

TOSHIBA Field Effect Transistor Silicon N Channel MOS Type (π -MOS)

2SK3762

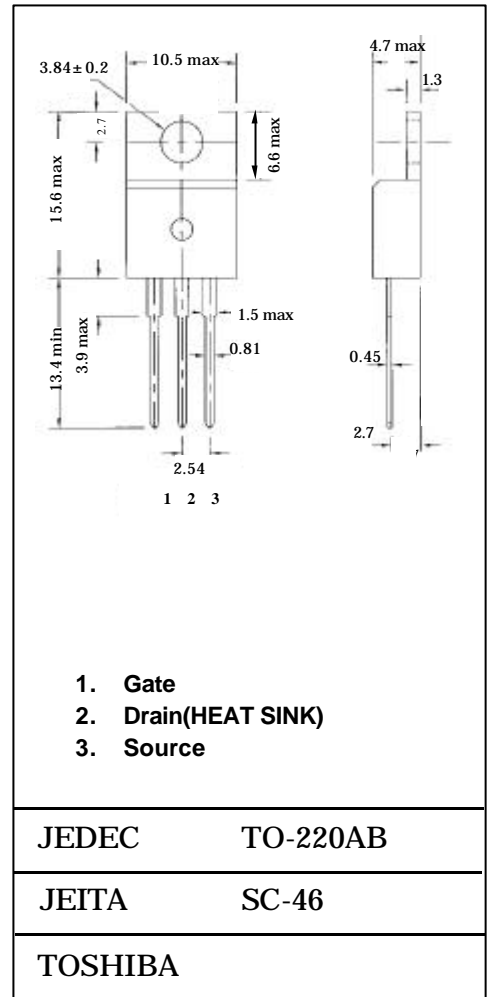
unit : mm

Switching Regulator Applications

- Low drain-source ON resistance: $R_{DS(ON)} = 5.6$ (typ.)
- High forward transfer admittance: $|Y_{fs}| = 2.0$ S (typ.)
- Low leakage current: $I_{DSS} = 100 \mu A$ ($V_{DS} = 720$ 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}	900	V	
Drain-gate voltage ($R_{GS} = 20$ k Ω)	V_{DGR}	900	V	
Gate-source voltage	V_{GSS}	± 30	V	
Drain current	DC (Note 1)	I_D	2.5	A
	Pulse ($t = 1$ ms) (Note 1)	I_{DP}	7.5	
Drain power dissipation ($T_c = 25^\circ C$)	P_D	62	W	
Single pulse avalanche energy (Note 2)	E_{AS}	21.6	mJ	
Avalanche current	I_{AR}	2.5	A	
Repetitive avalanche energy (Note 3)	E_{AR}	6.2	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	$R_{th(ch-c)}$	2.02	$^\circ C/W$
Thermal resistance, channel to ambient	$R_{th(ch-a)}$	83.3	$^\circ C/W$

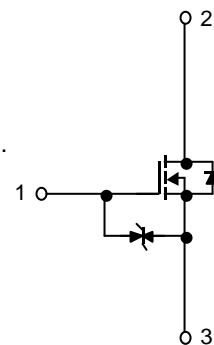
Weight : 2.0g(typ.)

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

Note 2: $V_{DD} = 90$ V, $T_{ch} = 25^\circ C$, $L = 6.3$ mH, $I_{AR} = 2.5$ 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.



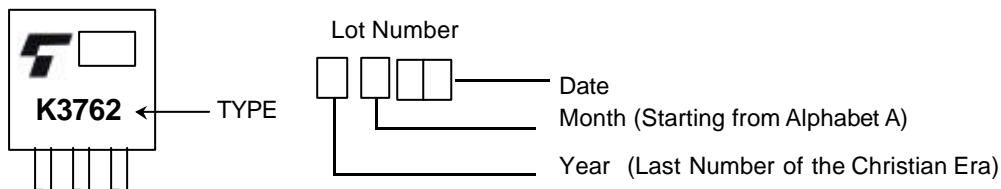
Electrical Characteristics (Ta = 25°C)

