

# 4V Drive Pch MOS FET

## RSQ030P03

### ●Structure

Silicon P-channel MOS FET

### ●Features

- 1) Low On-resistance.(90mΩ at 4.5V)
- 2) High Power Package. ( $P_D=1.25W$ )
- 3) High speed switching.
- 4) Low voltage drive. (4V)

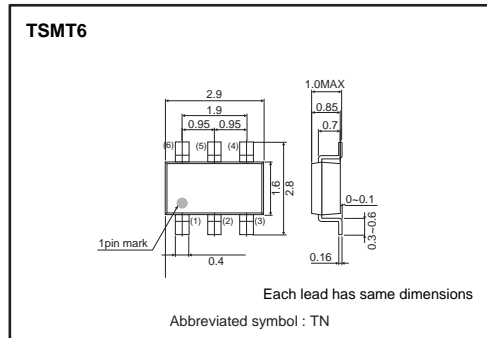
### ●Applications

DC-DC converter

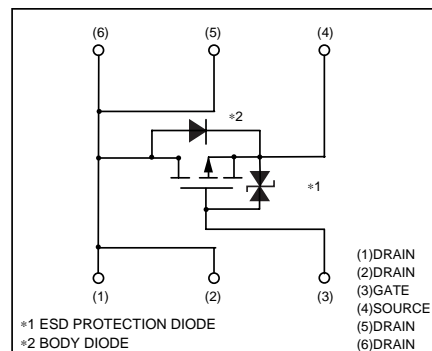
### ●Packaging specifications

Type	Package	Taping
	Code	TR
	Basic ordering unit (pieces)	3000
RSQ030P03		○

### ●External dimensions (Unit : mm)



### ●Equivalent circuit



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

Parameter	Symbol	Limits	Unit	
Drain-source voltage	$V_{DS}$	-30	V	
Gate-source voltage	$V_{GS}$	$\pm 20$	V	
Drain current	Continuous	$I_D$	$\pm 3$	A
	Pulsed	$I_{DP}$ *1	$\pm 12$	A
Source current (Body diode)	Continuous	$I_S$	-1	A
	Pulsed	$I_{SP}$ *1	-4	A
Total power dissipation	$P_D$ *2	1.25	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 Mounted on a ceramic board

### ●Thermal resistance

Parameter	Symbol	Limits	Unit
Channel to ambient	$R_{th(ch-a)}$ *	100	$^\circ\text{C} / \text{W}$

\* Mounted on a ceramic board.

## Transistor

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
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>	–30	–	–	V	I <sub>D</sub> =–1mA, V <sub>GS</sub> =0V
Zero gate voltage drain current	I <sub>DSS</sub>	–	–	–1	μA	V <sub>DS</sub> =–30V, 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	R <sub>DS(on)</sub> *	–	60	80	mΩ	I <sub>D</sub> =–3A, V <sub>GS</sub> =–10V
		–	90	125	mΩ	I <sub>D</sub> =–3A, V <sub>GS</sub> =–4.5V
		–	100	140	mΩ	I <sub>D</sub> =–1.5A, V <sub>GS</sub> =–4.0V
Forward transfer admittance	Y <sub>fs</sub>   *	1.5	–	–	S	V <sub>DS</sub> =–10V, I <sub>D</sub> =–1.5A
Input capacitance	C <sub>iss</sub>	–	440	–	pF	V <sub>DS</sub> =–10V, V <sub>GS</sub> =0V f=1MHz
Output capacitance	C <sub>oss</sub>	–	110	–	pF	
Reverse transfer capacitance	C <sub>rss</sub>	–	80	–	pF	
Turn-on delay time	t <sub>d(on)</sub> *	–	10	–	ns	I <sub>D</sub> =–1.5A V <sub>DD</sub> =–15V V <sub>GS</sub> =–10V R <sub>L</sub> =10Ω R <sub>G</sub> =10Ω
Rise time	t <sub>r</sub> *	–	13	–	ns	
Turn-off delay time	t <sub>d(off)</sub> *	–	40	–	ns	
Fall time	t <sub>f</sub> *	–	12	–	ns	
Total gate charge	Q <sub>g</sub>	–	6.0	–	nC	V <sub>DD</sub> =–15V V <sub>GS</sub> =–5V I <sub>D</sub> =–3A
Gate-source charge	Q <sub>gs</sub>	–	1.6	–	nC	
Gate-drain charge	Q <sub>gd</sub>	–	2.0	–	nC	

\*PULSED

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Forward voltage	V <sub>SD</sub>	–	–	–1.2	V	I <sub>S</sub> =–1A, V <sub>GS</sub> =0V

