

1.5V Drive Nch MOSFET

RQ1C075UN

● Structure

Silicon N-channel MOSFET

● Features

- 1) Low on-resistance.
- 2) High power package(TSMT8).
- 3) Low voltage drive(1.5V drive).

● Application

Switching

● Packaging specifications

Type	Package	Taping
	Code	TR
	Basic ordering unit (pieces)	3000
RQ1C075UN		○

● Absolute maximum ratings (Ta = 25°C)

Parameter		Symbol	Limits	Unit
Drain-source voltage		V_{DSS}	20	V
Gate-source voltage		V_{GSS}	±10	V
Drain current	Continuous	I_D	±7.5	A
	Pulsed	I_{DP} *1	±30	A
Source current (Body Diode)	Continuous	I_S	1	A
	Pulsed	I_{SP} *1	30	A
Power dissipation		P_D *2	1.5	W
Channel temperature		Tch	150	°C
Range of storage temperature		Tstg	-55 to +150	°C

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

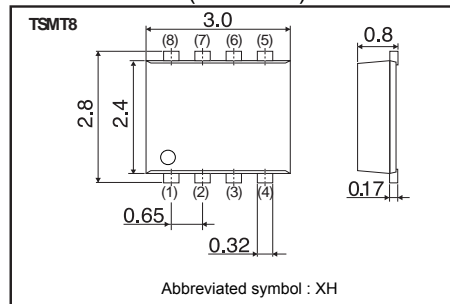
*2 Each terminal mounted on a ceramic board.

● Thermal resistance

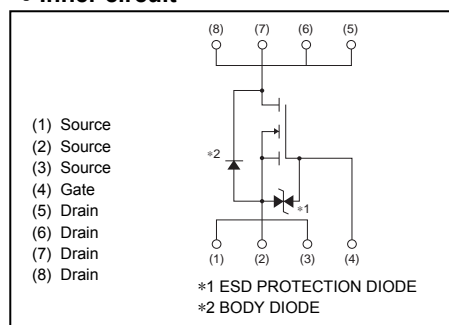
Parameter	Symbol	Limits	Unit
Channel to Ambient	Rth (ch-a)*	83.3	°C / W

* Each terminal mounted on a ceramic board.

● Dimensions (Unit : mm)



● Inner circuit



● Electrical characteristics (Ta = 25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Gate-source leakage	I_{GSS}	-	-	± 10	μA	$V_{GS} = \pm 10V, V_{DS} = 0V$
Drain-source breakdown voltage	$V_{(BR)DSS}$	20	-	-	V	$I_D = 1mA, V_{GS} = 0V$
Zero gate voltage drain current	I_{DSS}	-	-	1	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	$R_{DS(on)}^*$	-	11	16	m Ω	$I_D = 7.5A, V_{GS} = 4.5V$
		-	14	20		$I_D = 7.5A, V_{GS} = 2.5V$
		-	17	24		$I_D = 3.7A, V_{GS} = 1.8V$
		-	20	40		$I_D = 1.5A, V_{GS} = 1.5V$
Forward transfer admittance	$ Y_{fs} ^*$	7	-	-	S	$I_D = 7.5A, V_{DS} = 10V$
Input capacitance	C_{iss}	-	1400	-	pF	$V_{DS} = 10V$
Output capacitance	C_{oss}	-	310	-	pF	$V_{GS} = 0V$
Reverse transfer capacitance	C_{rss}	-	210	-	pF	$f = 1MHz$
Turn-on delay time	$t_{d(on)}^*$	-	15	-	ns	$I_D = 3.7A, V_{DD} = 10V$
Rise time	t_r^*	-	50	-	ns	$V_{GS} = 4.5V$
Turn-off delay time	$t_{d(off)}^*$	-	100	-	ns	$R_L = 2.7\Omega$
Fall time	t_f^*	-	85	-	ns	$R_G = 10\Omega$
Total gate charge	Q_g^*	-	18	-	nC	$I_D = 7.5A, R_L = 1.3\Omega$
Gate-source charge	Q_{gs}^*	-	3.2	-	nC	$V_{DD} = 10V, R_G = 10\Omega$
Gate-drain charge	Q_{gd}^*	-	2.9	-	nC	$V_{GS} = 4.5V$

*Pulsed

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Forward Voltage	V_{SD}^*	-	-	1.2	V	$I_S = 7.5A, V_{GS} = 0V$

