

TOSHIBA

2SJ380

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

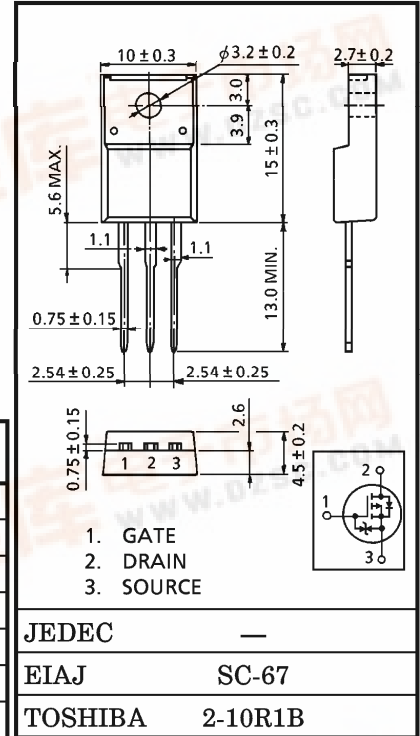
2SJ380

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

INDUSTRIAL APPLICATIONS

Unit in mm

- 4V Gate Drive
- Low Drain-Source ON Resistance : $R_{DS(ON)} = 0.15\Omega$ (Typ.)
- High Forward Transfer Admittance : $|Y_{fs}| = 6.0S$ (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	-12 A
	Pulse	I_{DP}	-48 A
Drain Power Dissipation ($T_c = 25^\circ C$)	P_D	35	W
Single Pulse Avalanche Energy**	E_{AS}	312	mJ
Avalanche Current	I_{AR}	-12	A
Repetitive Avalanche Energy*	E_{AR}	3.5	mJ
Channel Temperature	T_{ch}	150	°C
Storage Temperature Range	T_{stg}	-55~150	°C

Weight : 1.9g

THERMAL CHARACTERISTICS

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

Note ;

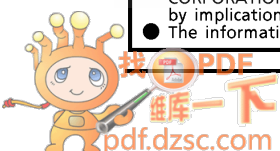
* Repetitive rating ; Pulse Width Limited by Max. junction temperature.

** $V_{DD} = -25V$, Starting $T_{ch} = 25^\circ C$, $L = 2.94mH$, $R_G = 25\Omega$, $I_{AR} = -12A$

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

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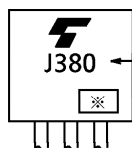
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		I_{GSS}	$V_{GS} = \pm 16V, V_{DS} = 0V$	—	—	± 10	μA
Drain Cut-off Current		I_{DSS}	$V_{DS} = -100V, V_{GS} = 0V$	—	—	-100	μA
Drain-Source Breakdown Voltage		$V_{(BR)DSS}$	$I_D = -10mA, V_{GS} = 0V$	-100	—	—	V
Gate Threshold Voltage		V_{th}	$V_{DS} = -10V, I_D = -1mA$	-0.8	—	-2.0	V
Drain-Source ON Resistance		$R_{DS(ON)}$	$V_{GS} = -4V, I_D = -6A$	—	0.25	0.32	Ω
			$V_{GS} = -10V, I_D = -6A$	—	0.15	0.21	
Forward Transfer Admittance		$ Y_{fs} $	$V_{DS} = -10V, I_D = -6A$	4.5	7.7	—	S
Input Capacitance		C_{iss}	$V_{DS} = -10V, V_{GS} = 0V$ $f = 1MHz$	—	1100	—	pF
Reverse Transfer Capacitance		C_{rss}		—	200	—	
Output Capacitance		C_{oss}		—	440	—	
Switching Time	Rise Time	t_r	<p>$V_{GS} = 0V, -10V$ $I_D = -6A$ $R_L = 8.3\Omega$ $V_{DD} = -50V$</p>	—	18	—	ns
	Turn-on Time	t_{on}		—	30	—	
	Fall Time	t_f		—	18	—	
	Turn-off Time	t_{off}		$V_{IN} : t_r, t_f < 5ns$ $Duty \leq 1\%, t_w = 10\mu s$	—	65	
Total Gate Charge (Gate-Source Plus Gate-Drain)		Q_g	$V_{DD} = -80V, V_{GS} = -10V$ $I_D = -12A$	—	48	—	nC
Gate-Source Charge		Q_{gs}		—	29	—	
Gate-Drain ("Miller") Charge		Q_{gd}		—	19	—	

