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

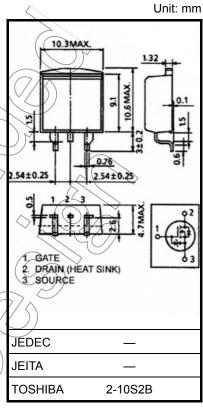
2SK3879

Switching Regulator Applications

- Low drain-source ON-resistance: R_{DS} (ON) = 1.35 Ω (typ.)
- High forward transfer admittance: $|Y_{fS}| = 5.2 \text{ S (typ.)}$
- Low leakage current: $I_{DSS} = 100 \mu A \text{ (max) (V}_{DS} = 640 \text{ V)}$
- Enhancement model: V_{th} = 2.0 to 4.0 V (V_{DS} = 10 V, I_D = 1 mA)

Absolute Maximum Ratings (Ta = 25°C)

				()
Characteristic		Symbol	Rating	Unit
Drain-source voltage		V_{DSS}	800	(\checkmark)
Drain-gate voltage ($R_{GS} = 20 \text{ k}\Omega$)			800	\ \ \
Gate-source voltage			±30	\
DC	(Note 1)	ΙD	6.5	A
Pulse	(Note 1)	I _{DP}	19.5	A
Drain power dissipation (Tc = 25°C)			80	W
Single pulse avalanche energy (Note 2)			375	C ^B Z
Avalanche current		IAR)) 6.5	A
Repetitive avalanche energy (Note 3)			8 (mJ
Channel temperature			150	∫\°C
Storage temperature range			-55 to 150	Ĉ€
	DC Pulse ion (Tc = he energy	$R_{GS} = 20 \text{ k}\Omega$) DC (Note 1) Pulse (Note 1) ion (Tc = 25°C) the energy (Note 2)	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	V_{DSS} 800 V_{DGR} 800 V_{GSS} ±30 V_{GSS} ±40 V_{GSS} ±40 $V_{$



Weight: 1.5 g (typ.)

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).

Thermal Characteristics

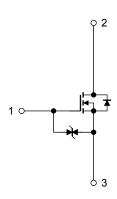
Characteristic	Symbol	Max	Unit
Thermal resistance, channel to case	Rth (ch-c)	1.56	°C/W

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

Note 2: $V_{DD} = 90 \text{ V}$, $T_{ch} = 25^{\circ}\text{C}$ (initial), L = 16.1 mH, $R_G = 25 \Omega$, $I_{AR} = 6.5 \text{ A}$

Note 3: Repetitive rating: pulse width limited by maximum channel temperature.

This transistor is an electrostatic-sensitive device. Handle with care.



Electrical Characteristics (Ta = 25°C)

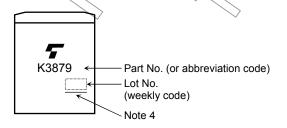
Char	acteristic	Symbol	Test Condition	Min	Тур.	Max	Unit
Gate leakage cur	rent	I _{GSS}	$V_{GS} = \pm 25 \text{ V}, V_{DS} = 0 \text{ V}$	_	_	±10	μΑ
Gate-source brea	akdown voltage	V (BR) GSS	$I_G=\pm 10~\mu A,~V_{DS}=0~V$	±30	_	_	V
Drain cutoff curre	ent	I _{DSS}	V _{DS} = 640 V, V _{GS} = 0 V		_	100	μΑ
Drain-source brea	akdown voltage	V (BR) DSS	$I_D = 10$ mA, $V_{GS} = 0$ V	800	_	_	V
Gate threshold vo	oltage	V _{th}	V _{DS} = 10 V, I _D = 1 mA	2.0) >_	4.0	V
Drain-source ON	resistance	R _{DS} (ON)	V _{GS} = 10 V, I _D = 3.5 A	\nearrow	1.35	1.7	Ω
Forward transfer	admittance	Y _{fs}	V _{DS} = 20 V, I _D = 3.5 A	2.5	5.2	_	S
Input capacitance		C _{iss}			1500	_	
Reverse transfer capacitance		C _{rss}	V _{DS} = 25 V, V _{GS} = 0 V, f = 1 MHz	_	25	_	pF
Output capacitance		Coss		_	140	_	
Switching time	Rise time	t _r	V _{GS} D=3,5 A V _{OUT}	- (35	<u>></u>	
	Turn-on time	t _{on}	0 V — R _L = 114 Ω		80	_	
	Fall time	t _f	Duty ≤ 1%, t _W = 10 μs		50	_	ns
	Turn-off time	t _{off}) —	220	_	
Total gate charge (gate-source plus		Qg			35	_	_
Gate-source charge		Qgs	$V_{DD} \approx 400 \text{ V}, V_{GS} = 10 \text{ V}, I_{D} = 6.5 \text{ A}$	_	22	_	nC
Gate-drain ("Miller") charge		Q _{gd} \	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	_	13	_	

