

4V Drive Nch MOSFET

RVQ040N05

●Structure

Silicon N-channel MOSFET

●Features

- 1) Low On-resistance.
- 2) Space savingsmall surface mount package (TSMT6).

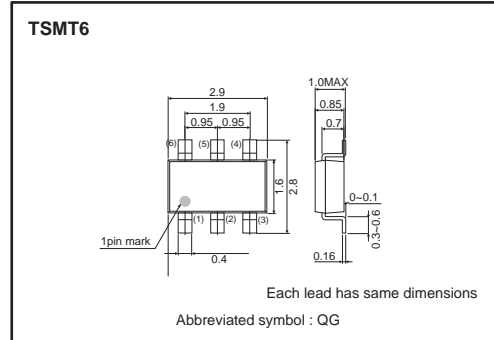
●Applications

Switching

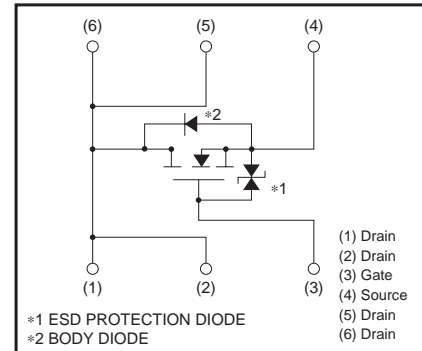
●Packaging specifications

Type	Package	Taping
	Code	TR
	Basic ordering unit (pieces)	3000
RVQ040N05		○

●Dimensions (Unit : mm)



●Inner circuit



●Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit	
Drain-source voltage	V_{DSS}	45	V	
Gate-source voltage	V_{GSS}	21	V	
Drain current	Continuous	I_D	± 4.0	A
	Pulsed	I_{DP} *1	± 16	A
Source current (Body diode)	Continuous	I_S	1.6	A
	Pulsed	I_{SP} *1	16	A
Total power dissipation	P_D *2	1.25	W	
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 Mounted on a ceramic board

●Thermal resistance

Parameter	Symbol	Limits	Unit
Channel to ambient	$R_{th(ch-a)}$ *	100	°C/W

* Mounted on a ceramic board

●Electrical characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Gate-source leakage	I_{GSS}	–	–	10	μA	$V_{GS}=21V, V_{DS}=0V$
Drain-source breakdown voltage	$V_{(BR)DSS}$	45	–	–	V	$I_D=1mA, V_{GS}=0V$
Zero gate voltage drain current	I_{DSS}	–	–	1	μA	$V_{DS}=45V, V_{GS}=0V$
Gate threshold voltage	$V_{GS(th)}$	1.0	–	2.5	V	$V_{DS}=10V, I_D=1mA$
Static drain-source on-state resistance	$R_{DS(on)}$ *	–	38	53	$m\Omega$	$I_D=4A, V_{GS}=10V$
		–	47	66	$m\Omega$	$I_D=4A, V_{GS}=4.5V$
		–	53	74	$m\Omega$	$I_D=4A, V_{GS}=4.0V$
Forward transfer admittance	$ Y_{fs} $ *	3.0	–	–	S	$V_{DS}=10V, I_D=4A$
Input capacitance	C_{iss}	–	530	–	pF	$V_{DS}=10V$
Output capacitance	C_{oss}	–	120	–	pF	$V_{GS}=0V$
Reverse transfer capacitance	C_{rss}	–	65	–	pF	$f=1MHz$
Turn-on delay time	$t_{d(on)}$ *	–	12	–	ns	$V_{DD}=25V$
Rise time	t_r *	–	15	–	ns	$I_D=2.0A$
Turn-off delay time	$t_{d(off)}$ *	–	40	–	ns	$V_{GS}=10V$
Fall time	t_f *	–	12	–	ns	$R_L=12.5\Omega$
Total gate charge	Q_g *	–	6.3	8.8	nC	$V_{DD}=25V, I_D=4A$
Gate-source charge	Q_{gs} *	–	2.0	–	nC	$V_{GS}=5V$
Gate-drain charge	Q_{gd} *	–	2.6	–	nC	$R_L=6\Omega, R_G=10\Omega$

*Pulsed

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Forward voltage	V_{SD} *	–	–	1.2	V	$I_S=4.0A, V_{GS}=0V$

*Pulsed

●Electrical characteristic curves

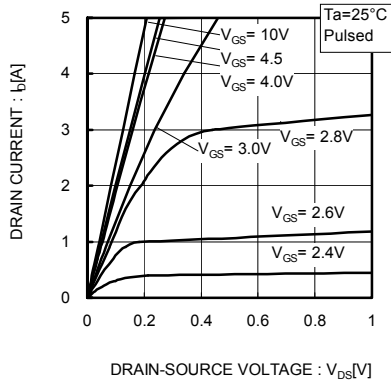


Fig.1 Typical Output Characteristics (I)

