

TOSHIBA Field Effect Transistor Silicon N Channel MOS Type (π-MOSII<sup>5</sup>)

# 2SK1120

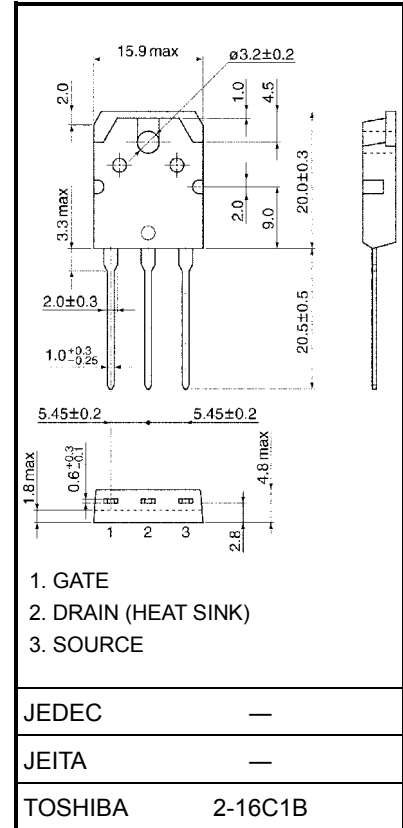
DC-DC Converter and Motor Drive Applications

Unit: mm

- Low drain-source ON resistance :  $R_{DS(ON)} = 1.5 \Omega$  (typ.)
- High forward transfer admittance :  $|Y_{fs}| = 4.0 S$  (typ.)
- Low leakage current :  $I_{DSS} = 300 \mu A$  (max) ( $V_{DS} = 800 V$ )
- Enhancement-mode :  $V_{th} = 1.5 \sim 3.5 V$  ( $V_{DS} = 10 V, I_D = 1 mA$ )

## Maximum Ratings (Ta = 25°C)

Characteristics		Symbol	Rating	Unit
Drain-source voltage		$V_{DSS}$	1000	V
Drain-gate voltage ( $R_{GS} = 20 k\Omega$ )		$V_{DGR}$	1000	V
Gate-source voltage		$V_{GSS}$	$\pm 20$	V
Drain current	DC (Note 1)	$I_D$	8	A
	Pulse (Note 1)	$I_{DP}$	24	
Drain power dissipation ( $T_c = 25^\circ C$ )		$P_D$	150	W
Channel temperature		$T_{ch}$	150	°C
Storage temperature range		$T_{stg}$	-55~150	°C



Weight: 4.6 g (typ.)

## Thermal Characteristics

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

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

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

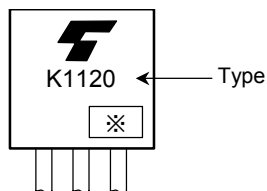
## Electrical Characteristics (Ta = 25°C)

Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Gate leakage current		$I_{GSS}$	$V_{GS} = \pm 20\text{ V}, V_{DS} = 0\text{ V}$	—	—	$\pm 100$	nA
Drain cut-off current		$I_{DSS}$	$V_{DS} = 800\text{ V}, V_{GS} = 0\text{ V}$	—	—	300	$\mu\text{A}$
Drain-source breakdown voltage		$V_{(BR)DSS}$	$I_D = 10\text{ mA}, V_{GS} = 0\text{ V}$	1000	—	—	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		$R_{DS(ON)}$	$V_{GS} = 10\text{ V}, I_D = 4\text{ A}$	—	1.5	1.8	$\Omega$
Forward transfer admittance		$ Y_{fs} $	$V_{DS} = 20\text{ V}, I_D = 4\text{ A}$	2.0	4.0	—	S
Input capacitance		$C_{iss}$	$V_{DS} = 25\text{ V}, V_{GS} = 0\text{ V}, f = 1\text{ MHz}$	—	1300	—	pF
Reverse transfer capacitance		$C_{rss}$		—	100	—	
Output capacitance		$C_{oss}$		—	180	—	
Switching time	Rise time	$t_r$		—	25	—	ns
	Turn-on time	$t_{on}$		—	40	—	
	Fall time	$t_f$		—	20	—	
	Turn-off time	$t_{off}$		—	100	—	
Total gate charge (Gate-source plus gate-drain)		$Q_g$	$V_{DD} \approx 400\text{ V}, V_{GS} = 10\text{ V}, I_D = 8\text{ A}$	—	120	—	nC
Gate-source charge		$Q_{gs}$		—	70	—	
Gate-drain ("miller") charge		$Q_{gd}$		—	50	—	

