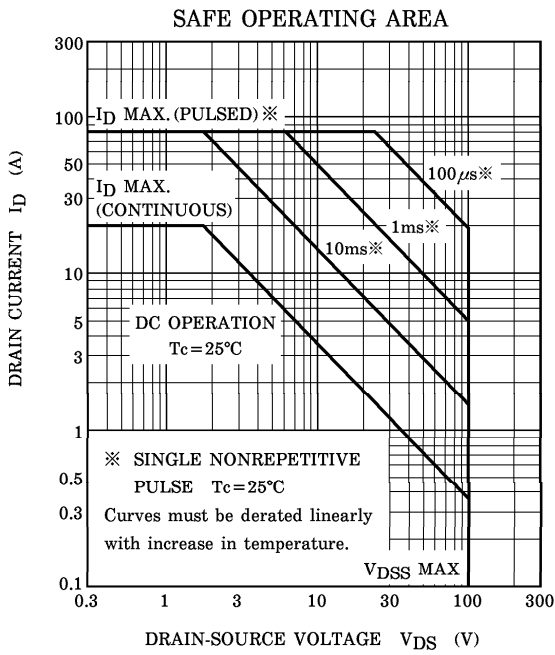
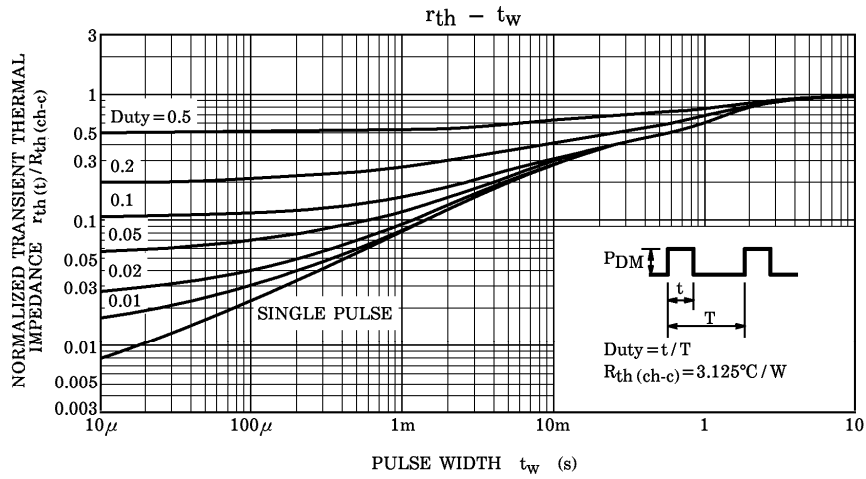
※ Lot Number

□ □ — Month (Starting from Alphabet A)

— Year (Last Number of the Christian Era)







Peak $I_{AR} = 20A$, $R_G = 25\Omega$
 $V_{DD} = 25V$, $L = 840\mu H$

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