

# 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).

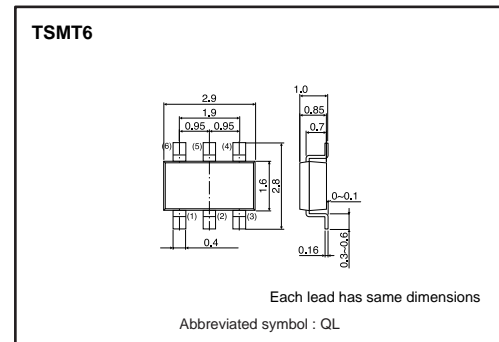
### ●Applications

Switching

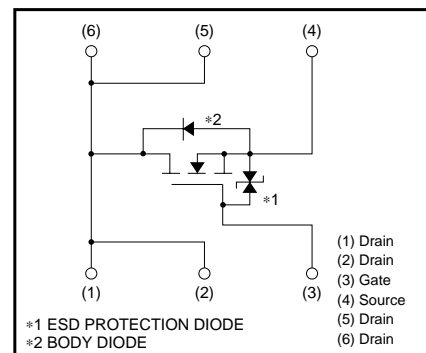
### ●Packaging specifications

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	$I_{GSS}$	-	-	10	$\mu A$	$V_{GS}=20V, V_{DS}=0V$
Drain-source breakdown voltage	$V_{(BR)DSS}$	30	-	-	V	$I_D=1mA, V_{GS}=0V$
Zero gate voltage drain current	$I_{DSS}$	-	-	1	$\mu A$	$V_{DS}=30V, V_{GS}=0V$
Gate threshold voltage	$V_{GS(th)}$	1.0	-	2.5	V	$V_{DS}=10V, I_D=1mA$
Static drain-source on-state resistance	$R_{DS(on)}$ *	-	27	38	$m\Omega$	$I_D=4.5A, V_{GS}=10V$
		-	36	51	$m\Omega$	$I_D=4.5A, V_{GS}=4.5V$
		-	40	56	$m\Omega$	$I_D=4.5A, V_{GS}=4V$
Forward transfer admittance	$ Y_{fs} $ *	3.5	-	-	S	$V_{DS}=10V, I_D=4.5A$
Input capacitance	$C_{iss}$	-	520	-	pF	$V_{DS}=10V$
Output capacitance	$C_{oss}$	-	150	-	pF	$V_{GS}=0V$
Reverse transfer capacitance	$C_{rss}$	-	95	-	pF	$f=1MHz$
Turn-on delay time	$t_{d(on)}$ *	-	12	-	ns	$V_{DD}=15V$
Rise time	$t_r$ *	-	19	-	ns	$I_D=2.25A$
Turn-off delay time	$t_{d(off)}$ *	-	41	-	ns	$V_{GS}=10V$
Fall time	$t_f$ *	-	14	-	ns	$R_L=6.67\Omega$
Total gate charge	$Q_g$ *	-	6.8	9.5	nC	$V_{DD}=15V, V_{GS}=5V$
Gate-source charge	$Q_{gs}$ *	-	1.6	-	nC	$I_D=4.5A$
Gate-drain charge	$Q_{gd}$ *	-	2.3	-	nC	$R_L=3.33\Omega, R_G=10\Omega$

\*Pulsed

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Forward voltage	$V_{SD}$	-	-	1.2	V	$I_S=1.0A, V_{GS}=0V$

●Electrical characteristic curves

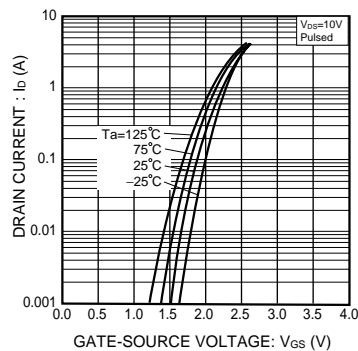


Fig.1 Typical Transfer Characteristics

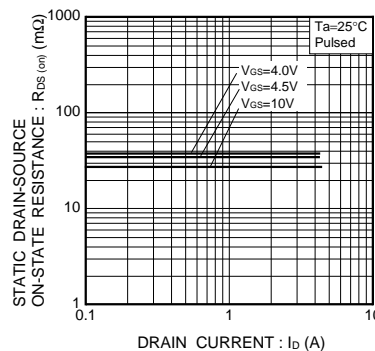


Fig.2 Static Drain-Source On-State Resistance vs. Drain Current (I)

