

ANTREX Electronics

Electronic Components Sourcing Information

Product Reference Information

Part Number: RSD050N10TL
Manufacturer: Rohm Semiconductor
Package: Please confirm with sales
Availability: Please confirm with sales

Product Page:

<https://antrexco.com/product/details/rohm-semiconductor/rsd050n10tl.html>

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New & Original Components

Supplier verification and packaging condition review

CoC / RoHS / REACH documents available on request

Secure sourcing support for OEM / EMS projects

Note:

This PDF includes an ANTREX product reference cover page.

The original manufacturer datasheet follows from the next page.

4V Drive Nch MOSFET

RSD050N10

●Structure

Silicon N-channel MOSFET

●Features

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

●Applications

Switching

●Packaging specifications

Type	Package	CPT3
	Code	TL
	Basic ordering unit (pieces)	2500

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

Parameter		Symbol	Limits	Unit
Drain-source voltage		V_{DSS}	100	V
Gate-source voltage		V_{GSS}	± 20	V
Drain current	Continuous	I_D	± 5.0	A
	Pulsed	I_{DP}^{*1}	± 20	A
Source current (Body Diode)	Continuous	I_S	5.0	A
	Pulsed	I_{SP}^{*1}	20	A
Power dissipation		P_D^{*2}	15	W
Channel temperature		T_{ch}	150	$^{\circ}\text{C}$
Range of storage temperature		T_{stg}	-55 to $+150$	$^{\circ}\text{C}$

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

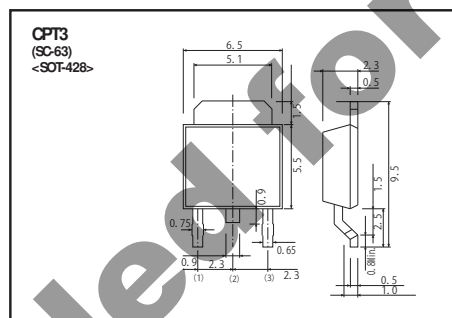
*2 $T_c = 25^\circ\text{C}$

- Thermal resistance

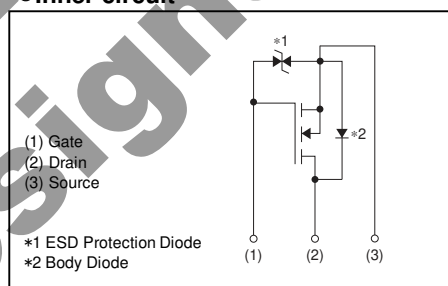
Parameter	Symbol	Limits	Unit
Channel to Case	$R_{th(ch-c)}^*$	8.33	°C / W

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

● **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	$V_{\text{GS}}=\pm 20\text{V}$, $V_{\text{DS}}=0\text{V}$
Drain-source breakdown voltage	$V_{(\text{BR})\text{DSS}}$	100	-	-	V	$I_{\text{D}}=1\text{mA}$, $V_{\text{GS}}=0\text{V}$
Zero gate voltage drain current	I_{DSS}	-	-	10	μA	$V_{\text{DS}}=100\text{V}$, $V_{\text{GS}}=0\text{V}$
Gate threshold voltage	$V_{\text{GS(th)}}$	1.0	-	2.5	V	$V_{\text{DS}}=10\text{V}$, $I_{\text{D}}=1\text{mA}$
Static drain-source on-state resistance	$R_{\text{DS(on)}}^*$	-	135	190	m Ω	$I_{\text{D}}=5.0\text{A}$, $V_{\text{GS}}=10\text{V}$
		-	142	200		$I_{\text{D}}=5.0\text{A}$, $V_{\text{GS}}=4.5\text{V}$
		-	145	205		$I_{\text{D}}=5.0\text{A}$, $V_{\text{GS}}=4.0\text{V}$
Forward transfer admittance	$ Y_{\text{fs}} ^*$	2.5	-	-	S	$I_{\text{D}}=5.0\text{A}$, $V_{\text{DS}}=10\text{V}$
Input capacitance	C_{ISS}	-	530	-	pF	$V_{\text{DS}}=25\text{V}$
Output capacitance	C_{OSS}	-	50	-	pF	$V_{\text{GS}}=0\text{V}$
Reverse transfer capacitance	C_{RSS}	-	30	-	pF	$f=1\text{MHz}$
Turn-on delay time	$t_{\text{d(on)}}^*$	-	10	-	ns	$I_{\text{D}}=2.5\text{A}$, $V_{\text{DD}}=50\text{V}$
Rise time	t_{r}^*	-	15	-	ns	$V_{\text{GS}}=10\text{V}$
Turn-off delay time	$t_{\text{d(off)}}^*$	-	45	-	ns	$R_{\text{L}}=20\Omega$
Fall time	t_{f}^*	-	15	-	ns	$R_{\text{G}}=10\Omega$
Total gate charge	Q_{g}^*	-	14	-	nC	$V_{\text{DD}}=50\text{V}$
Gate-source charge	Q_{gs}^*	-	1.7	-	nC	$I_{\text{D}}=5.0\text{A}$,
Gate-drain charge	Q_{gd}^*	-	3.0	-	nC	$V_{\text{GS}}=10\text{V}$

