

查询"2SK3707\_06"供应商 TOSHIBA Field Effect Transistor Silicon N Channel MOS Type ( $\pi$ -MOSVI)

**2SK3767**

## Switching Regulator Applications

Unit: mm

- Low drain-source ON resistance:  $R_{DS\text{ (ON)}} = 3.3\ \Omega$  (typ.)
- High forward transfer admittance:  $|Y_{fs}| = 1.6\text{S}$  (typ.)
- Low leakage current:  $Id_{SS} = 100\ \mu\text{A}$  ( $V_{DS} = 600\ \text{V}$ )
- Enhancement mode:  $V_{th} = 2.0$  to  $4.0\ \text{V}$  ( $V_{DS} = 10\ \text{V}$ ,  $Id = 1\ \text{mA}$ )

### Absolute Maximum Ratings (Ta = 25°C)

Characteristics	Symbol	Rating	Unit
Drain-source voltage	V <sub>DSS</sub>	600	V
Drain-gate voltage (R <sub>GS</sub> = 20 kΩ)	V <sub>DGR</sub>	600	V
Gate-source voltage	V <sub>GSS</sub>	±30	V
Drain current	DC (Note 1)	I <sub>D</sub>	2
	Pulse (Note 1)	I <sub>DP</sub>	5
Drain power dissipation (T <sub>C</sub> = 25°C)	P <sub>D</sub>	25	W
Single pulse avalanche energy (Note 2)	E <sub>AS</sub>	93	mJ
Avalanche current	I <sub>AR</sub>	2	A
Repetitive avalanche energy (Note 3)	E <sub>AR</sub>	4	mJ
Channel temperature	T <sub>ch</sub>	150	°C
Storage temperature range	T <sub>stg</sub>	-55~150	°C

Technical drawing of a MOSFET component showing dimensions and lead labels. The drawing includes top and side views with various dimension lines and feature labels like "Gate", "Drain", and "Source".

Dimensions (in mm):

- Width:  $10 \pm 0.3$
- Height:  $15 \pm 0.3$
- Lead thickness:  $0.64 \pm 0.15$
- Lead spacing:  $1.14 \pm 0.15$
- Lead height:  $0.69 \pm 0.15$
- Lead width:  $\phi 0.2$
- Lead gap:  $2.54$
- Lead length:  $2.6 \pm 0.1$
- Lead width:  $4.5 \pm 0.2$
- Lead gap:  $2.54$
- Lead length:  $13 \pm 0.5$
- Lead gap:  $3.9$
- Lead length:  $15 \pm 0.3$
- Lead gap:  $3.0$
- Lead length:  $2.7 \pm 0.2$

Labels:

- 1: Gate
- 2: Drain
- 3: Source

Weight : 1.7 g (typ.)

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

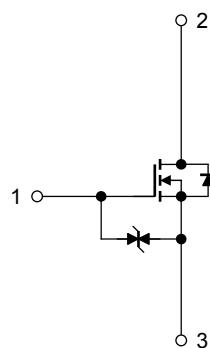
Characteristics	Symbol	Max	Unit
Thermal resistance, channel to case	$R_{th}$ (ch-c)	5.0	°C/W
Thermal resistance, channel to ambient	$R_{th}$ (ch-a)	62.5	°C/W

Note 1: Ensure that the channel temperature does not exceed 150°C.

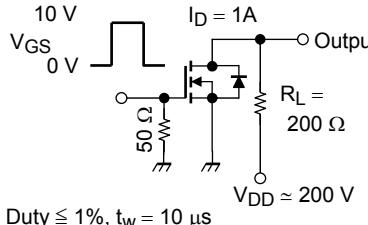
Note 2:  $V_{DD} = 90 \text{ V}$ ,  $T_{ch} = 25^\circ\text{C}$  (initial) ,  $L = 41\text{mH}$ ,  $R_G = 25 \Omega$  ,  $I_{AB} = 2 \text{ A}$

