

To our customers,

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## Old Company Name in Catalogs and Other Documents

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Renesas Electronics website: <http://www.renesas.com>

April 1<sup>st</sup>, 2010  
Renesas Electronics Corporation

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MOS FIELD EFFECT TRANSISTOR  
2SJ621

P-CHANNEL MOS FIELD EFFECT TRANSISTOR  
FOR SWITCHING

DESCRIPTION

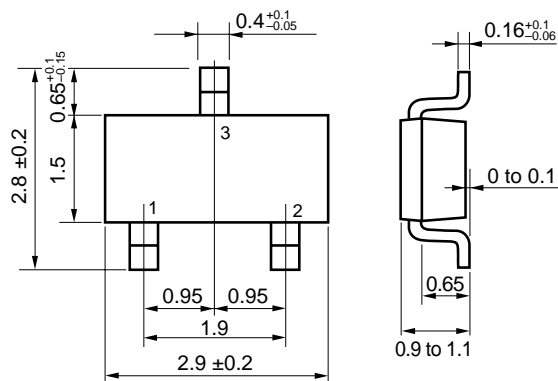
The 2SJ621 is a switching device which can be driven directly by a 1.8 V power source.

This device 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

- 1.8 V drive available
- Low on-state resistance  
 $R_{DS(on)1} = 44 \text{ m}\Omega \text{ MAX. (} V_{GS} = -4.5 \text{ V, } I_D = -2.0 \text{ A)}$   
 $R_{DS(on)2} = 56 \text{ m}\Omega \text{ MAX. (} V_{GS} = -3.0 \text{ V, } I_D = -2.0 \text{ A)}$   
 $R_{DS(on)3} = 62 \text{ m}\Omega \text{ MAX. (} V_{GS} = -2.5 \text{ V, } I_D = -2.0 \text{ A)}$   
 $R_{DS(on)4} = 105 \text{ m}\Omega \text{ MAX. (} V_{GS} = -1.8 \text{ V, } I_D = -1.5 \text{ A)}$

PACKAGE DRAWING (Unit: mm)



1 : Gate  
2 : Source  
3 : Drain

ORDERING INFORMATION

PART NUMBER	PACKAGE
2SJ621	SC-96 (Mini Mold Thin Type)

Marking: XG

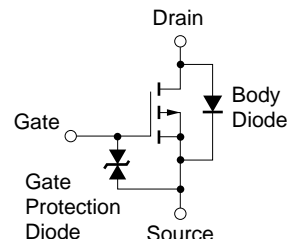
ABSOLUTE MAXIMUM RATINGS (T<sub>A</sub> = 25°C)

Drain to Source Voltage (V <sub>GS</sub> = 0 V)	V <sub>DSS</sub>	-12	V
Gate to Source Voltage (V <sub>DS</sub> = 0 V)	V <sub>GSS</sub>	±8.0	V
Drain Current (DC) (T <sub>A</sub> = 25°C)	I <sub>D(DC)</sub>	±3.5	A
Drain Current (pulse) <sup>Note1</sup>	I <sub>D(pulse)</sub>	±12	A
Total Power Dissipation (T <sub>A</sub> = 25°C)	P <sub>T1</sub>	0.2	W
Total Power Dissipation (T <sub>A</sub> = 25°C) <sup>Note2</sup>	P <sub>T2</sub>	1.25	W
Channel Temperature	T <sub>ch</sub>	150	°C
Storage Temperature	T <sub>stg</sub>	-55 to +150	°C

- Notes 1. PW ≤ 10 μs, Duty Cycle ≤ 1%  
2. Mounted on FR-4 board, t ≤ 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.

EQUIVALENT CIRCUIT

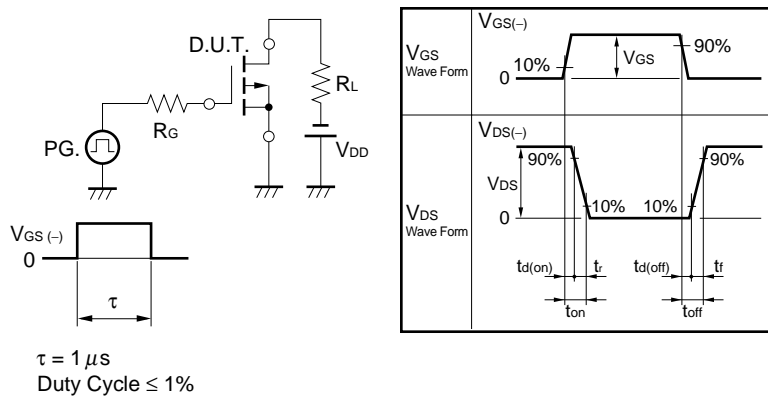


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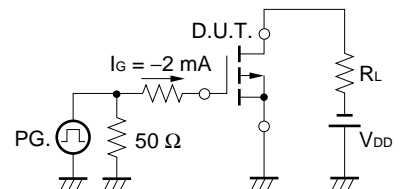
**ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25°C)**

