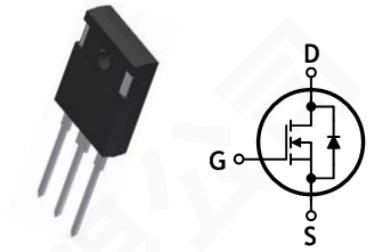
N-Channel Super Junction MOSFET

Features

- 75A, 600V Super-junction MOSFET
- Ultra fast recovery body diode
- Low drain-source On-resistance: $R_{DS(on)}$=0.026Ω (Typ.)
- 100% avalanche tested
- RoHS compliant device



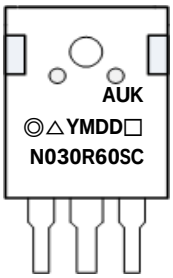
G D S

TO-247

Ordering Information

Part Number	Marking	Package
SJMN030R60SCW	N030R60SC	TO-247

Marking Information



Column 1: Manufacturer
Column 2: Production Information
e.g.) ◎△YMDD□
-. ◎△: Management Code
-. YMDD: Date Code (Year, Monthly, Daily)
-. □: Factory Management Code
Column 3: Device Code

Absolute maximum ratings (T_C=25°C unless otherwise noted)

Characteristic	Symbol		Rating	Unit
Drain-source voltage	V_{DSS}		600	V
Gate-source voltage	V_{GSS}		±30	V
Drain current (Continuous)	I_D	T_c=25°C	75 *	A
		T_c=100°C	55 *	A
Drain current (Pulsed) (Note 1)	I_{DM}		261 *	A
Single pulsed avalanche energy (Note 2)	E_{AS}		1083	mJ
Repetitive avalanche current (Note 1)	I_{AR}		13	A
Repetitive avalanche energy (Note 1)	E_{AR}		5.68	mJ
Power dissipation	P_D		568	W
Diode dv/dt ruggedness (Note 3)	dv/dt		50	V/ns
MOSFET dv/dt ruggedness	dv/dt		100	V/ns
Junction temperature	T_J		150	°C
Storage temperature range	T_{stg}		-55~150	°C

* Darin current limited by maximum junction temperature.

Thermal Characteristics

Characteristic	Symbol	Rating	Unit
Thermal resistance, junction to case	$R_{th(j-c)}$	Max. 0.22	°C/W
Thermal resistance, junction to ambient	$R_{th(j-a)}$	Max. 40	

Electrical Characteristics (T_C=25°C unless otherwise noted)

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Drain-source breakdown voltage	BV_{DSS}	I_D=250uA, V_{GS}=0	600	-	-	V
Gate threshold voltage	$V_{GS(th)}$	I_D=5mA, V_{DS}=V_{GS}	3	-	5	V
Drain-source cut-off current	I_{DSS}	V_{DS}=600V, V_{GS}=0V	-	-	10	uA
Gate leakage current	I_{GSS}	V_{DS}=0V, V_{GS}=±30V	-	-	±100	nA
Drain-source on-resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=37.5A	-	0.026	0.03	Ω
Internal gate resistance	R_g	f=1MHz, open drain	-	1	-	Ω
Input capacitance	C_{iss}	V_{DS}=400V, V_{GS}=0V, f=1MHz	-	8520	-	pF
Output capacitance	C_{oss}		-	192	-	
Reverse transfer capacitance	C_{rss}		-	20	-	
Turn-on delay time (Note 4, 5)	$t_{d(on)}$	V_{DS}=400V, I_D=37.5A, R_G=2.7Ω, V_{GS}=10V	-	37	-	ns
Rise time (Note 4, 5)	t_r		-	14	-	
Turn-off delay time (Note 4, 5)	$t_{d(off)}$		-	128	-	
Fall time (Note 4, 5)	t_f		-	11	-	
Total gate charge (Note 4, 5)	Q_g	V_{DS}=400V, V_{GS}=10V, I_D=30.8A	-	209	-	nC
Gate-source charge (Note 4, 5)	Q_{gs}		-	49	-	
Gate-drain charge (Note 4, 5)	Q_{gd}		-	104	-	

Source-Drain Diode Ratings and Characteristics (T_C=25°C unless otherwise noted)

