

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

2SJ349

HIGH SPEED, HIGH CURRENT SWITCHING APPLICATIONS

DC-DC CONVERTER, RELAY DRIVE AND MOTOR DRIVE APPLICATIONS

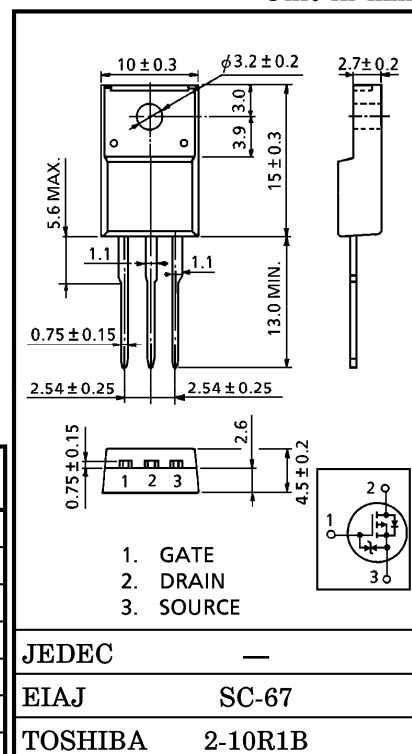
- 4V Gate Drive
- Low Drain-Source ON Resistance : $R_{DS(ON)} = 33\text{ m}\Omega$ (Typ.)
- High Forward Transfer Admittance : $|Y_{fs}| = 20\text{ S}$ (Typ.)
- Low Leakage Current : $I_{DSS} = -100\text{ }\mu\text{A}$ (Max.) ($V_{DS} = -60\text{ V}$)
- Enhancement-Mode : $V_{th} = -0.8 \sim -2.0\text{ V}$
($V_{DS} = -10\text{ V}$, $I_D = -1\text{ mA}$)

MAXIMUM RATINGS ($T_a = 25^\circ\text{C}$)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Drain-Source Voltage	V_{DSS}	-60	V
Drain-Gate Voltage ($R_{GS} = 20\text{ k}\Omega$)	V_{DGR}	-60	V
Gate-Source Voltage	V_{GSS}	± 20	V
Drain Current	DC	I_D	-20
	Pulse	I_{DP}	-80
Drain Power Dissipation ($T_c = 25^\circ\text{C}$)	P_D	35	W
Single Pulse Avalanche Energy**	E_{AS}	800	mJ
Avalanche Current	I_{AR}	-20	A
Repetitive Avalanche Energy*	E_{AR}	3.5	mJ
Channel Temperature	T_{ch}	150	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	-55~150	$^\circ\text{C}$

INDUSTRIAL APPLICATIONS

Unit in mm



JEDEC

EIAJ

SC-67

TOSHIBA

2-10R1B

Weight : 1.9 g

THERMAL CHARACTERISTICS

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

Note ;

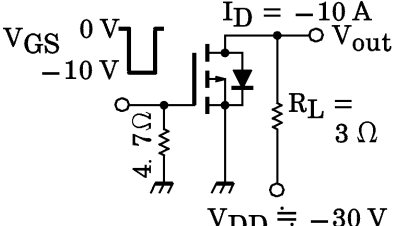
* Repetitive rating ; Pulse Width Limited by Max. junction temperature.

** $V_{DD} = -50\text{ V}$, $T_{ch} = 25^\circ\text{C}$ (initial), $L = 1.44\text{ mH}$, $R_G = 25\text{ }\Omega$, $I_{AR} = -20\text{ A}$ **This transistor is an electrostatic sensitive device.****Please handle with caution.**

