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

2SK2847

DC-DC Converter and Motor Drive Applications

• Low drain-source ON resistance : $R_{DS (ON)} = 1.1 \Omega (typ.)$

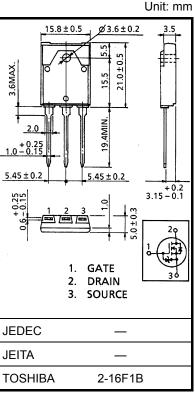
• High forward transfer admittance : $|Y_{fs}| = 7.0 \text{ S (typ.)}$

• Low leakage current : I_{DSS} = 100 μA (max) (V_{DS} = 720 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)

Characteri	stics	Symbol	Rating	Unit
Drain-source voltage		V_{DSS}	900	V
Drain-gate voltage (R	_{GS} = 20 kΩ)	V_{DGR}	900	V
Gate-source voltage		V _{GSS}	±30	V
Drain current	DC (Note 1)	ΙD	8	Α
	Pulse (Note 1)	I _{DP}	24	Α
Drain power dissipatio	n (Tc = 25°C)	P _D	85	W
Single pulse avalanche energy (Note 2)		E _{AS}	799	mJ
Avalanche current		I _{AR}	8	Α
Repetitive avalanche energy (Note 3)		E _{AR}	8.5	mJ
Channel temperature		T _{ch}	150	°C
Storage temperature range		T _{stg}	-55 to 150	°C



Weight: 5.8 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)}	1.47	°C/W
Thermal resistance, channel to ambient	R _{th (ch-a)}	41.6	°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 = 22.9 mH, R_G = 25 Ω , I_{AR} = 8 A

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

This transistor is an electrostatic-sensitive device.

Please handle with caution.

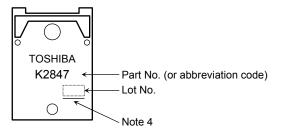
Electrical Characteristics (Ta = 25°C)

Chara	cteristics	Symbol	Test Condition	Min	Тур.	Max	Unit
Gate leakage cu	urrent	I _{GSS}	V _{GS} = ±30 V, V _{DS} = 0 V	_	_	±10	μΑ
Gate-source br	eakdown voltage	V (BR) GSS	I _G = ±10 μA, V _{DS} = 0 V	±30	_	_	V
Drain cut-off cu	rrent	I _{DSS}	V _{DS} = 720 V, V _{GS} = 0 V	_	_	100	μΑ
Drain-source b	reakdown voltage	V (BR) DSS	I _D = 10 mA, V _{GS} = 0 V	900	_	_	V
Gate threshold	voltage	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 = 4 A	_	1.1	1.4	Ω
Forward transfe	r admittance	Y _{fs}	V _{DS} = 15 V, I _D = 4 A	3.0	7.0	_	S
Input capacitan	ce	C _{iss}		_	2040	_	
Reverse transfer capacitance		C _{rss}	V _{DS} = 25 V, V _{GS} = 0 V, f = 1 MHz	_	45	_	pF
Output capacitance		Coss		_	190	_	
Switching time	Rise time	t _r	$V_{GS} \stackrel{10V}{\underset{0V}{\longrightarrow}} \stackrel{I_{D}=4A}{\underset{R_{L}}{\longrightarrow}} V_{OUT}$ $4.7\Omega \stackrel{*}{\underset{M}{\longrightarrow}} V_{DD}$ $= 400V$ $Duty \leq 1\%, \ t_{W} = 10\mu s$	_	25	_	
	Turn-on time	t _{on}		_	60	_	ne
	Fall time	t _f			20		ns
	Turn-off time	t _{off}			95		
Total gate charge (gate-source plus gate-drain)		Qg		_	58	_	_
Gate-source charge		Q _{gs}	V _{DD} ≈ 400 V, V _{GS} = 10 V, I _D = 8 A		32		nC
Gate-drain ("miller") Charge		Q _{gd}			26		

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

Characteristics	Symbol	Test Condition	Min	Тур.	Max	Unit
Continuous drain reverse current (Note 1)	I _{DR}	_	_	_	8	Α
Pulse drain reverse current (Note 1)	I _{DRP}	_	_	_	24	Α
Forward voltage (diode)	V _{DSF}	I _{DR} = 8 A, V _{GS} = 0 V	_	_	-1.9	V
Reverse recovery time	t _{rr}	I _{DR} = 8 A, V _{GS} = 0 V	_	1650	1	ns
Reverse recovery charge	Q _{rr}	dI _{DR} / dt = 100 A / μs	_	21		μC

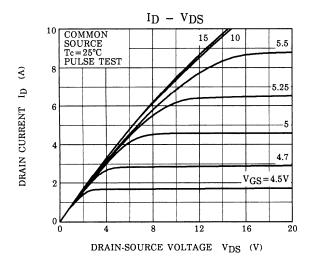
Marking

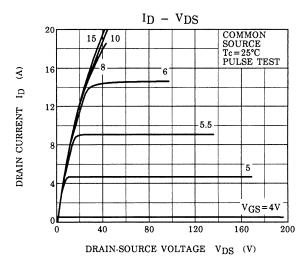


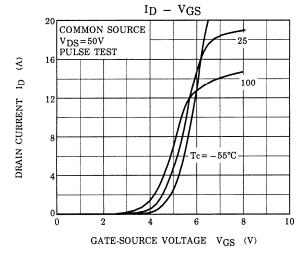
Note 4: A line under a Lot No. identifies the indication of product Labels.

