N-Channel Enhancement Mode MOSFET

• Features

1) Low on-resistance.
2) Fast switching speed.
3) Low voltage drive (2.5V) makes this device ideal for portable equipment.
4) Easily designed drive circuits.
5) Easy to parallel.

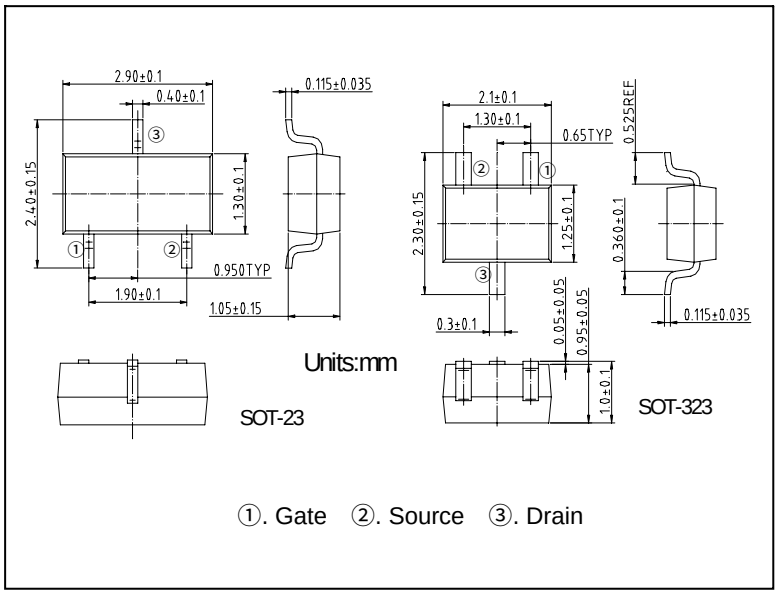
• Applications

Interfacing, switching (30V, 100mA)

• Structure

Silicon N-channel MOSFET

• External dimensions

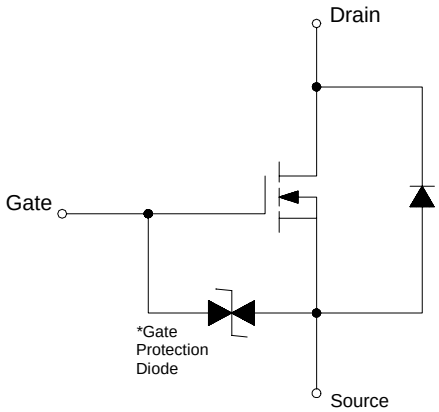


• Absolute maximum ratings (Ta = 25°C)

Parameter		Symbol	Limits	Unit
Drain-source voltage		V_{DSS}	30	V
Gate-source voltage		V_{GSS}	20	V
Drain current	Continuous	I_D	100	mA
	Pulsed	I_{DP*1}	200	mA
Reverse drain current	Continuous	I_{DR}	100	mA
	Pulsed	I_{DRP*1}	200	mA
Total power dissipation(Tc=25°C)		P_{D*2}	200	mW
Channel temperature		Tch	150	°C
Storage temperature		Tstg	-55~+150	°C

*1Pw≤10μs,Duty Cycle≤50%
*2With each pin mounted on the recommended lands

• Equivalent circuit



*A protection diode is included between the gate and the source terminals to protect the diode against static electricity when the product is in use. Use a protection circuit when the fixed voltages are exceeded.

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• Electrical characteristics (Ta = 25°C)

Parameter	Symbo	Min.	Typ.	Max.	Unit	Test Conditions
Gate-source leakage	I_{GSS}	----	----	±1	μA	V_{GS}=±20V,V_{DS}=0V
Drain-source breakdown voltage	$V_{(BR)DS}$	30	----	----	V	I_D=10μA ,V_{GS}=0V
Zero gate voltage drain current	I_{DSS}	----	----	1	μA	V_{DS}=30V ,V_{GS}=0V
Gate treshold Voltage	$V_{GS(th)}$	0.8	----	1.5	V	V_{DS}=3V ,I_D=100μA
Static drain-source on-state resistance	$R_{DS(ON)}$	----	5	8	Ω	I_D=10mA , V_{GS}= 4V
	$R_{DS(ON)}$	----	7	13	Ω	I_D=1mA , V_{GS}=2.5V
Forward transfer admittance	Yfs	20	----	----	mS	V_{DS}=3V, I_D=10mA
Input capacitance	Ciss	----	13	----	pF	V_{DS}=5V V_{GS}=0V F=1 MHz
Output capacitance	Coss	----	9	----	pF	
Reverse transfer capacitance	Crss	----	4		pF	
Turn-on delay time	td(on)	----	15		ns	I_D=10 mA ,V_{DO}=5V V_{GS}= 5V R_L=500Ω R_{GS}=10Ω
Rise time	tr	----	35		ns	
Turn-off delay time	td(off)	----	80		ns	
Fall time	tr	----	80		ns	