Source-Drain Ratings and Characteristics (Ta = 25°C)

Characteristic	Symbol	Test Condition	Min	Тур.	Max	Unit
Continuous drain reverse current (Note 1)	I _{DR}	_	_	_	6.5	Α
Pulse drain reverse current (Note 1)	IDRP		_	_	19.5	Α
Forward voltage (diode)	V _{DSF}	I _{DR} = 6.5 A, V _{GS} = 0 V	_	_	-1.7	V
Reverse recovery time		I _{DR} = 6.5 A, V _{GS} = 0 V,	_	1200		ns
Reverse recovery charge	Q_{rr}	dl _{DR} /dt = 100 A/μs	_	11.5		μС

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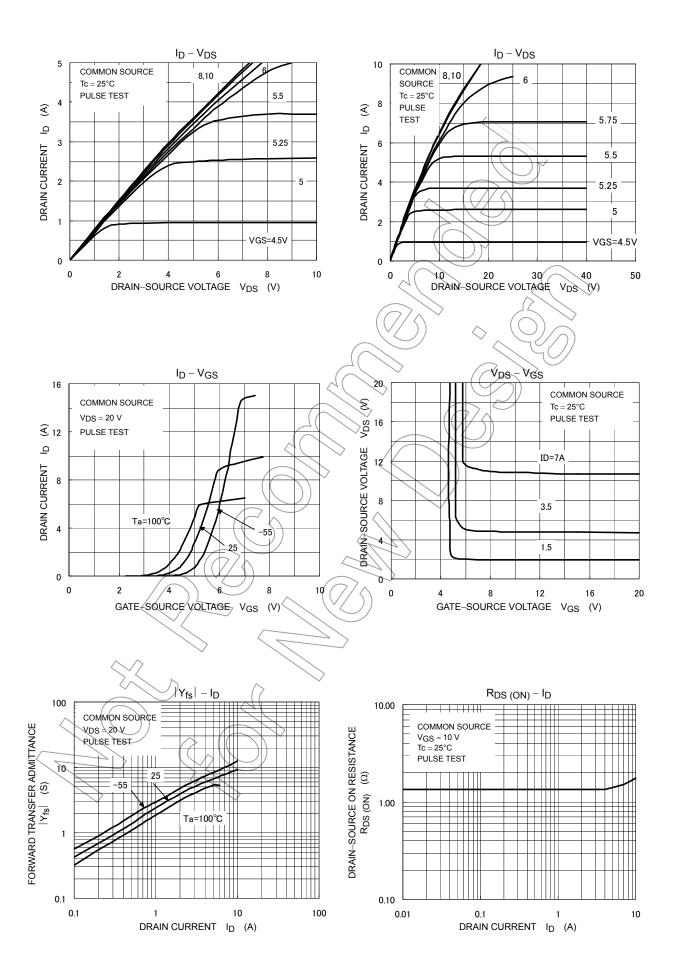


