

# 4V Drive Pch MOSFET

## RSF010P05

### ●Structure

Silicon P-channel MOSFET

### ●Features

- 1) Low On-resistance.
- 2) Small high power package.
- 3) Low voltage drive.(4V)

### ●Application

Switching

### ●Packaging specifications

Type	Package	Taping
	Code	TL
	Basic ordering unit (pieces)	3000
RSF010P05		○

### ●Absolute maximum ratings (Ta = 25°C)

Parameter		Symbol	Limits	Unit
Drain-source voltage		$V_{DSS}$	-45	V
Gate-source voltage		$V_{GSS}$	±20	V
Drain current	Continuous	$I_D$	±1	A
	Pulsed	$I_{DP}$ *1	±4	A
Source current (Body Diode)	Continuous	$I_S$	-0.6	A
	Pulsed	$I_{SP}$ *1	-4	A
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 ≤ 1%

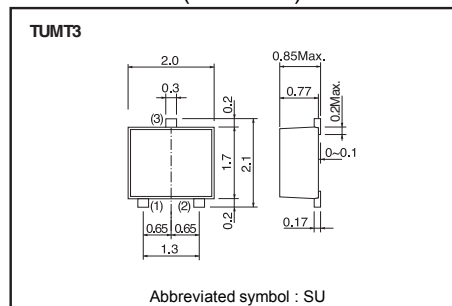
\*2 Mounted on a ceramic board.

### ●Thermal resistance

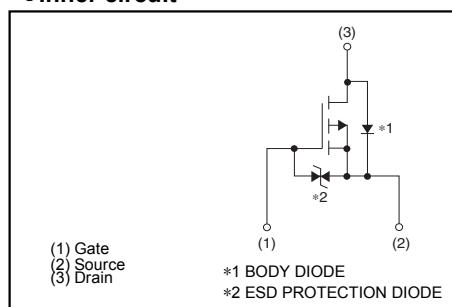
Parameter	Symbol	Limits	Unit
Channel to Ambient	$R_{th}(ch-a)^*$	156	°C / W

\*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	$I_{GSS}$	-	-	$\pm 10$	$\mu A$	$V_{GS} = \pm 20V, V_{DS} = 0V$
Drain-source breakdown voltage	$V_{(BR)DSS}$	-45	-	-	V	$I_D = -1mA, V_{GS} = 0V$
Zero gate voltage drain current	$I_{DSS}$	-	-	-1	$\mu A$	$V_{DS} = -45V, V_{GS} = 0V$
Gate threshold voltage	$V_{GS(th)}$	-1.0	-	-2.5	V	$V_{DS} = -10V, I_D = -1mA$
Static drain-source on-state resistance	$R_{DS(on)}^*$	-	330	460	m $\Omega$	$I_D = -1A, V_{GS} = -10V$
		-	450	630		$I_D = -0.5A, V_{GS} = -4.5V$
		-	490	690		$I_D = -0.5A, V_{GS} = -4V$
Forward transfer admittance	$ Y_{fs} ^*$	1	-	-	S	$I_D = -1A, V_{DS} = -10V$
Input capacitance	$C_{iss}$	-	160	-	pF	$V_{DS} = -10V$
Output capacitance	$C_{oss}$	-	40	-	pF	$V_{GS} = 0V$
Reverse transfer capacitance	$C_{rss}$	-	17	-	pF	$f = 1MHz$
Turn-on delay time	$t_{d(on)}^*$	-	6	-	ns	$I_D = -0.5A, V_{DD} = -25V$
Rise time	$t_r^*$	-	4	-	ns	$V_{GS} = -10V$
Turn-off delay time	$t_{d(off)}^*$	-	18	-	ns	$R_L = 50\Omega$
Fall time	$t_f^*$	-	6	-	ns	$R_G = 10\Omega$
Total gate charge	$Q_g^*$	-	2.3	-	nC	$I_D = -1A$
Gate-source charge	$Q_{gs}^*$	-	0.9	-	nC	$V_{DD} = -25V$
Gate-drain charge	$Q_{gd}^*$	-	0.6	-	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	$I_s = -1A, V_{GS} = 0V$

