

2SK2746

DC-DC Converter and Motor Drive Applications

- Low drain-source ON resistance : $R_{DS(ON)} = 1.3 \Omega$ (typ.)
- High forward transfer admittance : $|Y_{fs}| = 5.0 S$ (typ.)
- Low leakage current : $I_{DSS} = 100 \mu A$ (max) ($V_{DS} = 640 V$)
- Enhancement mode : $V_{th} = 2.0 \sim 4.0 V$ ($V_{DS} = 10 V, I_D = 1 mA$)

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

Characteristics	Symbol	Rating	Unit
Drain-source voltage	V_{DSS}	800	V
Drain-gate voltage ($R_{GS} = 20 k\Omega$)	V_{DGR}	800	V
Gate-source voltage	V_{GSS}	± 30	V
Drain current	DC (Note 1)	I_D	7 A
	Pulse (Note 1)	I_{DP}	21 A
Drain power dissipation ($T_c = 25^\circ C$)	P_D	150	W
Single pulse avalanche energy (Note 2)	E_{AS}	673	mJ
Avalanche current	I_{AR}	7	A
Repetitive avalanche energy (Note 3)	E_{AR}	15	mJ
Channel temperature	T_{ch}	150	$^\circ C$
Storage temperature range	T_{stg}	-55~150	$^\circ C$

Thermal Characteristics

Characteristics	Symbol	Max	Unit
Thermal resistance, channel to case	$R_{th(ch-c)}$	0.833	$^\circ C / W$
Thermal resistance, channel to ambient	$R_{th(ch-a)}$	50	$^\circ C / W$

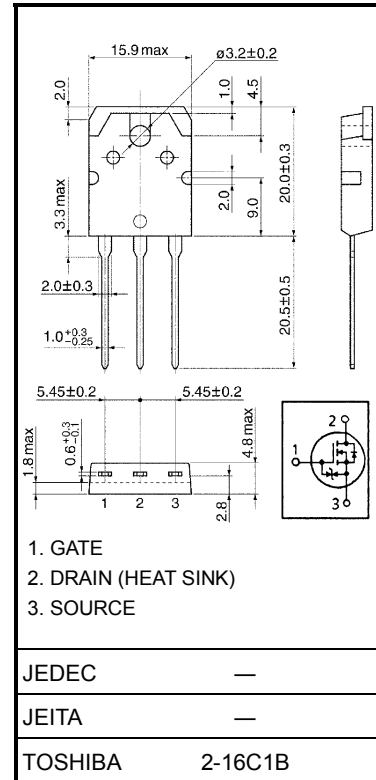
Note 1: Ensure that the channel temperature does not exceed $150^\circ C$.

Note 2: $V_{DD} = 90 V, T_{ch} = 25^\circ C$ (initial), $L = 24.9 mH, R_G = 25 \Omega, I_{AR} = 7 A$

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: 4.6 g (typ.)

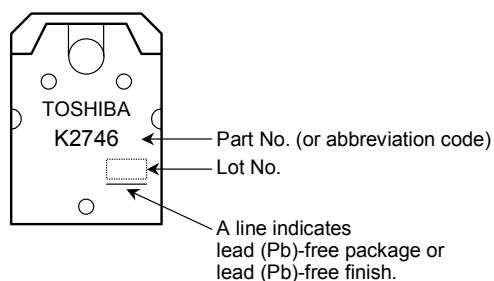
Electrical Characteristics (Ta = 25°C)

