

TOSHIBA FIELD EFFECT TRANSISTOR SILICON P CHANNEL MOS TYPE (L²-π-MOSV)

2SJ412

HIGH SPEED, HIGH CURRENT SWITCHING APPLICATIONS

DC-DC CONVERTER, RELAY DRIVE AND MOTOR DRIVE APPLICATIONS

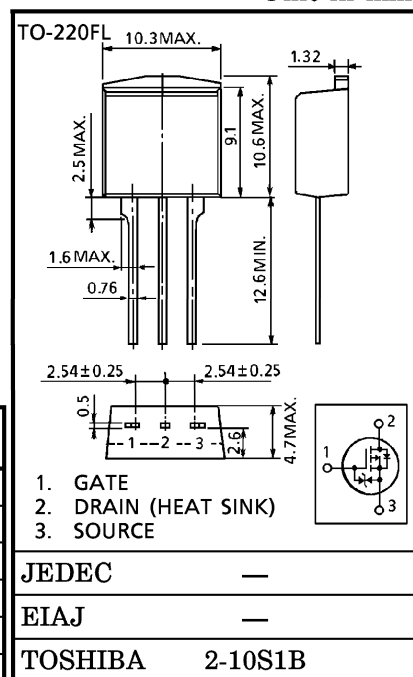
INDUSTRIAL APPLICATIONS

Unit in mm

- 4 V Gate Drive
- Low Drain-Source ON Resistance : $R_{DS(ON)} = 0.15 \Omega$ (Typ.)
- High Forward Transfer Admittance : $|Y_{fs}| = 7.7 S$ (Typ.)
- Low Leakage Current : $I_{DSS} = -100 \mu A$ (Max.) ($V_{DS} = -100 V$)
- Enhancement-Mode : $V_{th} = -0.8 \sim -2.0 V$
($V_{DS} = -10 V, I_D = -1 mA$)

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Drain-Source Voltage		V_{DSS}	-100	V
Drain-Gate Voltage ($R_{GS} = 20 k\Omega$)		V_{DGR}	-100	V
Gate-Source Voltage		V_{GSS}	±20	V
Drain Current	DC	I_D	-16	A
	Pulse	I_{DP}	-64	A
Drain Power Dissipation (Tc = 25°C)		P_D	60	W
Single Pulse Avalanche Energy**		E_{AS}	292	mJ
Avalanche Current		I_{AR}	-16	A
Repetitive Avalanche Energy*		E_{AR}	6	mJ
Channel Temperature		T_{ch}	150	°C
Storage Temperature Range		T_{stg}	-55~150	°C



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Unit in mm

THERMAL CHARACTERISTICS

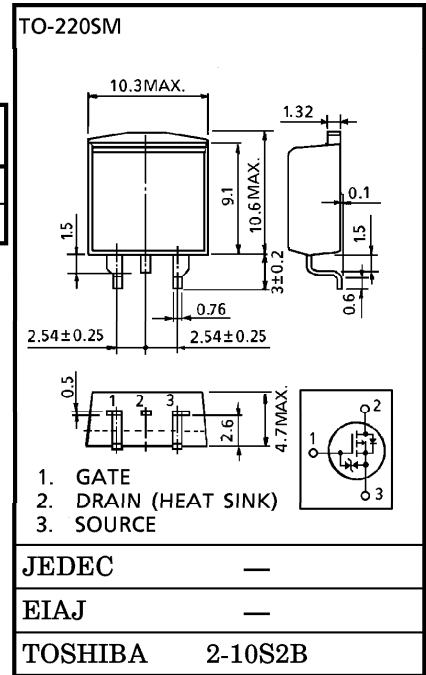
CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance, Channel to Case	$R_{th(ch-c)}$	2.08	°C/W
Thermal Resistance, Channel to Ambient	$R_{th(ch-a)}$	83.3	°C/W

Note ;

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

** $V_{DD} = -25\text{ V}$, $T_{ch} = 25^\circ\text{C}$ (initial), $L = 1.84\text{ mH}$
 $R_G = 25\ \Omega$, $I_{AR} = -16\text{ A}$