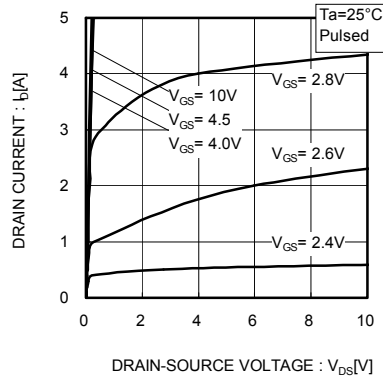


Fig.2 Typical Output Characteristics (II)

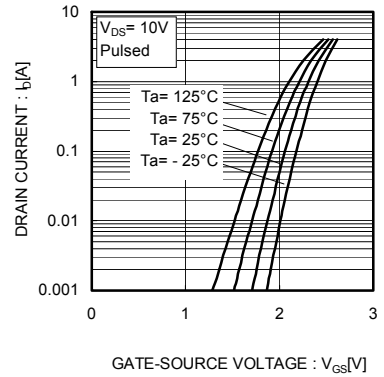


Fig.3 Typical Transfer Characteristics

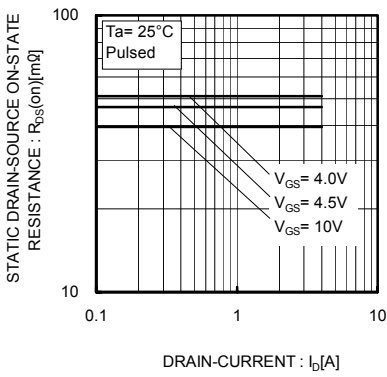


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current(I)

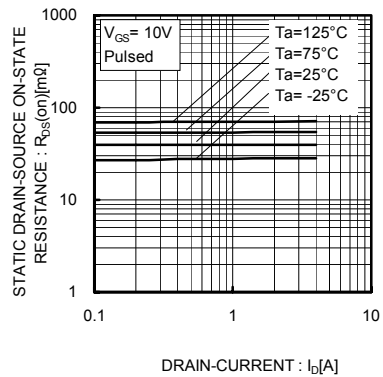


Fig.5 Static Drain-Source On-State Resistance vs. Drain Current(II)

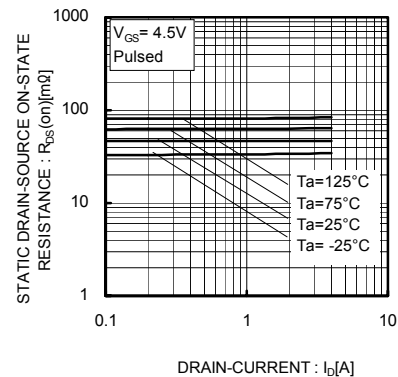


Fig.6 Static Drain-Source On-State Resistance vs. Drain Current(III)

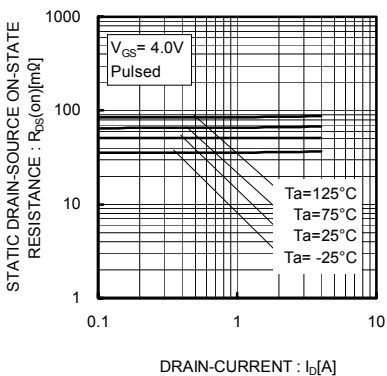


Fig.7 Static Drain-Source On-State Resistance vs. Drain Current(IV)

