

# 1.8V Drive Nch MOSFET

## RUE003N02

### ●Structure

Silicon N-channel  
MOSFET

### ●Features

- 1) Low on-resistance.
- 2) Fast switching speed.
- 3) Low voltage drive (1.8V) makes this device ideal for portable equipment.
- 4) Drive circuits can be simple.
- 5) Parallel use is easy.

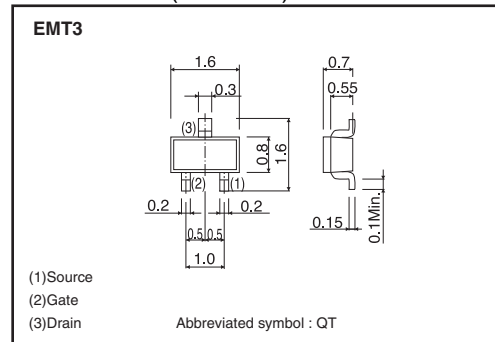
### ●Applications

Switching

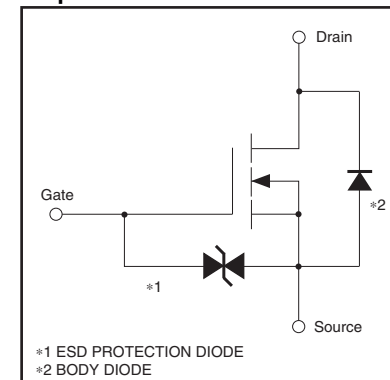
### ●Packaging specifications

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

### ●Dimensions (Unit : mm)



### ●Equivalent circuit



### ●Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Drain-source voltage	$V_{DS}$	20	V
Gate-source voltage	$V_{GS}$	$\pm 8$	V
Drain current	Continuous	$I_D$	$\pm 300$ mA
	Pulsed	$I_{DP}^{*1}$	$\pm 600$ mA
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 cycle  $\leq 1\%$

\*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

●Electrical characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Gate-source leakage	$I_{GSS}$	-	-	10	$\mu A$	$V_{GS}=\pm 8V, V_{DS}=0V$
Drain-source breakdown voltage	$V_{(BR)DSS}$	20	-	-	V	$I_D=1mA, V_{GS}=0V$
Zero gate voltage drain current	$I_{DSS}$	-	-	1.0	$\mu A$	$V_{DS}=20V, V_{GS}=0V$
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	$\Omega$	$I_D=300mA, V_{GS}=4.0V$
		-	0.8	1.2	$\Omega$	$I_D=300mA, V_{GS}=2.5V$
		-	1.0	1.4	$\Omega$	$I_D=300mA, V_{GS}=1.8V$
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	$I_D=150mA, V_{DD} \approx 10V$
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

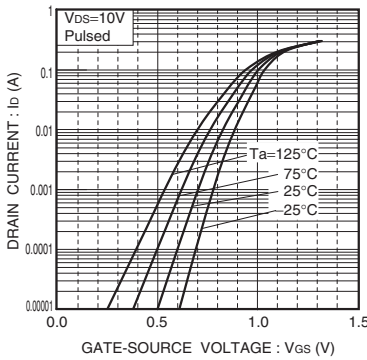


Fig.1 Typical transfer characteristics

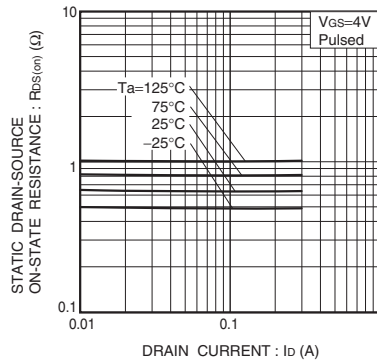


Fig.2 Static drain-source on-state resistance vs. drain current (I)

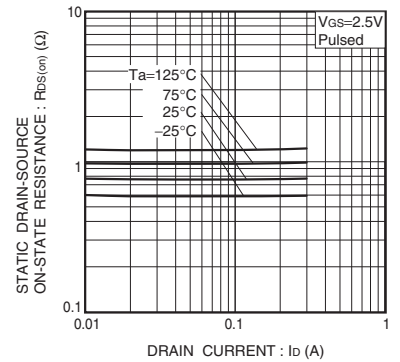


Fig.3 Static drain-source on-state resistance vs. drain current (II)

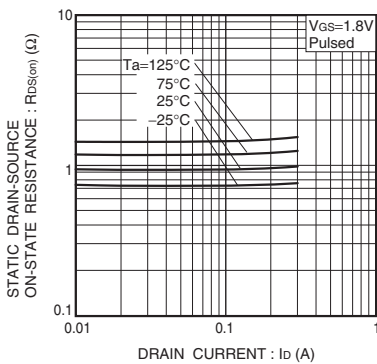


Fig.4 Static drain-source on-state resistance vs. drain current (III)

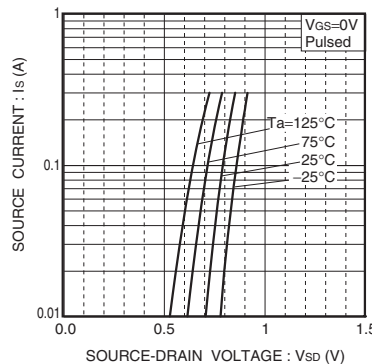


Fig.5 Source current vs. source-drain voltage

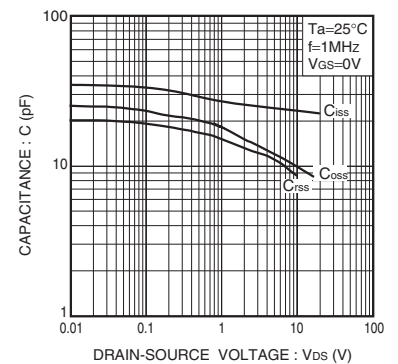


Fig.6 Typical capacitance vs. drain-source voltage

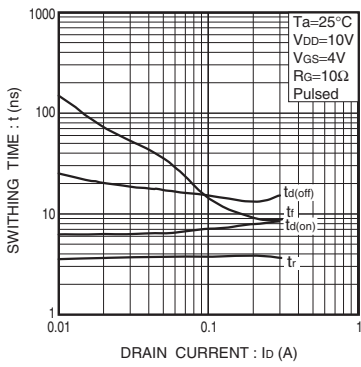


Fig.7 Switching characteristics

●Switching characteristics measurement circuit

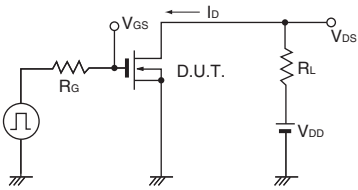


Fig.8 Switching time measurement circuit

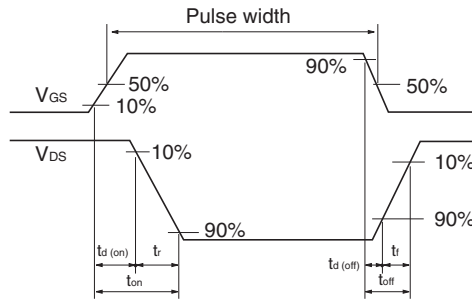


Fig.9 Switching time waveforms

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