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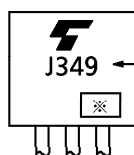
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		I_{GSS}	$V_{GS} = \pm 16 \text{ V}, V_{DS} = 0 \text{ V}$	—	—	± 10	μA
Drain Cut-off Current		I_{DSS}	$V_{DS} = -60 \text{ V}, V_{GS} = 0 \text{ V}$	—	—	-100	μA
Drain-Source Breakdown Voltage		$V_{(BR) DSS}$	$I_D = -10 \text{ mA}, V_{GS} = 0 \text{ V}$	-60	—	—	V
Gate Threshold Voltage		V_{th}	$V_{DS} = -10 \text{ V}, I_D = -1 \text{ mA}$	-0.8	—	-2.0	V
Drain-Source ON Resistance		$R_{DS(ON)}$	$V_{GS} = -4 \text{ V}, I_D = -10 \text{ A}$	—	50	90	m Ω
			$V_{GS} = -10 \text{ V}, I_D = -10 \text{ A}$	—	33	45	
Forward Transfer Admittance		$ Y_{fs} $	$V_{DS} = -10 \text{ V}, I_D = -10 \text{ A}$	10	20	—	S
Input Capacitance		C_{iss}	$V_{DS} = -10 \text{ V}, V_{GS} = 0 \text{ V},$ $f = 1 \text{ MHz}$	—	2800	—	pF
Reverse Transfer Capacitance		C_{rss}		—	450	—	
Output Capacitance		C_{oss}		—	1300	—	
Switching Time	Rise Time	t_r	 $V_{GS} = 0 \text{ V}, -10 \text{ V}$ $I_D = -10 \text{ A}$ $R_L = 3 \Omega$ $V_{DD} = -30 \text{ V}$ $V_{IN} : t_r, t_f < 5 \text{ ns}$ $\text{Duty} \leq 1\%, t_w = 10 \mu\text{s}$	—	15	—	ns
	Turn-on Time	t_{on}		—	35	—	
	Fall Time	t_f		—	25	—	
	Turn-off Time	t_{off}		—	120	—	
Total Gate Charge (Gate-Source Plus Gate-Drain)		Q_g	$V_{DD} = -48 \text{ V}, V_{GS} = -10 \text{ V},$ $I_D = -20 \text{ A}$	—	90	—	nC
Gate-Source Charge		Q_{gs}		—	65	—	
Gate-Drain ("Miller") Charge		Q_{gd}		—	25	—	

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

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current	I_{DR}	—	—	—	-20	A
Pulse Drain Reverse Current	I_{DRP}	—	—	—	-80	A
Diode Forward Voltage	V_{DSF}	$I_{DR} = -20 \text{ A}, V_{GS} = 0 \text{ V}$	—	—	1.7	V
Reverse Recovery Time	t_{rr}	$I_{DR} = -20 \text{ A}, V_{GS} = 0 \text{ V}$ $dI_{DR}/dt = 50 \text{ A}/\mu\text{s}$	—	75	—	ns
Reverse Recovery Charge	Q_{rr}		—	83	—	μC