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Source current (DC)	I_S	Integral reverse diode in the MOSFET	-	-	75	A
Source current (Pulsed)	I_{SM}		-	-	261	A
Forward voltage	V_{SD}	V_{GS}=0V, I_S=37.5A	-	-	1.2	V
Reverse recovery time (Note 4)	t_{rr}	I_S=37.5A, V_{GS}=0V, dI_S/dt=100A/us	-	234	-	ns
Reverse recovery charge (Note 4)	Q_{rr}		-	2.3	-	uC

Note:
1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. I_{AS}=10.1A, V_{DD}=50V, Starting T_J=25°C
3. I_{SD}≤37.5A, V_{DS}≤400V, dIs/dt≤100A/us, Starting T_J=25°C
4. V_{DS}≤400V, T_J=25°C
5. Pulse test: Pulse width≤300us, Duty cycle≤2%

%

Typical Electrical Characteristics Curves

Fig. 1 Typical Output Characteristics

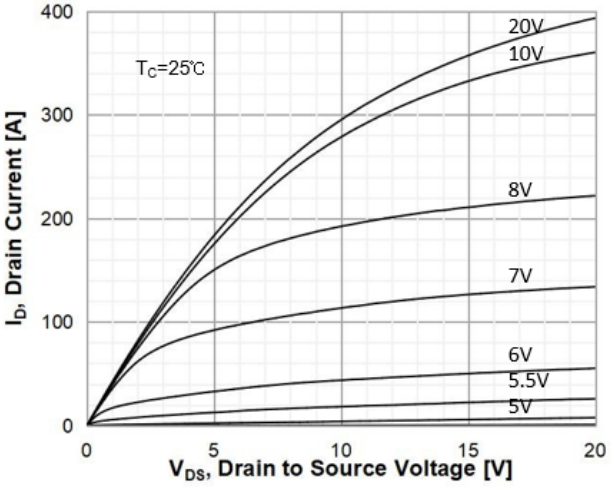


Fig. 2 Typical Transfer Characteristics

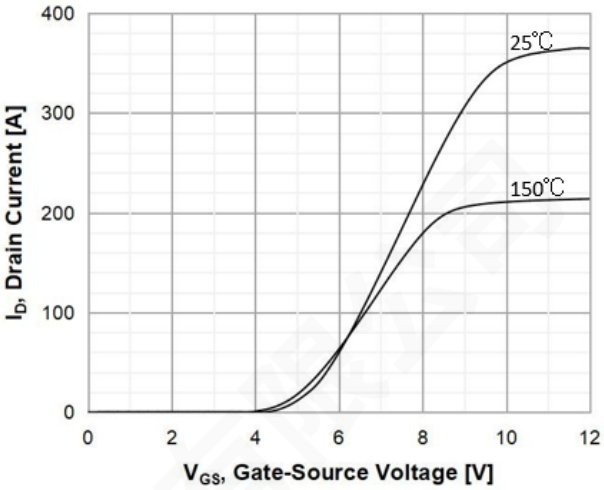


Fig.3 On-Resistance Variation with Drain Current and Gate Voltage

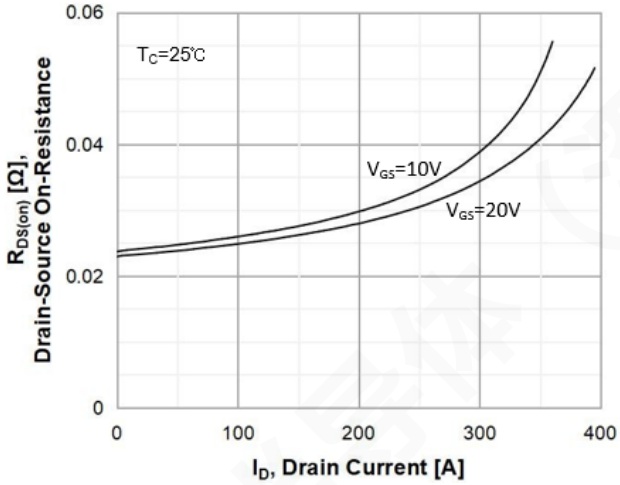


Fig. 4 Body Diode Forward Voltage Variation with Source Current

