

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)

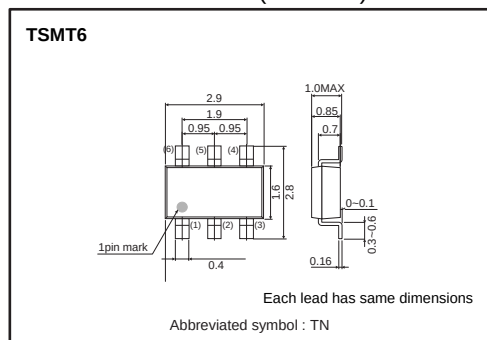
●Applications

DC-DC converter

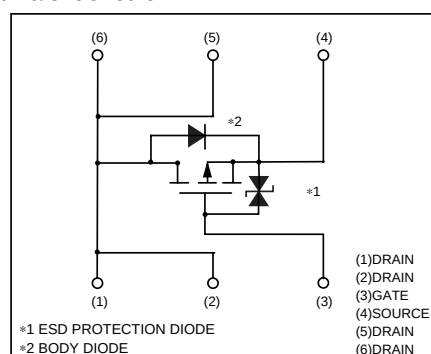
●Packaging specifications

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

●External dimensions (Unit : mm)



●Equivalent circuit



●Absolute maximum ratings (Ta=25°C)

Parameter		Symbol	Limits	Unit
Drain-source voltage		V_{DS}	-30	V
Gate-source voltage		V_{GS}	±20	V
Drain current	Continuous	I_D	±3	A
	Pulsed	I_{DP} *1	±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	°C
Range of Storage temperature		T_{stg}	-55 to +150	°C

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

*2 Mounted on a ceramic board

●Thermal resistance

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

* Mounted on a ceramic board.

Transistor

●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	$V_{(BR)DSS}$	–30	–	–	V	$I_D=-1mA$, $V_{GS}=0V$
Zero gate voltage drain current	I_{DSS}	–	–	–1	μA	$V_{DS}=-30V$, $V_{GS}=0V$
Gate threshold voltage	$V_{GS(th)}$	–1.0	–	–2.5	V	$V_{DS}=-10V$, $I_D=-1mA$
Static drain-source on-state resistance	$R_{DS(on)}^*$	–	60	80	m Ω	$I_D=-3A$, $V_{GS}=-10V$
		–	90	125	m Ω	$I_D=-3A$, $V_{GS}=-4.5V$
		–	100	140	m Ω	$I_D=-1.5A$, $V_{GS}=-4.0V$
Foward transfer admittance	$ Y_{fs} ^*$	1.5	–	–	S	$V_{DS}=-10V$, $I_D=-1.5A$
Input capacitance	C_{iss}	–	440	–	pF	$V_{DS}=-10V$, $V_{GS}=0V$ $f=1MHz$
Output capacitance	C_{oss}	–	110	–	pF	
Reverse transfer capacitance	C_{rss}	–	80	–	pF	
Turn-on delay time	$t_{d(on)}^*$	–	10	–	ns	$I_D=-1.5A$ $V_{DD}=-15V$ $V_{GS}=-10V$ $R_L=10\Omega$ $R_G=10\Omega$
Rise time	t_r^*	–	13	–	ns	
Turn-off delay time	$t_{d(off)}^*$	–	40	–	ns	
Fall time	t_f^*	–	12	–	ns	
Total gate charge	Q_g	–	6.0	–	nC	$V_{DD}=-15V$ $V_{GS}=-5V$ $I_D=-3A$
Gate-source charge	Q_{gs}	–	1.6	–	nC	
Gate-drain charge	Q_{gd}	–	2.0	–	nC	

*PULSED

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Forward voltage	V_{SD}	–	–	–1.2	V	$I_S=-1A$, $V_{GS}=0V$