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

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



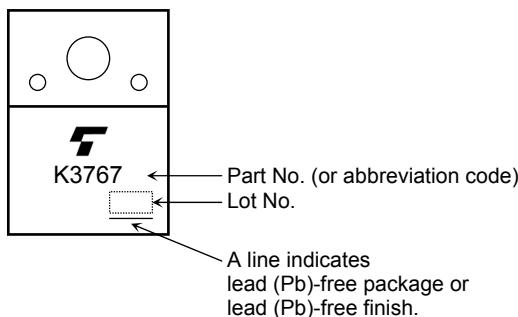
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Electrical Characteristics (Ta = 25°C)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Gate leakage current	$I_{GSS}$	$V_{GS} = \pm 25 \text{ V}$ , $V_{DS} = 0 \text{ V}$	—	—	$\pm 10$	$\mu\text{A}$
Gate-source breakdown voltage	$V_{(\text{BR})\text{GSS}}$	$I_G = \pm 10 \mu\text{A}$ , $V_{DS} = 0 \text{ V}$	$\pm 30$	—	—	V
Drain cut-off current	$I_{DSS}$	$V_{DS} = 600 \text{ V}$ , $V_{GS} = 0 \text{ V}$	—	—	100	$\mu\text{A}$
Drain-source breakdown voltage	$V_{(\text{BR})\text{DSS}}$	$I_D = 10 \text{ mA}$ , $V_{GS} = 0 \text{ V}$	600	—	—	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	$R_{DS(\text{ON})}$	$V_{GS} = 10 \text{ V}$ , $I_D = 1 \text{ A}$	—	3.3	4.5	$\Omega$
Forward transfer admittance	$ Y_{fs} $	$V_{DS} = 10 \text{ V}$ , $I_D = 1 \text{ A}$	0.8	1.6	—	S
Input capacitance	$C_{iss}$	$V_{DS} = 10 \text{ V}$ , $V_{GS} = 0 \text{ V}$ , $f = 1 \text{ MHz}$	—	320	—	pF
Reverse transfer capacitance	$C_{rss}$		—	30	—	
Output capacitance	$C_{oss}$		—	100	—	
Switching time	Rise time	$t_r$		—	15	—
	Turn-on time	$t_{on}$		—	55	—
	Fall time	$t_f$		—	20	—
	Turn-off time	$t_{off}$		—	80	—
Total gate charge	$Q_g$	$V_{DD} \approx 400 \text{ V}$ , $V_{GS} = 10 \text{ V}$ , $I_D = 2 \text{ A}$	—	9	—	nC
Gate-source charge	$Q_{gs}$		—	5	—	
Gate-drain charge	$Q_{gd}$		—	4	—	