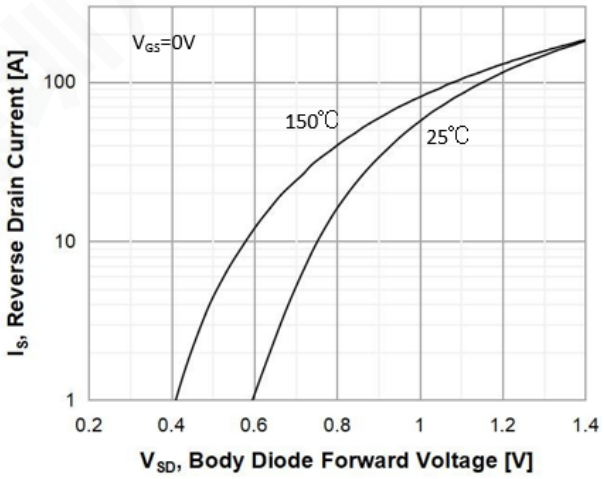


Fig. 5 Typical Capacitance Characteristics

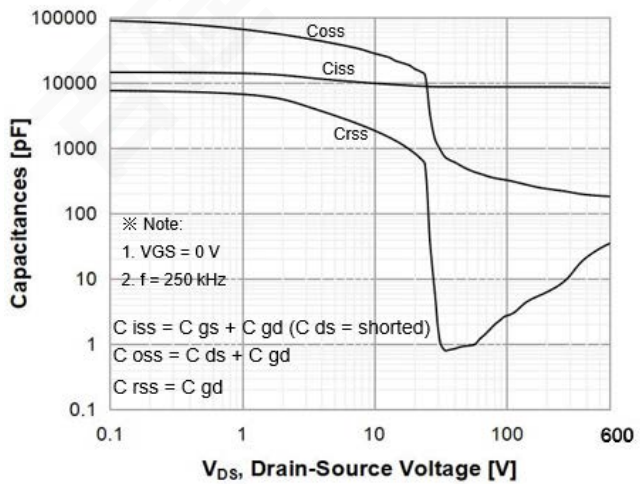


Fig. 6 Typical Total Gate Charge Characteristics

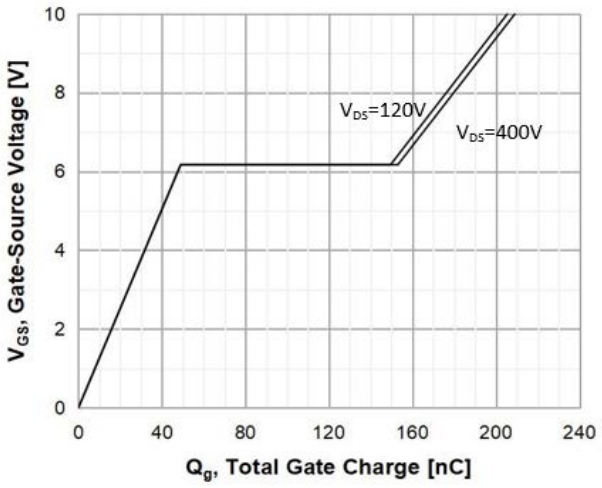


Fig. 7 Breakdown Voltage Variation vs. Temperature

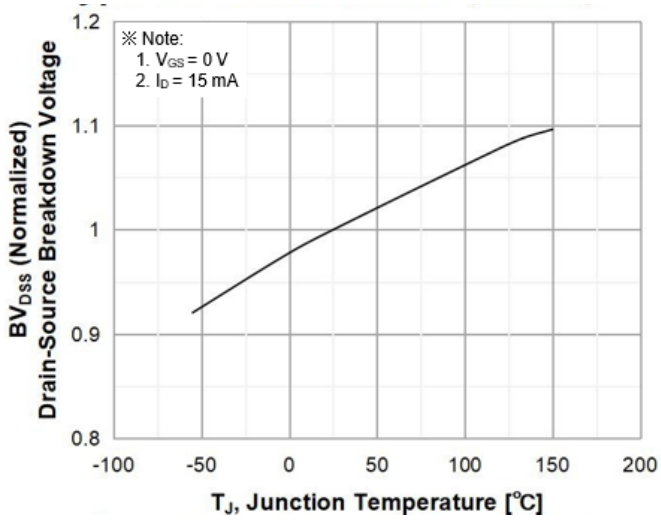


Fig. 8 On-Resistance Variation vs. Temperature

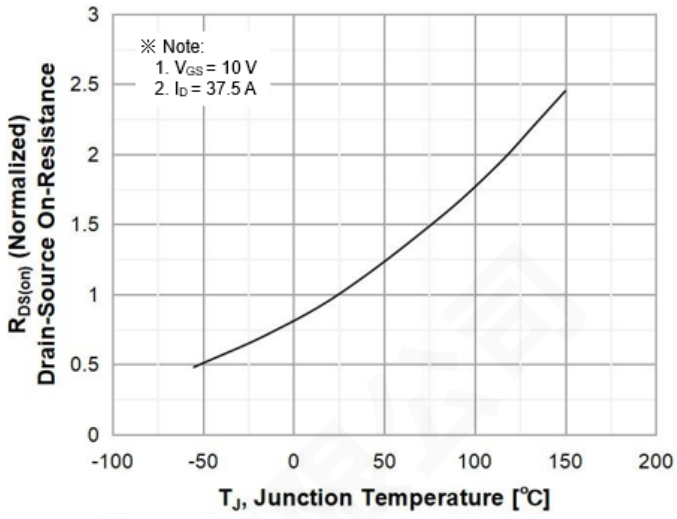


Fig. 9 Maximum Drain Current vs. Case Temperature

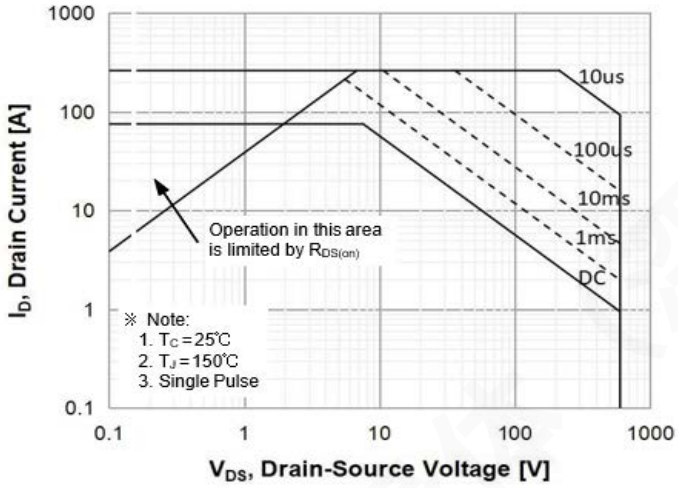


