

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

2SK2391

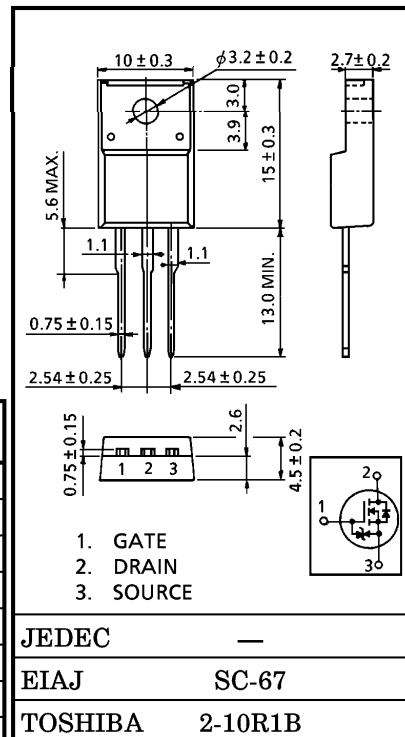
HIGH SPEED, HIGH CURRENT SWITCHING APPLICATIONS
 CHOPPER REGULATOR, DC-DC CONVERTER AND MOTOR DRIVE APPLICATIONS

INDUSTRIAL APPLICATIONS
 Unit in mm

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

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Drain-Source Voltage	V_{DSS}	100	V
Drain-Gate Voltage ($R_{GS} = 20k\Omega$)	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 $T_{ch} = 25°C$, $L = 840\mu H$, $R_G = 25\Omega$, $I_{AR} = 20A$

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

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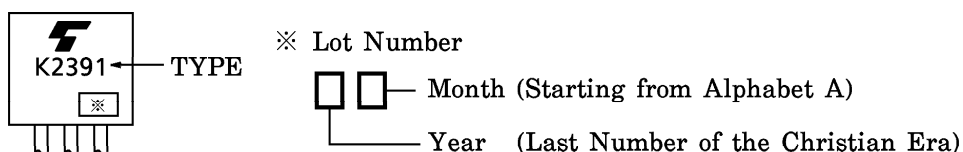
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

