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

2SK2847

DC-DC Converter and Motor Drive Applications

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

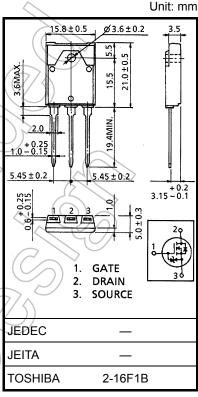
High forward transfer admittance : |Y_{fs}| = 7.0 S (typ.)

Low leakage current : $I_{DSS} = 100 \mu A \text{ (max) (V}_{DS} = 720 \text{ V)}$

• 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)

Characteri	stics	Symbol	Rating	Unit
Drain-source voltage		V_{DSS}	900	$\langle \rangle$
Drain-gate voltage (R	_{GS} = 20 kΩ)	V_{DGR}	900)>/
Gate-source voltage		V_{GSS}	±30	>
Drain current	DC (Note 1)	ΙD	8	Α
	Pulse (Note 1)	I _{DP}	24	Α
Drain power dissipatio	n (Tc = 25°C)	PD	85	W
Single pulse avalanche	e energy (Note 2)	E _{AS}	799	mJ mJ
Avalanche current		I _{AR})) 8	Α
Repetitive avalanche	energy (Note 3)	EAR	8.5	mJ
Channel temperature		T _{ch}	150	J°¢
Storage temperature r	ange	Tstg	-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.

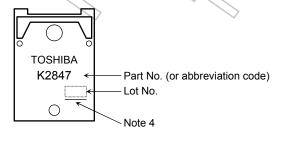
Electrical Characteristics (Ta = 25°C)

Charac	cteristics	Symbol	Test Condition	Min	Тур.	Max	Unit
Gate leakage cu	irrent	I _{GSS}	V _{GS} = ±30 V, V _{DS} = 0 V	_	_	±10	μA
Gate-source bre	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	1	_	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 = 4 A	7/~	1.1	1.4	Ω
Forward transfer	r admittance	Y _{fs}	V _{DS} = 15 V, I _D = 4 A	3.0	7.0	_	S
Input capacitano	e	C _{iss}			2040	-	
Reverse transfer capacitance		C _{rss}	V _{DS} = 25 V, V _{GS} = 0 V, f = 1 MHz	⁷ –	45	-	pF
Output capacitance		Coss		_	190		
Switching time	Rise time	t _r	$V_{GS} \stackrel{10V}{\underset{0V}{\text{ID}}} \stackrel{I_{D}=4A}{\underset{EI}{\text{NOUT}}}$	- (25	<u> </u>	-
	Turn-on time	t _{on}		<u></u>	60) –	
	Fall time	t _f	4.70 \$ V _{DD}	7	20	_	ns
	Turn-off time	t _{off}	Duty $\leq 1\%$, $t_{\rm W} = 10 \mu \rm s$		95	_	
Total gate charg plus gate-drain)		Qg			58		
Gate-source charge		Q _{gs}	$V_{DD} \approx 400 \text{ V}, V_{GS} = 10 \text{ V}, I_{D} = 8 \text{ A}$		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)	IDR	<u> </u>	_	_	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		I _{DR} = 8 A, V _{GS} = 0 V		1650	_	ns
Reverse recovery charge	Qrr	dl _{DR} / dt = 100 A / μs	_	21	_	μC