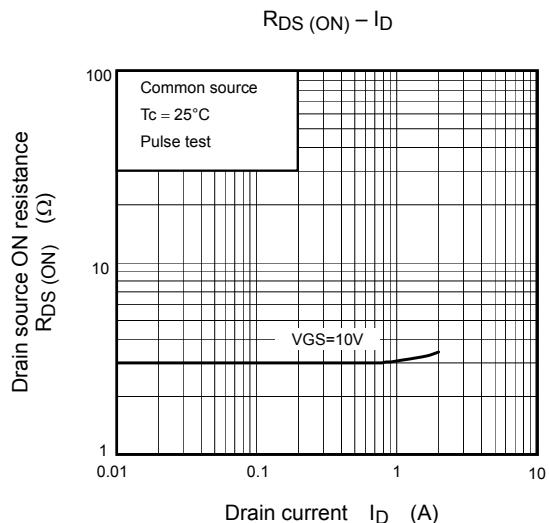
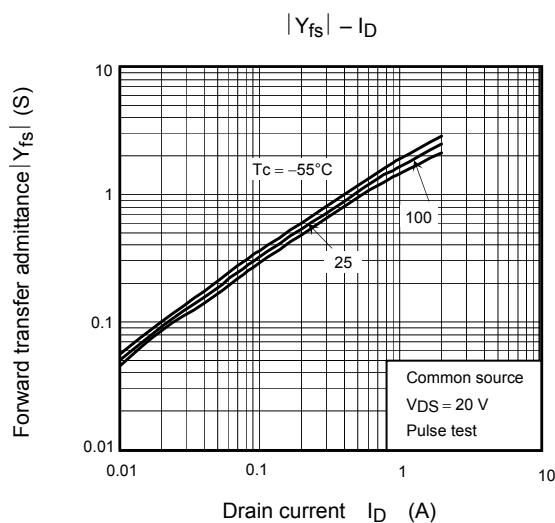
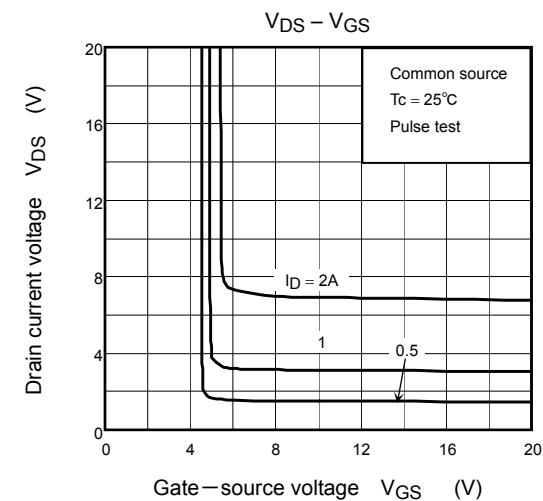
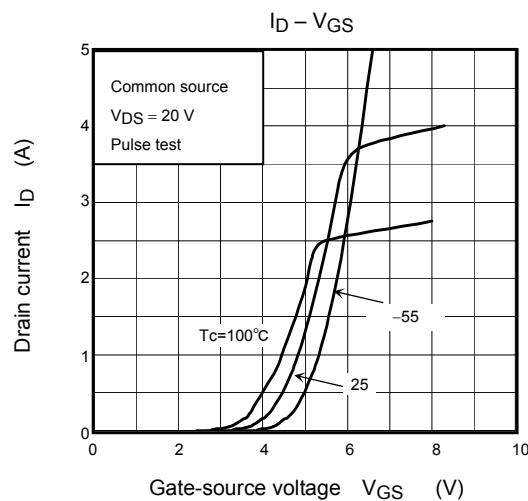
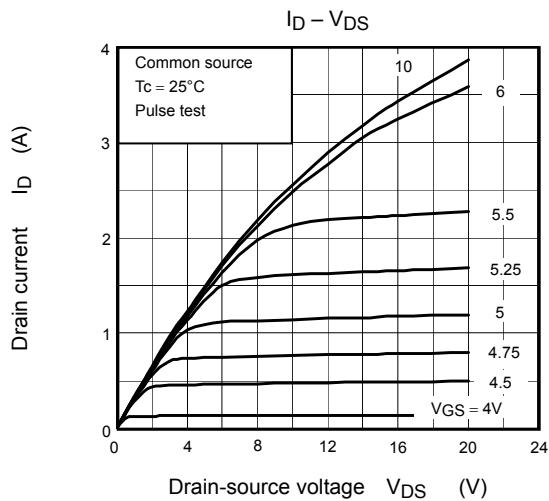
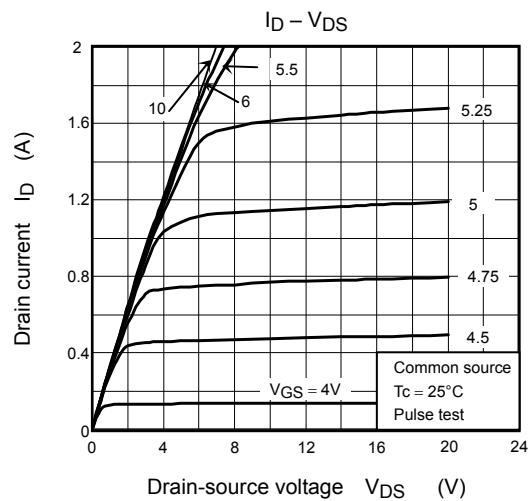
## Source-Drain Ratings and Characteristics (Ta = 25°C)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Continuous drain reverse current (Note 1)	$I_{DR}$	—	—	—	2	A
Pulse drain reverse current (Note 1)	$I_{DRP}$	—	—	—	5	A
Forward voltage (diode)	$V_{DSF}$	$I_{DR} = 2 \text{ A}$ , $V_{GS} = 0 \text{ V}$	—	—	-1.7	V
Reverse recovery time	$t_{rr}$	$I_{DR} = 2 \text{ A}$ , $V_{GS} = 0 \text{ V}$ , $dI_{DR}/dt = 100 \text{ A}/\mu\text{s}$	—	1000	—	ns
Reverse recovery charge	$Q_{rr}$		—	3.5	—	$\mu\text{C}$