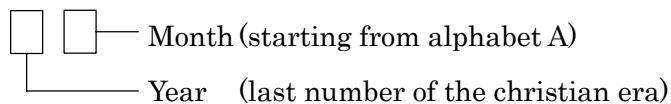
## Source-Drain Ratings and Characteristics (Ta = 25°C)

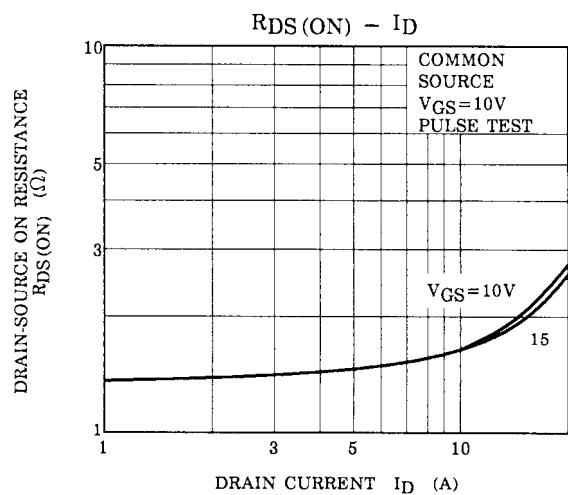
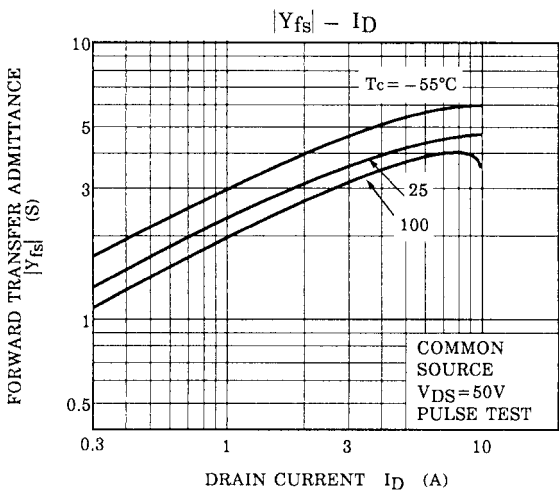
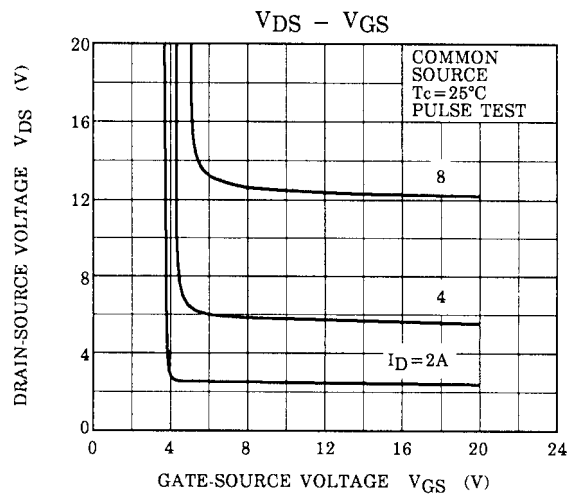
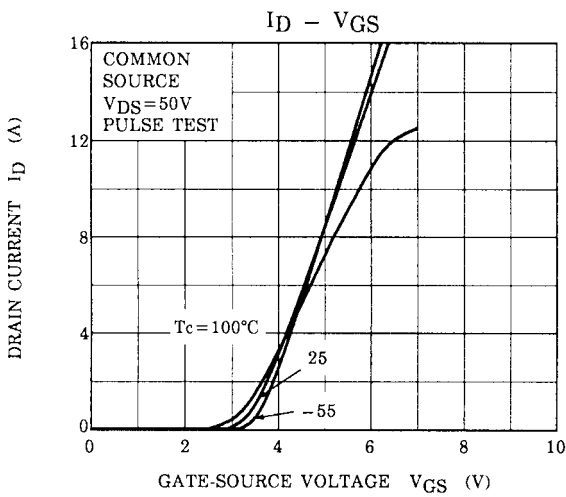
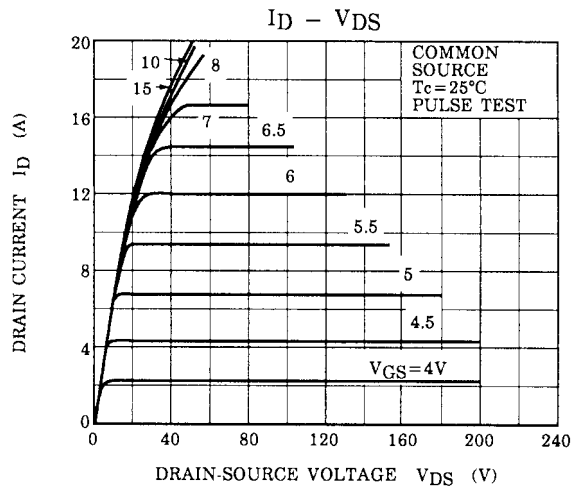
