

TOSHIBA FIELD EFFECT TRANSISTOR
2SJ380
 SILICON P CHANNEL MOS TYPE
(L² - π - MOS V)

(2SJ380)

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

- 4V Gate Drive
- Low Drain-Source ON Resistance : $R_{DS(ON)} = 0.15\Omega$ (Typ.)
- High Forward Transfer Admittance : $|Y_{fs}| = 6.0S$ (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 ($T_a = 25^\circ C$)

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	$^\circ C$
Storage Temperature Range		T_{stg}	-55~150	$^\circ C$

THEMAL 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 ;

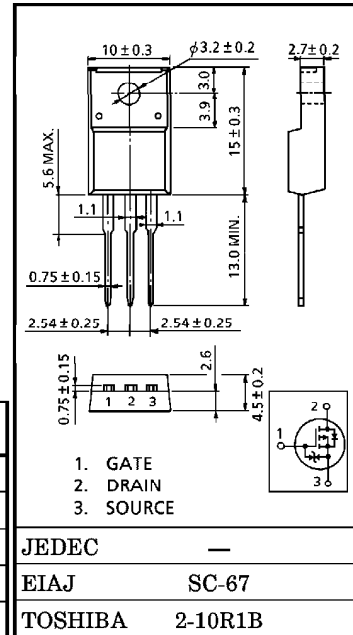
* Repetitive rating ; Pulse Width Limited by Max. junction temperature.

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

THIS TRANSISTOR IS AN ELECTROSTATIC SENSITIVE
 DEVICE. PLEASE HANDLE WITH CAUTION.

INDUSTRIAL APPLICATIONS

Unit in mm

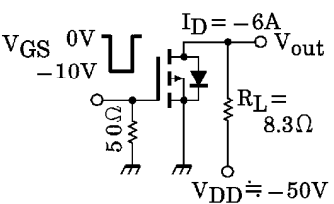


Weight : 1.9g

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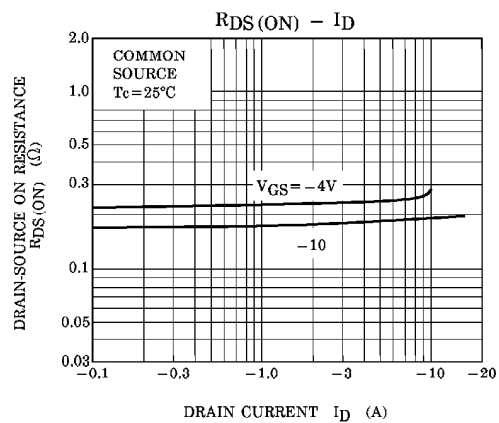
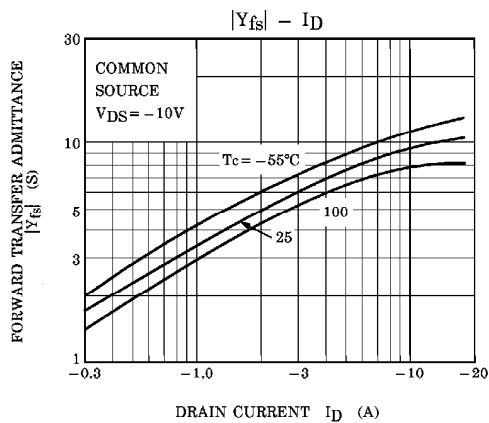
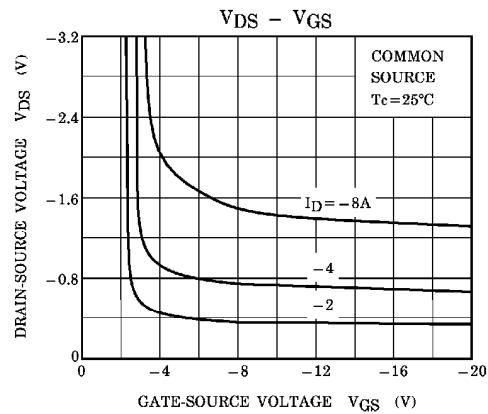
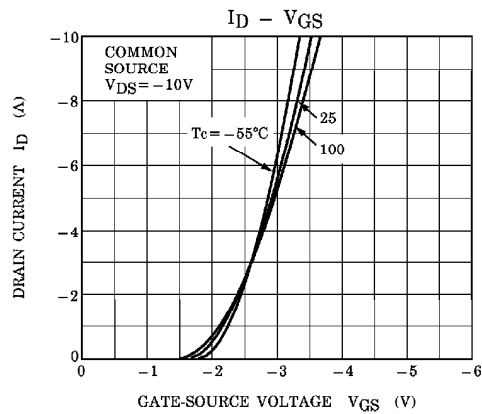
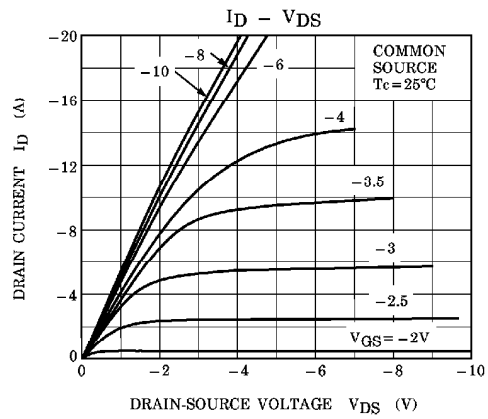
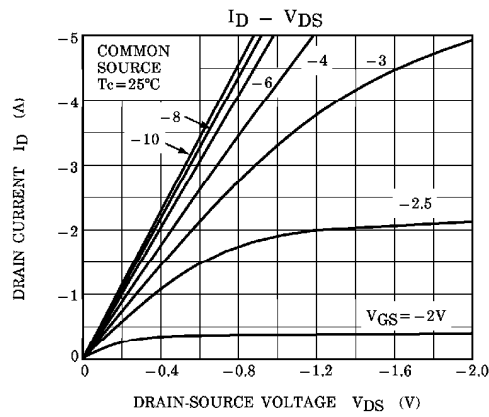
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

