

4V Drive Pch MOSFET

RSD160P05

●Structure

Silicon P-channel MOSFET

●Features

- 1) Low on-resistance.
- 2) Fast switching speed.
- 3) Drive circuits can be simple.
- 4) Parallel use is easy.

●Application

Switching

●Packaging specifications

Type	Package	Taping
	Code	TL
	Basic ordering unit (pieces)	2500
RSD160P05		○

●Absolute maximum ratings ($T_a = 25^\circ\text{C}$)

Parameter		Symbol	Limits	Unit
Drain-source voltage		V_{DSS}	-45	V
Gate-source voltage		V_{GSS}	± 20	V
Drain current	Continuous	I_D	± 16	A
	Pulsed	I_{DP} *1	± 32	A
Source current (Body Diode)	Continuous	I_S	-16	A
	Pulsed	I_{SP} *1	-32	A
Power dissipation		P_D *2	20	W
Channel temperature		T_{ch}	150	$^\circ\text{C}$
Range of storage temperature		T_{stg}	-55 to +150	$^\circ\text{C}$

*1 $P_w \leq 10\mu\text{s}$, Duty cycle $\leq 1\%$

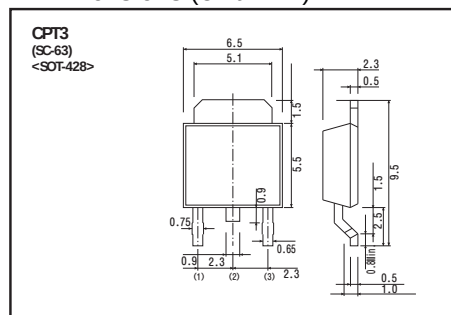
*2 $T_c = 25^\circ\text{C}$

●Thermal resistance

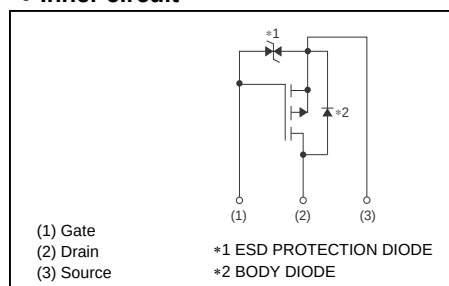
Parameter	Symbol	Limits	Unit
Channel to Case	$R_{th(ch-c)}$ *	6.25	$^\circ\text{C} / \text{W}$

* $T_c = 25^\circ\text{C}$

●Dimensions (Unit : mm)



●Inner circuit



●Electrical characteristics ($T_a = 25^\circ\text{C}$)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Gate-source leakage	I_{GSS}	-	-	± 10	μA	$V_{GS} = \pm 20\text{V}$, $V_{DS} = 0\text{V}$
Drain-source breakdown voltage	$V_{(BR)DSS}$	-45	-	-	V	$I_D = -1\text{mA}$, $V_{GS} = 0\text{V}$
Zero gate voltage drain current	I_{DSS}	-	-	-1	μA	$V_{DS} = -45\text{V}$, $V_{GS} = 0\text{V}$
Gate threshold voltage	$V_{GS(th)}$	-1.0	-	-3.0	V	$V_{DS} = -10\text{V}$, $I_D = -1\text{mA}$
Static drain-source on-state resistance	$R_{DS(on)}^*$	-	35	50	$\text{m}\Omega$	$I_D = -16\text{A}$, $V_{GS} = -10\text{V}$
		-	45	63		$I_D = -8\text{A}$, $V_{GS} = -4.5\text{V}$
		-	50	70		$I_D = -8\text{A}$, $V_{GS} = -4.0\text{V}$
Forward transfer admittance	$ Y_{fs} ^*$	8.0	-	-	S	$I_D = -8\text{A}$, $V_{DS} = -10\text{V}$
Input capacitance	C_{iss}	-	2000	-	pF	$V_{DS} = -10\text{V}$
Output capacitance	C_{oss}	-	250	-	pF	$V_{GS} = 0\text{V}$
Reverse transfer capacitance	C_{rss}	-	140	-	pF	$f = 1\text{MHz}$
Turn-on delay time	$t_{d(on)}^*$	-	13	-	ns	$I_D = -8.0\text{A}$, $V_{DD} = -25\text{V}$
Rise time	t_r^*	-	22	-	ns	$V_{GS} = -10\text{V}$
Turn-off delay time	$t_{d(off)}^*$	-	90	-	ns	$R_L = 3.1\Omega$
Fall time	t_f^*	-	50	-	ns	$R_G = 10\Omega$
Total gate charge	Q_g^*	-	16.0	-	nC	$V_{DD} = -25\text{V}$
Gate-source charge	Q_{gs}^*	-	5.2	-	nC	$I_D = -16\text{A}$,
Gate-drain charge	Q_{gd}^*	-	5.0	-	nC	$V_{GS} = -5\text{V}$

