TOSHIBA Field Effect Transistor Silicon P-Channel MOS Type (π-MOSV)

2SJ610

Switching Regulator, DC/DC Converter and Motor Drive Applications

- Low drain-source ON-resistance: R_{DS} (ON) = 1.85 Ω (typ.)
- High forward transfer admittance: |Y_{fs}| = 18 S (typ.)
- Low leakage current: $I_{DSS} = -100 \mu A (V_{DS} = -250 V)$
- Enhancement mode: $V_{th} = -1.5 \sim -3.5 \text{ V } (V_{DS} = 10 \text{ V}, I_D = 1 \text{ mA})$

Absolute Maximum Ratings (Ta = 25°C)

Characteristic		Symbol	Rating	Unit
Drain-source voltage		V_{DSS}	-250	V
Drain-gate voltage ($R_{GS} = 20 \text{ k}\Omega$)		V_{DGR}	-250	V
Gate-source voltage		V_{GSS}	±20	V
Drain current	DC (Note 1)	I _D	-2.0	
	Pulse (t = 1 ms) (Note 1)	I _{DP}	-4.0	Α
Drain power dissipati	on	PD	20	W
Single-pulse avalanche energy (Note 2)		E _{AS}	180	mJ
Avalanche current		I _{AR}	-2.0	Α
Repetitive avalanche energy (Note 3)		E _{AR}	2.0	mJ
Channel temperature		T _{ch}	150	°C
Storage temperature range		T _{stg}	-55~150	°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).

Thermal Characteristics

Characteristic	Symbol	Max	Unit
Thermal resistance, channel to case	R _{th (ch-c)}	6.25	°C/W
Thermal resistance, channel to ambient	R _{th (ch-a)}	125	°C/W

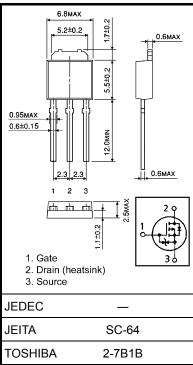
Note 1: Ensure that the channel temperature does not exceed 150°C.

Note 2: $V_{DD} = -50~V,~T_{Ch} = 25^{\circ}C$ (initial), L = 75 mH, I_{AR} = -2.0 A, R_G = 25 Ω

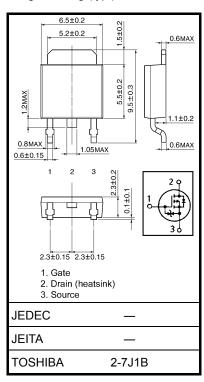
Note 3: Repetitive rating: pulse width limited by maximum channel temperature

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





Weight: 0.36 g (typ.)



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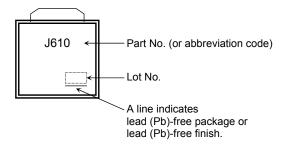
Electrical Characteristics (Ta = 25°C)

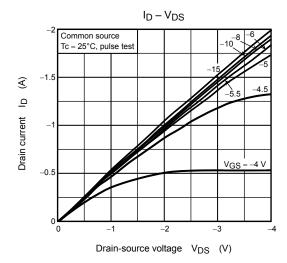
Char	acteristic	Symbol	Test Condition	Min	Тур.	Max	Unit
Gate leakage current		I _{GSS}	$V_{GS} = \pm 16 \text{ V}, V_{DS} = 0 \text{ V}$	_	_	±10	μА
Drain cutoff curre	ent	I _{DSS}	$V_{DS} = -250 \text{ V}, V_{GS} = 0 \text{ V}$	_	_	-100	μА
Drain-source breakdown voltage		V (BR) DSS	$I_D = -10 \text{ mA}, V_{GS} = 0 \text{ V}$	-250	_	_	V
Gate threshold v	oltage	V _{th}	$V_{DS} = -10 \text{ V}, I_D = -1 \text{ mA}$	-1.5	_	-3.5	٧
Drain-source ON	-resistance	R _{DS (ON)}	V _{GS} = -10 V, I _D = -1.0 A		1.85	2.55	Ω
Forward transfer admittance		Y _{fs}	$V_{DS} = -10 \text{ V}, I_D = -1.0 \text{ A}$	0.5	1.8	_	S
Input capacitance		C _{iss}	V _{DS} = -10 V, V _{GS} = 0 V, f = 1 MHz		381	_	pF
Reverse transfer capacitance		C _{rss}		_	52	_	
Output capacitance		Coss			157	_	
Switching time	Rise time	t _r	$V_{GS} = 1.0 \text{ A} V_{OUT}$ $V_{GS} = 100 \Omega$ $V_{DU} \approx 100 V$ $V_{DU} \approx 100 V$ $V_{DU} \approx 100 V$	_	5	_	
	Turn-on time	t _{on}		_	20		
	Fall time	t _f		_	6	_	ns
	Turn-off time	t _{off}		_	36	_	
Total gate charge		Qg	$V_{DD} \simeq -200 \text{ V}, V_{GS} = -10 \text{ V},$ $I_{D} = -2.0 \text{ A}$	_	24	_	nC
Gate-source charge		Q _{gs}		_	11	_	
Gate-drain charge		Q _{gd}	1102.0 A	_	13	_	

