

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

2SK2614

Chopper Regulator, DC/DC Converter and Motor Drive Applications

Unit: mm

- 4 V gate drive
- Low drain-source ON-resistance : $R_{DS(ON)} = 0.032 \Omega$ (typ.)
- High forward transfer admittance : $|Y_{fs}| = 13S$ (typ.)
- Low leakage current : $I_{DSS} = 100 \mu A$ (max) ($V_{DS} = 50 V$)
- Enhancement mode : $V_{th} = 0.8 \sim 2.0 V$ ($V_{DS} = 10 V$, $I_D = 1 mA$)

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

Characteristic	Symbol	Rating	Unit
Drain-source voltage	V_{DSS}	50	V
Drain-gate voltage ($R_{GS} = 20 k\Omega$)	V_{DGR}	50	V
Gate-source voltage	V_{GSS}	± 20	V
Drain current	DC (Note 1)	I_D	20
	Pulse (Note 1)	I_{DP}	50
Drain power dissipation ($T_c = 25^\circ C$)	P_D	40	W
Channel temperature	T_{ch}	150	$^\circ C$
Storage temperature range	T_{stg}	$-55 \sim 150$	$^\circ C$

Note 1: Ensure that the channel temperature does not exceed $150^\circ C$.

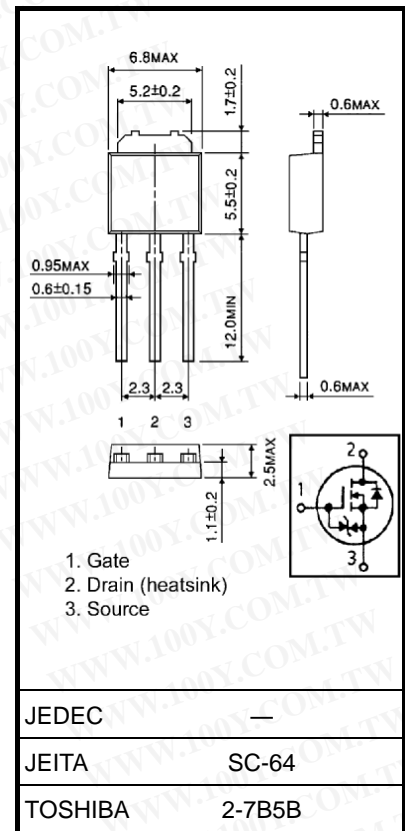
Note 2: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) 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

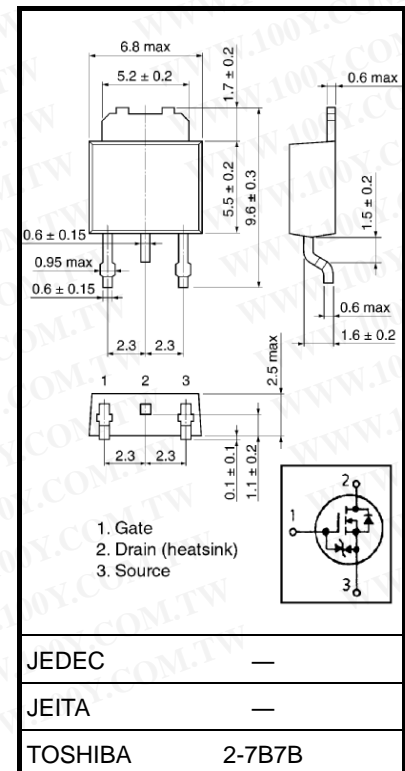
Characteristic	Symbol	Max	Unit
Thermal resistance, channel to case	$R_{th(ch-c)}$	3.125	$^\circ C / W$
Thermal resistance, channel to ambient	$R_{th(ch-a)}$	125	$^\circ C / W$

This transistor is an electrostatic-sensitive device. Handle with care.

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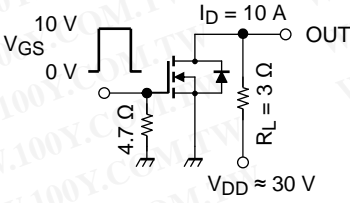


Weight: 0.36 g (typ.)



