

4V Drive Pch MOSFET

RRL025P03

●Structure

Silicon P-channel MOSFET

●Features

- 1) Low On-resistance.
- 2) High speed switching.

●Applications

Switching

●Packaging specifications

Type	Package	Taping
	Code	TR
	Basic ordering unit (pieces)	3000
RRL025P03		○

●Absolute maximum ratings (Ta=25°C)

Parameter		Symbol	Limits	Unit
Drain-source voltage		V _{DS}	−30	V
Gate-source voltage		V _{GSS}	±20	V
Drain current	Continuous	I _D	±2.5	A
	Pulsed	I _{DP} *1	±10	A
Source current (Body diode)	Continuous	I _S	−0.8	A
	Pulsed	I _{SP} *1	−10	A
Total power dissipation		P _D *2	1	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 $\leq 1\%$

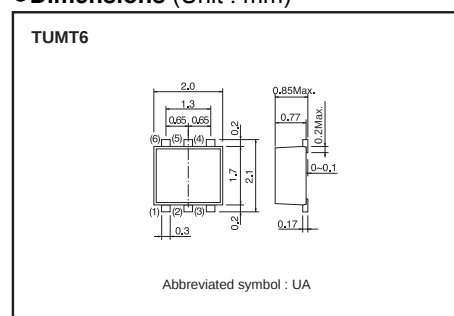
*2 When mounted on a ceramic board

●Thermal resistance

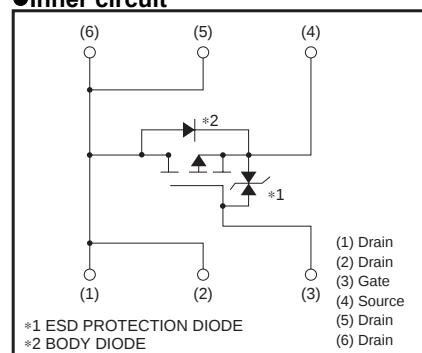
Parameter	Symbol	Limits	Unit
Channel to ambient	$R_{th(ch-a)}$ *	125	°C/W

* 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	$R_{DS(on)}$ *	–	55	75	mΩ	$I_D = -2.5A$, $V_{GS} = -10V$
		–	85	115	mΩ	$I_D = -1.2A$, $V_{GS} = -4.5V$
		–	95	125	mΩ	$I_D = -1.2A$, $V_{GS} = -4.0V$
Forward transfer admittance	$ Y_{fs} $ *	2	–	–	S	$V_{DS} = -10V$, $I_D = -2.5A$
Input capacitance	C_{iss}	–	480	–	pF	$V_{DS} = -10V$
Output capacitance	C_{oss}	–	70	–	pF	$V_{GS} = 0V$
Reverse transfer capacitance	C_{rss}	–	70	–	pF	$f = 1MHz$
Turn-on delay time	$t_{d(on)}$ *	–	7	–	ns	$V_{DD} \doteq -15V$
Rise time	t_r *	–	16	–	ns	$I_D = -1.2A$
Turn-off delay time	$t_{d(off)}$ *	–	50	–	ns	$V_{GS} = -10V$
Fall time	t_f *	–	33	–	ns	$R_L \doteq 12.5\Omega$
Total gate charge	Q_g	–	5.2	–	nC	$V_{DD} \doteq -15V$, $I_D = -2.5A$
Gate-source charge	Q_{gs}	–	1.6	–	nC	$V_{GS} = -5V$
Gate-drain charge	Q_{gd}	–	1.6	–	nC	$R_L \doteq 6\Omega$ $R_G = 10\Omega$

*Pulsed

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Forward voltage	V_{SD} *	–	–	–1.2	V	$I_S = -2.5A$, $V_{GS} = 0V$

*Pulsed

●Electrical characteristic curves

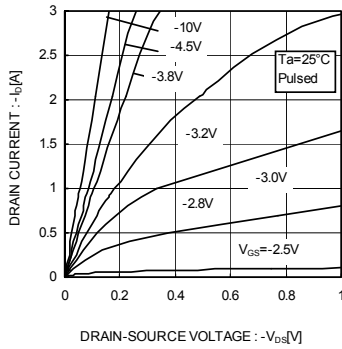


Fig. 1 Typical output characteristics(I)

