

1.5V Drive Pch MOSFET

RZF020P01

●Structure

Silicon P-channel MOSFET

●Features

- 1) Low on-resistance.
- 2) Built-in G-S Protection Diode.
- 3) Small and Surface Mount Package (TUMT3).
- 4) Low voltage drive (1.5V).

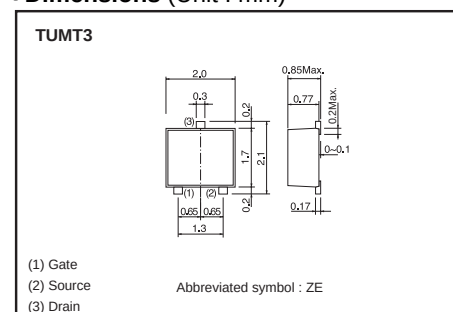
●Applications

Switching

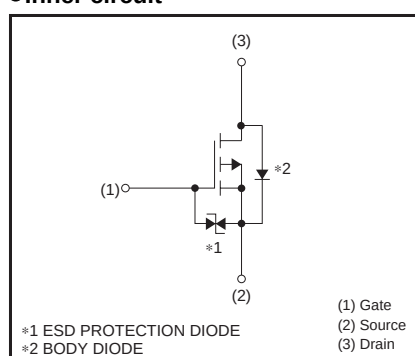
●Packaging specifications

Type	Package	Taping
	Code	TL
	Basic ordering unit (pieces)	3000
RZF020P01		○

●Dimensions (Unit : mm)



●Inner circuit



●Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Drain-source voltage	V_{DS}	-12	V
Gate-source voltage	V_{GS}	±10	V
Drain current	Continuous	I_D	±2
	Pulsed	I_{DP} *1	±6
Source current (Body diode)	Continuous	I_S	-0.6
	Pulsed	I_{SP} *1	-6
Total power dissipation	P_D *2	0.8	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	$R_{th}(ch-a)$ *	156	°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	$V_{(BR) DSS}$	–12	–	–	V	$I_D = -1mA, V_{GS} = 0V$
Zero gate voltage drain current	I_{DSS}	–	–	–1	μA	$V_{DS} = -12V, V_{GS} = 0V$
Gate threshold voltage	$V_{GS(th)}$	–0.3	–	–1.0	V	$V_{DS} = -6V, I_D = -1mA$
Static drain-source on-state resistance	$R_{DS(on)}$ *	–	75	105	m Ω	$I_D = -2A, V_{GS} = -4.5V$
		–	105	145	m Ω	$I_D = -1A, V_{GS} = -2.5V$
		–	150	225	m Ω	$I_D = -1A, V_{GS} = -1.8V$
		–	200	400	m Ω	$I_D = -0.4A, V_{GS} = -1.5V$
Forward transfer admittance	$ Y_{fs} $ *	2	–	–	S	$V_{DS} = -6V, I_D = -2A$
Input capacitance	C_{iss}	–	770	–	pF	$V_{DS} = -6V$
Output capacitance	C_{oss}	–	75	–	pF	$V_{GS} = 0V$
Reverse transfer capacitance	C_{rss}	–	60	–	pF	$f = 1MHz$
Turn-on delay time	$t_{d(on)}$ *	–	10	–	ns	$V_{DD} \doteq -6V$ $I_D = -1A$
Rise time	t_r *	–	17	–	ns	$V_{GS} = -4.5V$
Turn-off delay time	$t_{d(off)}$ *	–	65	–	ns	$R_L \doteq 6\Omega$
Fall time	t_f *	–	35	–	ns	$R_G = 10\Omega$
Total gate charge	Q_g *	–	6.5	–	nC	$V_{DD} \doteq -6V, I_D = -2A$
Gate-source charge	Q_{gs} *	–	1.3	–	nC	$V_{GS} = -4.5V$
Gate-drain charge	Q_{gd} *	–	0.8	–	nC	$R_L \doteq 3\Omega, R_G = 10\Omega$

* 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

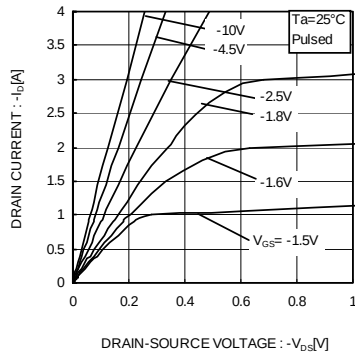


Fig.1 Typical Output Characteristics(I)