Transistor

●Electrical characteristic curves

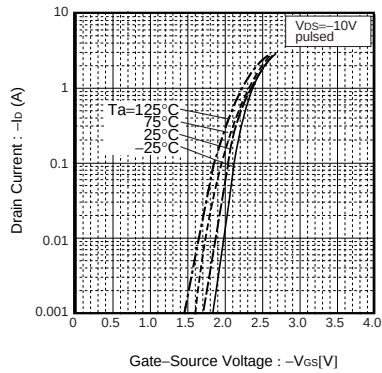


Fig.1 Typical Transfer Characteristics

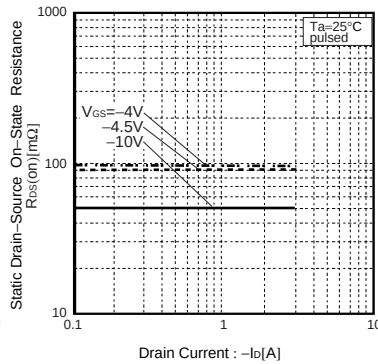


Fig.2 Static Drain-Source On-State Resistance vs. Drain Current

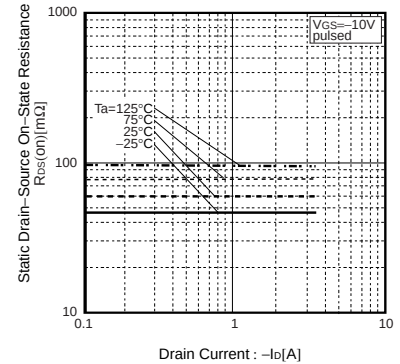


Fig.3 Static Drain-Source On-State Resistance vs. Drain Current

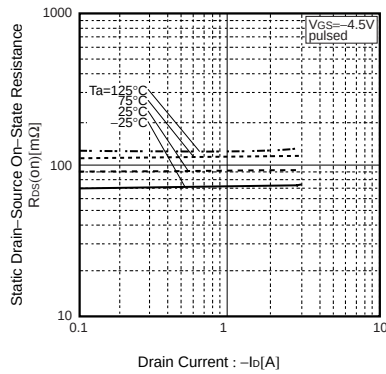


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current

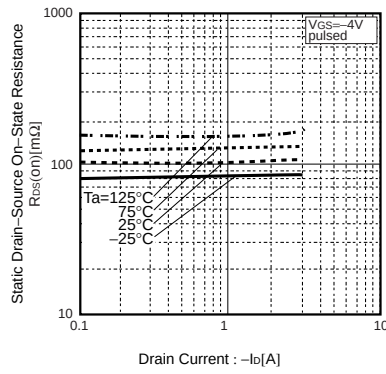


Fig.5 Static Drain-Source On-State Resistance vs. Drain Current

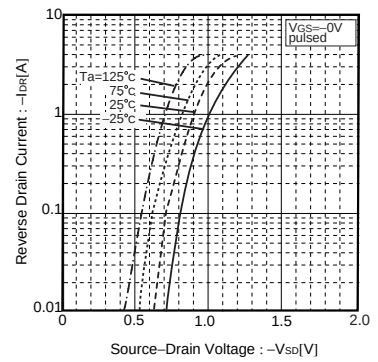


Fig.6 Reverse Drain Current vs. Source-Drain Voltage

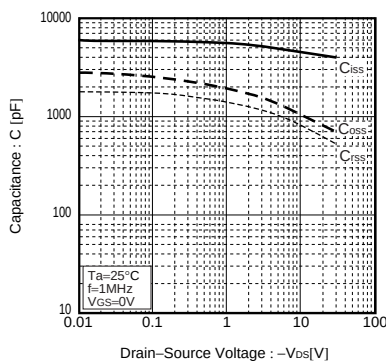


Fig.7 Typical Capacitance vs. Drain-Source Voltage

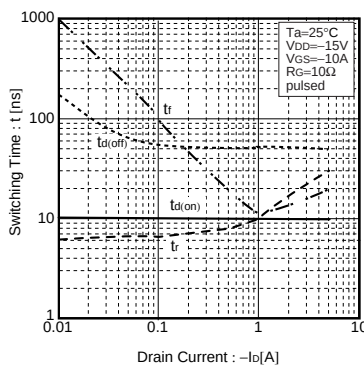


Fig.8 Switching Characteristics

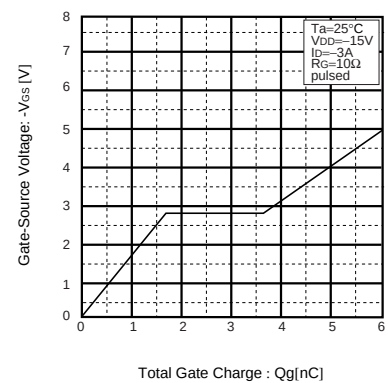


Fig.9 Dynamic Input Characteristics

Transistor

●Measurement circuits

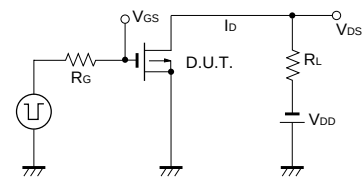


Fig.10 Switching Time Measurement Circuit

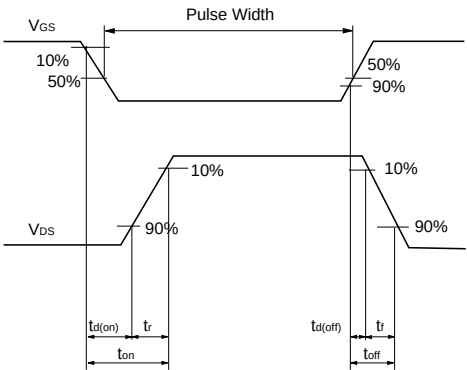


Fig.11 Switching Waveforms

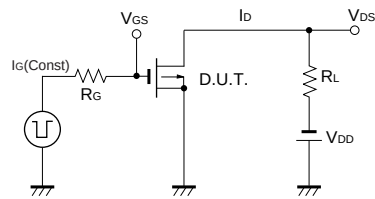


Fig.12 Gate Charge Measurement Circuit

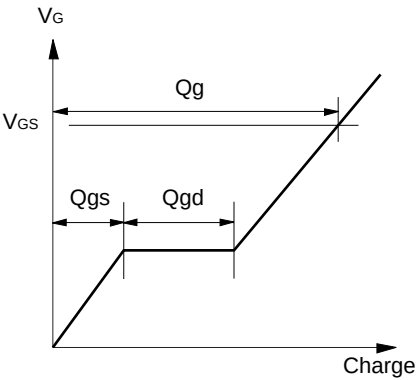


Fig.13 Gate Charge Waveforms

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