

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

2SK3205

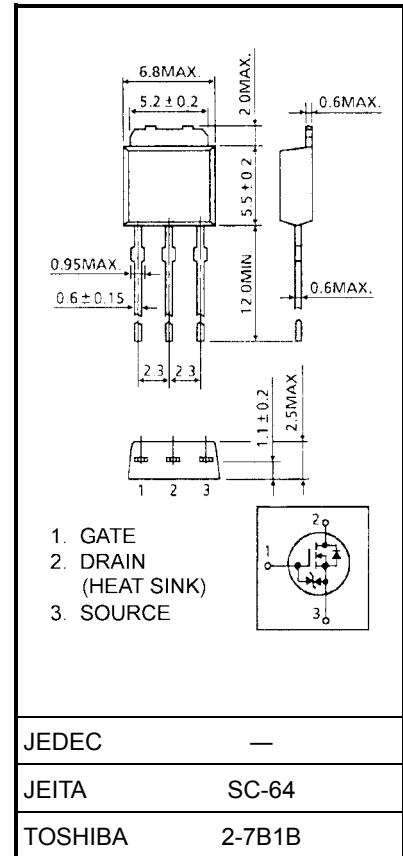
Switching Regulator Applications DC-DC Converter, and Motor Drive Applications

Unit: mm

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

Maximum Ratings ($T_a = 25^\circ C$)

Characteristics		Symbol	Rating	Unit
Drain-source voltage		V_{DSS}	150	V
Drain-gate voltage ($R_{GS} = 20 k\Omega$)		V_{DGR}	150	V
Gate-source voltage		V_{GSS}	± 20	V
Drain current	DC (Note 1)	I_D	5	A
	Pulse (Note 1)	I_{DP}	20	
Drain power dissipation ($T_c = 25^\circ C$)		P_D	20	W
Single pulse avalanche energy (Note 2)		E_{AS}	71	mJ
Avalanche current		I_{AR}	5	A
Repetitive avalanche energy (Note 3)		E_{AR}	2	mJ
Channel temperature		T_{ch}	150	$^\circ C$
Storage temperature range		T_{stg}	-55~150	$^\circ C$



Weight: 0.36 g (typ.)

Thermal Characteristics

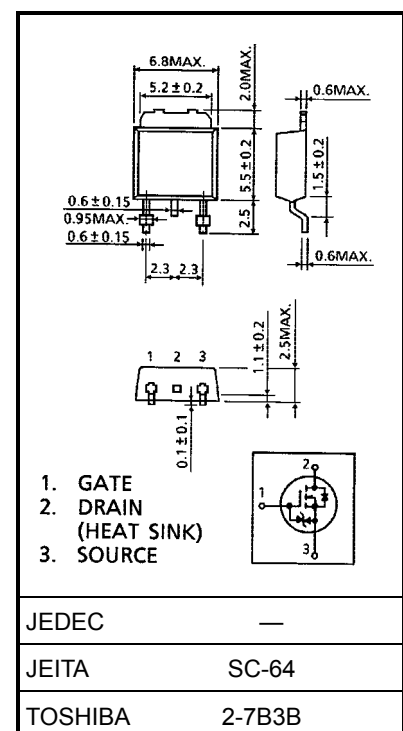
Characteristics	Symbol	Max	Unit
Thermal resistance, channel to case	$R_{th(ch-c)}$	6.25	$^\circ C / W$
Thermal resistance, channel to ambient	$R_{th(ch-a)}$	125	$^\circ C / W$

Note 1: Please use devices on condition that the channel temperature is below $150^\circ C$.

Note 2: $V_{DD} = 50 V$, $T_{ch} = 25^\circ C$ (initial), $L = 4.2 mH$, $I_{AR} = 5 A$, $R_G = 25 \Omega$,

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

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



Weight: 0.36 g (typ.)

Electrical Characteristics (Ta = 25°C)

Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Gate leakage current		I_{GSS}	$V_{GS} = \pm 16\text{ V}, V_{DS} = 0\text{ V}$	—	—	± 10	μA
Drain cut-off current		I_{DSS}	$V_{DS} = 150\text{ V}, V_{GS} = 0\text{ V}$	—	—	100	μA
Drain-source breakdown voltage		$V_{(BR)DSS}$	$I_D = 10\text{ mA}, V_{GS} = 0\text{ V}$	150	—	—	V
Gate threshold voltage		V_{th}	$V_{DS} = 10\text{ V}, I_D = 1\text{ mA}$	0.8	—	2.0	V
Drain-source ON resistance		$R_{DS(ON)}$	$V_{GS} = 4\text{ V}, I_D = 2.5\text{ A}$	—	0.54	0.75	Ω
		$R_{DS(ON)}$	$V_{GS} = 10\text{ V}, I_D = 2.5\text{ A}$	—	0.36	0.5	
Forward transfer admittance		$ Y_{fs} $	$V_{DS} = 10\text{ V}, I_D = 2.5\text{ A}$	2.0	4.5	—	S
Input capacitance		C_{iss}	$V_{DS} = 10\text{ V}, V_{GS} = 0\text{ V}, f = 1\text{ MHz}$	—	330	—	pF
Reverse transfer capacitance		C_{rss}		—	50	—	
Output capacitance		C_{oss}		—	145	—	
Switching time	Rise time	t_r	<p>$I_D = 2.5\text{ A}$ $V_{GS} = 10\text{ V}, 0\text{ V}$ 4.7Ω $R_L = 40\Omega$ $V_{DD} = 100\text{ V}$ V_{OUT} Duty $\leq 1\%$, $t_w = 10\mu\text{s}$</p>	—	10	—	ns
	Turn-on time	t_{on}		—	15	—	
	Fall time	t_f		—	10	—	
	Turn-off time	t_{off}		—	60	—	
Total gate charge (Gate-source plus gate-drain)		Q_g	$V_{DD} \approx 120\text{ V}, V_{GS} = 10\text{ V}, I_D = 5\text{ A}$	—	12	—	nC
Gate-source charge		Q_{gs}		—	8	—	
Gate-drain ("miller") charge		Q_{gd}		—	4	—	

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

Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Continuous drain reverse current (Note 1)		I_{DR}	—	—	—	5	A
Pulse drain reverse current (Note 1)		I_{DRP}	—	—	—	20	A
Forward voltage (diode)		V_{DSF}	$I_{DR} = 5\text{ A}, V_{GS} = 0\text{ V}$	—	—	-1.7	V
Reverse recovery time		t_{rr}	$I_{DR} = 5\text{ A}, V_{GS} = 0\text{ V}, dI_{DR} / dt = 100\text{ A} / \mu\text{s}$	—	110	—	ns
Reverse recovery charge		Q_{rr}		—	0.47	—	nC

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