\*Pulsed

●Electrical characteristic curves (Ta=25°C)

Fig.1 Typical Output Characteristics ( I )

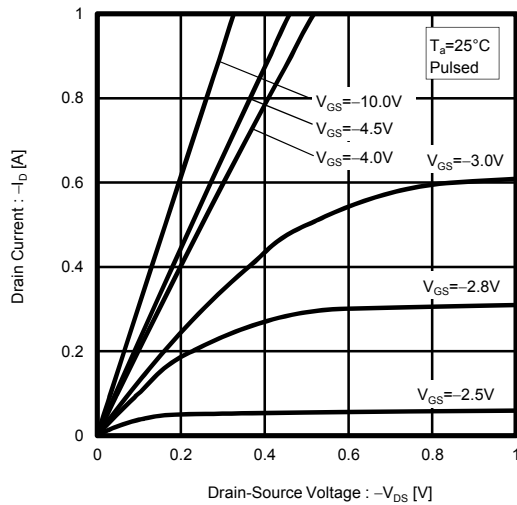


Fig.2 Typical Output Characteristics ( II )

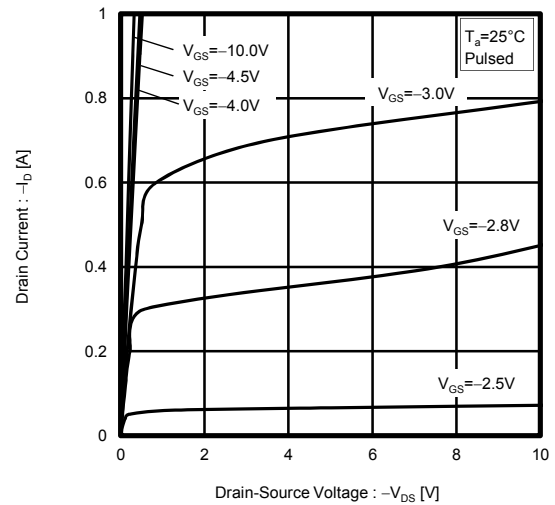


Fig.3 Static Drain-Source On-State Resistance vs. Drain Current

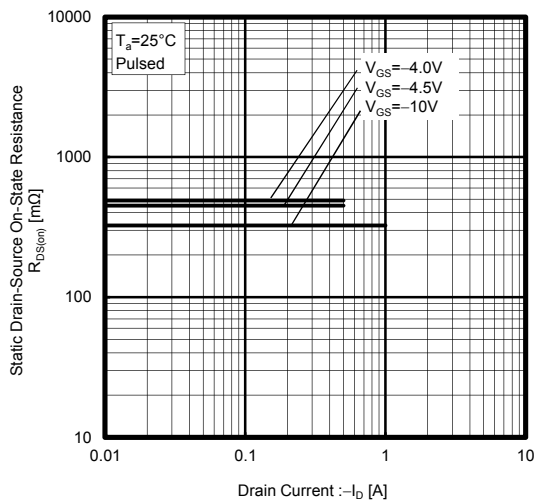


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current

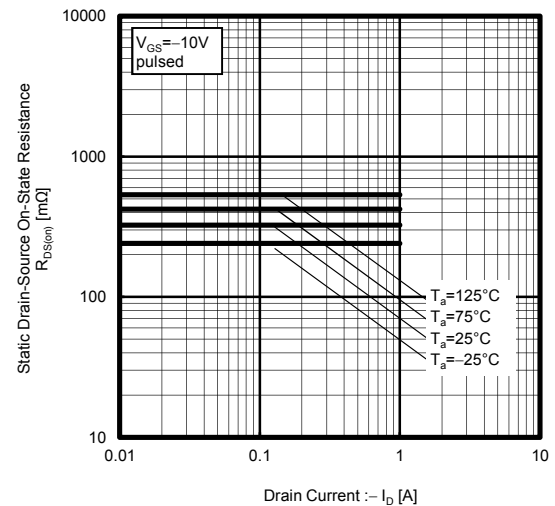


