

ROHM SEMICONDUCTOR		PRODUCTS TO252		TYPE RD3G400GN		PAGE 1/4	
1.TYPE RD3G400GN							
2.STRUCTURE SILICON N-CHANNEL MOS FET							
3.APPLICATIONS SWITCHING							
4.ABSOLUTE MAXIMUM RATINGS [T _a =25°C]							
DRAIN-SOURCE VOLTAGE				V _{DSS}	...	40V	
GATE-SOURCE VOLTAGE				V _{GSS}	...	±20V	
DRAIN CURRENT		CONTINUOUS	I _D	...	±40A		
		PULSED	I _{DP}	...	±80A	Pw≤10 μ s , Duty cycle≤1%	
SOURCE CURRENT		CONTINUOUS	I _S	...	21A		
(BODY DIODE)		PULSED	I _{SP}	...	80A	Pw≤10 μ s , Duty cycle≤1%	
AVALANCHE CURRENT			I _{AS}	...	20A	L≈0.01mH, V _{DD} =20V, R _G =25 Ω STARTING T _{ch} =25°C See Fig.3-1, 3-2	
AVALANCHE ENERGY			E _{AS}	...	3.1mJ	L≈0.01mH, V _{DD} =20V, R _G =25 Ω STARTING T _{ch} =25°C See Fig.3-1, 3-2	
POWER DISSIPATION			P _D	...	26W	T _c =25°C	
CHANNEL TEMPERATURE			T _{ch}	...	150°C		
RANGE OF STORAGE TEMPERATURE			T _{stg}	...	-55~150°C		
5.THERMAL RESISTANCE							
CHANNEL TO CASE			R _{th(ch-c)}	...	4.8°C/W	T _c =25°C	
*Limited only by maximum channel temperature allowed.							
DESIGN	CHECK	APPROVAL	DATE: 03/FEB/2015		SPECIFICATION No. TSQ03139-RD3G400GN		
<i>K. Suganuma</i>	<i>K. Niimoto</i>	<i>K. Yoshinochi</i>	REV.: 0		ROHM Co.,Ltd.		

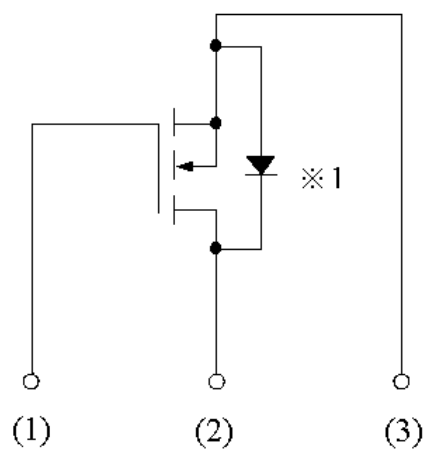
6.ELECTRICAL CHARACTERISTICS [$T_a=25^{\circ}\text{C}$]

