

1. TYPE RSH140N03  
 2. STRUCTURE SILICON N-CHANNEL MOS FET  
 3. APPLICATIONS SWITCHING

4. ABSOLUTE MAXIMUM RATINGS [ $T_a=25^{\circ}\text{C}$ ]

DRAIN-SOURCE VOLTAGE		$V_{DSS}$	...	30V	
GATE-SOURCE VOLTAGE		$V_{GSS}$	...	$\pm 20\text{V}$	
DRAIN CURRENT	CONTINUOUS	$I_D$	...	$\pm 14\text{A}$	
	PULSED	$I_{DP}$	...	$\pm 56\text{A}$	PW 10 $\mu\text{s}$ , Duty cycle 1%
SOURCE CURRENT (BODY DIODE)	CONTINUOUS	$I_S$	...	1.6A	
	PULSED	$I_{SP}$	...	6.4A	PW 10 $\mu\text{s}$ , Duty cycle 1%
POWER DISSIPATION		$P_D$	...	2.0W	MOUNTED ON A CERAMIC BOARD
CHANNEL TEMPERATURE		$T_{ch}$	...	150 $^{\circ}\text{C}$	
RANGE OF STORAGE TEMPERATURE		$T_{stg}$	...	$-55\sim 150^{\circ}\text{C}$	

5. THERMAL RESISTANCE

CHANNEL TO AMBIENT	$R_{th(ch-a)}$	...	62.5 $^{\circ}\text{C}/\text{W}$	MOUNTED ON A CERAMIC BOARD
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DESIGN	CHECK	APPROVAL	DATE: 23/OCT/2009	SPECIFICATION No. Q03080-RSH140N03
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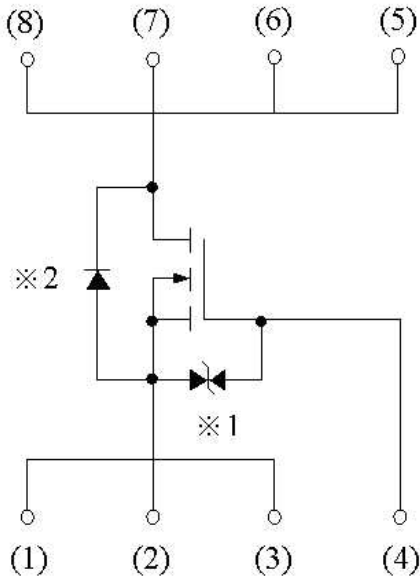
6.ELECTRICAL CHARACTERISTICS [T<sub>a</sub>=25°C]

PARAMETER	ITEM	CONDITION	MIN.	TYP.	MAX.
GATE-SOURCE LEAKAGE	I <sub>GSS</sub>	V <sub>GS</sub> =±20V / V <sub>DS</sub> =0V	-	-	±10 μA
DRAIN-SOURCE BREAKDOWN VOLTAGE	V <sub>(BR)DSS</sub>	I <sub>D</sub> =1mA / V <sub>GS</sub> =0V	30V	-	-
ZERO GATE VOLTAGE DRAIN CURRENT	I <sub>DSS</sub>	V <sub>DS</sub> =30V / V <sub>GS</sub> =0V	-	-	1 μA
GATE THRESHOLD VOLTAGE	V <sub>GS(th)</sub>	V <sub>DS</sub> =10V / I <sub>D</sub> =1mA	1.0V	-	2.5V
STATIC DRAIN-SOURCE ON-STATE RESISTANCE	R <sub>DS(on)</sub> *PULSED	I <sub>D</sub> =14A / V <sub>GS</sub> =10V	-	4.9mΩ	6.9mΩ
		I <sub>D</sub> =14A / V <sub>GS</sub> =4.5V	-	6.0mΩ	8.4mΩ
		I <sub>D</sub> =14A / V <sub>GS</sub> =4.0V	-	6.5mΩ	9.1mΩ
FORWARD TRANSFER ADMITTANCE	Y <sub>fs</sub>   *PULSED	V <sub>DS</sub> =10V / I <sub>D</sub> =14A	13S	-	-
INPUT CAPACITANCE	C <sub>iss</sub>	V <sub>DS</sub> =10V V <sub>GS</sub> =0V f=1MHz	-	3150pF	-
OUTPUT CAPACITANCE	C <sub>oss</sub>		-	830pF	-
REVERSE TRANSFER CAPACITANCE	C <sub>rss</sub>		-	500pF	-
TURN-ON DELAY TIME	t <sub>d(on)</sub> *PULSED	V <sub>DD</sub> ≈15V I <sub>D</sub> =7.0A V <sub>GS</sub> =10V R <sub>L</sub> =2.15Ω R <sub>G</sub> =10Ω See Fig.1-1,1-2	-	16ns	-
RISE TIME	t <sub>r</sub> *PULSED		-	52ns	-
TURN-OFF DELAY TIME	t <sub>d(off)</sub> *PULSED		-	125ns	-
FALL TIME	t <sub>f</sub> *PULSED		-	78ns	-
TOTAL GATE CHARGE	Q <sub>g</sub> *PULSED	V <sub>DD</sub> ≈15V I <sub>D</sub> =14A V <sub>GS</sub> =5.0V See Fig.2-1,2-2	-	37nC	52nC
GATE-SOURCE CHARGE	Q <sub>gs</sub> *PULSED		-	6.2nC	-
GATE-DRAIN CHARGE	Q <sub>gd</sub> *PULSED		-	13.5nC	-

