

1.5V Drive Pch MOSFET

RZF013P01

●Structure

Silicon P-channel MOSFET

●Features

- 1) Low on-resistance.
- 2) High power package.
- 3) Low voltage drive. (1.5V)

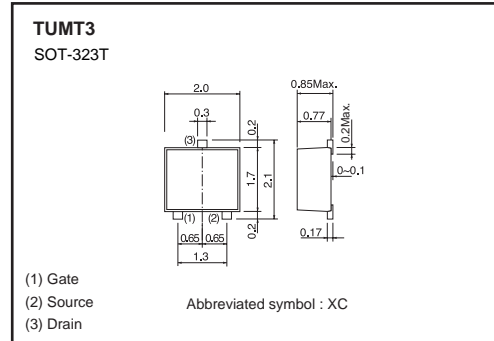
●Applications

Switching

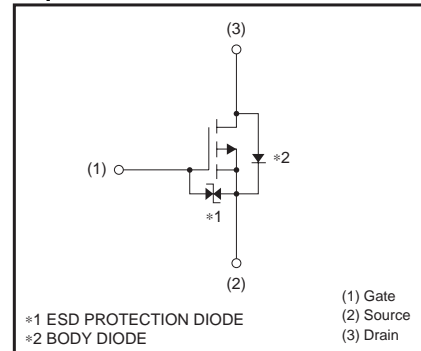
●Packaging specifications

Type	Package	Taping
	Code	TL
	Basic ordering unit (pieces)	3000
RZF013P01		○

●Dimensions (Unit : mm)



●Equivalent 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	±1.3	A
	Pulsed	I_{DP} *1	±5.2	A
Source current (Body diode)	Continuous	I_S *1	-0.6	A
	Pulsed	I_{SP}	-5.2	A
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	$R_{DS(on)}$ *	-	190	260	m Ω	$I_D = -1.3A, V_{GS} = -4.5V$
		-	280	390	m Ω	$I_D = -0.6A, V_{GS} = -2.5V$
		-	400	600	m Ω	$I_D = -0.6A, V_{GS} = -1.8V$
		-	530	1060	m Ω	$I_D = -0.2A, V_{GS} = -1.5V$
Forward transfer admittance	$ Y_{fs} $ *	1.4	-	-	S	$V_{DS} = -6V, I_D = -1.3A$
Input capacitance	C_{iss}	-	290	-	pF	$V_{DS} = -6V$
Output capacitance	C_{oss}	-	28	-	pF	$V_{GS}=0V$
Reverse transfer capacitance	C_{rss}	-	21	-	pF	$f=1MHz$
Turn-on delay time	$t_{d(on)}$ *	-	8	-	ns	$V_{DD} \doteq -6V$
Rise time	t_r *	-	10	-	ns	$I_D = -0.6A$
Turn-off delay time	$t_{d(off)}$ *	-	30	-	ns	$V_{GS} = -4.5V$
Fall time	t_f *	-	9	-	ns	$R_L \doteq 10\Omega$
Total gate charge	Q_g *	-	2.4	-	nC	$V_{DD} \doteq -6V \quad R_L \doteq 4.6\Omega$
Gate-source charge	Q_{gs} *	-	0.6	-	nC	$I_D = -1.3A \quad R_G = 10\Omega$
Gate-drain charge	Q_{gd} *	-	0.4	-	nC	$V_{GS} = -4.5V$

*Pulsed

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Forward voltage	V_{SD} *	-	-	-1.2	V	$I_S = -1.3A, V_{GS}=0V$

*Pulsed

●Electrical characteristic curves

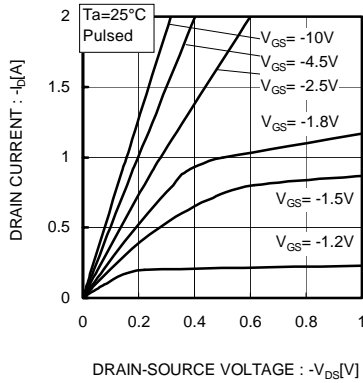


Fig.1 Typical Output Characteristics (I)

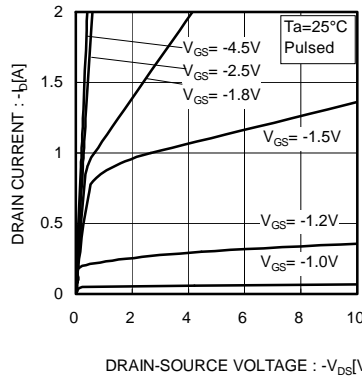


Fig.2 Typical Output Characteristics (II)

