

2SK3302

Switching Regulator, DC-DC Converter Applications

- Low drain-source ON resistance: $R_{DS(ON)} = 11.5\ \Omega$ (typ.)
- High forward transfer admittance: $|Y_{fs}| = 0.4\ S$ (typ.)
- Low leakage current: $I_{DSS} = 100\ \mu A$ (max) ($V_{DS} = 500\ V$)
- Enhancement-model: $V_{th} = 2.0\sim 4.0\ V$ ($V_{DS} = 10\ V$, $I_D = 1\ mA$)

Maximum Ratings (Ta = 25°C)

Characteristics		Symbol	Rating	Unit
Drain-source voltage		V_{DSS}	500	V
Drain-gate voltage ($R_{GS} = 20\ k\Omega$)		V_{DGR}	500	V
Gate-source voltage		V_{GSS}	± 30	V
Drain current	DC (Note 1)	I_D	0.5	A
	Pulse (Note 1)	I_{DP}	1.5	
Drain power dissipation		P_D	1.3	W
Single pulse avalanche energy (Note 2)		E_{AS}	14.3	mJ
Avalanche current		I_{AR}	0.5	A
Repetitive avalanche energy (Note 3)		E_{AR}	0.13	mJ
Channel temperature		T_{ch}	150	°C
Storage temperature range		T_{stg}	$-55\sim 150$	°C

Thermal Characteristics

Characteristics	Symbol	Max	Unit
Thermal resistance, channel to ambient	$R_{th(ch-a)}$	96.1	°C/W

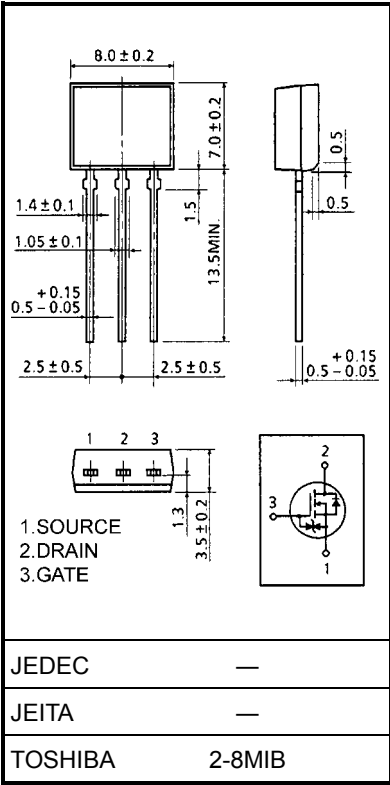
Note 1: Please use device on condition that the channel temperature is below 150°C.

Note 2: $V_{DD} = 90\ V$, $T_{ch} = 25^\circ C$, $L = 100\ mH$, $R_G = 25\ \Omega$, $I_{AR} = 0.5\ A$

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

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

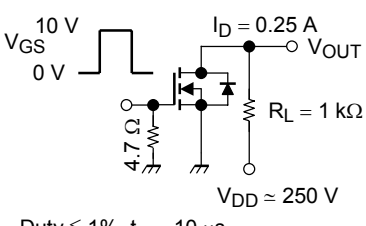
Unit: mm



Weight: 1.9 g (typ.)

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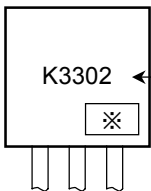
Electrical Characteristics (Ta = 25°C)

Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Gate leakage current		I_{GSS}	$V_{GS} = \pm 25\text{ V}, V_{DS} = 0\text{ V}$	—	—	± 10	μA
Gate-source breakdown voltage		$V_{(BR)GSS}$	$I_G = \pm 10\text{ }\mu\text{A}, V_{GS} = 0\text{ V}$	± 30	—	—	V
Drain cut-OFF current		I_{DSS}	$V_{DS} = 500\text{ V}, V_{GS} = 0\text{ V}$	—	—	100	μA
Drain-source breakdown voltage		$V_{(BR)DSS}$	$I_D = 10\text{ mA}, V_{GS} = 0\text{ V}$	500	—	—	V
Gate threshold voltage		V_{th}	$V_{DS} = 10\text{ V}, I_D = 1\text{ mA}$	2.0	—	4.0	V
Drain-source ON resistance		$R_{DS(ON)}$	$V_{GS} = 10\text{ V}, I_D = 0.25\text{ A}$	—	10	18	Ω
Forward transfer admittance		$ Y_{fs} $	$V_{DS} = 10\text{ V}, I_D = 0.25\text{ A}$	0.2	0.4	—	S
Input capacitance		C_{iss}	$V_{DS} = 10\text{ V}, V_{GS} = 0\text{ V}, f = 1\text{ MHz}$	—	75	—	pF
Reverse transfer capacitance		C_{rss}		—	7	—	
Output capacitance		C_{oss}		—	24	—	
Switching time	Rise time	t_r		—	11	—	ns
	Turn-ON time	t_{on}		—	18	—	
	Fall time	t_f		—	54	—	
	Turn-OFF time	t_{off}		—	95	—	
Total gate charge (gate-source plus gate-drain)		Q_g	$V_{DD} \approx 400\text{ V}, V_{GS} = 10\text{ V}, I_D = 0.5\text{ A}$	—	3.8	—	nC
Gate-source charge		Q_{gs}		—	1.9	—	
Gate-drain ("miller") charge		Q_{gd}		—	1.9	—	

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

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Continuous drain reverse current (Note 1)	I_{DR}	—	—	—	0.5	A
Pulse drain reverse current (Note 1)	I_{DRP}	—	—	—	1.5	A
Forward voltage (diode)	V_{DSF}	$I_{DR} = 0.5\text{ A}, V_{GS} = 0\text{ V}$	—	—	−1.5	V
Reverse recovery time	t_{rr}	$I_{DR} = 0.5\text{ A}, V_{GS} = 0\text{ V},$	—	190	—	ns
Reverse recovery charge	Q_{rr}	$dI_{DR}/dt = 100\text{ A}/\mu\text{s}$	—	380	—	nC

