HE10N082SG

N-CHANNEL MOSFET

R+O 宏嘉诚科技 www.ichjc.com

TO-220CB Plastic-Encapsulate MOSFETS

● Features

- V_{DS}=100V
- I_D=110A
- $R_{DS(on)}@V_{GS}$=10V $<$ 8.2mΩ
- $R_{DS(on)}@V_{GS}$=4.5V $<$ 10mΩ
- Fast Switching
- Low Gate Charge and Rdson
- Advanced Split Gate Trench Technology

● Applications

- Power switching application
- Battery management
- Uninterruptible power supply

● Mechanical Data

- Case: TO-220CB
  Molding compound meets UL 94V-0 flammability rating, RoHS-compliant,halogen-free
- Terminals: Solder plated, solderable per MIL-STD-750,Method 2026

● Function Diagram

Drain-source Voltage
100V
Drain Current
110 Ampere
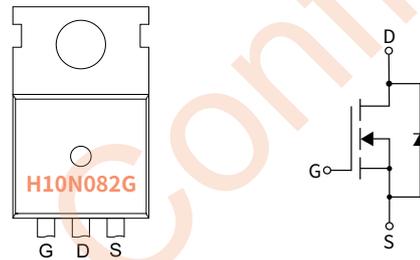
TO-220CB

● Ordering Information

PACKAGE	UNIT WEIGHT(g)	TUBE(pcs)	BOX(pcs)
TO-220CB	2.04	50	1000

● Maximum Ratings (Ta=25°C Unless otherwise specified)

PARAMETER	SYMBOL	UNIT	VALUE
Drain-source Voltage	V_{DS}	V	100
Gate-source Voltage	V_{GS}	V	±20
Drain Current	I_D	A	110
Pulsed Drain Current [1]	I_{DM}	A	440
Total Power Dissipation	P_D	W	125
Single pulse avalanche energy[2]	EAS	mJ	125
Junction temperature	T_J	°C	-55 ~+150
Storage temperature	T_{stg}	°C	-55 ~+150
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	°C / W	1

● Static Parameter Characteristics (Tj=25℃ Unless otherwise specified)

PARAMETER	SYMBOL	Condition	UNIT	Min	Typ	Max
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V$, $I_D=250\mu A$	V	100	—	—
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=100V$, $V_{GS}=0V$	μA	—	—	1.0
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm20V$, $V_{DS}=0V$	nA	—	—	±100
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$, $I_D=250\mu A$	V	1.0	1.7	2.5
Static Drain-Source On-Resistance [3]	$R_{DS(ON)}$	$V_{GS}=10V$, $I_D=40A$	mΩ	—	6.5	8.2
		$V_{GS}=4.5V$, $I_D=30A$	mΩ	—	8.1	10

● Dynamic Parameters

PARAMETER	SYMBOL	Condition	UNIT	Min	Typ	Max
Input Capacitance	C_{iss}	$V_{DS}=50V$, $V_{GS}=0V$, f=1MHZ	pF	—	2312	—
Output Capacitance	C_{oss}		pF	—	729	—
Reverse Transfer Capacitance	C_{rss}		pF	—	25.6	—

● Switching Parameters

PARAMETER	SYMBOL	Condition	UNIT	Min	Typ	Max
Turn-on Delay Time	$t_{D(on)}$	$V_{GS}=10V$, $V_{DD}=50V$, $I_D=50A$, $R_{GEN}=4.7\Omega$	nS	—	17.6	—
Turn-on Rise Time	t_r		nS	—	21	—
Turn-off Delay Time	$t_{D(off)}$		nS	—	31	—
Turn-off fall Time	t_f		nS	—	10.6	—
Total Gate Charge	Q_g	$V_{DS}=50V$, $I_D=50A$ $V_{GS}=10V$	nC	—	40	—
Gate-Source Charge	Q_{gs}		nC	—	7	—
Gate-Drain Charge	Q_{gd}		nC	—	9	—

