

Transistor

1.8V Drive Nch MOSFET

RUE003N02

●Structure

Silicon N-channel
MOSFET

●Applications

Switching

●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.

●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 _{DSS}	20	V	
Gate-source voltage	V _{GSS}	±8	V	
Drain current	Continuous	I _D	±300	mA
	Pulsed	I _{DP} *1	±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≤10μs, Duty cycle≤1%

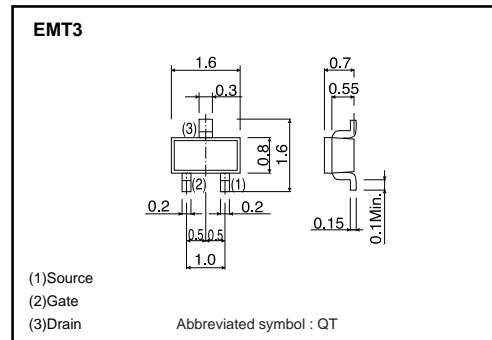
*2 Each terminal mounted on a recommended land

●Thermal resistance

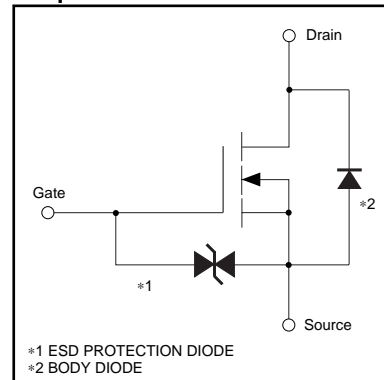
Parameter	Symbol	Limits	Unit
Channel to ambient	R _{th(ch-a)} *	833	°C / W

* Each terminal mounted on a recommended land

●Dimensions (Unit : mm)



●Equivalent circuit



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●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

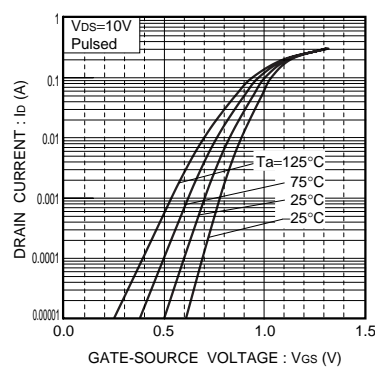


Fig.1 Typical transfer characteristics

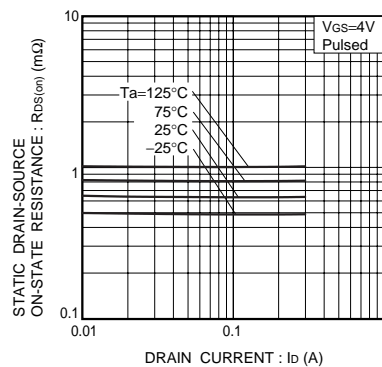


Fig.2 Static drain-source on-state resistance vs. drain current (I)

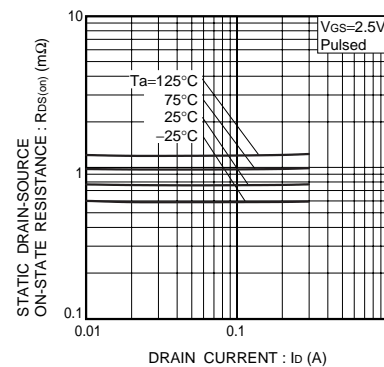


Fig.3 Static drain-source on-state resistance vs. drain current (II)

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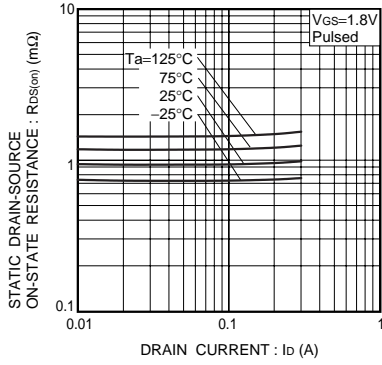


Fig.4 Static drain-source on-state resistance vs. drain current (III)

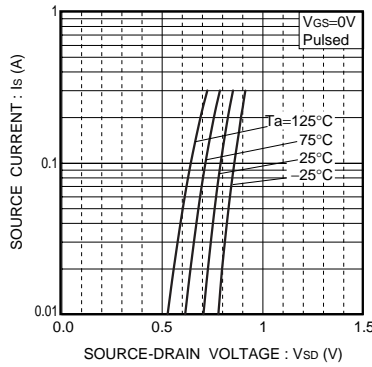


Fig.5 Source current vs. source-drain voltage

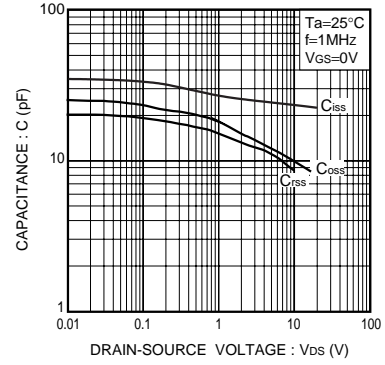


Fig.6 Typical capacitance vs. drain-source voltage

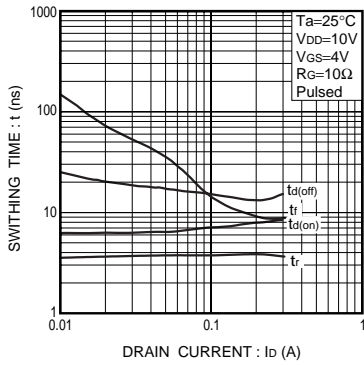


Fig.7 Switching characteristics

●Switching characteristics measurement circuit

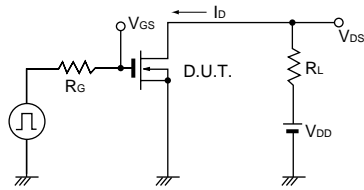


Fig.8 Switching time measurement circuit

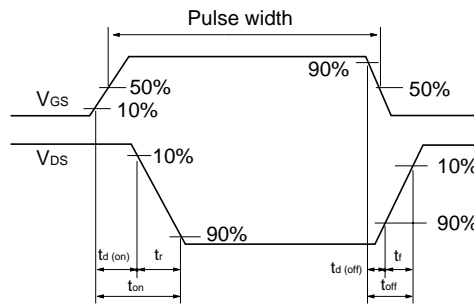


Fig.9 Switching time waveforms

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