Marking



← Type

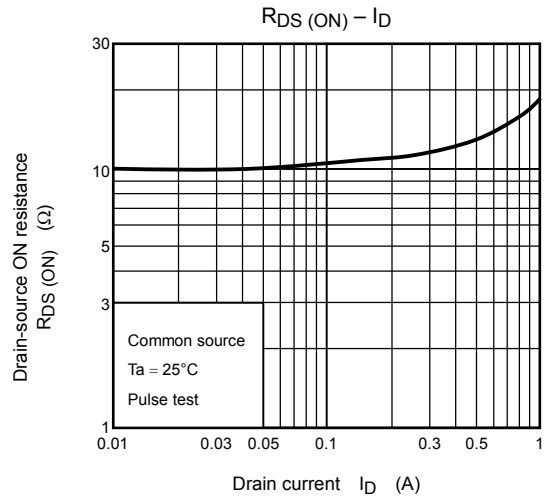
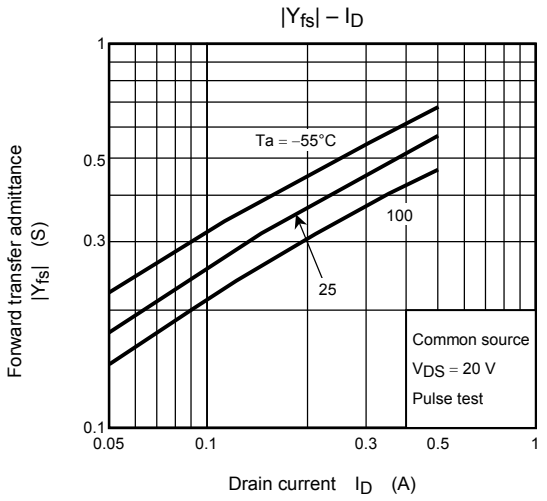
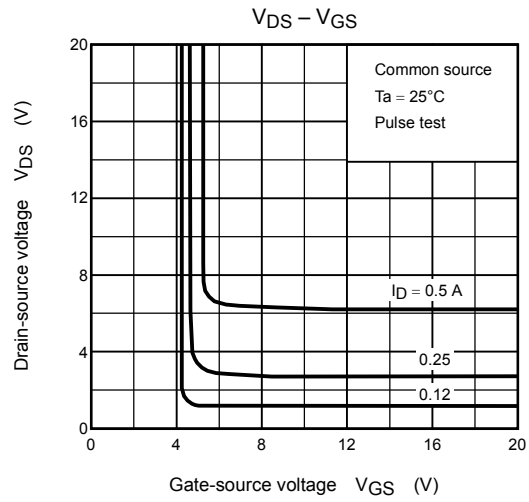
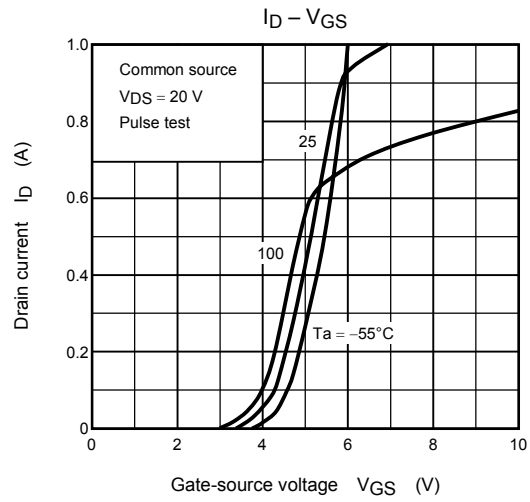
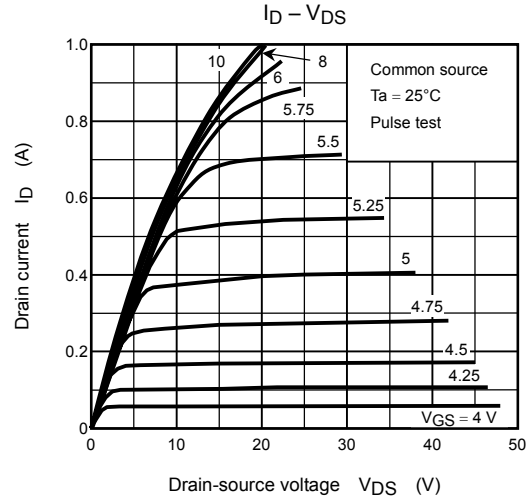
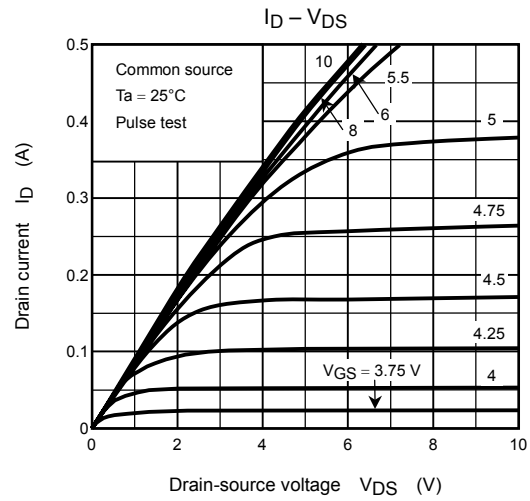
※ Lot Number