CHARACTERISTICS	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = -12 V, V <sub>GS</sub> = 0 V			-10	μA
Gate Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> = ±8.0 V, V <sub>DS</sub> = 0 V			±10	μA
Gate Cut-off Voltage	V <sub>GS(off)</sub>	V <sub>DS</sub> = -10 V, I <sub>D</sub> = -1.0 mA	0.45		1.5	V
Forward Transfer Admittance	y <sub>fs</sub>	V <sub>DS</sub> = -10 V, I <sub>D</sub> = -3.5 A	4.0			S
Drain to Source On-state Resistance	R <sub>DS(on)1</sub>	V <sub>GS</sub> = -4.5 V, I <sub>D</sub> = -2.0 A		35	44	mΩ
	R <sub>DS(on)2</sub>	V <sub>GS</sub> = -3.0 V, I <sub>D</sub> = -2.0 A		42	56	mΩ
	R <sub>DS(on)3</sub>	V <sub>GS</sub> = -2.5 V, I <sub>D</sub> = -2.0 A		46	62	mΩ
	R <sub>DS(on)4</sub>	V <sub>GS</sub> = -1.8 V, I <sub>D</sub> = -1.5 A		63	105	mΩ
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> = -10 V		630		pF
Output Capacitance	C <sub>oss</sub>	V <sub>GS</sub> = 0 V		170		pF
Reverse Transfer Capacitance	C <sub>rss</sub>	f = 1.0 MHz		100		pF
Turn-on Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> = -6.0 V, I <sub>D</sub> = -2.0 A		20		ns
Rise Time	t <sub>r</sub>	V <sub>GS</sub> = -4.0 V		70		ns
Turn-off Delay Time	t <sub>d(off)</sub>	R <sub>G</sub> = 10 Ω		320		ns
Fall Time	t <sub>f</sub>			200		ns
Total Gate Charge	Q <sub>G</sub>	V <sub>DD</sub> = -10 V		6.2		nC
Gate to Source Charge	Q <sub>GS</sub>	V <sub>GS</sub> = -4.0 V		1.0		nC
Gate to Drain Charge	Q <sub>GD</sub>	I <sub>D</sub> = -3.5 A		2.0		nC
Body Diode Forward Voltage	V <sub>F(S-D)</sub>	I <sub>F</sub> = 3.5 A, V <sub>GS</sub> = 0 V		0.84		V