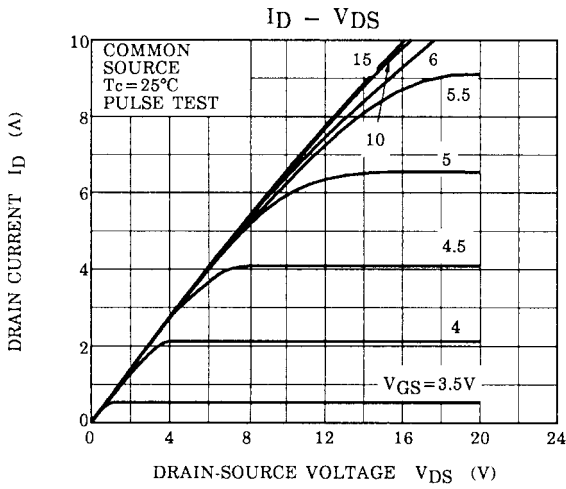
Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Continuous drain reverse current (Note 1)	$I_{DR}$	—	—	—	8	A
Pulse drain reverse current (Note 1)	$I_{DRP}$	—	—	—	24	A
Forward voltage (diode)	$V_{DSF}$	$I_{DR} = 8\text{ A}, V_{GS} = 0\text{ V}$	—	—	-1.9	V

