TOSHIBA Field Effect Transistor Silicon N Channel MOS Type ($L^2-\pi$ -MOSV)

2SK3205

Switching Regulator Applications DC–DC Converter, and Motor Drive Applications

- 4 V gate drive
- Low drain-source ON resistance $R_{DS}(ON) = 0.36 \Omega$ (typ.)
- High forward transfer admittance $|Y_{fs}| = 4.5 \text{ S (typ.)}$
- Low leakage current $: I_{DSS} = 100 \ \mu A \ (max) \ (V_{DS} = 150 \ V)$
- Enhancement-mode $: V_{th} = 0.8 \sim 2.0 \text{ V} (V_{DS} = 10 \text{ V}, \text{ ID} = 1 \text{ mA})$

Absolute Maximum Ratings (Ta = 25°C)

Characteris	stics	Symbol	Rating	Unit	
Drain-source voltage		V _{DSS}	150	V	
Drain-gate voltage (R	_{GS} = 20 kΩ)	V _{DGR}	150	V	
Gate-source voltage		V _{GSS}	±20	V	
Drain current	DC (Note 1)	۱ _D	5	А	
	Pulse (Note 1)	I _{DP}	20	A	
Drain power dissipation	n (Tc = 25°C)	PD	20	W	
Single pulse avalanche	e energy (Note 2)	E _{AS}	71	mJ	
Avalanche current		I _{AR}	5	А	
Repetitive avalanche e	ve avalanche energy (Note 3)		2	mJ	
Channel temperature		T _{ch}	150	°C	
Storage temperature ra	ange	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

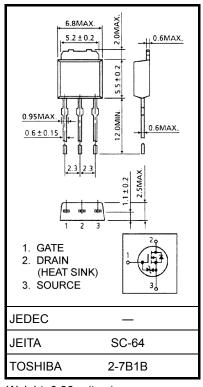
Characteristics	Symbol	Max	Unit
Thermal resistance, channel to case	R _{th (ch-c)}	6.25	°C / W
Thermal resistance, channel to ambient	R _{th (ch−a)}	125	°C / W

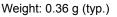
Note 1: Please use devices on condition that the channel temperature is below 150°C.

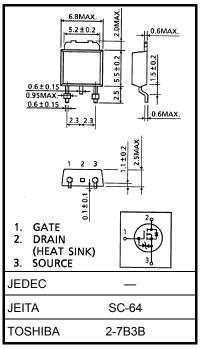
Note 2: V_{DD} = 50 V, T_{ch} = 25°C (initial), L = 4.2 mH, I_{AR} = 5 A, R_G = 25 Ω

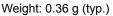
Note 3: Repetitive rating; Pulse width limited by maximum channel temperature.

This transistor is an electrostatic sensitive device. Please handle with caution.









Unit: mm

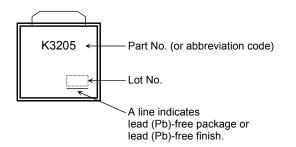
Electrical Characteristics (Ta = 25°C)

Charao	cteristics	Symbol	Test Condition	Min	Тур.	Max	Unit	
Gate leakage cu	ırrent	I _{GSS}	V _{GS} = ±16 V, V _{DS} = 0 V		_	±10	μA	
Drain cut-off cu	rrent	I _{DSS}	V _{DS} = 150 V, V _{GS} = 0 V	_		100	μA	
Drain-source br	eakdown voltage	V (BR) DSS	I _D = 10 mA, V _{GS} = 0 V	150	_	_	V	
Gate threshold	voltage	V _{th}	V _{DS} = 10 V, I _D = 1 mA	0.8	_	2.0	V	
Drain-source ON resistance		R _{DS (ON)}	V _{GS} = 4 V, I _D = 2.5 A	_	0.54	0.75	Ω	
		R _{DS (ON)}	V _{GS} = 10 V, I _D = 2.5 A	_	0.36	0.5		
Forward transfe	r admittance	Y _{fs}	V _{DS} = 10 V, I _D = 2.5 A	2.0	4.5	_	S	
Input capacitant	ce	C _{iss}	C _{iss}		330	_	pF	
Reverse transfer capacitance		C _{rss}	V _{DS} = 10 V, V _{GS} = 0 V, f = 1 MHz	_	50	_		
Output capacitance		C _{oss}		_	145	_		
Switching time	Rise time	tr	$V_{GS} \stackrel{10V}{}_{0V} \stackrel{I_{D}=2.5A}{}_{0V} \stackrel{V_{OUT}}{}_{0V} \stackrel{I_{D}=2.5A}{}_{R_{L}=40\Omega}$	_	10	_		
	Turn-on time	t _{on}		_	15	_	20	
	Fall time	t _f		_	10	_	- ns	
	Turn-off time	t _{off}	V_{DD} ≒100V Duty ≤1%, t _w =10µs	_	60			
Total gate charge (Gate-source plus gate-drain)		Qg		_	12	_		
Gate-source charge		Q _{gs}	V _{DD} ≈ 120 V, V _{GS} = 10 V, I _D = 5 A		8		nC	
Gate-drain ("miller") charge		Q _{gd}			4	—		

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	А
Pulse drain reverse current (Note 1)	I _{DRP}	_	_		20	А
Forward voltage (diode)	V _{DSF}	I _{DR} = 5 A, V _{GS} = 0 V	_	_	-1.7	V
Reverse recovery time	t _{rr}	I _{DR} = 5 A, V _{GS} = 0 V, dI _{DR} / dt = 100 A / μs		110		ns
Reverse recovery charge	Q _{rr}		_	0.47	_	nC

Marking



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20070701-EN

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