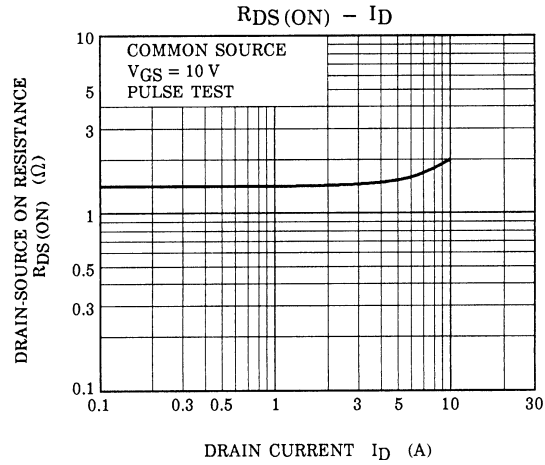
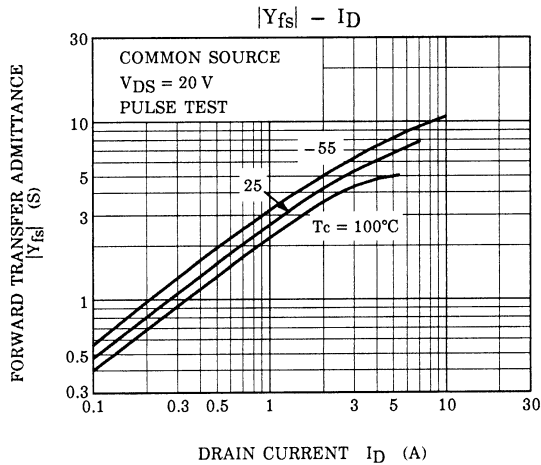
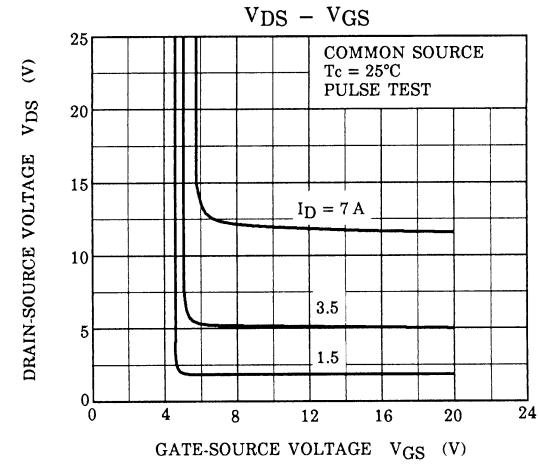
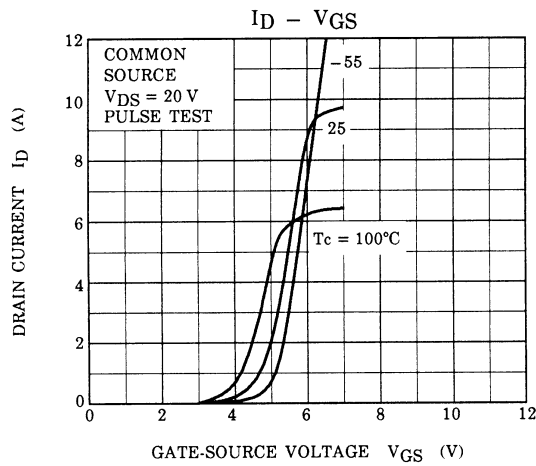
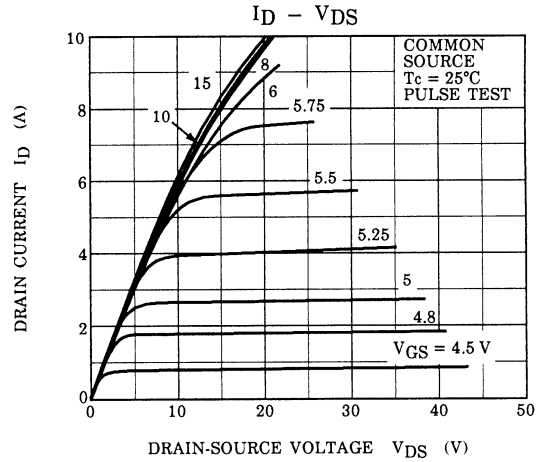
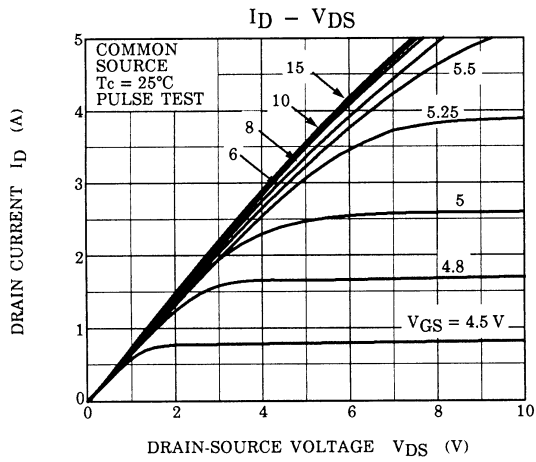
Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Gate leakage current		I_{GSS}	$V_{GS} = \pm 30\text{ V}, V_{DS} = 0\text{ V}$	—	—	± 10	μA
Gate-source breakdown voltage		$V_{(BR)GSS}$	$I_G = \pm 10\ \mu\text{A}, V_{DS} = 0\text{ V}$	± 30	—	—	V
Drain cut-off current		I_{DSS}	$V_{DS} = 640\text{ V}, V_{GS} = 0\text{ V}$	—	—	100	μA
Drain-source breakdown voltage		$V_{(BR)DSS}$	$I_D = 10\text{ mA}, V_{GS} = 0\text{ V}$	800	—	—	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		$R_{DS(ON)}$	$V_{GS} = 10\text{ V}, I_D = 3.5\text{ A}$	—	1.3	1.7	Ω
