

TOSHIBA Field Effect Transistor Silicon P Channel MOS Type ( $\pi$ -MOSV)

## 2SJ516

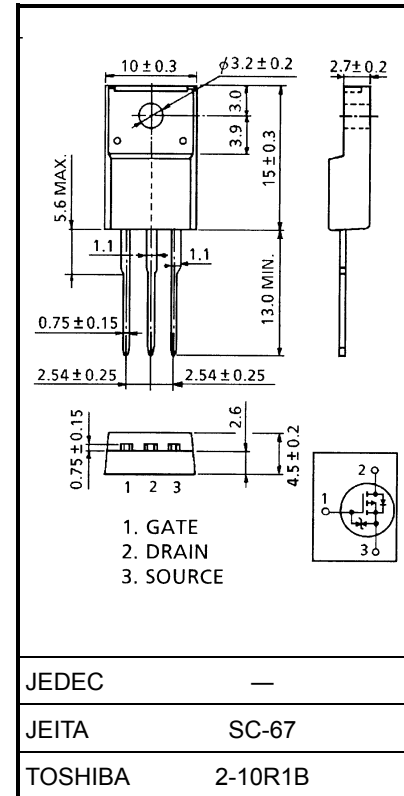
Chopper Regulator, DC-DC Converter and Motor Drive Applications

Unit: mm

- Low drain-source ON resistance :  $R_{DS(ON)} = 0.6 \Omega$  (typ.)
- High forward transfer admittance :  $|Y_{fs}| = 5.3 S$  (typ.)
- Low leakage current :  $I_{DSS} = -100 \mu A$  (max) ( $V_{DS} = -250 V$ )
- 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		$V_{GSS}$	$\pm 20$	V
Drain current	DC (Note 1)	$I_D$	-6.5	A
	Pulse (Note 1)	$I_{DP}$	-13	A
Drain power dissipation ( $T_c = 25^\circ C$ )		$P_D$	35	W
Single pulse avalanche energy (Note 2)		$E_{AS}$	157	mJ
Avalanche current		$I_{AR}$	-6.5	A
Repetitive avalanche energy (Note 3)		$E_{AR}$	3.5	mJ
Channel temperature		$T_{ch}$	150	$^\circ C$
Storage temperature range		$T_{stg}$	-55~150	$^\circ C$



Weight: 1.9 g (typ.)

### Thermal Characteristics

Characteristics	Symbol	Max	Unit
Thermal resistance, channel to case	$R_{th(ch-c)}$	3.57	$^\circ C / W$
Thermal resistance, channel to ambient	$R_{th(ch-a)}$	62.5	$^\circ C / W$

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

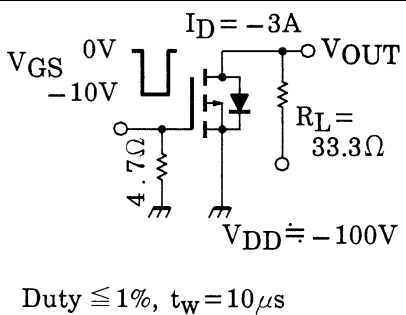
Note 2:  $V_{DD} = -50 V$ ,  $T_{ch} = 25^\circ C$  (initial),  $L = 6.3 mH$ ,  $R_G = 25 \Omega$ ,  $I_{AR} = -6.5 A$

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

This transistor is an electrostatic sensitive device.

Please handle with caution.

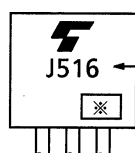
## Electrical Characteristics (Ta = 25°C)

Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Gate leakage current		$I_{GSS}$	$V_{GS} = \pm 16 \text{ V}, V_{DS} = 0 \text{ V}$	—	—	$\pm 10$	$\mu\text{A}$
Drain cut-off current		$I_{DSS}$	$V_{DS} = -250 \text{ V}, V_{GS} = 0 \text{ V}$	—	—	-100	$\mu\text{A}$
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		$R_{DS(ON)}$	$V_{GS} = -10 \text{ V}, I_D = -3 \text{ A}$	—	0.6	0.8	$\Omega$
Forward transfer admittance		$ Y_{fs} $	$V_{DS} = -10 \text{ V}, I_D = -3 \text{ A}$	2.5	5.3	—	S
Input capacitance		$C_{iss}$	$V_{DS} = -10 \text{ V}, V_{GS} = 0 \text{ V}, f = 1 \text{ MHz}$	—	1120	—	pF
Reverse transfer capacitance		$C_{rss}$		—	110	—	
Output capacitance		$C_{oss}$		—	320	—	
Switching time	Rise time	$t_r$		—	17	—	ns
	Turn-on time	$t_{on}$		—	34	—	
	Fall time	$t_f$		—	6	—	
	Turn-off time	$t_{off}$		—	71	—	
Total gate charge (Gate-source plus gate-drain)		$Q_g$	$V_{DD} \approx -200 \text{ V}, V_{GS} = -10 \text{ V}, I_D = -6.5 \text{ A}$	—	29	—	nC
Gate-source charge		$Q_{gs}$		—	19	—	
Gate-drain ("miller") charge		$Q_{gd}$		—	10	—	

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

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Continuous drain reverse current (Note 1)	$I_{DR}$	—	—	—	-6.5	A
Pulse drain reverse current (Note 1)	$I_{DRP}$	—	—	—	-13	A
Forward voltage (diode)	$V_{DSF}$	$I_{DR} = -6.5 \text{ A}, V_{GS} = 0 \text{ V}$	—	—	2.0	V
Reverse recovery time	$t_{rr}$	$I_{DR} = -6.5 \text{ A}, V_{GS} = 0 \text{ V}$	—	190	—	ns
Reverse recovery charge	$Q_{rr}$	$dI_{DR} / dt = 100 \text{ A} / \mu\text{s}$	—	2.1	—	$\mu\text{C}$

