

TOSHIBA Field Effect Transistor Silicon N Channel MOS Type (π -MOSII⁵)

2SK1930

Chopper Regulator, DC-DC Converter, and Motor Drive Applications

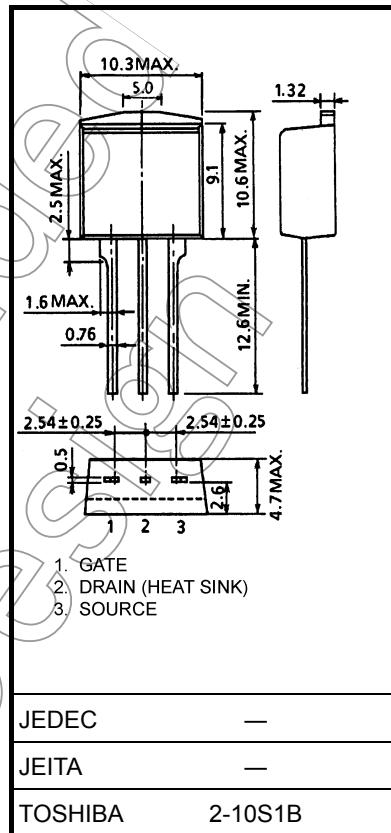
Unit: mm

- Low drain-source ON resistance : $R_{DS(ON)} = 3.0 \Omega$ (typ.)
- High forward transfer admittance : $|Y_{fs}| = 2.0 S$ (typ.)
- Low leakage current : $ID_{SS} = 300 \mu A$ (max) ($V_{DS} = 800 V$)
- Enhancement mode : $V_{th} = 1.5 \sim 3.5 V$ ($V_{DS} = 10 V$, $ID = 1 mA$)

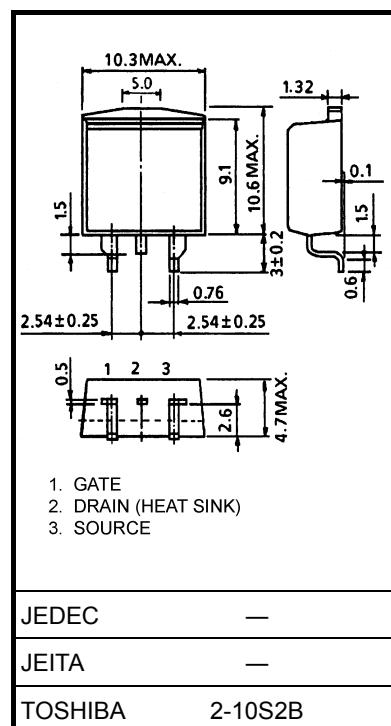
Absolute Maximum Ratings ($T_a = 25^\circ C$)

Characteristics	Symbol	Rating	Unit
Drain-source voltage	V_{DSS}	1000	V
Drain-gate voltage ($R_{GS} = 20 k\Omega$)	V_{DGR}	1000	V
Gate-source voltage	V_{GSS}	± 20	V
Drain current	DC (Note 1)	I_D	A
	Pulse (Note 1)	I_{DP}	
Drain power dissipation ($T_c = 25^\circ C$)	P_D	100	W
Channel temperature	T_{ch}	150	$^\circ C$
Storage temperature range	T_{stg}	-55~150	$^\circ C$

Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings. Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/Derating Concept and Methods) and individual reliability data (i.e. reliability test report and estimated failure rate, etc.).



Weight: 1.5 g (typ.)



Thermal Characteristics

Characteristics	Symbol	Max	Unit
Thermal resistance, channel to case	$R_{th}(ch-c)$	1.25	$^\circ C / W$
Thermal resistance, channel to ambient	$R_{th}(ch-a)$	83.3	$^\circ C / W$

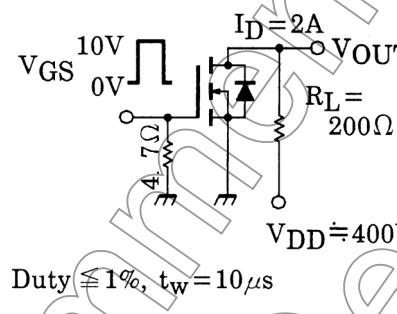
Note 1: Ensure that the channel temperature does not exceed 150°C.

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

Weight: 1.5 g (typ.)

