

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

- 4V Gate Drive
- Low Drain-Source ON Resistance : $R_{DS(ON)} = 0.15\Omega$ (Typ.)
- High Forward Transfer Admittance : $|Y_{fs}| = 7.7S$ (Typ.)
- Low Leakage Current : $I_{DSS} = -100\mu A$ (Max.) ($V_{DS} = -60V$)
- Enhancement-Mode : $V_{th} = -0.8 \sim -2.0V$
($V_{DS} = -10V, I_D = -1mA$)

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Drain-Source Voltage	V_{DSS}	-100	V
Drain-Gate Voltage ($R_{GS} = 20k\Omega$)	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

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.

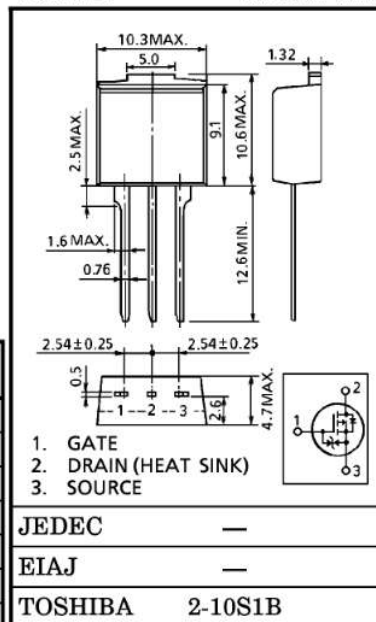
** $V_{DD} = -25V$, Starting $T_{ch} = 25°C$, $L = 1.84mH$
 $R_G = 25\Omega$, $I_{AR} = -16A$

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

INDUSTRIAL APPLICATIONS

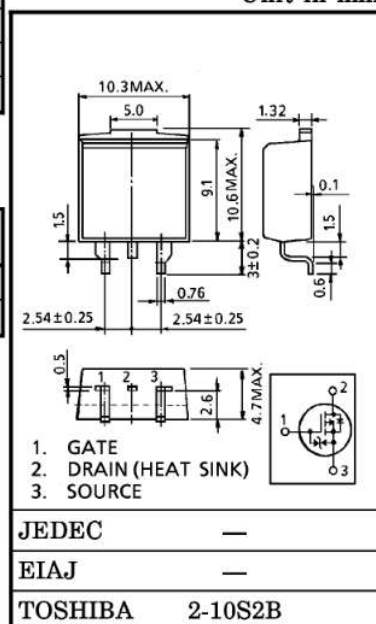
TO-220FL

Unit in mm



TO-220SM

Unit in mm



Weight : 1.5g

961001EAA2

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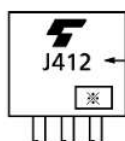
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		IGSS	VGS = ±16V, VDS = 0V	—	—	±10	μA
Drain Cut-off Current		IDSS	VDS = -100V, VGS = 0V	—	—	-100	μA
Drain-Source Breakdown Voltage		V(BR) DSS	ID = -10mA, VGS = 0V	-100	—	—	V
Gate Threshold Voltage		Vth	VDS = -10V, ID = -1mA	-0.8	—	-2.0	V
Drain-Source ON Resistance		RDS(ON)	VGS = -4V, ID = -6A	—	0.25	0.32	Ω
			VGS = -10V, ID = -6A	—	0.15	0.21	
Forward Transfer Admittance		Yfs	VDS = -10V, ID = -6A	4.5	7.7	—	S
Input Capacitance		Ciss	VDS = -10V, VGS = 0V, 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}		VIN : tr, tf < 5ns VDD ≐ -50V Duty ≤ 1%, tw = 10μs	—	65	
Total Gate Charge (Gate-Source Plus Gate-Drain)		Qg	VDD ≐ -80V, VGS = -10V, ID = -16A	—	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 = -16A, VGS = 0V	—	—	1.7	V
Reverse Recovery Time	t _{rr}	IDR = -16A, VGS = 0V	—	160	—	ns
Reverse Recovery Charge	Q _{rr}	dIDR/dt = 50A/μs	—	0.5	—	μC