PARAMETER	ITEM	CONDITION		MIN.	TYP.	MAX.
GATE-SOURCE-LEAKAGE	I _{GSS}	V _{GS} =±20V / V _{DS} =0V		–	–	±500nA
DRAIN-SOURCE BREAKDOWN VOLTAGE	V _{(BR)DSS}	I _D =1mA / V _{GS} =0V		40V	–	–
ZERO GATE VOLTAGE DRAIN CURRENT	I _{DSS}	V _{DS} =40V / V _{GS} =0V		–	–	1uA
GATE THRESHOLD VOLTAGE	V _{GS(th)}	V _{GS} =V _{DS} / I _D =1mA		1.0V	–	2.5V
STATIC DRAIN-SOURCE ON-STATE RESISTANCE	R _{DS(on)} *PULSED	I _D =40A / V _{GS} =10V		–	5.6m Ω	7.5m Ω
		I _D =40A / V _{GS} =4.5V		–	7.0m Ω	9.5m Ω
FORWARD TRANSFER ADMITTANCE	Y _{fs} *PULSED	V _{DS} =5V / I _D =20A		20S	–	–
INPUT CAPACITANCE	C _{iss}	V _{DS} =20V V _{GS} =0V f=1MHz		–	1410pF	–
OUTPUT CAPACITANCE	C _{oss}			–	230pF	–
REVERSE TRANSFER CAPACITANCE	C _{rss}			–	62pF	–
TURN-ON DELAY TIME	t _{d(on)} *PULSED	V _{DD} ≈20V I _D =20A V _{GS} =10V R _L =1.0 Ω R _G =10 Ω See Fig.1-1, 1-2		–	8.2ns	–
RISE TIME	t _r *PULSED			–	5.6ns	–
TURN-OFF DELAY TIME	t _{d(off)} *PULSED			–	41ns	–
FALL TIME	t _f *PULSED			–	6.8ns	–
TOTAL GATE CHARGE	Q _g *PULSED	V _{DD} ≈20V I _D =40A See Fig.2-1, 2-2	V _{GS} =10V	–	19nC	–
				–	9.7nC	–
GATE-SOURCE CHARGE	Q _{gs} *PULSED		V _{GS} =4.5V	–	3.7nC	–
GATE-DRAIN CHARGE	Q _{gd} *PULSED			–	2.8nC	–

BODY DIODE (SOURCE-DRAIN)

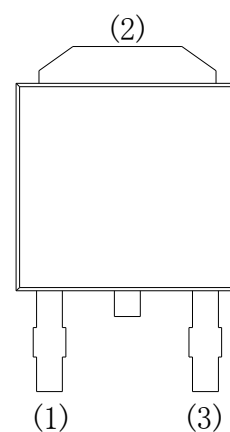
PARAMETER	ITEM	CONDITION	MIN.	TYP.	MAX.
FORWARD VOLTAGE	V_{SD} *PULSED	$I_S=21\text{A} / V_{GS}=0V$	–	–	1.2V
REVERSE RECOVERY TIME	t_{rr} *PULSED	$I_S=40\text{A} / V_{GS}=0V$ $di/dt=100\text{A}/\mu\text{s}$	–	21ns	–
REVERSE RECOVERY CHARGE	Q_{rr} *PULSED		–	8.8nC	–