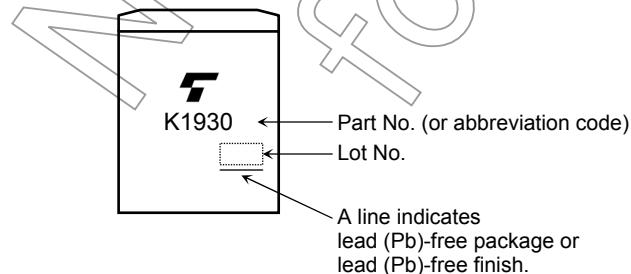
Electrical Characteristics ($T_a = 25^\circ\text{C}$)

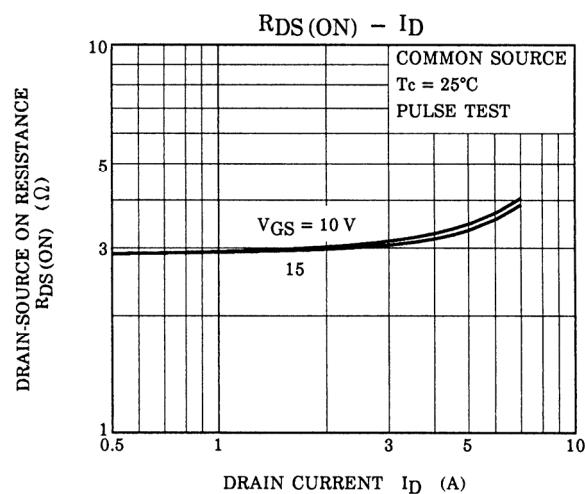
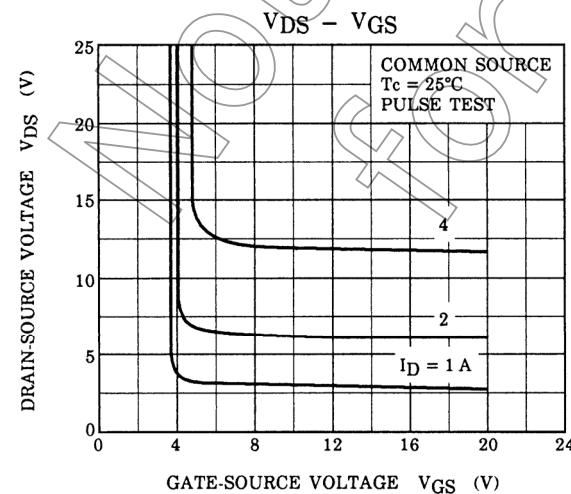
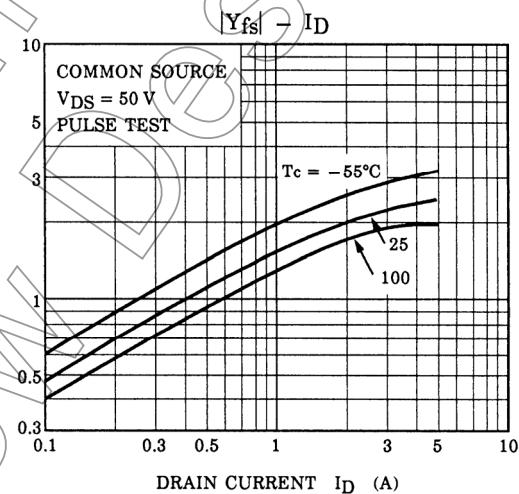
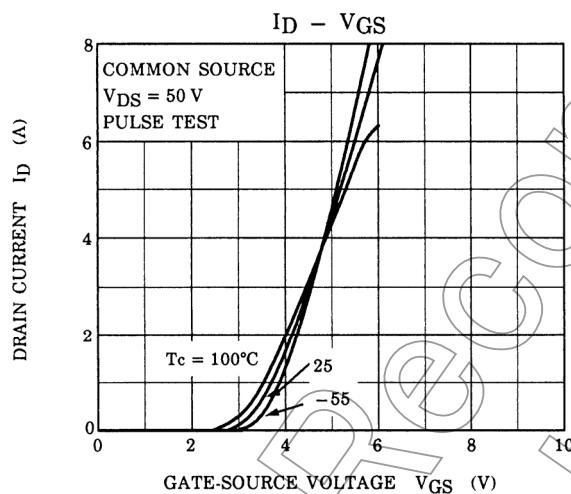
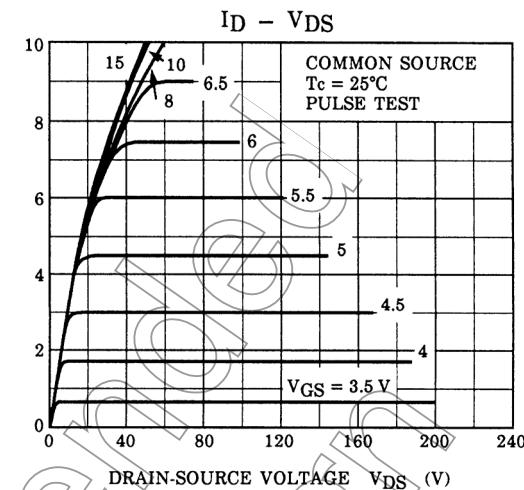
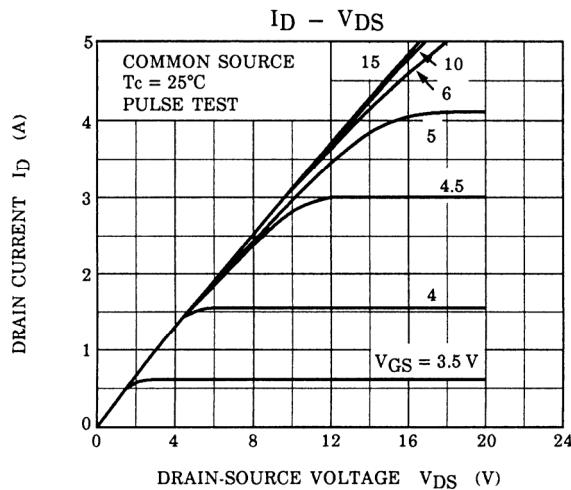
Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Gate leakage current	I_{GSS}	$V_{GS} = \pm 20\text{ V}$, $V_{DS} = 0\text{ V}$	—	—	± 100	nA
Drain cut-off current	I_{DSS}	$V_{DS} = 800\text{ V}$, $V_{GS} = 0\text{ V}$	—	—	300	μA
Drain-source breakdown voltage	$V_{(\text{BR})\text{DSS}}$	$I_D = 10\text{ mA}$, $V_{GS} = 0\text{ V}$	1000	—	—	V
Gate threshold voltage	V_{th}	$V_{DS} = 10\text{ V}$, $I_D = 1\text{ mA}$	1.5	—	3.5	V
Drain-source ON resistance	$R_{DS(\text{ON})}$	$V_{GS} = 10\text{ V}$, $I_D = 2\text{ A}$	—	3.0	3.8	Ω
Forward transfer admittance	$ Y_{fs} $	$V_{DS} = 20\text{ V}$, $I_D = 2\text{ A}$	1.0	2.0	—	S
Input capacitance	C_{iss}	$V_{DS} = 25\text{ V}$, $V_{GS} = 0\text{ V}$, $f = 1\text{ MHz}$	—	700	—	pF
Reverse transfer capacitance	C_{rss}		—	55	—	
Output capacitance	C_{oss}		—	100	—	
Switching time	Rise time	t_r	—	18	—	ns
	Turn-on time	t_{on}	—	30	—	
	Fall time	t_f	—	12	—	
	Turn-off time	t_{off}	—	70	—	
Total gate charge (Gate-source plus gate-drain)	Q_g	$V_{DD} \approx 400\text{ V}$, $V_{GS} = 10\text{ V}$, $I_D = 4\text{ A}$	—	60	—	nC
Gate-source charge	Q_{gs}		—	35	—	
Gate-drain ("miller") charge	Q_{gd}		—	25	—	

