

# 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.

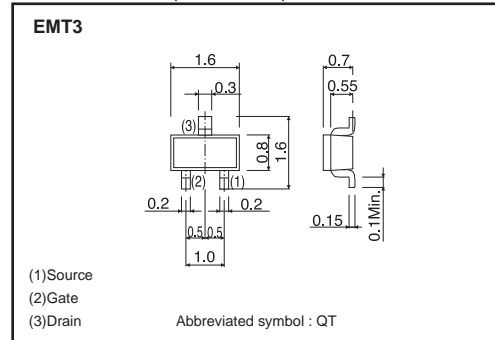
### ●Applications

Switching

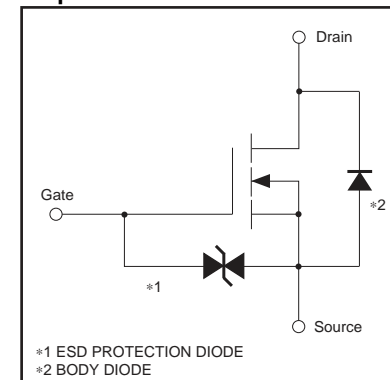
### ●Packaging specifications

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 <sub>GSS</sub>	-	-	10	μA	V <sub>GS</sub> =±8V, V <sub>DS</sub> =0V
Drain-source breakdown voltage	V <sub>(BR)DSS</sub>	20	-	-	V	I <sub>D</sub> =1mA, V <sub>GS</sub> =0V
Zero gate voltage drain current	I <sub>DSS</sub>	-	-	1.0	μA	V <sub>DS</sub> =20V, V <sub>GS</sub> =0V
Gate threshold voltage	V <sub>GS(th)</sub>	0.3	-	1.0	V	V <sub>DS</sub> =10V, I <sub>D</sub> =1mA
Static drain-source on-state resistance	R <sub>Ds(on)</sub> *	-	0.7	1.0	Ω	I <sub>D</sub> =300mA, V <sub>GS</sub> =4.0V
		-	0.8	1.2	Ω	I <sub>D</sub> =300mA, V <sub>GS</sub> =2.5V
		-	1.0	1.4	Ω	I <sub>D</sub> =300mA, V <sub>GS</sub> =1.8V
Forward transfer admittance	Y <sub>fs</sub>  *	400	-	-	ms	I <sub>D</sub> =300mA, V <sub>DS</sub> =10V
Input capacitance	C <sub>iss</sub>	-	25	-	pF	V <sub>DS</sub> =10V
Output capacitance	C <sub>oss</sub>	-	10	-	pF	V <sub>GS</sub> =0V
Reverse transfer capacitance	C <sub>rss</sub>	-	10	-	pF	f=1MHz
Turn-on delay time	t <sub>d(on)</sub> *	-	5	-	ns	I <sub>D</sub> =150mA, V <sub>DD</sub> ≐10V
Rise time	t <sub>r</sub> *	-	10	-	ns	V <sub>GS</sub> =4.0V
Turn-off delay time	t <sub>d(off)</sub> *	-	15	-	ns	R <sub>L</sub> =67Ω
Fall time	t <sub>f</sub> *	-	10	-	ns	R <sub>G</sub> =10Ω

\* Pulsed

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Forward voltage	V <sub>SD</sub> *	-	-	1.2	V	I <sub>S</sub> = 100mA, V <sub>GS</sub> =0V

\* Pulsed

●Electrical characteristic curves

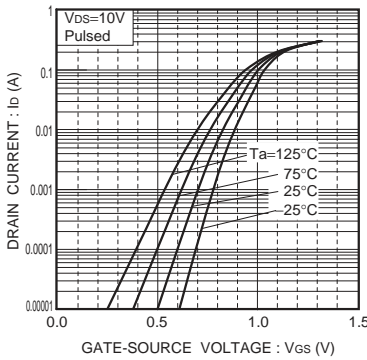


Fig.1 Typical transfer characteristics

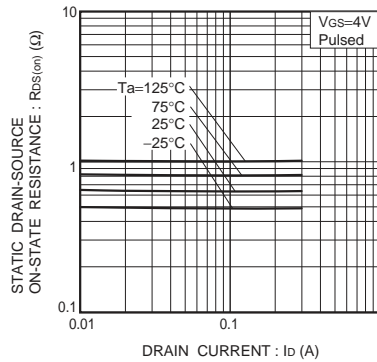


Fig.2 Static drain-source on-state resistance vs. drain current (I)