*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	$I_{\text{S}}=5.0\text{A}$, $V_{\text{GS}}=0\text{V}$

*Pulsed

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

Fig.1 Typical Output Characteristics (I)

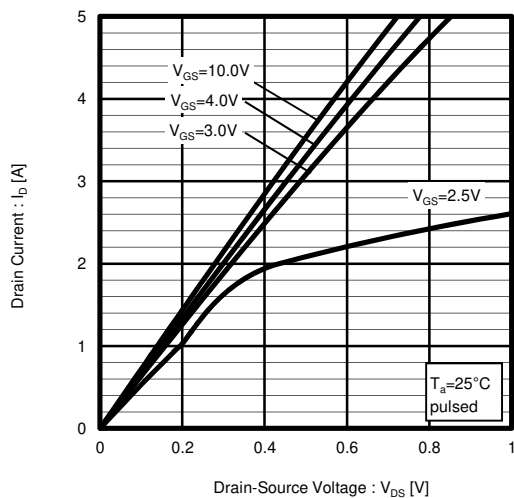


Fig.2 Typical Output Characteristics (II)

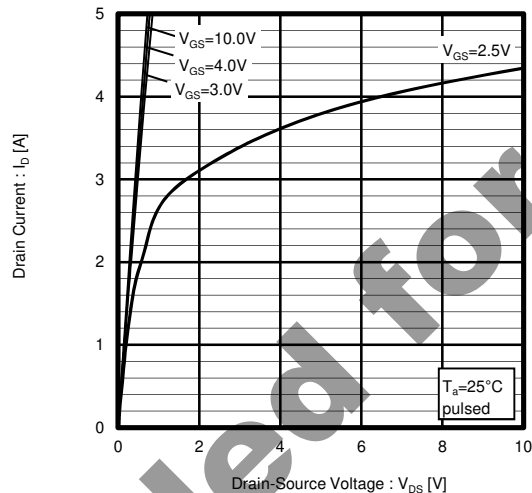


Fig.3 Static Drain-Source On-State Resistance vs. Drain Current

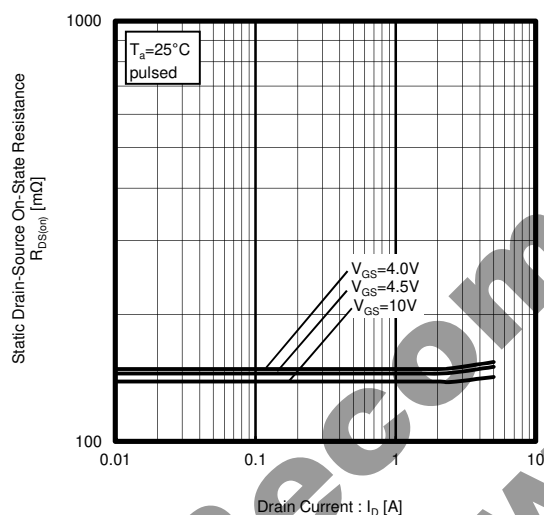


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current

