

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

2SK3462

High Speed Switching, High Current Applications
 Switching Regulator, DC-DC Converter and
 Motor Drive Applications

Features

- 4 V Gate drive
- Low drain-source ON resistance: $R_{DS(ON)} = 1.2 \Omega$ (typ.)
- High forward transfer admittance: $|Y_{fs}| = 2.2 S$ (typ.)
- Low leakage current: $I_{DSS} = 100 \mu A$ ($V_{DS} = 250 V$)
- Enhancement-mode: $V_{th} = 1.5 \sim 3.5 V$ ($V_{DS} = 10 V, I_D = 1 mA$)

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

Characteristics	Symbol	Rating	Unit
Drain-source voltage	V_{DSS}	250	V
Drain-gate voltage ($R_{GS} = 20 k\Omega$)	V_{DGR}	250	V
Gate-source voltage	V_{GSS}	± 20	V
Drain current	DC	I_D	3
	Pulse ($t = 1 ms$)	I_{DP}	6
Drain power dissipation ($T_a = 25^\circ C$) (Note)	P_D	20	W
Single pulse avalanche energy*	E_{AS}	36.2	mJ
Avalanche current	I_{AR}	3	A
Repetitive avalanche energy**	E_{AR}	2	mJ
Channel temperature	T_{ch}	150	$^\circ C$
Storage temperature range	T_{stg}	$-55 \sim 150$	$^\circ C$

Note:

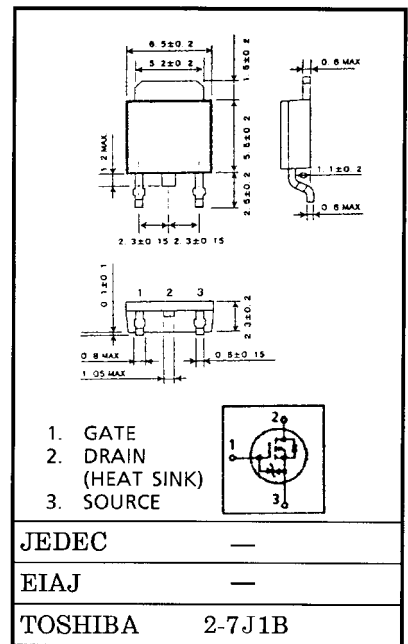
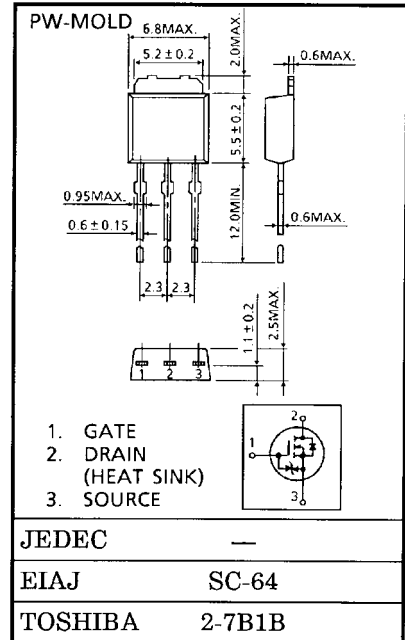
* $V_{DD} = 50 V, T_{ch} = 25^\circ C, L = 6.7 mH, I_{AR} = 3 A, R_G = 25 \Omega$

** Repetitive rating; pulse width limited by max channel temperature

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

INDUSTRIAL APPLICATIONS

Unit in mm



Weight : 0.36 g

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Thermal Characteristics

Characteristics	Symbol	Max	Unit
Thermal resistance, channel to case	$R_{th(ch-c)}$	6.25	°C/W
Thermal resistance, channel to ambient	$R_{th(ch-a)}$	125	°C/W

Electrical Characteristics (Ta = 25°C)