*Pulsed

●Body diode characteristics (Source-Drain) ($T_a = 25^\circ\text{C}$)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Forward Voltage	V_{SD}^*	-	-	-1.2	V	$I_S = -16\text{A}$, $V_{GS} = 0\text{V}$

*Pulsed

●Electrical characteristic curves (Ta=25°C)

Fig.1 Typical Output Characteristics (I)

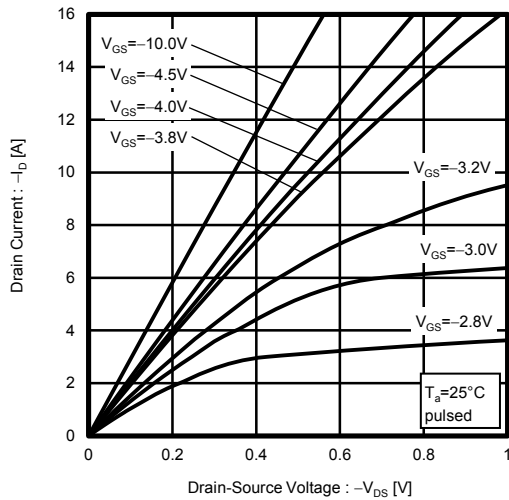


Fig.2 Typical Output Characteristics (II)