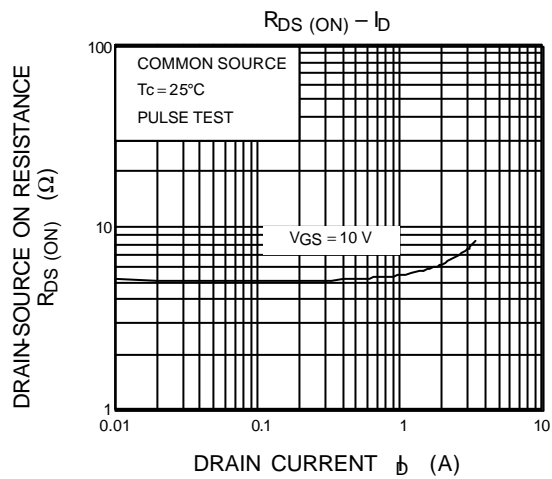
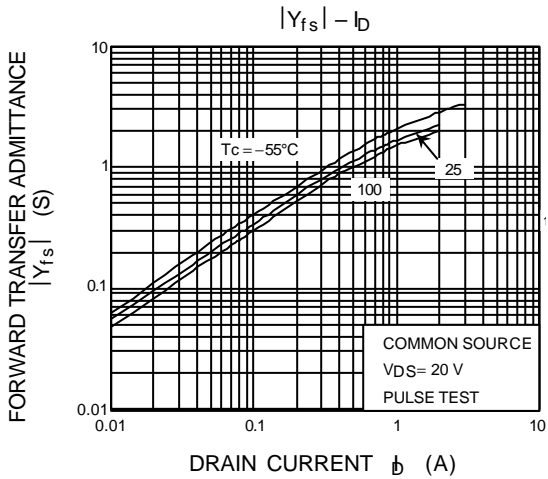
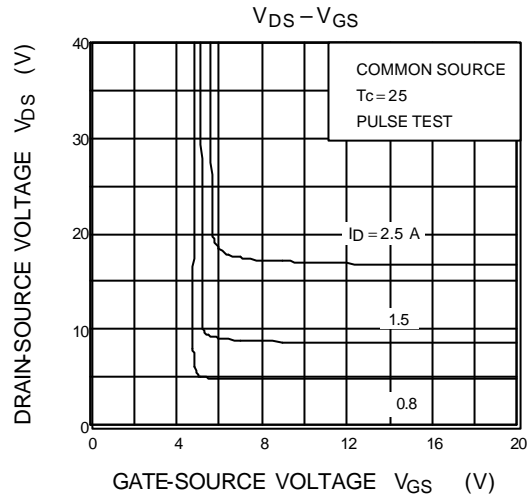
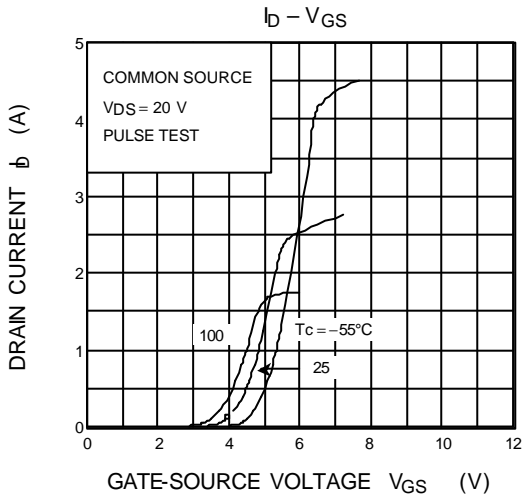
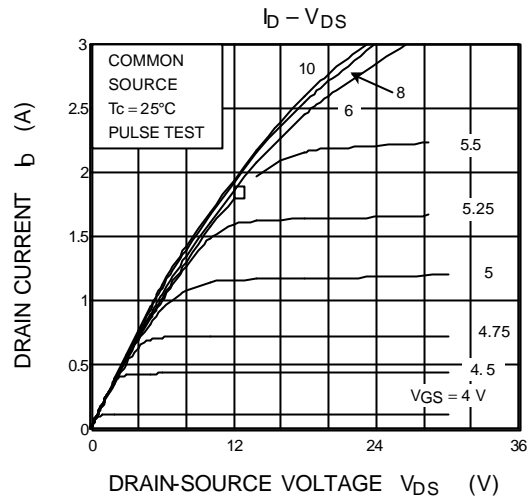
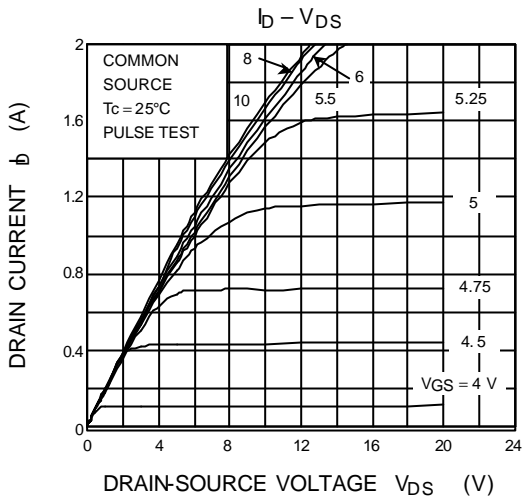
Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Gate leakage current		I_{GSS}	$V_{GS} = \pm 30\text{ V}, V_{DS} = 0\text{ V}$	—	—	± 10	μA
Gate-source breakdown voltage		$V_{(BR)GSS}$	$I_D = \pm 10\ \mu\text{A}, V_{GS} = 0\text{ V}$	± 30	—	—	V
Drain cut-off current		I_{DSS}	$V_{DS} = 720\text{ V}, V_{GS} = 0\text{ V}$	—	—	100	μA
Drain-source breakdown voltage		$V_{(BR)DSS}$	$I_D = 10\text{ mA}, V_{GS} = 0\text{ V}$	900	—	—	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		$R_{DS(ON)}$	$V_{GS} = 10\text{ V}, I_D = 1.5\text{ A}$	—	5.6	6.4	Ω
Forward transfer admittance		$ Y_{fs} $	$V_{DS} = 20\text{ V}, I_D = 1.5\text{ A}$	1.0	2.0	—	S
Input capacitance		C_{iss}	$V_{DS} = 25\text{ V}, V_{GS} = 0\text{ V}, f = 1\text{ MHz}$	—	470	—	pF
Reverse transfer capacitance		C_{rss}		—	10	—	
Output capacitance		C_{oss}		—	50	—	
Switching time	Rise time	t_r		—	20	—	ns
	Turn-on time	t_{on}		—	60	—	
	Fall time	t_f		—	30	—	
	Turn-off time	t_{off}		Duty $\leq 1\%$, $t_w = 10\ \mu\text{s}$	—	100	
Total gate charge		Q_g	$V_{DD} = 400\text{ V}, V_{GS} = 10\text{ V}, I_D = 2.5\text{ A}$	—	12	—	nC
Gate-source charge		Q_{gs}		—	7	—	
Gate-drain charge		Q_{gd}		—	5	—	