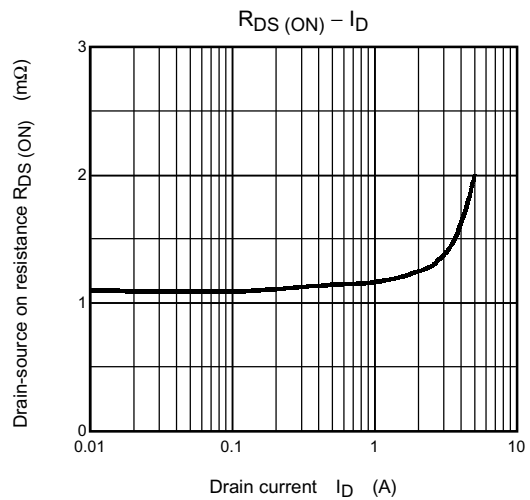
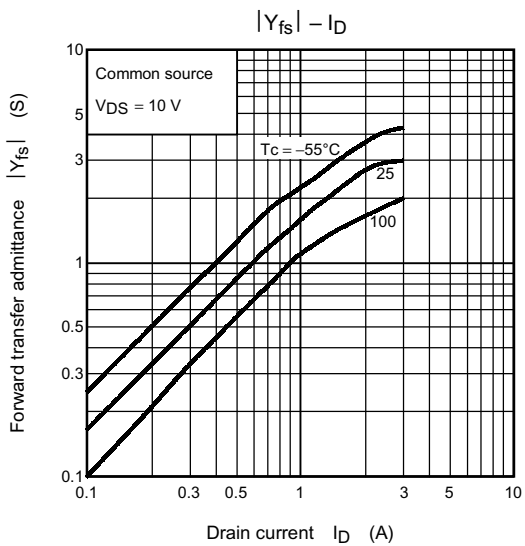
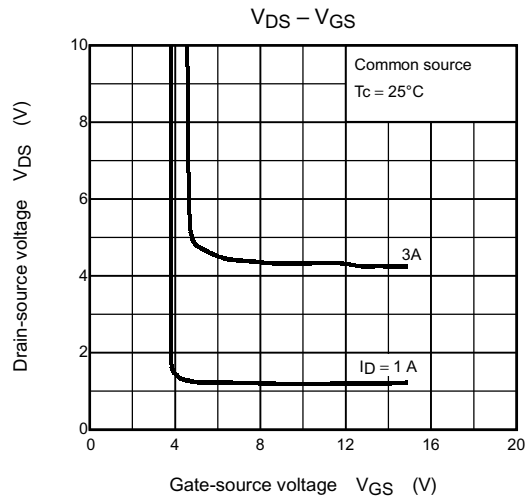
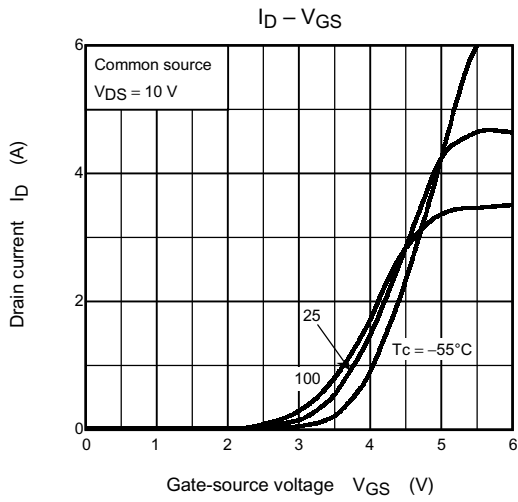
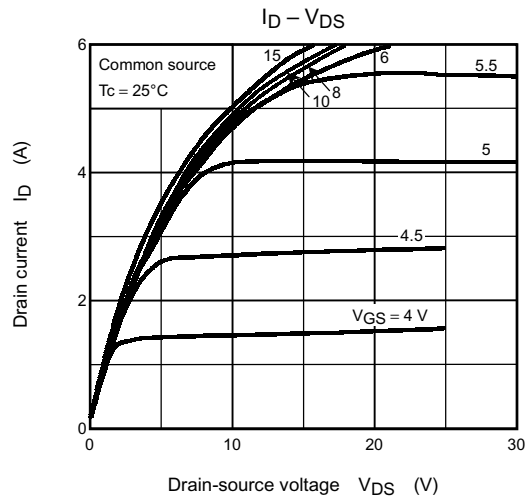
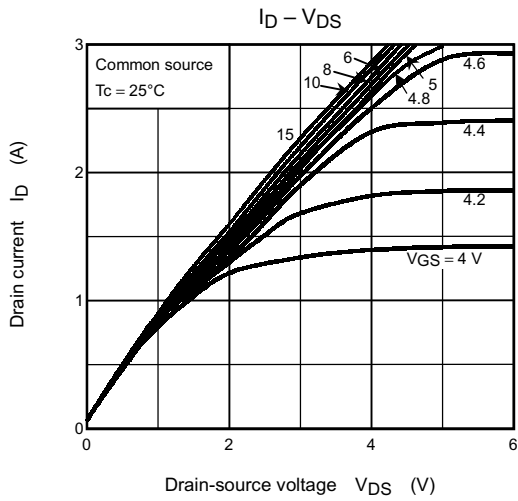
Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Gate leakage current		I_{GSS}	$V_{GS} = \pm 16\text{ V}, V_{DS} = 0\text{ V}$	—	—	±10	μA
Drain cut-off current		I_{DSS}	$V_{DS} = 250\text{ V}, V_{GS} = 0\text{ V}$	—	—	100	μA
Drain-source breakdown voltage		$V_{(BR)DSS}$	$I_D = 10\text{ mA}, V_{GS} = 0\text{ V}$	250	—	—	V
Gate threshold voltage		V_{th}	$V_{DS} = 10\text{ V}, I_D = 1\text{ mA}$	1.5	—	3.5	V
Drain-source ON resistance		$R_{DS(ON)}$	$V_{GS} = 10\text{ V}, I_D = 1.5\text{ A}$	—	1.2	1.7	Ω
Forward transfer admittance		$ Y_{fs} $	$V_{DS} = 10\text{ V}, I_D = 1.5\text{ A}$	0.5	2.2	—	S
Input capacitance		C_{iss}	$V_{DS} = 10\text{ V}, V_{GS} = 0\text{ V}, f = 1\text{ MHz}$	—	267	—	pF
Reverse transfer capacitance		C_{rss}		—	32	—	
Output capacitance		C_{oss}		—	98	—	
Switching time	Rise time	t_r		—	5	—	ns
	Turn-on time	t_{on}		—	20	—	
	Fall time	t_f		—	5	—	
	Turn-off time	t_{off}		—	30	—	
Total gate charge		Q_g	$V_{DD} = 200\text{ V}, V_{GS} = 10\text{ V}, I_D = 3\text{ A}$	—	12	—	nC
Gate-source charge		Q_{gs}		—	6	—	
Gate-drain charge		Q_{gd}		—	6	—	