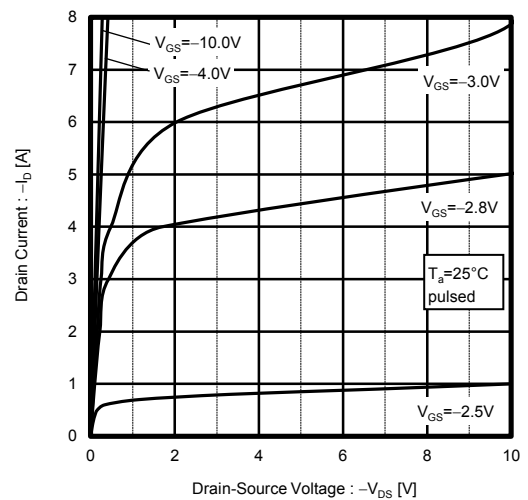


Fig.3 Static Drain-Source On-State Resistance vs. Drain Current

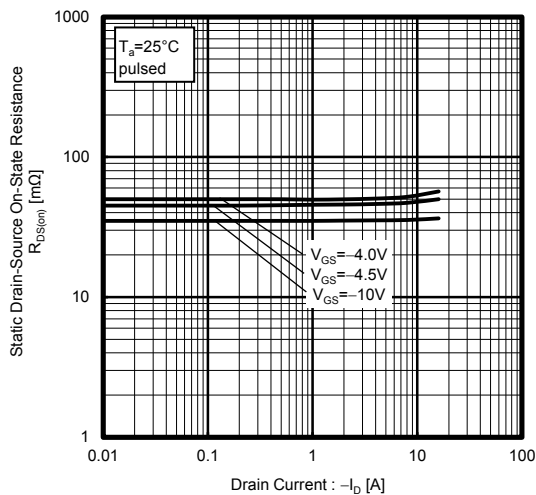


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current

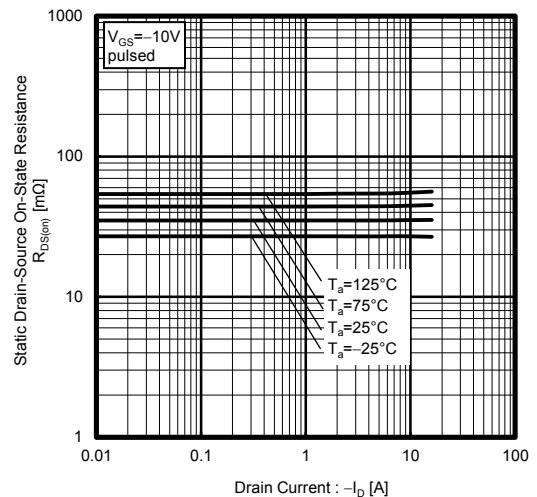


Fig.5 Static Drain-Source On-State Resistance vs. Drain Current

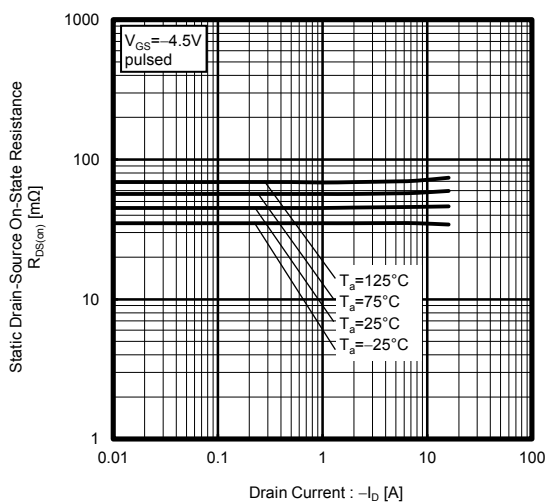


Fig.6 Static Drain-Source On-State Resistance vs. Drain Current

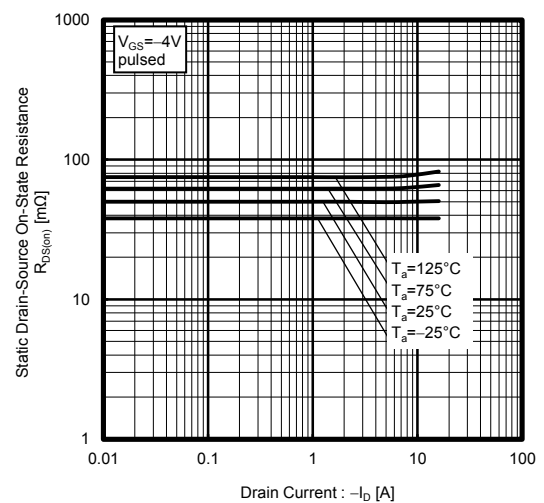


Fig.7 Forward Transfer Admittance vs. Drain Current

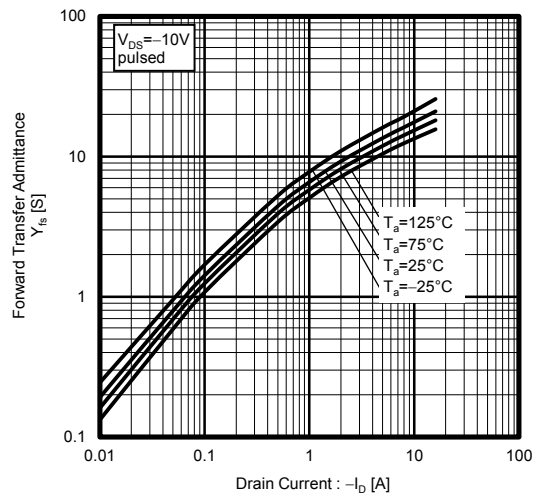