Fig.5 Static Drain-Source On-State Resistance vs. Drain Current

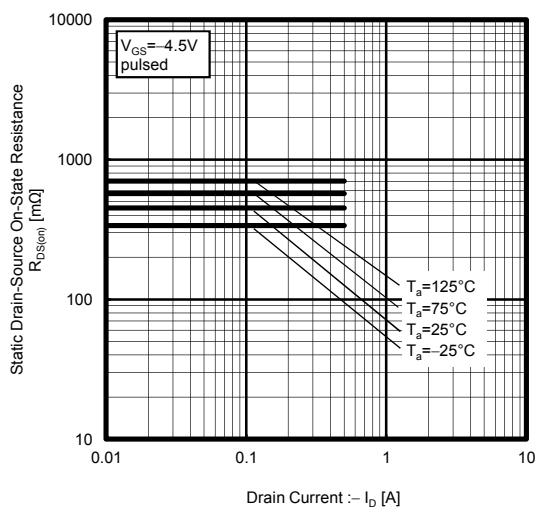


Fig.6 Static Drain-Source On-State Resistance vs. Drain Current

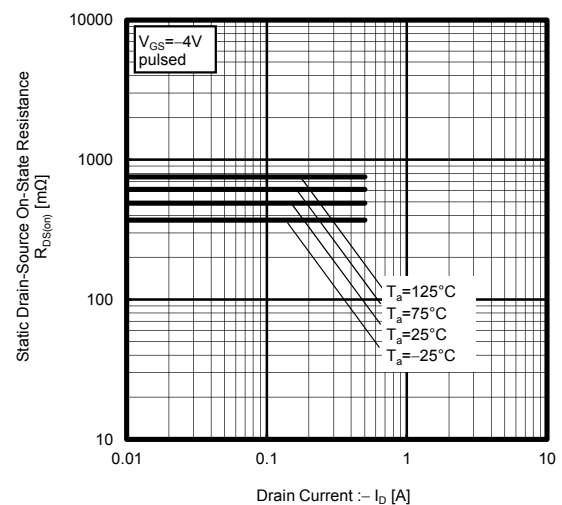


Fig.7 Forward Transfer Admittance vs. Drain Current

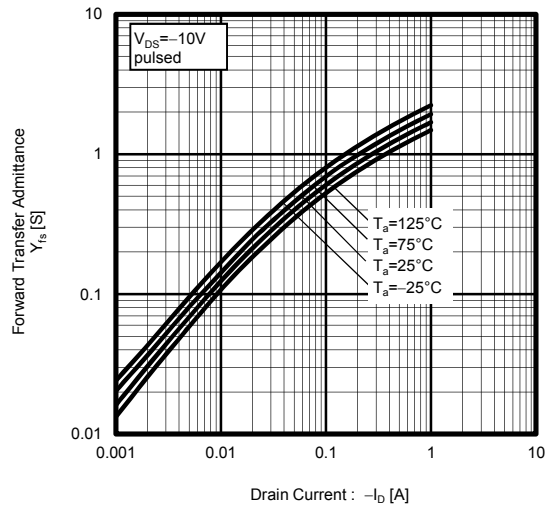


Fig.8 Typical Transfer Characteristics

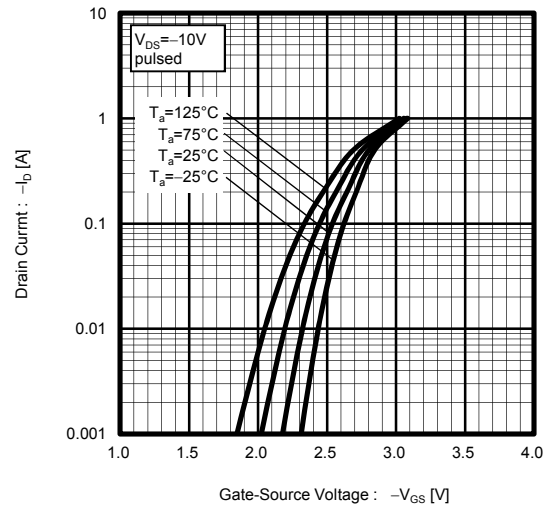


Fig.9 Source Current vs. Source-Drain Voltage

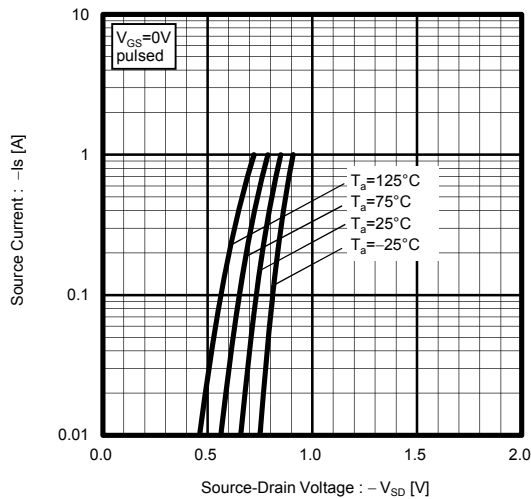


