

TOSHIBA

Discrete Semiconductors

2SJ238

Field Effect Transistor

Silicon P Channel MOS Type (L²-π-MOS IV)

High Speed, High Current DC-DC Converter,

Relay Drive and Motor Drive Applications

Features

- 4-Volt Gate Drive
- Low Drain-Source ON Resistance
 - $R_{DS(ON)} = 0.68\Omega$ (Typ.)
- High Forward Transfer Admittance
 - $|Y_{fs}| = 0.5S$ (Typ.)
- Low Leakage Current
 - $I_{DSS} = -100\mu A$ (Max.) @ $V_{DS} = -60V$
- Enhancement-Mode
 - $V_{th} = -0.8 \sim -2.0V$ @ $V_{DS} = -10V, I_D = -1mA$

Absolute Maximum Ratings (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Drain-Source Voltage	V_{DSS}	-60	V
Drain-Gate Voltage ($R_{GS} = 20k\Omega$)	V_{DGR}	-60	V
Gate-Source Voltage	V_{GSS}	± 20	V
Drain Current	DC	I_D	-1
	Pulse	I_{DP}	-3
Drain Power Dissipation (Tc = 25°C)	P_D	0.5	W
Drain Power Dissipation *	P_{D^*}	1.5	W
Channel Temperature	T_{ch}	150	°C
Storage Temperature Range	T_{stg}	-55 ~ 150	°C

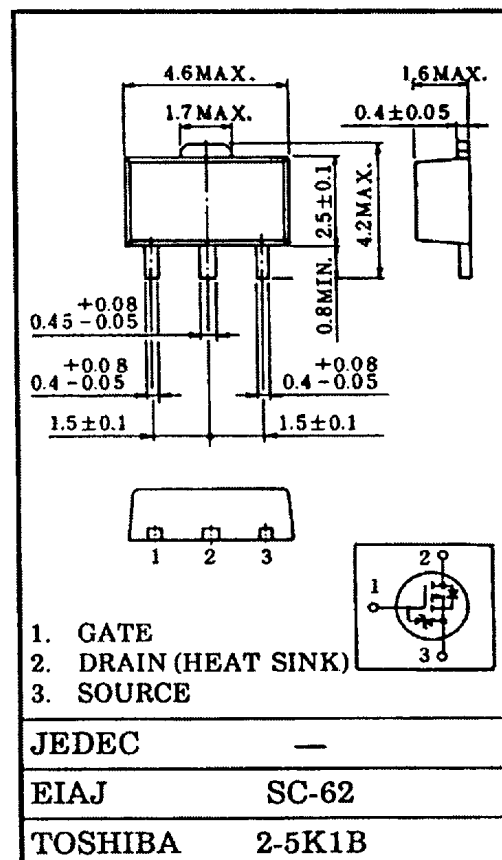
P_{D^*} : Mounted on ceramic substrate (600 mm² x 0.8t)

Thermal Characteristics

CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance, Channel to Ambient	$R_{th(ch-a)}$	250	°C/W

