

# 4V Drive Nch MOSFET

## RSQ045N03

### ●Structure

Silicon N-channel MOSFET

### ●Features

- 1) Low On-resistance.
- 2) Space saving, small surface mount package (TSMT6).
- 3) Low voltage drive (4V drive).

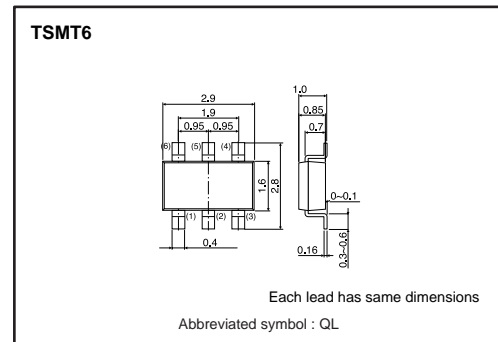
### ●Applications

Switching

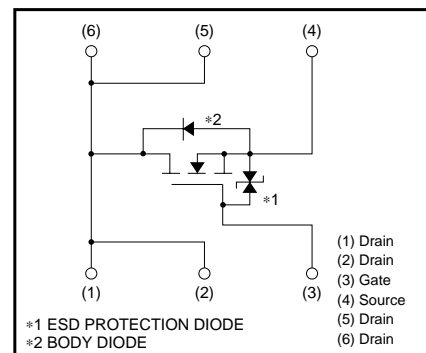
### ●Packaging specifications

Type	Package	Taping
	Code	TR
	Basic ordering unit (pieces)	3000
RSQ045N03		○

### ●Dimensions (Unit : mm)



### ●Inner circuit



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

Parameter	Symbol	Limits	Unit	
Drain-source voltage	$V_{DSS}$	30	V	
Gate-source voltage	$V_{GSS}$	20	V	
Drain current	Continuous	$I_D$	±4.5	A
	Pulsed	$I_{DP}$ *1	±18	A
Source current (Body diode)	Continuous	$I_S$	1.0	A
	Pulsed	$I_{SP}$ *1	18	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  $\leq 1\%$

\*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

Transistors

●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> *	–	27	38	mΩ	I <sub>D</sub> = 4.5A, V <sub>GS</sub> = 10V
		–	36	51	mΩ	I <sub>D</sub> = 4.5A, V <sub>GS</sub> = 4.5V
		–	40	56	mΩ	I <sub>D</sub> = 4.5A, V <sub>GS</sub> = 4V
Forward transfer admittance	Y <sub>fs</sub>  *	3.5	–	–	S	V <sub>DS</sub> = 10V, I <sub>D</sub> = 4.5A
Input capacitance	C <sub>iss</sub>	–	520	–	pF	V <sub>DS</sub> = 10V
Output capacitance	C <sub>oss</sub>	–	150	–	pF	V <sub>GS</sub> =0V
Reverse transfer capacitance	C <sub>rss</sub>	–	95	–	pF	f=1MHz
Turn-on delay time	t <sub>d (on)</sub> *	–	12	–	ns	V <sub>DD</sub> ≐ 15V I <sub>D</sub> = 2.25A
Rise time	t <sub>r</sub> *	–	19	–	ns	V <sub>GS</sub> = 10V
Turn-off delay time	t <sub>d (off)</sub> *	–	41	–	ns	R <sub>L</sub> =6.67Ω
Fall time	t <sub>f</sub> *	–	14	–	ns	R <sub>G</sub> =10Ω
Total gate charge	Q <sub>g</sub> *	–	6.8	9.5	nC	V <sub>DD</sub> ≐ 15V V <sub>GS</sub> = 5V
Gate-source charge	Q <sub>gs</sub> *	–	1.6	–	nC	I <sub>D</sub> = 4.5A
Gate-drain charge	Q <sub>gd</sub> *	–	2.3	–	nC	R <sub>L</sub> =3.33Ω R <sub>G</sub> =10Ω

\*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> = 1.0A, V <sub>GS</sub> =0V

●Electrical characteristic curves

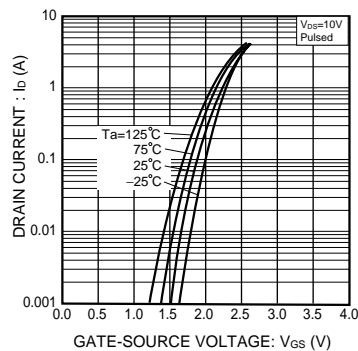


Fig.1 Typical Transfer Characteristics

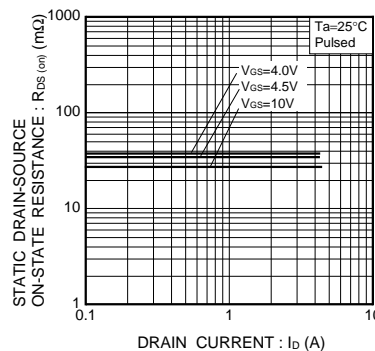


Fig.2 Static Drain-Source On-State Resistance vs. Drain Current (I)