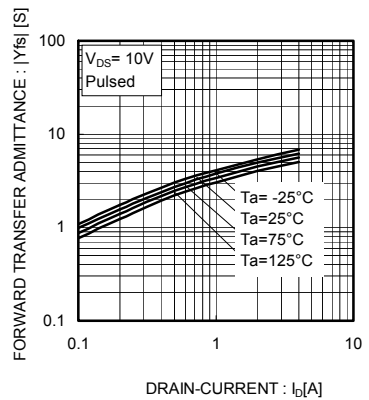


Fig.8 Forward Transfer Admittance vs. Drain Current

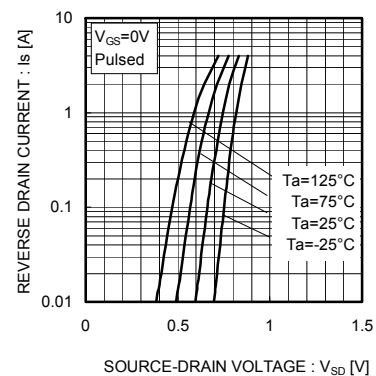


Fig.9 Reverse Drain Current vs. Source-Drain Voltage

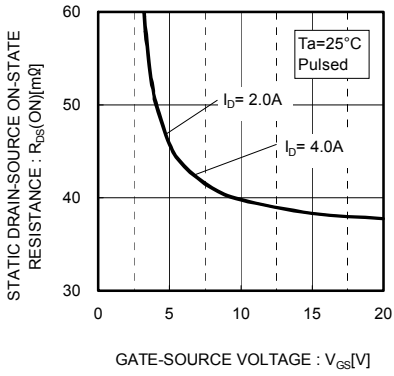


Fig.10 Static Drain-Source On-State Resistance vs. Gate Source Voltage

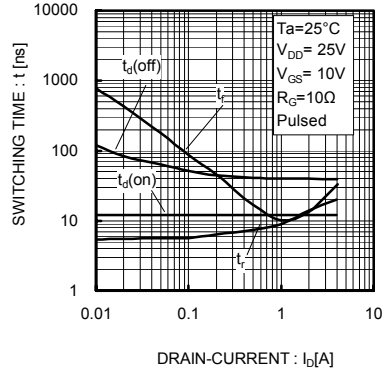


Fig.11 Switching Characteristics

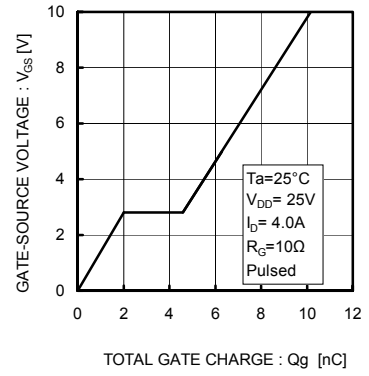


Fig.12 Dynamic Input Characteristics

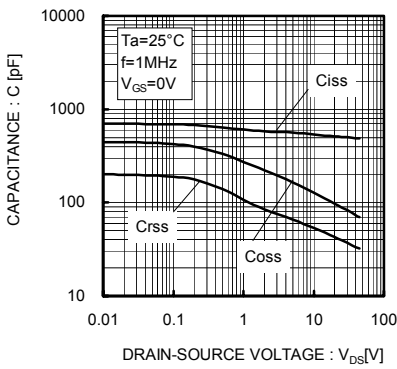


Fig.13 Typical Capacitance vs. Drain-Source Voltage

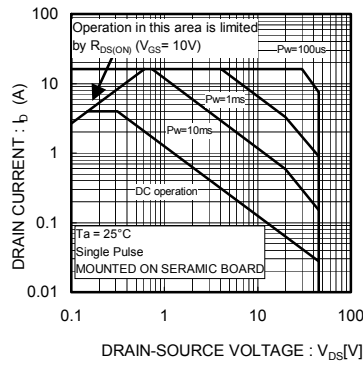


Fig.14 Maximum Safe Operating Area

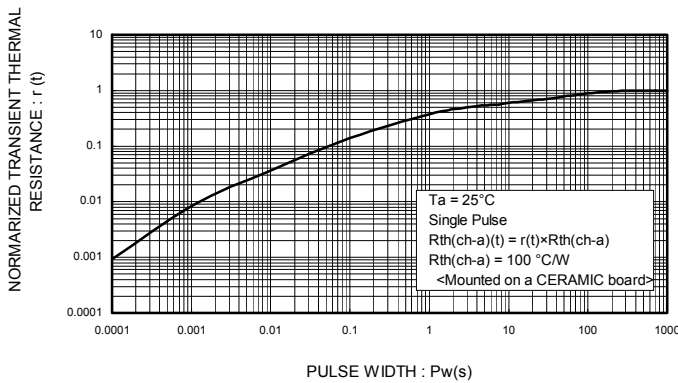


Fig.15 Normalized Transient Thermal Resistance vs. Pulse Width

●Measurement circuit

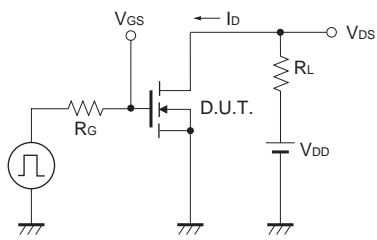


Fig.1-1 Switching Time Measurement Circuit

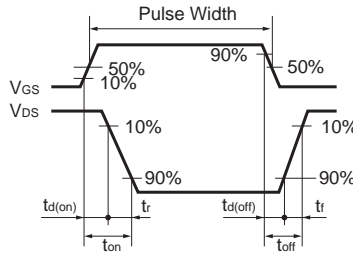


Fig.1-2 Switching Waveforms

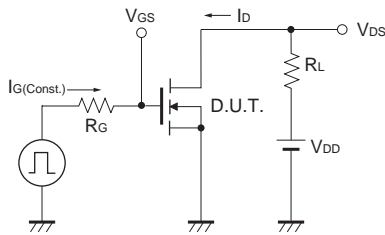


Fig.2-1 Gate Charge Measurement Circuit

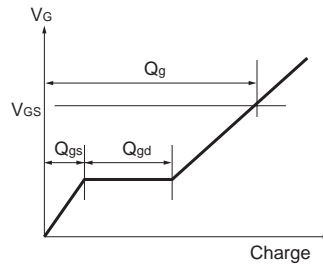


Fig.2-2 Gate Charge Waveform

Notes

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