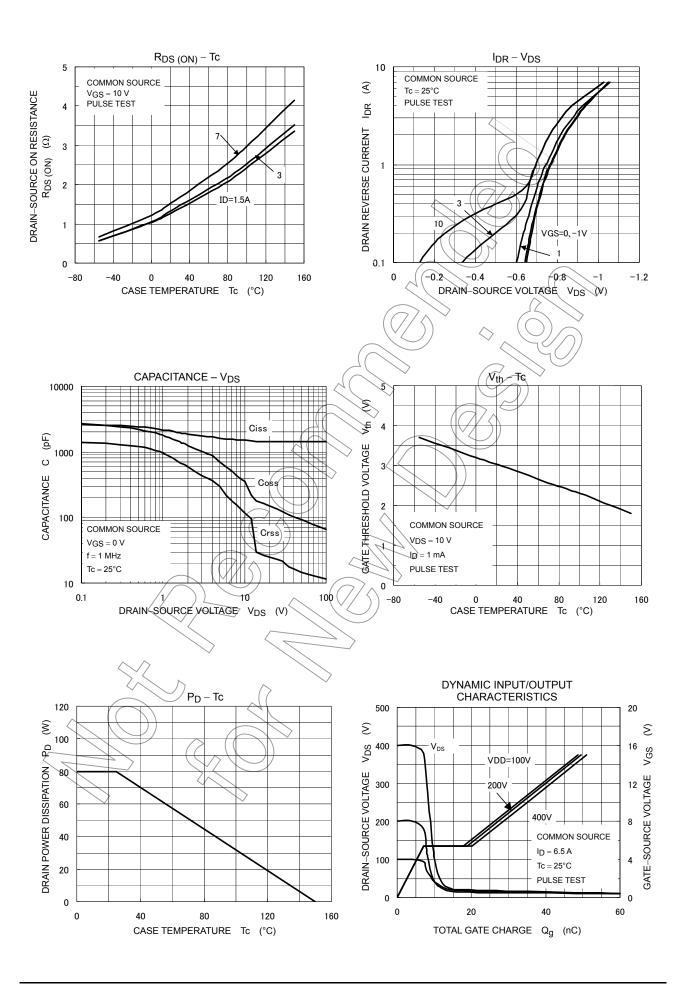


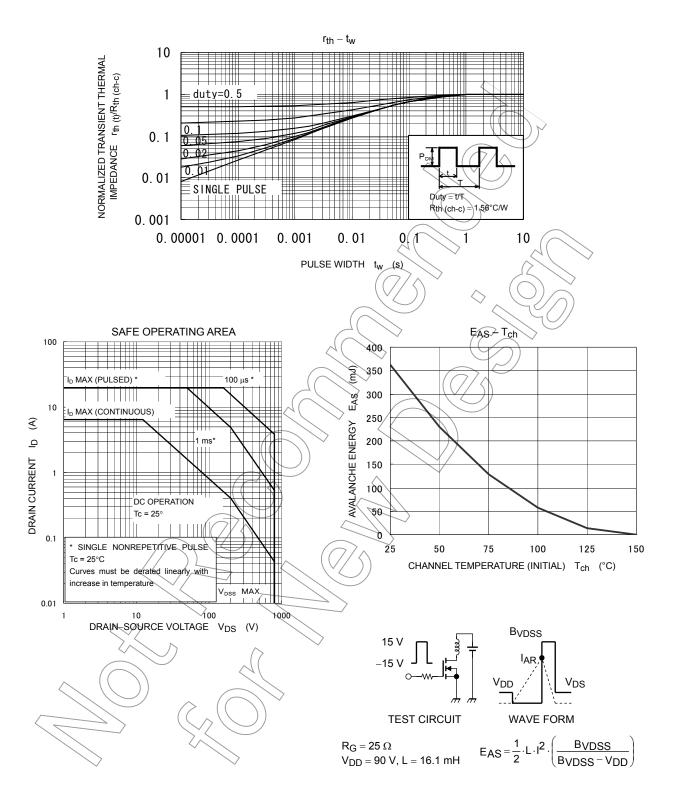
Note 4: A line under a Lot No. identifies the indication of product Labels.

Not underlined: [[Pb]]/INCLUDES > MCV Underlined: [[G]]/RoHS COMPATIBLE or [[G]]/RoHS [[Pb]]

Please contact your TOSHIBA sales representative for details as to environmental matters such as the RoHS compatibility of Product. The RoHS is the Directive 2002/95/EC of the European Parliament and of the Council of 27 January 2003 on the restriction of the use of certain hazardous substances in electrical and electronic equipment.







5 2011-04-25

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