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



Weight : 1.5 g

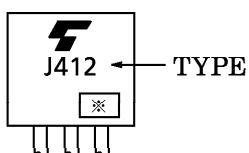
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		IGSS	VGS = ±16 V, VDS = 0 V	—	—	±10	μA
Drain Cut-off Current		IDSS	VDS = -100 V, VGS = 0 V	—	—	-100	μA
Drain-Source Breakdown Voltage		V(BR)DSS	ID = -10 mA, VGS = 0 V	-100	—	—	V
Gate Threshold Voltage		Vth	VDS = -10 V, ID = -1 mA	-0.8	—	-2.0	V
Drain-Source ON Resistance		RDS(ON)	VGS = -4 V, ID = -6 A	—	0.25	0.32	Ω
			VGS = -10 V, ID = -6 A	—	0.15	0.21	
Forward Transfer Admittance		Yfs	VDS = -10 V, ID = -6 A	4.5	7.7	—	S
Input Capacitance		Ciss	VDS = -10 V, VGS = 0 V, f = 1MHz	—	1100	—	pF
Reverse Transfer Capacitance		Crss		—	210	—	
Output Capacitance		Coss		—	440	—	
Switching Time	Rise Time	tr		—	18	—	ns
	Turn-on Time	ton		—	30	—	
	Fall Time	tf		—	18	—	
	Turn-off Time	t _{off}		—	65	—	
Total Gate Charge (Gate-Source Plus Gate-Drain)		Qg	VDD = -80 V, VGS = -10 V, ID = -16 A	—	48	—	nC
Gate-Source Charge		Qgs		—	29	—	
Gate-Drain ("Miller") Charge		Qgd		—	19	—	

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

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current	IDR	—	—	—	-16	A
Pulse Drain Reverse Current	IDRP	—	—	—	-64	A
Diode Forward Voltage	VDSF	IDR = -16 A, VGS = 0 V	—	—	1.7	V
Reverse Recovery Time	t _{rr}	IDR = -16 A, VGS = 0 V	—	160	—	ns
Reverse Recovery Charge	Q _{rr}	dIDR / dt = 50 A / μs	—	0.5	—	μC