MARKING



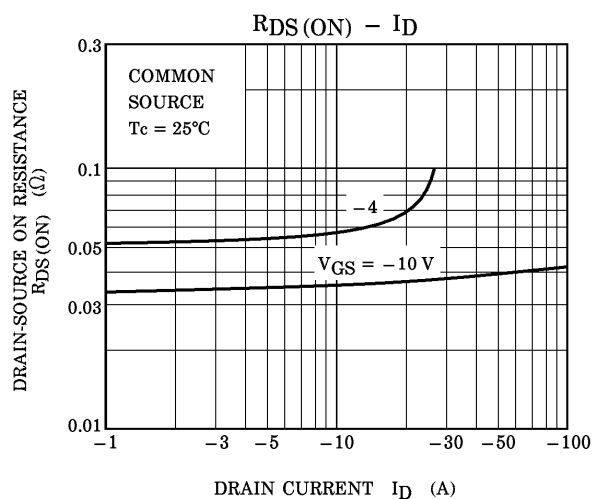
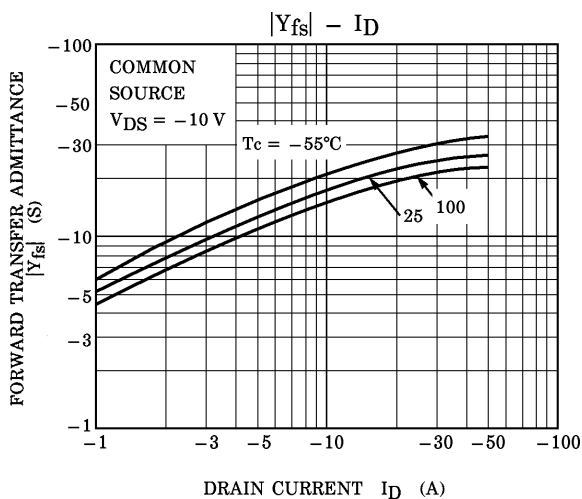
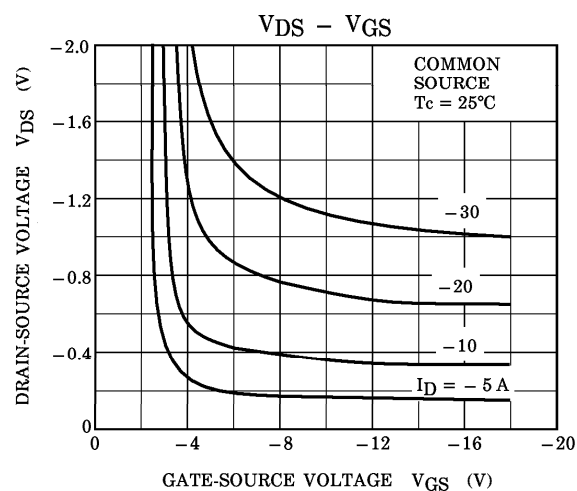
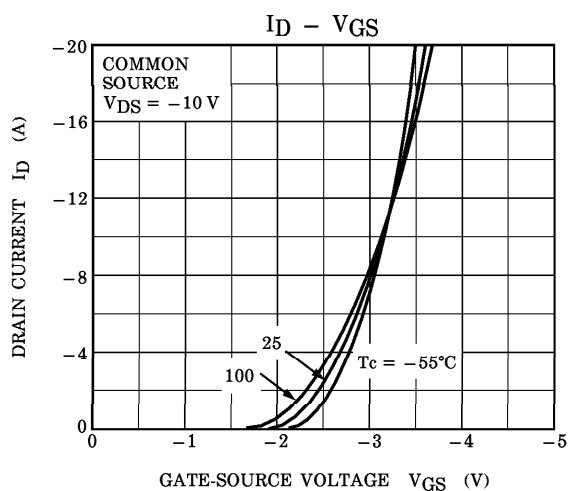
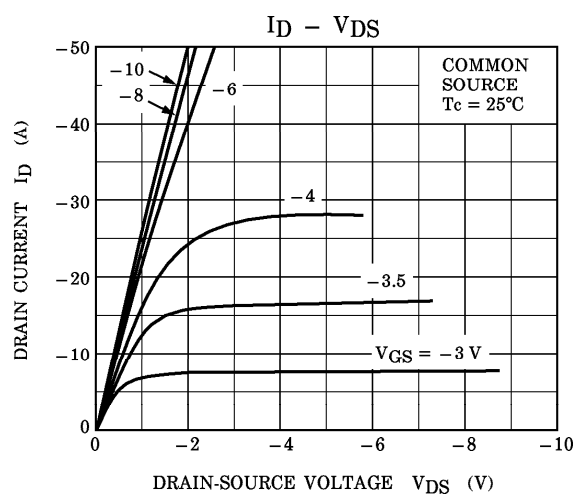
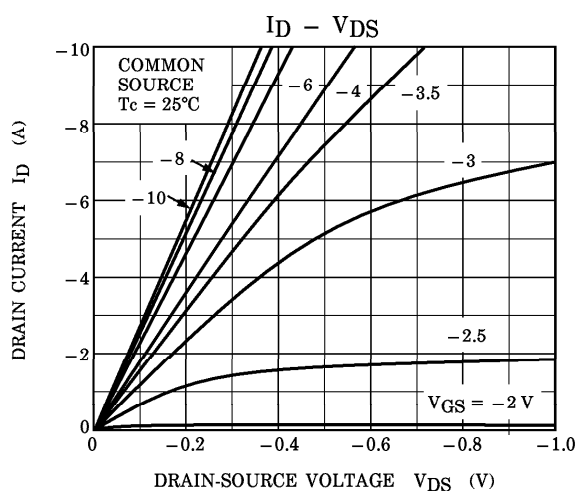
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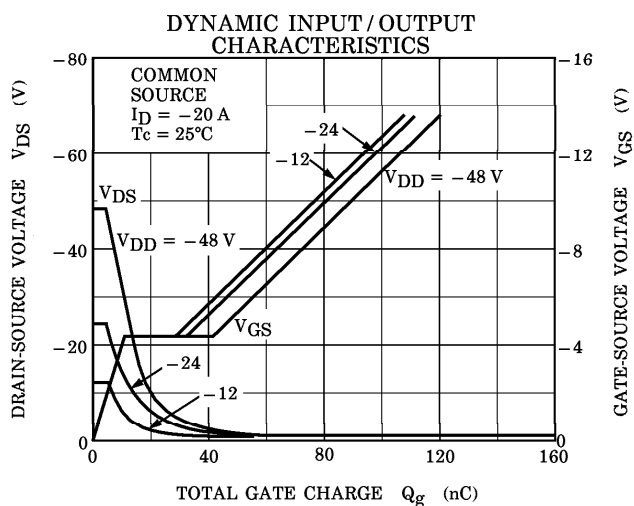