Forward transfer admittance		$ Y_{fs} $	$V_{DS} = 20\text{ V}, I_D = 3.5\text{ A}$	1.25	5.0	—	S
Input capacitance		C_{iss}	$V_{DS} = 25\text{ V}, V_{GS} = 0\text{ V}, f = 1\text{ MHz}$	—	1500	—	pF
Reverse transfer capacitance		C_{rss}		—	30	—	
Output capacitance		C_{oss}		—	140	—	
Switching time	Rise time	t_r	<p>$I_D = 3.5\text{ A}$ $V_{GS} = 10\text{ V}, 0\text{ V}$ $50\ \Omega$ $R_L = 114\ \Omega$ $V_{DD} \approx 400\text{ V}$ V_{OUT} Duty $\leq 1\%$, $t_w = 10\ \mu\text{s}$</p>	—	35	—	ns
	Turn-on time	t_{on}		—	80	—	
	Fall time	t_f		—	50	—	
	Turn-off time	t_{off}		—	220	—	
Total gate charge (gate-source plus gate-drain)		Q_g	$V_{DD} \approx 400\text{ V}, V_{GS} = 10\text{ V}, I_D = 7\text{ A}$	—	55	—	nC
Gate-source charge		Q_{gs}		—	30	—	
Gate-drain ("miller") Charge		Q_{gd}		—	25	—	

