Unit: mm

TOSHIBA Field Effect Transistor Silicon N Channel MOS Type (π–MOSIII)

2SK2610

Chopper Regulator, DC-DC Converter and Motor Drive Applications

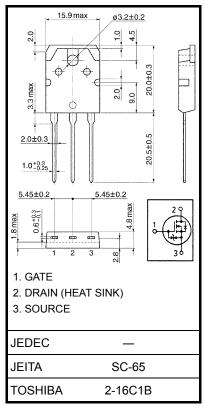
• Low drain-source ON resistance : RDS (ON) = 2.3Ω (typ.)

• High forward transfer admittance $|Y_{fs}| = 4.4 \text{ S (typ.)}$ • Low leakage current $|I_{DSS}| = 100 \text{ } \mu\text{A (max) (V}_{DS} = 720 \text{ V)}$

• Enhancement mode : $V_{th} = 2.0 \text{ to } 4.0 \text{ V (V}_{DS} = 10 \text{ V, I}_{D} = 1 \text{ mA})$

Absolute Maximum Ratings (Ta = 25°C)

Characteris	stics	Symbol	Rating	Unit	
Drain-source voltage		V_{DSS}	900	V	
Drain-gate voltage (Ro	_{SS} = 20 kΩ)	V_{DGR}	900	V	
Gate-source voltage		V_{GSS}	±30	V	
Drain current	DC (Note 1)	ΙD	5	Α	
	Pulse (Note 1)	I _{DP}	15		
Drain power dissipation	n (Tc = 25°C)	P_{D}	150	W	
Single pulse avalanche	e energy (Note 2)	E _{AS}	595	mJ	
Avalanche current		I _{AR}	5	Α	
Repetitive avalanche e	nergy (Note 3)	E _{AR}	15	mJ	
Channel temperature		T _{ch}	150	°C	
Storage temperature ra	ange	T _{stg}	−55 to 150	°C	



Weight: 4.6 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

Characteristics	Symbol	Max	Unit
Thermal resistance, channel to case	R _{th (ch-c)}	0.833	°C/W
Thermal resistance, channel to ambient	R _{th (ch-a)}	50	°C/W

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

Note 2: V_{DD} = 90 V, T_{ch} = 25°C (initial), L = 43.6 mH, I_{AR} = 5 A, R_G = 25 Ω

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

This transistor is an electrostatic-sensitive device.

Please handle with caution.

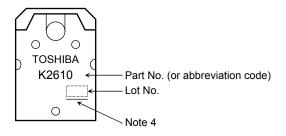
Electrical Characteristics (Ta = 25°C)

Charac	cteristics	Symbol	Test Condition	Min	Тур.	Max	Unit
Gate leakage cu	rrent	I _{GSS}	V _{GS} = ±30 V, V _{DS} = 0 V	_	_	±10	μA
Gate-source bre	eakdown voltage	V (BR) GSS	$I_G = \pm 10 \mu A, V_{DS} = 0 V$	±30	_	_	V
Drain cut-off cu	rrent	I _{DSS}	V _{DS} = 720 V, V _{GS} = 0 V	_	_	100	μA
Drain-source br	eakdown voltage	V (BR) DSS	I _D = 10 mA, V _{GS} = 0 V	900	_	_	V
Gate threshold v	oltage	V _{th}	V _{DS} = 10 V, I _D = 1 mA	2.0	_	4.0	V
Drain-source O	N resistance	R _{DS} (ON)	V _{GS} = 10 V, I _D = 3.0 A	_	2.3	2.5	Ω
Forward transfer	admittance	Y _{fs}	V _{DS} = 20 V, I _D = 3.0 A	1.1	4.4	_	S
Input capacitano	:e	C _{iss}		-	1200	_	
Reverse transfer capacitance		C _{rss}	V _{DS} = 25 V, V _{GS} = 0 V, f = 1 MHz	-	20	_	pF
Output capacitance		Coss]		120	_	
Switching time	Rise time	t _r	V_{GS}^{10V} V_{GS}^{10V} V_{Out} V_{DD} V_{DD}	_	40	_	
	Turn-on time	t _{on}		_	90	_	ne
	Fall time	t _f		ı	60	_	- ns
	Turn-off time	t _{off}	Duty $\leq 1\%$, $t_{\rm W} = 10 \mu \rm s$	_	200	_	
Total gate charge (gate-source plus gate-drain)		Qg			45		
Gate-source charge		Q _{gs}	$V_{DD} \approx 400 \text{ V}, V_{GS} = 10 \text{ V}, I_D = 5 \text{ A}$		25		nC
Gate-drain ("miller") Charge		Q _{gd}			20	_	

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

Characteristics	Symbol	Test Condition	Min	Тур.	Max	Unit
Continuous drain reverse current (Note 1)	I _{DR}	_	_	_	5	Α
Pulse drain reverse current (Note 1)	I _{DRP}	_	_	_	15	Α
Forward voltage (diode)	V_{DSF}	I _{DR} = 5 A, V _{GS} = 0 V	_	_	-1.9	V
Reverse recovery time	t _{rr}	I _{DR} = 5 A, V _{GS} = 0 V, dI _{DR} / dt = 100 A / μs	1	1300	-	ns
Reverse recovery charge	Qrr	IDR - 3 A, VGS - 0 V, αIDR / αt - 100 A / μs	_	11	_	μC

Marking

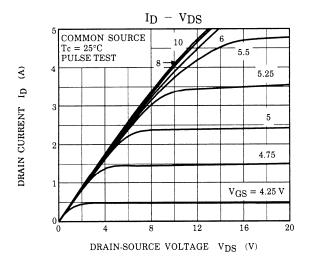


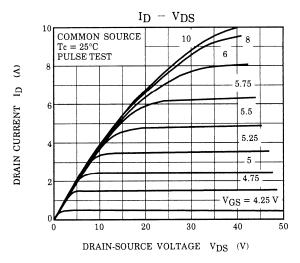
Note 4: A line under a Lot No. identifies the indication of product Labels.

