

4V Drive Pch MOSFET

RW1E015RP

●Structure

Silicon P-channel MOSFET

●Features

- 1) Low on-resistance.
- 2) Space saving, high power package.
- 3) Low voltage drive. (4V)

●Applications

Switching

●Packaging specifications

Type	Package	Taping
	Code	T2R
	Basic ordering unit (pieces)	8000
RW1E015RP		○

●Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Drain-source voltage	V_{DS}	-30	V
Gate-source voltage	V_{GS}	±20	V
Drain current	Continuous	I_D	±1.5
	Pulsed	I_{DP} *1	±6
Source current (Body diode)	Continuous	I_S	-0.5
	Pulsed	I_{SP} *1	-6
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 ≤ 1%

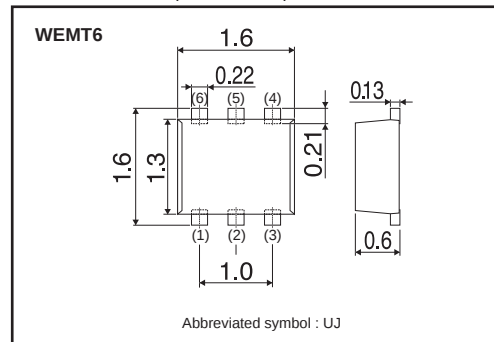
*2 When mounted on a ceramic board

●Thermal resistance

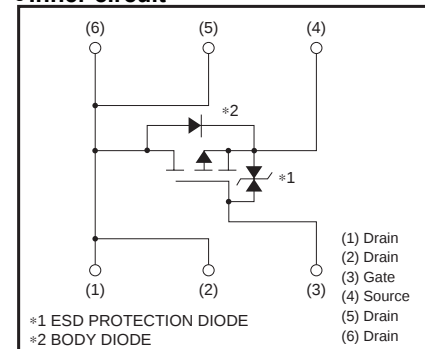
Parameter	Symbol	Limits	Unit
Channel to ambient	$R_{th(ch-a)}$ *	179	°C / W

* When mounted on a ceramic board.

●Dimensions (Unit : mm)



●Inner circuit



●Electrical characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Gate-source leakage	I_{GSS}	–	–	± 10	μA	$V_{GS} = \pm 20V, V_{DS} = 0V$
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	$R_{DS(on)}^*$	–	115	160	$m\Omega$	$I_D = -1.5A, V_{GS} = -10V$
		–	170	240	$m\Omega$	$I_D = -0.7A, V_{GS} = -4.5V$
		–	190	270	$m\Omega$	$I_D = -0.7A, V_{GS} = -4V$
Forward transfer admittance	$ Y_{fs} ^*$	1.2	–	–	S	$V_{DS} = -10V, I_D = -1.5A$
Input capacitance	C_{iss}	–	230	–	pF	$V_{DS} = -10V$
Output capacitance	C_{oss}	–	40	–	pF	$V_{GS} = 0V$
Reverse transfer capacitance	C_{rss}	–	33	–	pF	$f = 1MHz$
Turn-on delay time	$t_{d(on)}^*$	–	12	–	ns	$V_{DD} = -15V$
Rise time	t_r^*	–	8	–	ns	$I_D = -0.7A$
Turn-off delay time	$t_{d(off)}^*$	–	40	–	ns	$V_{GS} = -10V$
Fall time	t_f^*	–	13	–	ns	$R_L = 21.4\Omega$
Total gate charge	Q_g^*	–	3.2	–	nC	$V_{DD} = -15V, R_L = 10\Omega$
Gate-source charge	Q_{gs}^*	–	1.2	–	nC	$I_D = -1.5A, R_G = 10\Omega$
Gate-drain charge	Q_{gd}^*	–	0.7	–	nC	$V_{GS} = -5V$

*Pulsed

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Forward voltage	V_{SD}^*	–	–	–1.2	V	$I_S = -1.5A, V_{GS} = 0V$

