

TOSHIBA FIELD EFFECT TRANSISTOR SILICON P CHANNEL MOS TYPE (L^2 - π -MOS ν)

2SJ380

RELAY DRIVE, DC-DC CONVERTER AND MOTOR DRIVE
APPLICATIONS

- 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 ($T_a = 25^\circ C$)

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 (Note 1)	I_D	-12	A
	Pulse (Note 1)	I_{DP}	-48	A
Drain Power Dissipation ($T_c = 25^\circ C$)		P_D	35	W
Single Pulse Avalanche Energy (Note 2)		E_{AS}	312	mJ
Avalanche Current		I_{AR}	-12	A
Repetitive Avalanche Energy (Note 3)		E_{AR}	3.5	mJ
Channel Temperature		T_{ch}	150	$^\circ C$
Storage Temperature Range		T_{stg}	$-55 \sim 150$	$^\circ C$

THERMAL CHARACTERISTICS

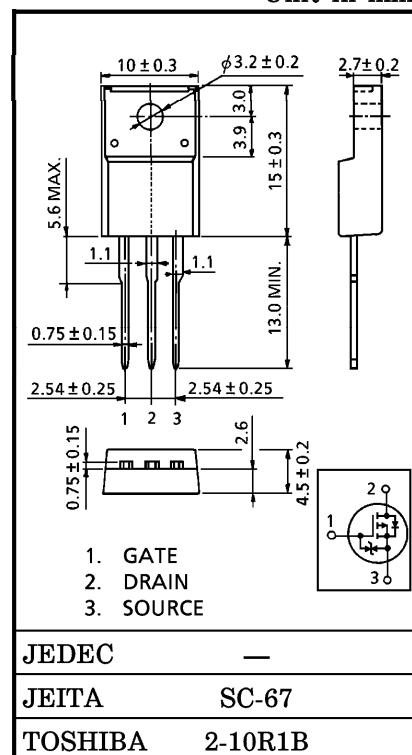
CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance, Channel to Case	$R_{th(ch-c)}$	3.57	$^\circ C/W$
Thermal Resistance, Channel to Ambient	$R_{th(ch-a)}$	62.5	$^\circ C/W$

(Note 1) : Please use devices on condition that the channel temperature is below $150^\circ C$.(Note 2) : $V_{DD} = -25 V$, $T_{ch} = 25^\circ C$ (initial), $L = 2.94 mH$, $R_G = 25 \Omega$, $I_{AR} = -12 A$

(Note 3) : Repetitive rating ; Pulse Width Limited by maximum junction temperature.

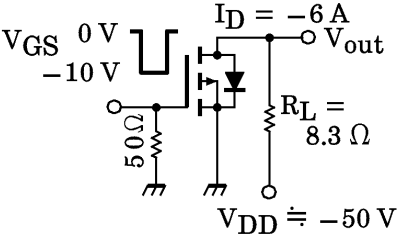
This transistor is an electrostatic sensitive device.
Please handle with caution.

Unit in mm



Weight : 1.9 g (Typ.)

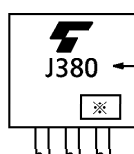
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		I _{GSS}	V _{GS} = ±16 V, V _{DS} = 0 V	—	—	±10	μA
Drain Cut-off Current		I _{DSS}	V _{DS} = -100 V, V _{GS} = 0 V	—	—	-100	μA
Drain-Source Breakdown Voltage		V _(BR) DSS	I _D = -10 mA, V _{GS} = 0 V	-100	—	—	V
Gate Threshold Voltage		V _{th}	V _{DS} = -10 V, I _D = -1 mA	-0.8	—	-2.0	V
Drain-Source ON Resistance		R _{DS} (ON)	V _{GS} = -4 V, I _D = -6 A	—	0.25	0.32	Ω
			V _{GS} = -10 V, I _D = -6 A	—	0.15	0.21	
Forward Transfer Admittance		Y _{fs}	V _{DS} = -10 V, I _D = -6 A	4.5	7.7	—	S
Input Capacitance		C _{iss}	V _{DS} = -10 V, V _{GS} = 0 V f = 1 MHz	—	1100	—	pF
Reverse Transfer Capacitance		C _{rss}		—	200	—	
Output Capacitance		C _{oss}		—	440	—	
Switching Time	Rise Time	t _r		—	18	—	ns
	Turn-on Time	t _{on}		—	30	—	
	Fall Time	t _f		—	18	—	
	Turn-off Time	t _{off}		—	65	—	
Total Gate Charge (Gate-Source Plus Gate-Drain)		Q _g	V _{DD} = -80 V, V _{GS} = -10 V I _D = -12 A	—	48	—	nC
Gate-Source Charge		Q _{gs}		—	29	—	
Gate-Drain ("Miller") Charge		Q _{gd}		—	19	—	

