

TOSHIBA FIELD EFFECT TRANSISTOR SILICON P CHANNEL MOS TYPE (π -MOS V)

2SJ516

HIGH SPEED, HIGH CURRENT SWITCHING APPLICATIONS

CHOPPER REGULATOR, DC-DC CONVERTER AND MOTOR DRIVE APPLICATIONS

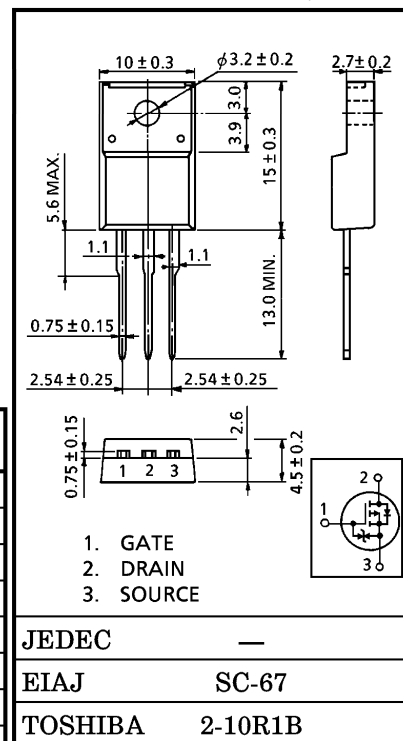
INDUSTRIAL APPLICATIONS

Unit in 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 : $I_{DSS} = -100 \mu A$ ($V_{DS} = -250 V$)
- Enhancement-Mode : $V_{th} = -1.5 \sim -3.5 V$
($V_{DS} = -10 V$, $I_D = -1 mA$)

MAXIMUM RATINGS ($T_a = 25^\circ C$)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Drain-Source Voltage		V _{DSS}	−250	V
Drain-Gate Voltage (R _{GS} = 20 kΩ)		V _{DGR}	−250	V
Gate-Source Voltage		V _{GSS}	±20	V
Drain Current	DC	I _D	−6.5	A
	Pulse	I _{DP}	−13	A
Drain Power Dissipation (T _c = 25°C)		P _D	35	W
Single Pulse Avalanche Energy**		E _{AS}	157	mJ
Avalanche Current		I _{AR}	−6.5	A
Repetitive Avalanche Energy*		E _{AR}	3.5	mJ
Chanel Temperature		T _{ch}	150	°C
Storage Temperature Range		T _{stg}	−55~150	°C



THERMAL CHARACTERISTICS

CHARACTERISTIC	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 ;

* Repetitive rating ; Pulse Width Limited by Max. junction temperature.

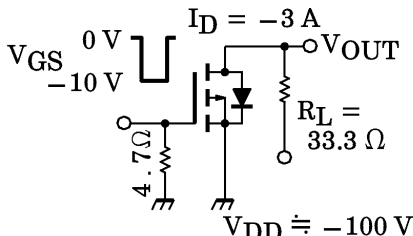
** $V_{DD} = -50 V$, Starting $T_{ch} = 25^\circ C$, $L = 6.3 mH$, $R_G = 25 \Omega$, $I_{AR} = -6.5 A$

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

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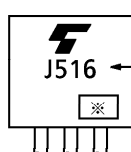
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		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		$R_{DS(ON)}$	$V_{GS} = -10 \text{ V}, I_D = -3 \text{ A}$	—	0.6	0.8	Ω
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	$V_{DD} \doteq -200 \text{ V}, V_{GS} = -10 \text{ V}$ $I_D = -6.5 \text{ A}$	—	29	—	nC
Gate-Source Charge		Q_{gs}		—	19	—	
Gate-Drain ("Miller") Charge		Q_{gd}		—	10	—	

SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current	I_{DR}	—	—	—	-6.5	A
Pulse Drain Reverse Current	I_{DRP}	—	—	—	-13	A
Diode Forward Voltage	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	—	μC