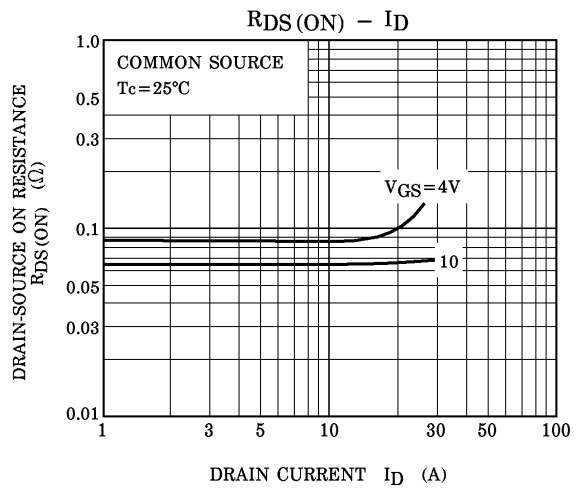
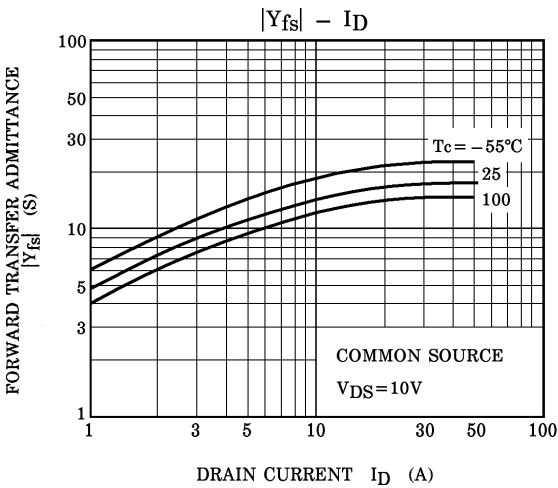
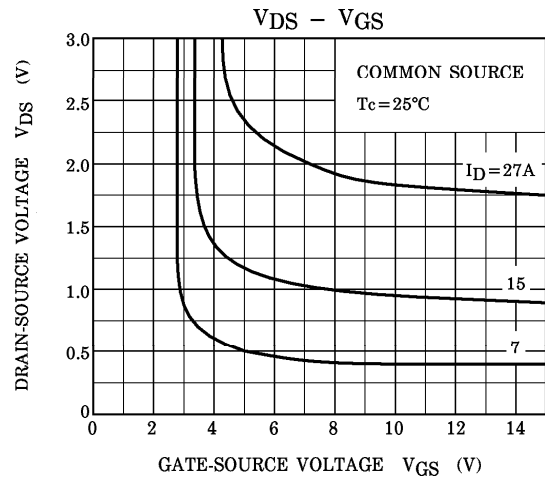
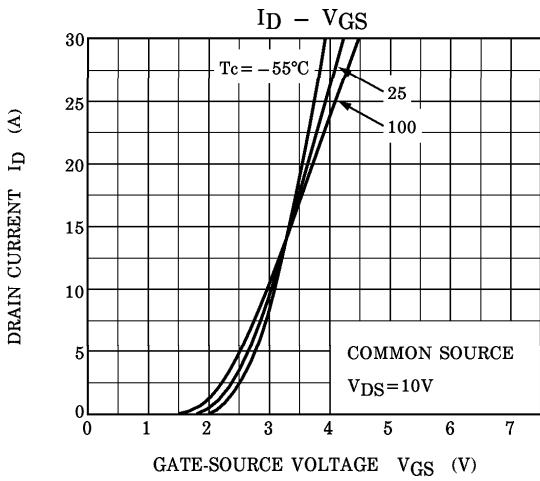
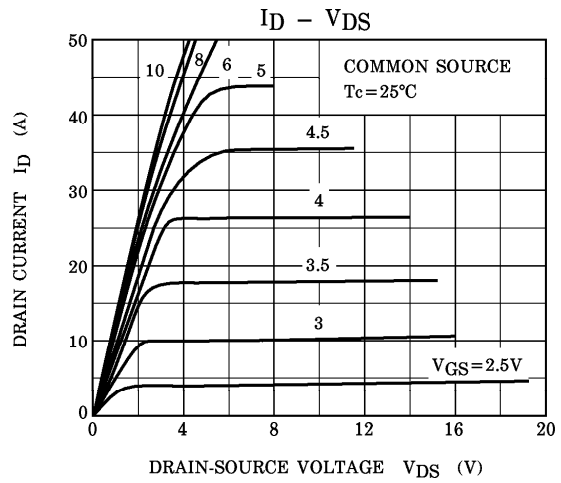
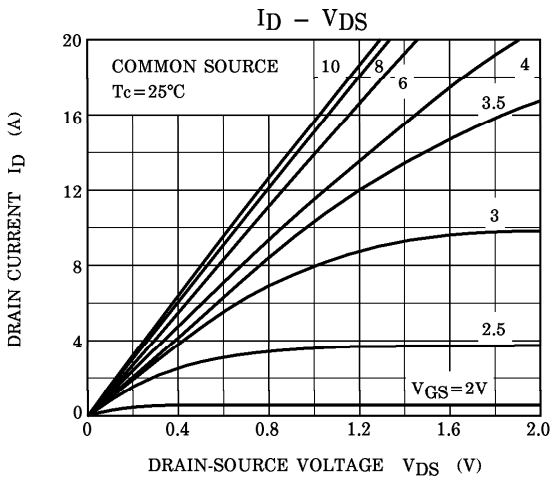
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current	I_{GSS}	$V_{GS} = \pm 16V, V_{DS} = 0V$	—	—	± 10	μA
Drain Cut-off Current	I_{DSS}	$V_{DS} = 100V, V_{GS} = 0V$	—	—	100	μA
Drain-Source Breakdown Voltage	$V_{(BR) DSS}$	$I_D = 10mA, V_{GS} = 0V$	100	—	—	V
Gate Threshold Voltage	V_{th}	$V_{DS} = 10V, I_D = 1mA$	0.8	—	2.0	V
Drain-Source ON Resistance	$R_{DS(ON)}$	$V_{GS} = 4V, I_D = 10A$	—	0.09	0.13	Ω
		$V_{GS} = 10V, I_D = 10A$	—	0.066	0.085	
Forward Transfer Admittance	$ Y_{fs} $	$V_{DS} = 10V, I_D = 10A$	8	16	—	S
Input Capacitance	C_{iss}	$V_{DS} = 10V, V_{GS} = 0V, f = 1MHz$	—	1100	—	pF
Reverse Transfer Capacitance	C_{rss}		—	180	—	
Output Capacitance	C_{oss}		—	400	—	
Switching Time	Rise Time	t_r		—	20	ns
	Turn-on Time	t_{on}		—	30	
	Fall Time	t_f		—	50	
	Turn-off Time	t_{off}		$V_{IN} : t_r, t_f < 5ns,$ $Duty \leq 1\%, t_w = 10\mu s$	—	
Total Gate Charge (Gate-Source Plus Gate-Drain)	Q_g	$V_{DD} \approx 80V, V_{GS} = 10V$	—	50	—	nC
Gate-Source Charge	Q_{gs}	$I_D = 27A$	—	34	—	
Gate-Drain ("Miller") Charge	Q_{gd}		—	16	—	