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

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current (Note 1)	I _{DR}	—	—	—	-12	A
Pulse Drain Reverse Current (Note 1)	I _{DRP}	—	—	—	-48	A
Forward Voltage (Diode)	V _{DSF}	I _{DR} = -12 A, V _{GS} = 0 V	—	—	1.7	V
Reverse Recovery Time	t _{rr}	I _{DR} = -12 A, V _{GS} = 0 V dI _{DR} /dt = 50 A/μs	—	160	—	ns
Reverse Recovery Charge	Q _{rr}		—	0.5	—	μC

MARKING



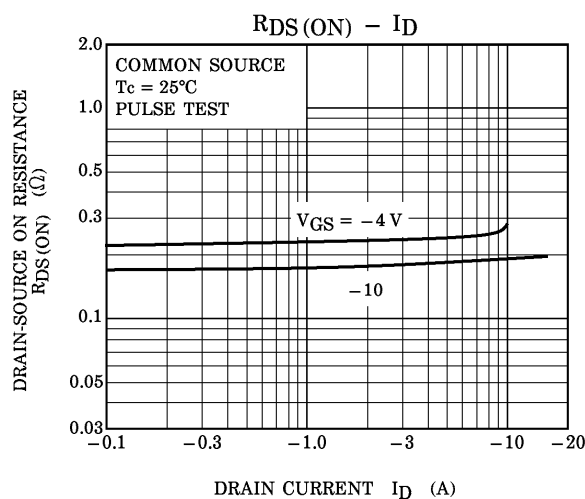
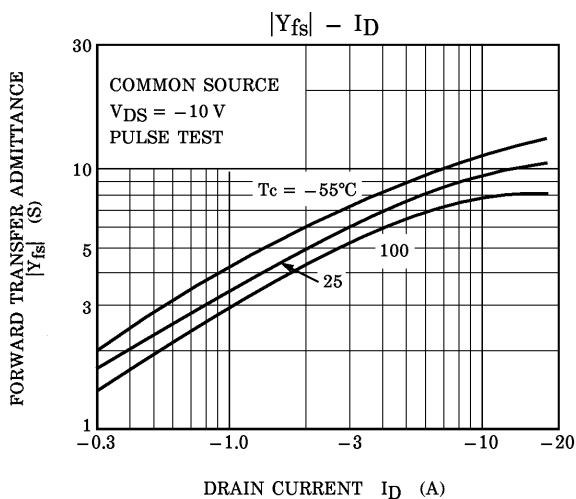
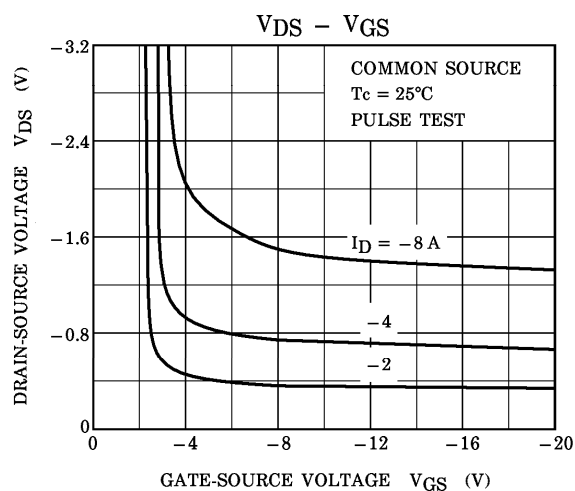
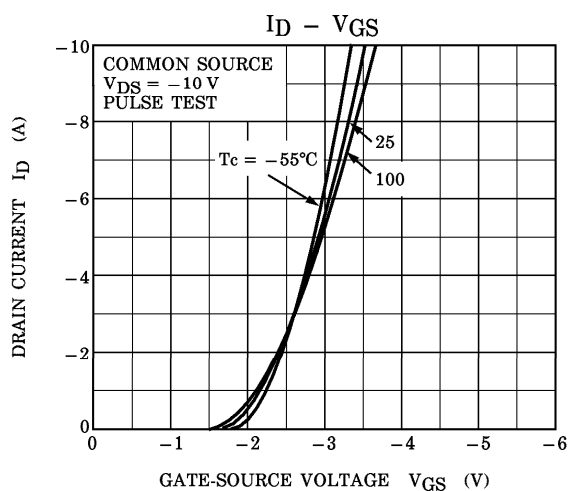
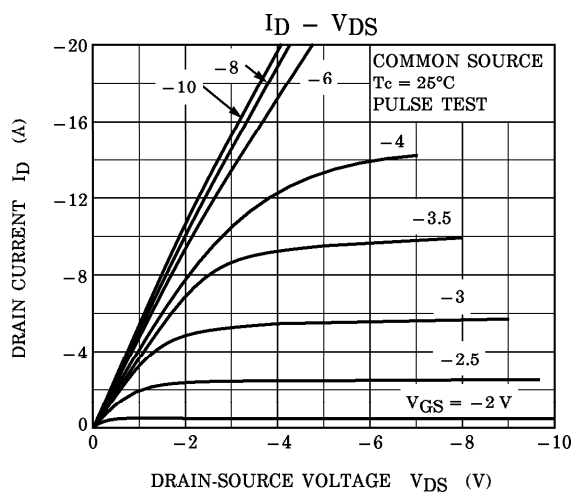
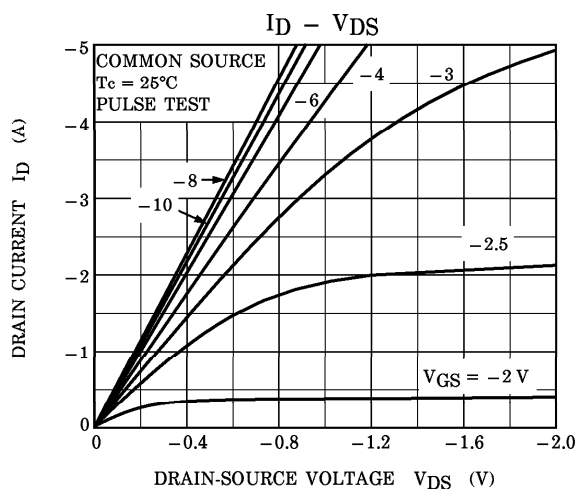
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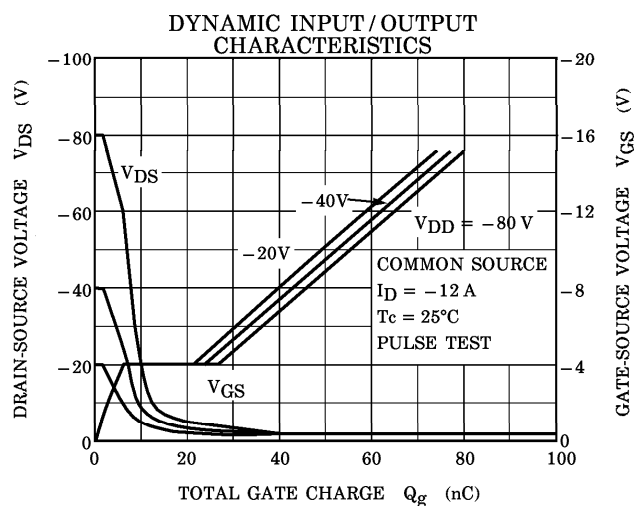
