

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

2SJ516

HIGH SPEED, HIGH CURRENT SWITCHING APPLICATIONS
 CHOPPER REGULATOR, DC-DC CONVERTER AND MOTOR DRIVE APPLICATIONS

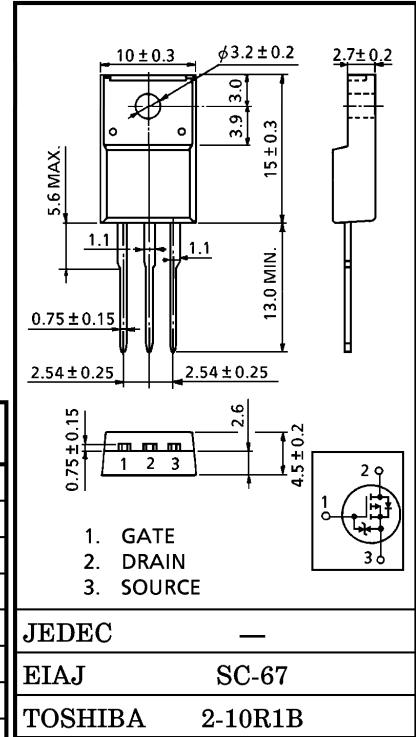
INDUSTRIAL APPLICATIONS

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 ($R_{GS} = 20 k\Omega$)	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 ($T_c = 25^\circ C$)	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	$^\circ C$
Storage Temperature Range	T_{stg}	-55~150	$^\circ C$



HERMAL CHARACTERISTICS

CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance, Chanel To Case	$R_{th(ch-c)}$	3.57	$^\circ C / W$
Thermal Resistance, Chanel 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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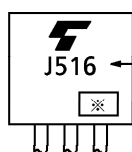
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

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	<p>$I_D = -3\text{ A}$ $V_{GS} = 0\text{ V}$ $V_{GS} = -10\text{ V}$ $R_L = 33.3\ \Omega$ $V_{DD} = -100\text{ V}$</p>	—	17	—	ns
	Turn-on Time	t_{on}		—	34	—	
	Fall Time	t_f		—	6	—	
	Turn-off Time	t_{off}		$V_{IN} : t_r, t_f < 5\text{ ns},$ $Duty \leq 1\%, t_w = 10\ \mu\text{s}$	—	71	
Total Gate Charge (Gate-Source Plus Gate-Drain)		Q_g	$V_{DD} = -200\text{ V}, V_{GS} = -10\text{ V}$ $I_D = -6.5\text{ A}$	—	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