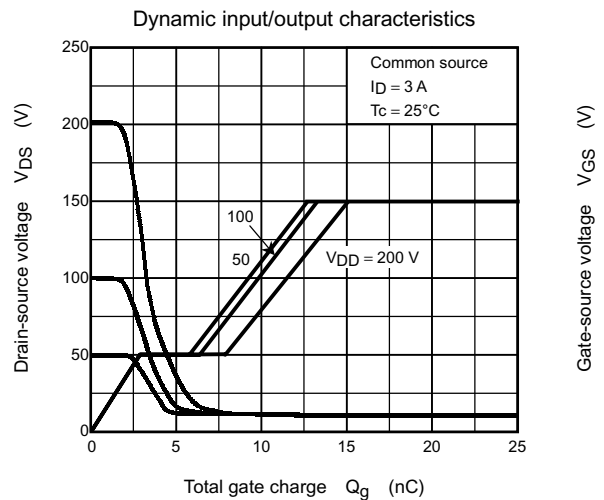
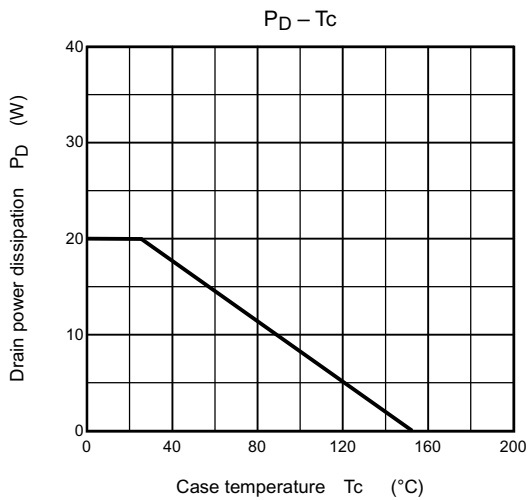
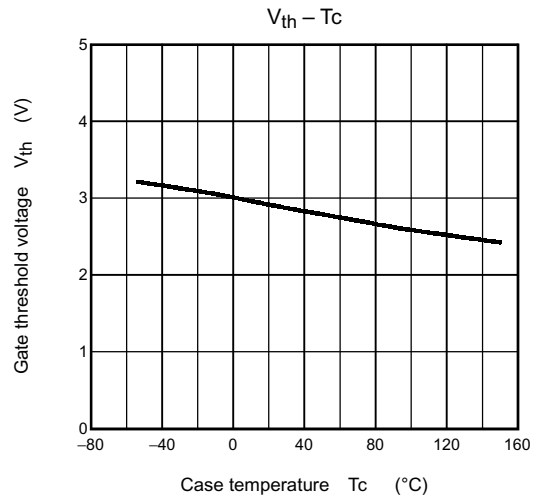
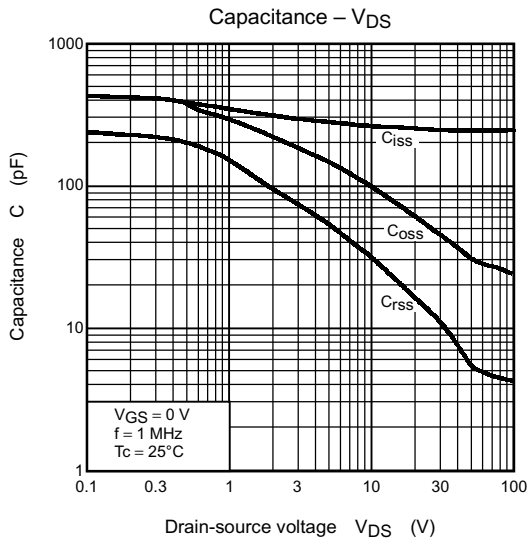
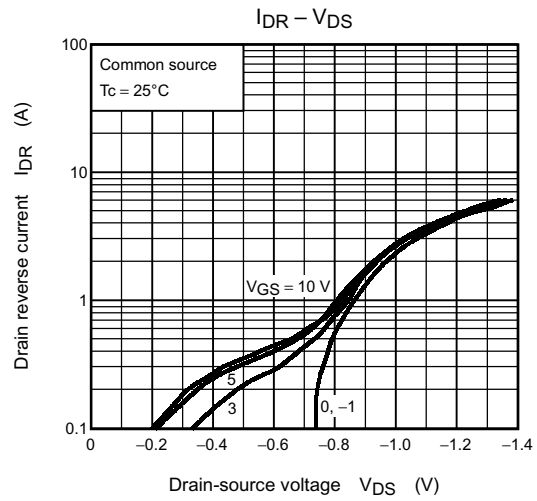
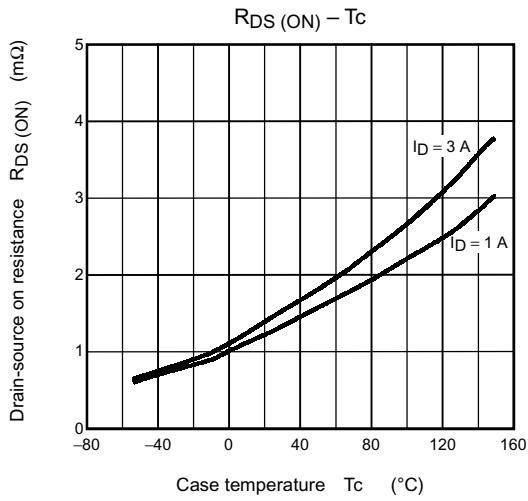
Source-Drain Diode Ratings and Characteristics (Ta = 25°C)

