

# P-CHANNEL MOS FIELD EFFECT TRANSISTOR FOR SWITCHING

0.65+0.7

2.8 ±0.2 1.5

### DESCRIPTION

The 2SJ557 is a switching device which can be driven directly by a 4 V power source.

The 2SJ557 features a low on-state resistance and excellent switching characteristics, and is suitable for applications such as power switch of portable machine and so on.

#### FEATURES

- Can be driven by a 4 V power source
- Low on-state resistance

 $\begin{array}{l} R_{DS(on)1} = 155 \ m\Omega \ MAX. \ (V_{GS} = -10 \ V, \ I_{D} = -1.0 \ A) \\ R_{DS(on)2} = 255 \ m\Omega \ MAX. \ (V_{GS} = -4.5 \ V, \ I_{D} = -1.0 \ A) \\ R_{DS(on)3} = 290 \ m\Omega \ MAX. \ (V_{GS} = -4.0 \ V, \ I_{D} = -1.0 \ A) \end{array}$ 

#### **ORDERING INFORMATION**

PART NUMBER	PACKAGE		
2SJ557	3-pin Mini Mold (Thin Type)		

#### ABSOLUTE MAXIMUM RATINGS (TA = 25°C)

Drain to Source Voltage	Vdss	-30	V
Gate to Source Voltage	Vgss	-20 / +5	V
Drain Current (DC)	D(DC)	±2.5	А
Drain Current (pulse) <sup>Note1</sup>	D(pulse)	±10	А
Total Power Dissipation	<b>P</b> T1	0.2	W
Total Power Dissipation Note2	Рт2	1.25	W
Channel Temperature	Tch	150	°C
Storage Temperature	Tstg	–55 to +150	°C



2

1: Gate

2 : Source 3 : Drain

0.95

1.9

2.9 ±0.2

0.95

0.16+0.1

0 to 0.1

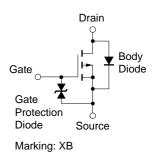
0.65

0.9 to 1.1

PACKAGE DRAWING (Unit : mm)

 $0.4^{+0.1}_{-0.05}$ 

#### EQUIVALENT CIRCUIT



**Notes 1.** PW  $\leq$  10  $\mu$ s, Duty Cycle  $\leq$  1 %

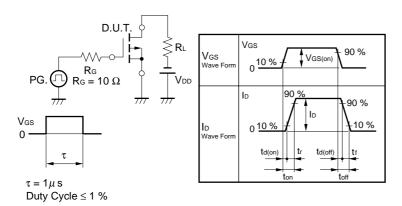
- **2.** Mounted on FR4 Board,  $t \le 5$  sec.
- **Remark** The diode connected between the gate and source of the transistor serves as a protector against ESD. When this device actually used, an additional protection circuit is externally required if a voltage exceeding the rated voltage may be applied to this device.

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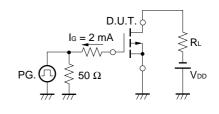
## ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25 °C)

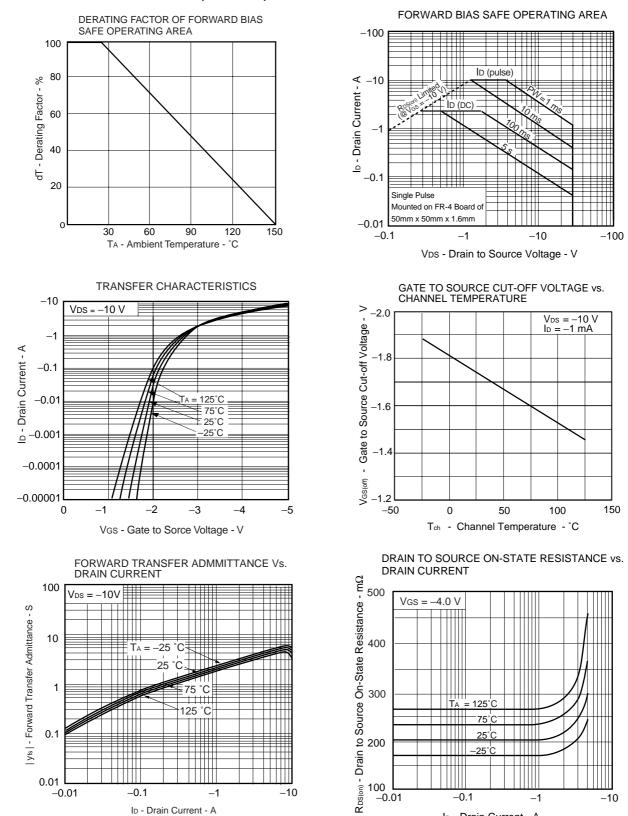
CHARACTERISTICS	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Drain Cut-off Current	IDSS	$V_{DS} = -30 V$ , $V_{GS} = 0 V$			-10	μA
Gate Leakage Current	lgss	$V_{GS} = \pm 16 V, V_{DS} = 0 V$			±10	μA
Gate Cut-off Voltage	VGS(off)	$V_{DS} = -10 V$ , $I_{D} = -1 mA$	-1.0	-1.7	-2.5	V
Forward Transfer Admittance	y <sub>fs</sub>	$V_{DS} = -10 V$ , $I_D = -1.5 A$	1	2.5		S
Drain to Source On-state Resistance	RDS(on)1	$V_{GS} = -10 \text{ V}, \text{ Id} = -1.0 \text{ A}$		114	155	mΩ
	RDS(on)2	$V_{GS} = -4.5 V$ , $I_D = -1.0 A$		178	255	mΩ
	RDS(on)3	$V_{GS} = -4.0 \text{ V}, \text{ Id} = -1.0 \text{ A}$		212	290	mΩ
Input Capacitance	Ciss	V <sub>DS</sub> = -10 V		312		pF
Output Capacitance	Coss	Vgs = 0 V		117		pF
Reverse Transfer Capacitance	Crss	f = 1 MHz		56		pF
Turn-on Delay Time	td(on)	$V_{DD} = -10 V$		12		ns
Rise Time	tr	ID = -1.0 A		7		ns
Turn-off Delay Time	td(off)	$V_{GS(on)} = -10 \text{ V}$		133		ns
Fall Time	tr	Rg = 10 Ω		85		ns
Total Gate Charge	QG	Vdd=-10 V		2.8		nC
Gate to Source Charge	Q <sub>GS</sub>	ID = -2.5 A		1.0		nC
Gate to Drain Charge	QGD	V <sub>GS</sub> = -4.0 V		1.2		nC
Diode Forward Voltage	VF(S-D)	IF = 2.5 A, VGS = 0 V		0.84		V
Reverse Recovery Time	trr	IF = 2.5 A, VGS = 0 V		28		ns
Reverse Recovery Charge	Qrr	di/dt = 50 A / $\mu$ s		7.8		nC