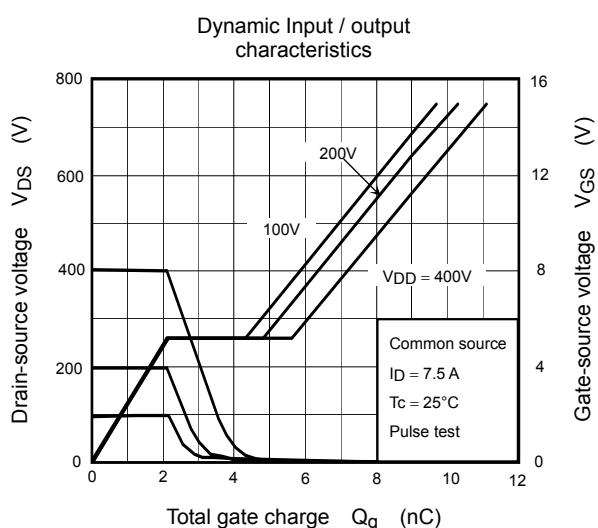
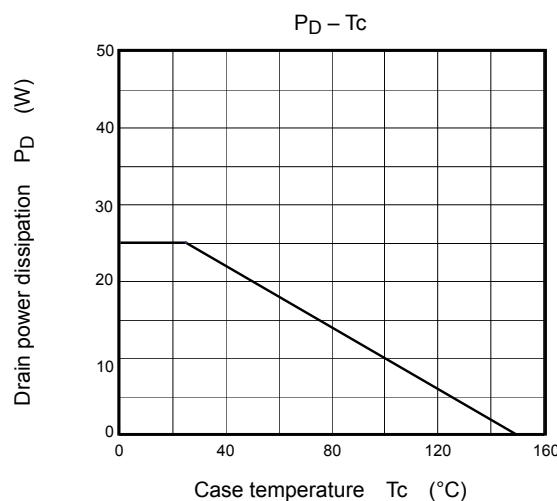
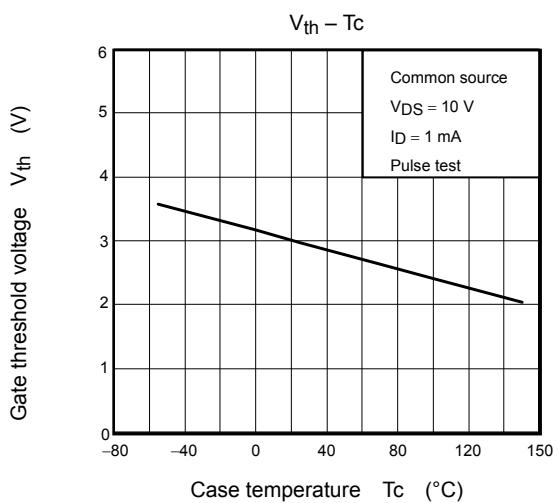
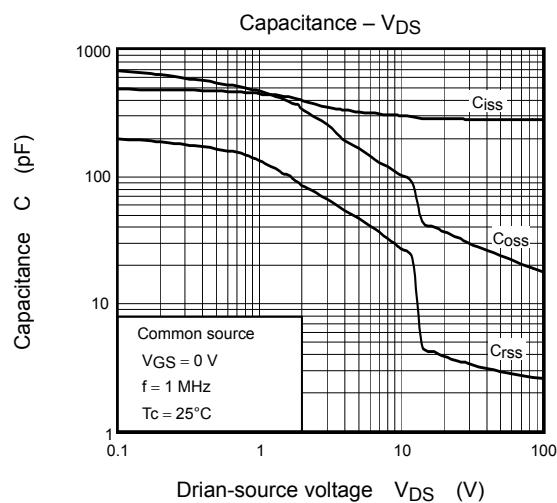
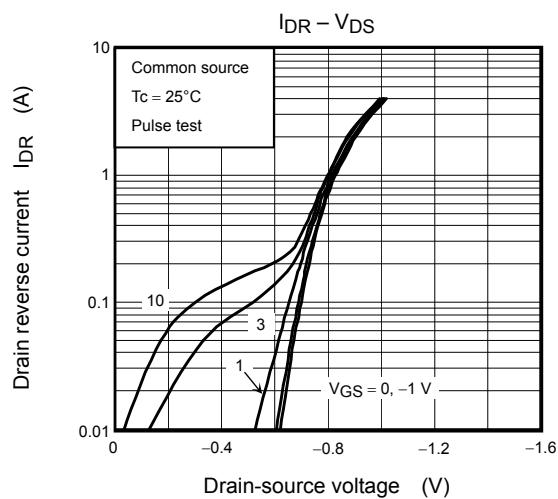
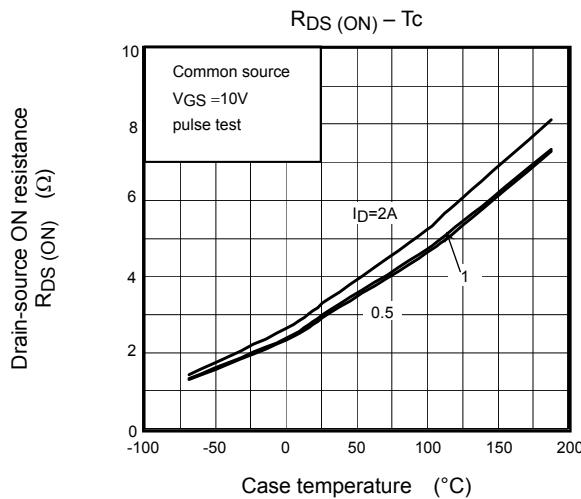
## Marking