Fig.8 Typical Transfer Characteristics

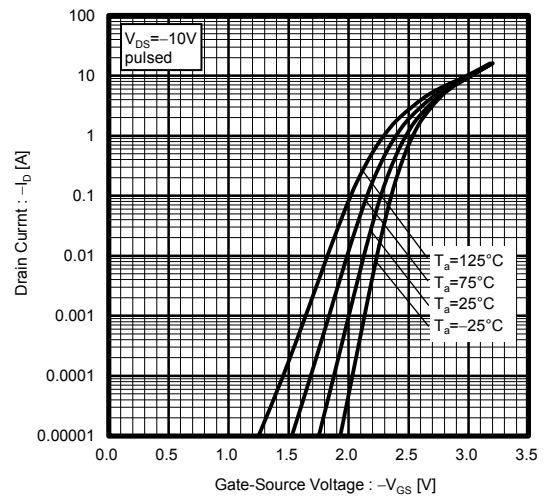


Fig.9 Source Current vs. Source-Drain Voltage

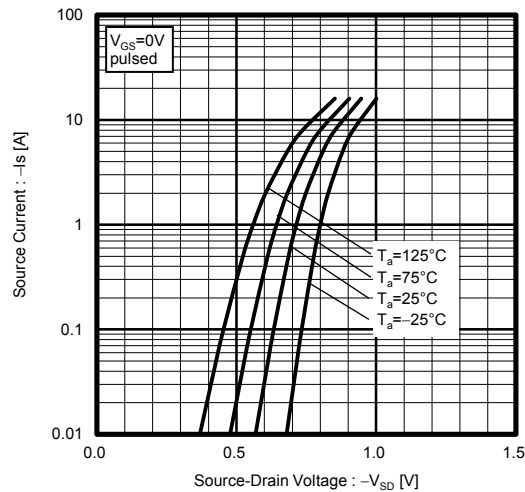


Fig.10 Static Drain-Source On-State Resistance vs. Gate-Source Voltage

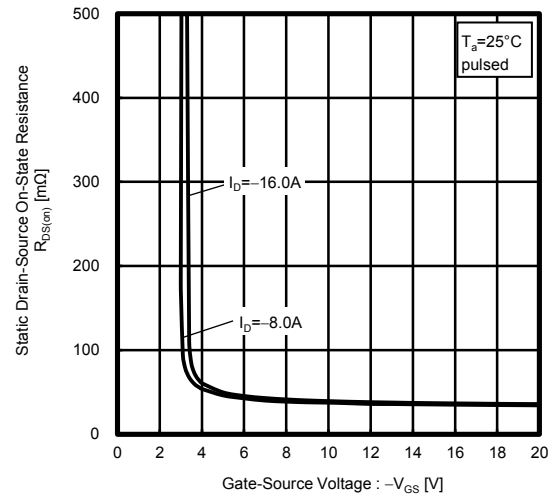


Fig.11 Switching Characteristics

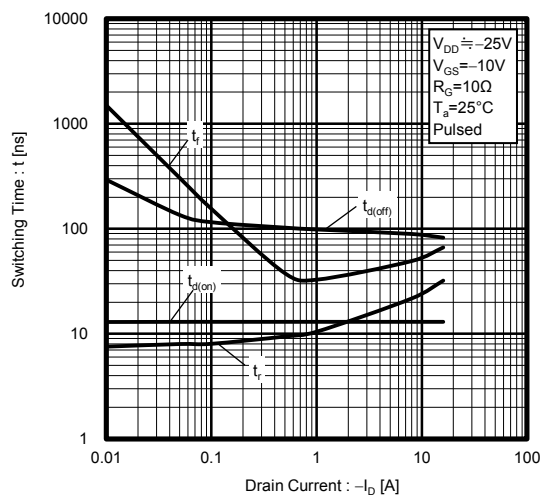


Fig.12 Dynamic Input Characteristics

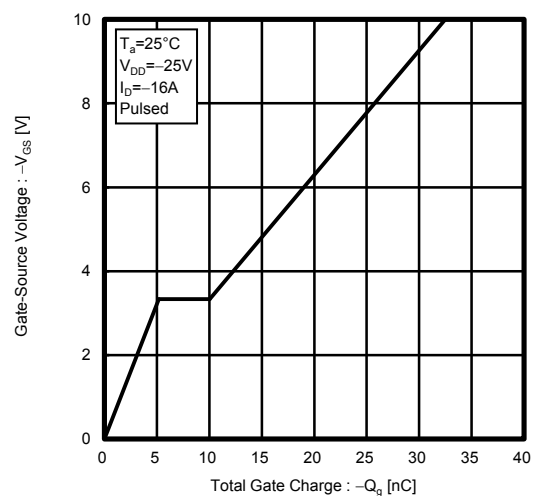


Fig.13 Typical Capacitance vs. Drain-Source Voltage

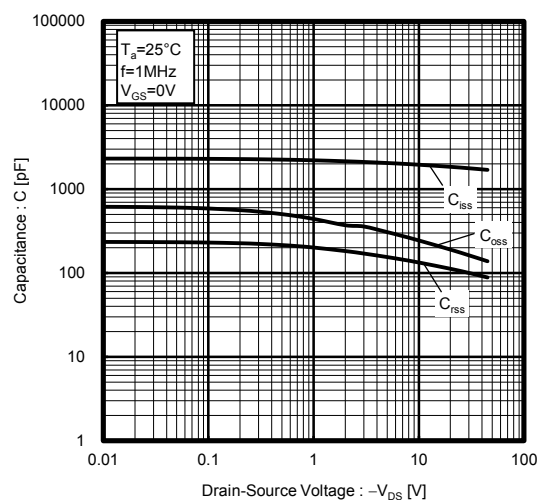


