

# 4V Drive Pch MOSFET

## RSY160P05

**●Structure**

Silicon P-channel MOSFET

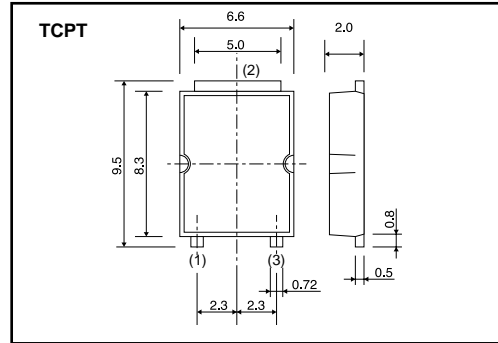
**●Features**

- 1) Low On-resistance.
- 2) Built-in G-S Protection Diode.
- 3) Same land pattern as CPT3 (D-PAK).

**●Application**

Switching

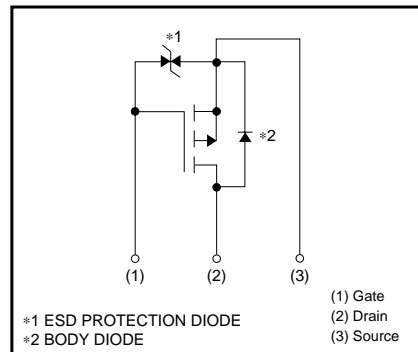
**●Dimensions (Unit : mm)**



**●Packaging specifications**

Type	Package	Taping
	Code	TL
	Basic ordering unit (pieces)	2500
RSY160P05		○

**●Equivalent circuit**



**●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	$I_D$	±16	A
	Pulsed	$I_{DP}$ *1	±32	A
Source current (Body diode)	Continuous	$I_S$	-16	A
	Pulsed	$I_{SP}$ *1	-32	A
Total power dissipation	$P_D$ *2	20	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  $T_c = 25^\circ C$

**●Thermal resistance**

Parameter	Symbol	Limits	Unit
Channel to ambient	$R_{th(ch-c)}$ *	6.25	°C / W

\*  $T_c = 25^\circ C$

## Transistors

## ●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	$V_{(BR) DSS}$	–45	–	–	V	$I_D = -1mA, V_{GS} = 0V$
Zero gate voltage drain current	$I_{DSS}$	–	–	–1	μA	$V_{DS} = -45V, V_{GS} = 0V$
Gate threshold voltage	$V_{GS(th)}$	–1.0	–	–2.5	V	$V_{DS} = -10V, I_D = -1mA$
Static drain-source on-state resistance	$R_{DS(on)}$ *	–	35	50	mΩ	$I_D = -16A, V_{GS} = -10V$
		–	45	63	mΩ	$I_D = -8A, V_{GS} = -4.5V$
		–	50	70	mΩ	$I_D = -8A, V_{GS} = -4.0V$
Forward transfer admittance	$ Y_{fs} $ *	8.5	–	–	S	$V_{DS} = -10V, I_D = -8A$
Input capacitance	$C_{iss}$	–	2150	–	pF	$V_{DS} = -10V$
Output capacitance	$C_{oss}$	–	250	–	pF	$V_{GS} = 0V$
Reverse transfer capacitance	$C_{rss}$	–	150	–	pF	$f = 1MHz$
Turn-on delay time	$t_{d(on)}$ *	–	13	–	ns	$I_D = -10A$
Rise time	$t_r$ *	–	30	–	ns	$V_{DD} = -25V$ $V_{GS} = -10V$
Turn-off delay time	$t_{d(off)}$ *	–	90	–	ns	$R_L = 2.5\Omega$
Fall time	$t_f$ *	–	105	–	ns	$R_G = 10\Omega$
Total gate charge	$Q_g$ *	–	17.0	25.5	nC	$V_{DD} = -25V, I_D = -10A$
Gate-source charge	$Q_{gs}$ *	–	5.2	–	nC	$V_{GS} = -5V$
Gate-drain charge	$Q_{gd}$ *	–	5.5	–	nC	$R_L = 2.5\Omega, R_G = 10\Omega$

\*Pulsed

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

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

\*Pulsed

Transistors

●Electrical characteristic curves

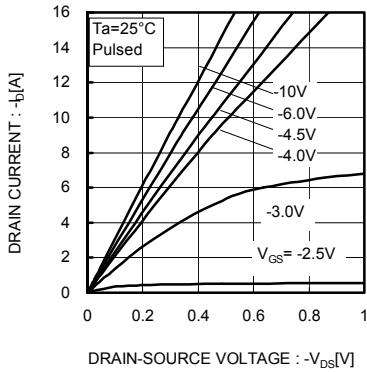


Fig.1 Typical Output Characteristics ( I )