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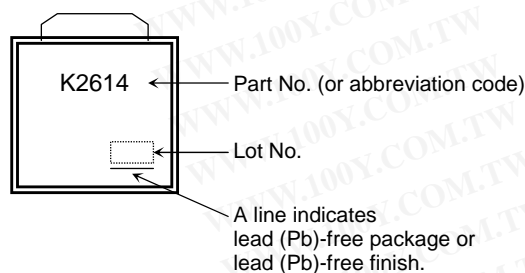
Electrical Characteristics (Ta = 25°C)

Characteristic		Symbol	Test Condition	Min	Typ.	Max	Unit
Gate leakage current		I _{GSS}	V _{GS} = ±16 V, V _{DS} = 0 V	—	—	±10	μA
Drain cutoff current		I _{DSS}	V _{DS} = 50 V, V _{GS} = 0 V	—	—	100	μA
Drain-source breakdown voltage		V _(BR) DSS	I _D = 10 mA, V _{GS} = 0 V	50	—	—	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 _{DS} = 4 V, I _D = 5 A	—	0.055	0.08	Ω
			V _{DS} = 10 V, I _D = 10 A	—	0.032	0.046	
Forward transfer admittance		Y _{fs}	V _{DS} = 10 V, I _D = 10 A	7	13	—	S
Input capacitance		C _{iss}	V _{DS} = 10 V, V _{GS} = 0 V, f = 1 MHz	—	900	—	pF
Reverse transfer capacitance		C _{rss}		—	130	—	
Output capacitance		C _{oss}		—	370	—	
Switching time	Rise time	t _r	 Duty ≤ 1%, t _w = 10 μs	—	15	—	ns
	Turn-on time	t _{on}		—	25	—	
	Fall time	t _f		—	30	—	
	Turn-off time	t _{off}		—	100	—	
Total gate charge (gate-source plus gate-drain)		Q _g	V _{DD} ≈ 40 V, V _{GS} = 10 V, I _D = 20 A	—	25	—	nC
Gate-source charge		Q _{gs}		—	19	—	
Gate-drain ("Miller") charge		Q _{gd}		—	6	—	