● Drian-Source Diode Characteristics

PARAMETER	SYMBOL	Condition	UNIT	Min	Typ	Max
Diode Forward Voltage	V_{SD}	$I_S=110A$, $V_{GS}=0V$	V	—	—	1.2
Maximum Body-Diode Continuous Current	I_S	—	A	—	—	110
Reverse Recovery Time	T_{rr}	$I_S=110A$, di/dt=100A/us, TJ=25℃	nS	—	51	—
Reverse Recovery Charge	Q_{rr}		nC	—	85	—

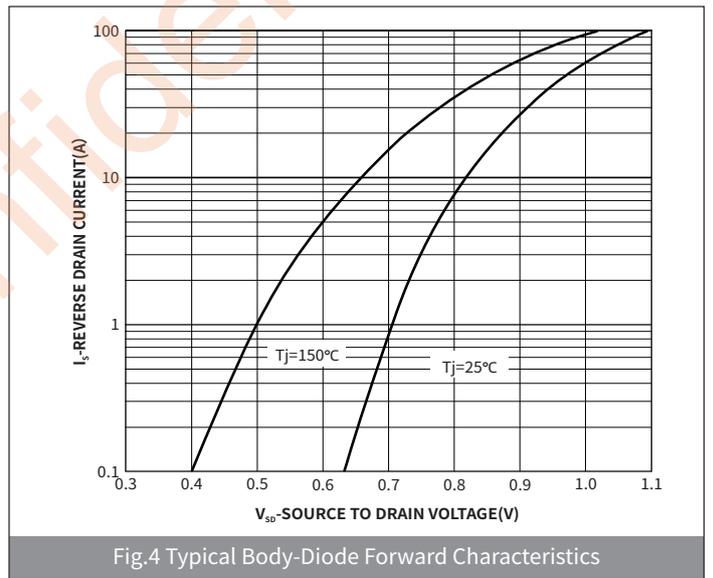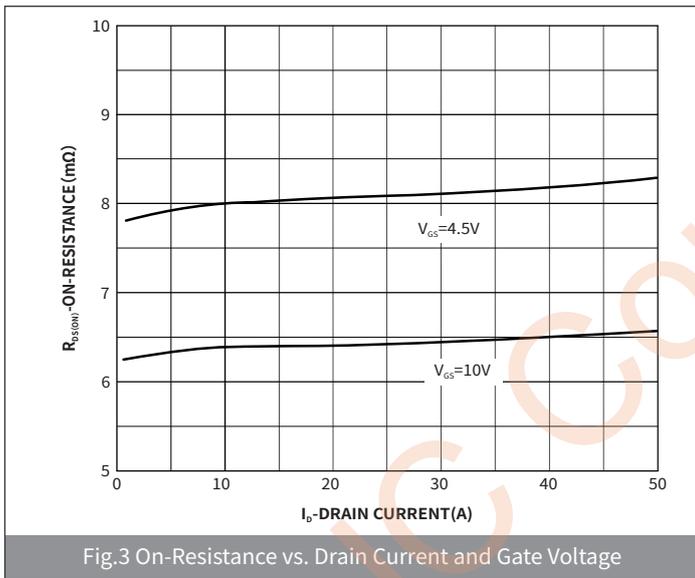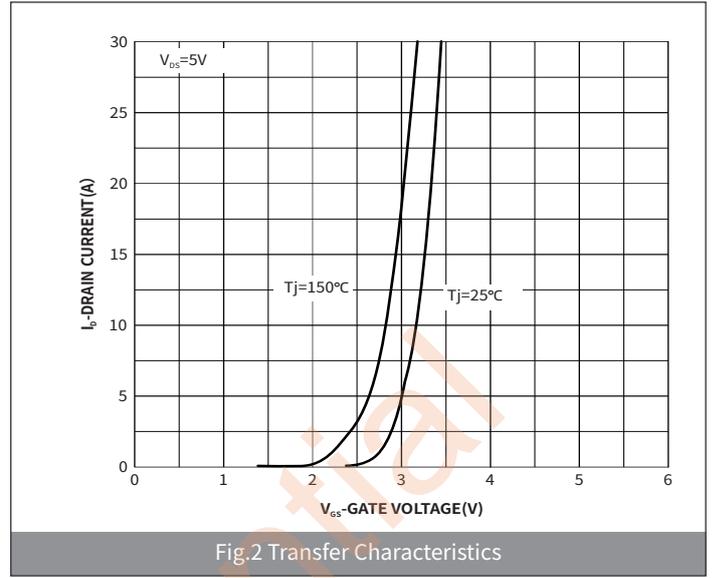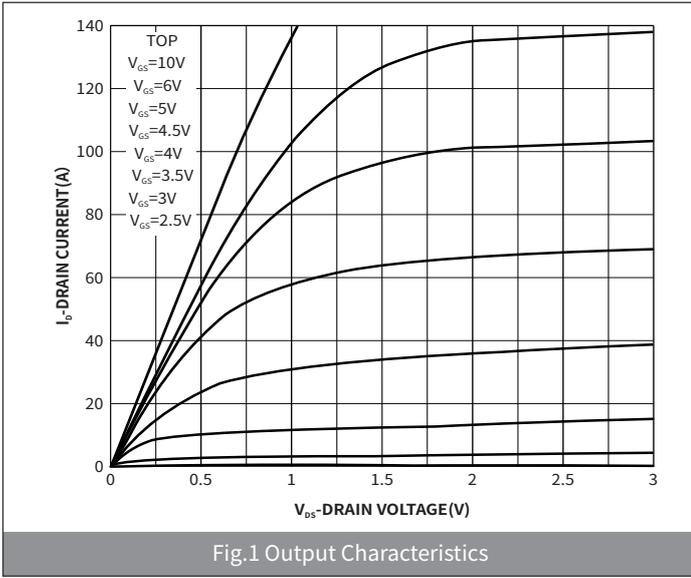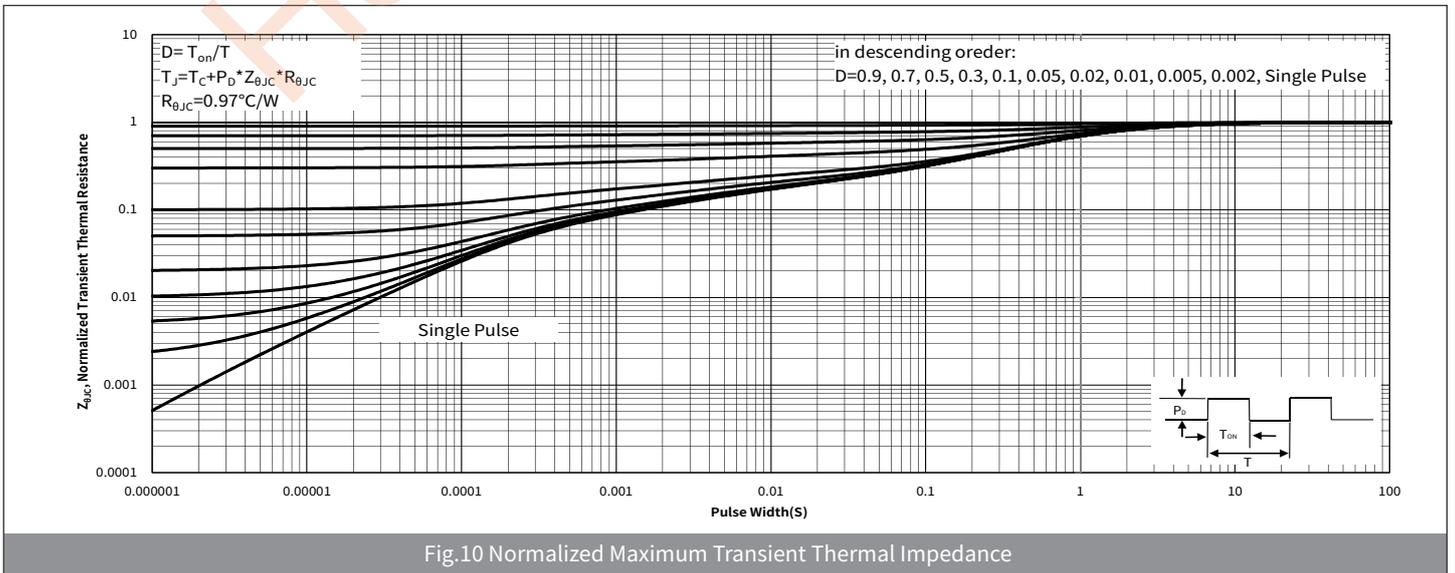Note :

