

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

2SJ512

HIGH SPEED, HIGH CURRENT SWITCHING APPLICATIONS

CHOPPER REGULATOR, DC-DC CONVERTER AND MOTOR DRIVE APPLICATIONS

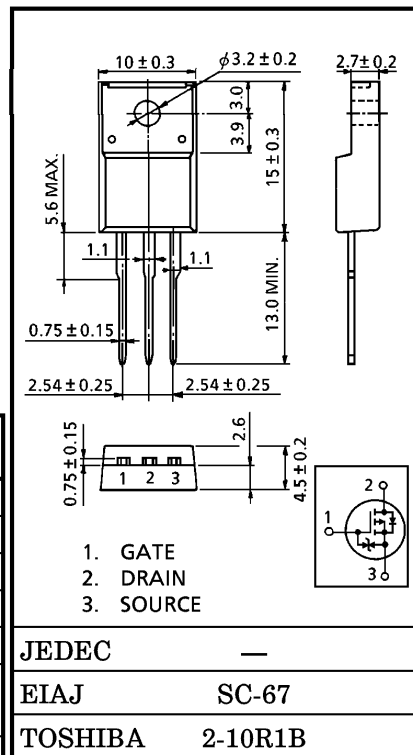
INDUSTRIAL APPLICATIONS

Unit in mm

- Low Drain-Source ON Resistance : $R_{DS(ON)} = 1.0 \Omega$ (Typ.)
- High Forward Transfer Admittance : $|Y_{fs}| = 3.7 S$ (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 ($T_a = 25^\circ C$)

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	-5
	Pulse	I_{DP}	-20
Drain Power Dissipation ($T_c = 25^\circ C$)	P_D	30	W
Single Pulse Avalanche Energy**	E_{AS}	155	mJ
Avalanche Current	I_{AR}	-5	A
Repetitive Avalanche Energy*	E_{AR}	3.0	mJ
Channel Temperature	T_{ch}	150	$^\circ C$
Storage Temperature Range	T_{stg}	-55~150	$^\circ C$



THERMAL CHARACTERISTICS

CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance, Channel To Case	$R_{th(ch-c)}$	4.16	$^\circ C/W$
Thermal Resistance, Channel to Ambient	$R_{th(ch-a)}$	62.5	$^\circ C/W$

Note ;

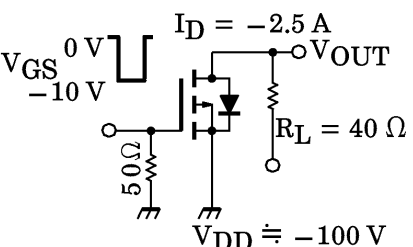
* Repetitive rating ; Pulse Width Limited by Max. junction temperature.

** $V_{DD} = -50 V$, $T_{ch} = 25^\circ C$ (initial), $L = 10.5 mH$, $R_G = 25 \Omega$, $I_{AR} = -5 A$ **This transistor is an electrostatic sensitive device.****Please handle with caution.**

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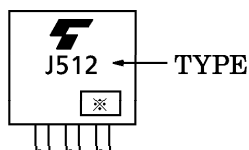
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		I _{GSS}	V _{GS} = ±16V, V _{DS} = 0 V	—	—	±10	μA
Drain Cut-off Current		I _{DSS}	V _{DS} = -250 V, V _{GS} = 0 V	—	—	-100	μA
Drain-Source Breakdown Voltage		V _(BR) DSS	I _D = -10 mA, V _{GS} = 0V	-250	—	—	V
Gate Threshold Voltage		V _{th}	V _{DS} = -10 V, I _D = -1 mA	-1.5	—	-3.5	V
Drain-Source ON Resistance		R _{DS} (ON)	V _{GS} = -10 V, I _D = -2.5 A	—	1.0	1.25	Ω
Forward Transfer Admittance		Y _{fs}	V _{DS} = -10 V, I _D = -2.5 A	1.8	3.7	—	S
Input Capacitance		C _{iss}	V _{DS} = -10 V, V _{GS} = 0 V, f = 1MHz	—	800	—	pF
Reverse Transfer Capacitance		C _{rss}		—	80	—	
Output Capacitance		C _{oss}		—	250	—	
Switching Time	Rise Time	t _r	 $I_D = -2.5 \text{ A}$ $V_{GS} = 0 \text{ V}, -10 \text{ V}$ $R_L = 40 \Omega$ $V_{DD} = -100 \text{ V}$ 入力 : t_r, t_f < 5 ns, Duty ≤ 1%, t_w = 10 μs	—	16	—	ns
	Turn-on Time	t _{on}		—	35	—	
	Fall Time	t _f		—	9	—	
	Turn-off Time	t _{off}		—	70	—	
Total Gate Charge (Gate-Source Plus Gate-Drain)		Q _g	V _{DD} = -200 V, V _{GS} = -10 V I _D = -5 A	—	22	—	nC
Gate-Source Charge		Q _{gs}		—	14	—	
Gate-Drain ("Miller") Charge		Q _{gd}		—	8	—	