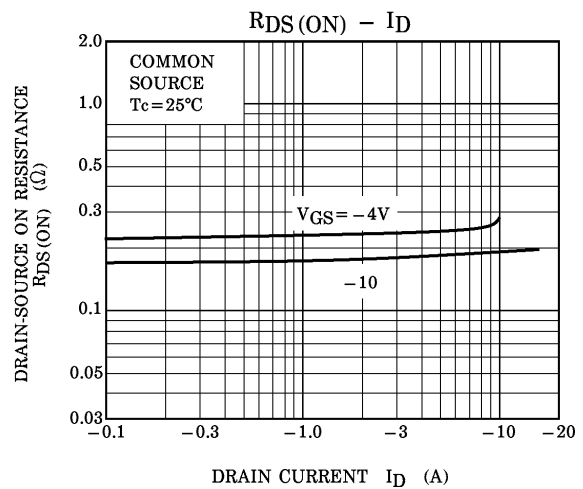
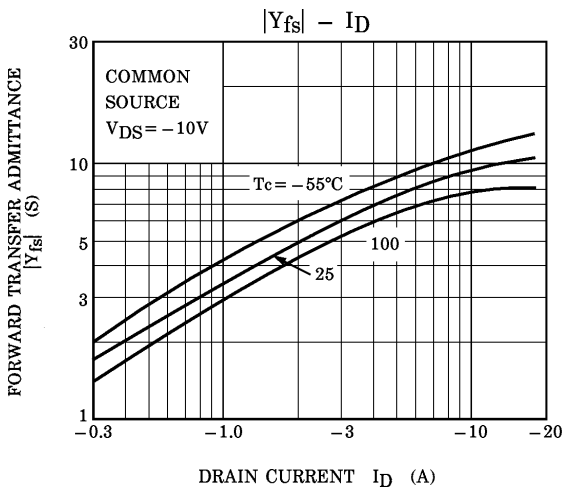
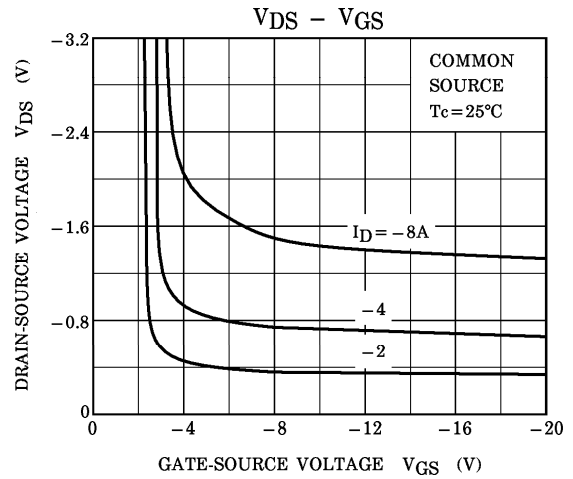
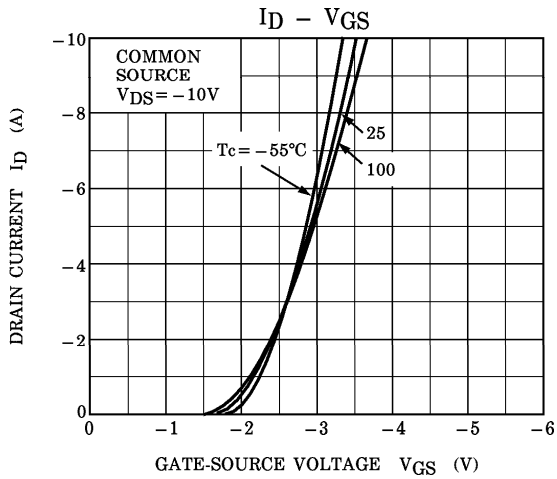
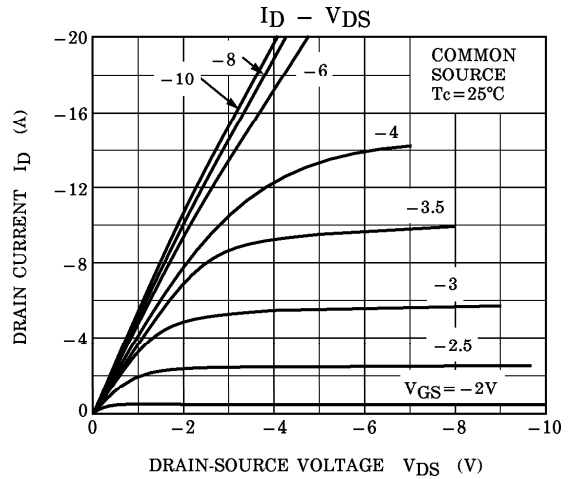
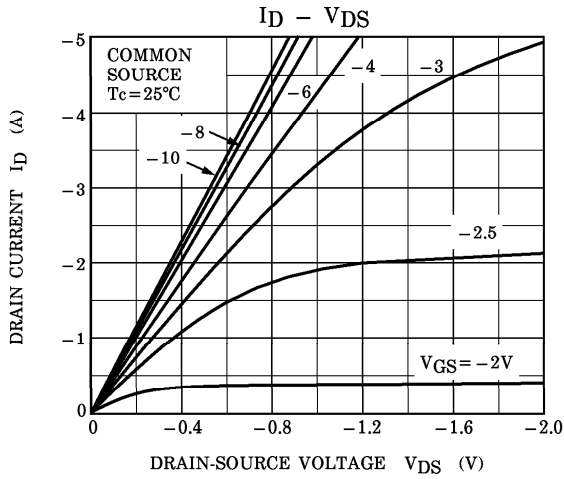
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (Ta = 25°C)