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		—	200	—	
Output Capacitance		Coss		—	440	—	
Switching Time	Rise Time	tr		—	18	—	ns
	Turn-on Time	ton		—	30	—	
	Fall Time	tf		—	18	—	
	Turn-off Time	toff		—	65	—	
Total Gate Charge (Gate-Source Plus Gate-Drain)		Qg	VDD = -80V, VGS = -10V ID = -12A	—	48	—	nC
Gate-Source Charge		Qgs		—	29	—	
Gate-Drain ("Miller") Charge		Qgd		—	19	—	

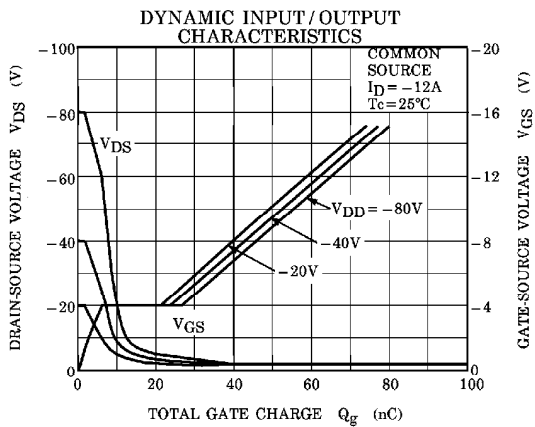
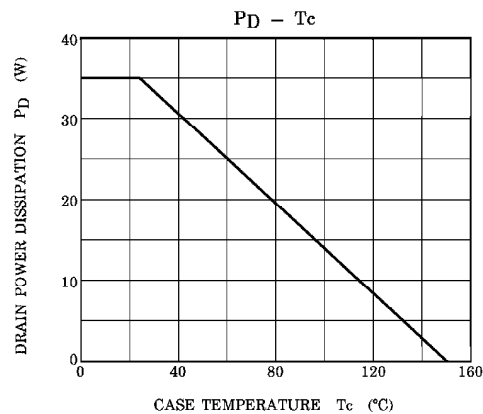
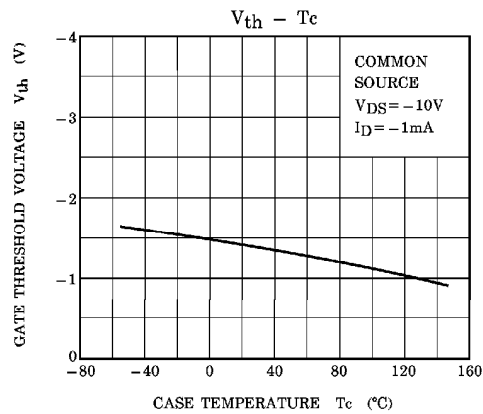
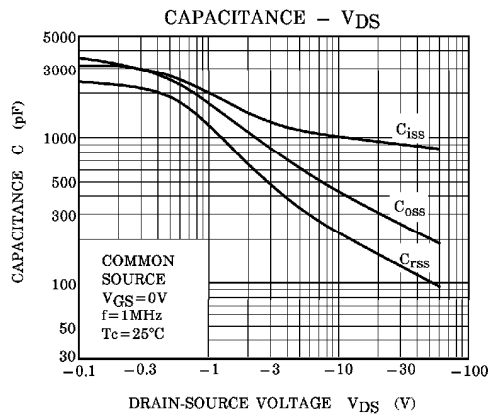
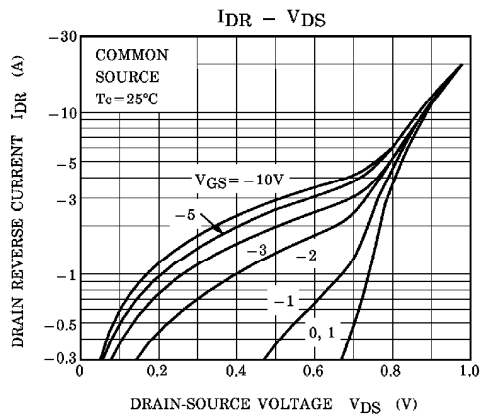
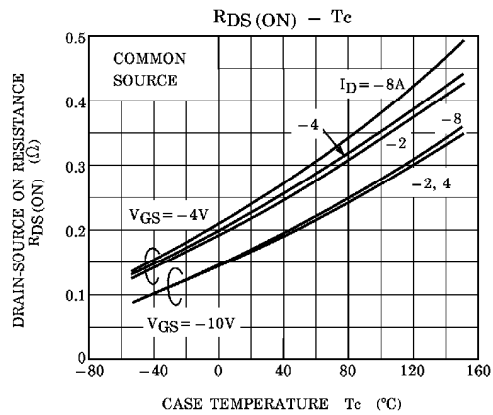
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current	IDR	—	—	—	-12	A
Pulse Drain Reverse Current	IDRP	—	—	—	-48	A
Diode Forward Voltage	VDSF	IDR = -12A, VGS = 0V	—	—	1.7	V
Reverse Recovery Time	trr	IDR = -12A, VGS = 0V	—	160	—	ns
Reverse Recovery Charge	Qrr	dIDR / dt = 50A / μs	—	0.5	—	μC