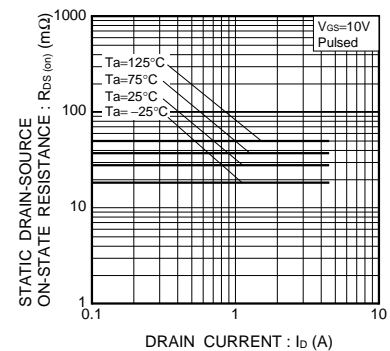


Fig.3 Static Drain-Source On-State Resistance vs. Drain Current (II)

Transistors

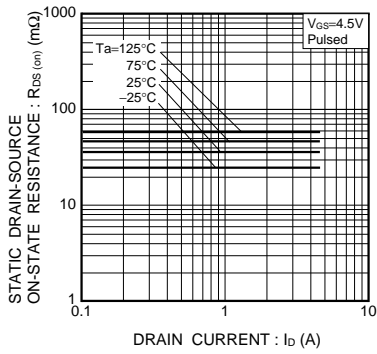


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current (III)

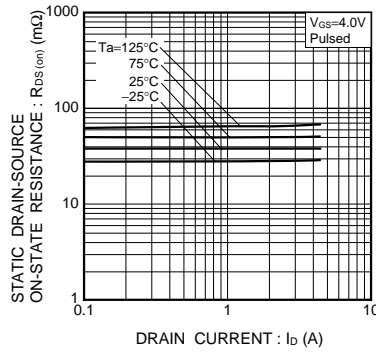


Fig.5 Static Drain-Source On-State Resistance vs. Drain Current (IV)

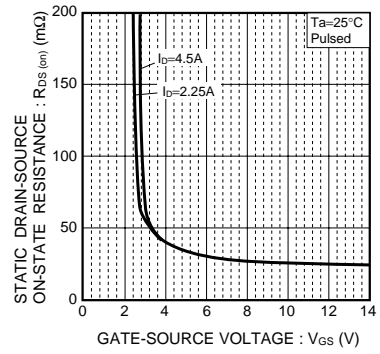


Fig.6 Static Drain-Source On-State Resistance vs. Gate-Source Voltage

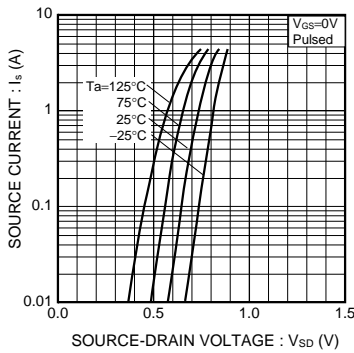


Fig.7 Source Current vs. Source-Drain Voltage

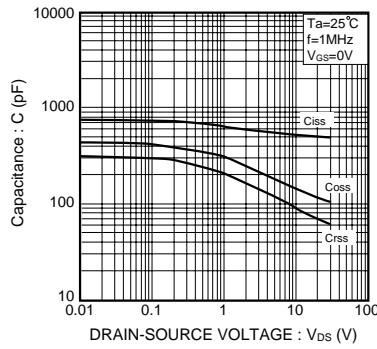


Fig.8 Typical Capacitance vs. Drain-Source Voltage

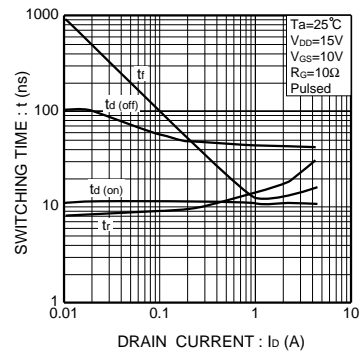


Fig.9 Switching Characteristics

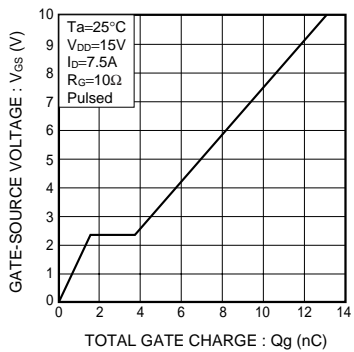


Fig.10 Dynamic Input Characteristics

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