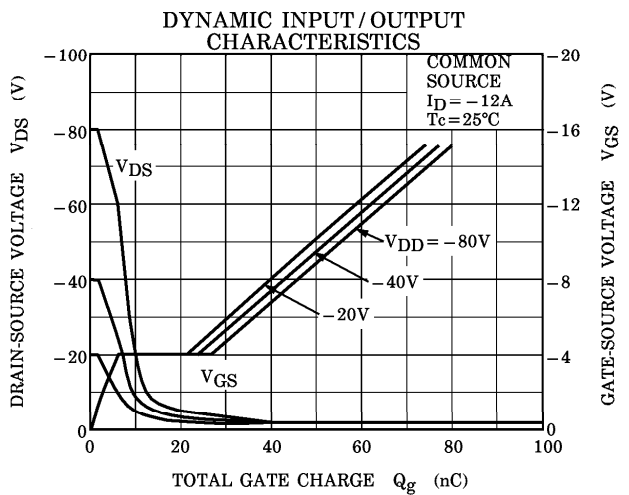
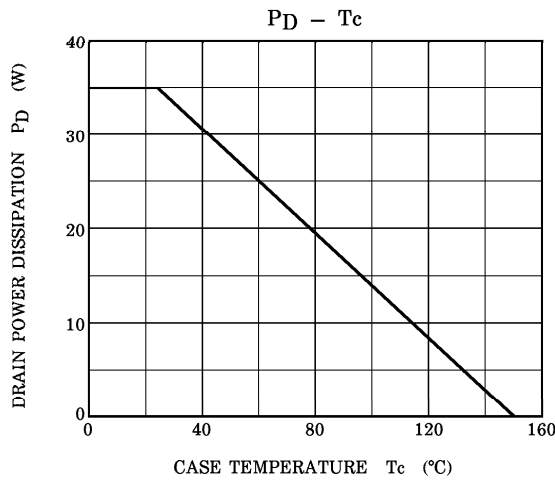
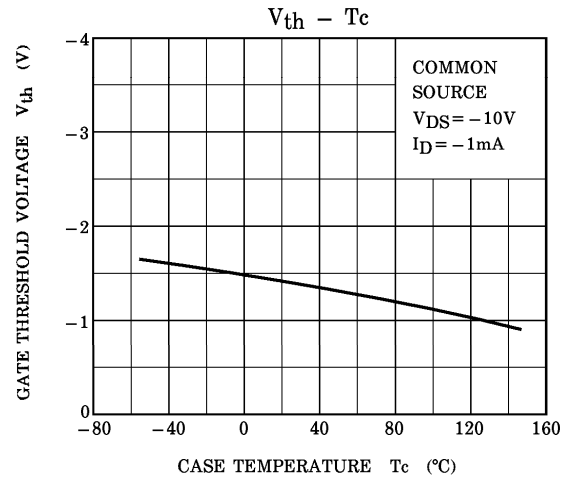
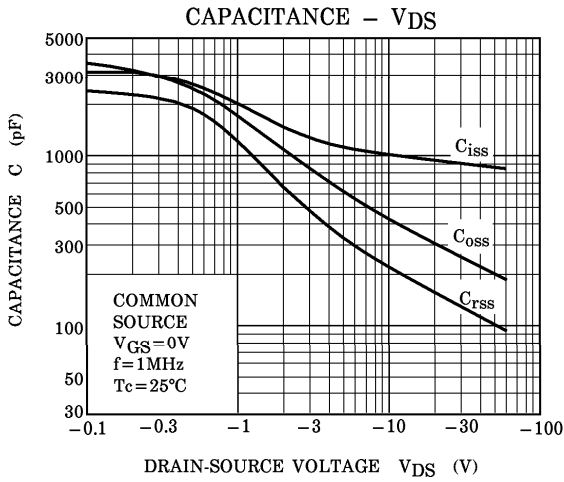
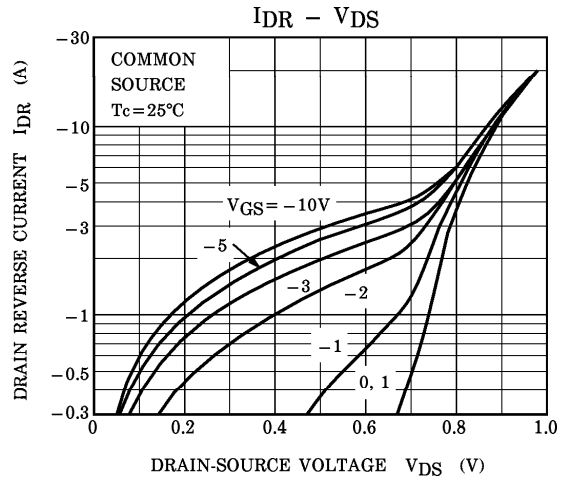
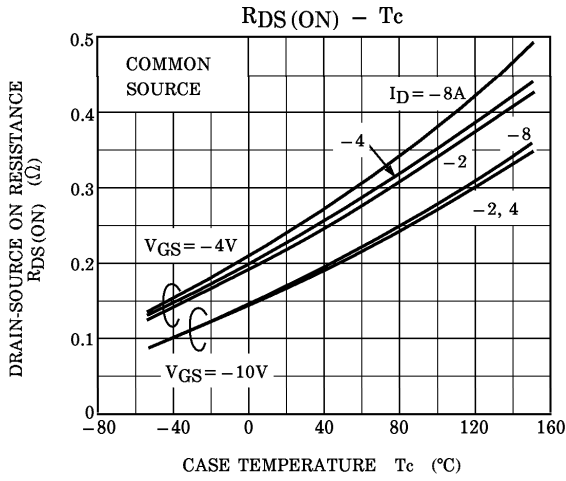
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current	I_{DR}	—	—	—	-12	A
Pulse Drain Reverse Current	I_{DRP}	—	—	—	-48	A
Diode Forward Voltage	V_{DSF}	$I_{DR} = -12A, V_{GS} = 0V$	—	—	1.7	V
Reverse Recovery Time	t_{rr}	$I_{DR} = -12A, V_{GS} = 0V$ $dI_{DR} / dt = 50A / \mu s$	—	160	—	ns
Reverse Recovery Charge	Q_{rr}		—	0.5	—	μC