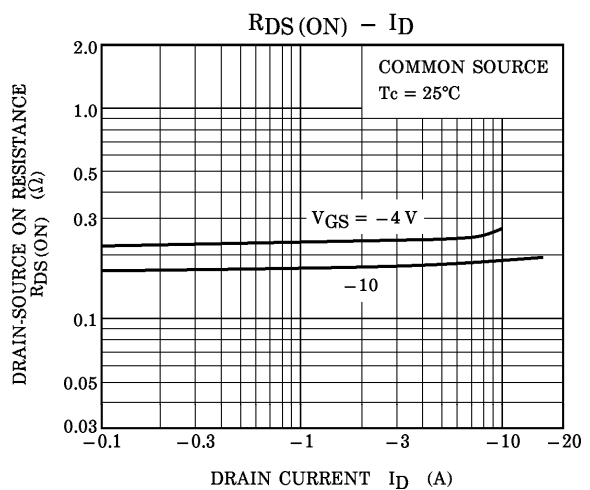
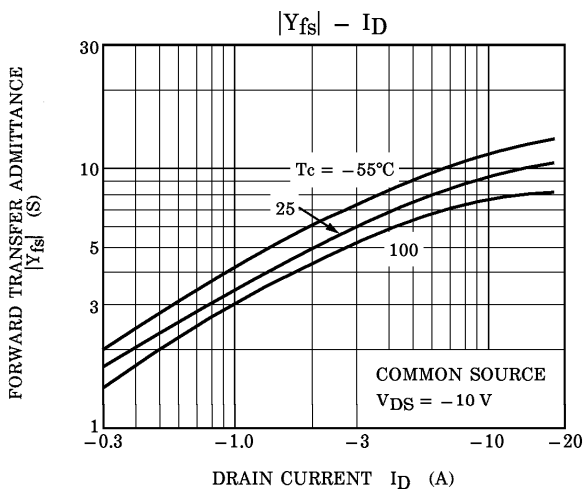
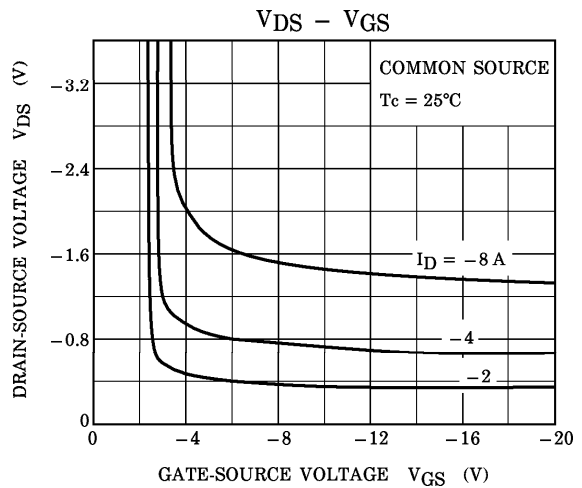
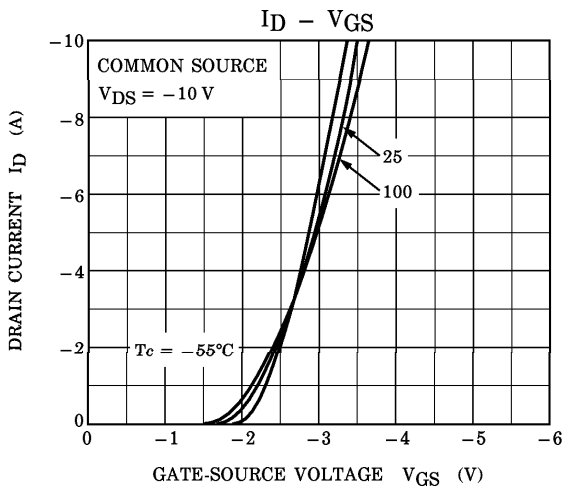
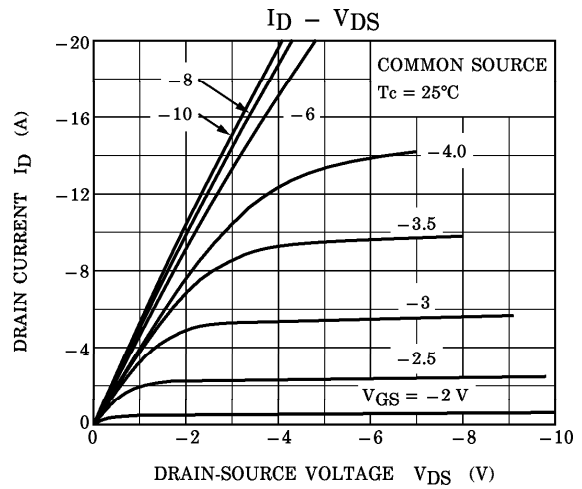
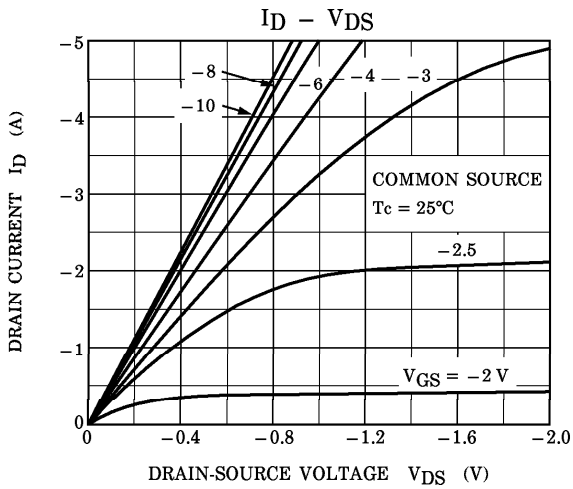
MARKING