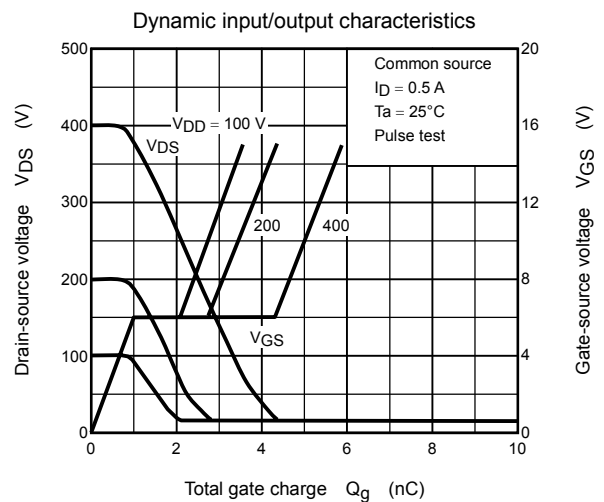
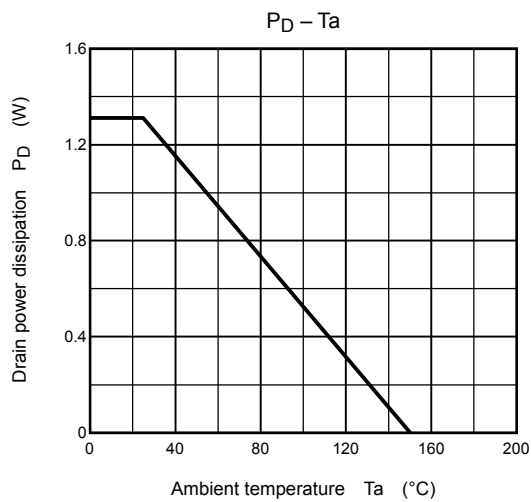
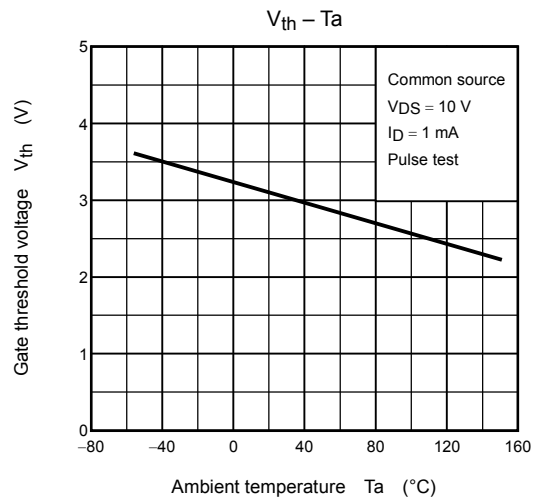
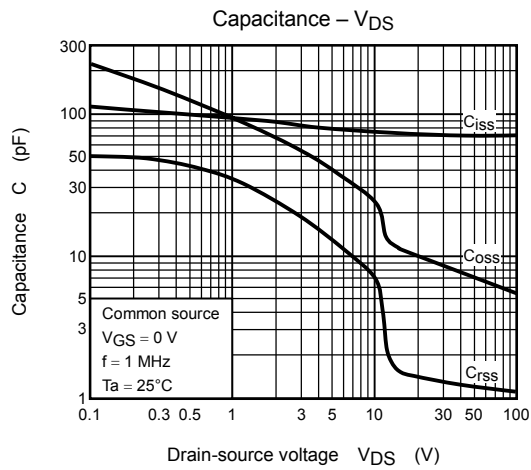
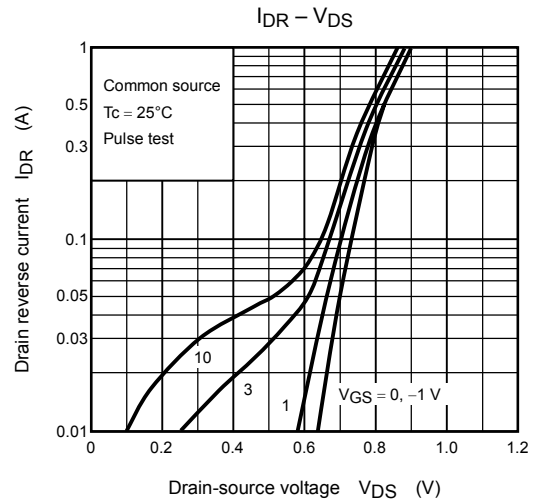
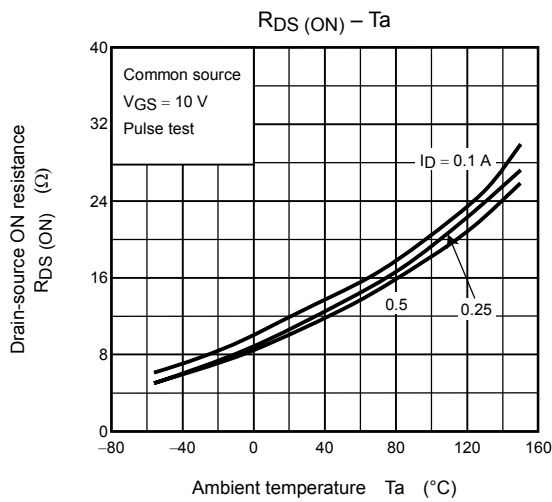
← Month (starting from alphabet A)