Fig.10 Static Drain-Source On-State Resistance vs. Gate-Source Voltage

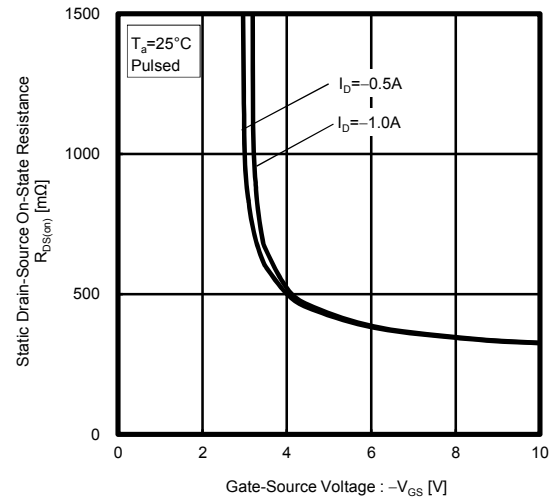


Fig.11 Switching Characteristics

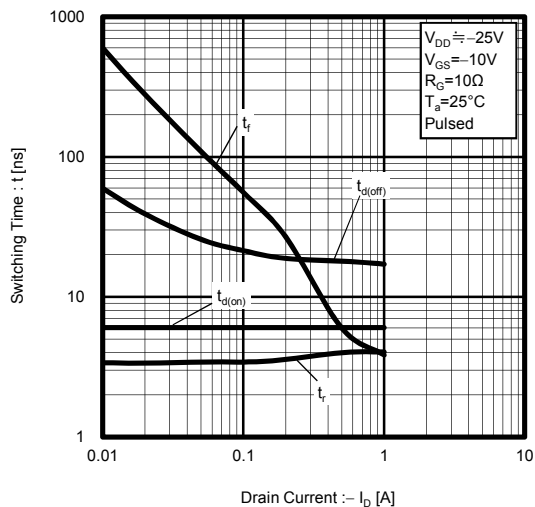


Fig.12 Dynamic Input Characteristics

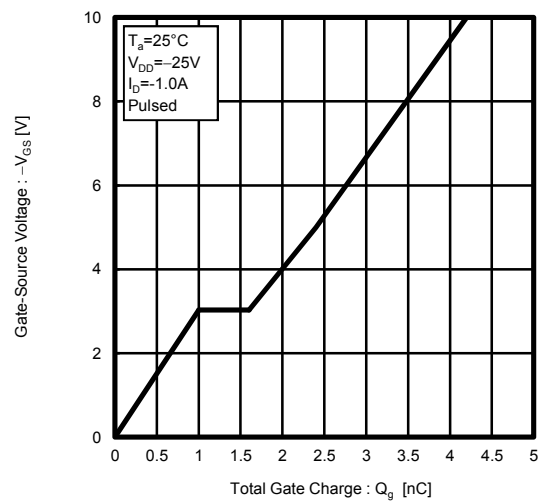


Fig.13 Typical Capacitance vs. Drain-Source Voltage

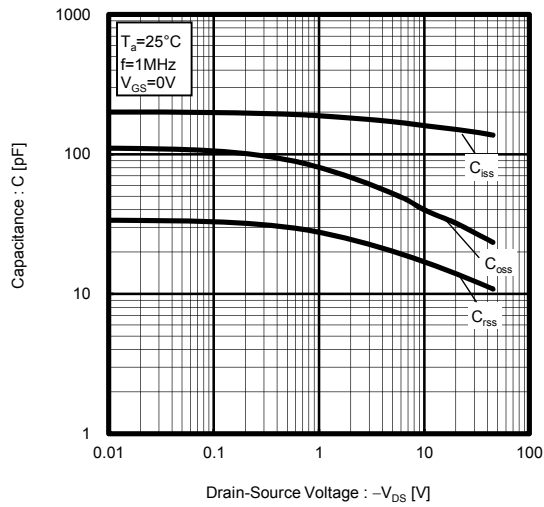


Fig.14 Maximum Safe Operating Area

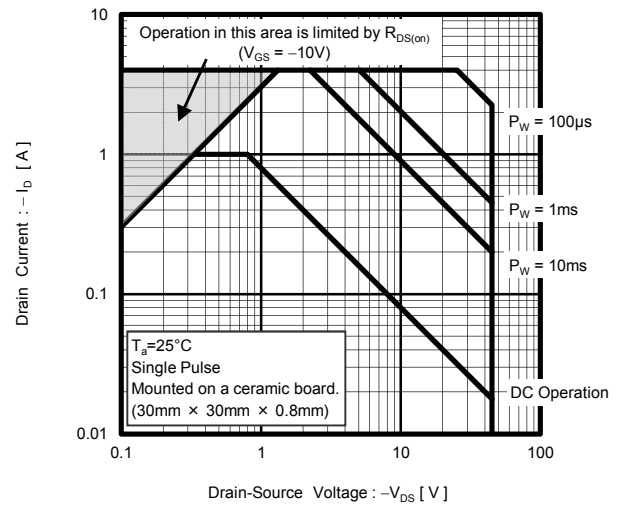
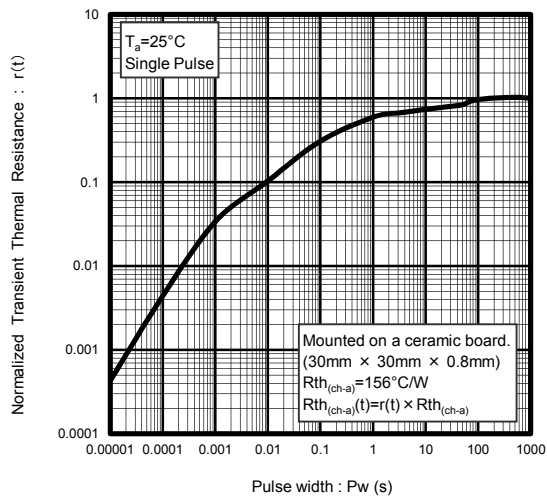