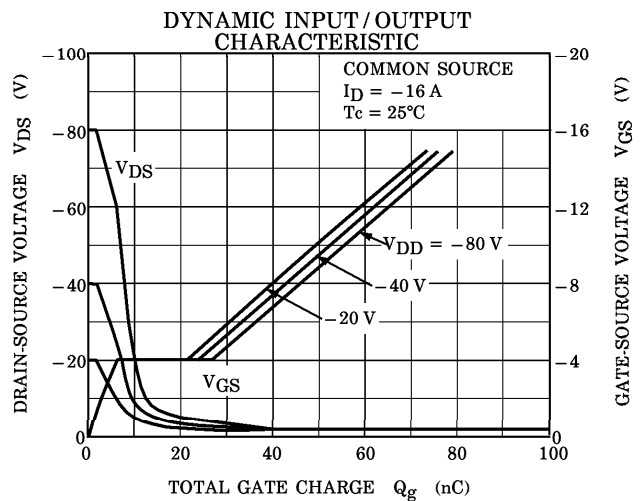
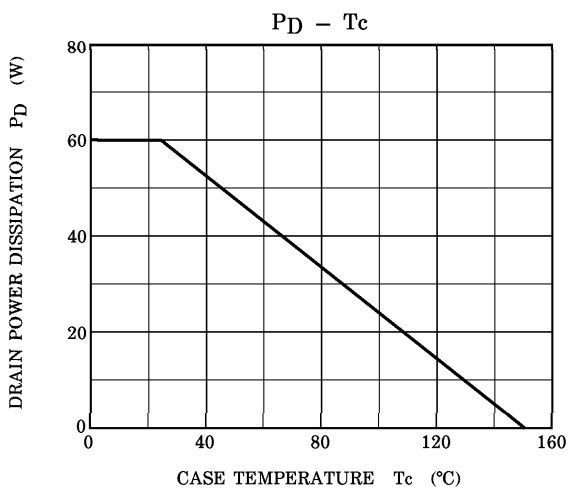
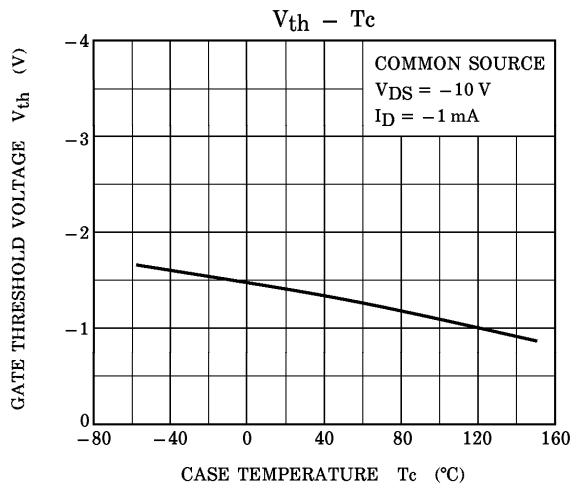
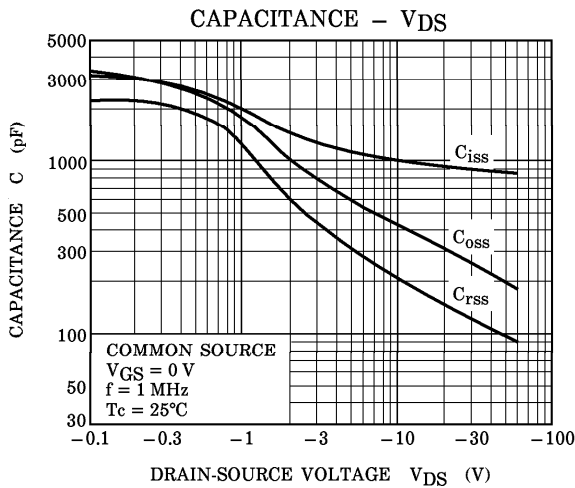
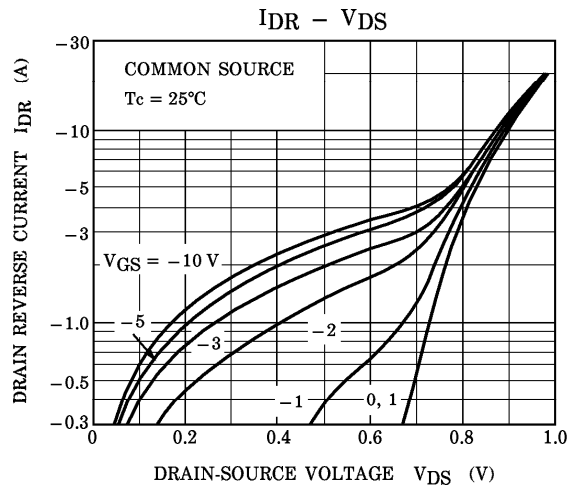
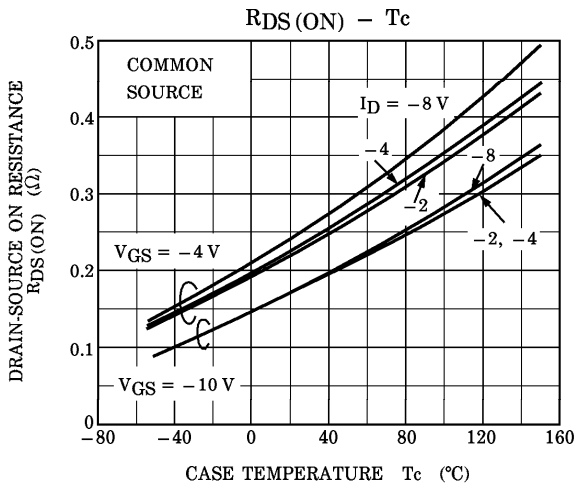


