

4.5V Drive Nch MOSFET

RMW180N03

● Structure

Silicon N-channel MOSFET

● Features

- 1) High Power package(PSOP8).
- 2) High-speed switching, Low On-resistance.
- 3) Low voltage drive(4.5V drive).

● Application

Switching

● Packaging specifications

Type	Package	Taping
	Code	TB
	Basic ordering unit (pieces)	2500
RMW180N03		○

● 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	± 18 A
	Pulsed	I_{DP}^{*1}	± 72 A
Source current (Body Diode)	Continuous	I_S	2.5 A
	Pulsed	I_{SP}^{*1}	72 A
Power dissipation	P_D^{*2}	3.0	W
Channel temperature	Tch	150	°C
Range of storage temperature	Tstg	-55 to +150	°C

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

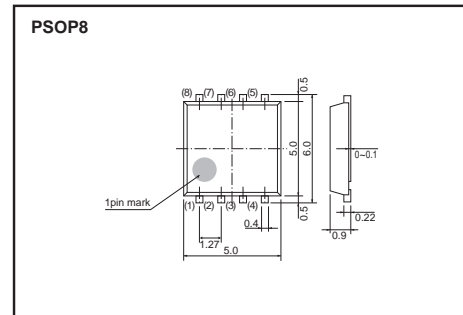
*2 MOUNTED ON 40mm x 40mm Cu BOARD

● Thermal resistance

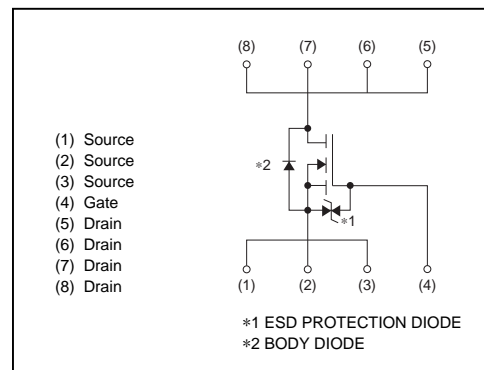
Parameter	Symbol	Limits	Unit
Channel to Ambient	$R_{th}(ch-a)^*$	41.7	°C / W

* MOUNTED ON 40mm x 40mm Cu BOARD

● Dimensions (Unit : mm)



● Inner circuit



● 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	$R_{DS(on)}$ *	-	4.0	5.6	m Ω	$I_D=18A, V_{GS}=10V$
		-	5.5	7.7		$I_D=18A, V_{GS}=4.5V$
Forward transfer admittance	$ Y_{fs} ^*$	15	-	-	S	$I_D=18A, V_{DS}=10V$
Input capacitance	C_{iss}	-	1250	-	pF	$V_{DS}=15V$
Output capacitance	C_{oss}	-	400	-	pF	$V_{GS}=0V$
Reverse transfer capacitance	C_{rss}	-	145	-	pF	$f=1MHz$
Turn-on delay time	$t_{d(on)}$ *	-	14	-	ns	$I_D=9A, V_{DD} \approx 15V$
Rise time	t_r *	-	39	-	ns	$V_{GS}=10V$
Turn-off delay time	$t_{d(off)}$ *	-	39	-	ns	$R_L=1.67\Omega$
Fall time	t_f *	-	12	-	ns	$R_G=10\Omega$
Total gate charge	Q_g *	-	24	-	nC	$I_D=18A, V_{DD} \approx 15V$
Gate-source charge	Q_{gs} *	-	4.4	-	nC	$V_{GS}=10V$
Gate-drain charge	Q_{gd} *	-	4.7	-	nC	

*Pulsed

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Forward Voltage	V_{SD} *	-	-	1.2	V	$I_S=2.5A, V_{GS}=0V$

*Pulsed

●Electrical characteristic curves (Ta=25°C)

Fig.1 Typical Output Characteristics(I)

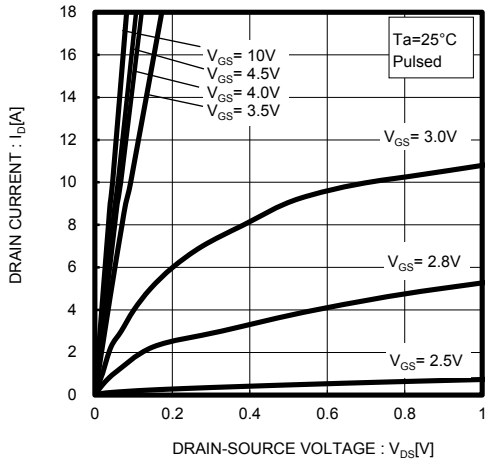


Fig.2 Typical Output Characteristics(II)