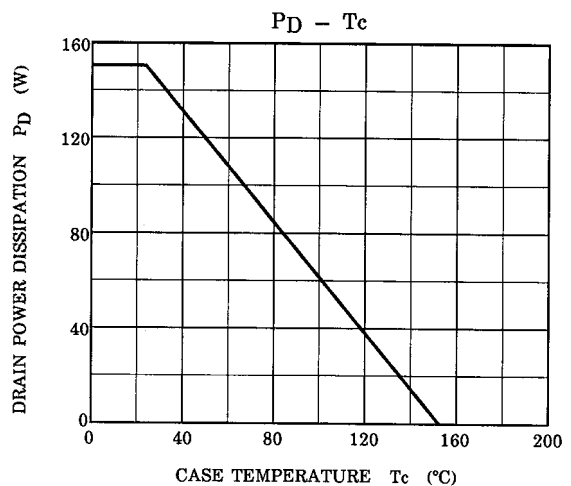
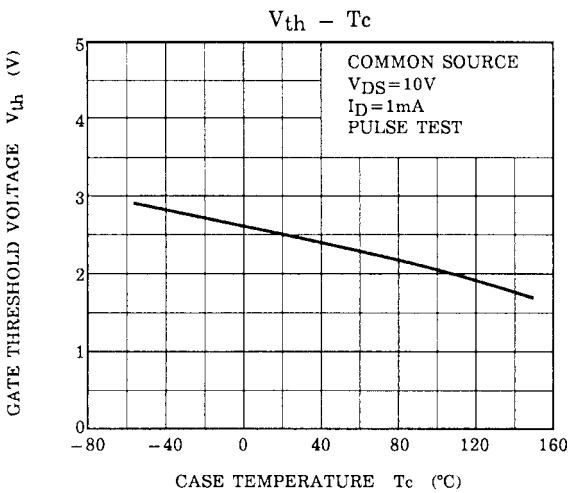
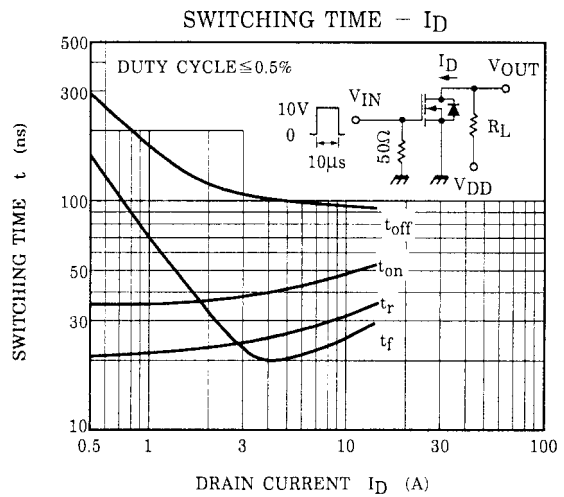
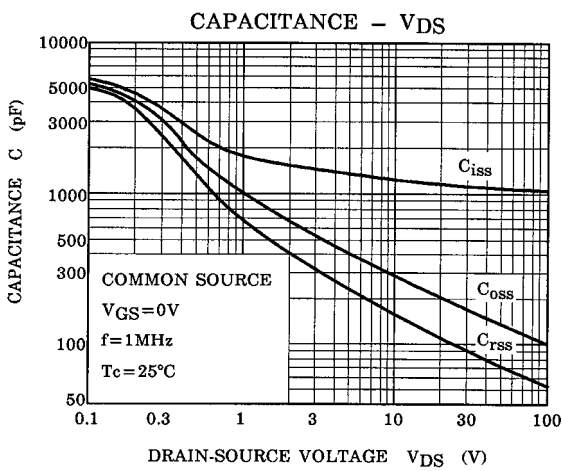
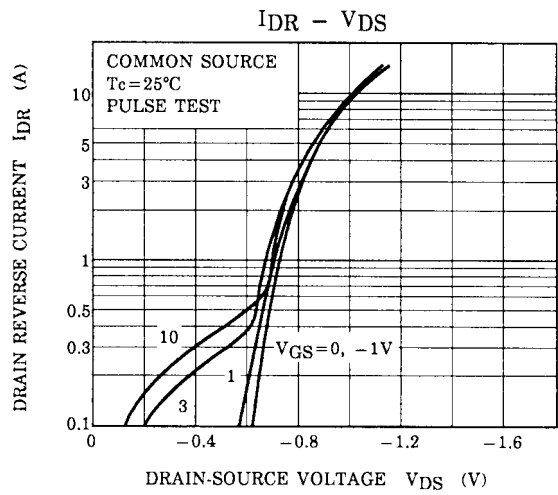
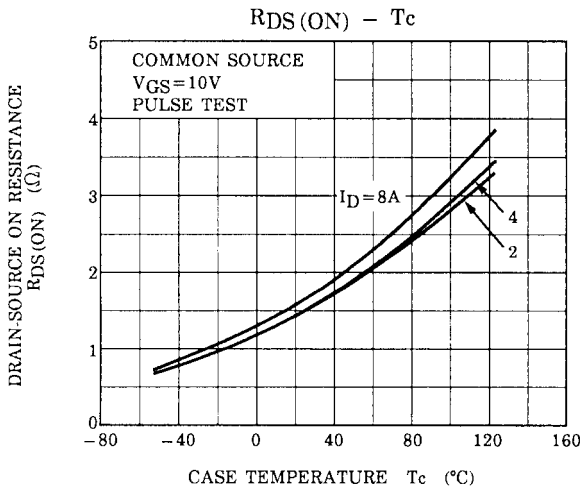
## Marking

