4V Drive Nch MOSFET

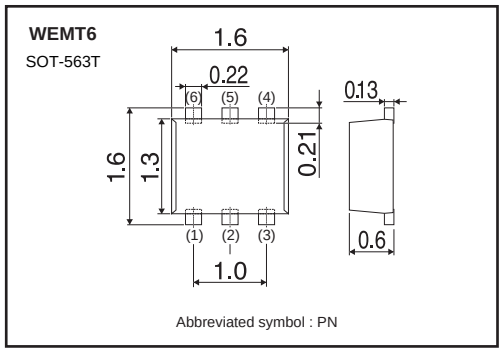
RW1E014SN

●Structure
Silicon N-channel MOSFET

●Features
1) Low On-resistance, High speed switching.
2) Built-in G-S Protection Diode.
3) Space Saving, Small Surface Mount Package (WEMT6).

●Applications
Switching

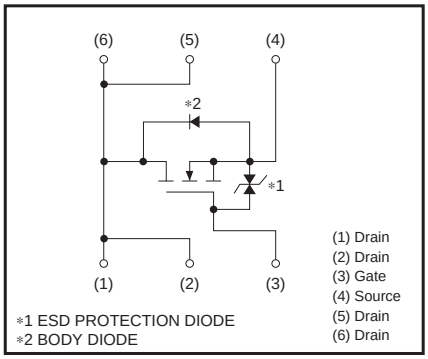
●Dimensions (Unit : mm)



●Packaging specifications

Type	Package	Taping
	Code	T2R
	Basic ordering unit (pieces)	8000
RW1E014SN		○

●Inner circuit



●Absolute maximum ratings (Ta=25°C)

Parameter		Symbol	Limits	Unit
Drain-source voltage		V_{DSS}	30	V
Gate-source voltage		V_{GSS}	±20	V
Drain current	Continuous	I_D	±1.4	A
	Pulsed	I_{DP} ∗1	±2.8	A
Source current (Body diode)	Continuous	I_S	0.5	A
	Pulsed	I_{SP} ∗1	2.8	A
Total power dissipation		P_D ∗2	0.7	W
Channel temperature		Tch	150	°C
Range of Storage temperature		Tstg	−55 to +150	°C

∗1 Pw≤10µs, Duty cycle≤1%
∗2 When mounted on a ceramic board

●Thermal resistance

Parameter	Symbol	Limits	Unit
Channel to ambient	Rth (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}= ±20V, V_{DS}=0V
Drain-source breakdown voltage	$V_{(BR)\ DSS}$	30	–	–	V	I_D= 1mA, V_{GS}=0V
Zero gate voltage drain current	I_{DSS}	–	–	1	μA	V_{DS}= 30V, 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	$R_{DS\ (on)}$ *	–	170	240	mΩ	I_D= 1.4A, V_{GS}= 10V
		–	250	350	mΩ	I_D= 1.4A, V_{GS}= 4.5V
		–	270	380	mΩ	I_D= 1.4A, V_{GS}= 4V
Forward transfer admittance	$\|Y_{fs}\|$ *	1	–	–	S	V_{DS}= 10V, I_D= 1.4A
Input capacitance	C_{iss}	–	70	–	pF	V_{DS}= 10V
Output capacitance	C_{oss}	–	15	–	pF	V_{GS}=0V
Reverse transfer capacitance	C_{rss}	–	12	–	pF	f=1MHz
Turn-on delay time	$t_{d\ (on)}$ *	–	6	–	ns	V_{DD} ≒ 15V I_D= 0.7A V_{GS}= 10V R_L ≒ 21Ω R_G=10Ω
Rise time	t_r *	–	6	–	ns	
Turn-off delay time	$t_{d\ (off)}$ *	–	13	–	ns	
Fall time	t_f *	–	8	–	ns	
Total gate charge	Q_g *	–	1.4	–	nC	V_{DD} ≒ 15V I_D= 1.4A V_{GS}= 5V R_L ≒ 11Ω R_G=10Ω
Gate-source charge	Q_{gs} *	–	0.6	–	nC	
Gate-drain charge	Q_{gd} *	–	0.3	–	nC	