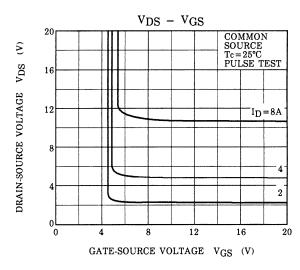
Not underlined: [[Pb]]/INCLUDES > MCV Underlined: [[G]]/RoHS COMPATIBLE or [[G]]/RoHS [[Pb]]

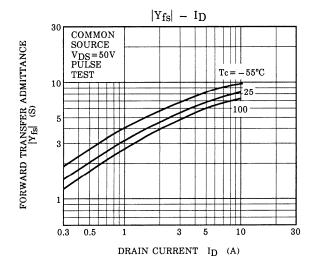
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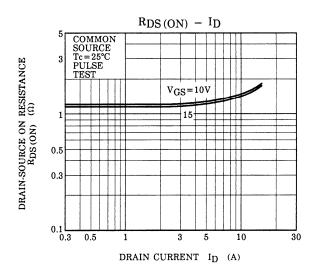




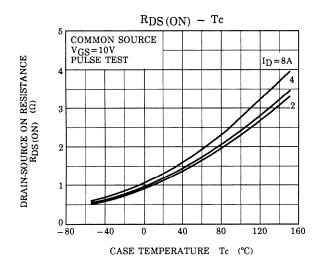


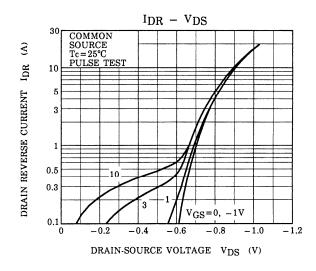


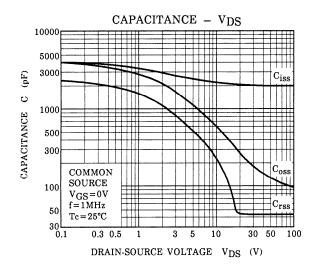


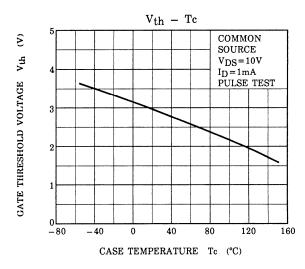


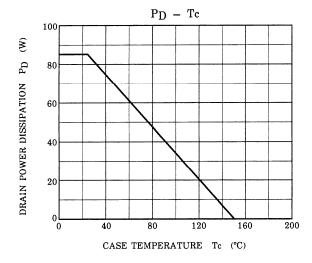
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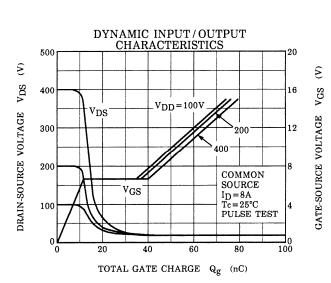


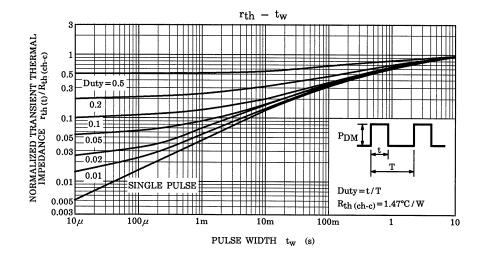


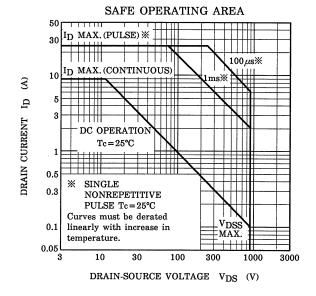


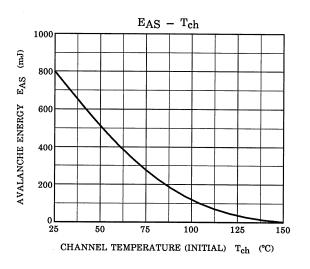


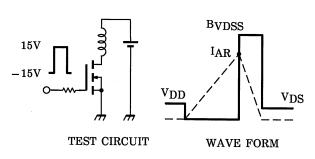












$$\begin{aligned} R_G &= 25~\Omega \\ V_{DD} &= 90~V,~L = 22.9~mH \end{aligned} \qquad EAS = \frac{1}{2} \cdot L \cdot I^2 \cdot \left(\frac{BVDSS}{BVDSS - VDD} \right) \end{aligned}$$

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