#### **TEST CIRCUIT 1 SWITCHING TIME**



### TEST CIRCUIT 2 GATE CHARGE



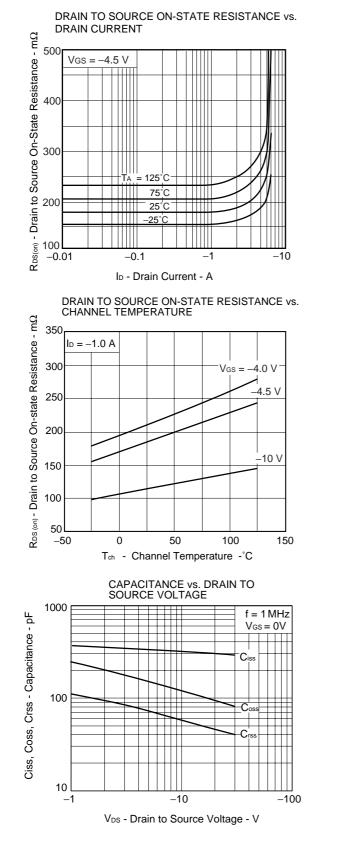


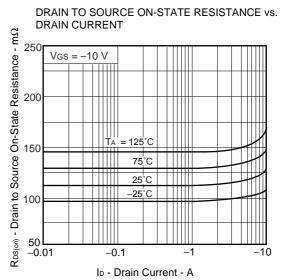
TYPICAL CHARACTERISTICS ( $T_A = 25^{\circ}C$ )

Data Sheet D13292EJ1V0DS00

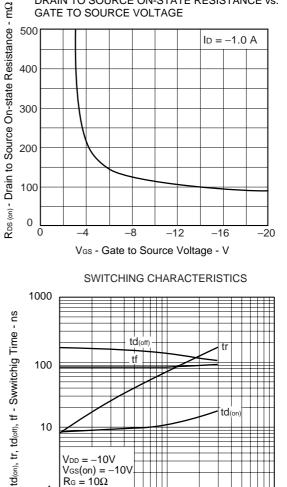
ID - Drain Current - A

ID - Drain Current - A





DRAIN TO SOURCE ON-STATE RESISTANCE vs. GATE TO SOURCE VOLTAGE



-1

ID - Drain Current - A

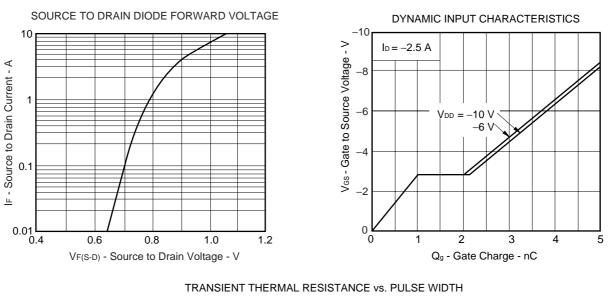
-10

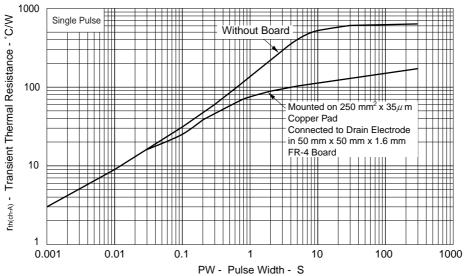
Data Sheet D13292EJ1V0DS00

1

-0.1

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