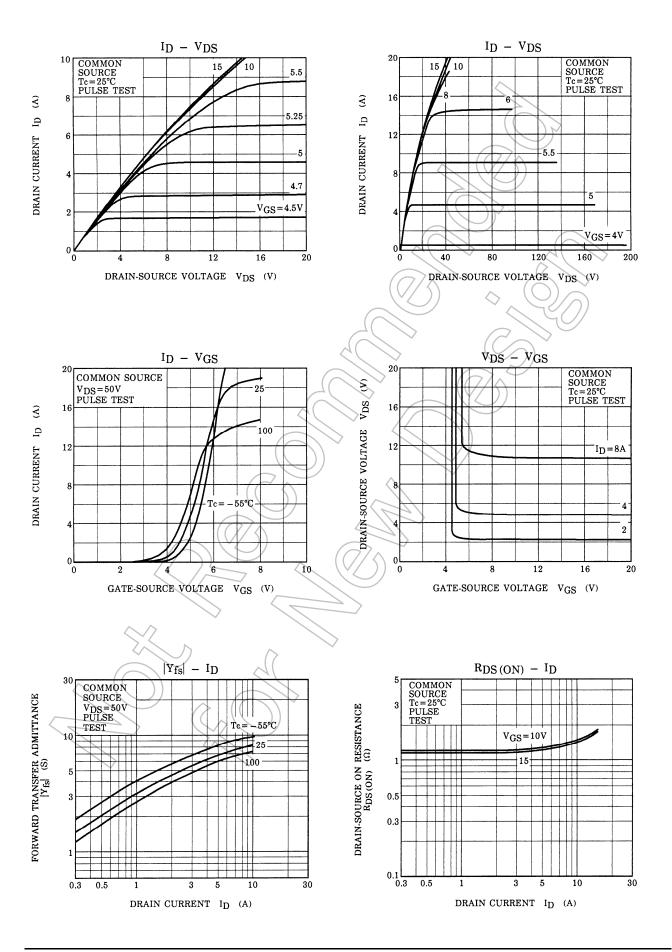
Marking

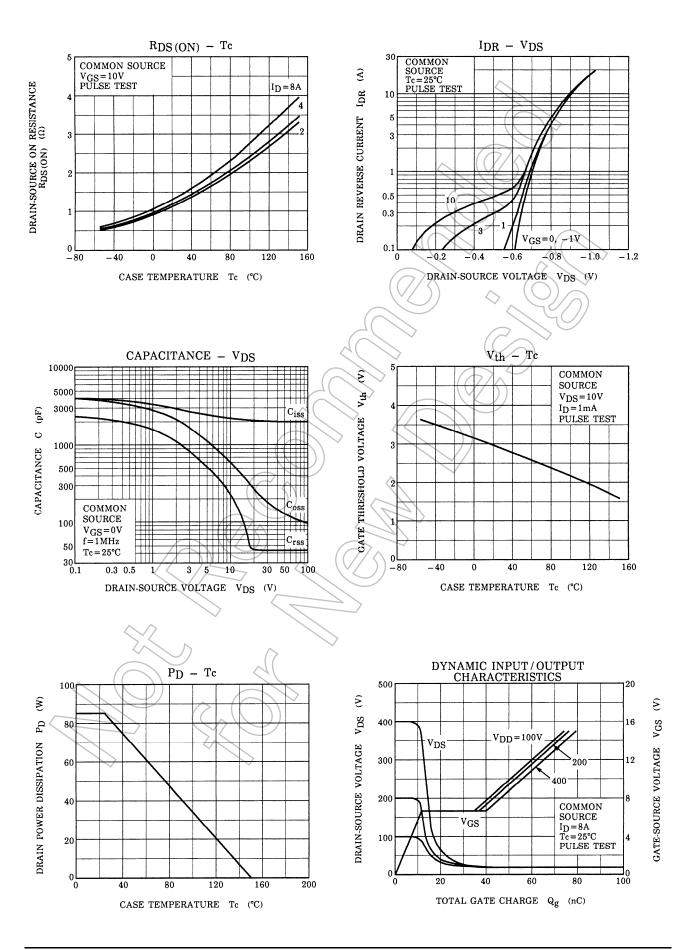


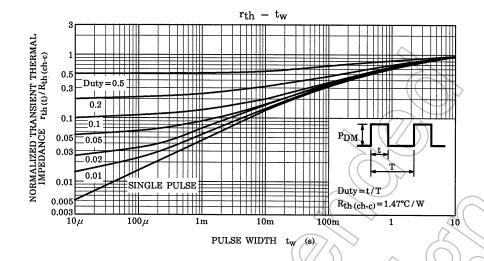
Note 4: A line under a Lot No. identifies the indication of product Labels.

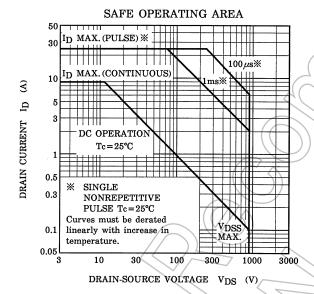
Not underlined: [[Pb]]/INCLUDES > MCV Underlined: [[G]]/RoHS COMPATIBLE or [[G]]/RoHS [[Pb]]

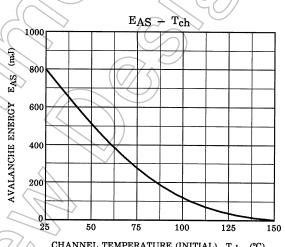
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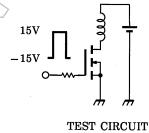


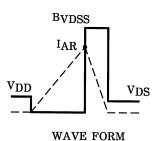






Channel temperature (initial) T_{ch} (°C)





 $R_G = 25 \Omega$ $V_{DD} = 90 \text{ V, L} = 22.9 \text{ mH}$

$$EAS = \frac{1}{2} \cdot L \cdot I^2 \cdot \left(\frac{BVDSS}{BVDSS - VDD} \right)$$

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