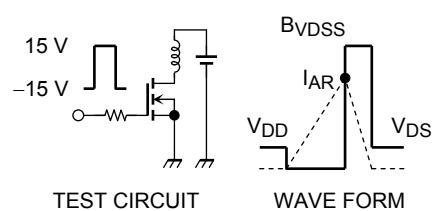
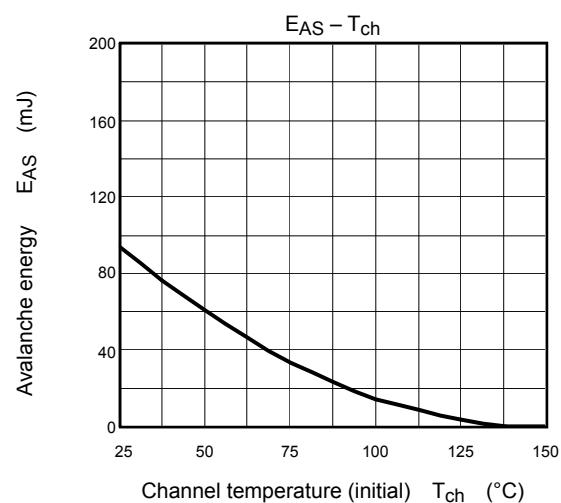
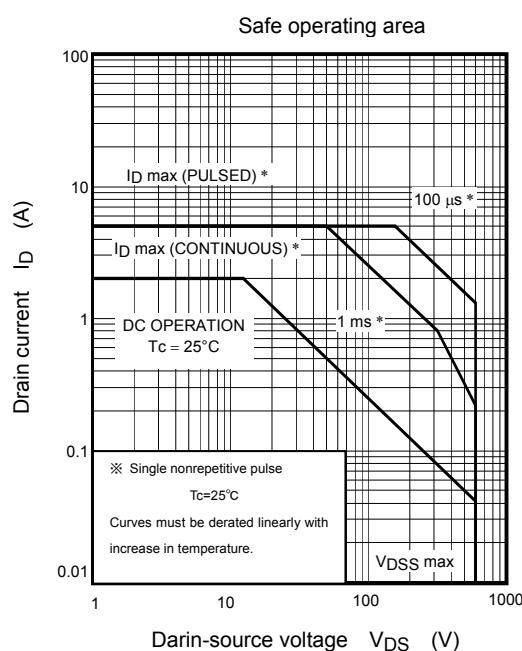
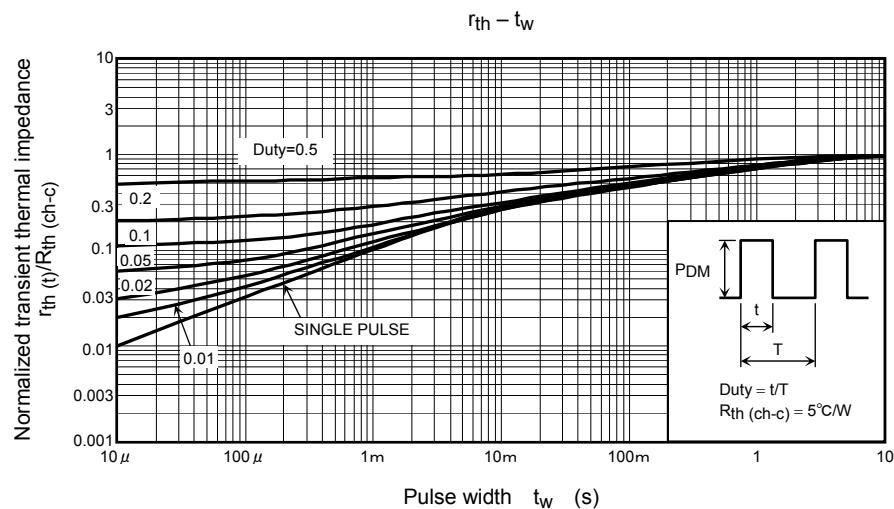
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$$R_G = 25 \Omega$$

$$V_{DD} = 90 \text{ V}, L = 41 \text{ mH}$$

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

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