Unit: mm

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

2SK3566

Switching Regulator Applications

• Low drain-source ON resistance: RDS (ON) = 5.6Ω (typ.)

• High forward transfer admittance: $|Y_{fs}| = 2.0 \mathrm{S}$ (typ.)

• Low leakage current: IDSS = 100 $\,\mu$ A (VDS = 720 V)

• Enhancement-mode: $V_{th} = 2.0 \sim 4.0 \text{ V (V}_{DS} = 10 \text{ V, I}_{D} = 1 \text{ mA})$

Maximum Ratings (Ta = 25°C)

Characteristics		Symbol	Rating	Unit	
Drain-source voltage		V_{DSS}	900	V	
Drain-gate voltage ($R_{GS} = 20 \text{ k}\Omega$)		V_{DGR}	900	V	
Gate-source voltage		V _{GSS}	±30	V	
Drain current	DC (Note 1)	ID	2.5	А	
	Pulse (t = 1 ms) (Note 1)	I _{DP}	7.5		
Drain power dissipation (Tc = 25°C)		P _D	40	W	
Single pulse avalanche energy (Note 2)		E _{AS}	216	mJ	
Avalanche current		I _{AR}	2.5	Α	
Repetitive avalanche energy (Note 3)		E _{AR}	4	mJ	
Channel temperature		T _{ch}	150	°C	
Storage temperature range		T _{stg}	-55~150	°C	

1: Gate 2: Drain 3: Source JEDEC JEITA SC-67 TOSHIBA 2.7±0.2

Weight: 1.7 g (typ.)

Thermal Characteristics

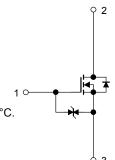
Characteristics	Symbol	Max	Unit
Thermal resistance, channel to case	R _{th (ch-c)}	3.125	°C/W
Thermal resistance, channel to ambient	R _{th (ch-a)}	62.5	°C/W

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

Note 2: V_{DD} = 90 V, T_{ch} = 25°C, L = 63.4 mH, I_{AR} = 2.5 A, R_G = 25 Ω

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

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



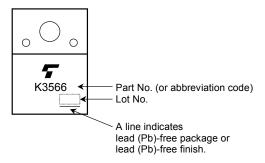
Electrical Characteristics (Ta = 25°C)

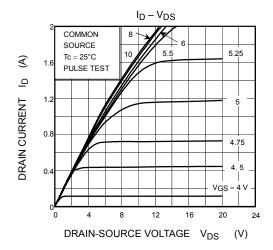
Char	acteristics	Symbol	Test Condition	Min	Тур.	Max	Unit
Gate leakage cui	rrent	I _{GSS}	$V_{GS} = \pm 25 \text{ V}, V_{DS} = 0 \text{ V}$	_	_	±10	μΑ
Gate-source brea	akdown voltage	V (BR) GSS	$I_G = \pm 10~\mu A,~V_{GS} = 0~V$	±30	_	_	V
Drain cut-off curr	ent	I _{DSS}	V _{DS} = 720 V, V _{GS} = 0 V	_	_	100	μА
Drain-source bre	akdown voltage	V (BR) DSS	$I_D = 10$ mA, $V_{GS} = 0$ V	900	_	_	V
Gate threshold v	oltage	V _{th}	V _{DS} = 10 V, I _D = 1 mA	2.0	_	4.0	V
Drain-source ON	resistance	R _{DS (ON)}	V _{GS} = 10 V, I _D = 1.5 A	_	5.6	6.4	Ω
Forward transfer	admittance	Y _{fs}	V _{DS} = 20 V, I _D = 1.5 A	1.0	2.0	_	S
Input capacitance		C _{iss}	V _{DS} = 25 V, V _{GS} = 0 V, f = 1 MHz	_	470	_	pF
Reverse transfer capacitance		C _{rss}		_	10	_	
Output capacitance		Coss		_	50	_	
Switching time	Rise time	t _r	$\begin{array}{c c} 10 \text{ V} & \text{ID} = 1.5 \text{ A} & \text{VouT} \\ \hline V_{GS} & & & \\ \hline 50 \Omega & & & \\ \end{array}$ $\begin{array}{c c} R_L = \\ 133 \Omega \\ \end{array}$ $\begin{array}{c c} V_{DD} \approx 200 \text{ V} \end{array}$	_	20	_	
	Turn-on time	t _{on}		_	60	_	20
	Fall time	t _f		_	30	_	ns
	Turn-off time	t _{off}	Duty \leq 1%, $t_W = 10 \ \mu s$	_	100		
Total gate charge		Qg		_	12	_	
Gate-source charge		Q _{gs}	$V_{DD} \simeq 400 \text{ V}, V_{GS} = 10 \text{ V}, I_D = 2.5 \text{ A}$	_	7	_	nC
Gate-drain charge		Q _{gd}		_	5	_	