*Pulsed

● Electrical characteristic curves

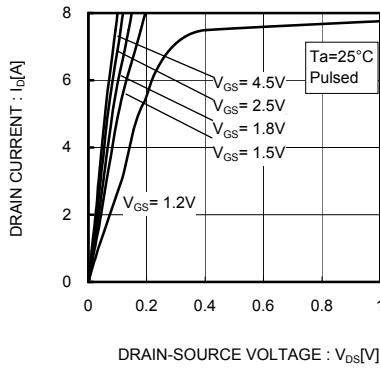


Fig.1 Typical Output Characteristics(I)

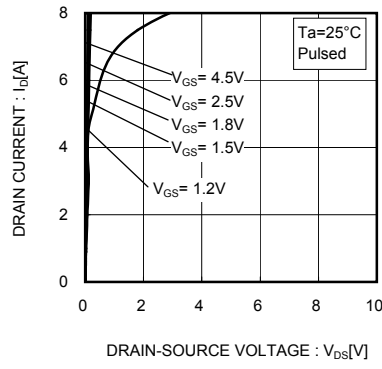


Fig.2 Typical Output Characteristics(II)

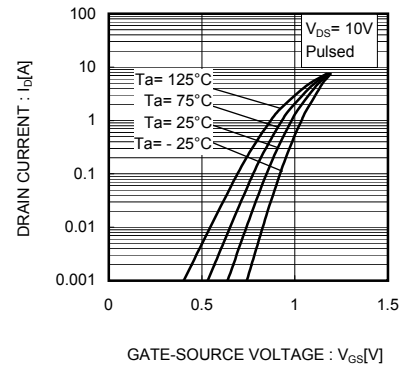


Fig.3 Typical Transfer Characteristics

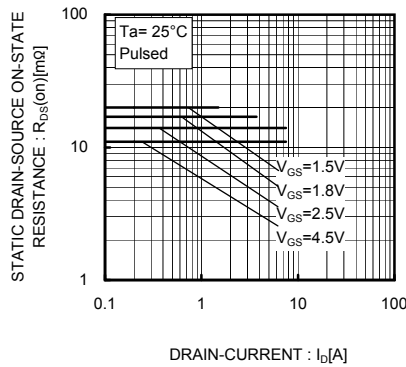


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current(I)

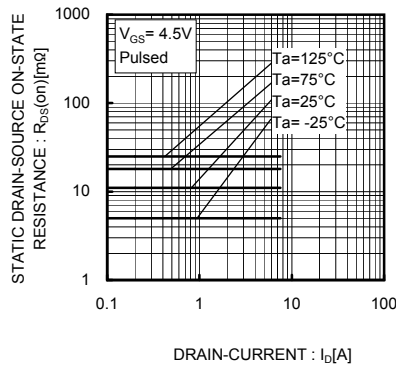


Fig.5 Static Drain-Source On-State Resistance vs. Drain Current(II)

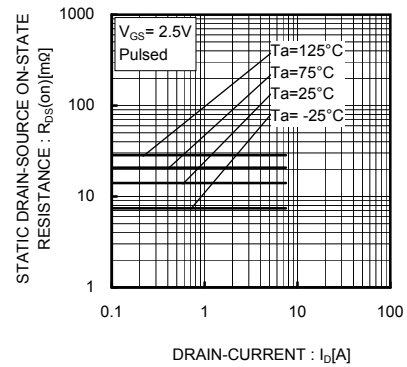


Fig.6 Static Drain-Source On-State Resistance vs. Drain Current(III)

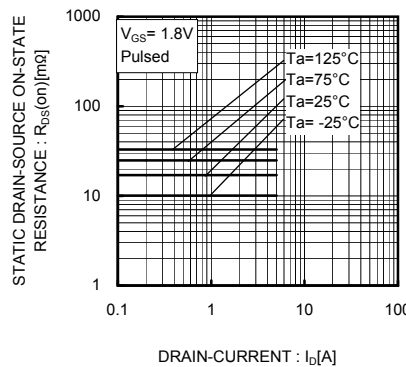


Fig.7 Static Drain-Source On-State Resistance vs. Drain Current(IV)

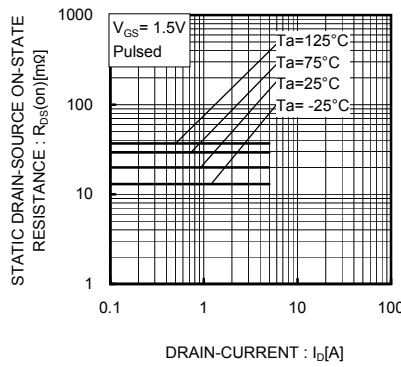


Fig.8 Static Drain-Source On-State Resistance vs. Drain Current(V)