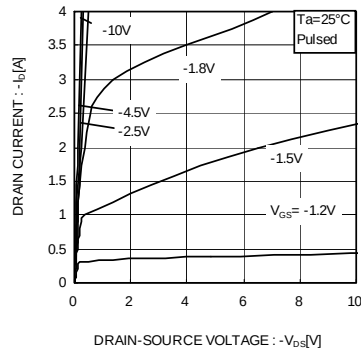


Fig.2 Typical Output Characteristics(II)

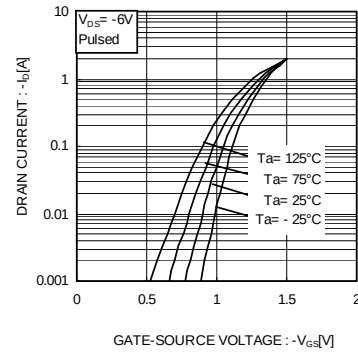


Fig.3 Typical Transfer Characteristics

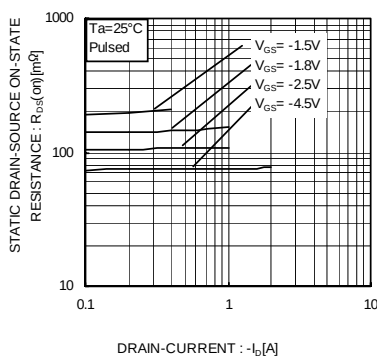


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current(I)

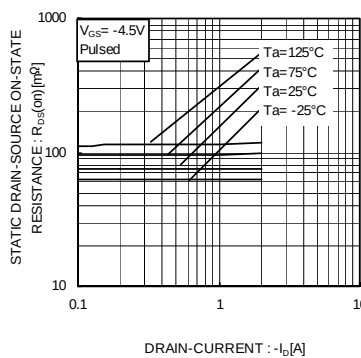


Fig.5 Static Drain-Source On-State Resistance vs. Drain Current(II)

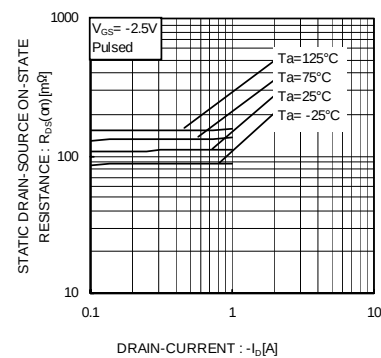


Fig.6 Static Drain-Source On-State Resistance vs. Drain Current(III)

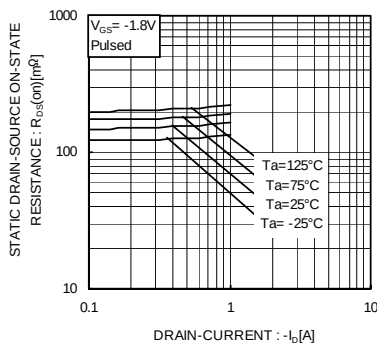


Fig.7 Static Drain-Source On-State Resistance vs. Drain Current(IV)

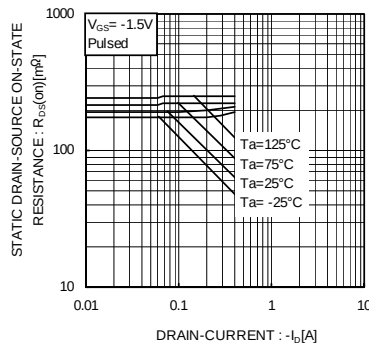


Fig.8 Static Drain-Source On-State Resistance vs. Drain Current(V)