• Electrical characteristic curves

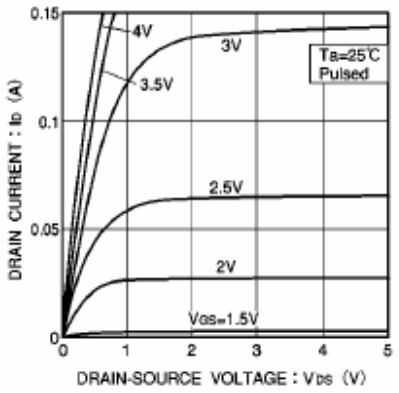

Fig.1 Typical output characteristics

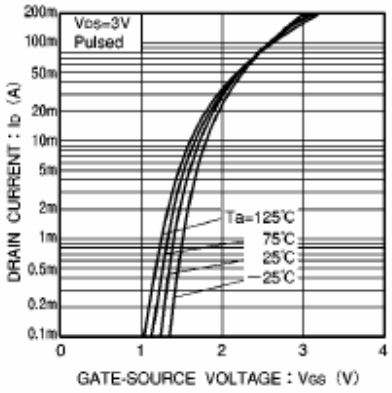

Fig.2 Typical transfer characteristics

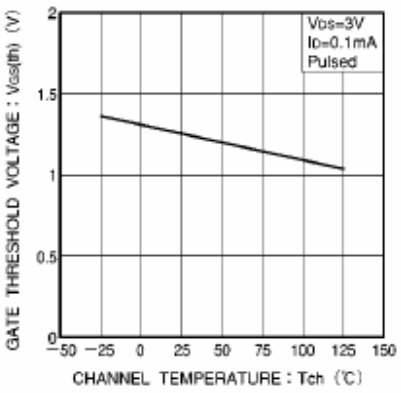

Fig.3 Gate threshold voltage vs. channel temperature

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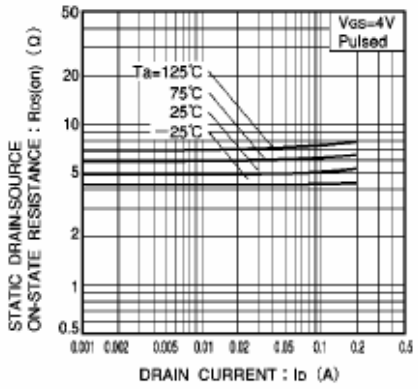

Fig.4 Static drain-source on-state resistance vs. drain current (Ⅰ)

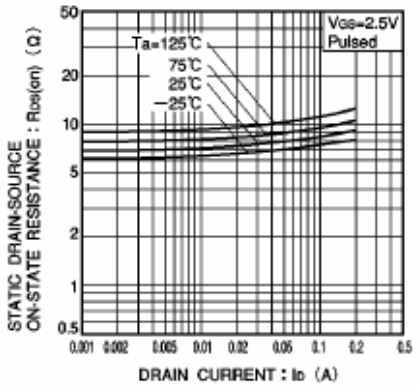

Fig.5 Static drain-source on-state resistance vs. drain current (Ⅱ)