(1)Repetitive Rating: Pulse width limited by maximum junction temperature.
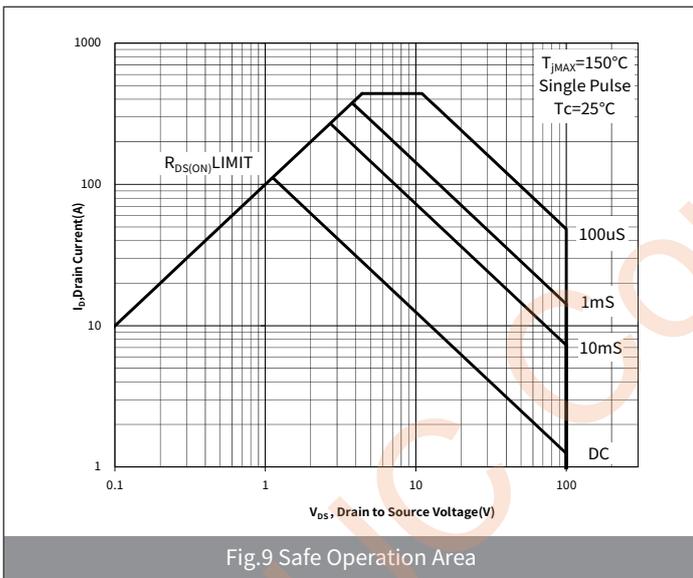
(2)EAS condition : Tj=25℃ ,VDD=50V,VG=10V,L=0.5mH,IAS=22.4A,Rg=25Ω.

(3)Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.

● Ratings And Characteristics Curves (Ta=25℃ Unless otherwise specified)

Fig.1 Output Characteristics

Fig.2 Transfer Characteristics

Fig.3 On-Resistance vs. Drain Current and Gate Voltage

Fig.4 Typical Body-Diode Forward Characteristics

Fig.5 Capacitance Characteristics
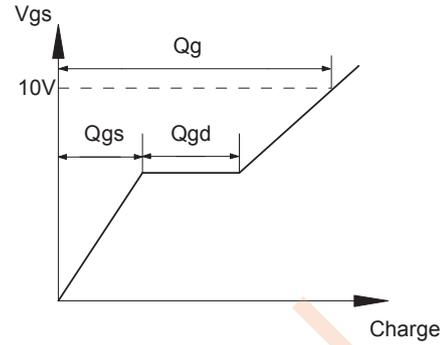
Fig.6 Gate Charge

HE10N082SG

N-CHANNEL MOSFET

● **Ratings And Characteristics Curves** (Ta=25℃ Unless otherwise specified)