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

Unit in mm



Weight : 0.05g

Marking



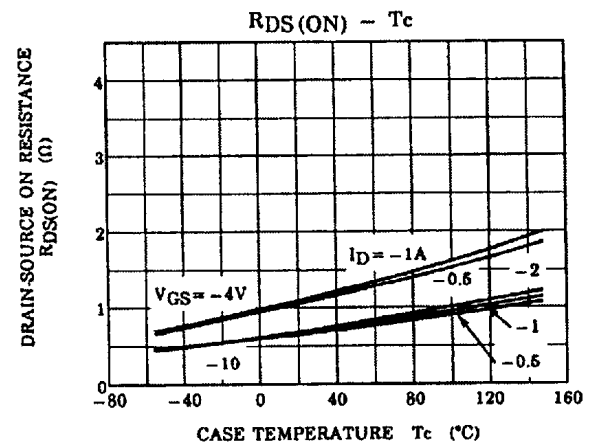
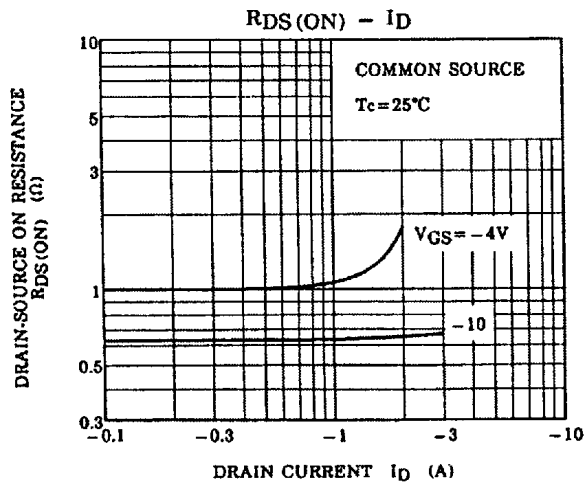
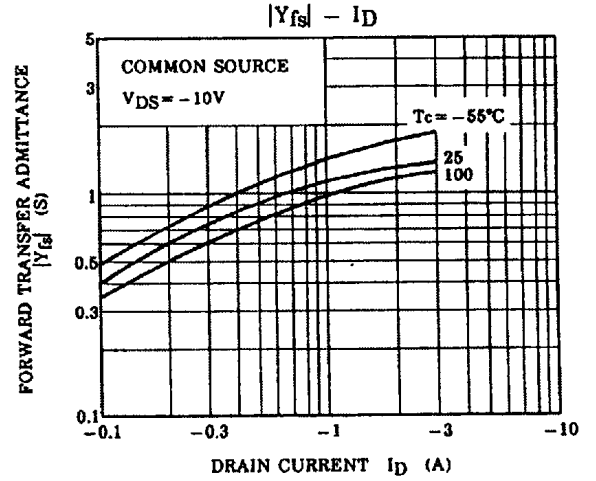
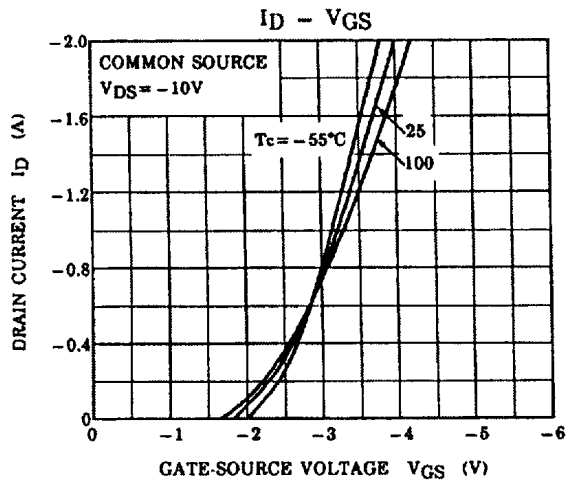
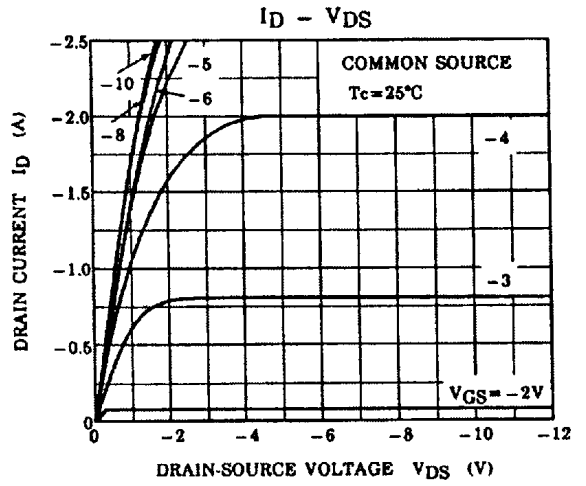
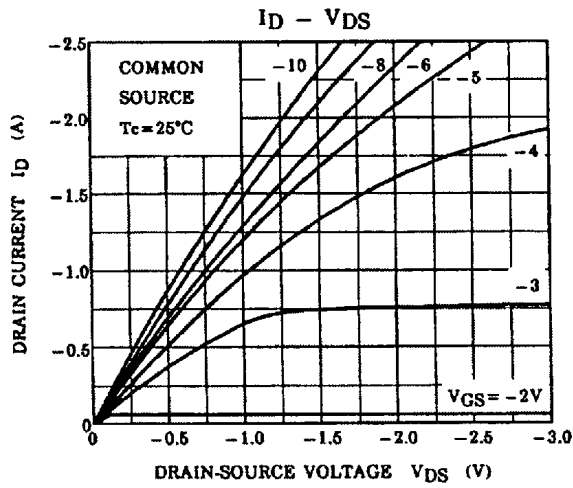
2SJ238

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}	$V_{DS} = -60V, V_{GS} = 0V$	-	-	-100	μA
Drain-Source Breakdown Voltage	$V_{(BR) DSS}$	$I_D = -10mA, V_{GS} = 0V$	-60	-	-	V
Gate Threshold Voltage	V_{th}	$V_{DS} = -10V, I_D = -1mA$	-0.8	-	-2.0	V
Drain-Source ON Resistance	$R_{DS(ON)}$	$V_{GS} = -4V, I_{DS} = -0.5A$	-	1.0	1.40	Ω
		$V_{GS} = 10V, I_{DS} = -0.5A$	-	0.68	0.85	
Forward Transfer Admittance	$ Y_{fs} $	$V_{DS} = -10V, I_{DS} = -0.5A$	0.3	0.5	-	S
Input Capacitance	C_{iss}	$V_{DS} = -10V, V_{GS} = 0V,$ $f = 1MHz$	-	150	220	pF
Reverse Transfer Capacitance	C_{rss}		-	20	40	
Output Capacitance	C_{oss}		-	75	120	
Switching Time	Rise Time	t_r	-	60	120	ns
	Turn-on Time	t_{on}	-	90	180	
	Fall Time	t_f	-	40	80	
	Turn-off Time	t_{off}	-	80	160	
		<p>$I_D = -0.5A$ $V_{GS} = 0V, -10V$ 50Ω $R_L = 60\Omega$ V_{OUT} $V_{DD} = -30V$ $V_{IN} : t_r, t_f < 5ns, V_{DD} = -30V$ Duty $\leq 1\%$, $t_w = 10\mu s$</p>				
Total Gate Charge (Gate-Source Plus Gate-Drain)	Q_g	$V_{DD} = -48V, V_{GS} = -10V,$ $I_D = -1A$	-	6.5	13	nC
Gate-Source Charge	Q_{gs}		-	4.2	-	
Gate-Drain ("Miller") Charge	Q_{gd}		-	2.3	-	

Source-Drain Diode Ratings and Characteristics (Ta = 25°C)

CHARACTERISTICS	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current	I_{DR}	-	-	-	-1	A
Pulse Drain Reverse Current	I_{DRP}	-	-	-	-3	A
Diode Forward Voltage	V_{DSF}	$I_{DR} = -1A, V_{GS} = 0V$	-	-	1.5	V
Reverse Recovery Time	t_{rr}	$I_{DR} = -1A, V_{GS} = 0V$ $di_{DR}/dt = 50A/\mu s$	-	50	-	ns
Reverse Recovered Charge	Q_{rr}		-	55	-	μC



2SJ238