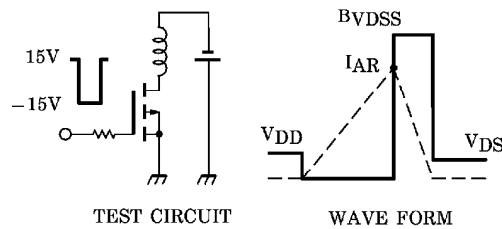
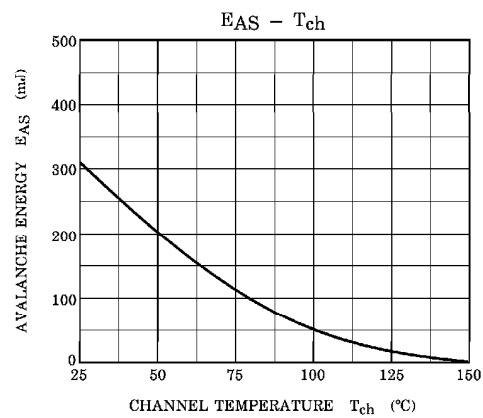
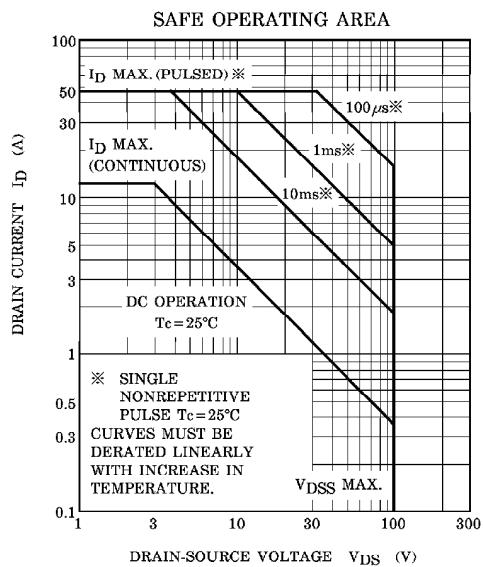
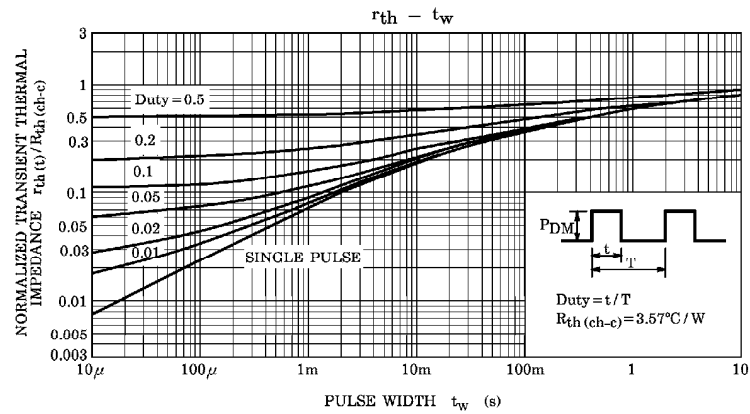
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Peak $I_{AR} = -12A$, $R_G = 25\Omega$ $E_{AS} = \frac{1}{2} \cdot L \cdot I^2 \cdot \left(\frac{BVDSS}{BVDSS - V_{DD}} \right)$
 $V_{DD} = -25V$, $L = 2.94mH$