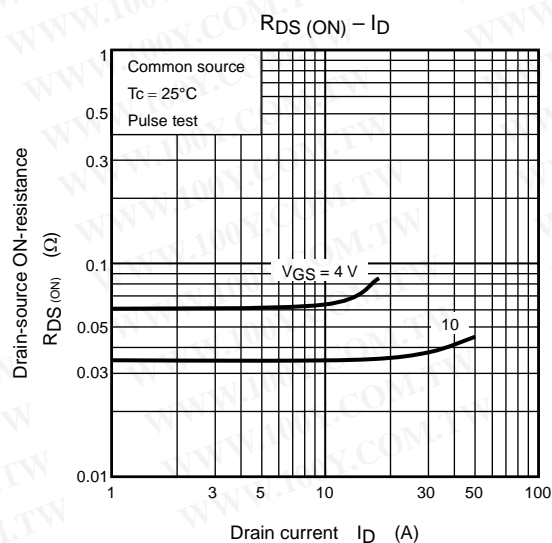
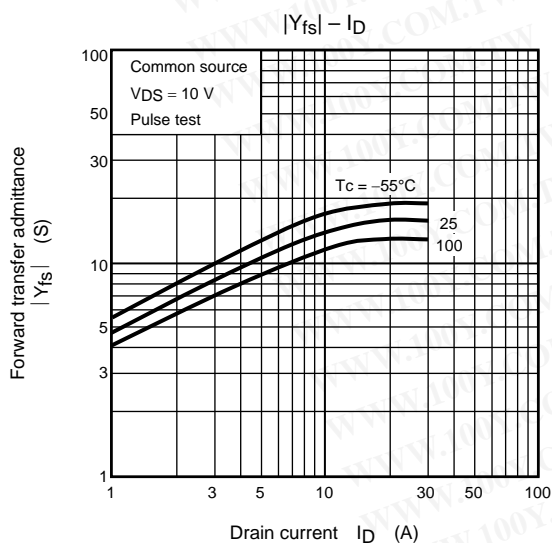
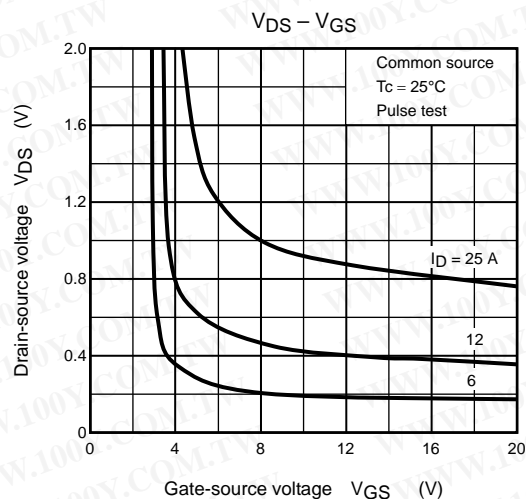
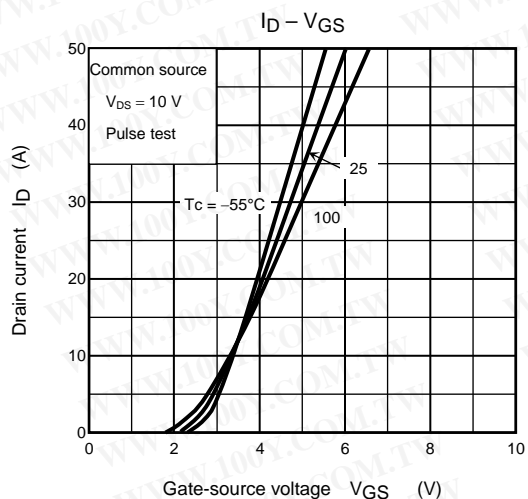
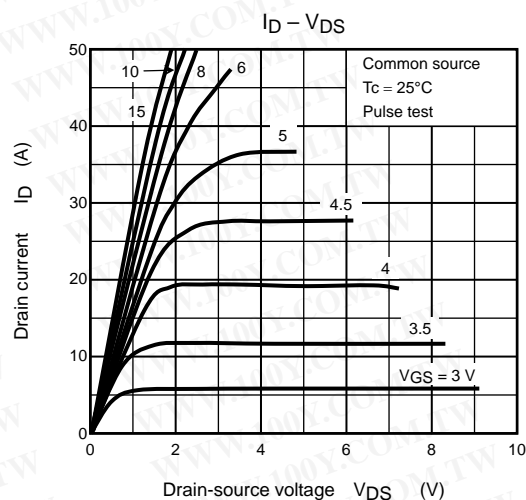
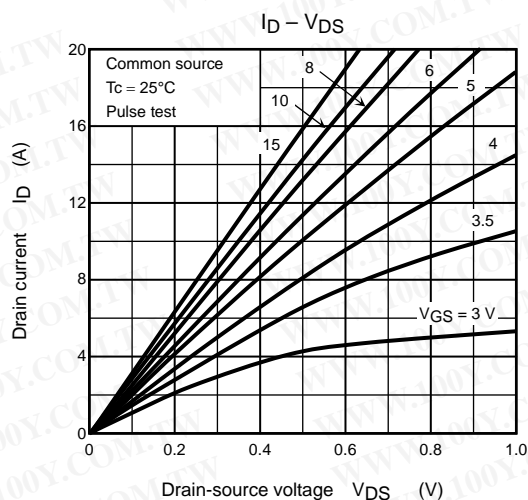
Source-Drain Ratings and Characteristics (Ta = 25°C)