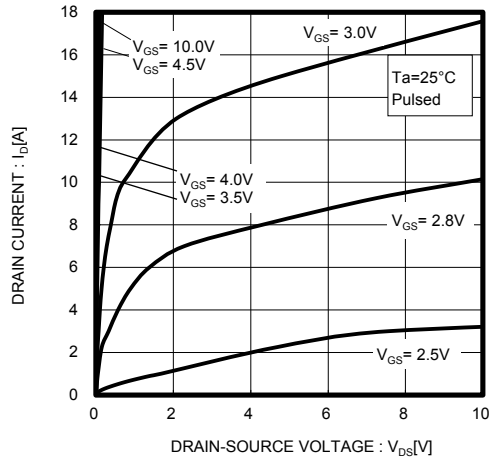


Fig.3 Typical Transfer Characteristics

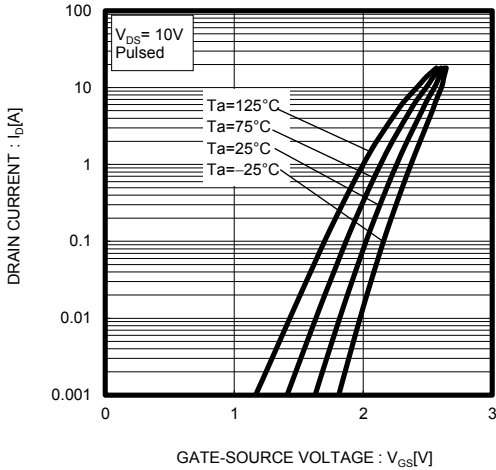


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current(I)

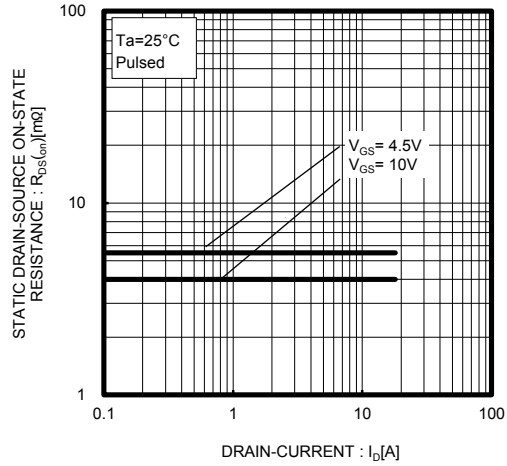


Fig.5 Static Drain-Source On-State Resistance vs. Drain Current(II)

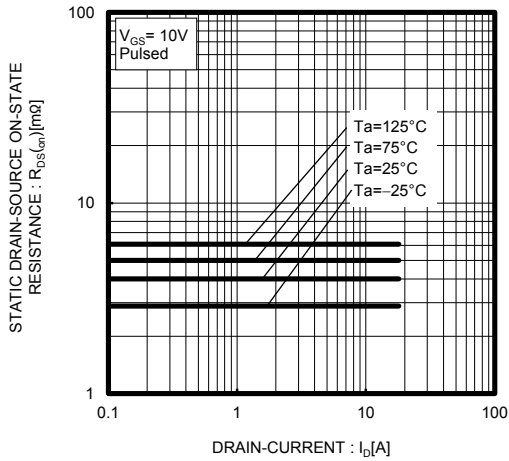


Fig.6 Static Drain-Source On-State Resistance vs. Drain Current(III)