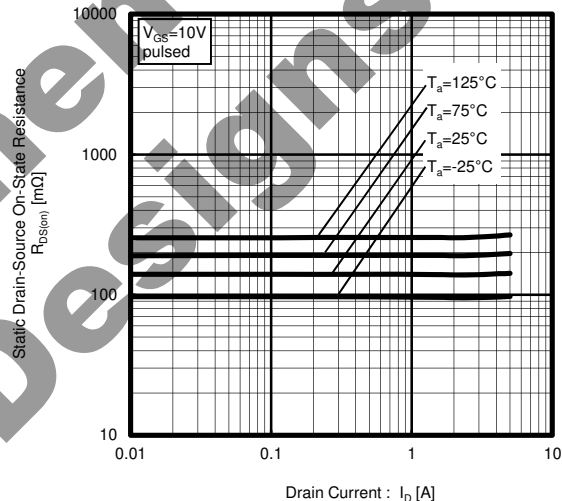


Fig.5 Static Drain-Source On-State Resistance vs. Drain Current

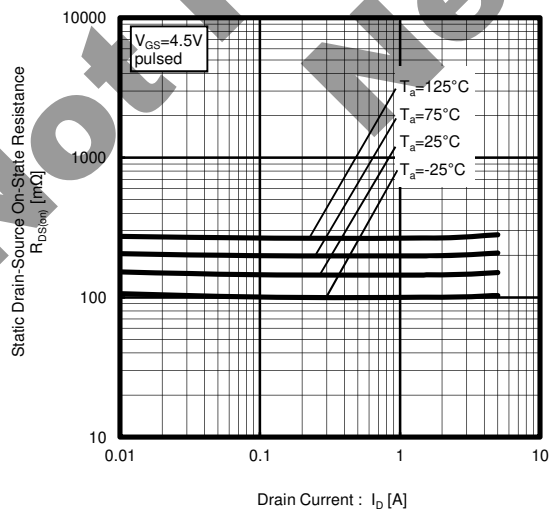


Fig.6 Static Drain-Source On-State Resistance vs. Drain Current

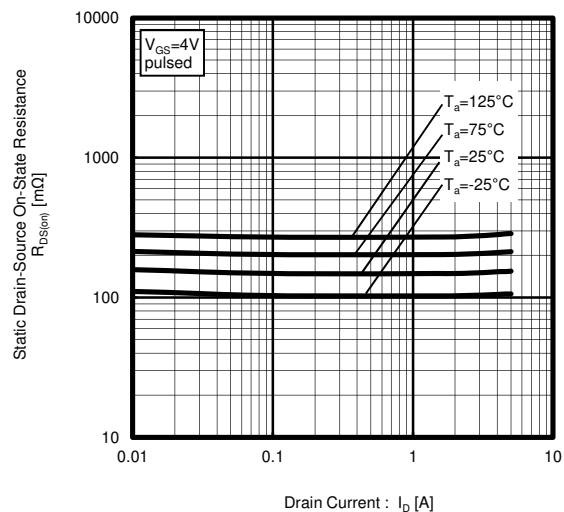


Fig.7 Forward Transfer Admittance vs. Drain Current

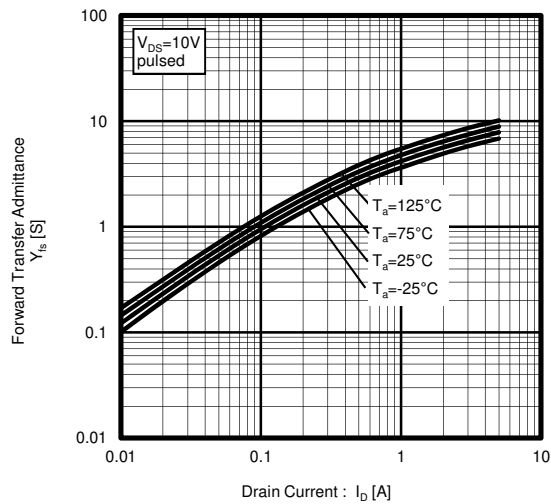


Fig.8 Typical Transfer Characteristics

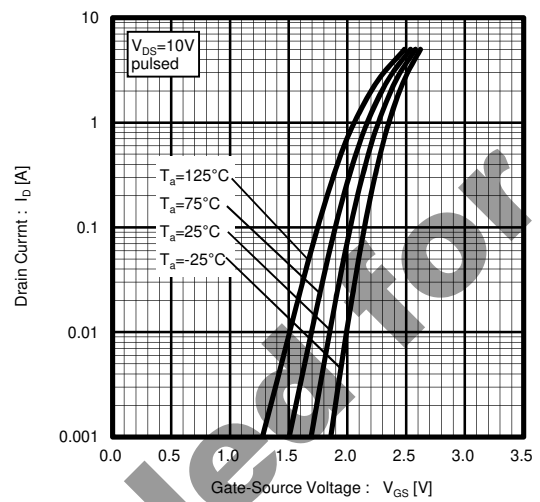


Fig.9 Source Current vs. Source-Drain Voltage