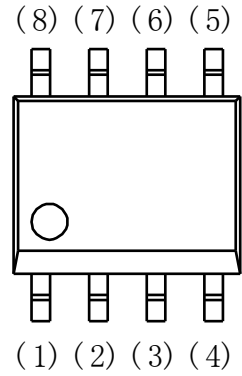
## BODY DIODE (SOURCE-DRAIN)

PARAMETER	ITEM	CONDITION	MIN.	TYP.	MAX.
FORWARD VOLTAGE	V <sub>SD</sub> *PULSED	I <sub>S</sub> =6.4A / V <sub>GS</sub> =0V	-	-	1.2V

7. INNER CIRCUIT

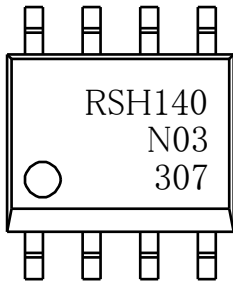


- (1) SOURCE
- (2) SOURCE
- (3) SOURCE
- (4) GATE
- (5) DRAIN
- (6) DRAIN
- (7) DRAIN
- (8) DRAIN



※1 ESD PROTECTION DIODE  
※2 BODY DIODE

8. MARKING



" 307 " MEANS PRODUCTION YEAR AND WEEK.

" ○ " MEANS 1pin MARK.

9.MEASUREMENT CIRCUIT

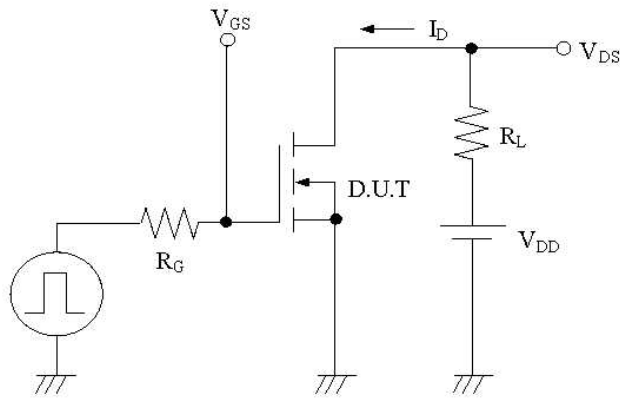


Fig.1-1 SWITCHING TIME MEASUREMENT CIRCUIT

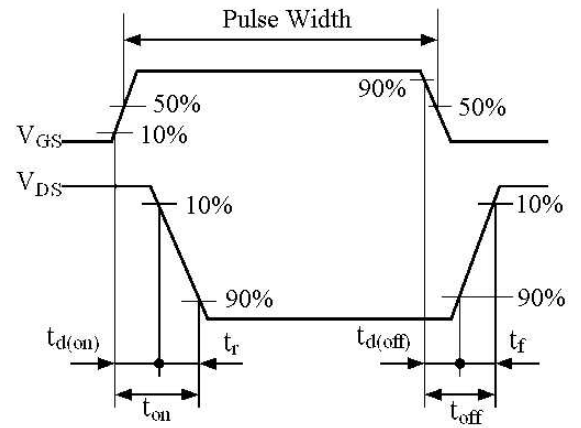


Fig.1-2 SWITCHING WAVEFORMS

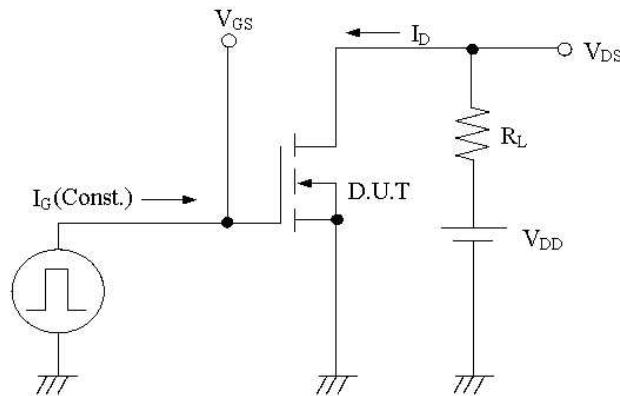


Fig.2-1 GATE CHARGE MEASUREMENT CIRCUIT

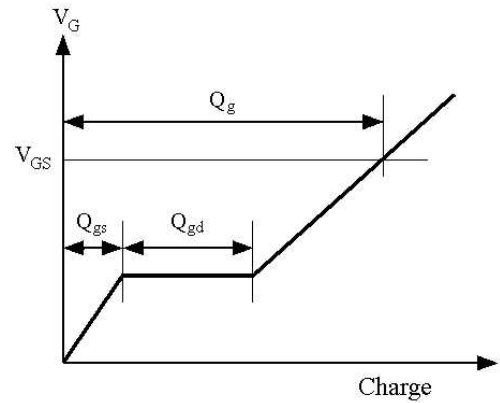


Fig.2-2 GATE CHARGE WAVEFORM