Fig.14 Maximum Safe Operating Area

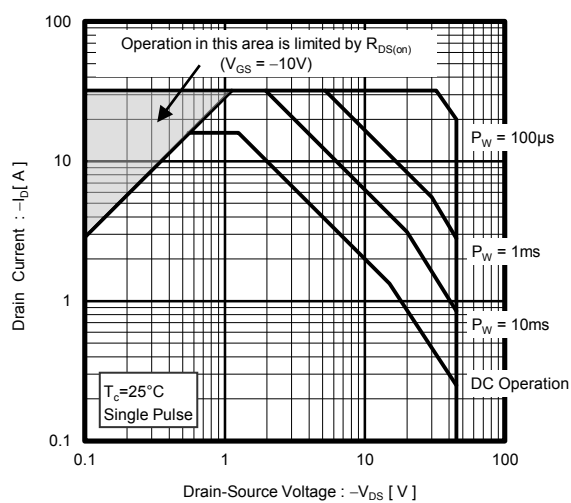
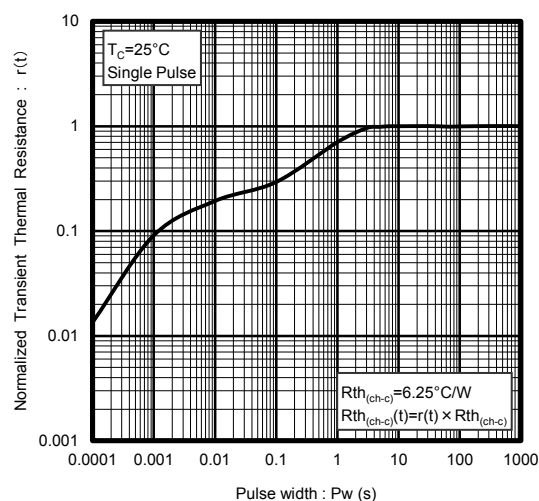


Fig.15 Normalized Transient Thermal Resistance v.s. Pulse Width



● Measurement circuits

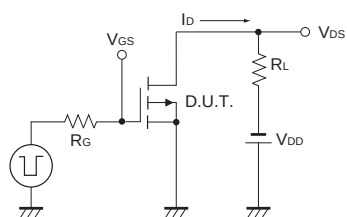


Fig.1-1 Switching Time Measurement Circuit

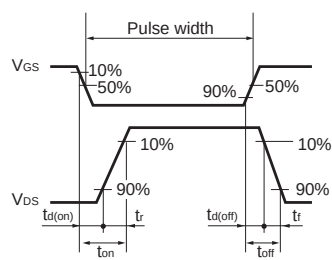


Fig.1-2 Switching Waveforms

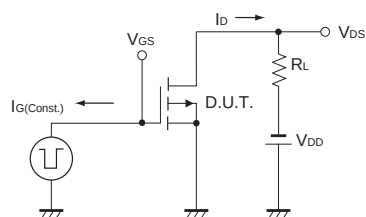


Fig.2-1 Gate Charge Measurement Circuit

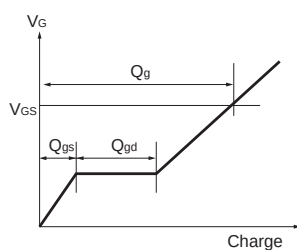


Fig.2-2 Gate Charge Waveform

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