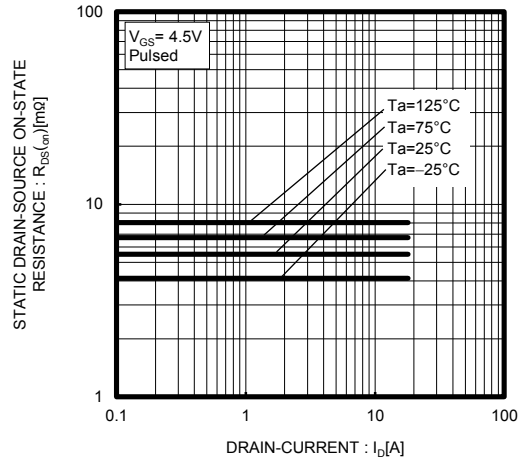


Fig.7 Forward Transfer Admittance vs. Drain Current

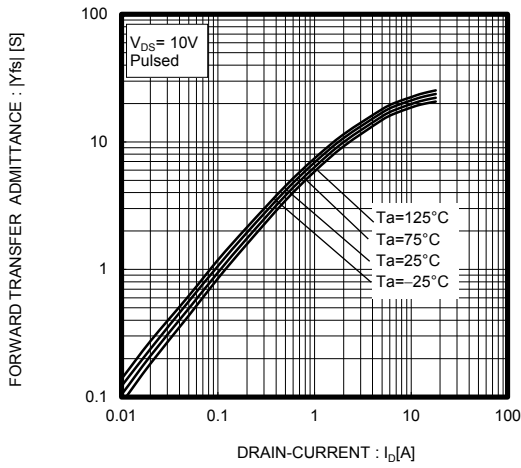


Fig.8 Reverse Drain Current vs. Source-Drain Voltage

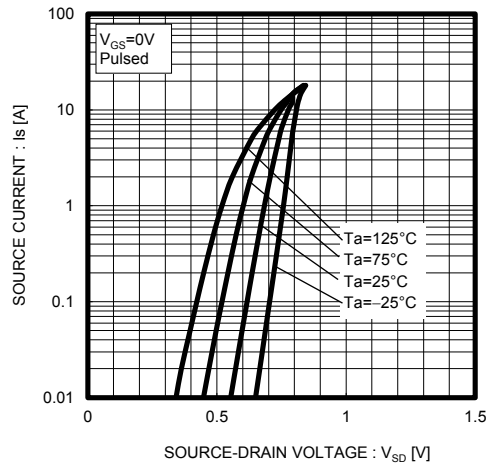


Fig.9 Static Drain-Source On-State Resistance vs. Gate Source Voltage

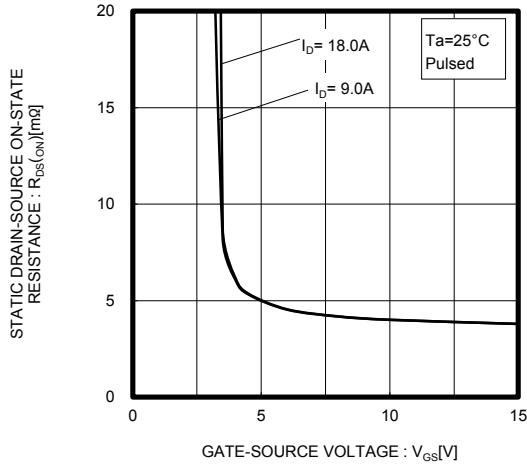


Fig.10 Switching Characteristics

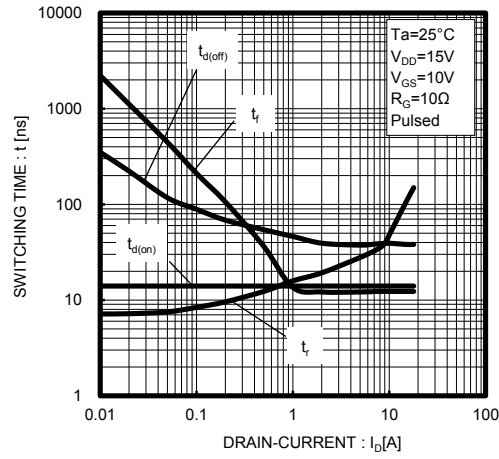


Fig.11 Dynamic Input Characteristics

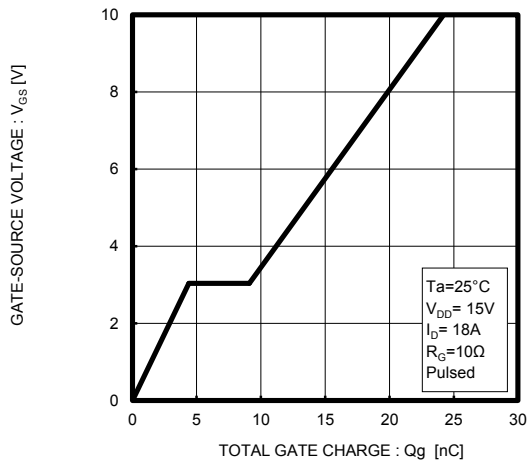


Fig.12 Typical Capacitance vs. Drain-Source Voltage

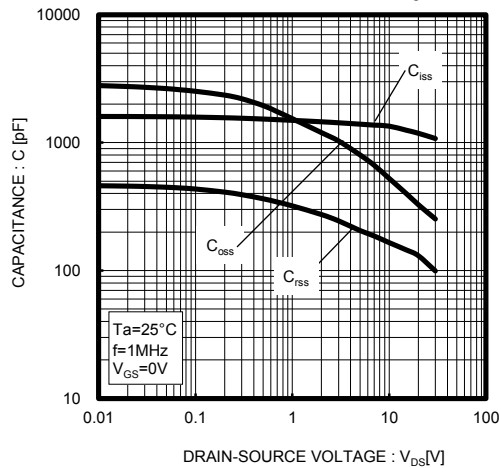


Fig.13 Maximum Safe Operating Area

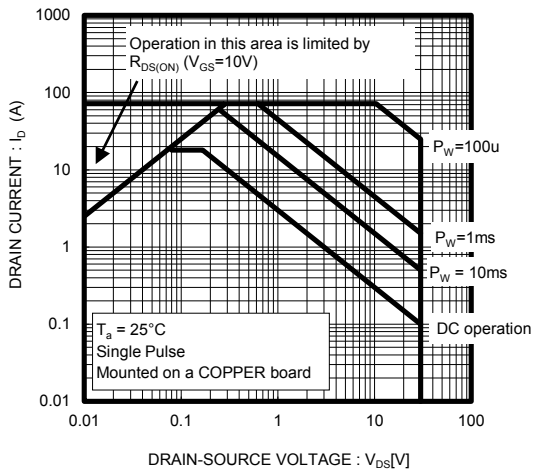