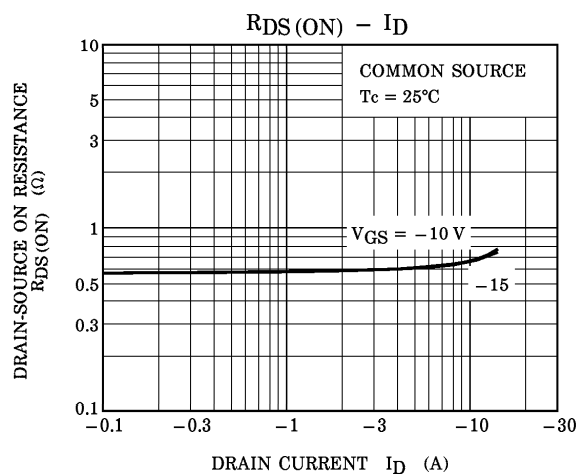
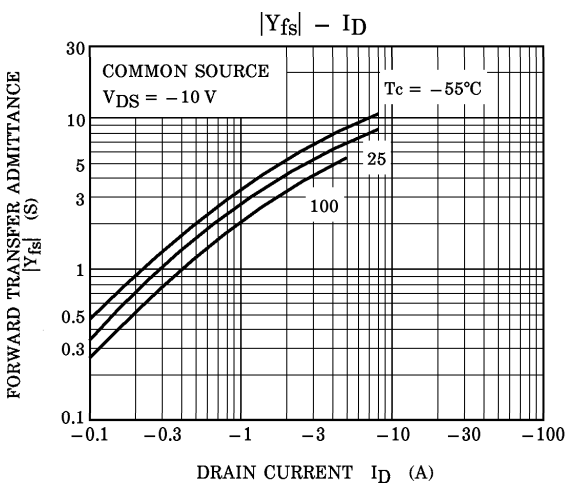
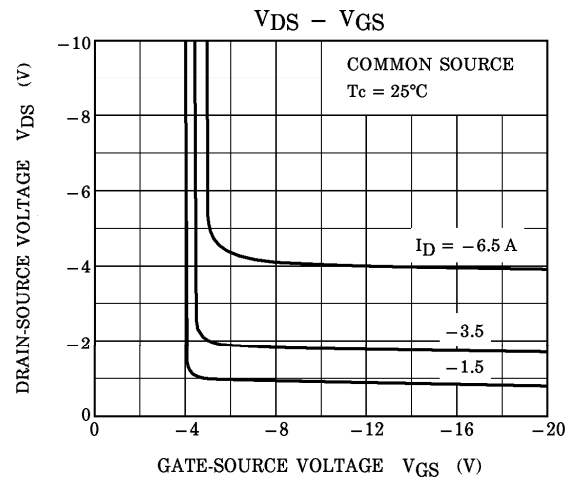
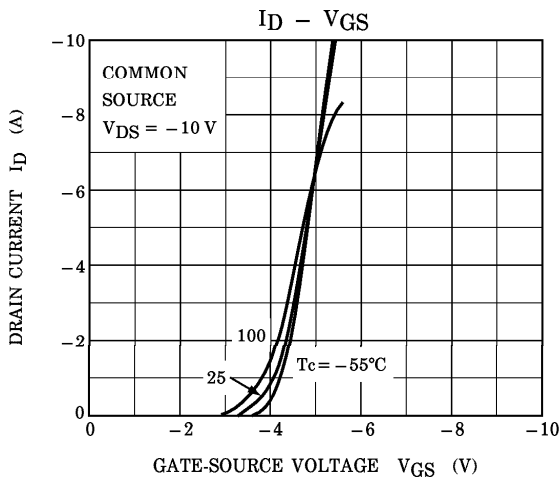
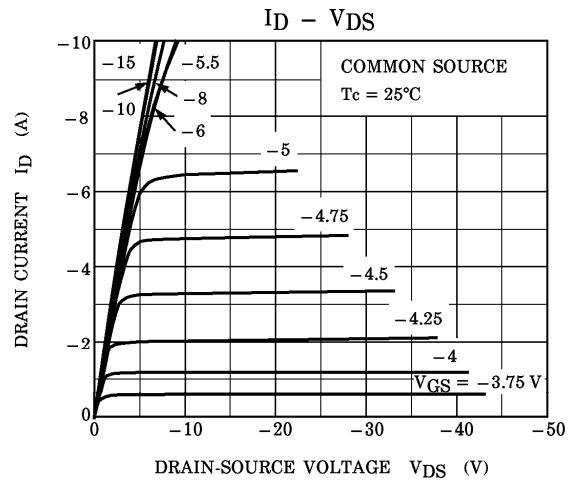
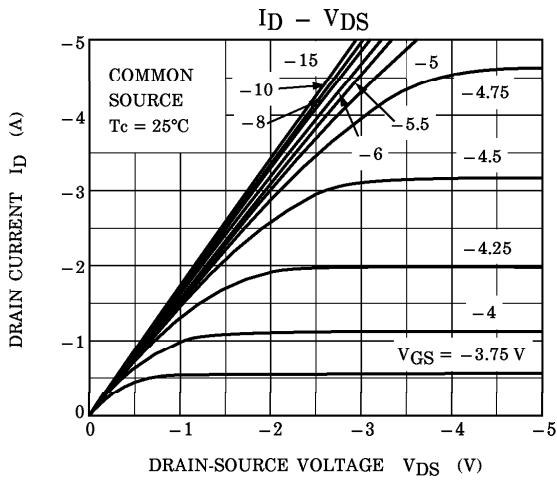