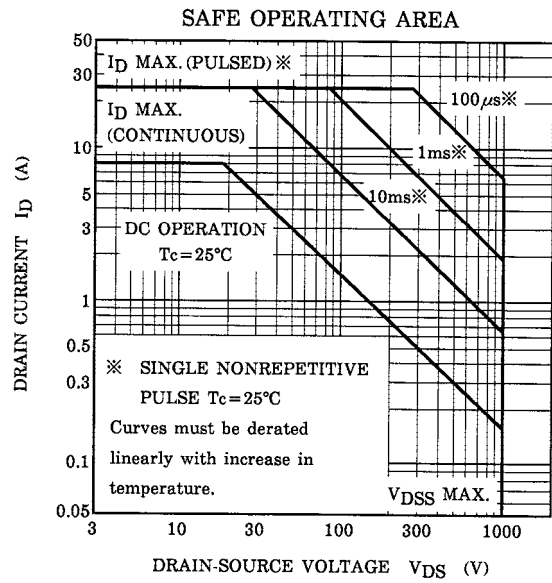
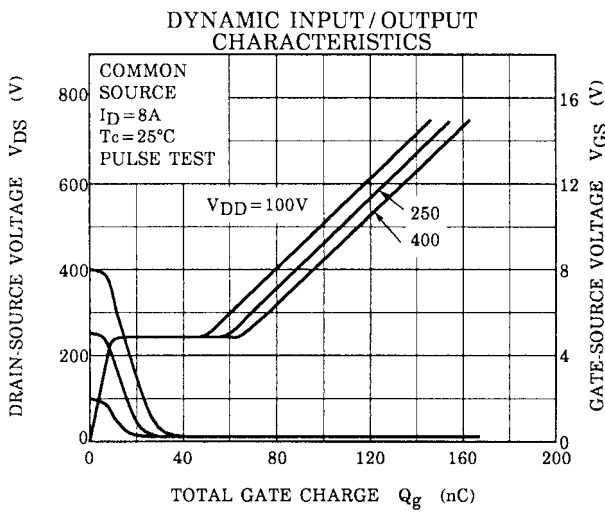
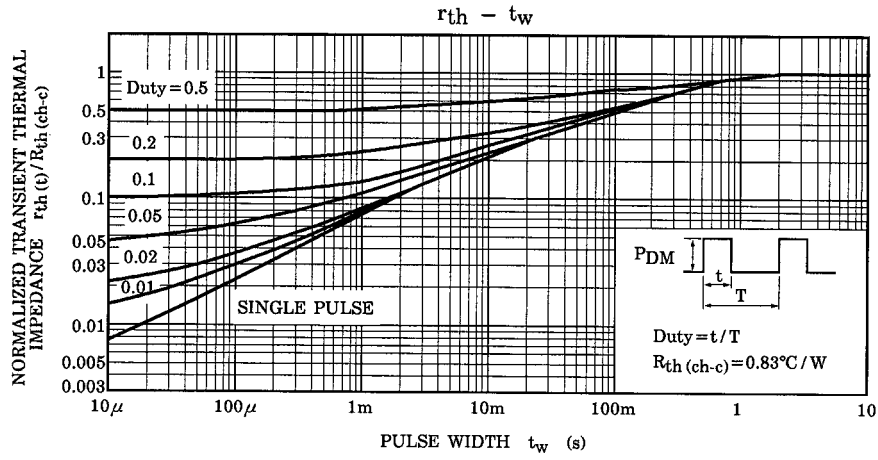


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