Fig. 10 Maximum Safe Operating Area

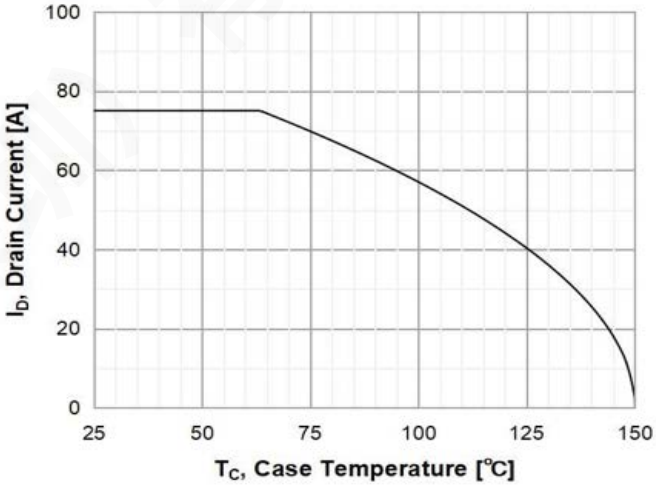


Fig. 11 Transient Thermal Impedance

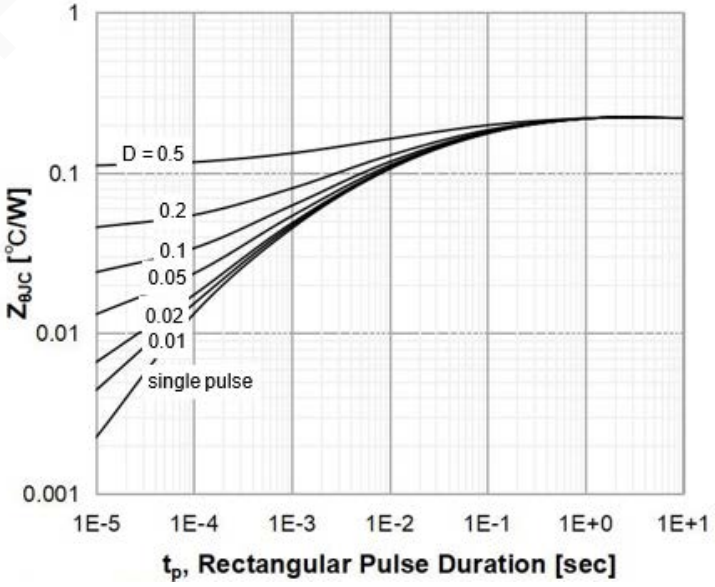
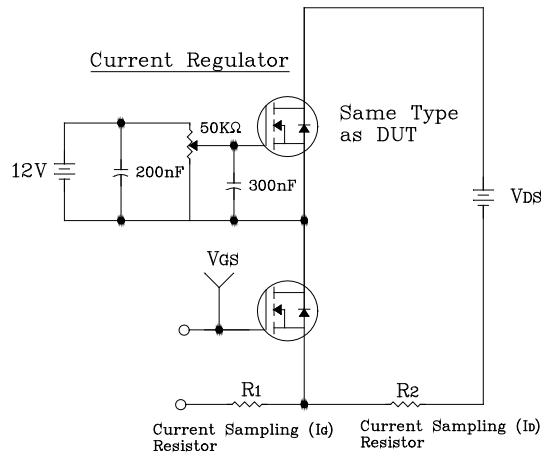


Fig. 12 Gate Charge Test Circuit & Waveform



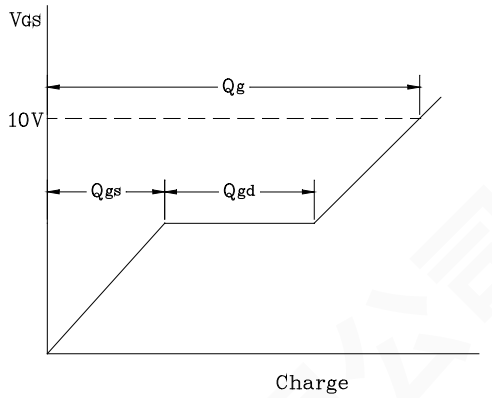
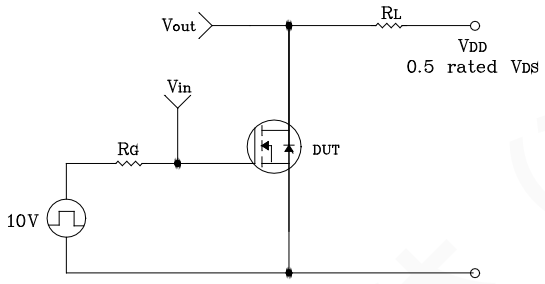


Fig. 13 Resistive Switching Test Circuit & Waveform



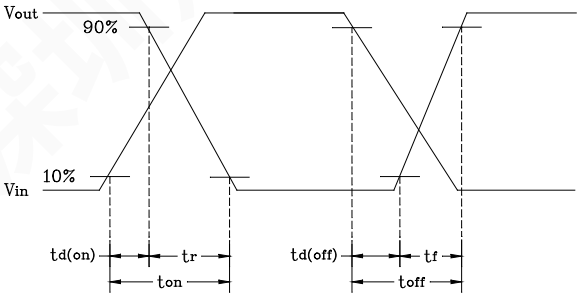
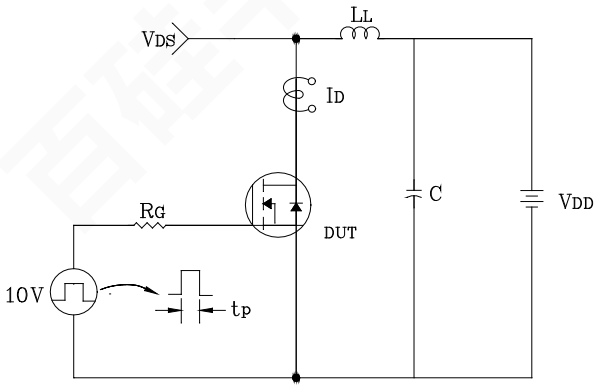


