

2.5V Drive Nch MOSFET

RUE003N02

●Structure

Silicon N-channel
MOSFET

●Applications

Switching

●Features

- 1) Low on-resistance.
- 2) Fast switching speed.
- 3) Low voltage drive (2.5V) makes this device ideal for portable equipment.
- 4) Drive circuits can be simple.
- 5) Parallel use is easy.

●Packaging specifications

Type	Package	Taping
	Code	TL
	Basic ordering unit (pieces)	3000
RUE003N02		○

●Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Drain-source voltage	V_{DS}	20	V
Gate-source voltage	V_{GS}	±8	V
Drain current	Continuous	I_D	±300
	Pulsed	I_{DP}^{*1}	±600
Total power dissipation	P_D^{*2}	150	mW
Channel temperature	T_{ch}	150	°C
Range of storage temperature	T_{stg}	-55 to +150	°C

*1 $P_w \leq 10 \mu s$, Duty cycles $\leq 1\%$

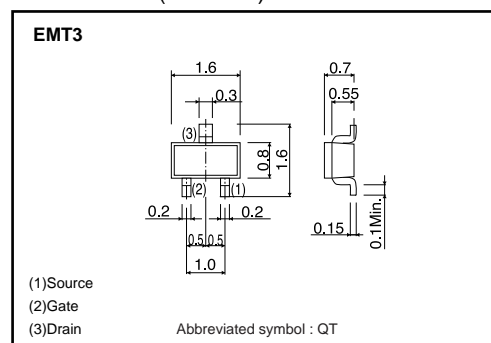
*2 Each terminal mounted on a recommended land

●Thermal resistance

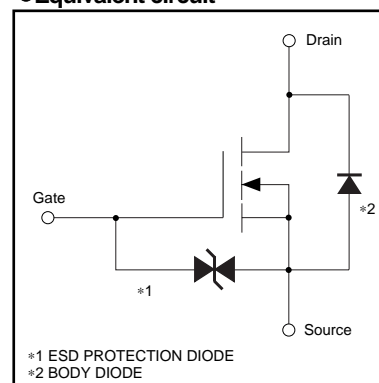
Parameter	Symbol	Limits	Unit
Channel to ambient	$R_{th(ch-a)}^*$	833	°C / W

* Each terminal mounted on a recommended land

●Dimensions (Unit : mm)



●Equivalent circuit



Transistor

●Electrical characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Gate-source leakage	I_{GSS}	—	—	10	μA	$V_{GS}=\pm 8V$, $V_{DS}=0V$
Drain-source breakdown voltage	$V_{(BR)DSS}$	20	—	—	V	$I_D=1mA$, $V_{GS}=0V$
Zero gate voltage drain current	I_{DSS}	—	—	1.0	μA	$V_{DS}=20V$, $V_{GS}=0V$
Gate threshold voltage	$V_{GS(th)}$	0.3	—	1.0	V	$V_{DS}=10V$, $I_D=1mA$
Static drain-source on-state resistance	$R_{DS(on)}^*$	—	0.7	1.0	Ω	$I_D=300mA$, $V_{GS}=4.0V$
		—	0.8	1.2	Ω	$I_D=300mA$, $V_{GS}=2.5V$
		—	1.0	1.4	Ω	$I_D=300mA$, $V_{GS}=1.8V$
Forward transfer admittance	$ Y_{fs} ^*$	400	—	—	ms	$I_D=300mA$, $V_{DS}=10V$
Input capacitance	C_{iss}	—	25	—	pF	$V_{DS}=10V$
Output capacitance	C_{oss}	—	10	—	pF	$V_{GS}=0V$
Reverse transfer capacitance	C_{rss}	—	10	—	pF	$f=1MHz$
Turn-on delay time	$t_{d(on)}^*$	—	5	—	ns	$I_D=150mA$, $V_{DD} \doteq 10V$
Rise time	t_r^*	—	10	—	ns	$V_{GS}=4.0V$
Turn-off delay time	$t_{d(off)}^*$	—	15	—	ns	$R_L=67\Omega$
Fall time	t_f^*	—	10	—	ns	$R_G=10\Omega$

* Pulsed

●Body diode characteristics (Source-drain) (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Forward voltage	V_{SD}^*	—	—	1.2	V	$I_S=100mA$, $V_{GS}=0V$