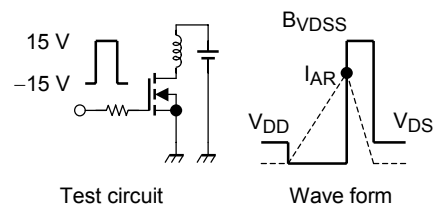
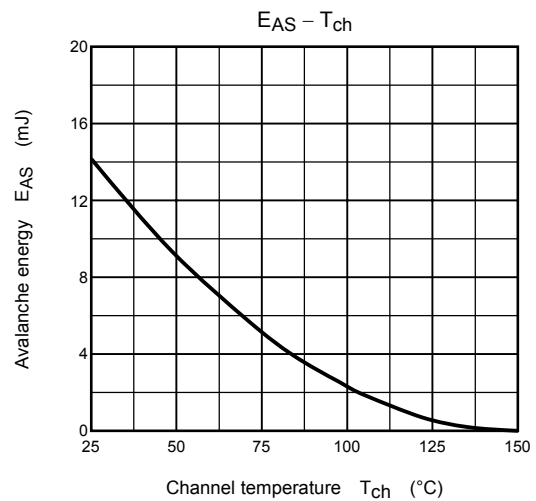
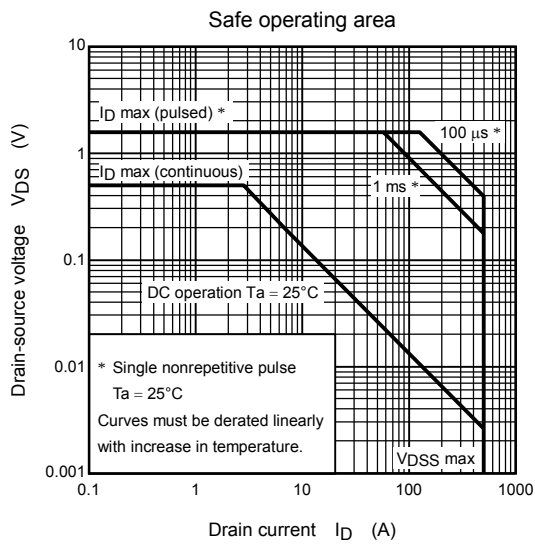
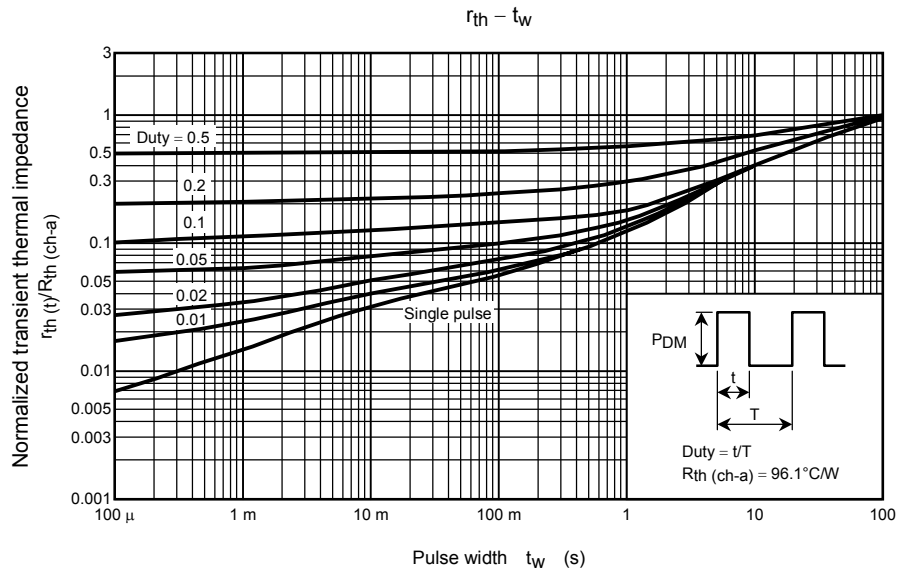
← Year (last number of the christian era)

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$$R_G = 25 \, \Omega$$

$$V_{DD} = 90 \, V, L = 100 \, mH$$

$$E_{AS} = \frac{1}{2} \cdot L \cdot I_{AR}^2 \cdot \left(\frac{B_{VDSS}}{B_{VDSS} - V_{DD}} \right)$$

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