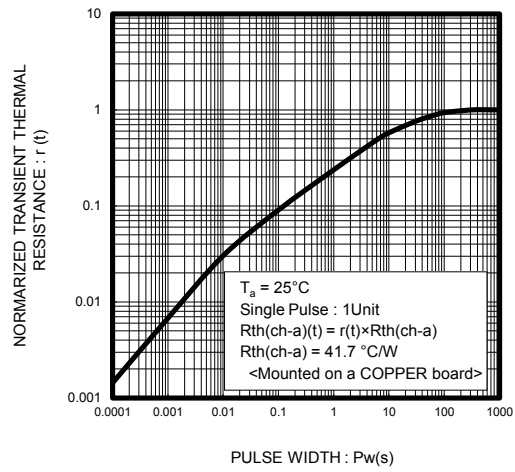


Fig.14 Normalized Transient Thermal Resistance vs. Pulse Width



● Measurement circuits

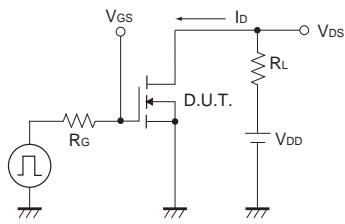


Fig.1-1 Switching Time Measurement Circuit

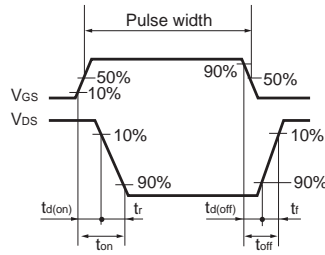


Fig.1-2 Switching Waveforms

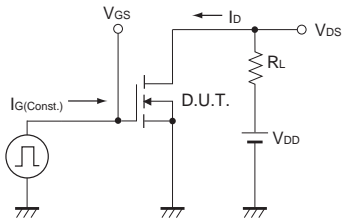


Fig.2-1 Gate Charge Measurement Circuit

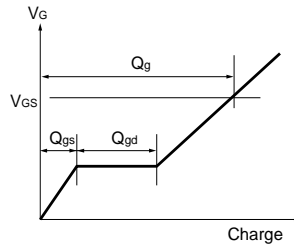


Fig.2-2 Gate Charge Waveform

● Notice

This product might cause chip aging and breakdown under the large electrified environment. Please consider to design ESD protection circuit.

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