*Pulsed

●Electrical characteristics curves

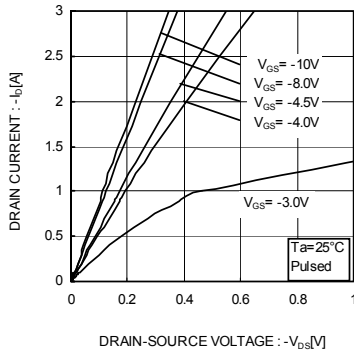


Fig.1 Typical Output Characteristics(I)

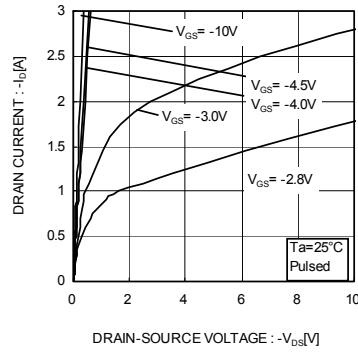


Fig.2 Typical Output Characteristics(II)

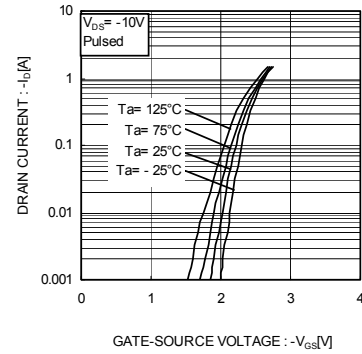


Fig.3 Typical Transfer Characteristics

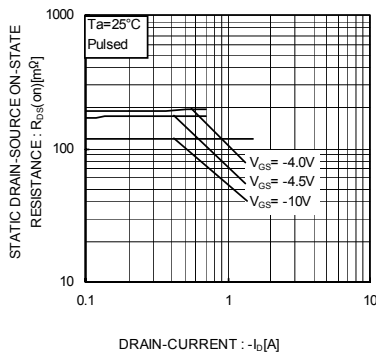


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current(I)

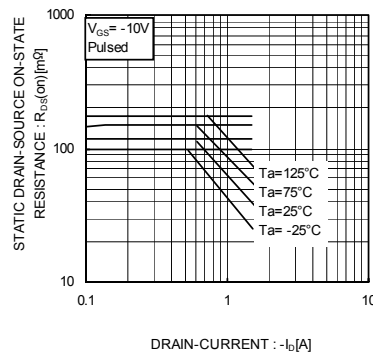


Fig.5 Static Drain-Source On-State Resistance vs. Drain Current(II)

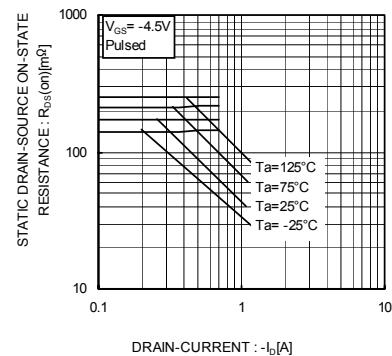


Fig.6 Static Drain-Source On-State Resistance vs. Drain Current(III)

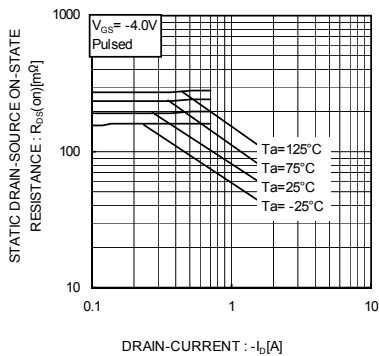


Fig.7 Static Drain-Source On-State Resistance vs. Drain Current(IV)