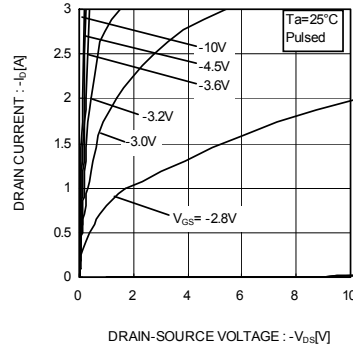


Fig. 2 Typical output characteristics(II)

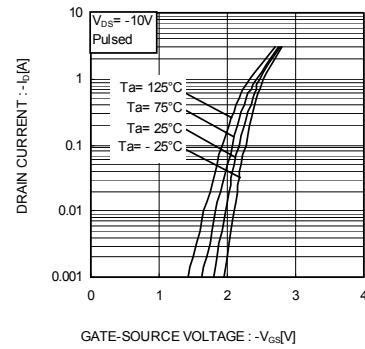


Fig. 3 Typical Transfer Characteristics

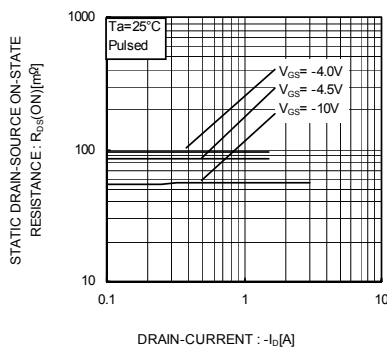


Fig. 4 Static Drain-Source On-State Resistance vs. Drain Current(I)

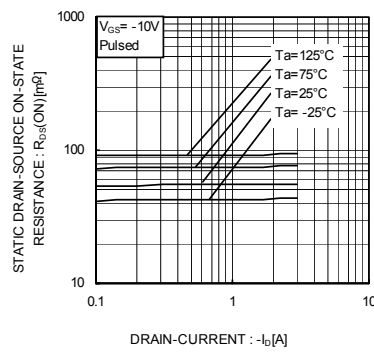


Fig. 5 Static Drain-Source On-State Resistance vs. Drain Current(II)

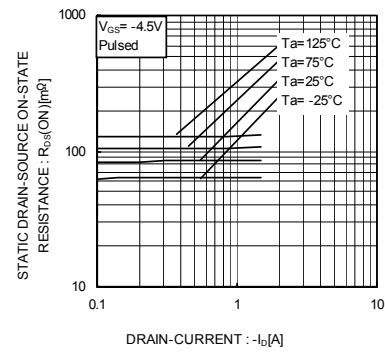


Fig. 6 Static Drain-Source On-State Resistance vs. Drain Current(III)

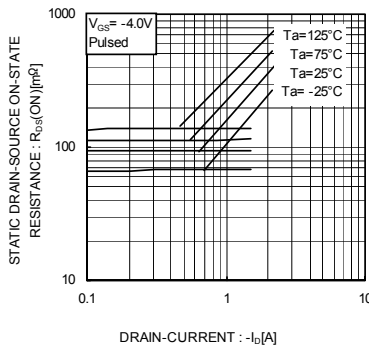


Fig. 7 Static Drain-Source On-State Resistance vs. Drain Current(IV)