MARKING



TYPE

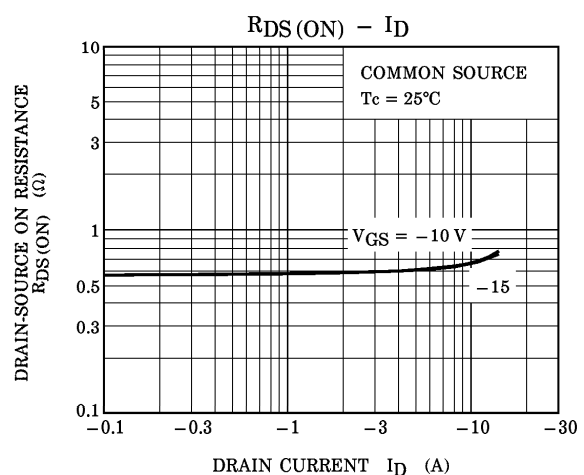
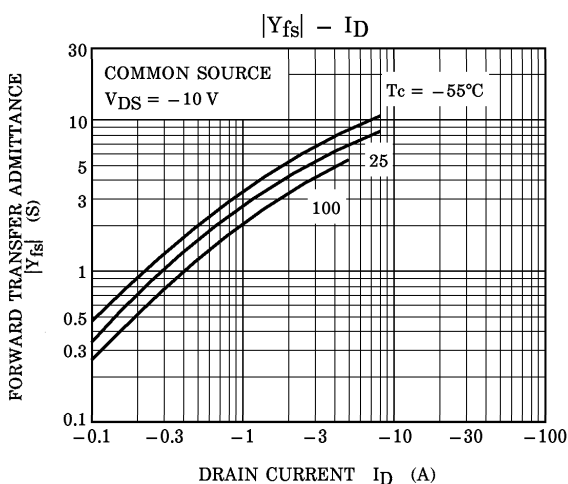
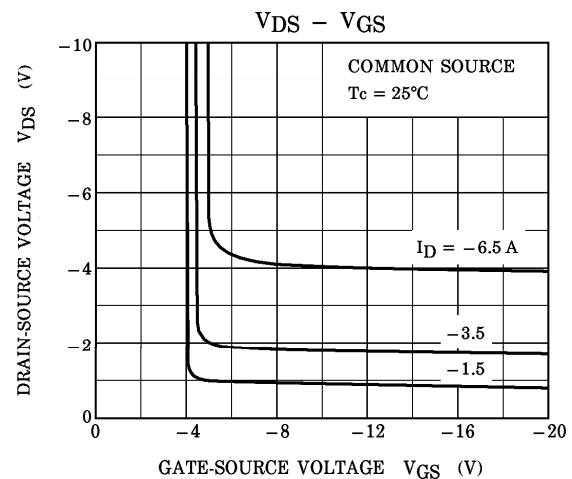
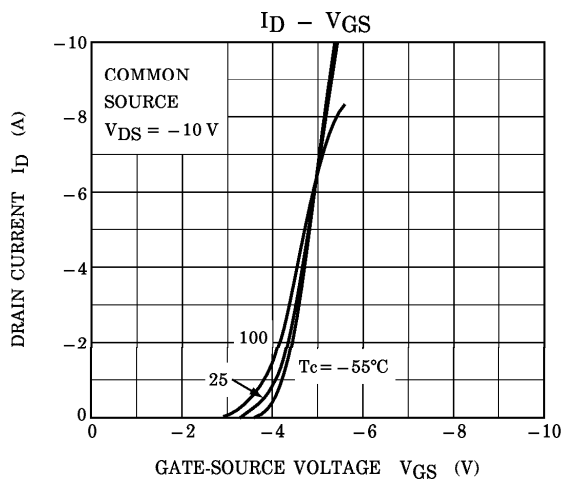