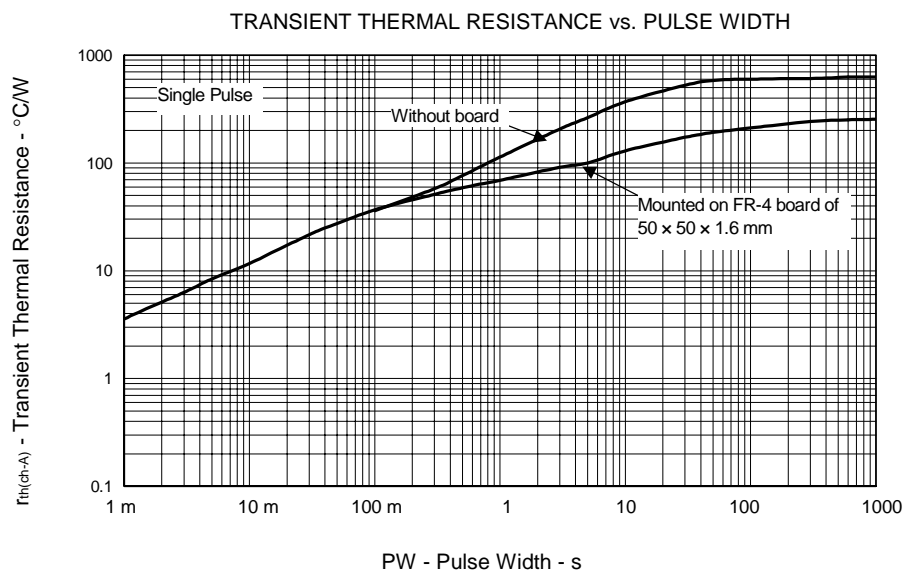
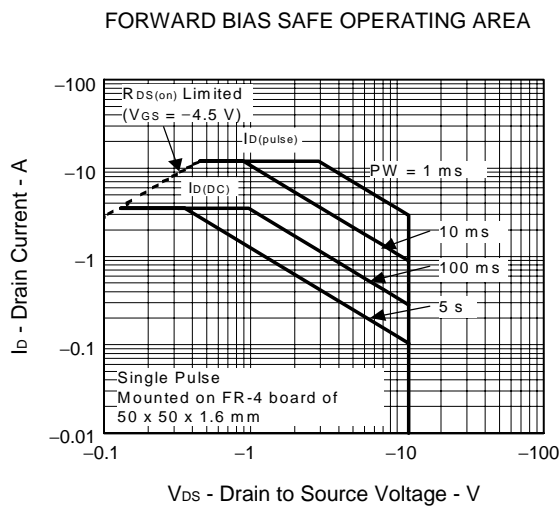
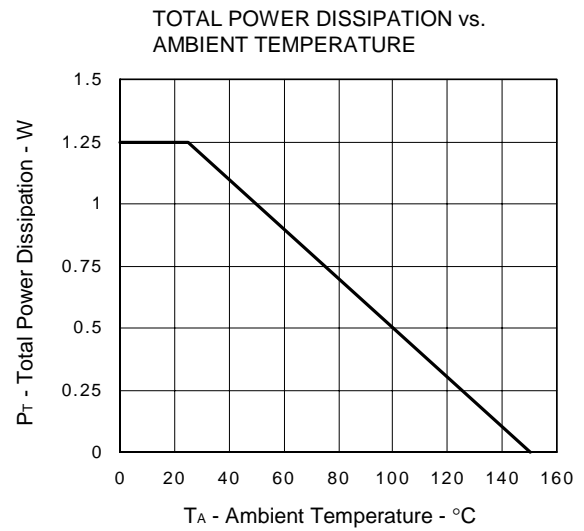
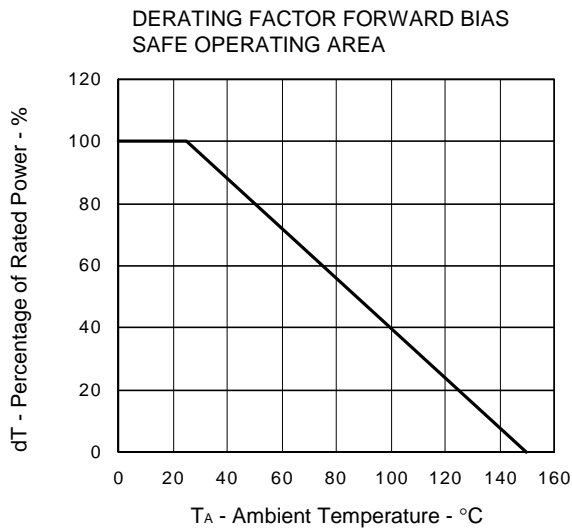
**TEST CIRCUIT 1 SWITCHING TIME**