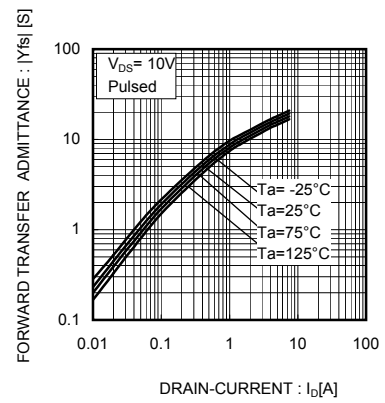


Fig.9 Forward Transfer Admittance vs. Drain Current

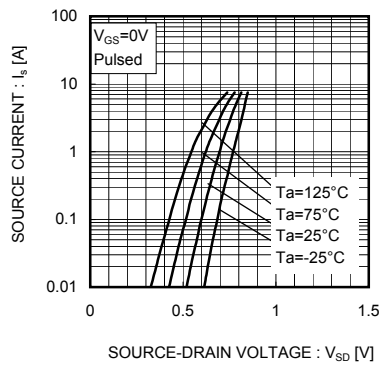


Fig.10 Reverse Drain Current
vs. Source-Drain Voltage

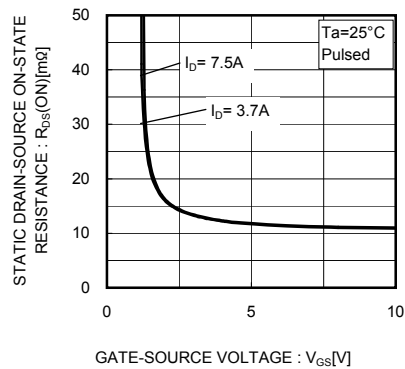


Fig.11 Static Drain-Source On-State
Resistance vs. Gate Source Voltage

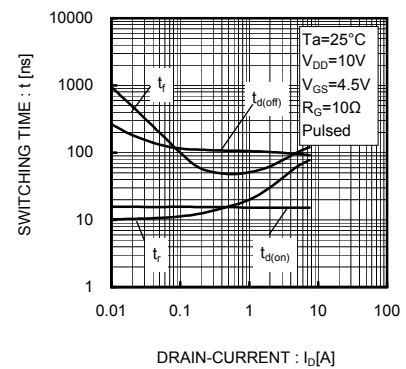


Fig.12 Switching Characteristics

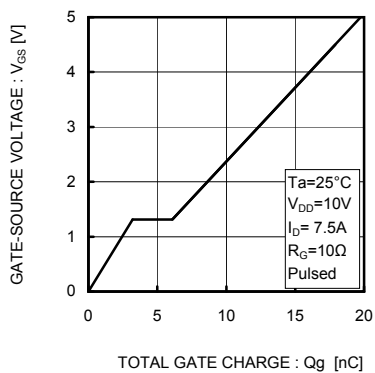


Fig.13 Dynamic Input Characteristics

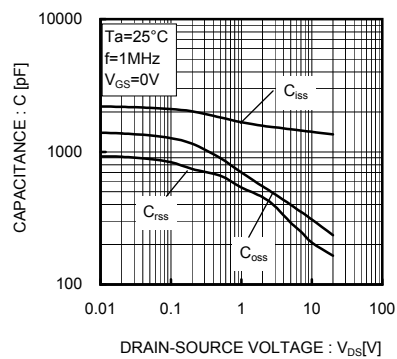


Fig.14 Typical Capacitance
vs. Drain-Source Voltage

● Measurement circuits

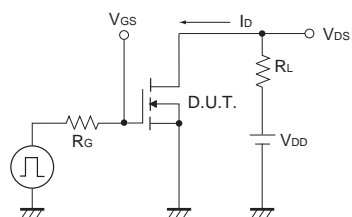


Fig.1-1 Switching time measurement circuit

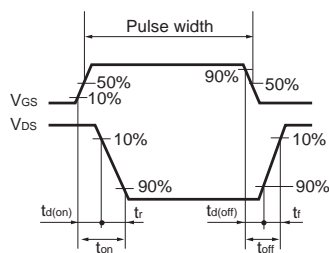


Fig.1-2 Switching waveforms

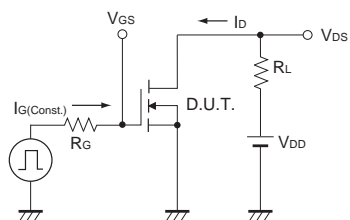


Fig.2-1 Gate charge measurement circuit

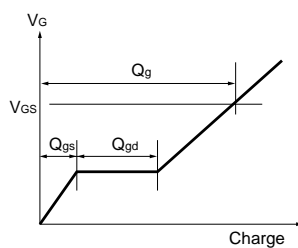


Fig.2-2 Gate Charge Waveform

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