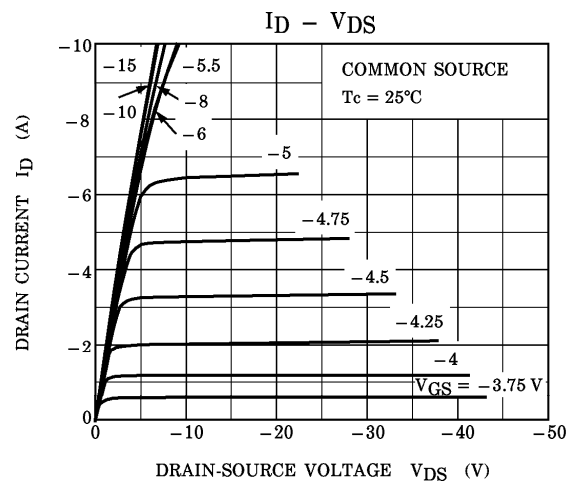
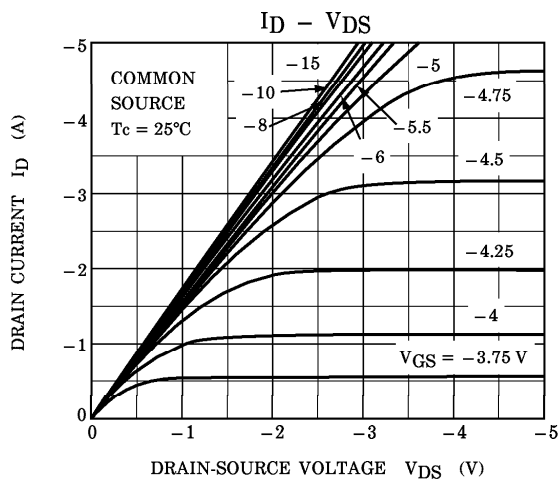
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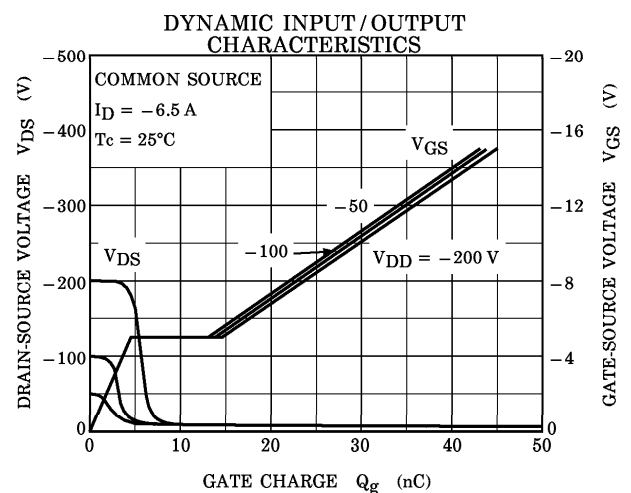