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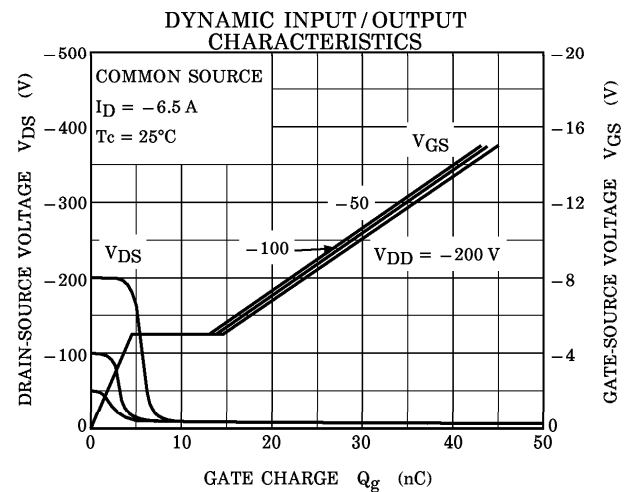
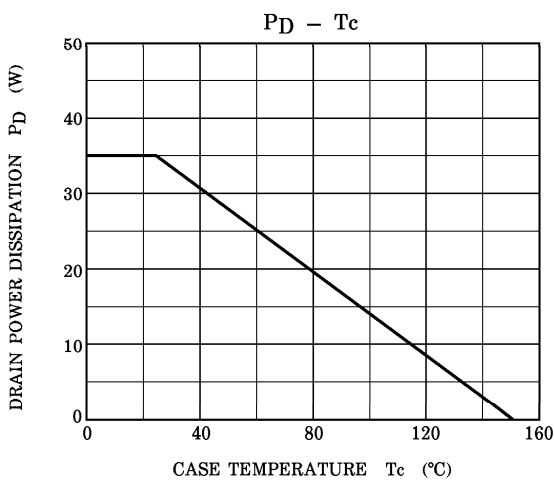
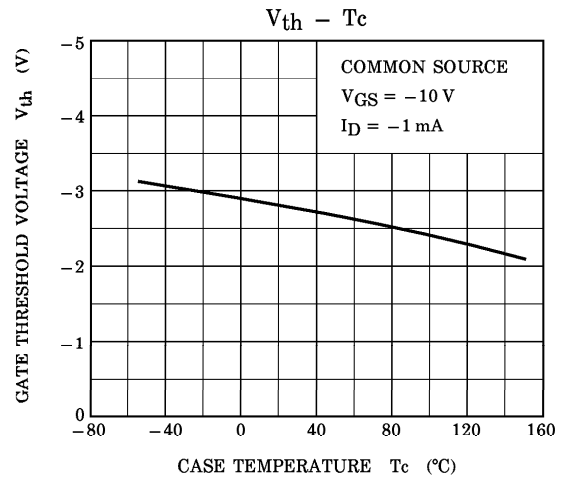
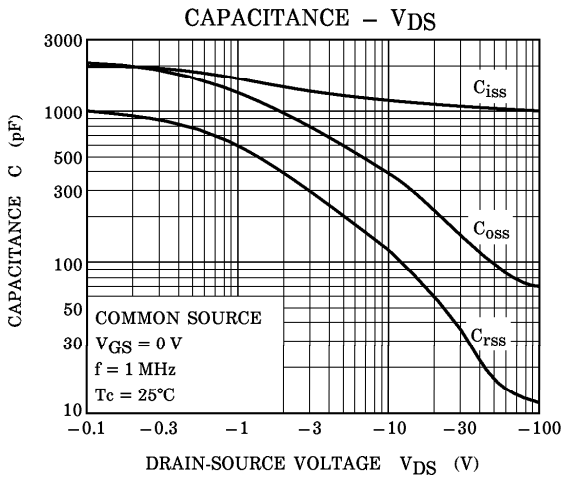
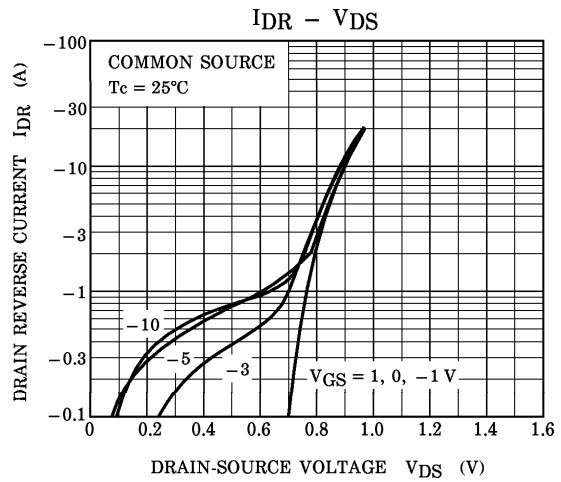
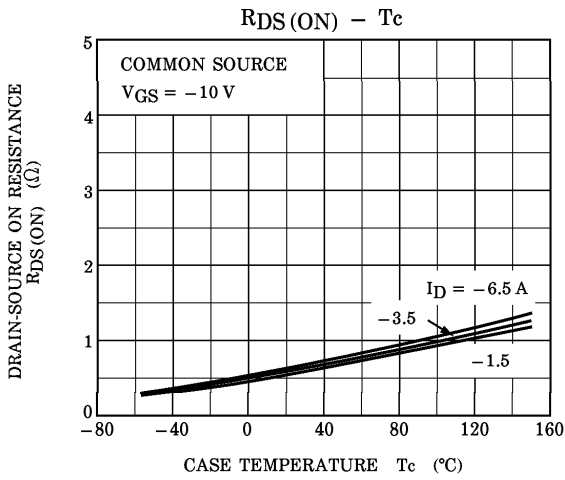