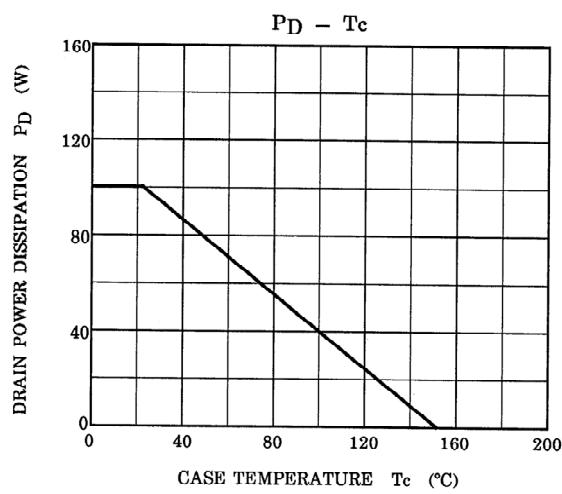
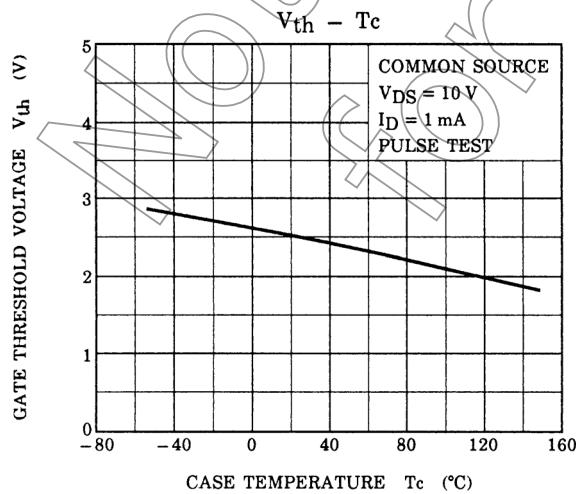
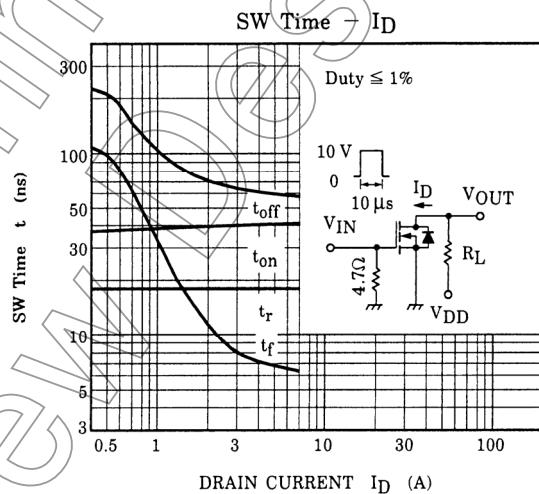
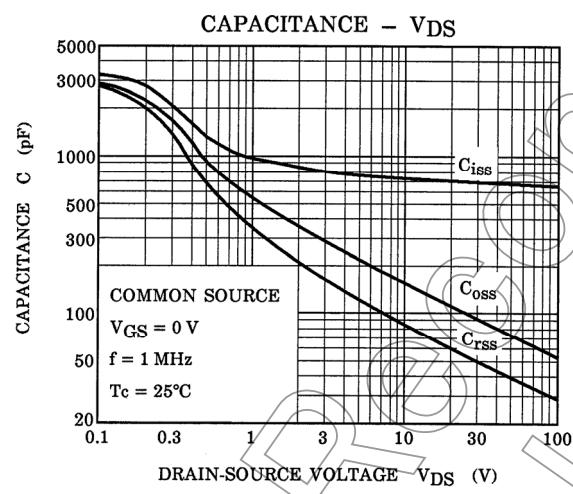
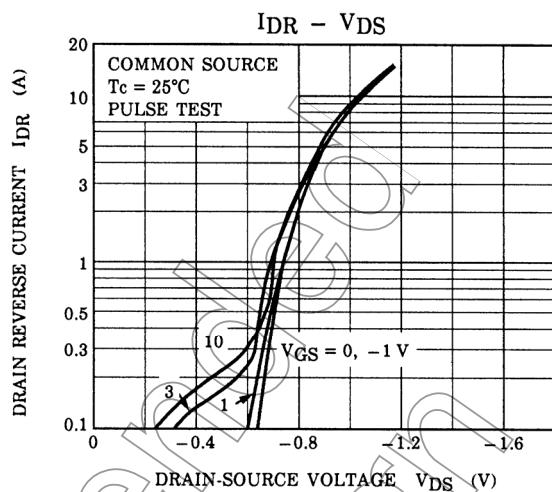
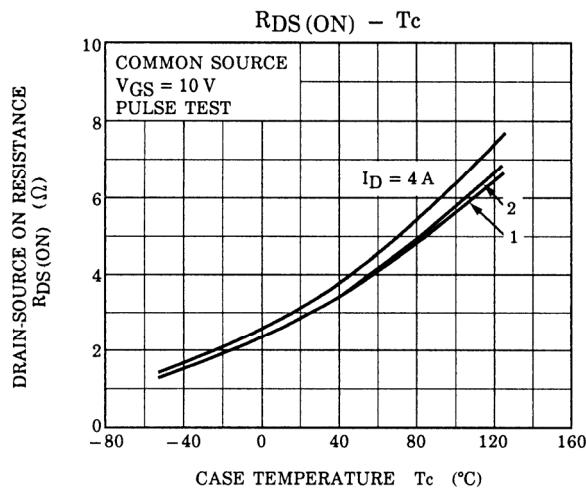
Source-Drain Ratings and Characteristics ($T_a = 25^\circ\text{C}$)

