

DC-DC Converter (-30V, -3A)

RSQ030P03

●Features

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

●Applications

DC-DC converter

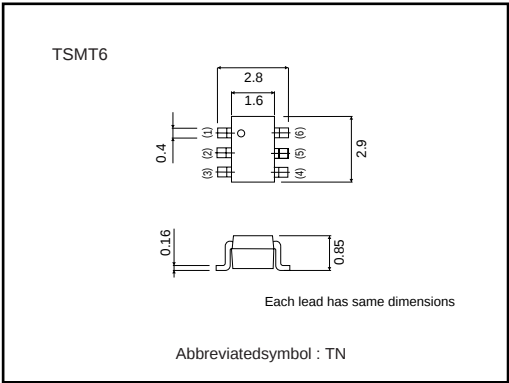
●Structure

Silicon P-channel
MOSFET

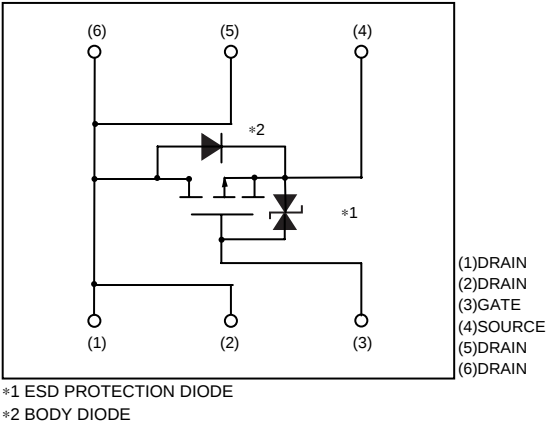
●Packaging specifications

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

●External dimensions (Units : mm)



●Equivalent circuit



Transistor

●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	±3	A
	Pulsed	I _{DP}	±12	A * ¹
Source current (Body diode)	Continuous	I _S	−1	A
	Pulsed	I _{SP}	−4	A * ¹
Total power dissipation		P _D	1.25	W* ²
Channel temperature		T _{ch}	150	°C
Range of Storage temperature		T _{stg}	−55~+150	°C

*1 Pw≤10μs, Duty cycle≤1%

*2 Mounted on a ceramic board

●Electrical characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Gate-source leakage	I _{GSS}	−	−	±10	μA	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	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	mΩ	I _D =−3A, V _{GS} =−10V
		−	90	125	mΩ	I _D =−3A, V _{GS} =−4.5V
		−	100	140	mΩ	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 =10Ω R _{GS} =10Ω
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 characteristics)

Forward voltage	V _{SD}	−	−	−1.2	V	I _S =−1A, V _{GS} =0V
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Transistor