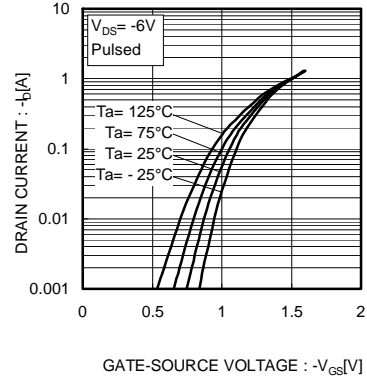


Fig.3 Typical Transfer Characteristics

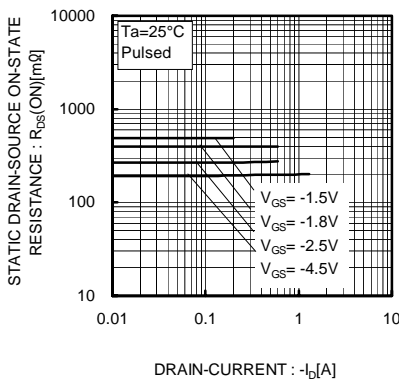


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current (I)

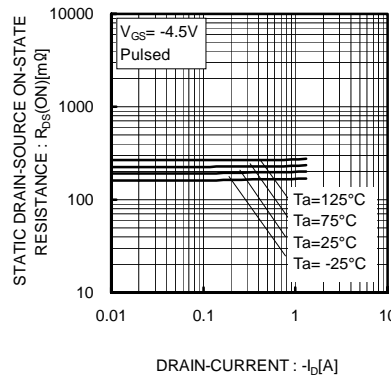


Fig.5 Static Drain-Source On-State Resistance vs. Drain Current (II)

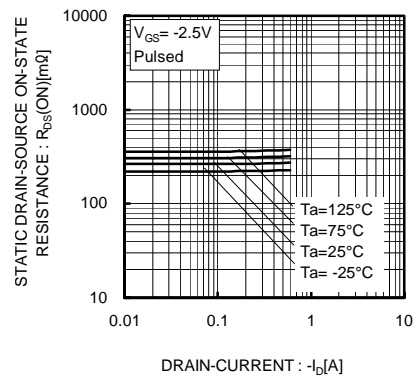


Fig.6 Static Drain-Source On-State Resistance vs. Drain Current (III)

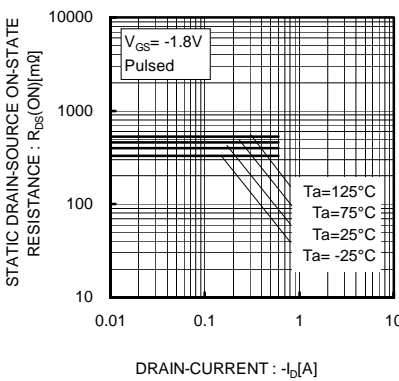


Fig.7 Static Drain-Source On-State Resistance vs. Drain Current (IV)

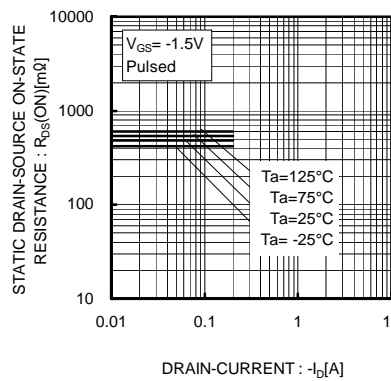


Fig.8 Static Drain-Source On-State Resistance vs. Drain Current (V)