MARKING

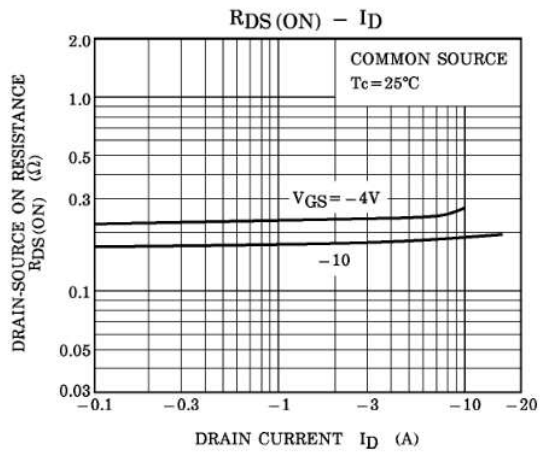
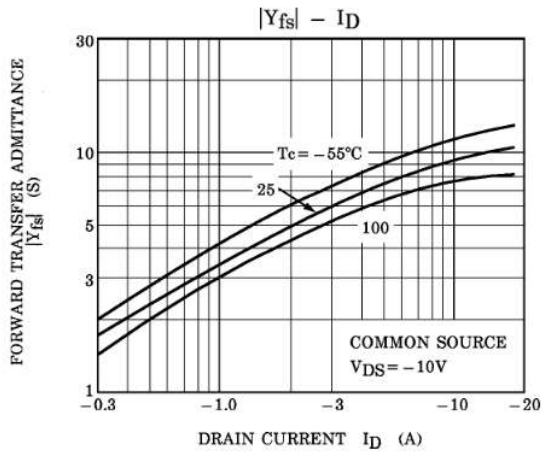
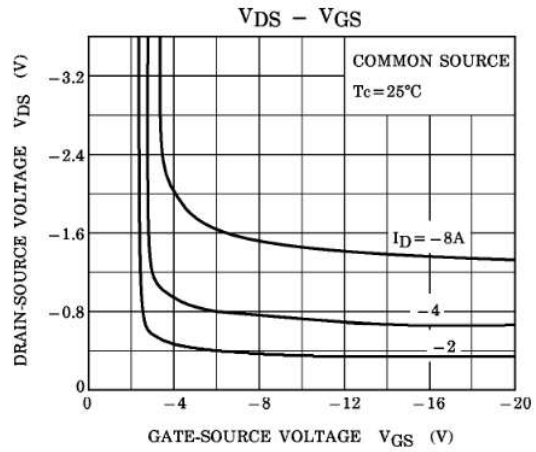
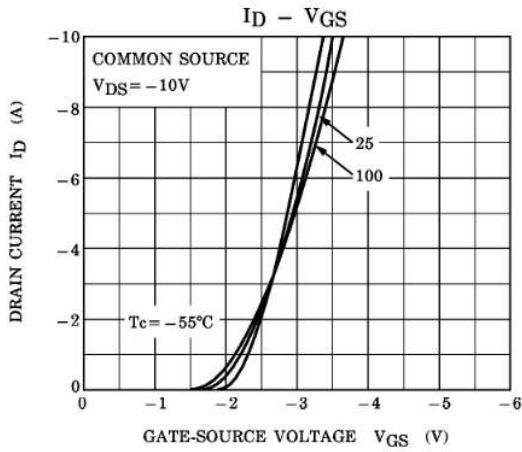
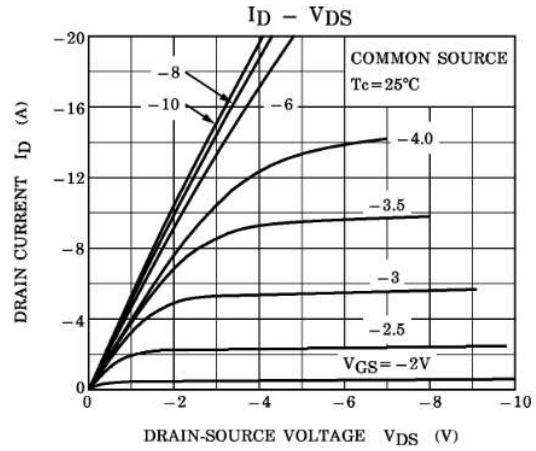
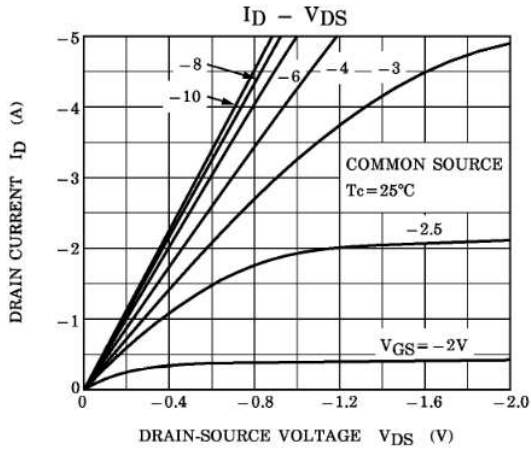