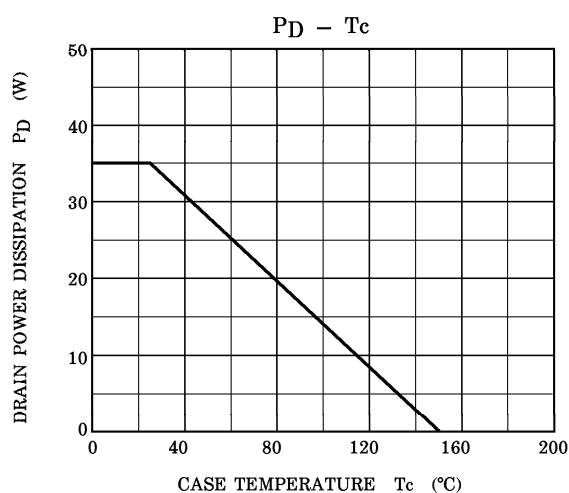
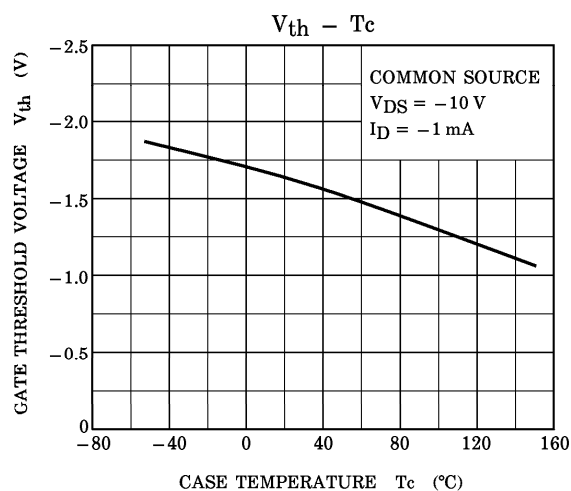
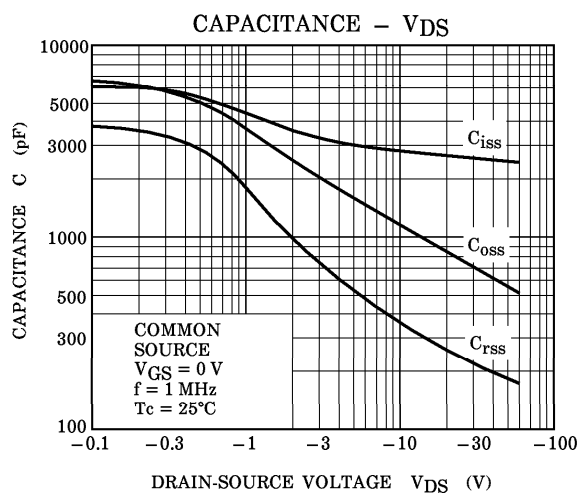
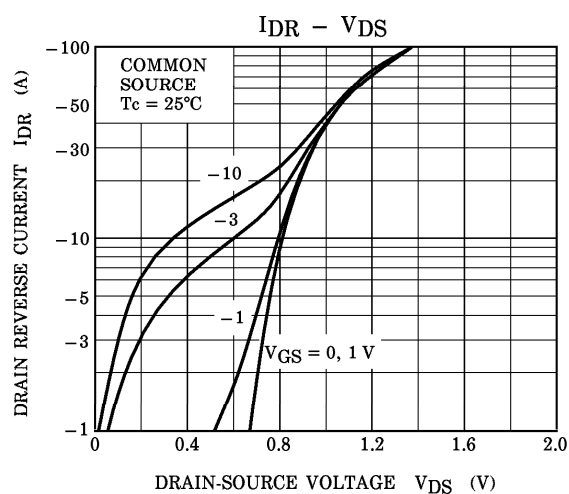
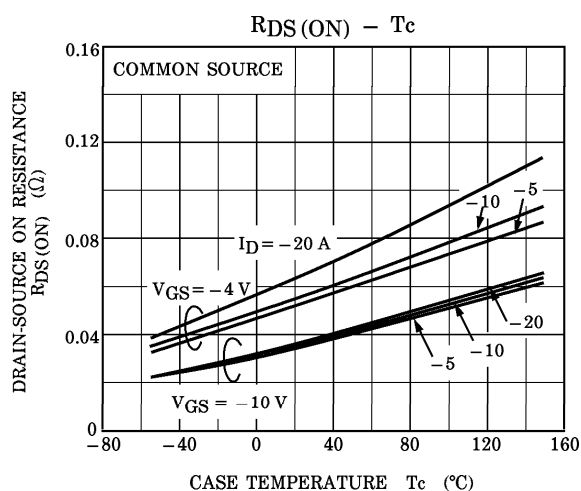
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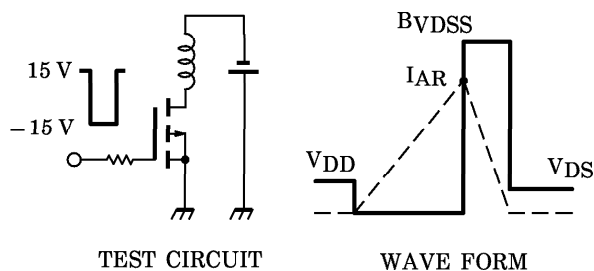