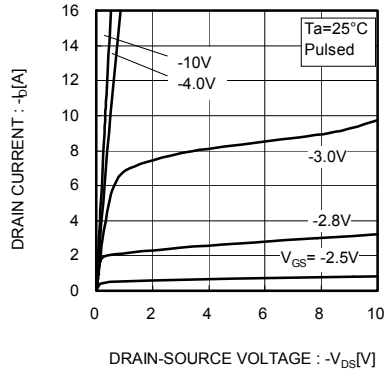


Fig.2 Typical Output Characteristics ( II )

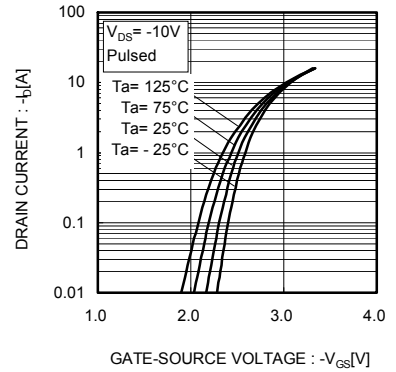


Fig.3 Typical Transfer Characteristics

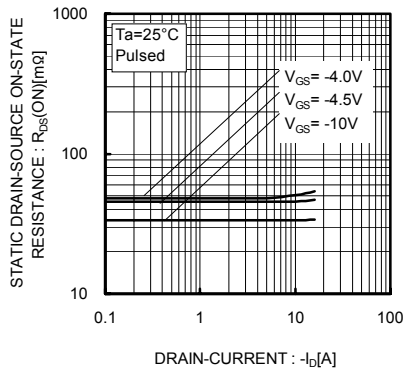


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current( I )

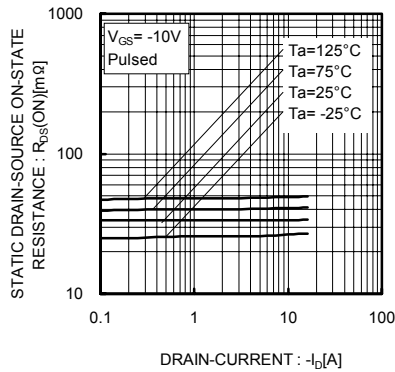


Fig.5 Static Drain-Source On-State Resistance vs. Drain Current( II )

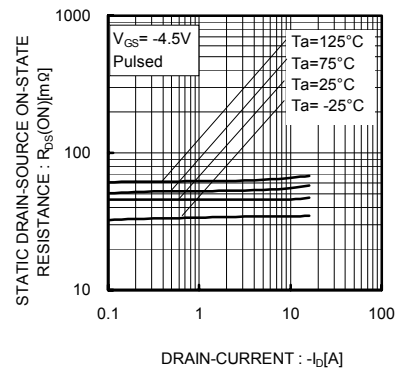


Fig.6 Static Drain-Source On-State Resistance vs. Drain Current( III )

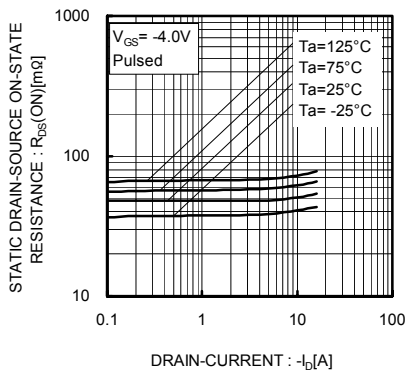


Fig.7 Static Drain-Source On-State Resistance vs. Drain Current(IV)