Fig.15 Normalized Transient Thermal Resistance v.s. Pulse Width



●Measurement circuits

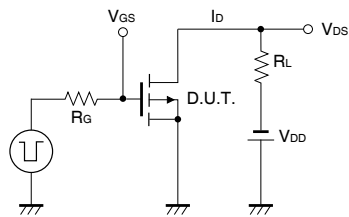


Fig.1-1 Switching Time Measurement Circuit

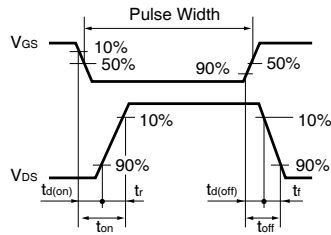


Fig.1-2 Switching Waveforms

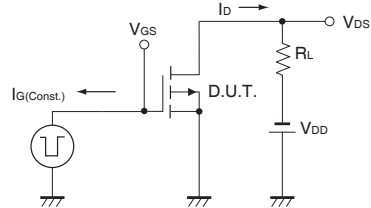


Fig.2-1 Gate Charge Measurement Circuit

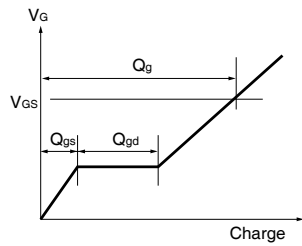


Fig.2-2 Gate Charge Waveform

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