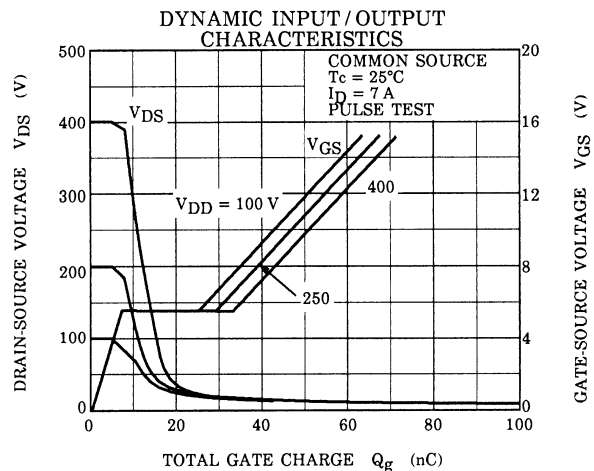
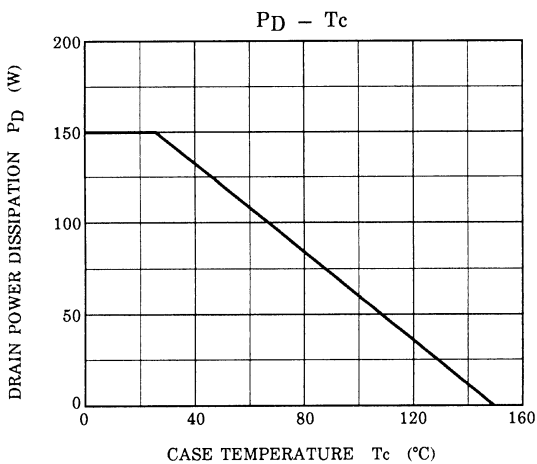
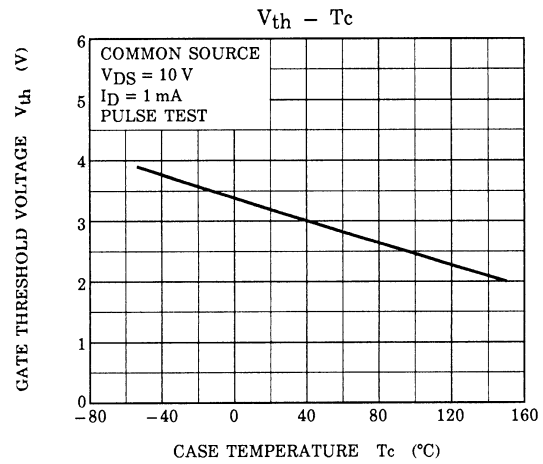
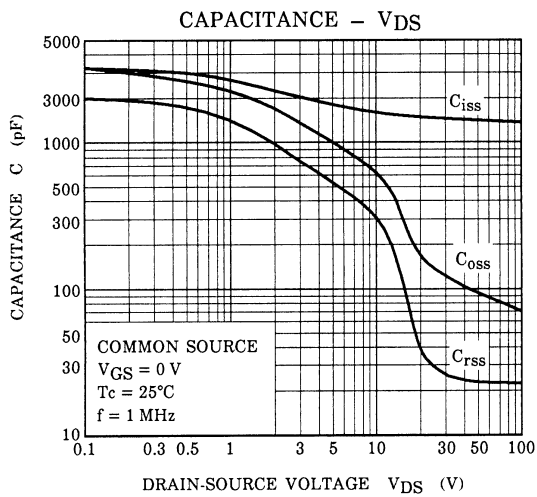
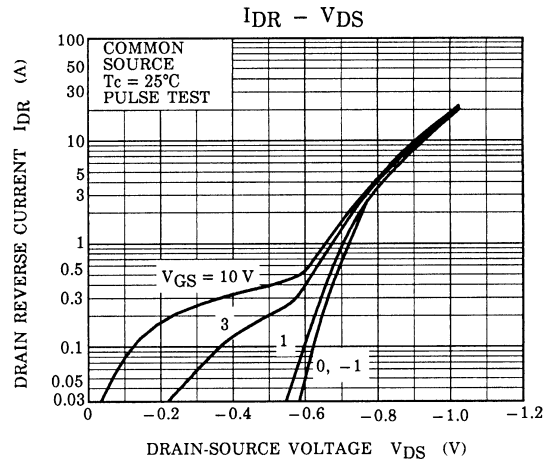
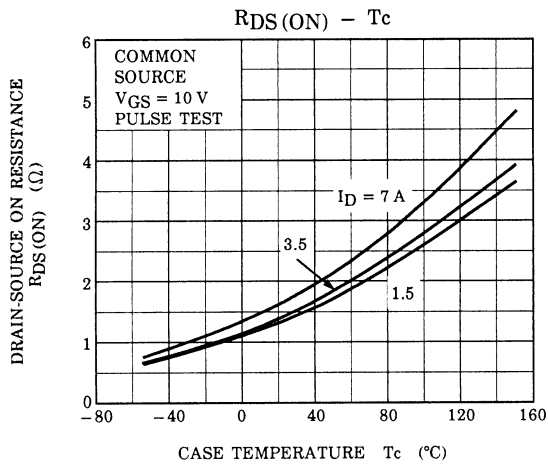
Source-Drain Ratings and Characteristics (Ta = 25°C)