## Marking



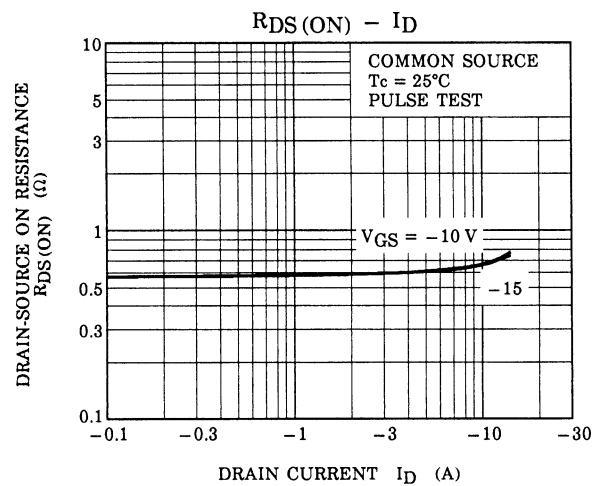
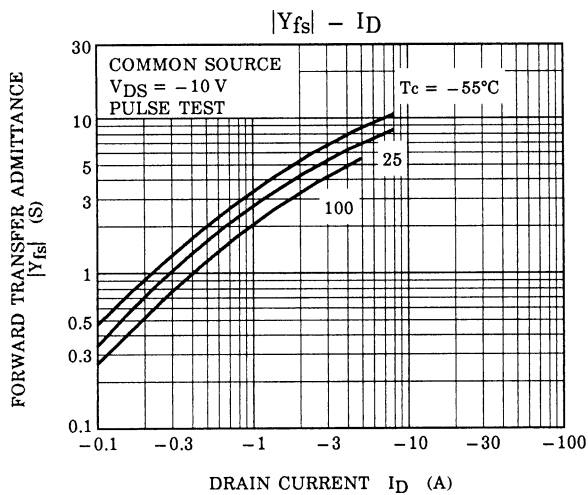
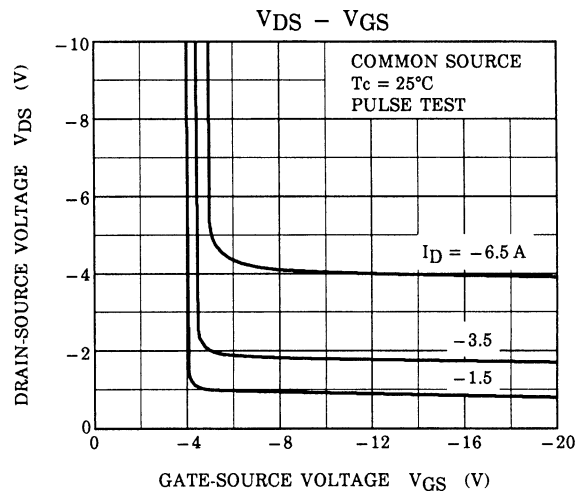
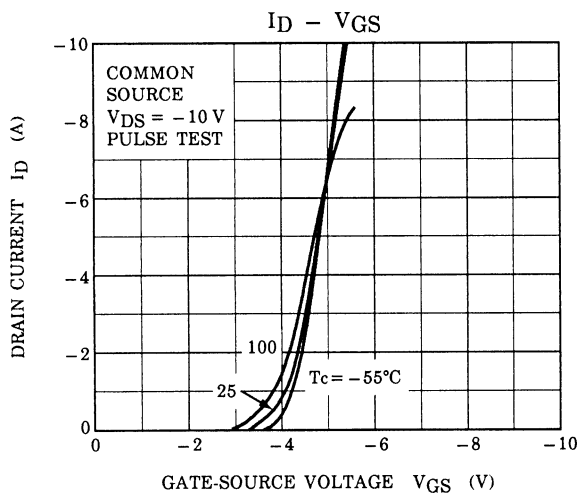
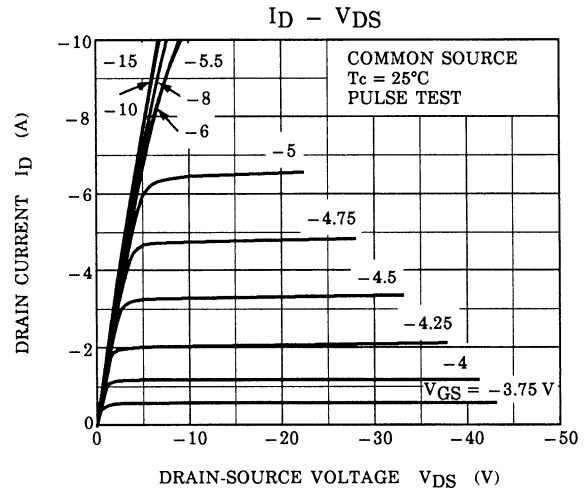
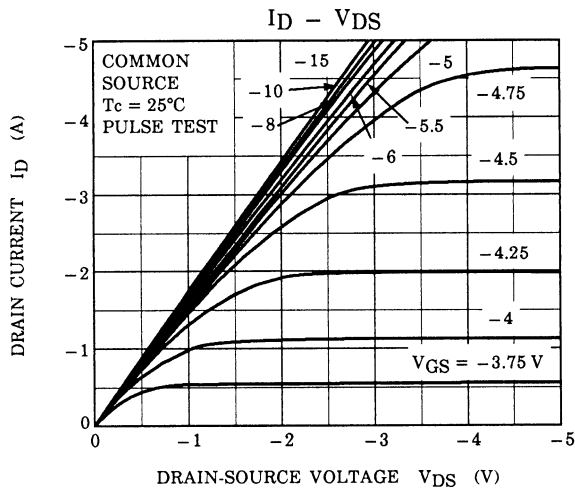
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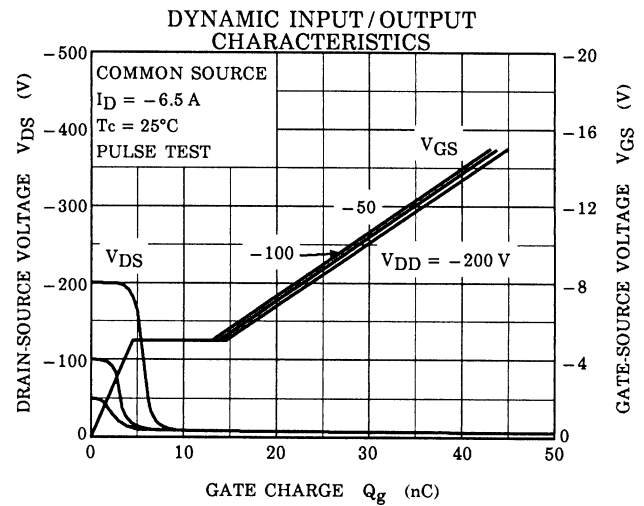