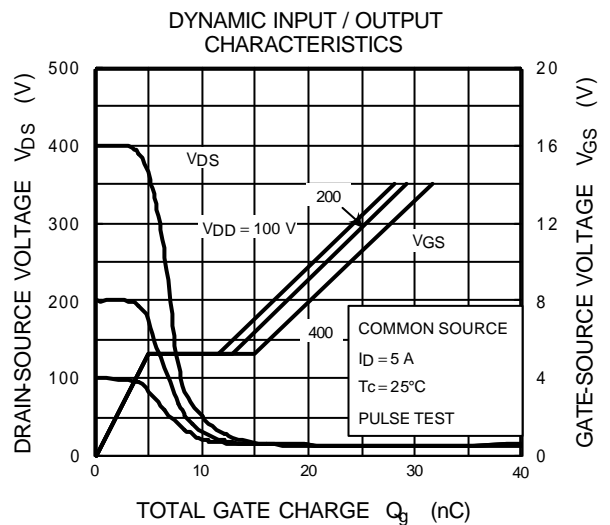
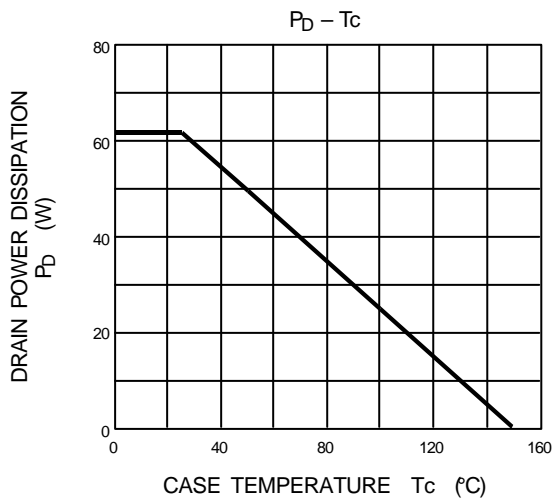
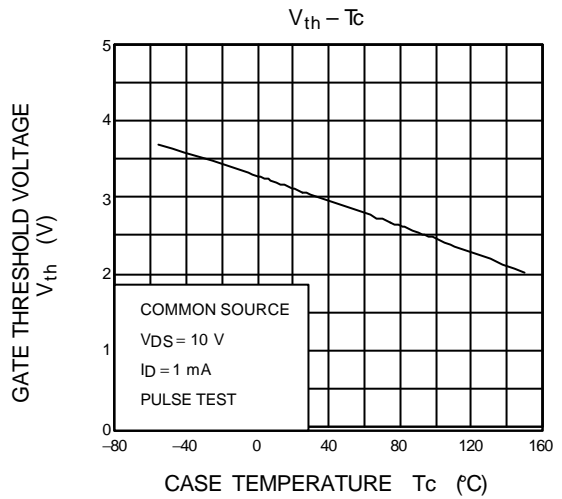
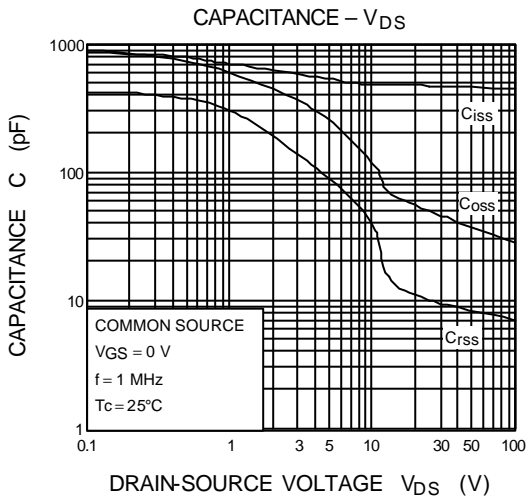
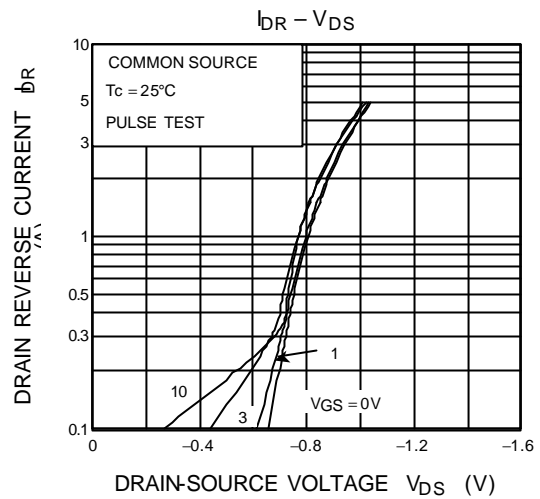
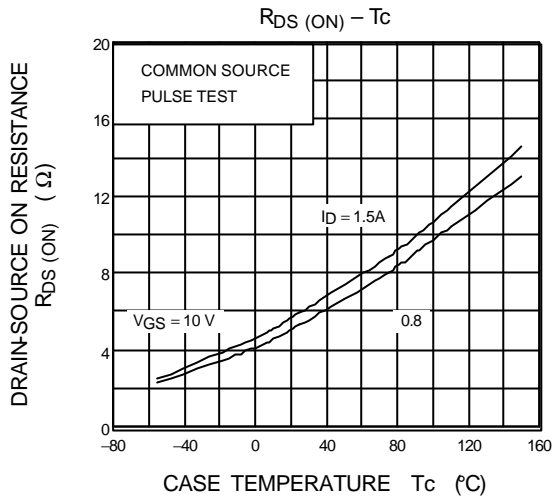
Source-Drain Ratings and Characteristics (Ta = 25°C)