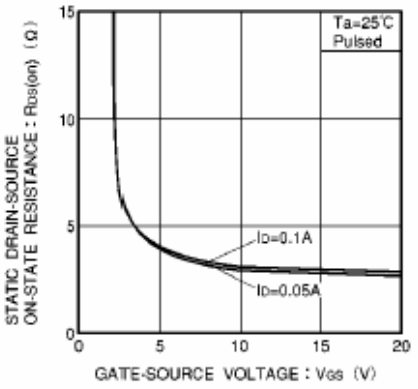

Fig.6 Static drain-source on-state resistance vs. gate-source voltage

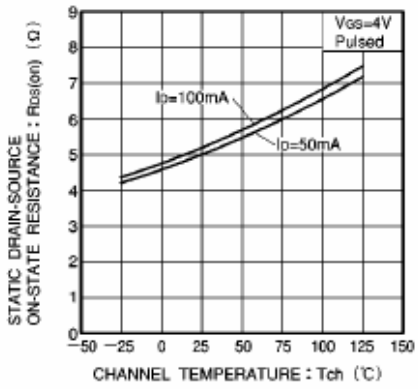

Fig.7 Static drain-source on-state resistance vs. channel temperature

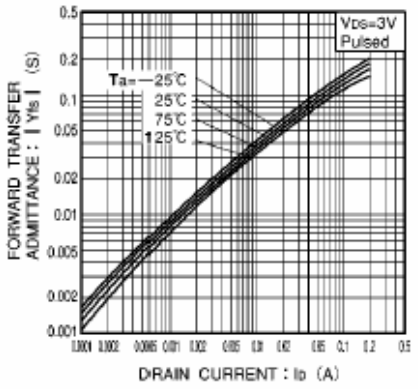

Fig.8 Forward transfer admittance vs. drain current

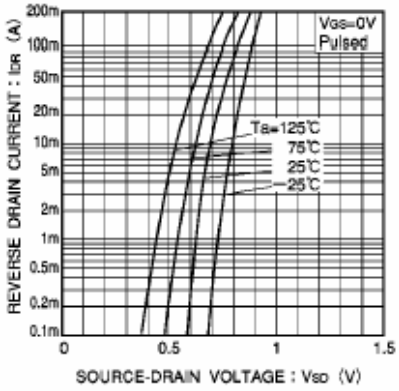

Fig.9 Reverse drain current vs. source-drain voltage (Ⅰ)

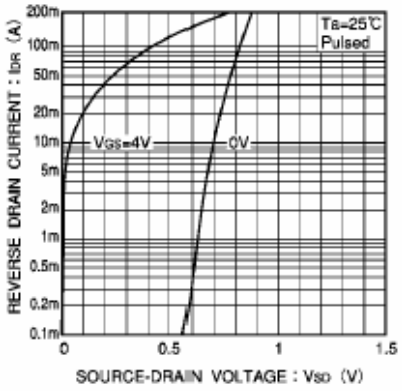

Fig.10 Reverse drain current vs. source-drain voltage (Ⅱ)

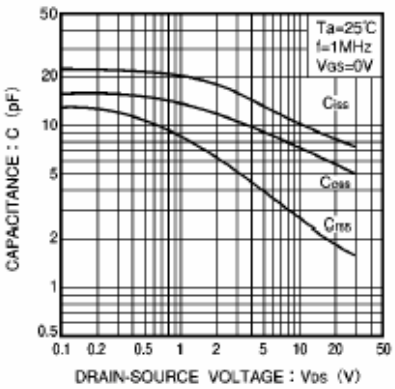

Fig.11 Typical capacitance vs. drain-source voltage

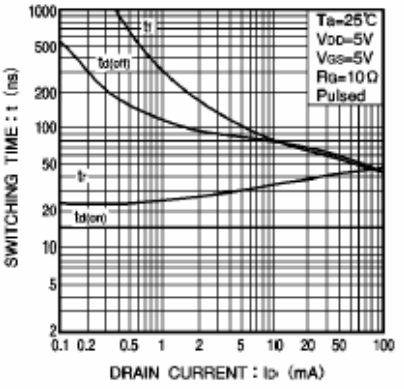

Fig.12 Switching characteristics (See Figures. 13 and 14 for the measurement circuit and resultant waveforms)

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- **Switching characteristics measurement circuit**

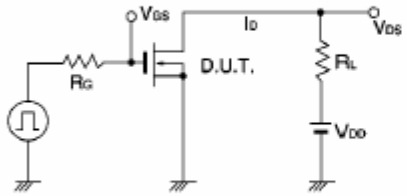

Fig.13 Switching time measurement circuit

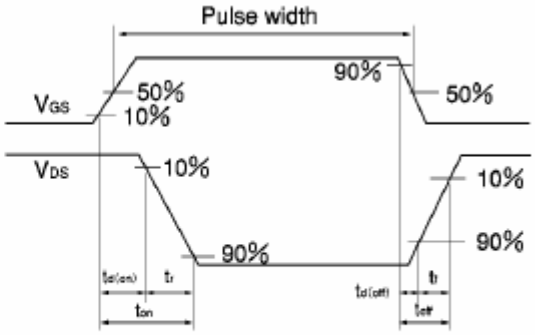

Fig.14 Switching time waveforms