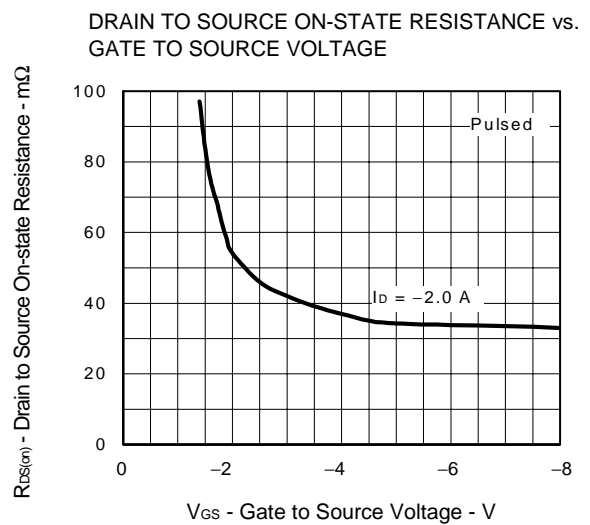
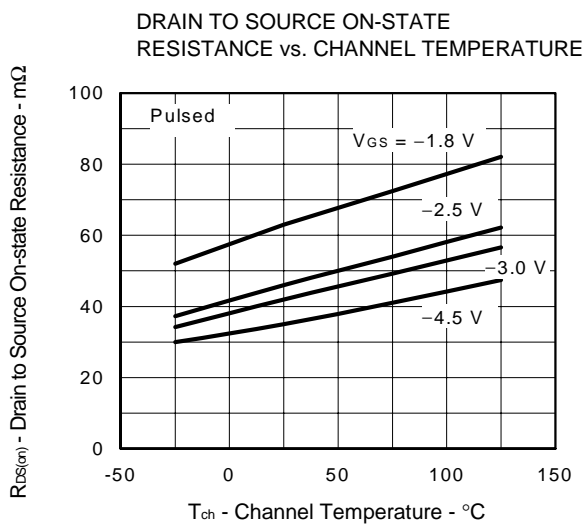
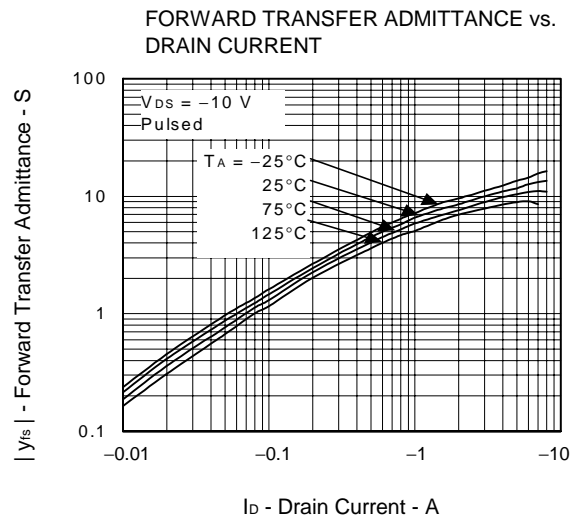
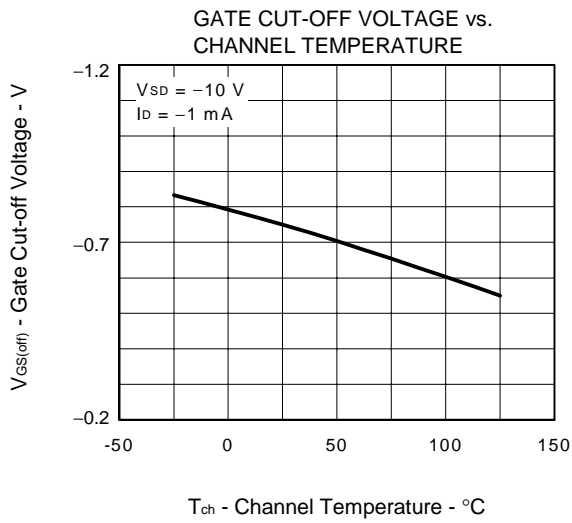
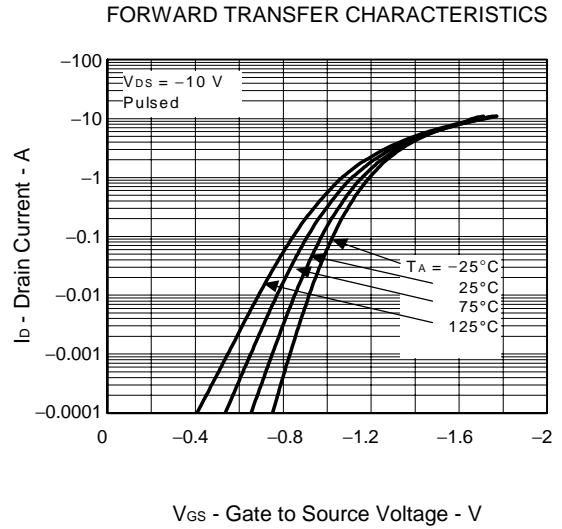
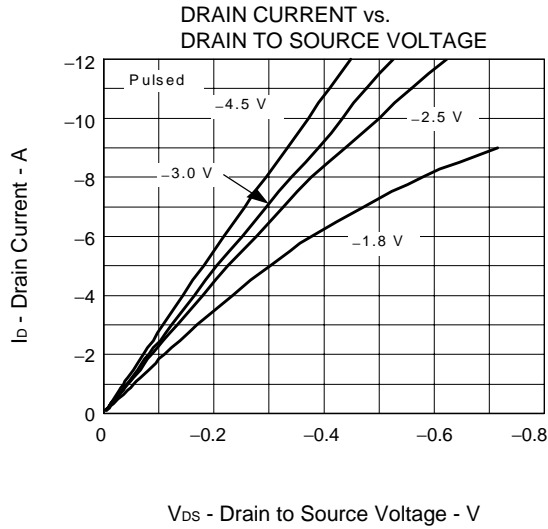