Fig. 14 E_{AS} Test Circuit & Waveform



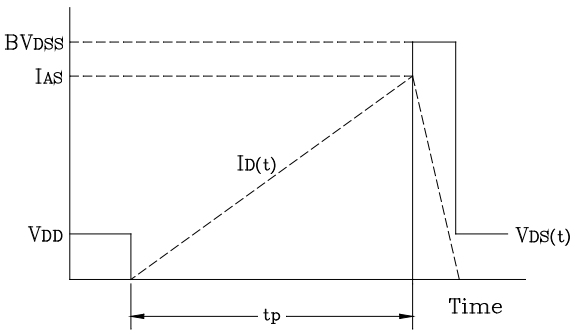
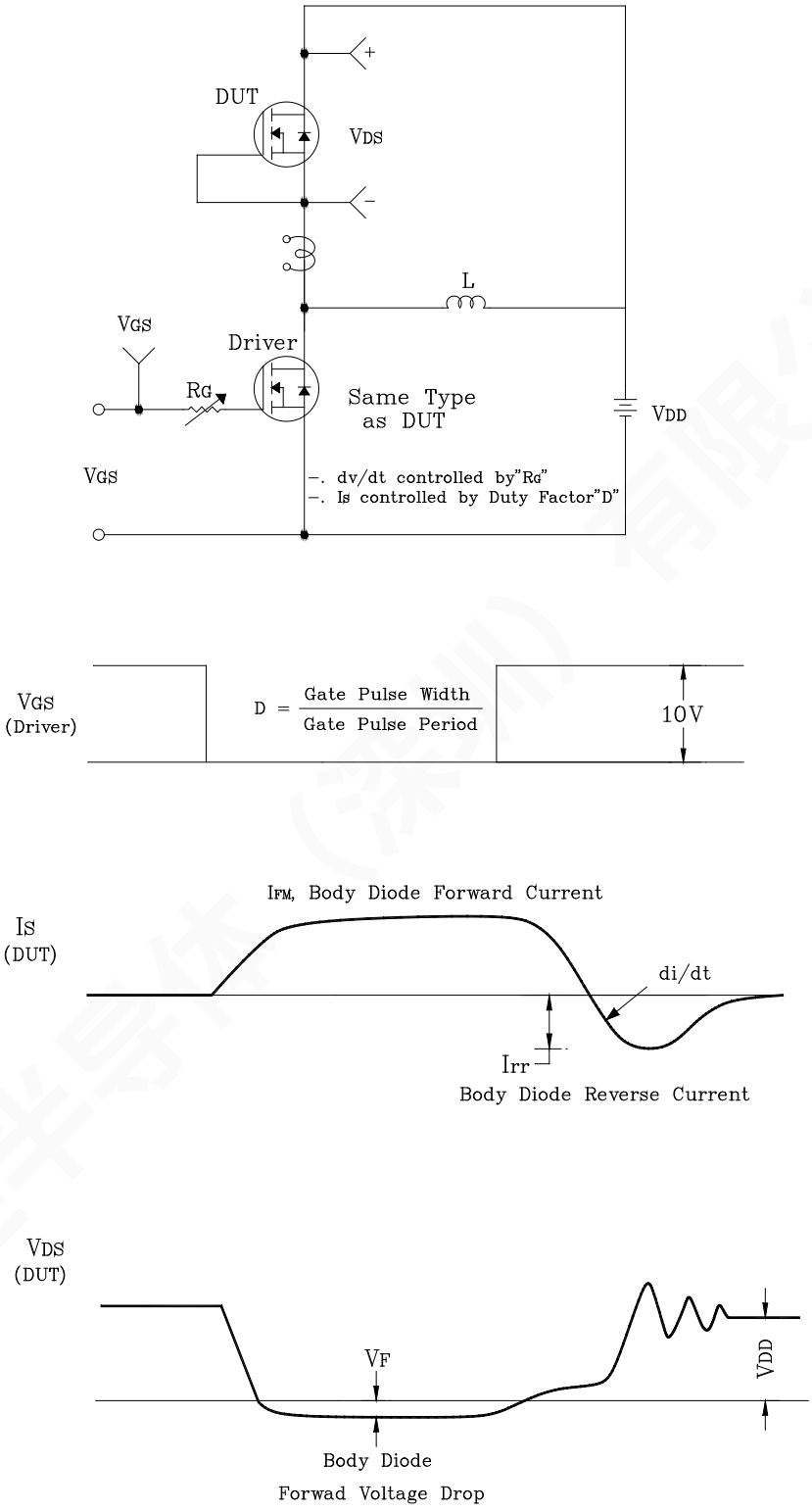
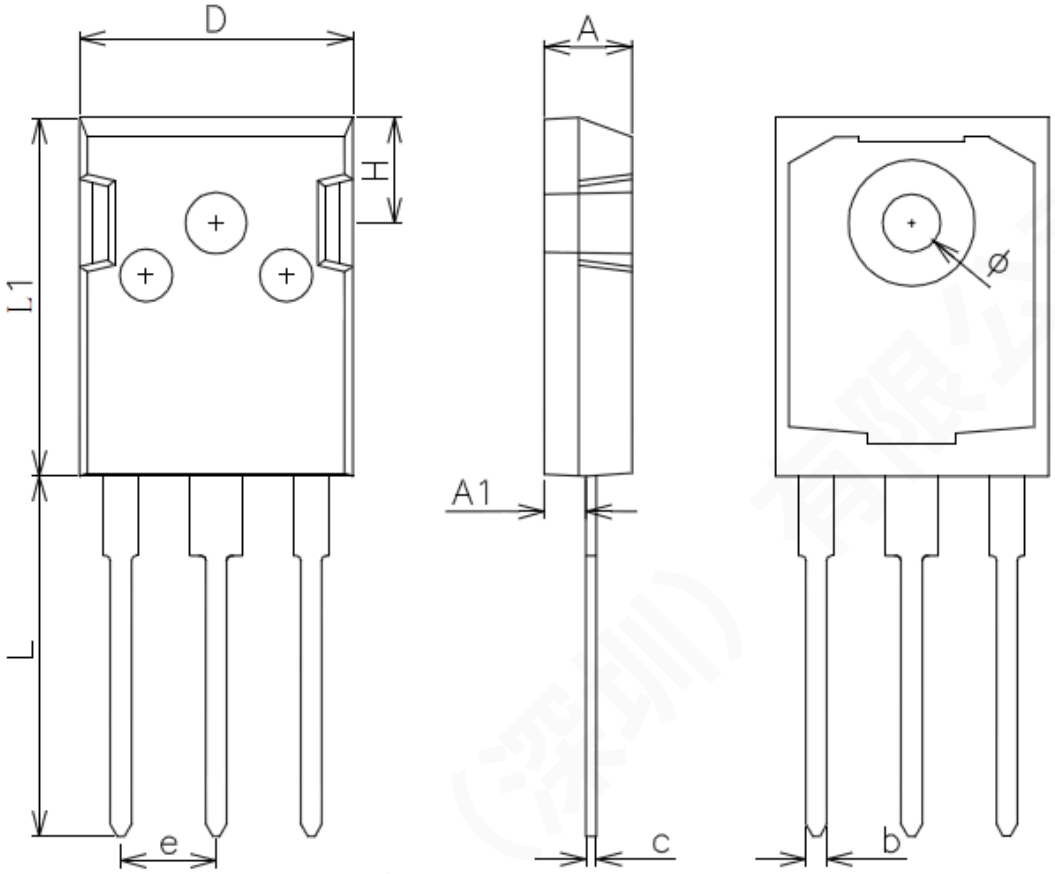


Fig. 15 Diode Reverse Recovery Time Test Circuit & Waveform



Package Outline Dimensions



SYMBOL	MILLIMETERS		
	MIN	Nominal	MAX
A	4.80	5.00	5.20
A1		2.41 REF	
b	1.00	1.20	1.40
c	0.40	0.60	0.80
D	15.60	15.80	16.00
e		5.45 REF	
H		6.15 REF	
L	19.35	19.95	20.55
L1	20.80	21.00	21.20
ø	3.20	3.50	3.80

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