

10V Drive Nch MOSFET

R5205CND

● Structure

Silicon N-channel MOSFET

● Features

- 1) Low resistance.
- 2) High speed switching.

● Application

Switching

● Packaging specifications

Type	Package	Taping
	Code	TL
	Basic ordering unit (pieces)	2500
R5205CND		○

● Absolute maximum ratings (Ta = 25°C)

Parameter		Symbol	Limits	Unit
Drain-source voltage		V_{DS}	525	V
Gate-source voltage		V_{GS}	± 30	V
Drain current	Continuous	I_D *1	± 5	A
	Pulsed	I_{DP} *2	± 20	A
Source current (Body Diode)	Continuous	I_S *1	5	A
	Pulsed	I_{SP} *2	20	A
Avalanche current		I_{AS} *3	2.5	A
Avalanche energy		E_{AS} *3	1.6	mJ
Total power dissipation (Tc=25°C)		P_D	40	W
Channel temperature		Tch	150	°C
Range of storage temperature		Tstg	-55 to +150	°C

*1 Limited only by maximum temperature allowed.

*2 $P_W \leq 10 \mu s$ Duty Cycle $\leq 1\%$

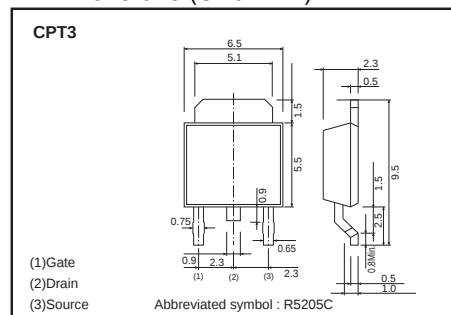
*3 $L = 500 \mu H$, $V_{DD} = 50V$, $R_g = 25 \Omega$ STARTING Tch=25°C

● Thermal resistance

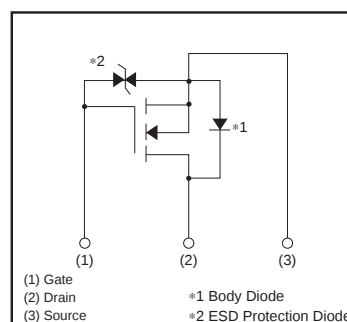
Parameter	Symbol	Limits	Unit
Channel to case	$R_{th}(ch-c)^*$	3.13	°C / W

* Limited only by maximum temperature allowed.

● Dimensions (Unit : mm)



● Inner circuit



● Electrical characteristics (Ta = 25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Gate-source leakage	I_{GSS}	-	-	± 10	μA	$V_{GS} = \pm 25V, V_{DS} = 0V$
Drain-source breakdown voltage	$V_{(BR)DSS}$	525	-	-	V	$I_D = 1mA, V_{GS} = 0V$
Zero gate voltage drain current	I_{DSS}	-	-	100	μA	$V_{DS} = 525V, V_{GS} = 0V$
Gate threshold voltage	$V_{GS(th)}$	2.5	-	4.5	V	$V_{DS} = 10V, I_D = 1mA$
Static drain-source on-state resistance	$R_{DS(on)}^*$	-	1.3	1.6	Ω	$I_D = 2.5A, V_{GS} = 10V$
Forward transfer admittance	$ Y_{fs} ^*$	1.5	2.5	-	S	$V_{DS} = 10V, I_D = 2.5A$
Input capacitance	C_{iss}	-	320	-	pF	$V_{DS} = 25V$
Output capacitance	C_{oss}	-	180	-	pF	$V_{GS} = 0V$
Reverse transfer capacitance	C_{rss}	-	15	-	pF	$f = 1MHz$
Turn-on delay time	$t_{d(on)}^*$	-	20	-	ns	$V_{DD} = 250V, I_D = 2.5A$
Rise time	t_r^*	-	25	-	ns	$V_{GS} = 10V$
Turn-off delay time	$t_{d(off)}^*$	-	40	-	ns	$R_L = 100\Omega$
Fall time	t_f^*	-	20	-	ns	$R_G = 10\Omega$
Total gate charge	Q_g^*	-	10.8	-	nC	$V_{DD} = 250V, I_D = 5A$
Gate-source charge	Q_{gs}^*	-	3.2	-	nC	$V_{GS} = 10V, R_L = 50\Omega$
Gate-drain charge	Q_{gd}^*	-	4.4	-	nC	$R_G = 10\Omega$

*Pulsed

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Forward voltage	V_{SD}^*	-	-	1.5	V	$I_s = 5A, V_{GS} = 0V$