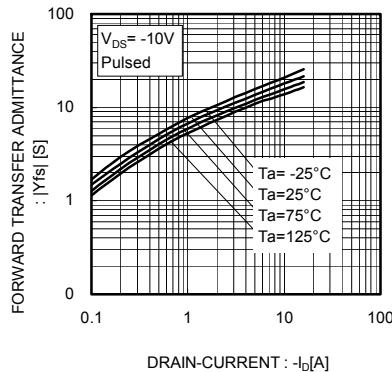


Fig.8 Forward Transfer Admittance vs. Drain Current

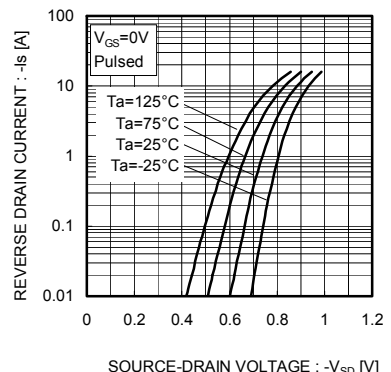


Fig.9 Reverse Drain Current vs. Source-Drain Voltage

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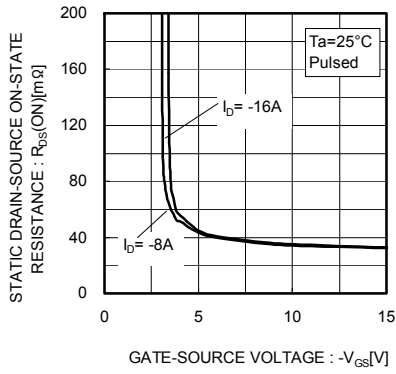


Fig. 10 Static Drain-Source On-State Resistance vs. Gate Source

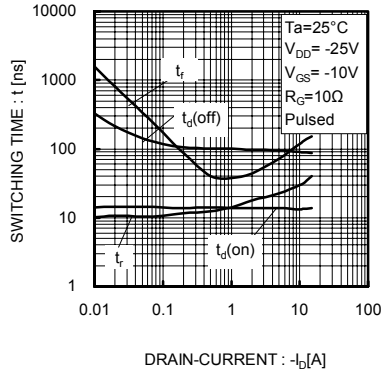


Fig. 11 Switching Characteristics

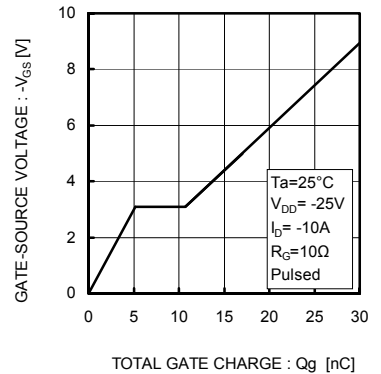


Fig. 12 Dynamic Input Characteristics

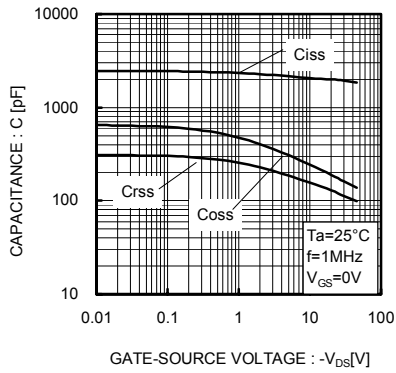


Fig. 13 Typical Capacitance vs. Drain-Source Voltage

Transistors

● Measurement circuits

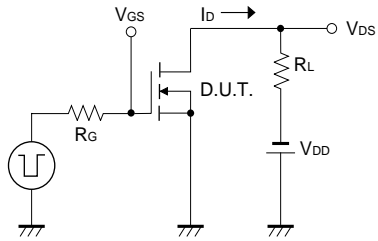


Fig.14 Switching Time Test Circuit

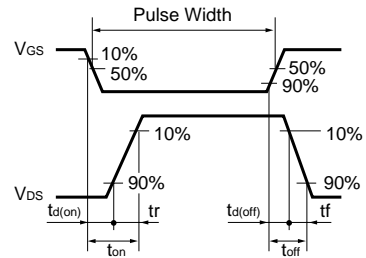


Fig.15 Switching Time Waveforms

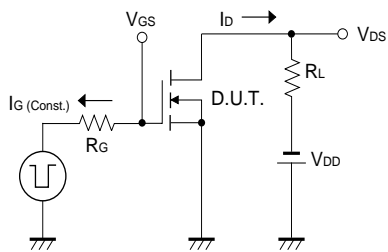


Fig.16 Gate Charge Test Circuit

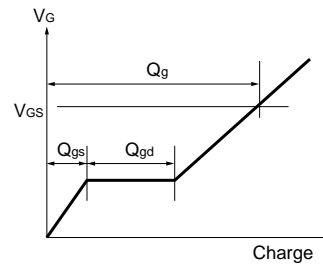


Fig.17 Gate Charge Waveform

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