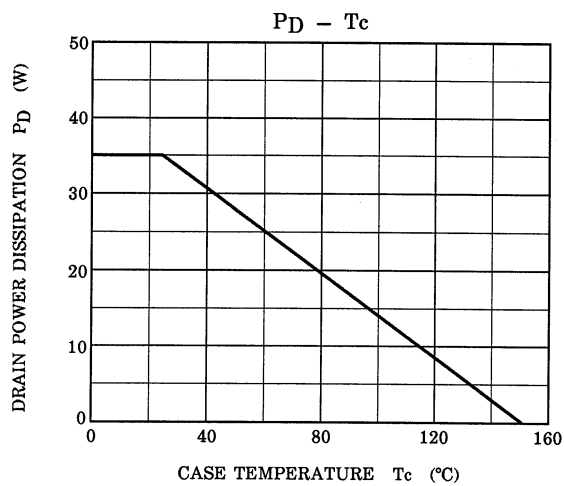
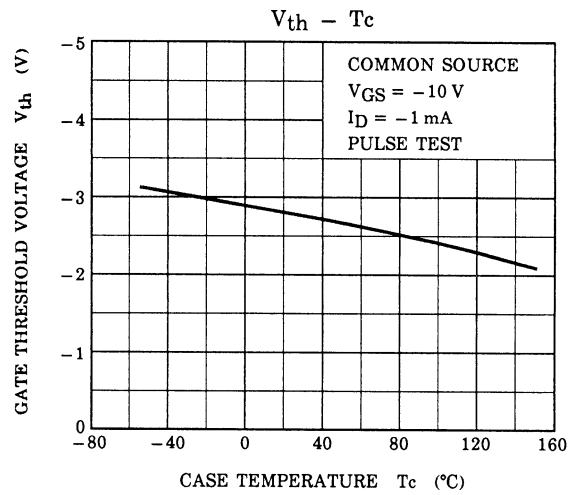
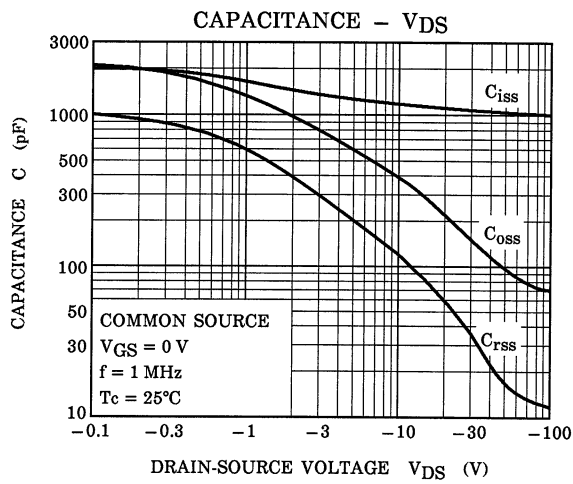
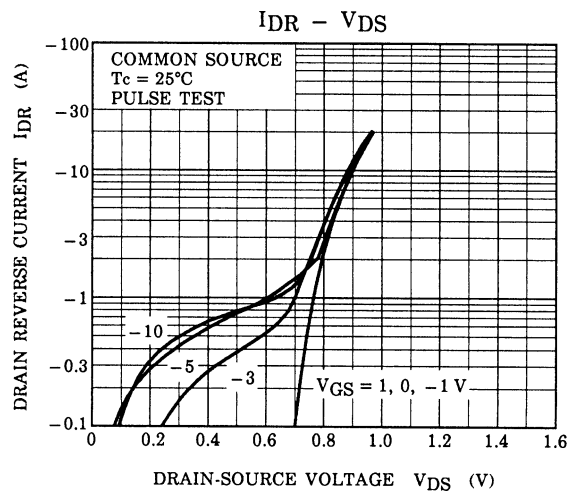
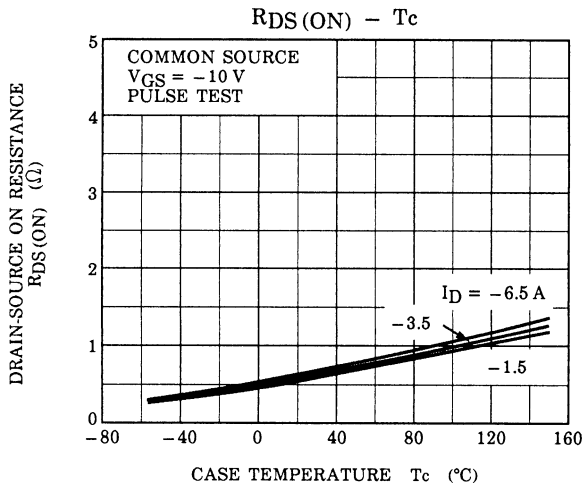
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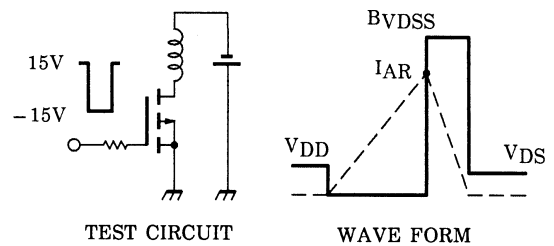
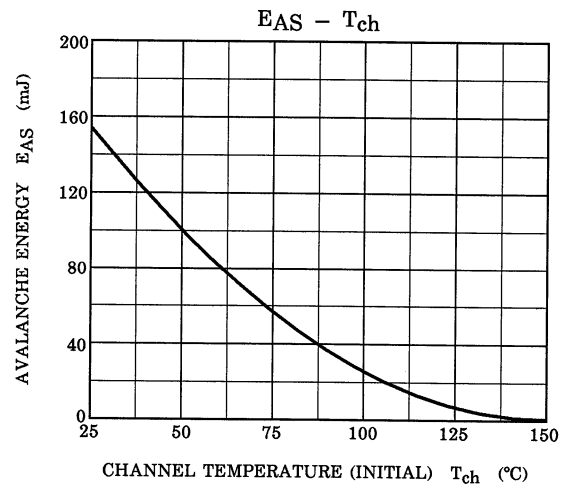