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

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current	I _{DR}	—	—	—	-5	A
Pulse Drain Reverse Current	I _{DRP}	—	—	—	-20	A
Diode Forward Voltage	V _{DSF}	I _{DR} = -5 A, V _{GS} = 0 V	—	—	2.0	V
Reverse Recovery Time	t _{rr}	I _{DR} = -5 A, V _{GS} = 0 V	—	205	—	ns
Reverse Recovery Charge	Q _{rr}	dI _{DR} / dt = 100 A / μs	—	2.1	—	μC

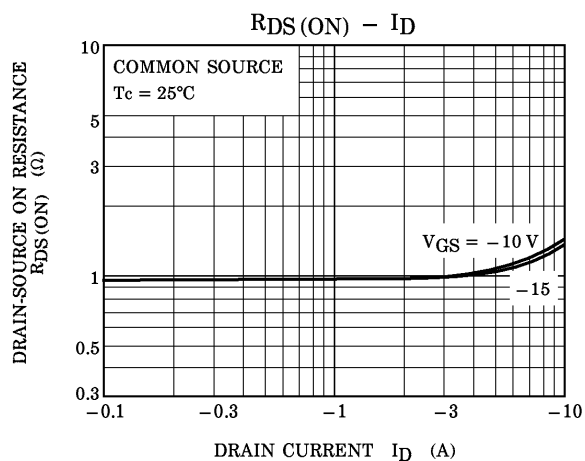
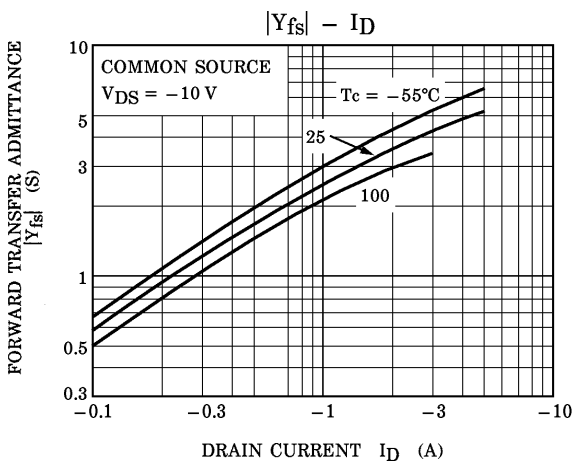
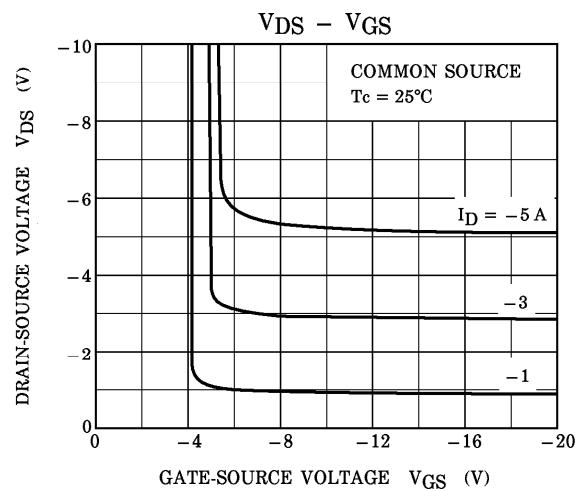
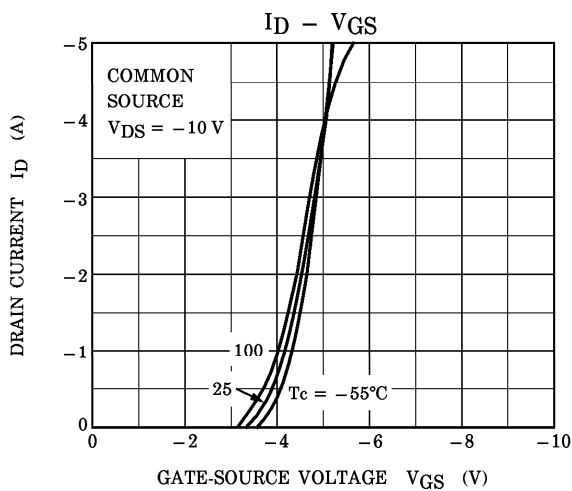
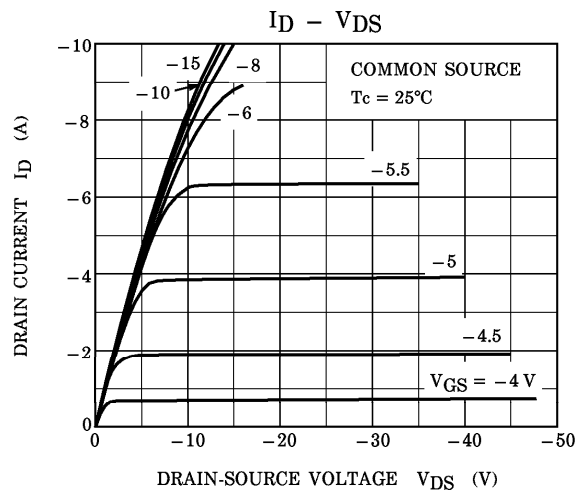
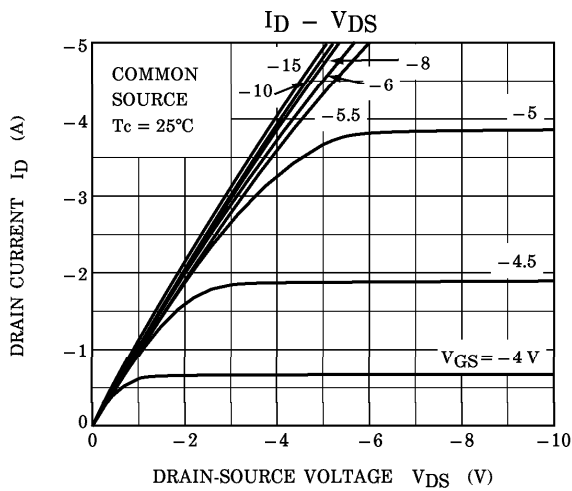