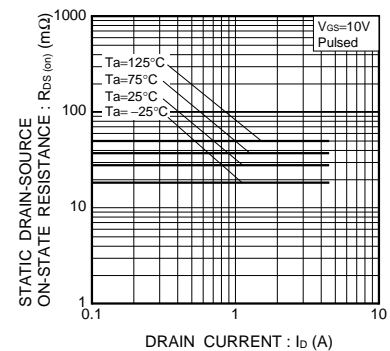


Fig.3 Static Drain-Source On-State Resistance vs. Drain Current (II)

Transistors

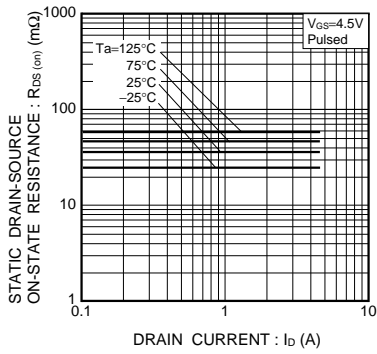


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current (III)

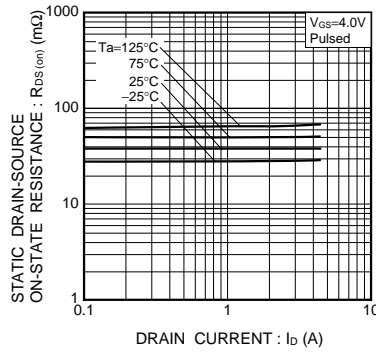


Fig.5 Static Drain-Source On-State Resistance vs. Drain Current (IV)

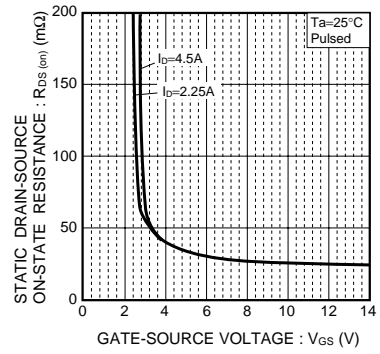


Fig.6 Static Drain-Source On-State Resistance vs. Gate-Source Voltage

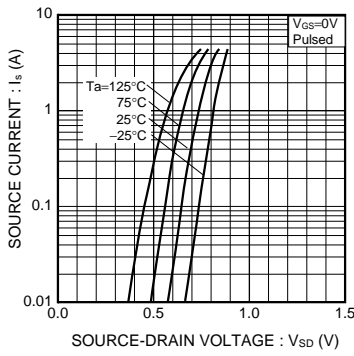


Fig.7 Source Current vs. Source-Drain Voltage

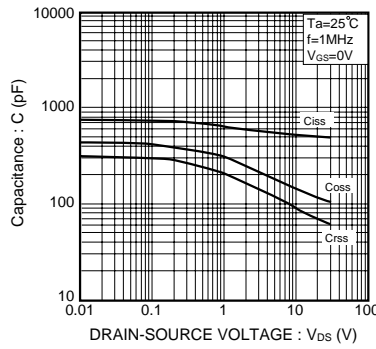


Fig.8 Typical Capacitance vs. Drain-Source Voltage

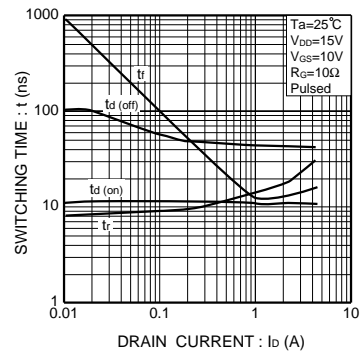


Fig.9 Switching Characteristics

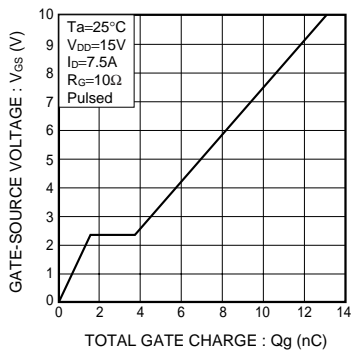


Fig.10 Dynamic Input Characteristics

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