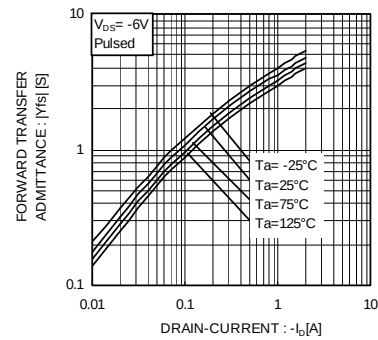


Fig.9 Forward Transfer Admittance vs. Drain Current

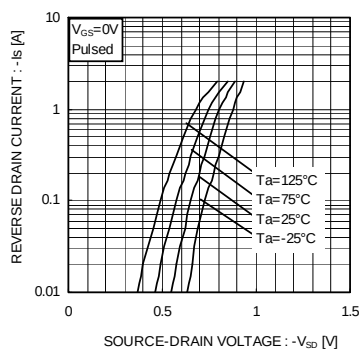


Fig.10 Reverse Drain Current vs. Source-Drain Voltage

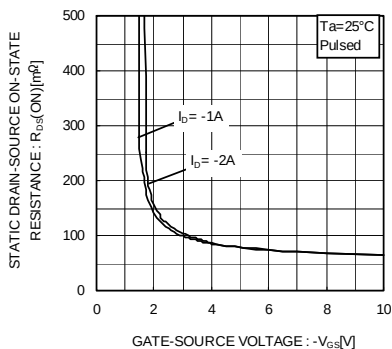


Fig.11 Static Drain-Source On-State Resistance vs. Gate Source Voltage

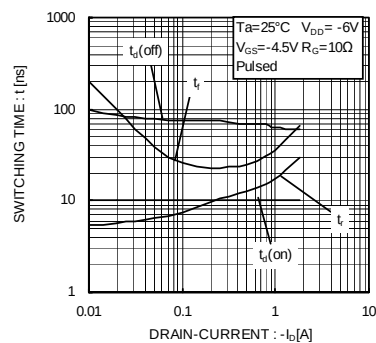


Fig.12 Switching Characteristics

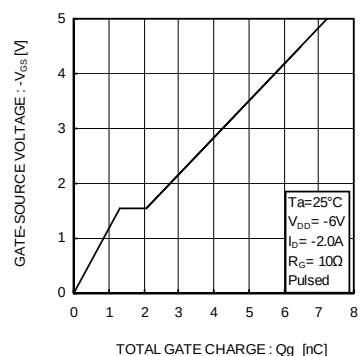


Fig.13 Dynamic Input Characteristics

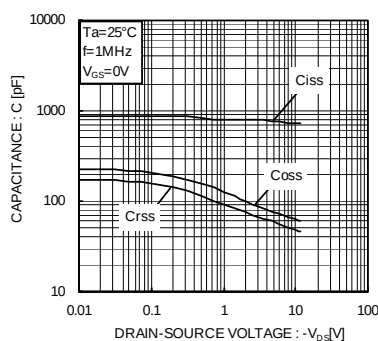


Fig.14 Typical Capacitance vs. Drain-Source Voltage

●Measurement circuit

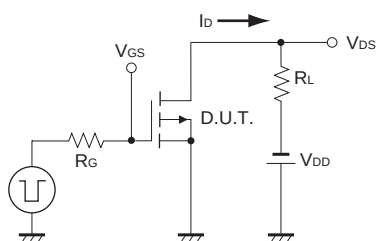


Fig.1-1 Switching Time Measurement Circuit

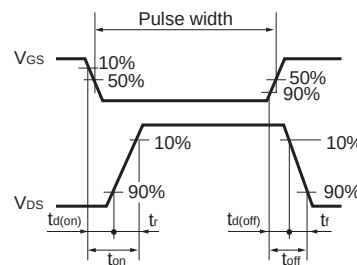


Fig.1-2 Switching Waveforms

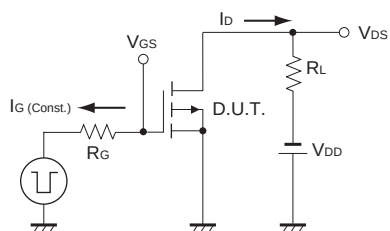


Fig.2-1 Gate Charge Measurement Circuit

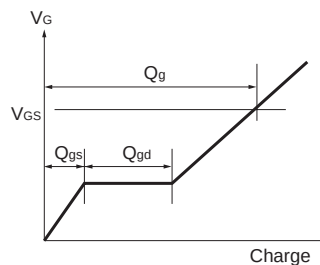


Fig.2-2 Gate Charge Waveform

●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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