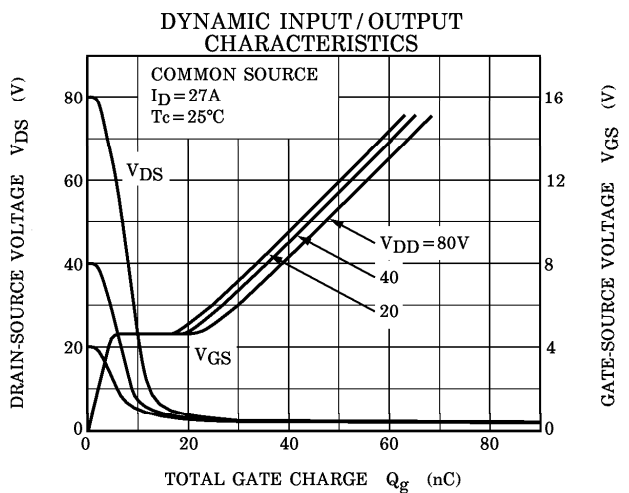
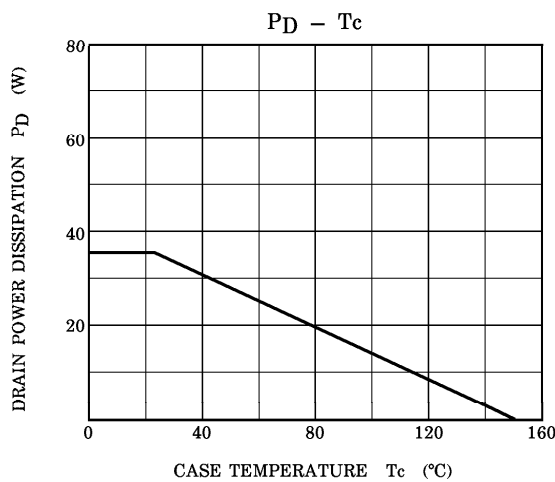
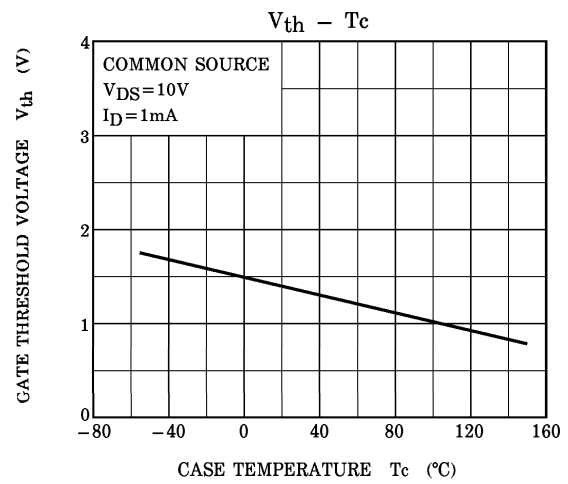
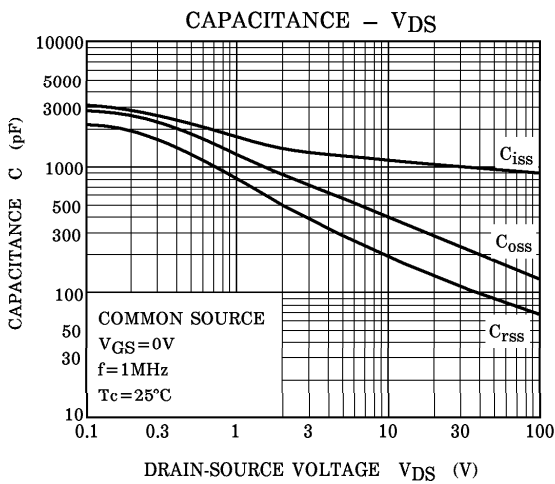
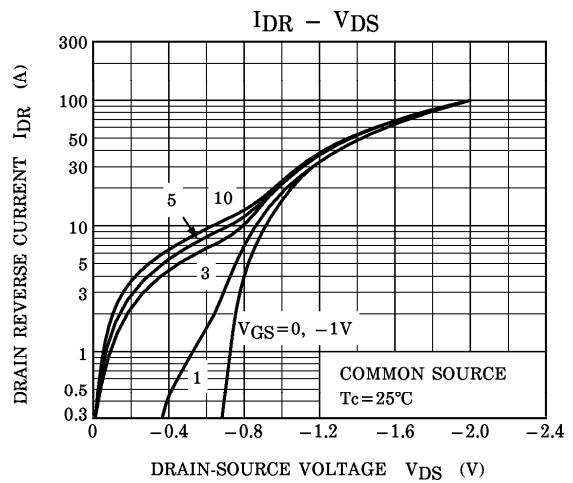
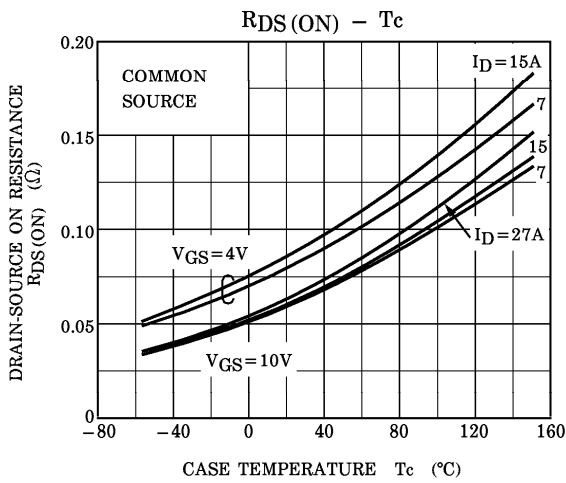
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (Ta = 25°C)