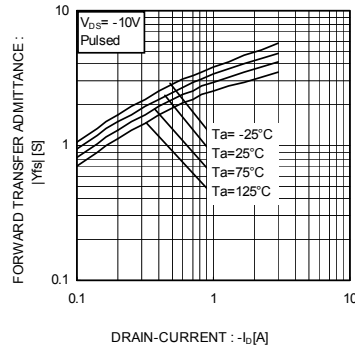


Fig. 8 Forward Transfer Admittance vs. Drain Current

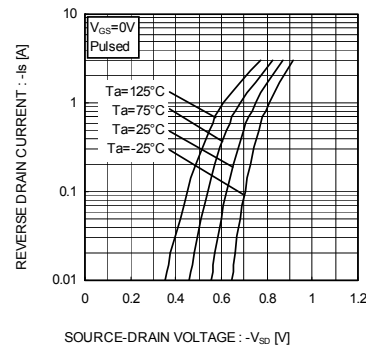


Fig. 9 Reverse Drain Current vs. Source-Drain Voltage

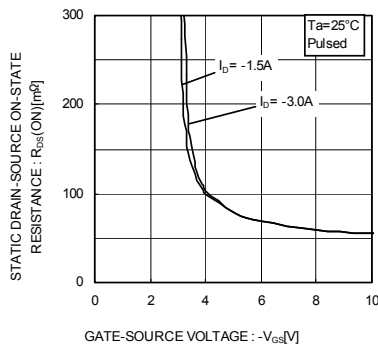


Fig.10 Static Drain-Source On-State Resistance vs. Gate Source Voltage

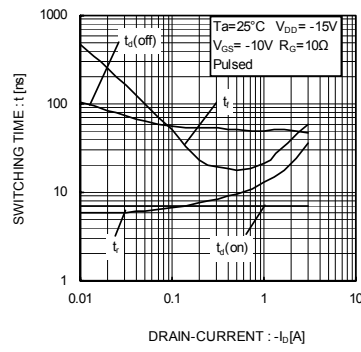


Fig.11 Switching Characteristics

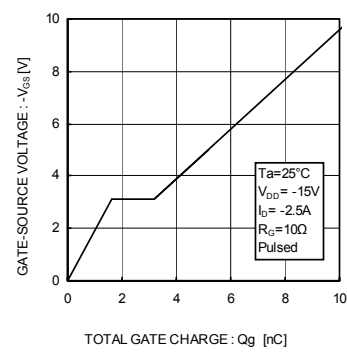


Fig.12 Dynamic Input Characteristics

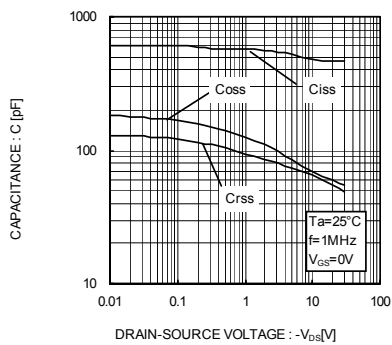


Fig.13 Typical Capacitance vs. Drain-Source Voltage

●Measurement circuit

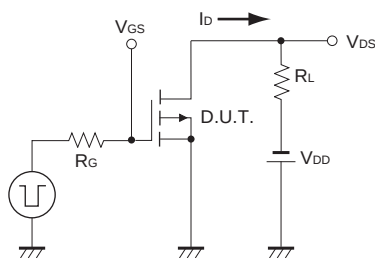


Fig.1-1 Switching Time Measurement Circuit

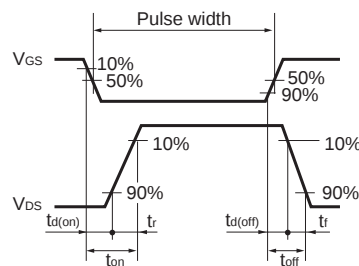


Fig.1-2 Switching Waveforms

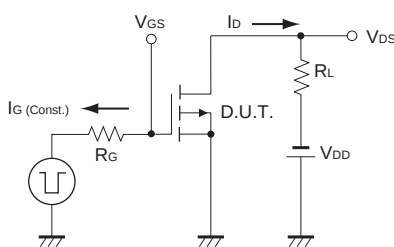


Fig.2-1 Gate Charge Measurement Circuit

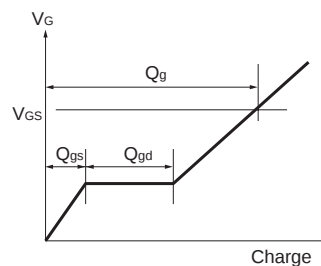


Fig.2-2 Gate Charge Waveform

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