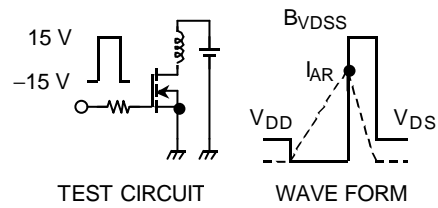
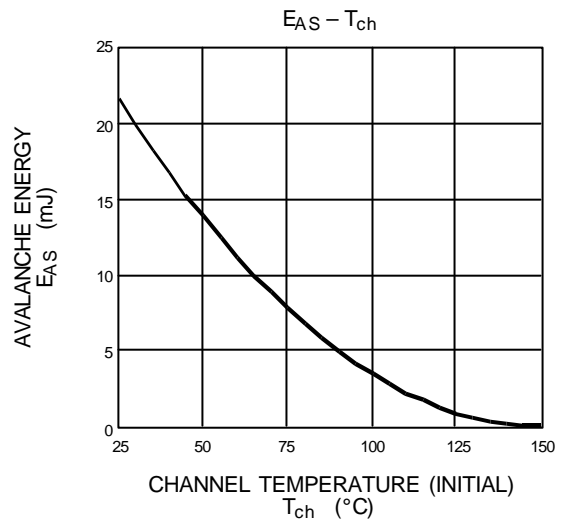
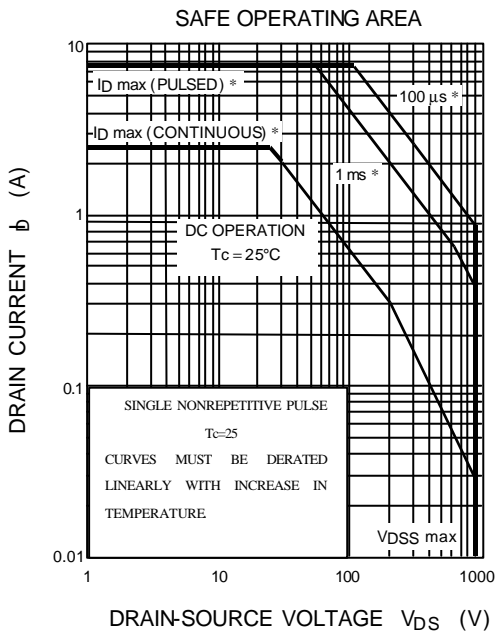
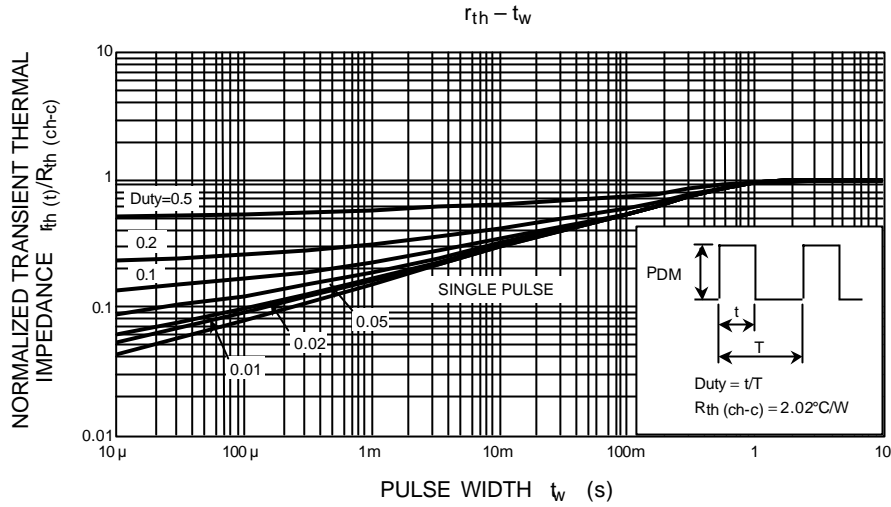
Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Continuous drain reverse current (Note 1)	I_{DR}	—	—	—	2.5	A
Pulse drain reverse current (Note 1)	I_{DRP}	—	—	—	7.5	A
Forward voltage (diode)	V_{DSF}	$I_{DR} = 2.5\text{ A}, V_{GS} = 0\text{ V}$	—	—	-1.7	V
Reverse recovery time	t_{rr}	$I_{DR} = 2.5\text{ A}, V_{GS} = 0\text{ V},$	—	720	—	ns
Reverse recovery charge	Q_{rr}	$dI_{DR}/dt = 100\text{ A}/\mu\text{s}$	—	3.6	—	μC

Marking









$R_G = 25 \Omega$
 $V_{DD} = 90 \text{ V}, L = 6.3 \text{ mH}$

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

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