

1.5V Drive Nch MOSFET

RW1C020UN

●Structure

Silicon N-channel MOSFET

●Features

- 1) Low On-resistance.
- 2) Built-in G-S Protection Diode.
- 3) Space Saving,
Small Surface Mount Package (WEMT6).
- 4) Low voltage drive (1.5V drive).

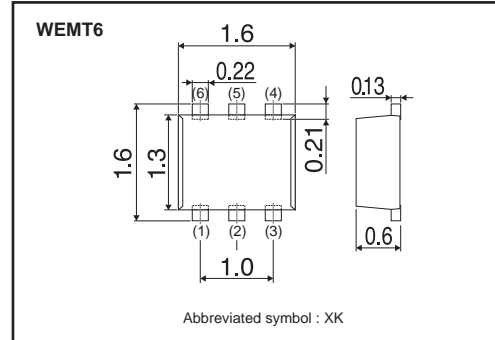
●Applications

Switching

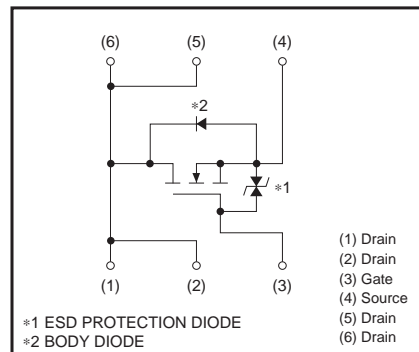
●Packaging specifications

Type	Package	Taping
	Code	T2R
	Basic ordering unit (pieces)	8000
RW1C020UN		○

●Dimensions (Unit : mm)



●Inner circuit



●Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit	
Drain-source voltage	V_{DS}	20	V	
Gate-source voltage	V_{GS}	± 10	V	
Drain current	Continuous	I_D	± 2	A
	Pulsed	I_{DP} *1	± 6	A
Source current (Body diode)	Continuous	I_S	0.5	A
	Pulsed	I_{SP} *1	6	A
Total power dissipation	P_D *2	0.7	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 When mounted on a ceramic board

●Thermal resistance

Parameter	Symbol	Limits	Unit
Channel to ambient	$R_{th}(ch-a)$ *	179	°C / W

* When mounted on a ceramic board

●Electrical characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Gate-source leakage	I_{GSS}	–	–	± 10	μA	$V_{GS} = \pm 10V, V_{DS} = 0V$
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	$R_{DS(on)}$ *	–	75	105	m Ω	$I_D = 2A, V_{GS} = 4.5V$
		–	95	135	m Ω	$I_D = 2A, V_{GS} = 2.5V$
		–	130	185	m Ω	$I_D = 1A, V_{GS} = 1.8V$
		–	170	240	m Ω	$I_D = 0.4A, V_{GS} = 1.5V$
Forward transfer admittance	$ Y_{fs} $ *	1.8	–	–	S	$V_{DS} = 10V, I_D = 2A$
Input capacitance	C_{iss}	–	180	–	pF	$V_{DS} = 10V$
Output capacitance	C_{oss}	–	45	–	pF	$V_{GS} = 0V$
Reverse transfer capacitance	C_{rss}	–	25	–	pF	$f = 1MHz$
Turn-on delay time	$t_{d(on)}$ *	–	6	–	ns	$V_{DD} = 10V$ $I_D = 1A$
Rise time	t_r *	–	17	–	ns	$V_{GS} = 4.5V$
Turn-off delay time	$t_{d(off)}$ *	–	30	–	ns	$R_L = 10\Omega$
Fall time	t_f *	–	30	–	ns	$R_G = 10\Omega$
Total gate charge	Q_g *	–	2.0	–	nC	$V_{DD} = 10V$ $I_D = 2A$
Gate-source charge	Q_{gs} *	–	0.6	–	nC	$V_{GS} = 4.5V$
Gate-drain charge	Q_{gd} *	–	0.4	–	nC	$R_L = 5\Omega$ $R_G = 10\Omega$

*Pulsed

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Forward voltage	V_{SD} *	–	–	1.2	V	$I_S = 2A, V_{GS} = 0V$