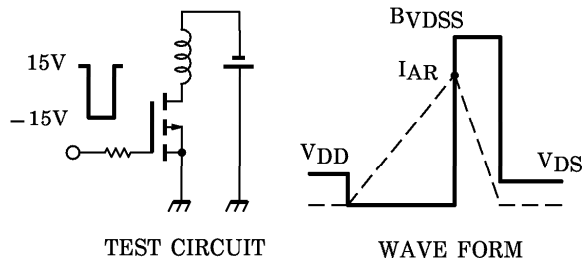
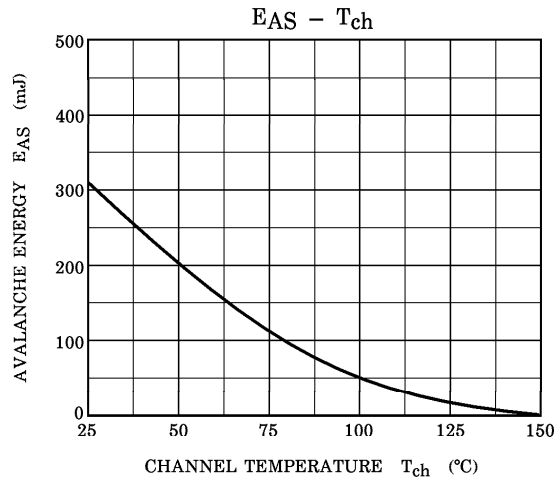
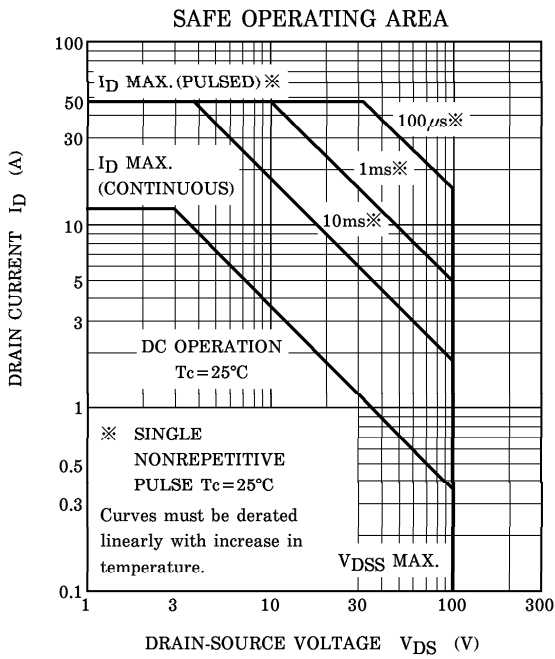
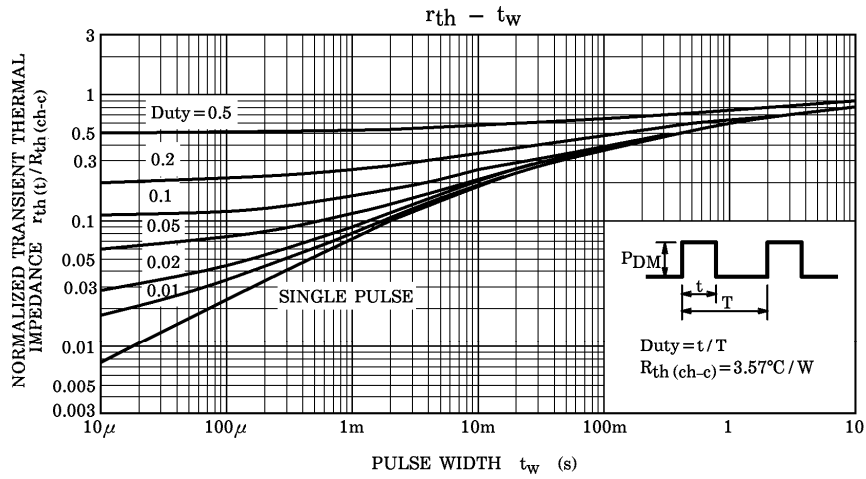
MARKING



TYPE → J380
 ※ Lot Number
 □ □ — Month (Starting from Alphabet A)
 — Year (Last Number of the Christian Era)







Peak $I_{AR} = -12A$, $R_G = 25\Omega$ $E_{AS} = \frac{1}{2} \cdot L \cdot I^2 \cdot \left(\frac{BVDSS}{BVDSS - V_{DD}} \right)$
 $V_{DD} = -25V$, $L = 2.94mH$