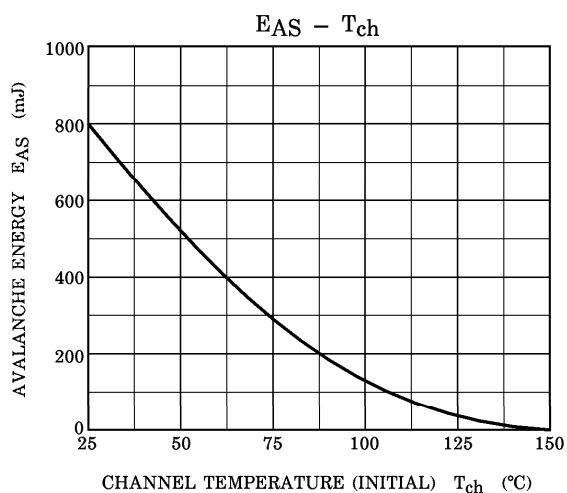
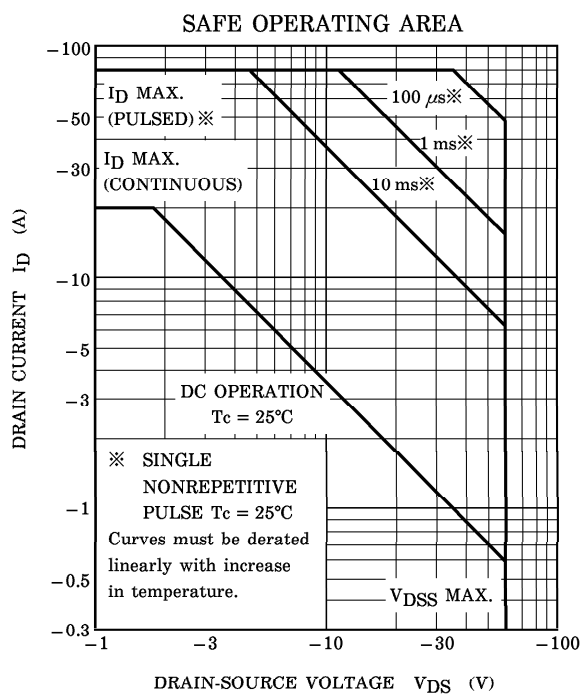
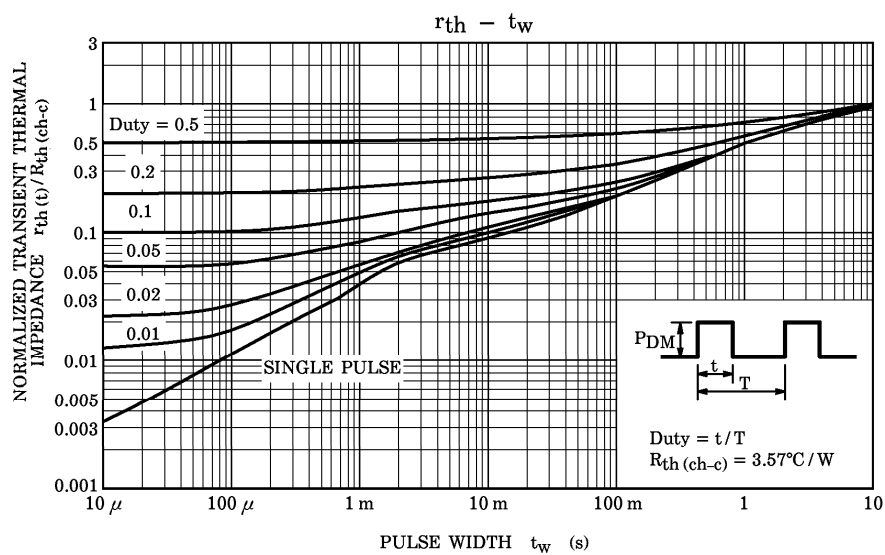


Month (Starting from Alphabet A)

Year (Last Number of the Christian Era)







Peak $I_{AR} = -20$ A, $R_G = 25 \Omega$
 $V_{DD} = -50$ V, $L = 1.44$ mH

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