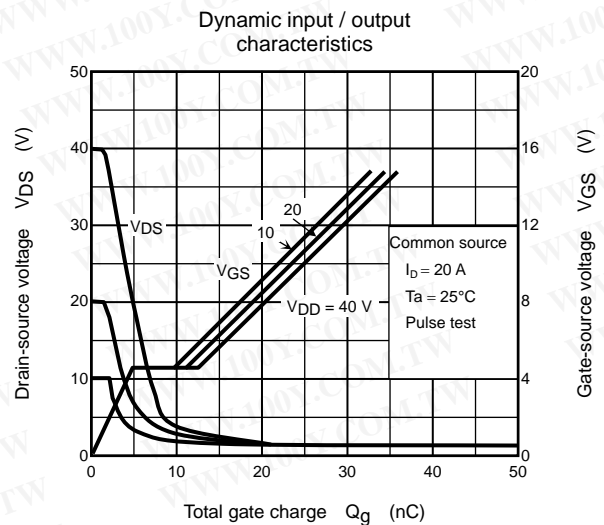
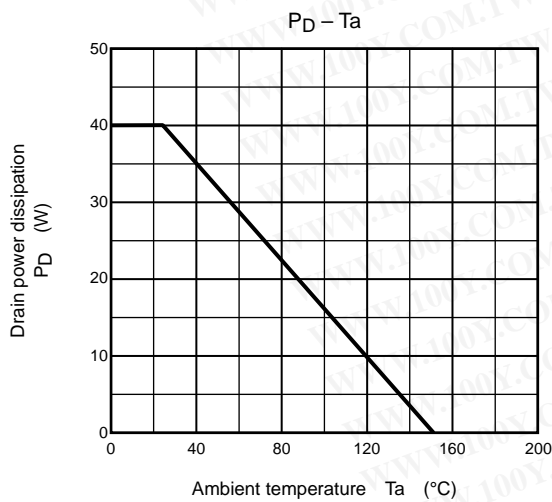
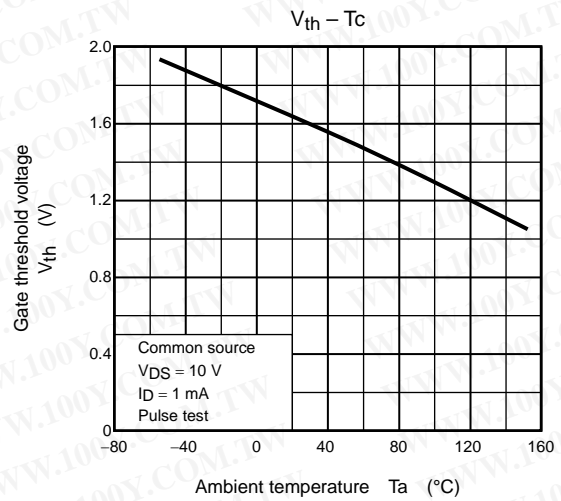
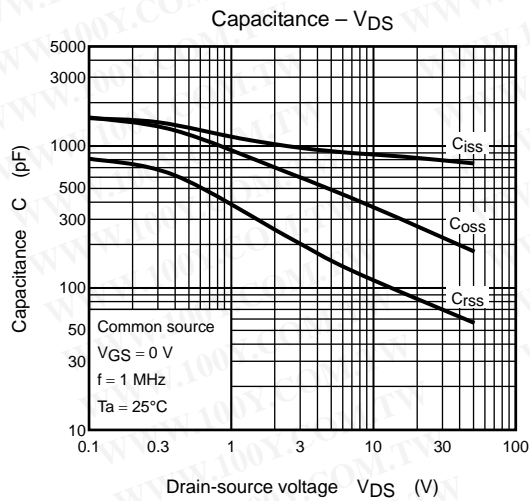
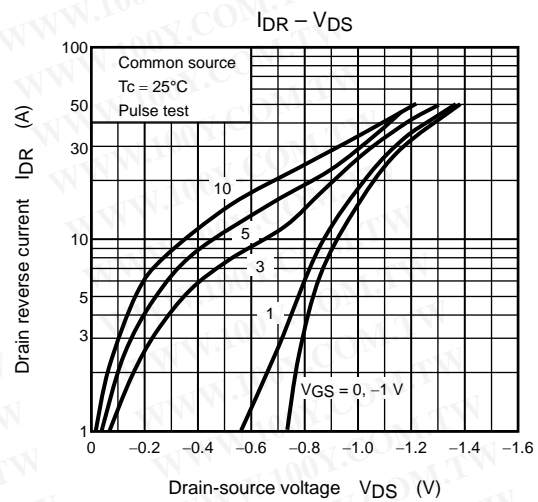
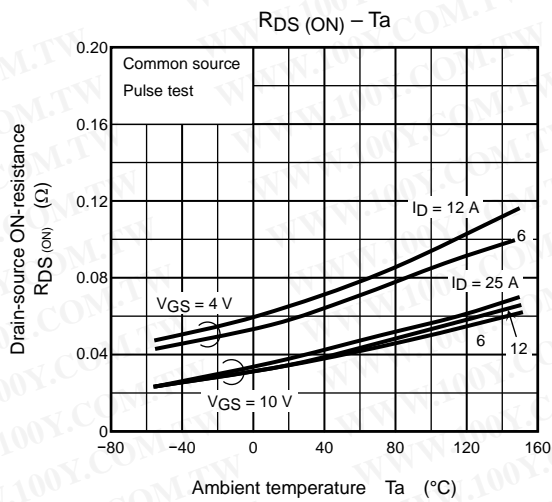
Characteristic	Symbol	Test Condition	Min	Typ.	Max	Unit
Continuous drain reverse current (Note 1)	I _{DR}	—	—	—	20	A
Pulse drain reverse current (Note 1)	I _{DRP}	—	—	—	50	A
Forward voltage (diode)	V _{DSF}	I _{DR} = 20 A, V _{GS} = 0 V	—	—	-1.7	V
Reverse recovery time	t _{rr}	I _{DR} = 20 A, V _{GS} = 0 V, dI _{DR} / dt = 50 A / μs	—	60	—	ns
Reverse recovery charge	Q _{rr}		—	45	—	μC