*Pulsed

●Electrical characteristics curves

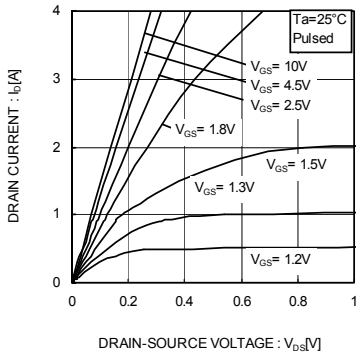


Fig.1 Typical Output Characteristics(I)

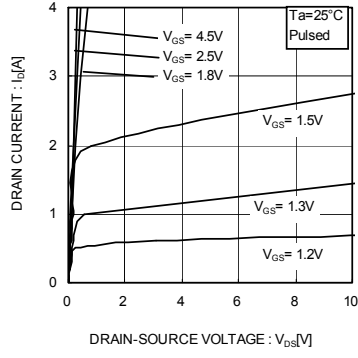


Fig.2 Typical Output Characteristics(II)

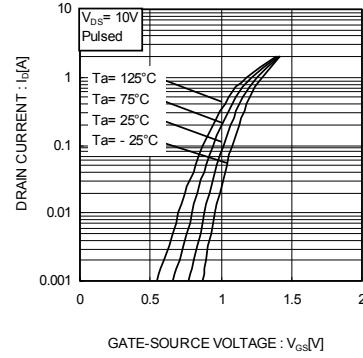


Fig.3 Typical Transfer Characteristics

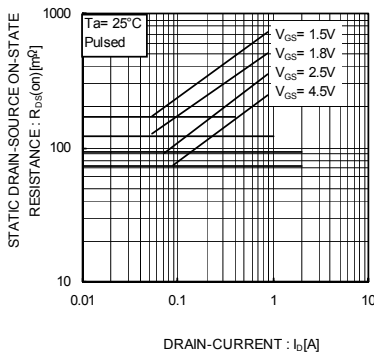


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current(I)

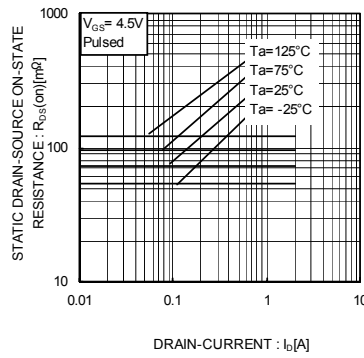


Fig.5 Static Drain-Source On-State Resistance vs. Drain Current(II)

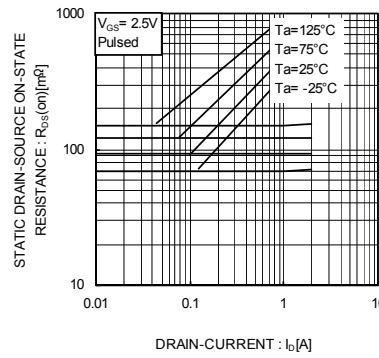


Fig.6 Static Drain-Source On-State Resistance vs. Drain Current(III)

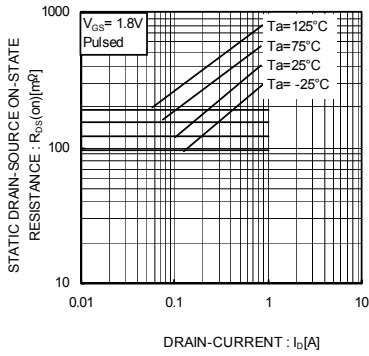


Fig.7 Static Drain-Source On-State Resistance vs. Drain Current(IV)

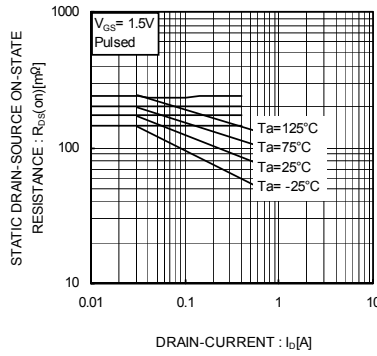


Fig.8 Static Drain-Source On-State Resistance vs. Drain Current(V)