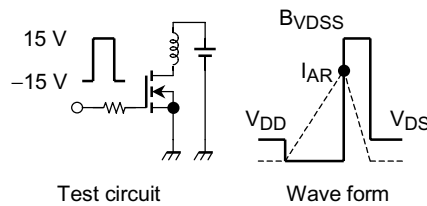
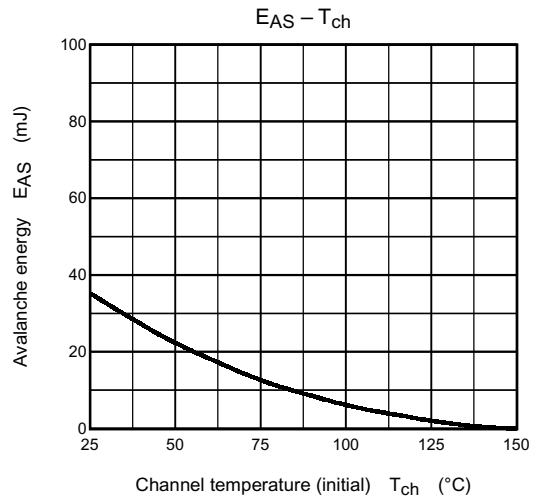
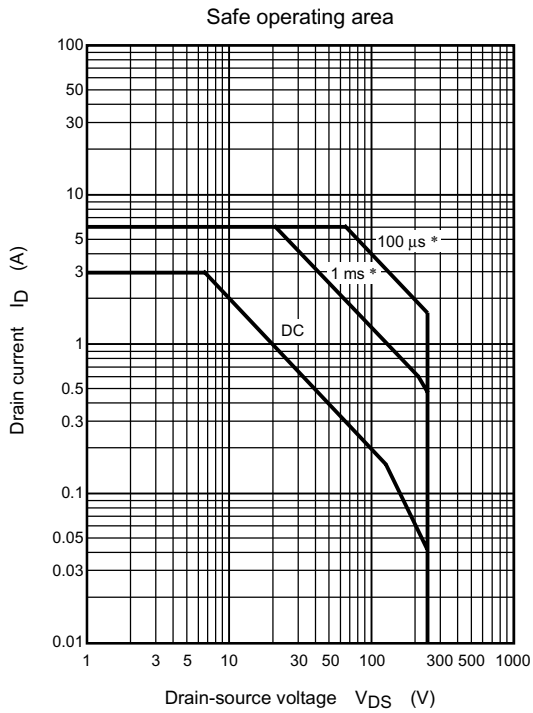
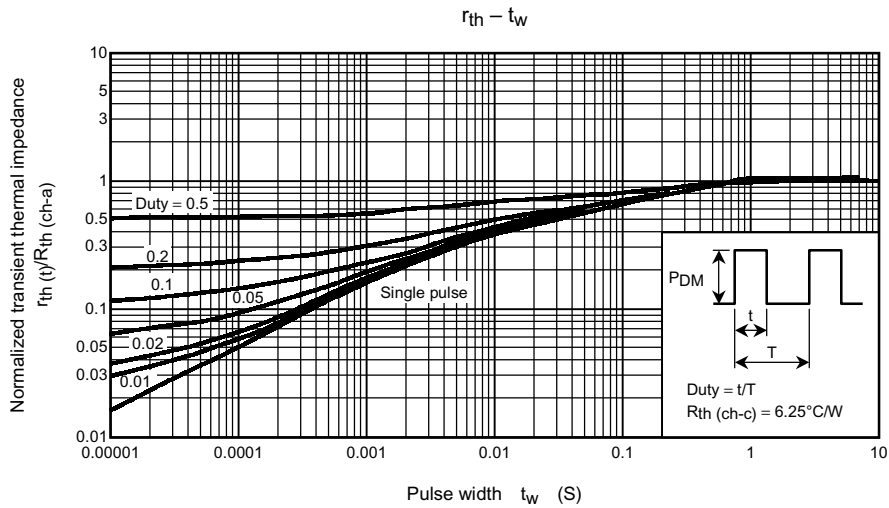
Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Continuous drain reverse current	I_{DR}	—	—	—	3	A
Pulse drain reverse current	I_{DRP}	—	—	—	6	A
Diode forward voltage	V_{DSF}	$I_{DR} = 3\text{ A}, V_{GS} = 0\text{ V}$	—	—	-2.0	V
Reverse recovery time	t_{rr}	$I_{DR} = 3\text{ A}, V_{GS} = 0\text{ V}$,	—	125	—	ns
Reverse recovery charge	Q_{rr}	$dI_{DR}/dt = 100\text{ A}/\mu\text{s}$	—	470	—	nC

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Peak $I_{AR} = 3 A$, $R_G = 25 \Omega$
 $V_{DD} = 50 V$, $L = 6.7 mH$

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