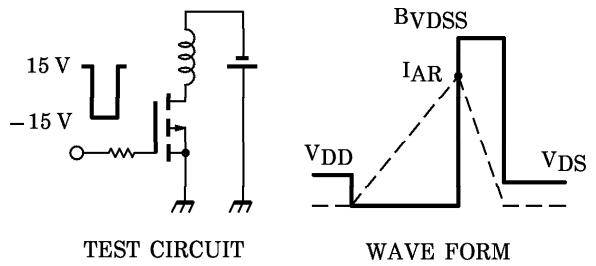
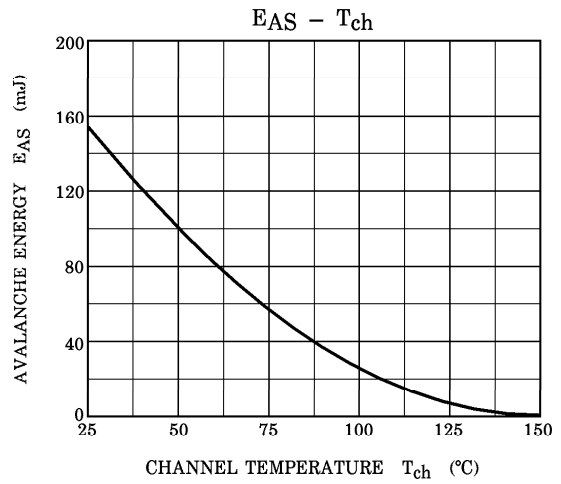
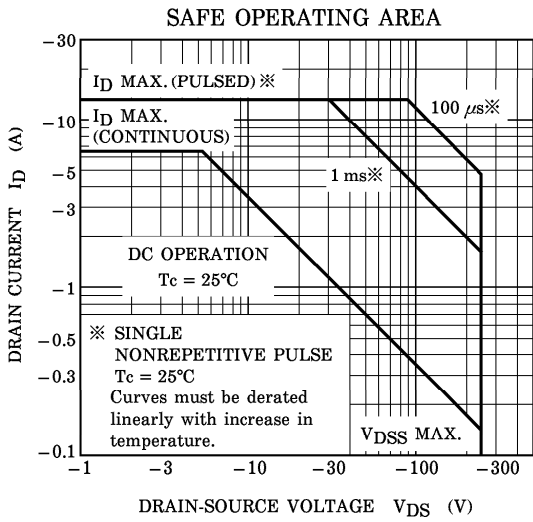
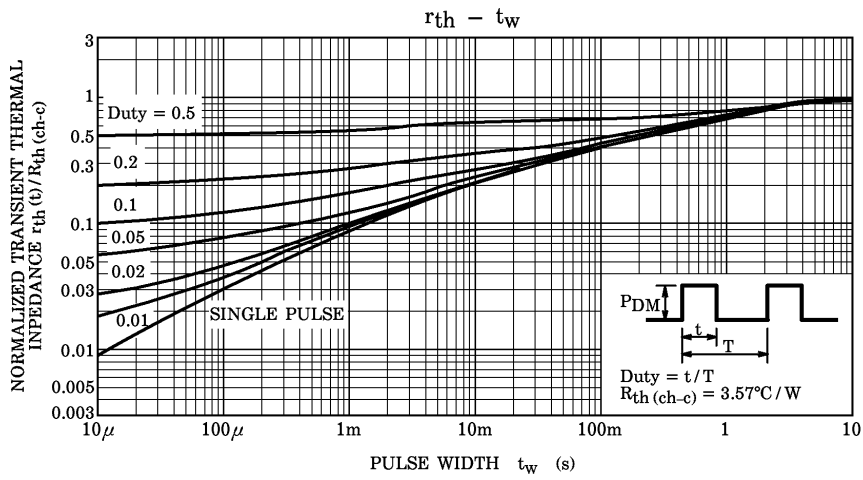
※ Lot Number

□ □ — Month (Starting from Alphabet A)

— Year (Last Number of the Christian Era)







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