*Pulsed

●Electrical characteristic curves

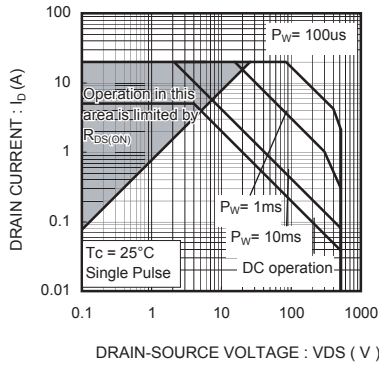


Fig.1 Maximum Safe Operating Area

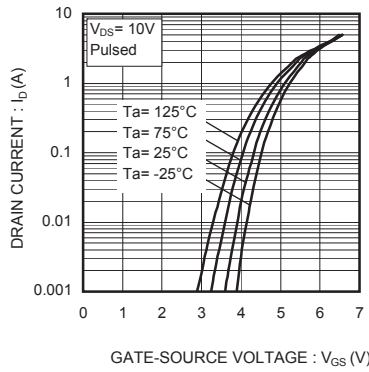


Fig.2 Typical Transfer Characteristics

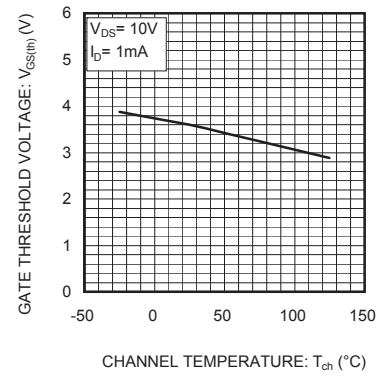


Fig.3 Gate Threshold Voltage vs. Channel Temperature

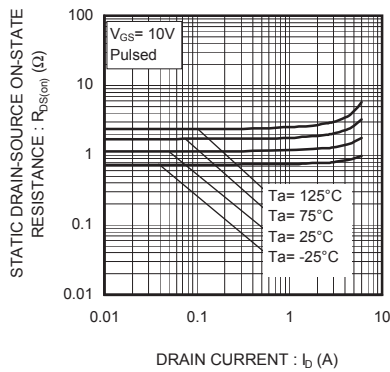


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current

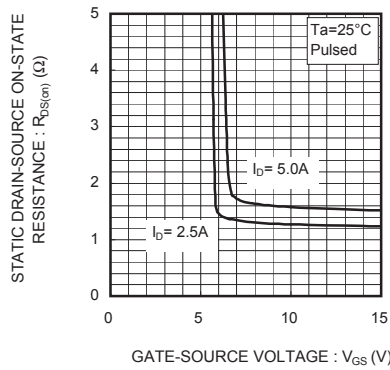


Fig.5 Static Drain-Source On-State Resistance vs. Gate Source

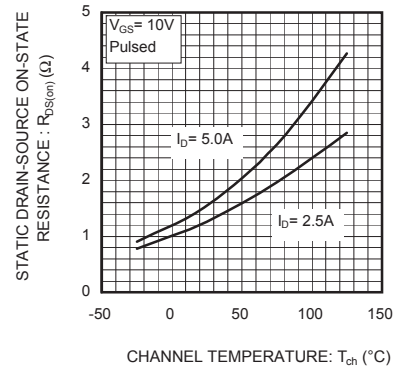


Fig.6 Static Drain-Source On-State Resistance vs. Channel

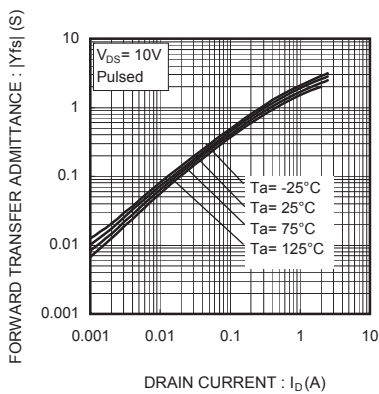


Fig.7 Forward Transfer Admittance vs. Drain Current

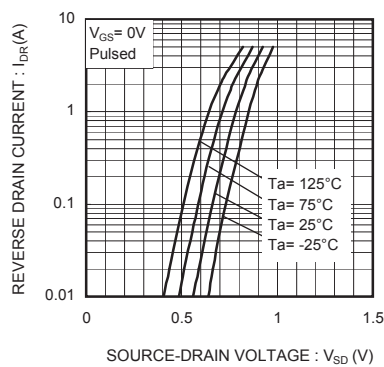


Fig.8 Reverse Drain Current vs. Source-Drain Voltage