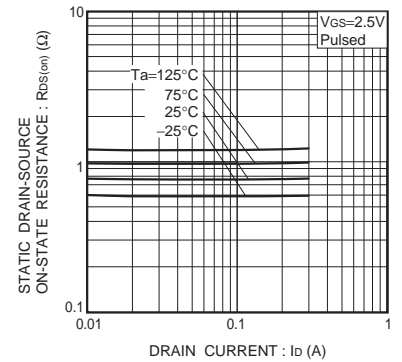


Fig.3 Static drain-source on-state resistance vs. drain current (II)

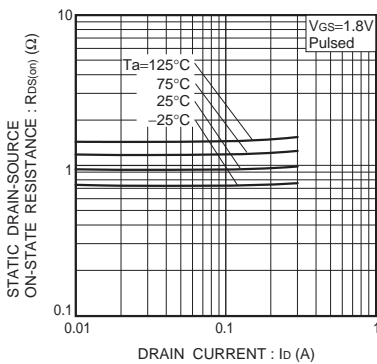


Fig.4 Static drain-source on-state resistance vs. drain current (III)

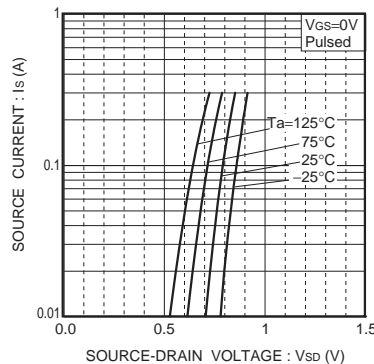


Fig.5 Source current vs. source-drain voltage

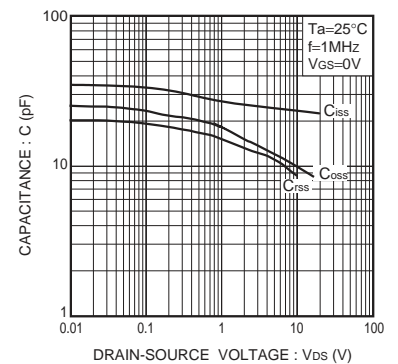


Fig.6 Typical capacitance vs. drain-source voltage

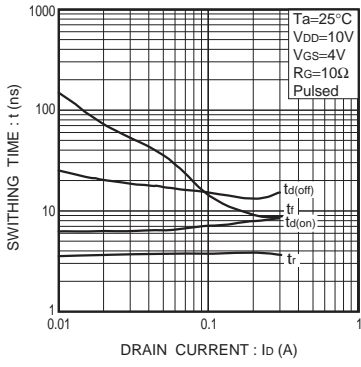


Fig.7 Switching characteristics

●Switching characteristics measurement circuit

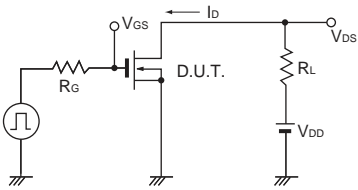


Fig.8 Switching time measurement circuit

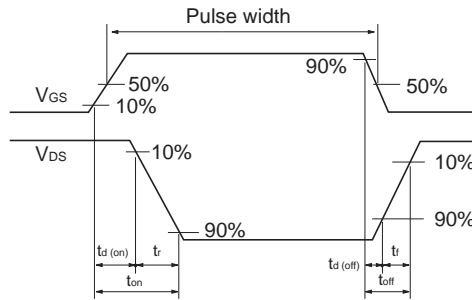


Fig.9 Switching time waveforms

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