Transistor

●Electrical characteristic curves

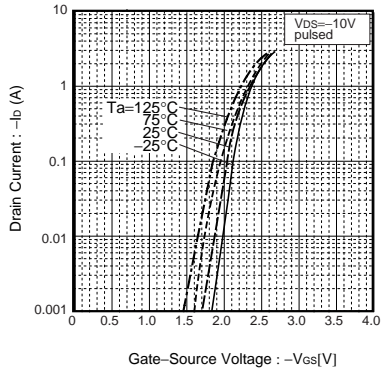


Fig.1 Typical Transfer Characteristics

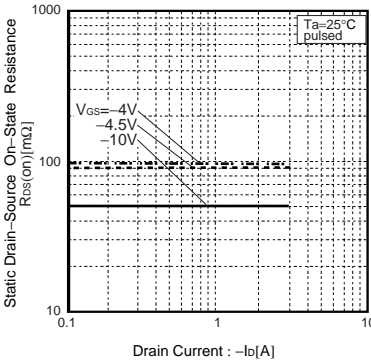


Fig.2 Static Drain-Source On-State Resistance vs. Drain Current

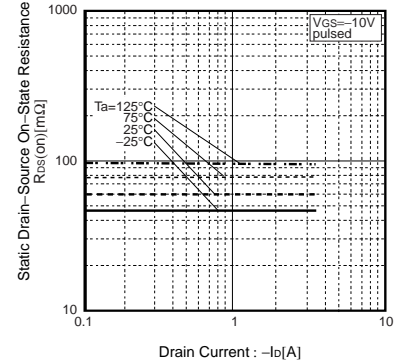


Fig.3 Static Drain-Source On-State Resistance vs. Drain Current

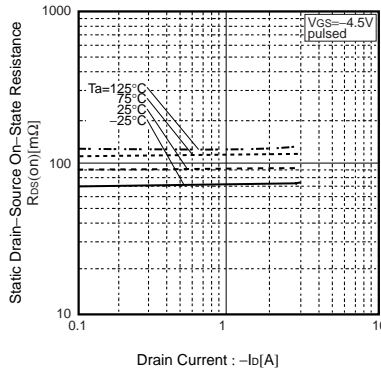


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current

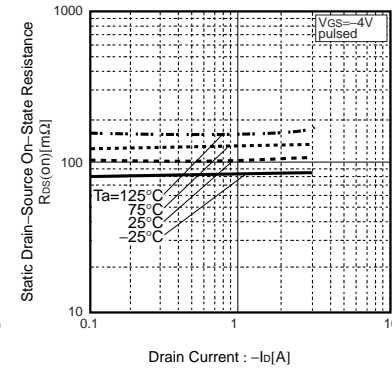


Fig.5 Static Drain-Source On-State Resistance vs. Drain Current

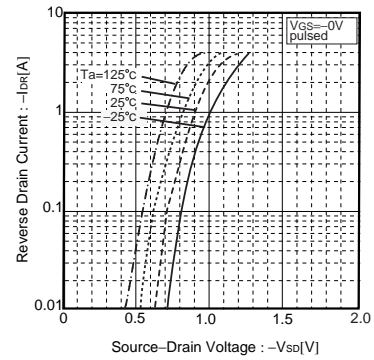


Fig.6 Reverse Drain Current Source-Drain Current

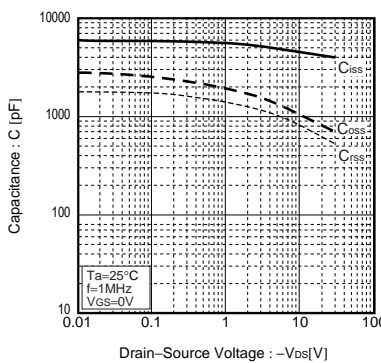


Fig.7 Typical Capacitance vs. Drain-Source Voltage

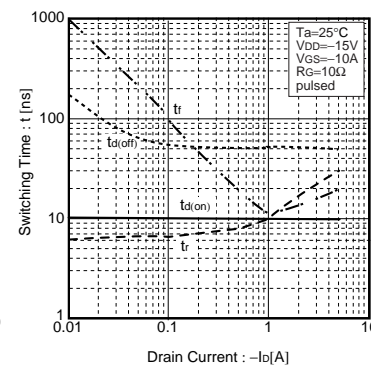


Fig.8 Switching Characteristics

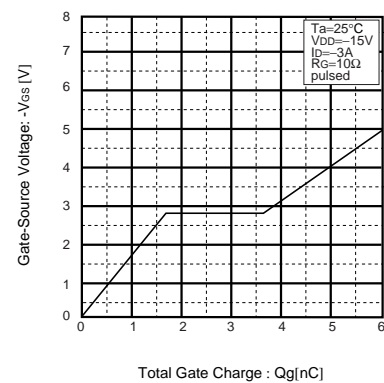


Fig.9 Dynamic Input Characteristics

Transistor

●Measurement circuits

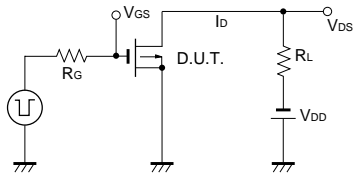


Fig.10 Switching Time Measurement Circuit

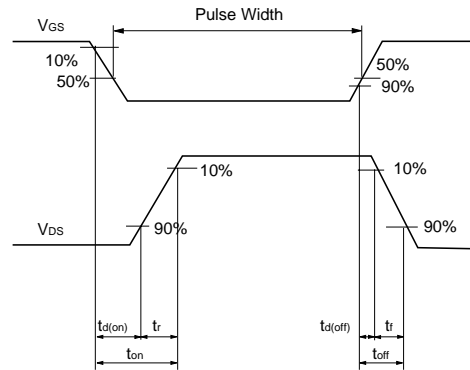


Fig.11 Switching Waveforms

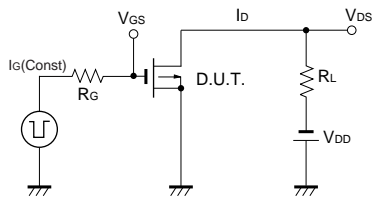


Fig.12 Gate Charge Measurement Circuit

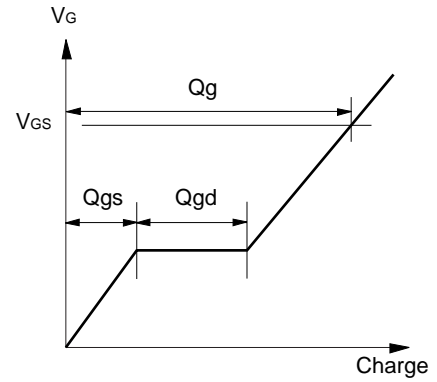


Fig.13 Gate Charge Waveforms

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