●Electrical characteristic curves

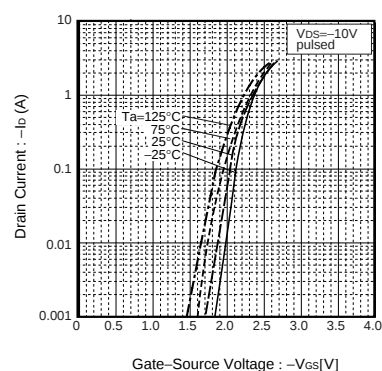


Fig.1 Typical Transfer Characteristics

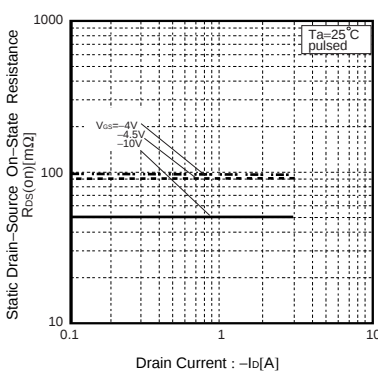


Fig.2 Static Drain-Source On-State Resistance vs. Drain Current

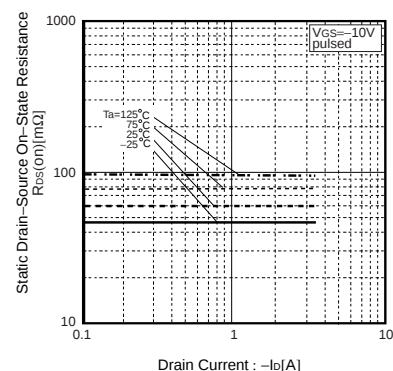


Fig.3 Static Drain-Source On-State Resistance vs. Drain Current

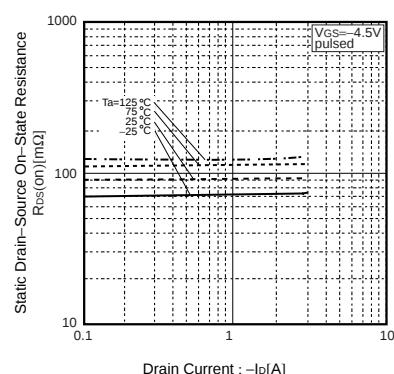


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current

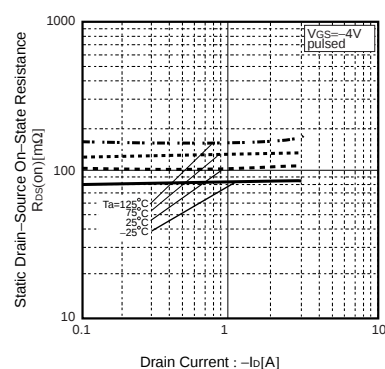


Fig.5 Static Drain-Source On-State Resistance vs. Drain Current

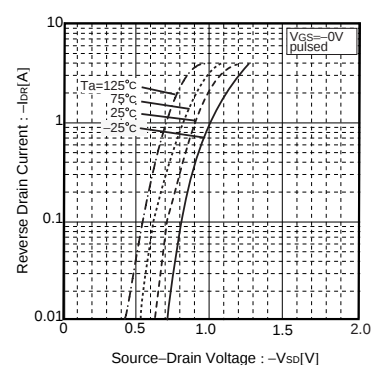


Fig.6 Reverse Drain Current vs. Source-Drain Current

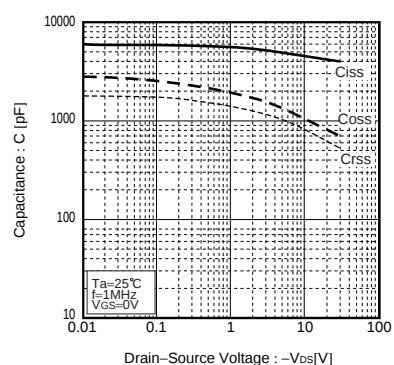


Fig.7 Typical Capacitance vs. Drain-Source Voltage

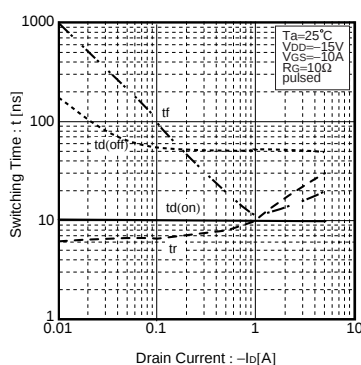


Fig.8 Switching Characteristics

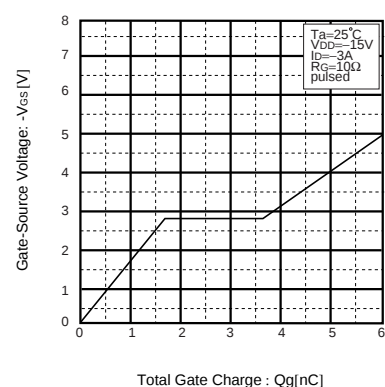


Fig.9 Dynamic Input Characteristics

Transistor

●Measurement circuits

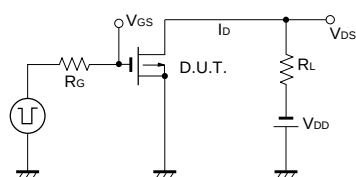


Fig.10 Switching Time Measurement Circuit

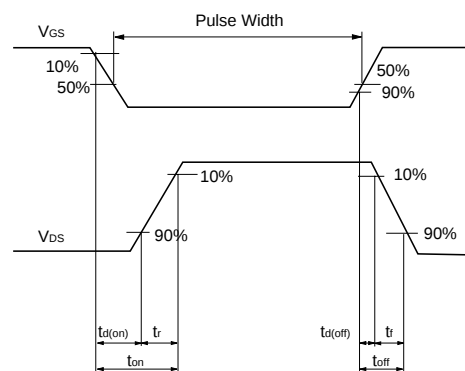


Fig.11 Switching Waveforms

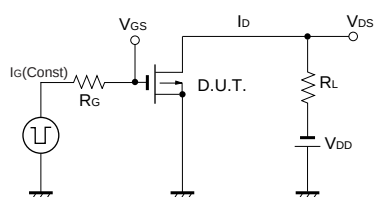


Fig.12 Gate Charge Measurement Circuit

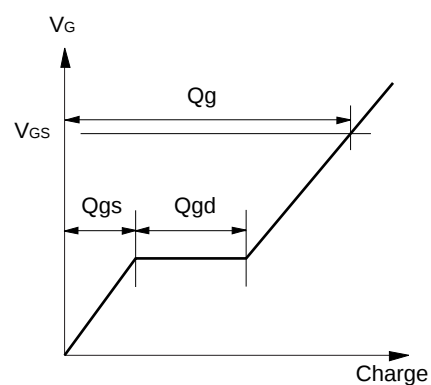


Fig.13 Gate Charge Waveforms