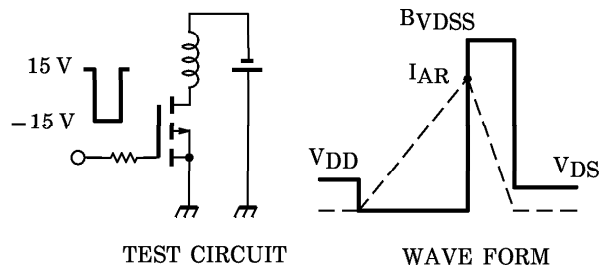
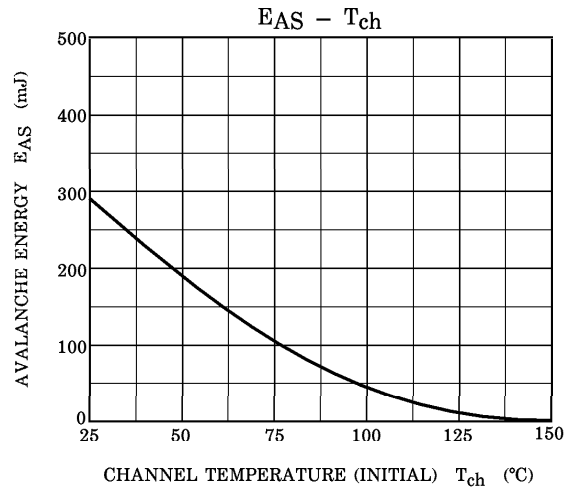
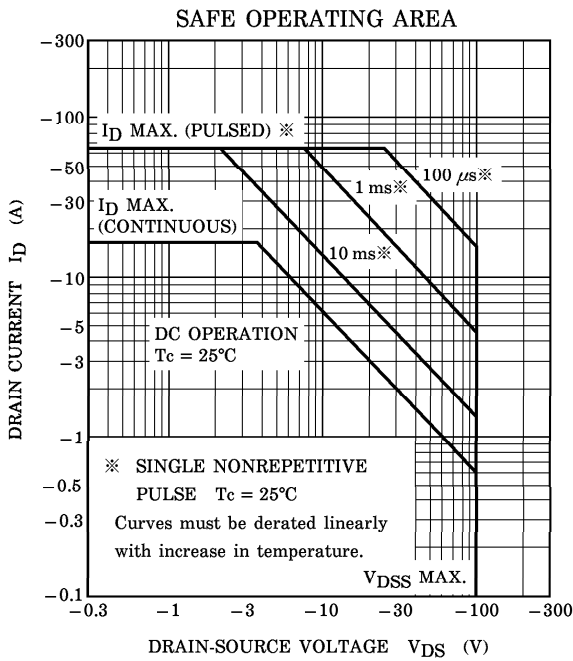
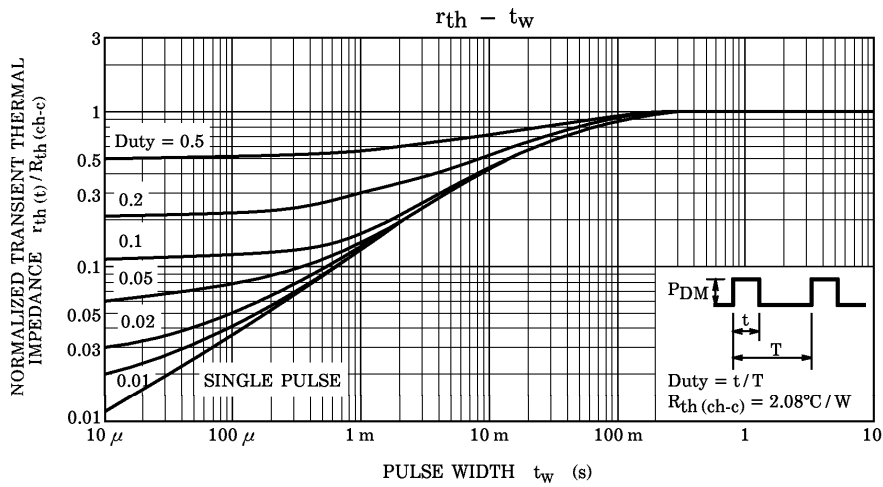
※ Lot Number

□ □ — Month (Starting from Alphabet A)

— Year (Last Number of the Christian Era)







Peak $I_{AR} = -16\text{ A}$, $R_G = 25\Omega$
 $V_{DD} = -25\text{ V}$, $L = 1.84\text{ mH}$

$$E_{AS} = \frac{1}{2} \cdot L \cdot I^2 \cdot \left(\frac{BV_{DSS}}{BV_{DSS} - V_{DD}} \right)$$