Transistor

# Switching (45V, 7.0A) **RSS070N05**

#### Features

1) Built-in G-S Protection Diode.

2) Small and Surface Mount Package (SOP8).

## Applications

Power switching , DC / DC converter , Inverter

#### Structure

Silicon N-channel MOS FET

#### Packaging dimensions

Package	Taping
Code	TB
Basic ordering unit(pieces)	2500

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

Parameter	Symbol	Limits	Unit	
Drain-source voltage	V <sub>DSS</sub>	45	V	
Gate-source voltage	V <sub>GSS</sub>	20	V	
Drain current	Continuous	I <sub>D</sub>	±7.0	А
	Pulsed	I <sub>DP</sub>	±28	Α *΄
Source current	Continuous	ا <sub>s</sub>	1.6	А
(Body diode)	Pulsed	I <sub>SP</sub>	28	Α *΄
Total power dissipation	PD	2	W *2	
Chanel temperature	T <sub>ch</sub>	150	°C	
Range of Storage temp	T <sub>stg</sub>	-55 to +150	°C	

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

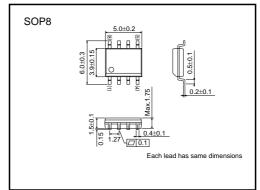
\*2 Mounted on a ceramic board

## •Thermal resistance (Ta=25°C)

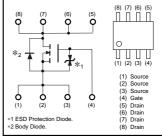
Parameter	Symbol	Limits	Unit	
Chanel to ambient	R <sub>th(ch-a)</sub>	62.5	°C/W *2	
*2 Mounted on a ceramic board				

Mounted on a ceramic board

## •External dimensions (Unit : mm)



#### Equivalent circuit



A protection diode is included between the gate and the source terminals to protect the diode against static electricity when the product is in use.Use a protection circuit when the fixed voltage are exceeded.

# Transistor

## ●Electrical characteristics (Ta=25°C)

Parameter	Symbol	Min.	Тур.	Max.	Unit	Condition
Gate-source leakage	I <sub>GSS</sub>	_	-	10	μA	V <sub>GS</sub> =20V/V <sub>DS</sub> =0V
Drain-source breakdown voltage	V <sub>(BR)DSS</sub>	45	-	_	V	I <sub>D</sub> =1mA/V <sub>GS</sub> =0V
Zero gate voltage drain current	I <sub>DSS</sub>	_	-	1	μΑ	V <sub>DS</sub> =45V/V <sub>GS</sub> =0V
Gate threshold voltage	V <sub>GS(th)</sub>	1.0	-	2.5	V	V <sub>DS</sub> =10V/I <sub>D</sub> =1mA
Static drain-source on-state resistance		_	18	25	mΩ	I <sub>D</sub> =7A/V <sub>GS</sub> =10V
	R <sub>DS(on)</sub> *	—	23	32		$I_D=7A/V_{GS}=4.5V$
		_	25	35		I <sub>D</sub> =7A/V <sub>GS</sub> =4.0V
Forward transfer admittance	Y <sub>fs</sub>   *	6.0	—	—	S	V <sub>DS</sub> =10V/I <sub>D</sub> =7A
Input capacitance	C <sub>iss</sub>	_	1000	_	pF	V <sub>DS</sub> =10V
Output capacitance	C <sub>oss</sub>	_	230	_		V <sub>GS</sub> =0V
Reverce transfer capacitance	C <sub>rss</sub>	_	125	_	1	f=1MHz
Turn-on delay time	t <sub>d(on)</sub> *	_	16	_		V <sub>DD</sub> =25V
Rise time	t <sub>r</sub> *	_	27	_		I <sub>D</sub> =3.5A
Turn-off delay time	t <sub>d(off)</sub> *	_	57	_	ns	V <sub>GS</sub> =10V
Fall time	t <sub>f</sub> *	_	21	_		$R_L=7.1\Omega/R_G=10\Omega$
Total gate charge	Q <sub>g</sub> *	—	12.0	16.8	nC	$V_{DD}=25V/I_{D}=7 A$
Gate-source charge	Q <sub>gs</sub> *	_	3.0	_		V <sub>GS</sub> =5V
Gate-drain charge	Q <sub>qd</sub> *	_	4.6	—		$R_L=3.6\Omega/R_G=10\Omega$

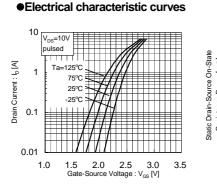
\* pulsed

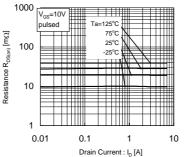
## •Body diode characteristics (Source-Drain)

Parameter	Symbol	Min.	Тур.	Max.	Unit	Condition
Forward voltage	V <sub>SD</sub> *	—	_	1.2	V	I <sub>S</sub> =1.6A/V <sub>GS</sub> =0V
* pulsed						

# RSS070N05

## Transistor





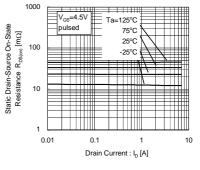


Fig.1 Typical Transfer Characteristics

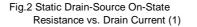


Fig.3 Static Drain-Source On-State Resistance vs. Drain Current (2)

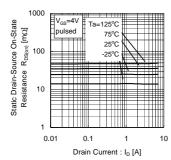


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current (3)

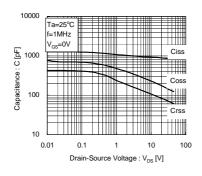
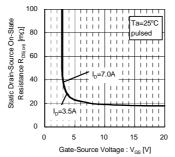


Fig.7 Typical capacitance vs. Source-Drain Voltage





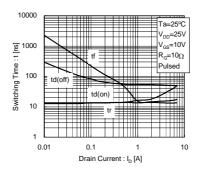


Fig.8 Switching Characteristics

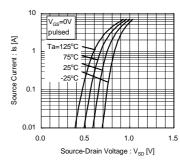
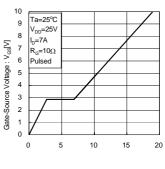


Fig.6 Source-Current vs. Source-Drain Voltage



Total Gate Charge : Qg [nC]



## Transistor

## Measurement circuits

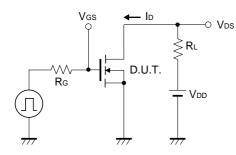


Fig.10 Switching Time Test Circuit

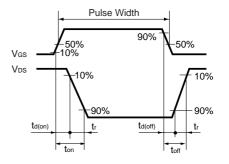


Fig.11 Switching Time Waveforms

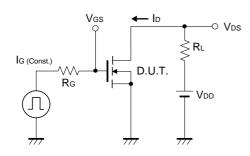
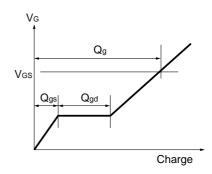


Fig.12 Gate Charge Test Circuit





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