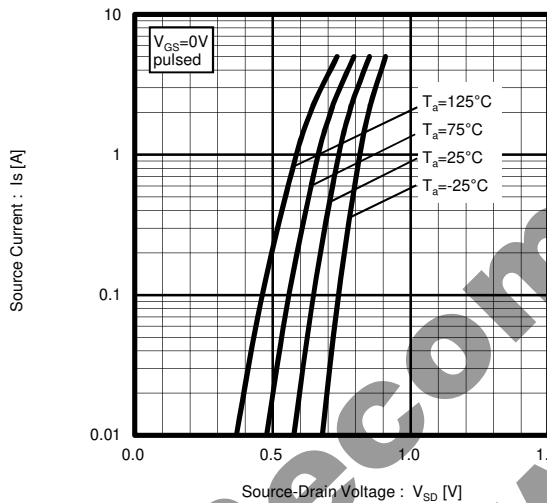


Fig.10 Static Drain-Source On-State Resistance vs. Gate-Source Voltage

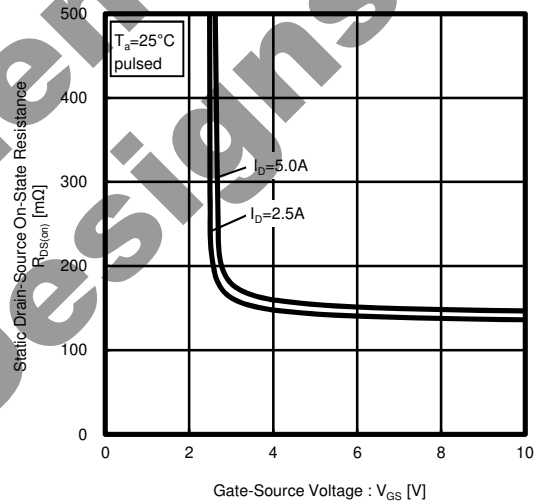


Fig.11 Switching Characteristics

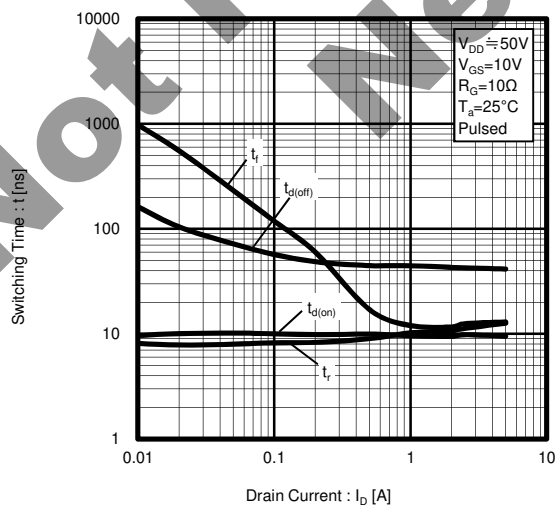


Fig.12 Dynamic Input Characteristics

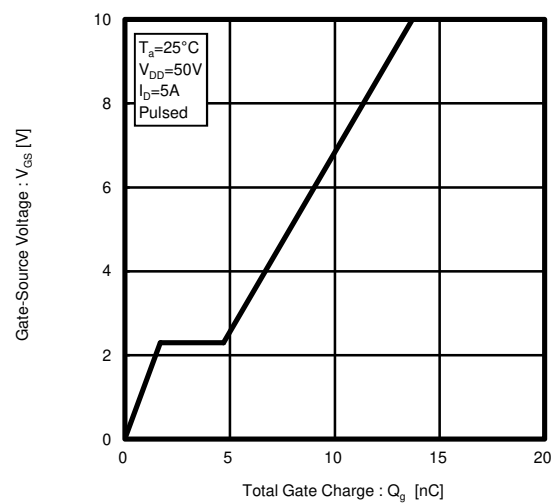


Fig.13 Typical Capacitance vs. Drain-Source Voltage

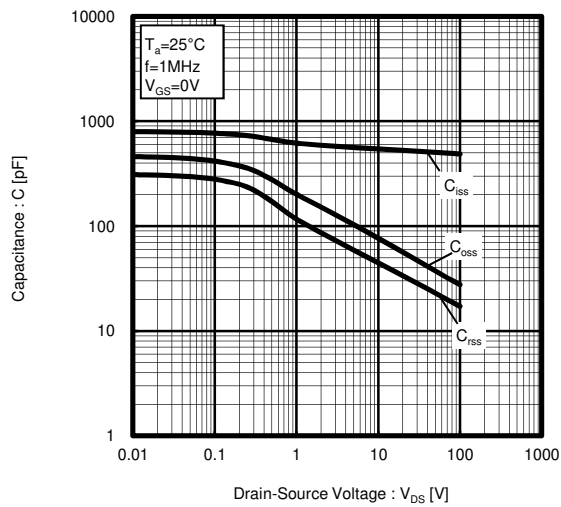


Fig.14 Maximum Safe Operating Area

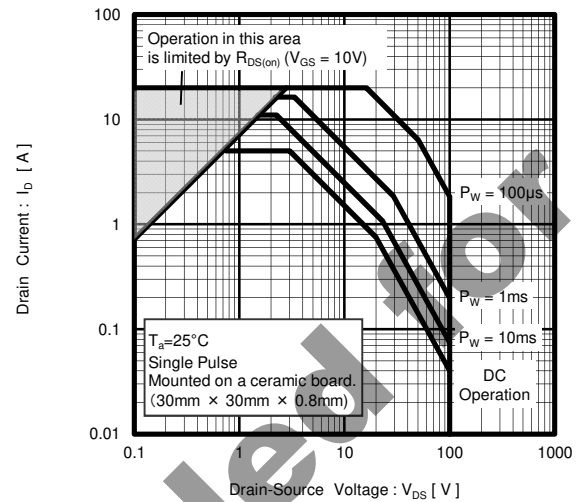