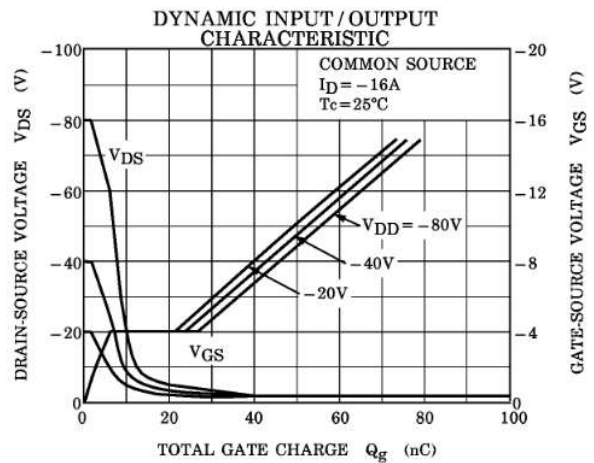
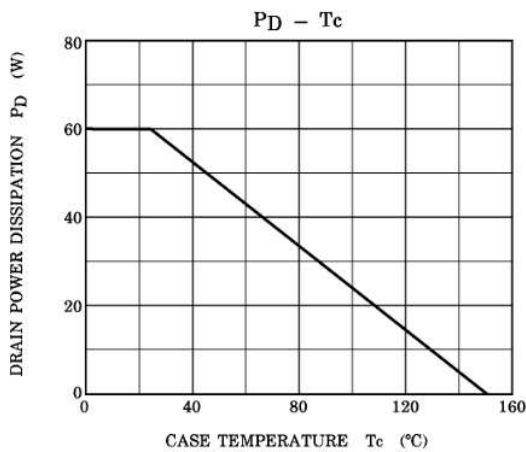
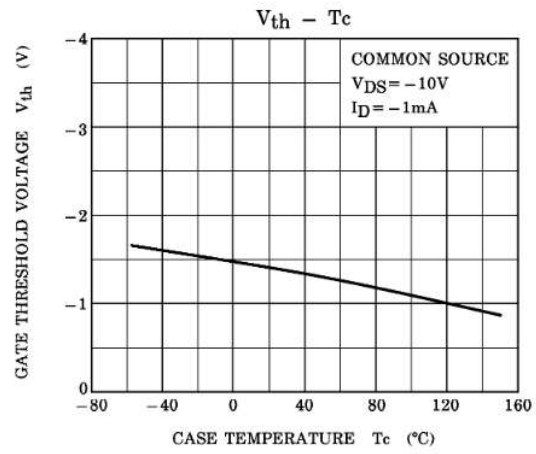
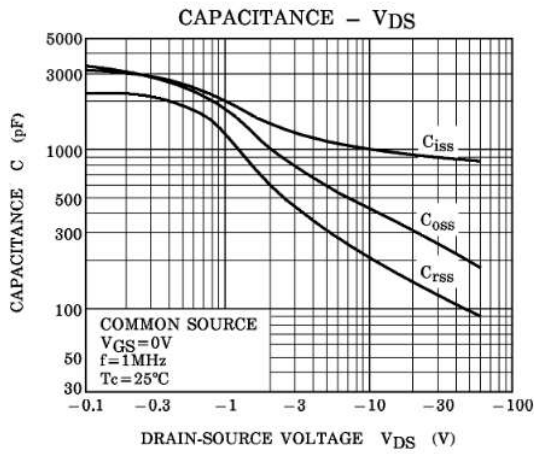
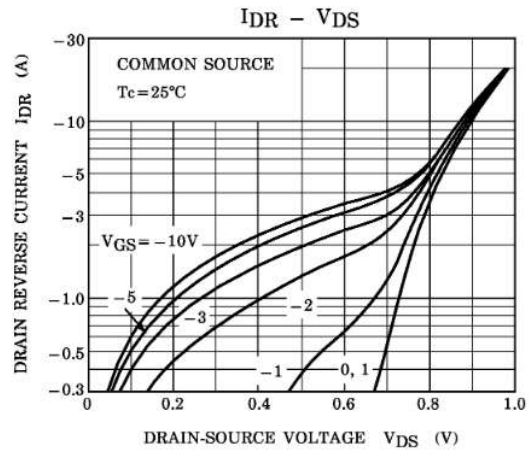
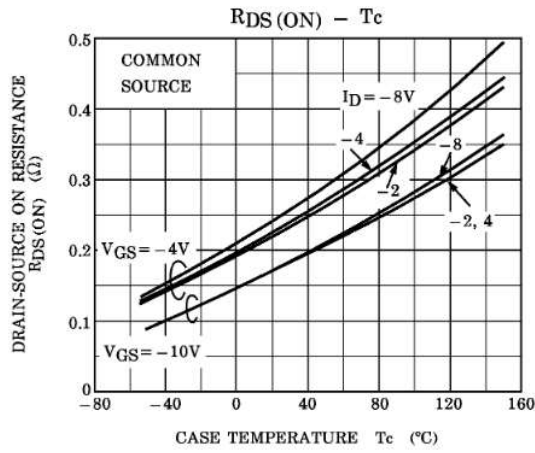
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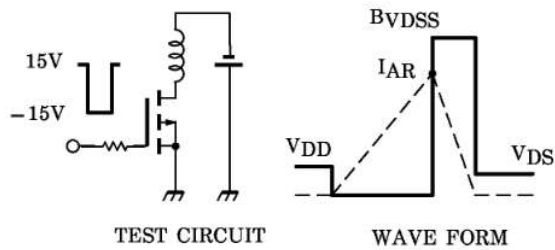