7.INNER CIRCUIT

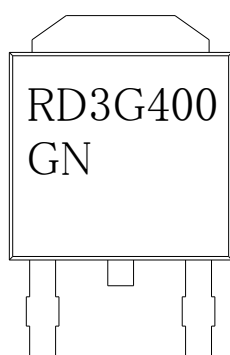


※1 BODY DIODE

- (1) GATE
- (2) DRAIN
- (3) SOURCE



8.MARKING



9. MEASUREMENT CIRCUIT

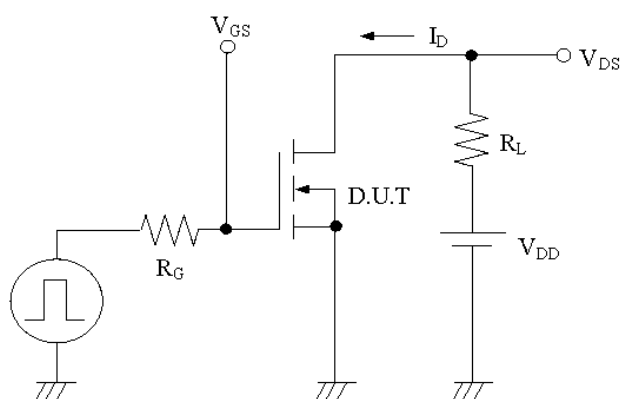


Fig.1-1 SWITCHING TIME MEASUREMENT CIRCUIT

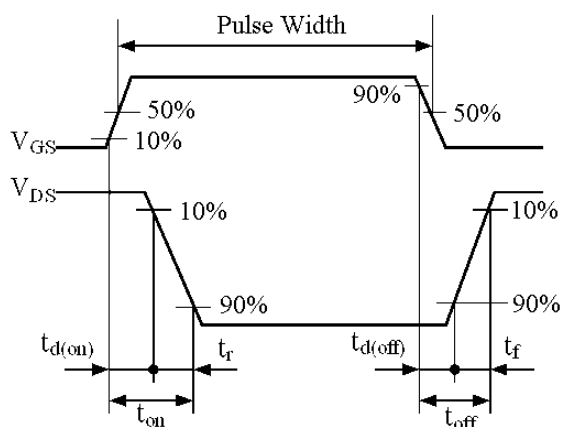


Fig.1-2 SWITCHING WAVEFORMS

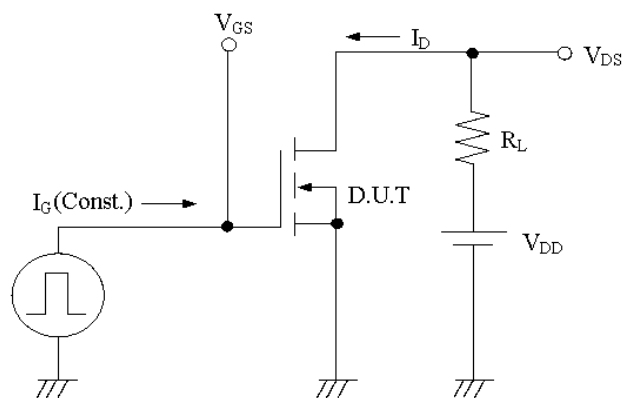


Fig.2-1 GATE CHARGE MEASUREMENT CIRCUIT

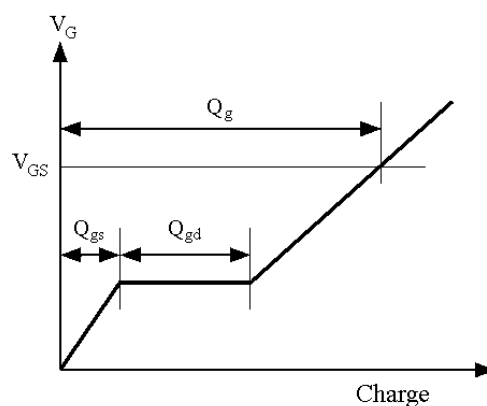


Fig.2-2 GATE CHARGE WAVEFORM

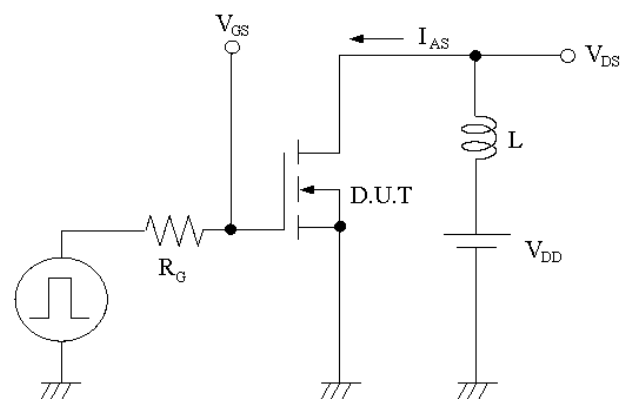


Fig.3-1 AVALANCHE MEASUREMENT CIRCUIT

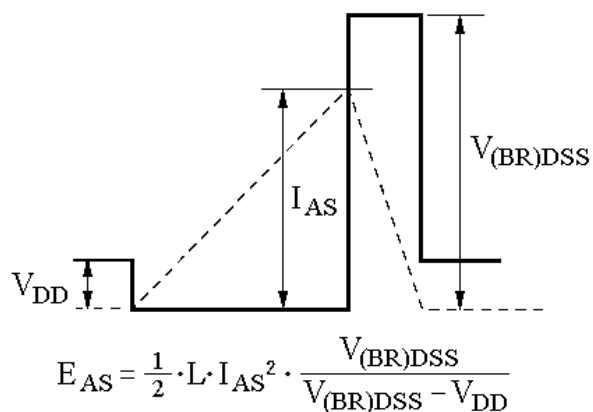


Fig.3-2 AVALANCHE WAVEFORM