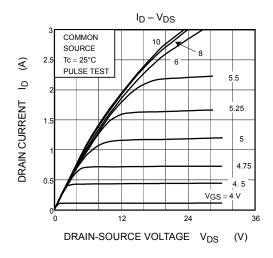
Source-Drain Ratings and Characteristics (Ta = 25°C)

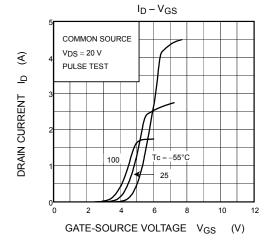
Characteristics	Symbol	Test Condition	Min	Тур.	Max	Unit
Continuous drain reverse current (Note 1	I _{DR}	_	_	_	2.5	Α
Pulse drain reverse current (Note 1) I _{DRP}	_	_	_	7.5	Α
Forward voltage (diode)	V _{DSF}	$I_{DR} = 2.5 \text{ A}, V_{GS} = 0 \text{ V}$		_	-1.7	V
Reverse recovery time	t _{rr}	$I_{DR}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

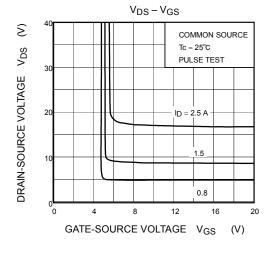
Marking

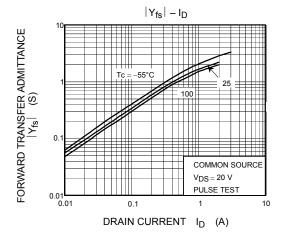


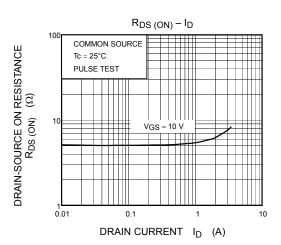


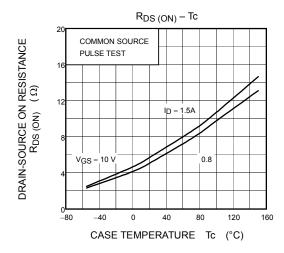


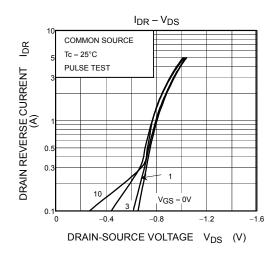


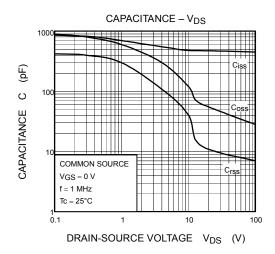


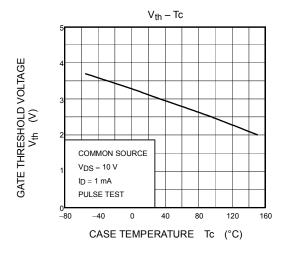


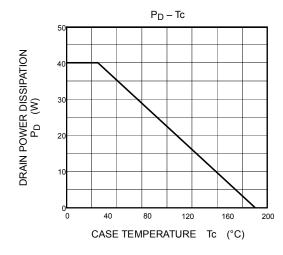


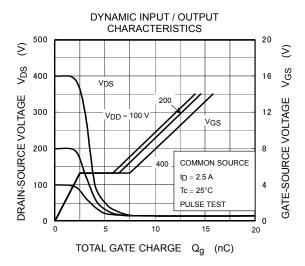


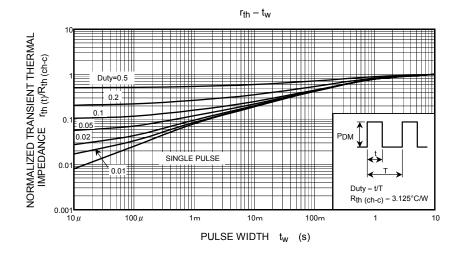


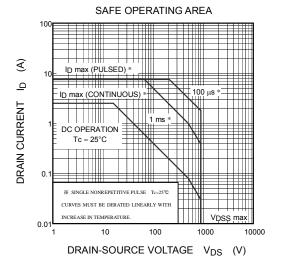


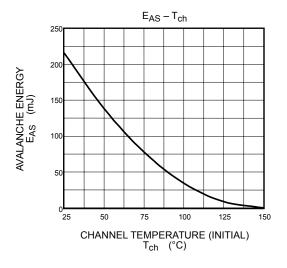


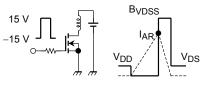












TEST CIRCUIT WAVE FORM
$$R_G = 25~\Omega$$

$$V_{DD} = 90~V,~L = 43.4mH$$

$$EAS = \frac{1}{2} \cdot L \cdot l^2 \cdot \left(\frac{BVDSS}{BVDSS} - VDD\right)$$

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