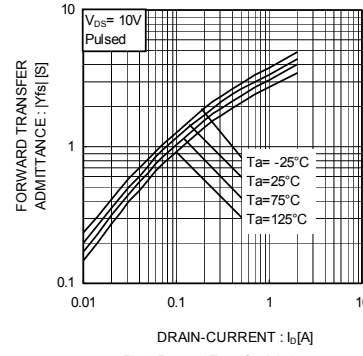


Fig.9 Forward Transfer Admittance vs. Drain Current

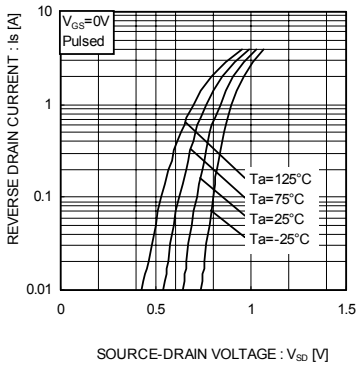


Fig.10 Reverse Drain Current vs. Source-Drain Voltage

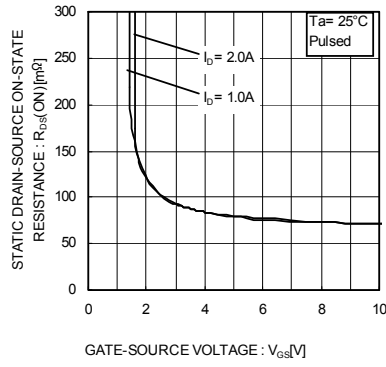


Fig.11 Static Drain-Source On-State Resistance vs. Gate Source Voltage

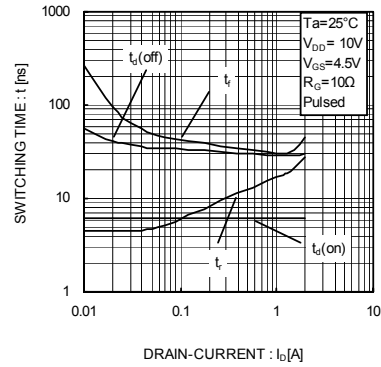


Fig.12 Switching Characteristics

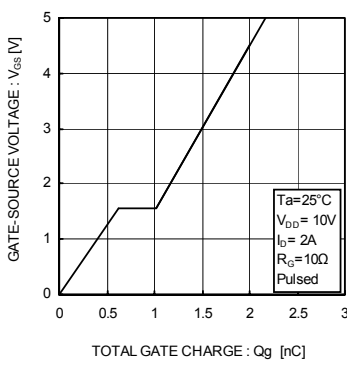


Fig.13 Dynamic Input Characteristics

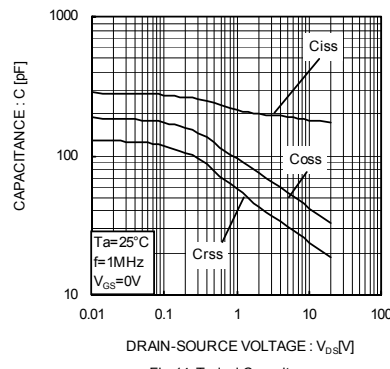


Fig.14 Typical Capacitance vs. Drain-Source Voltage

●Measurement circuit

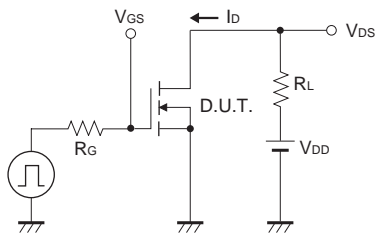


Fig.1-1 Switching Time Measurement Circuit

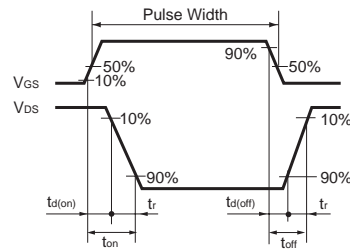


Fig.1-2 Switching Waveforms

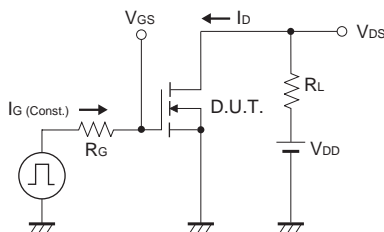


Fig.2-1 Gate Charge Measurement Circuit

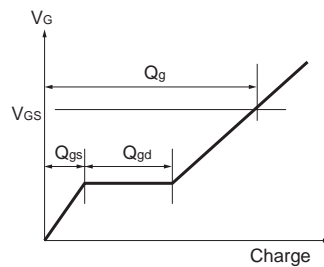


Fig.2-2 Gate Charge Waveform

●Notice

This product might cause chip aging and breakdown under the large electrified environment. Please consider to design ESD protection circuit.

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