**TEST CIRCUIT 2 GATE CHARGE**

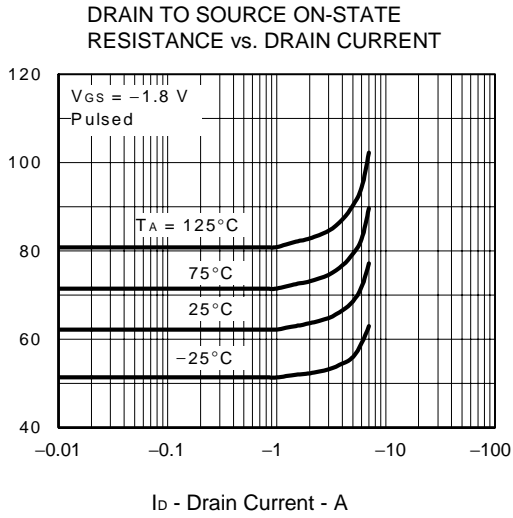


TYPICAL CHARACTERISTICS (T<sub>A</sub> = 25°C)

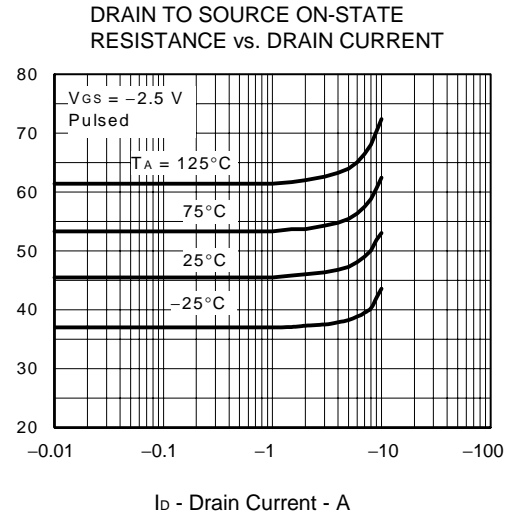




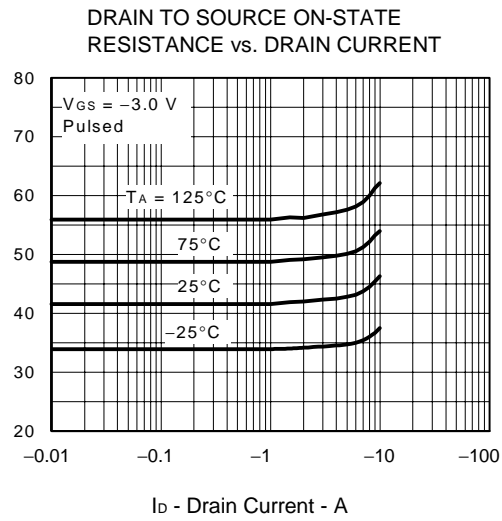
$R_{DS(on)}$  - Drain to Source On-state Resistance - m $\Omega$



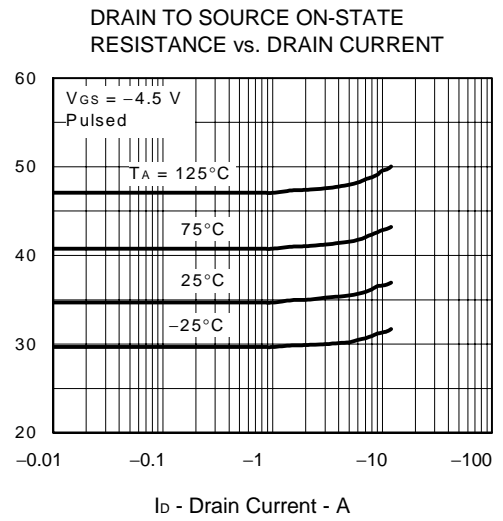
$R_{DS(on)}$  - Drain to Source On-state Resistance - m $\Omega$