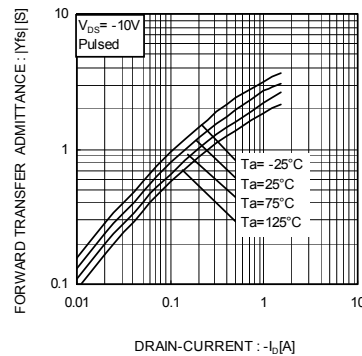


Fig.8 Forward Transfer Admittance vs. Drain Current

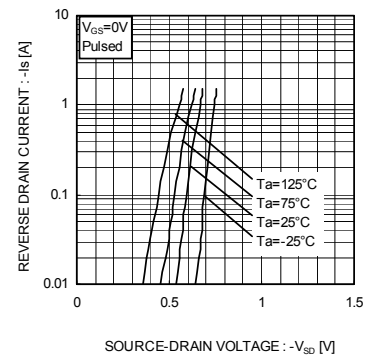


Fig.9 Reverse Drain Current vs. Source-Drain Voltage

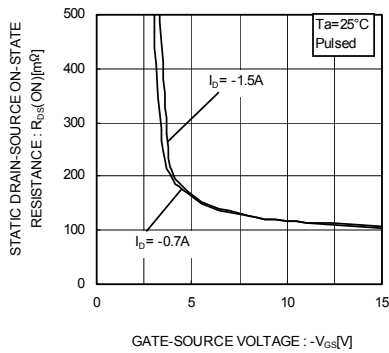


Fig.10 Static Drain-Source On-State Resistance vs. Gate Source Voltage

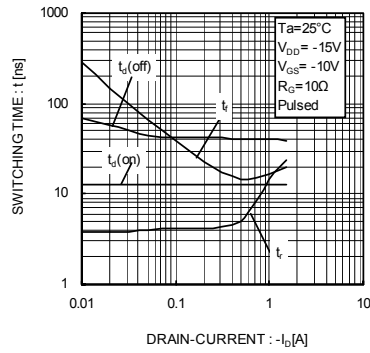


Fig.11 Switching Characteristics

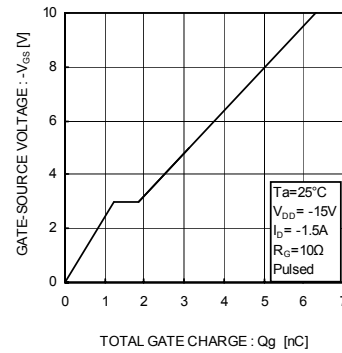


Fig.12 Dynamic Input Characteristics

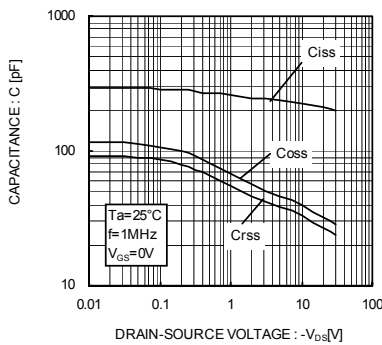


Fig.13 Typical Capacitance vs. Drain-Source Voltage

●Measurement circuit

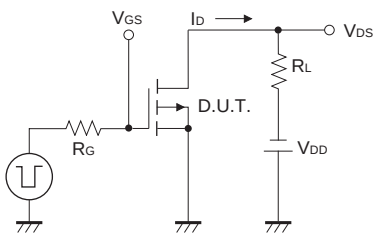


Fig.1-1 Switching Time Measurement Circuit

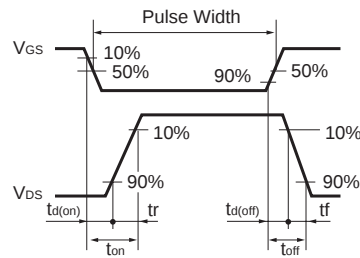


Fig.1-2 Switching Waveforms

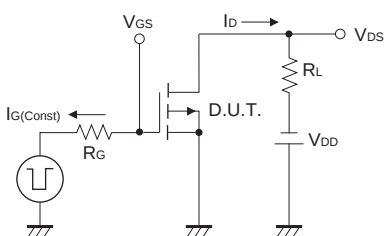


Fig.2-1 Gate Charge Measurement Circuit

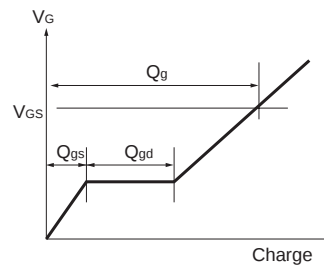


Fig.2-2 Gate Charge Waveform

●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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