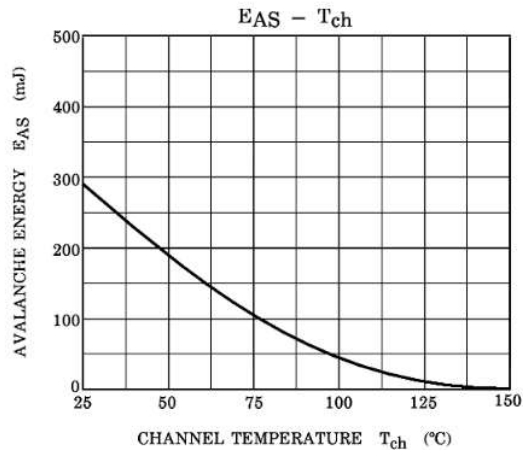
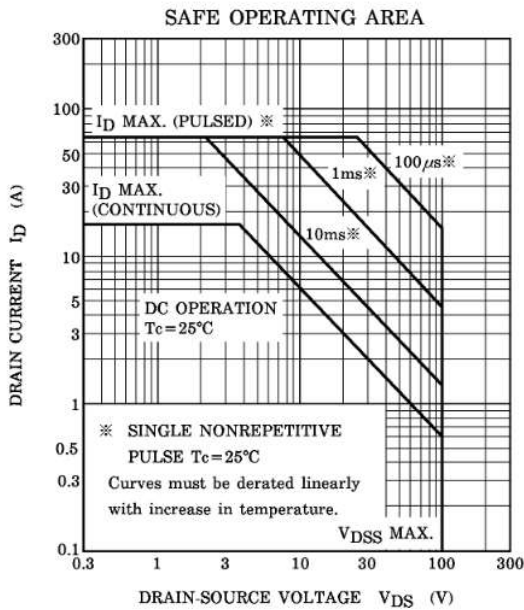
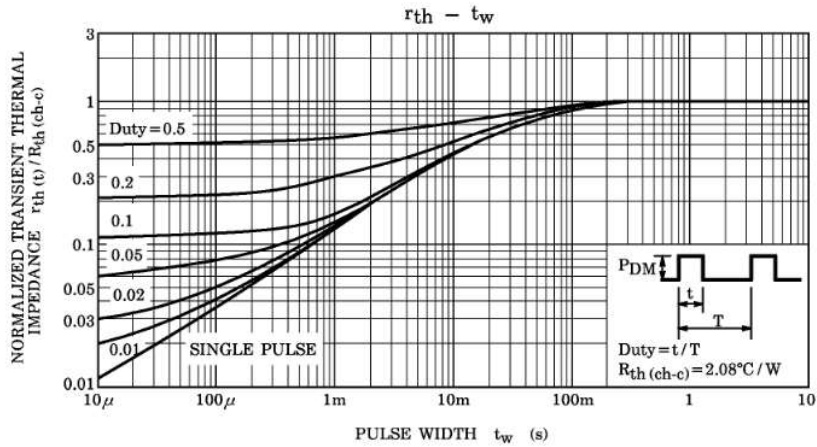
※ Lot Number

□ □ — Month (Starting from Alphabet A)

— Year (Last Number of the Christian Era)







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

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