* Pulsed

●Electrical characteristic curves

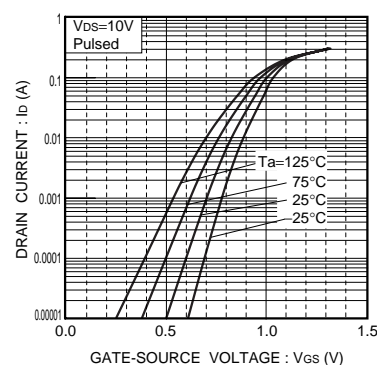


Fig.1 Typical transfer characteristics

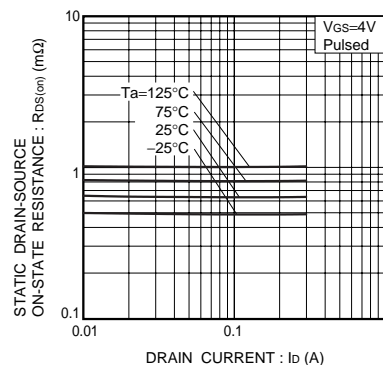


Fig.2 Static drain-source on-state resistance vs. drain current (I)

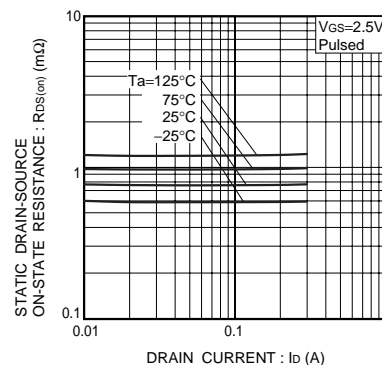


Fig.3 Static drain-source on-state resistance vs. drain current (II)

Transistor

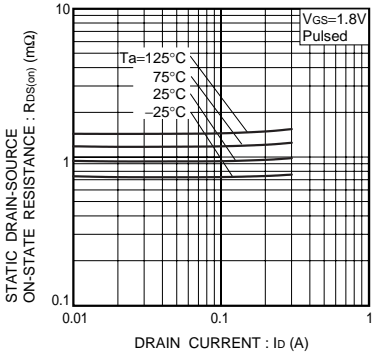


Fig.4 Static drain-source on-state resistance vs. drain current (III)

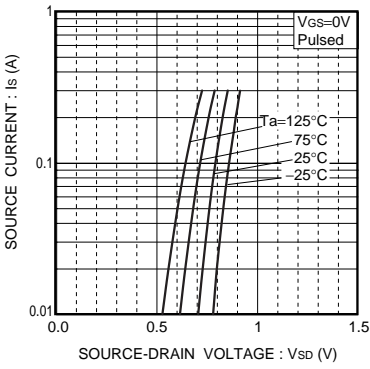


Fig.5 Source current vs. source-drain voltage

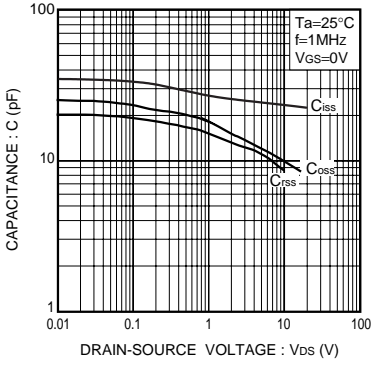


Fig.6 Typical capacitance vs. drain-source voltage

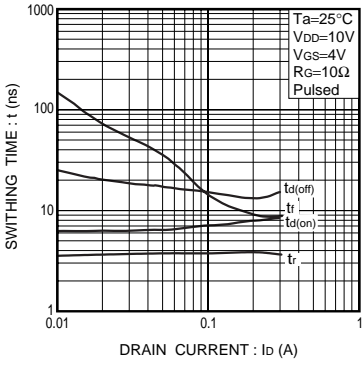


Fig.7 Switching characteristics

●Switching characteristics measurement circuit

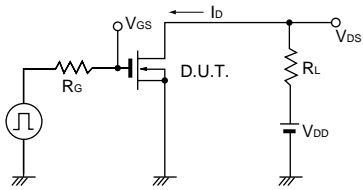


Fig.8 Switching time measurement circuit

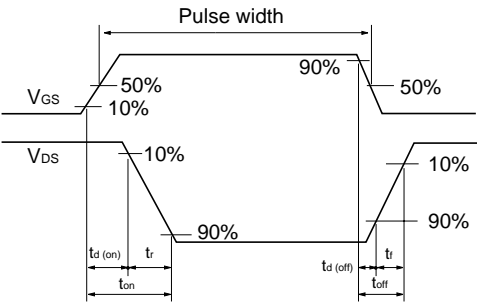


Fig.9 Switching time waveforms

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