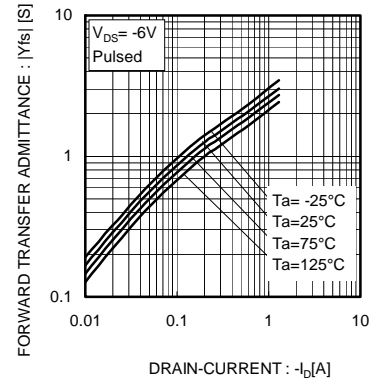


Fig.9 Forward Transfer Admittance vs. Drain Current

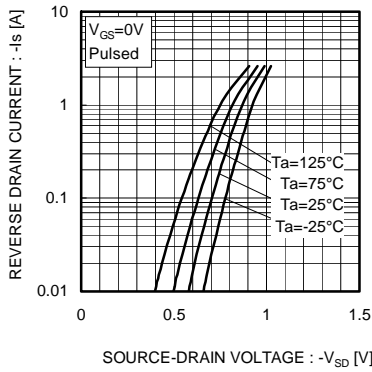


Fig.10 Reverse Drain Current vs. Source-Drain Voltage

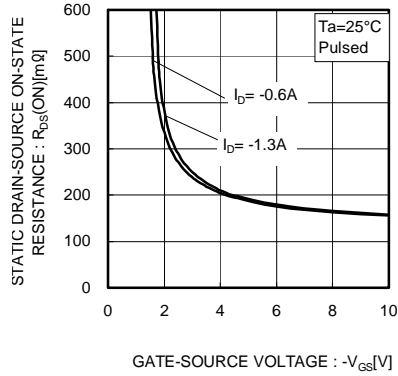


Fig.11 Static Drain-Source On-State Resistance vs. Gate Source Voltage

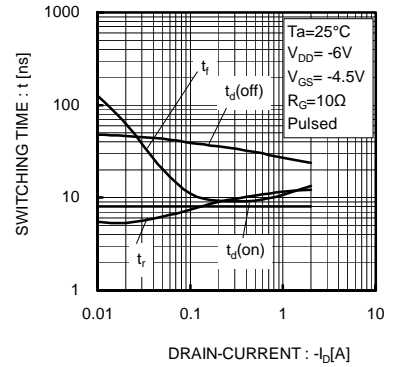


Fig.12 Switching Characteristics

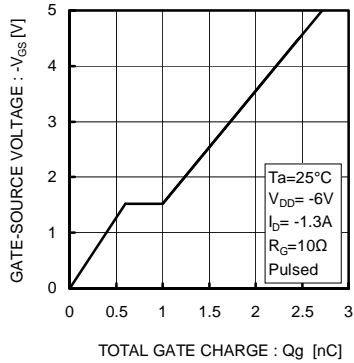


Fig.13 Dynamic Input Characteristics

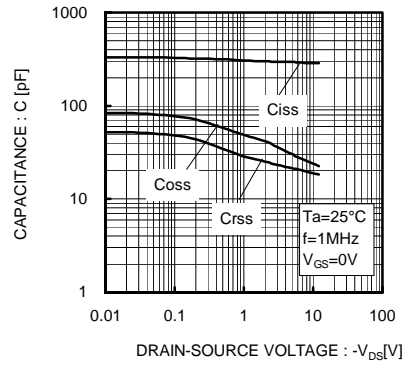


Fig.14 Typical Capacitance vs. Drain-Source Voltage

●Measurement circuits

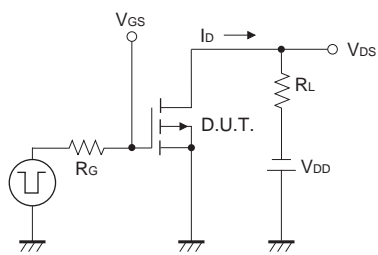


Fig.1-1 Switching Time Measurement Circuit

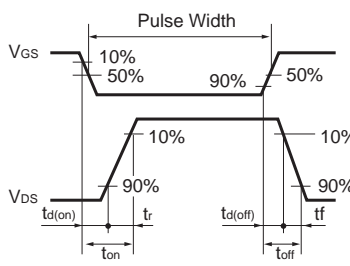


Fig.1-2 Switching Waveforms

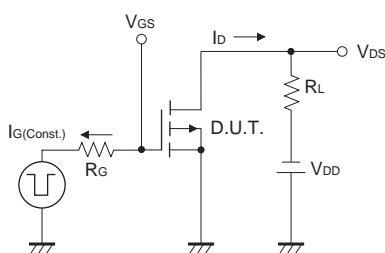


Fig.2-1 Gate Charge Measurement Circuit

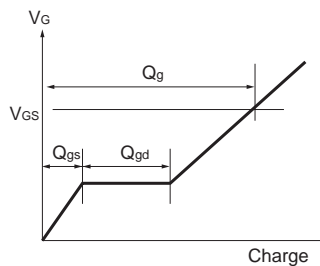


Fig.2-2 Gate Charge Waveform

●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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