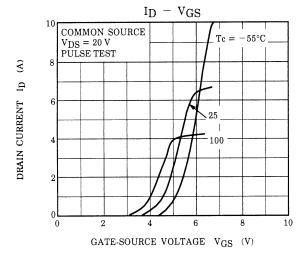
Not underlined: [[Pb]]/INCLUDES > MCV

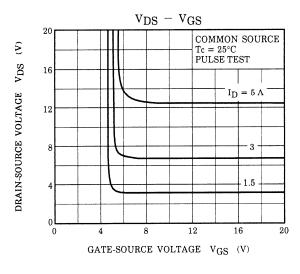
Underlined: [[G]]/RoHS COMPATIBLE or [[G]]/RoHS [[Pb]]

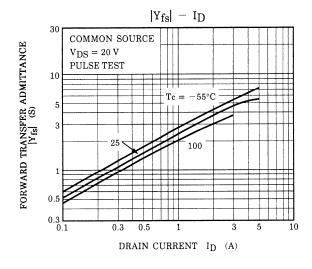
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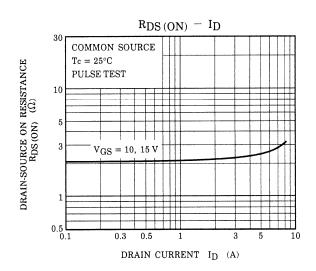




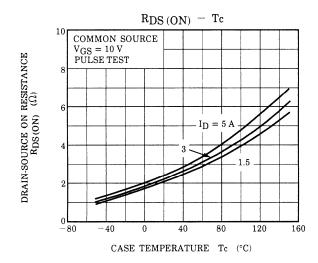


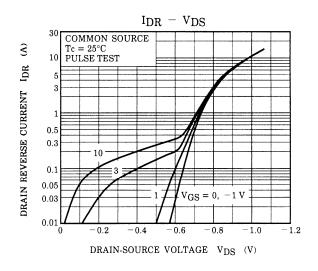


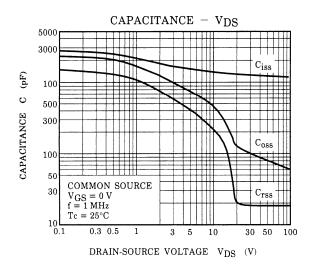


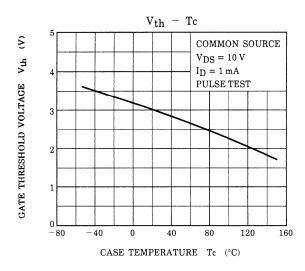


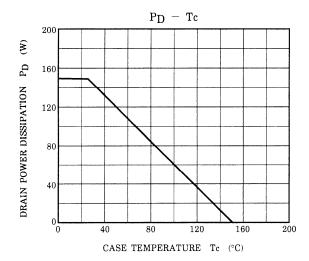
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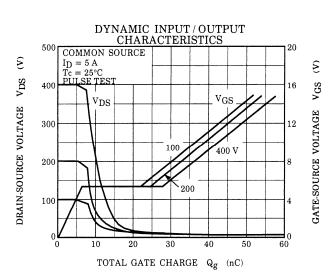




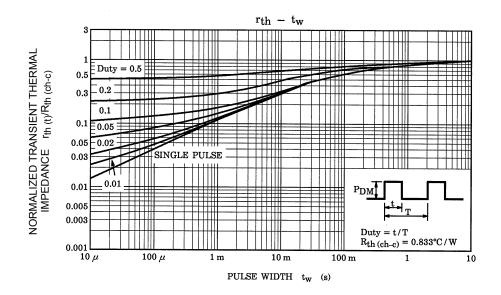


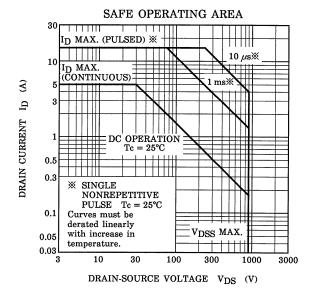


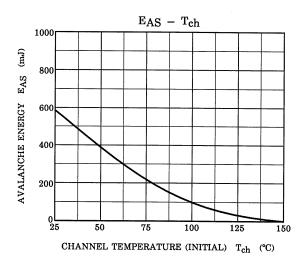


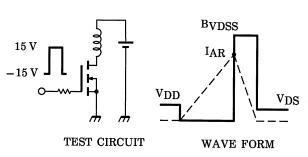


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$$R_G = 25 \Omega$$

 $V_{DD} = 90 \text{ V}, L = 43.6 \text{ mH}$ $E_{AS} = \frac{1}{2} \cdot L \cdot I^2 \cdot \left(\frac{B_{VDSS}}{B_{VDSS} - V_{DD}}\right)$

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