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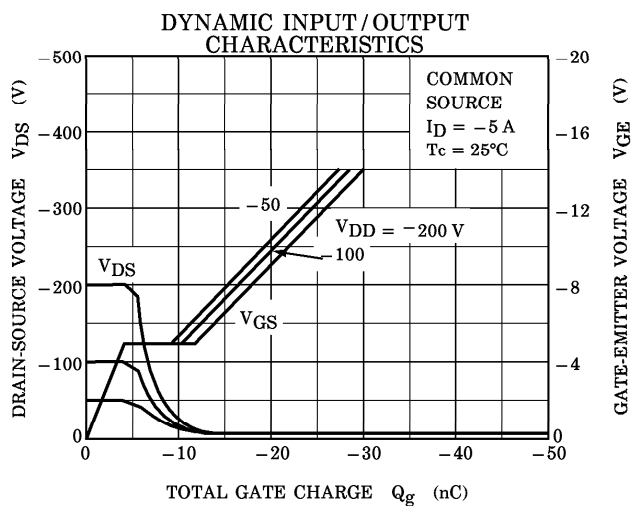
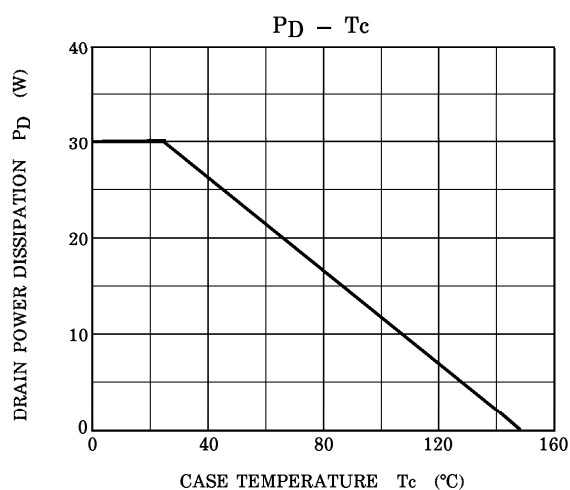
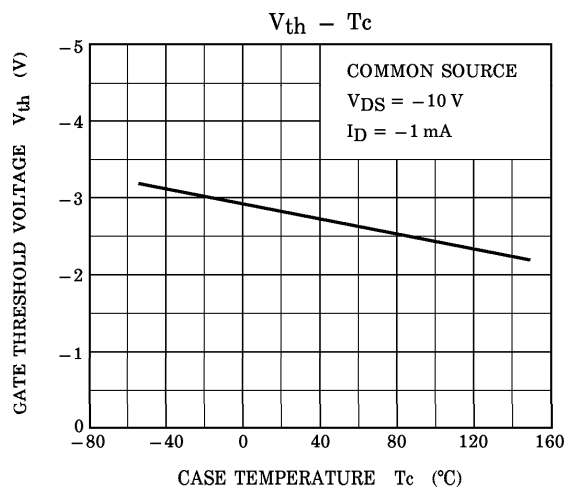
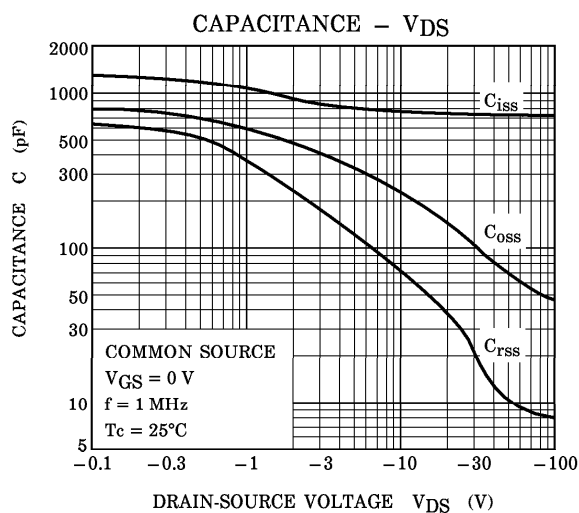
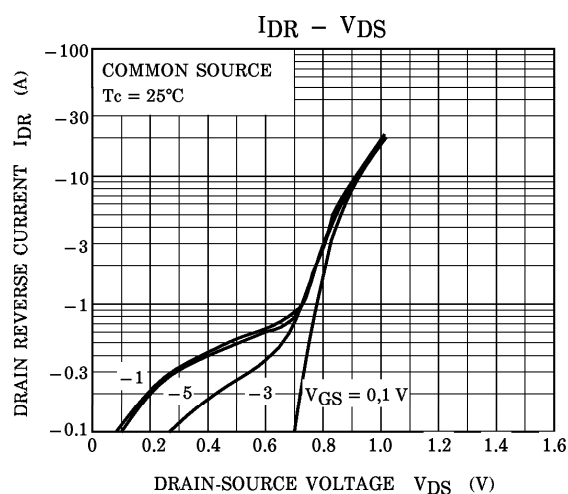
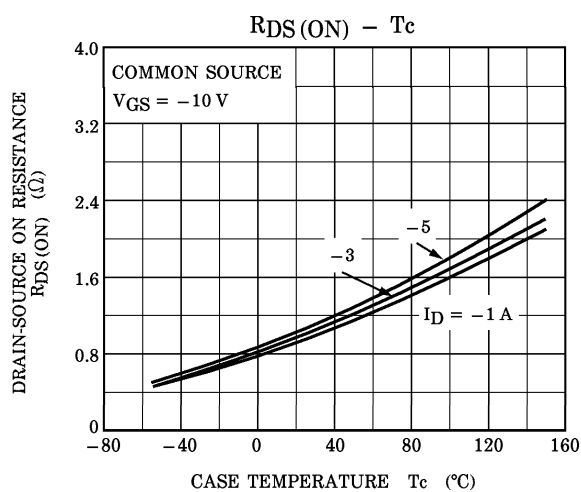