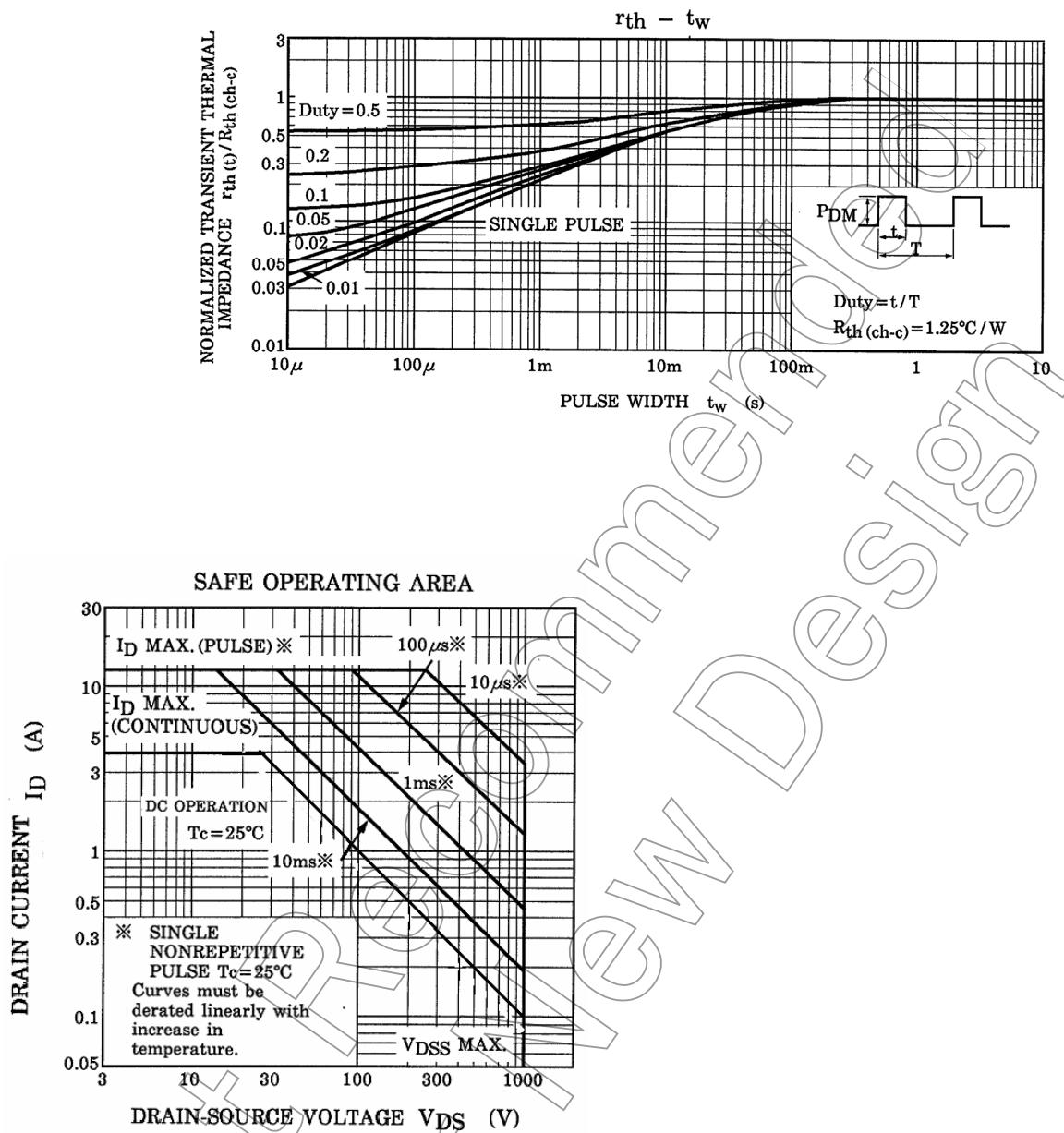
Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Continuous drain reverse current (Note 1)	I_{DR}	—	—	—	4	A
Pulse drain reverse current (Note 1)	I_{DRP}	—	—	—	12	A
Forward voltage (diode)	V_{DSF}	$I_{DR} = 4\text{ A}$, $V_{GS} = 0\text{ V}$	—	—	-1.9	V

Marking









recommended design

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20070701-EN

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