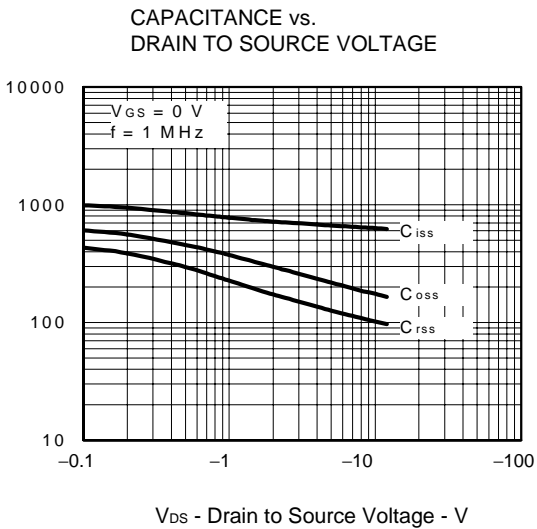
$R_{DS(on)}$  - Drain to Source On-state Resistance - m $\Omega$



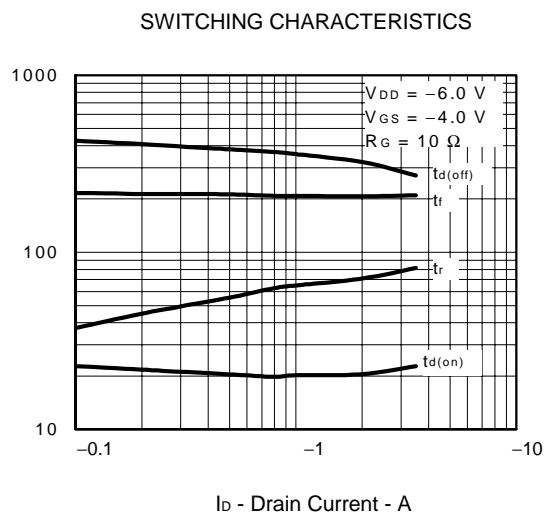
$R_{DS(on)}$  - Drain to Source On-state Resistance - m $\Omega$

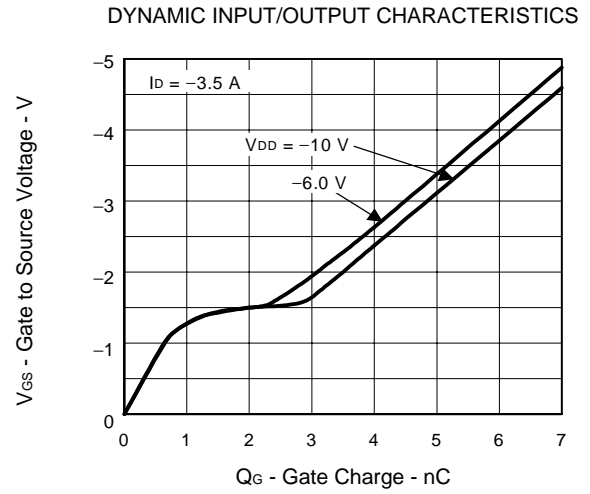
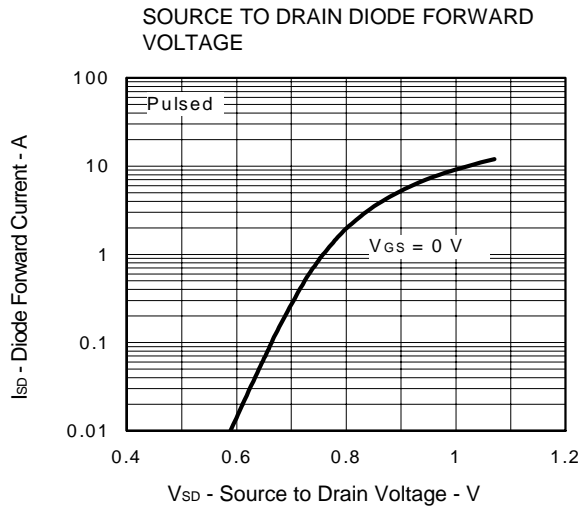


$C_{iss}$ ,  $C_{oss}$ ,  $C_{rss}$  - Capacitance - pF



$t_{d(on)}$ ,  $t_r$ ,  $t_{d(off)}$ ,  $t_f$  - Switching Time - ns







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