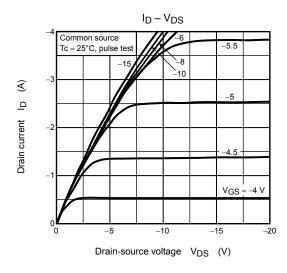
Source-Drain Ratings and Characteristics (Ta = 25°C)

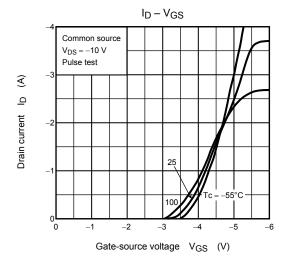
Characteristic	Symbol	Test Condition	Min	Тур.	Max	Unit
Continuous drain reverse current (Note 1)	I_{DR}	_	_	_	-2.0	Α
Pulse drain reverse current (Note 1)	I _{DRP}	_	_	_	-4.0	Α
Forward voltage (diode)	V_{DSF}	$I_{DR} = -2.0 \text{ A}, V_{GS} = 0 \text{ V}$	_	_	2.0	V
Reverse recovery time	t _{rr}	$I_{DR} = -2.0 \text{ A}, V_{GS} = 0 \text{ V},$	_	120	_	ns
Reverse recovery charge	Qrr	dI _{DR} /dt = 100 A/μs		540	_	nC

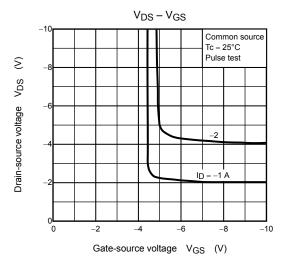
Marking

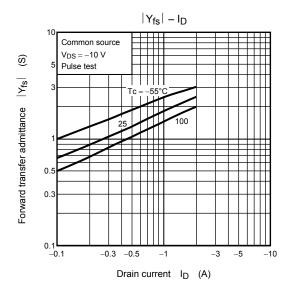


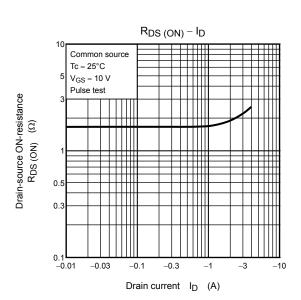




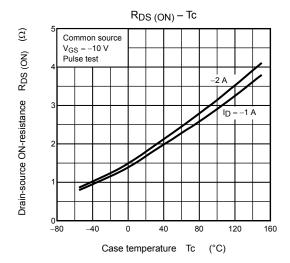


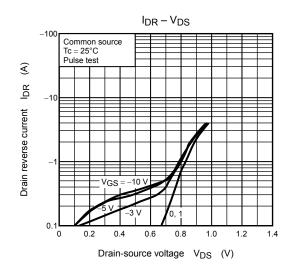


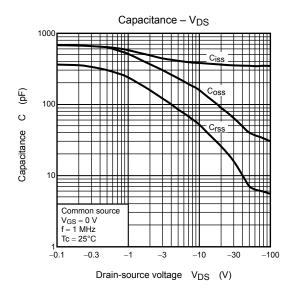


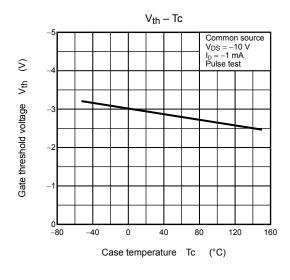


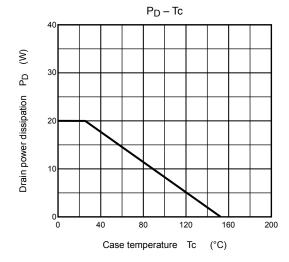
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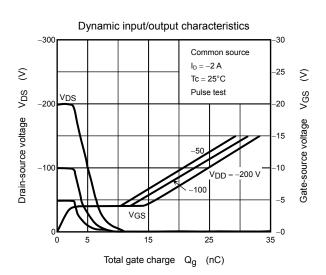


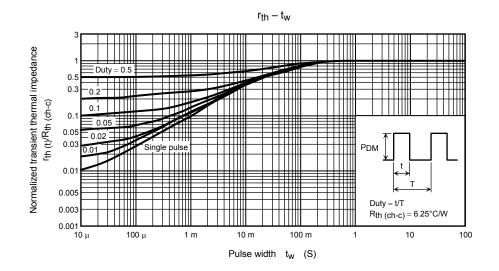


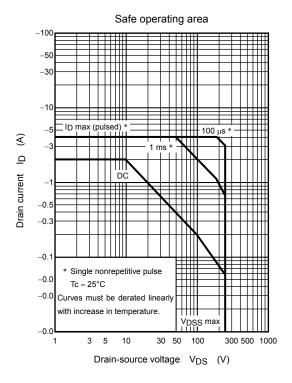


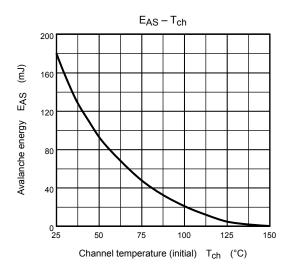


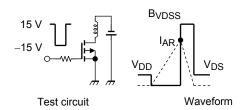












 $R_G = 25 \ \Omega$ $V_{DD} = -50 \ V, \ L = 75 \ mH$

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