*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= 1.4A, V_{GS}=0V

*Pulsed

●Electrical characteristics curves

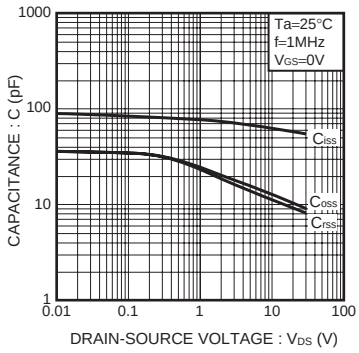


Fig.1 Typical Capacitance vs. Drain-Source Voltage

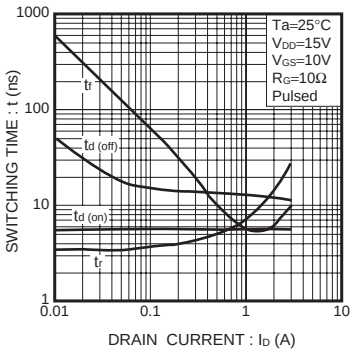


Fig.2 Switching Characteristics

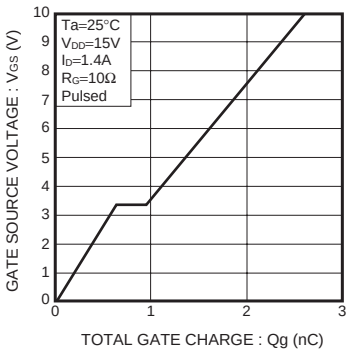


Fig.3 Dynamic Input Characteristics

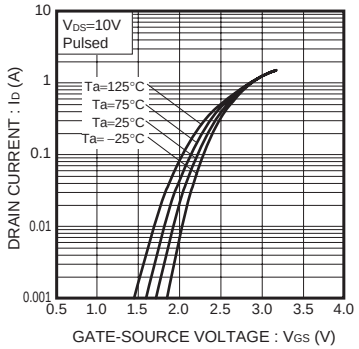


Fig.4 Typical Transfer Characteristics

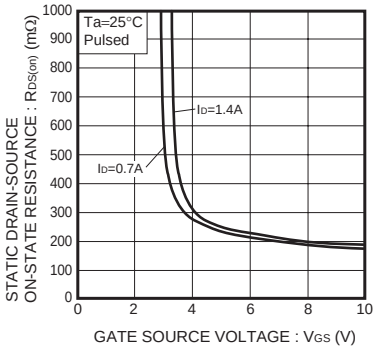


Fig.5 Static Drain-Source On-State Resistance vs. Gate-Source Voltage

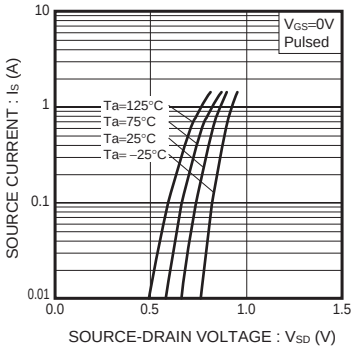


Fig.6 Source Current vs. Source-Drain Voltage

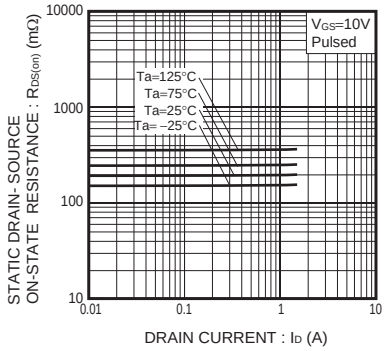


Fig.7 Static Drain-Source On-State Resistance vs. Drain Current (I)

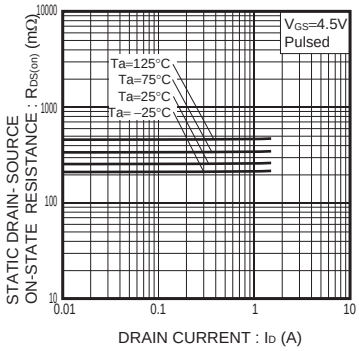


Fig.8 Static Drain-Source On-State Resistance vs. Drain Current (II)

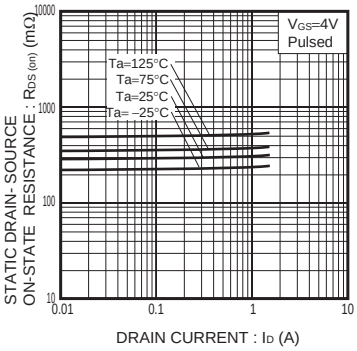


Fig.9 Static Drain-Source On-State Resistance vs. Drain Current (III)

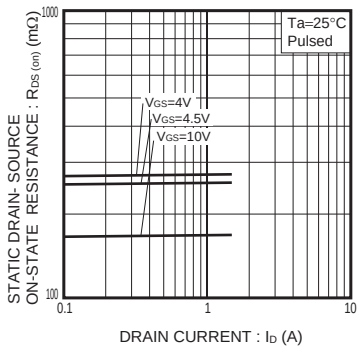


Fig.10 Static Drain-Source On-State Resistance vs. Drain Current (IV)

●**Measurement circuit**

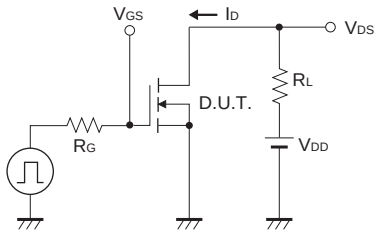


Fig.1-1 Switching Time Measurement Circuit

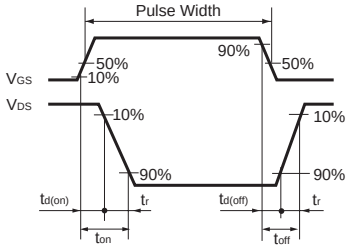


Fig.1-2 Switching Waveforms

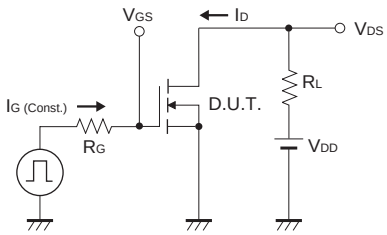


Fig.2-1 Gate Charge Measurement Circuit

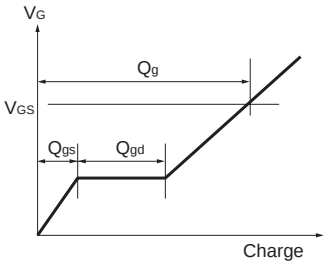


Fig.2-2 Gate Charge Waveform

●**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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