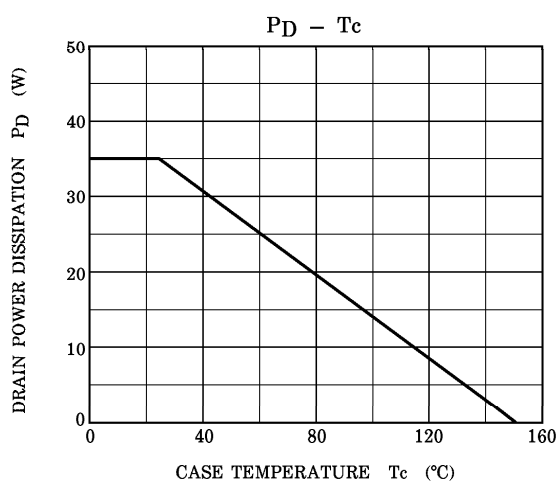
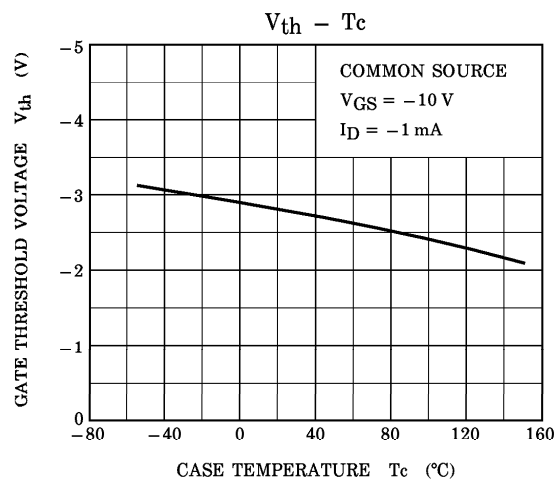
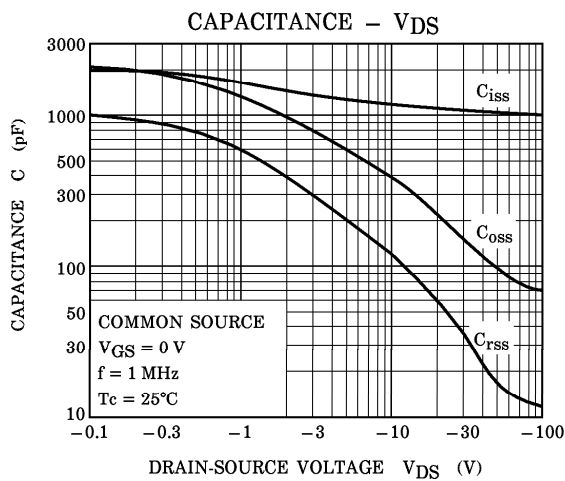
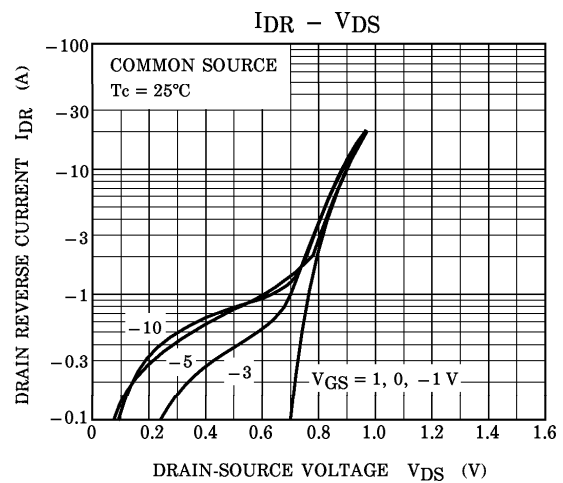
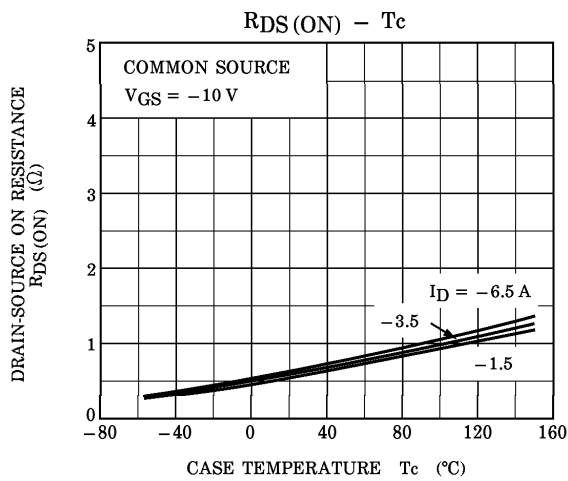