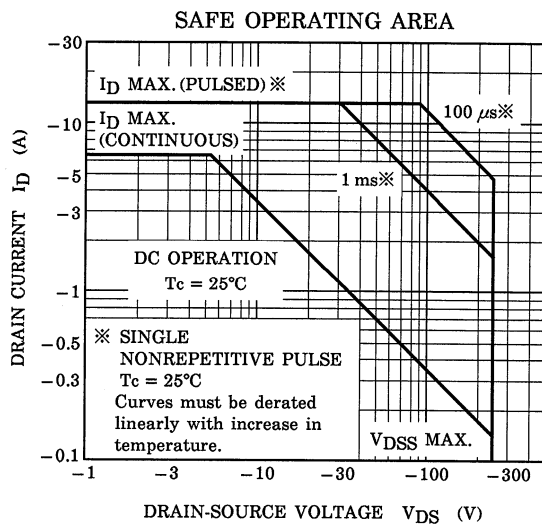
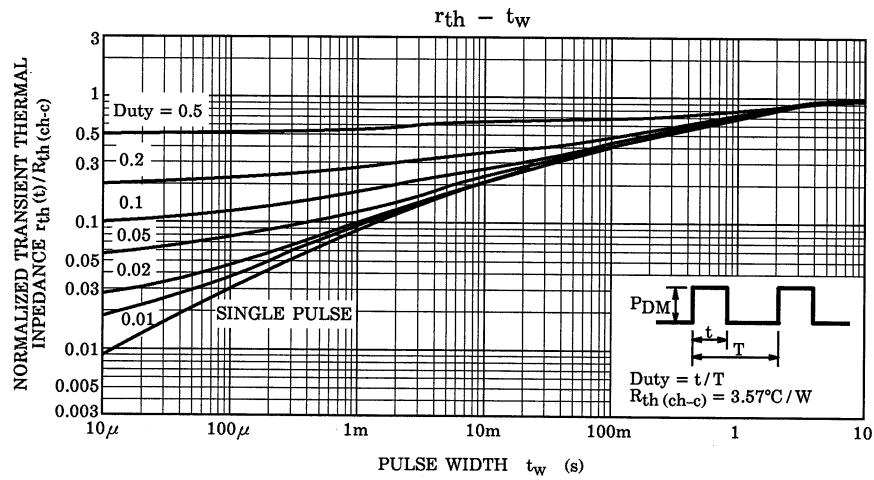


Month (Starting from Alphabet A)

Year (Last Number of the Christian Era)







$$R_G = 25\Omega$$

$$V_{DD} = -50V, L = 6.3mH$$

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

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