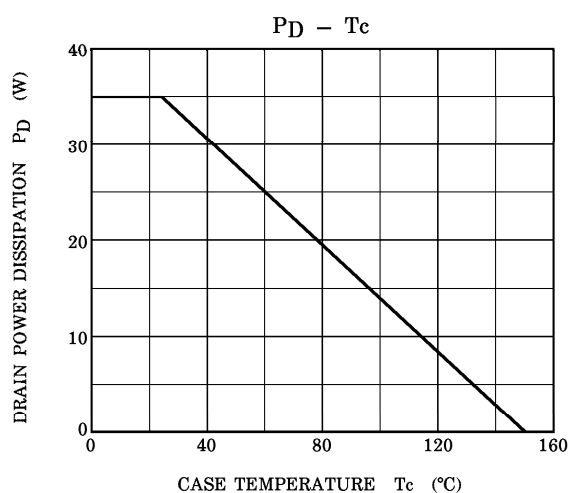
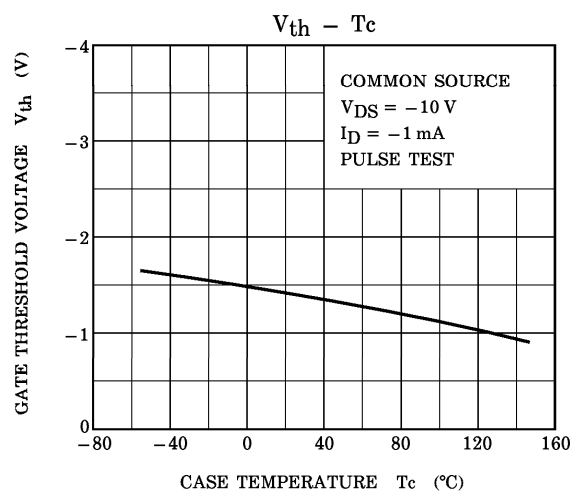
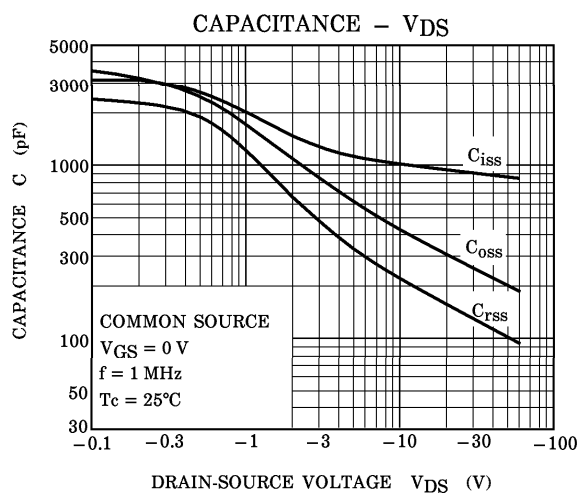
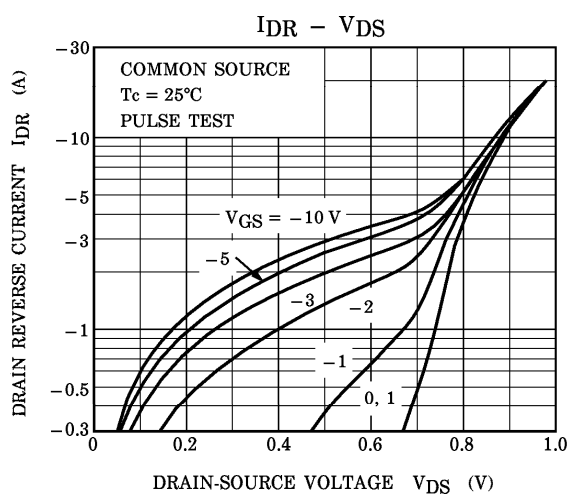
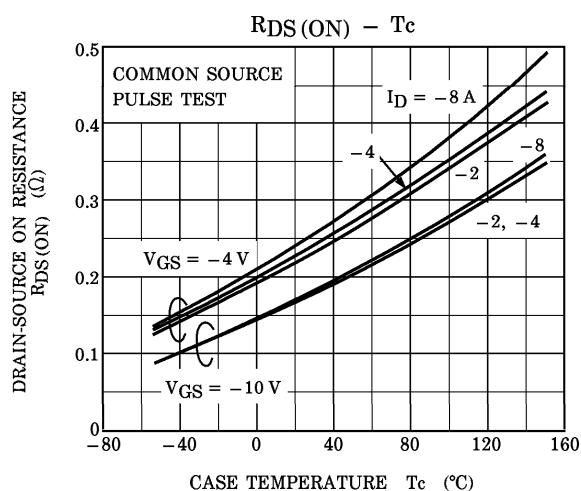
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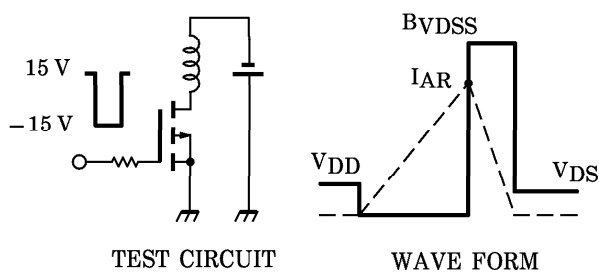
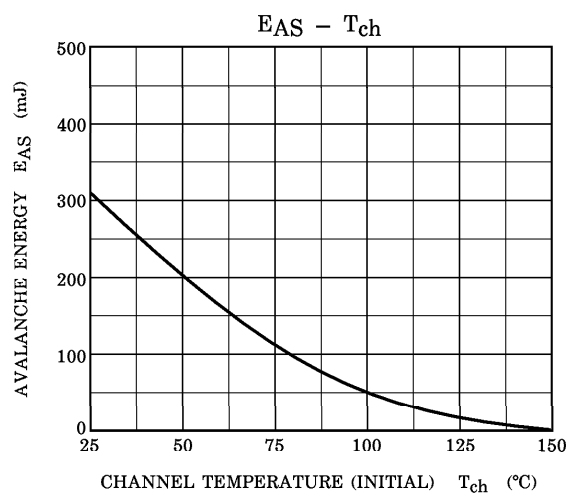