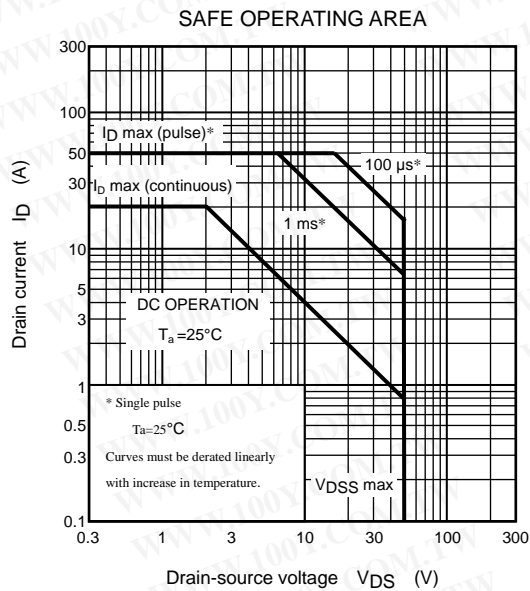
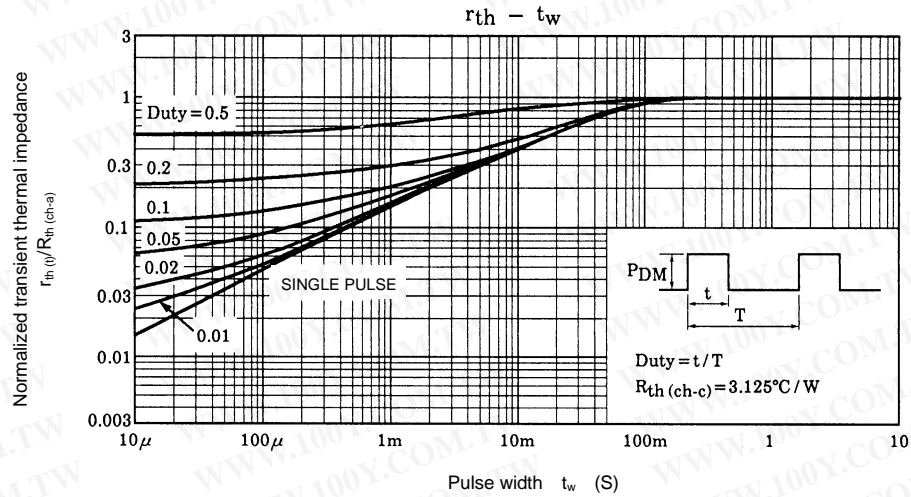
Marking



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