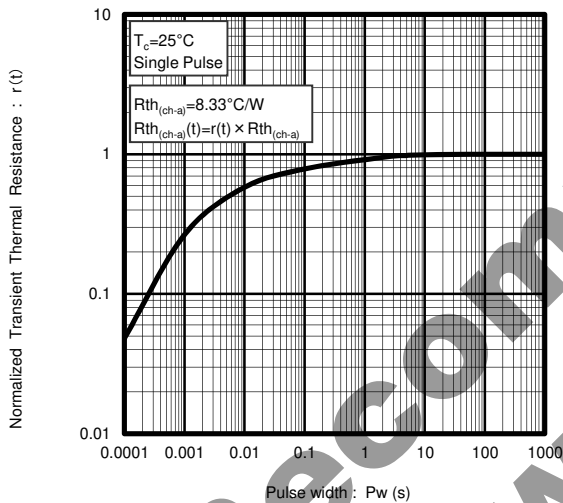


Fig.15 Normalized Transient Thermal Resistance v.s. Pulse Width



●Measurement circuits

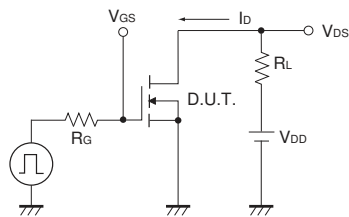


Fig.1-1 Switching time measurement circuit

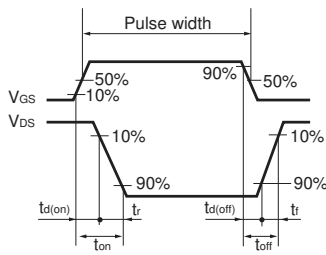


Fig.1-2 Switching waveforms

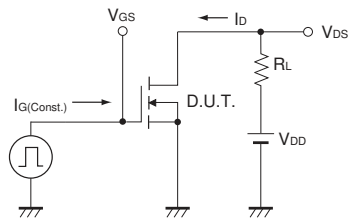


Fig.2-1 Gate charge measurement circuit

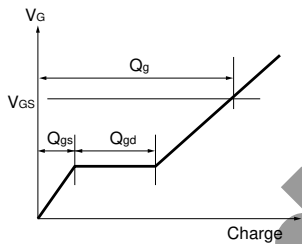


Fig.2-2 Gate Charge Waveform

Notes

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