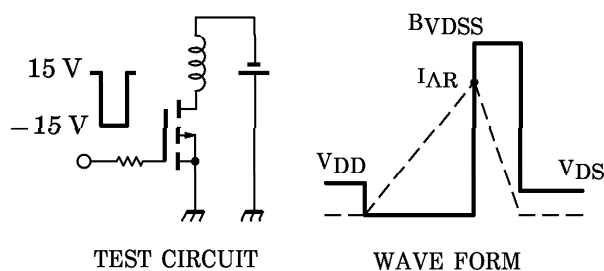
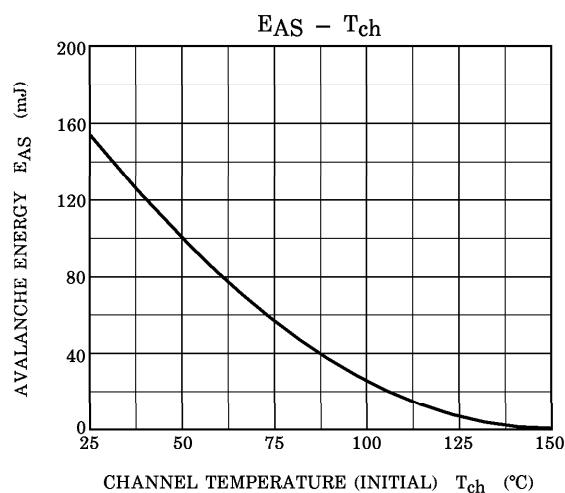
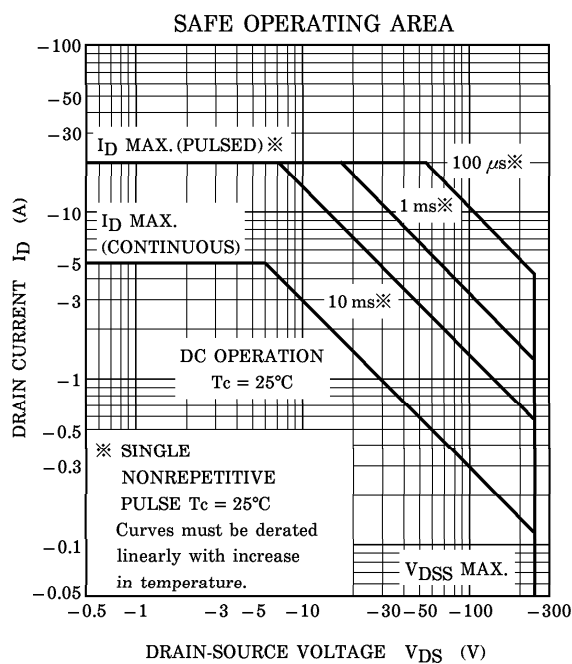
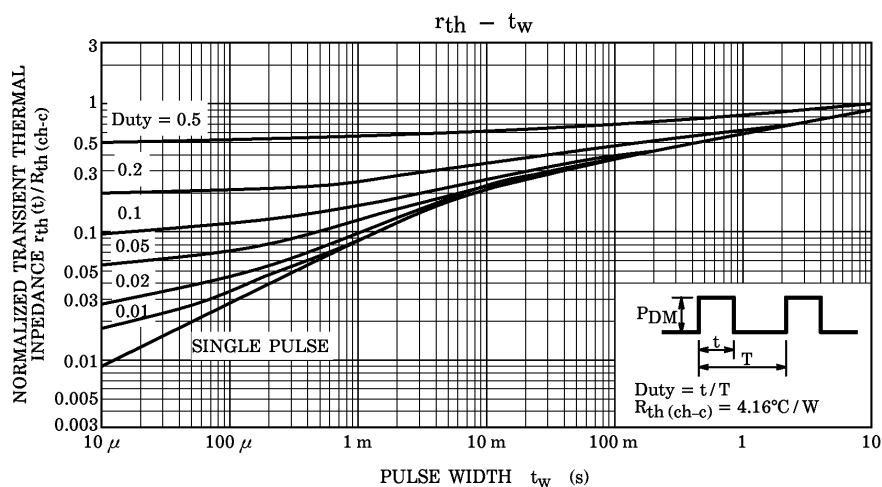
※ Lot Number

□ □ — Month (Starting from Alphabet A)

— Year (Last Number of the Christian Era)







$$\begin{aligned} \text{Peak } I_{AR} &= -5 \text{ A, } R_G = 25 \, \Omega \\ V_{DD} &= -50 \text{ V, } L = 10.5 \text{ mH} \end{aligned} \quad E_{AS} = \frac{1}{2} \cdot L \cdot I^2 \cdot \left(\frac{BVDSS}{BVDSS - V_{DD}} \right)$$