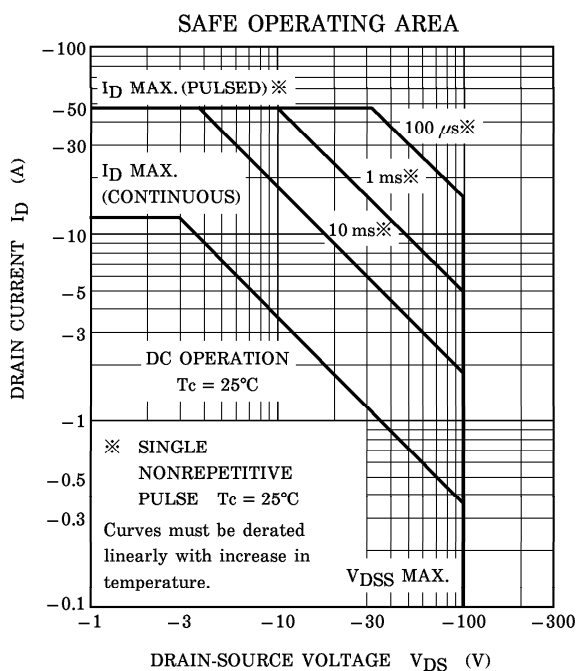
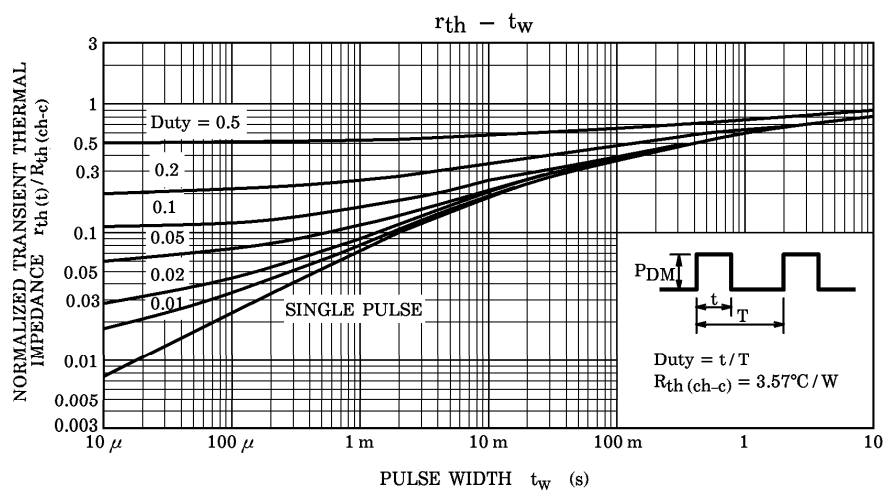


Month (Starting from Alphabet A)

Year (Last Number of the Christian Era)







$$R_G = 25 \, \Omega$$

$$V_{DD} = -25 \, \text{V}, L = 2.94 \, \text{mH} \quad E_{AS} = \frac{1}{2} \cdot L \cdot I^2 \cdot \left(\frac{B_{VDSS}}{B_{VDSS} - V_{DD}} \right)$$

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