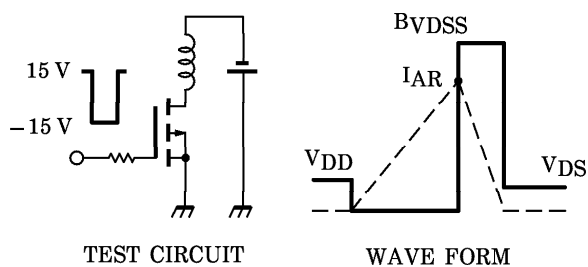
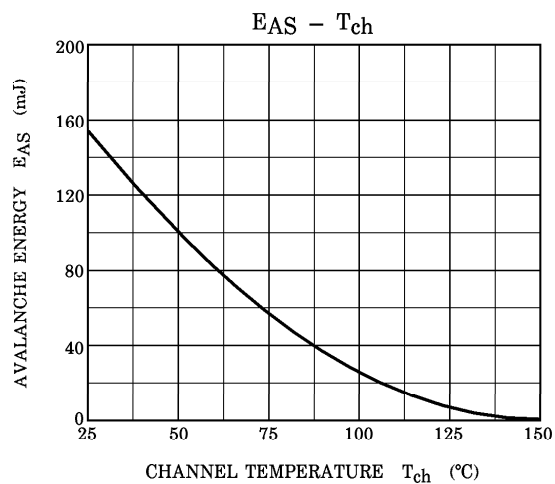
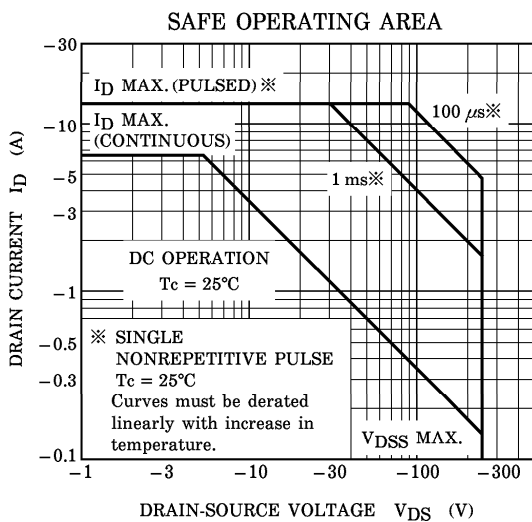
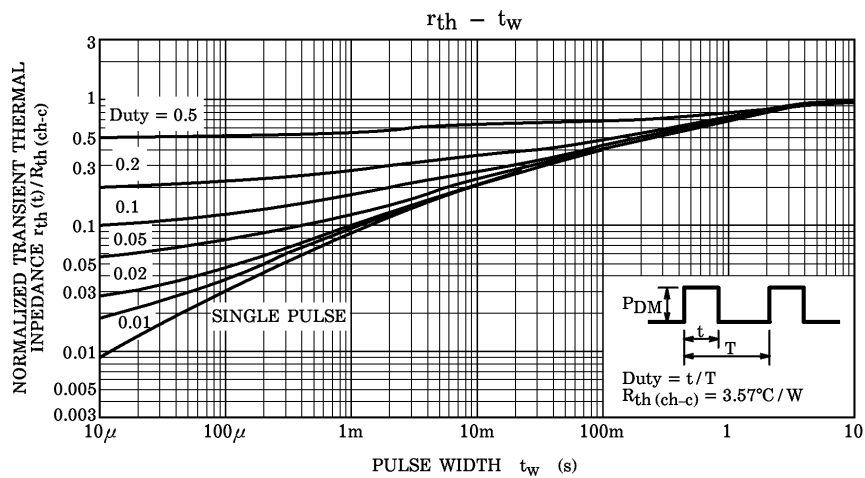
Month (Starting from Alphabet A)



Year (Last Number of the Christian Era)







Peak $I_{AR} = -6.5$ A, $R_G = 25 \Omega$ $E_{AS} = \frac{1}{2} \cdot L \cdot I^2 \cdot \left(\frac{BVDSS}{BVDSS - V_{DD}} \right)$
 $V_{DD} = -50$ V, $L = 6.3$ mH