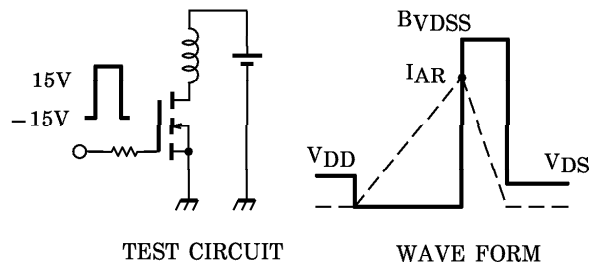
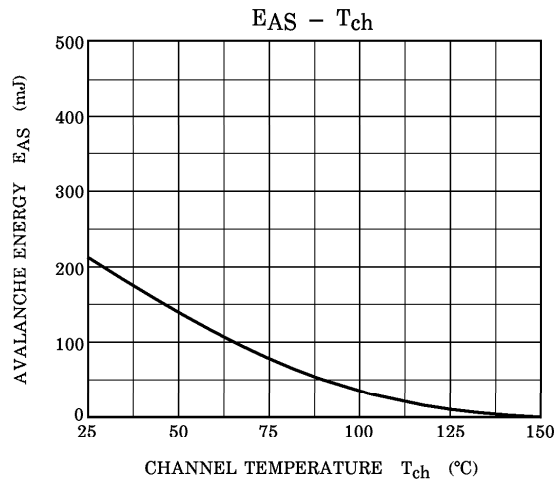
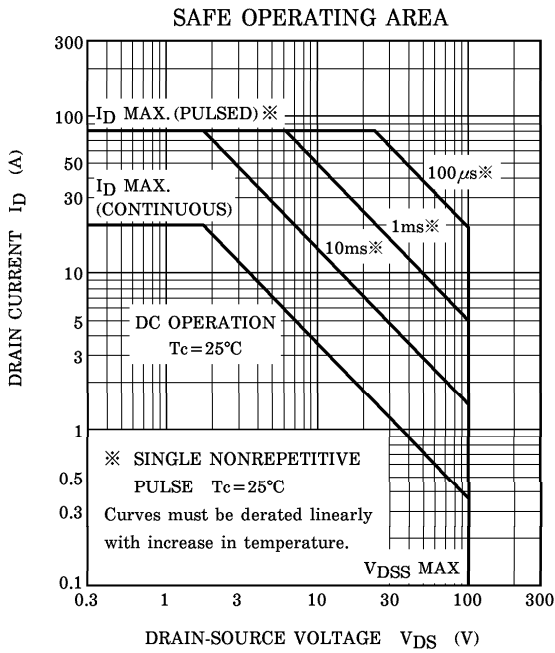
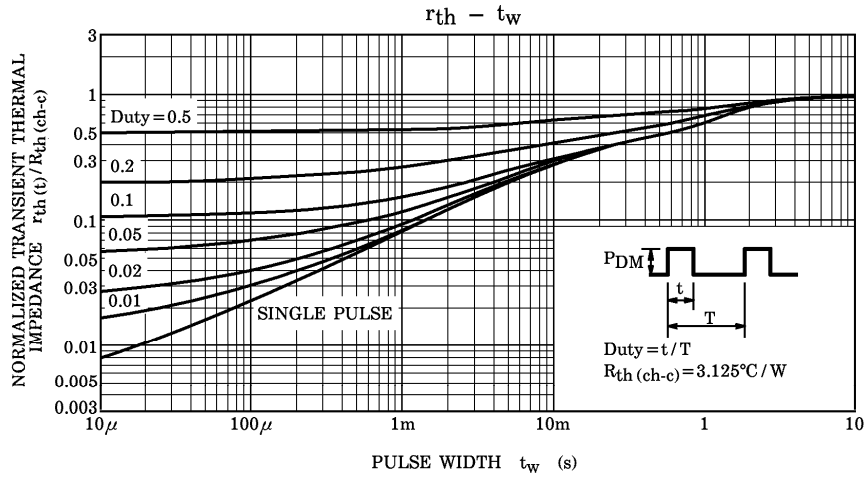
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current	I_{DR}	—	—	—	20	A
Pulse Drain Reverse Current	I_{DRP}	—	—	—	80	A
Diode Forward Voltage	V_{DSF}	$I_{DR} = 20A, V_{GS} = 0V$	—	—	-1.7	V
Reverse Recovery Time	t_{rr}	$I_{DR} = 20A, V_{GS} = 0V$	—	155	—	ns
Reverse Recovery Charge	Q_{rr}	$dI_{DR} / dt = 50A / \mu s$	—	0.31	—	μC

MARKING









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

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