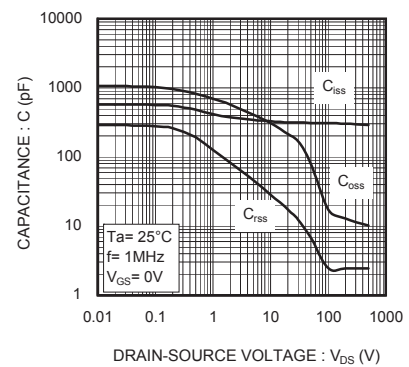
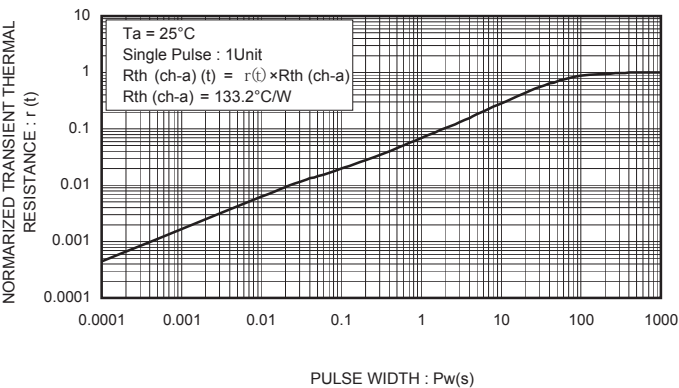
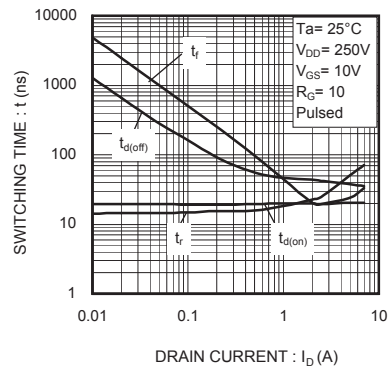
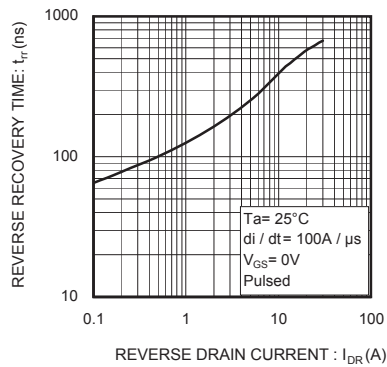
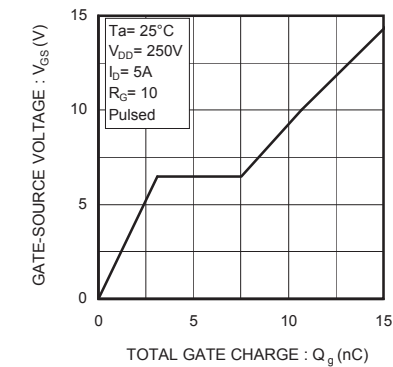


Fig.9 Typical Capacitance vs. Drain-Source Voltage



●Measurement circuits

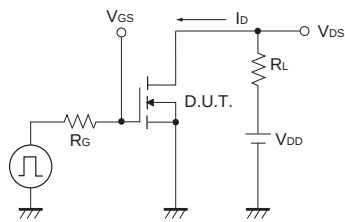


Fig.1-1 Switching time measurement circuit

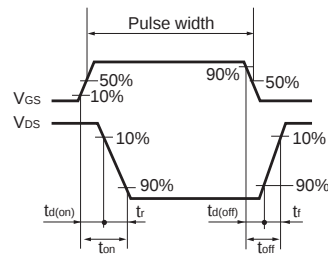


Fig.1-2 Switching waveforms

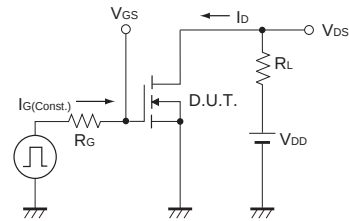


Fig.2-1 Gate charge measurement circuit

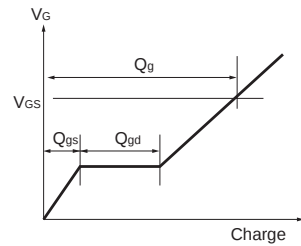


Fig.2-2 Gate charge waveform

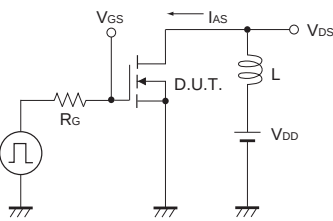


Fig.3-1 Avalanche Measurement circuit

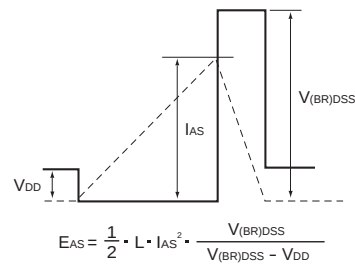


Fig.3-2 Avalanche waveform

Notes

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