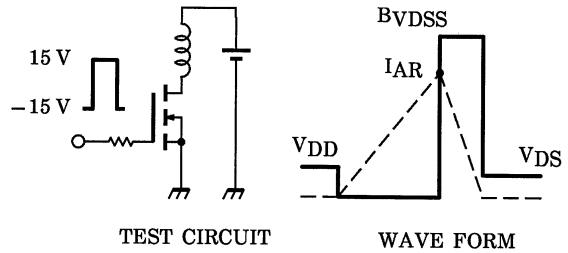
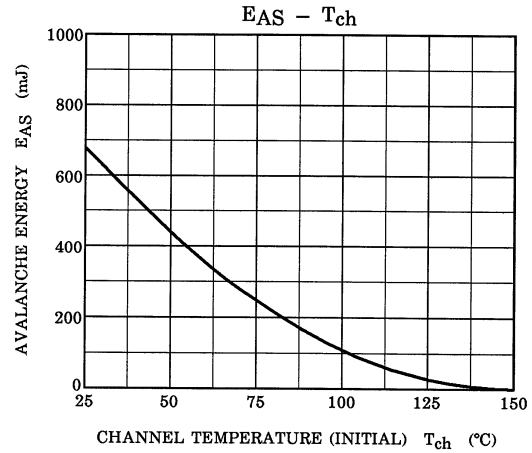
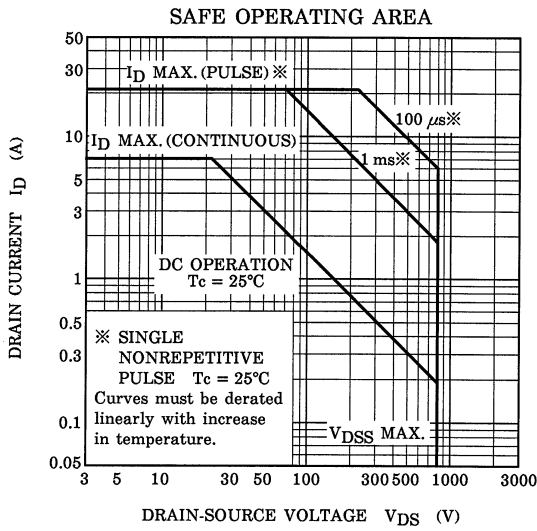
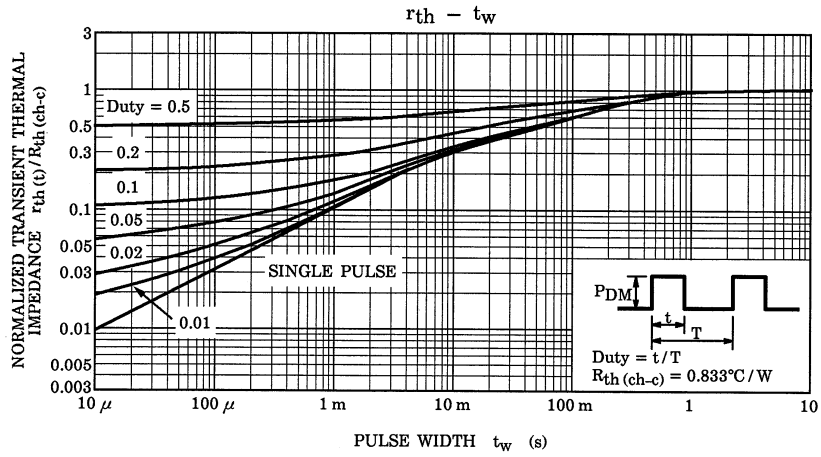
Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Continuous drain reverse current (Note 1)	I_{DR}	—	—	—	7	A
Pulse drain reverse current (Note 1)	I_{DRP}	—	—	—	21	A
Forward voltage (diode)	V_{DSF}	$I_{DR} = 7\text{ A}, V_{GS} = 0\text{ V}$	—	—	-1.9	V
Reverse recovery time	t_{rr}	$I_{DR} = 7\text{ A}, V_{GS} = 0\text{ V}, dI_{DR}/dt = 100\text{ A}/\mu\text{s}$	—	1300	—	ns
Reverse recovery charge	Q_{rr}		—	14	—	μC

Marking









$R_G = 25 \Omega$
 $V_{DD} = 90 \text{ V}, L = 24.9 \text{ mH}$

$$EAS = \frac{1}{2} \cdot L \cdot I^2 \cdot \left(\frac{B_{VDSS}}{B_{VDSS} - V_{DD}} \right)$$

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