Fig.7 V(BR)DSS vs.Junction Temperature

Fig.8 Gate Thresold Variation vs. Tj

Fig.9 Safe Operation Area
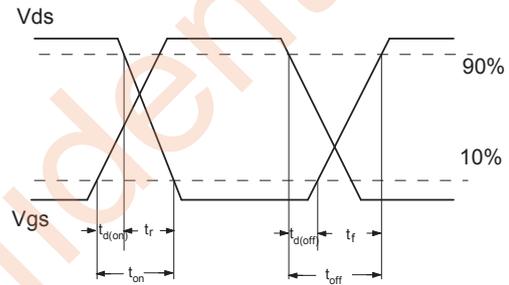

Fig.10 Normalized Maximum Transient Thermal Impedance

HE10N082SG

N-CHANNEL MOSFET
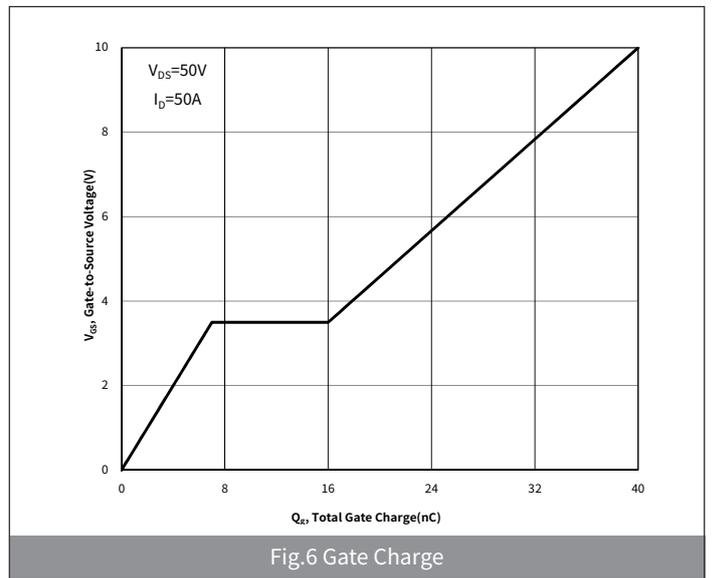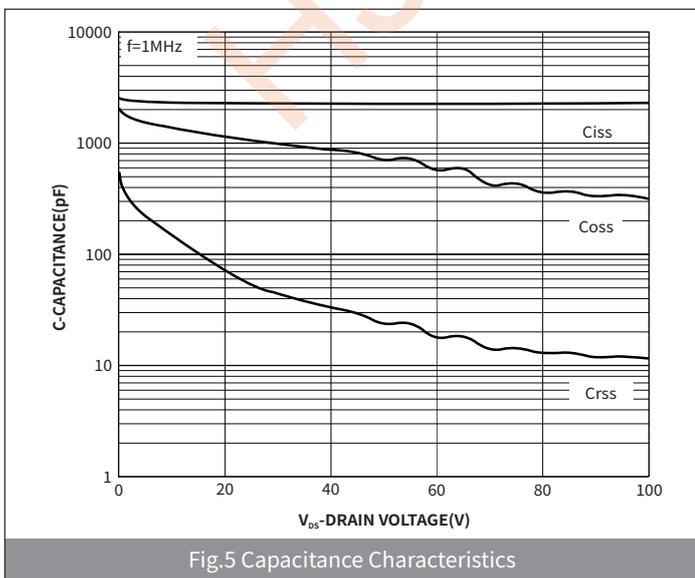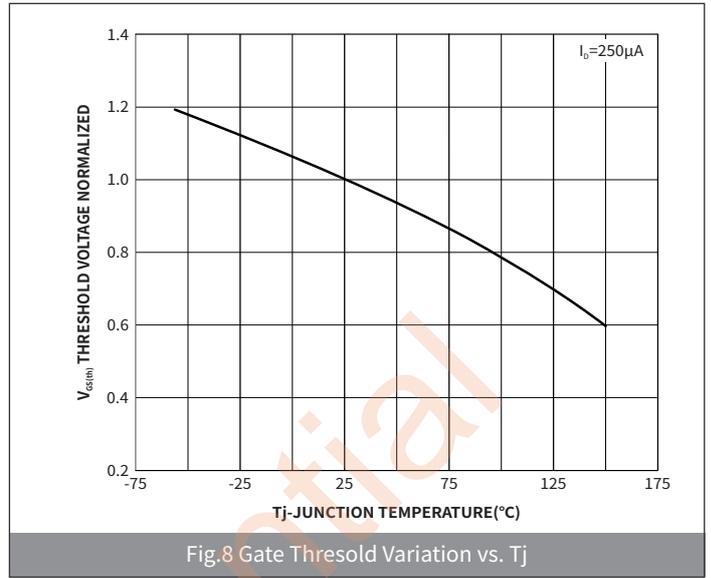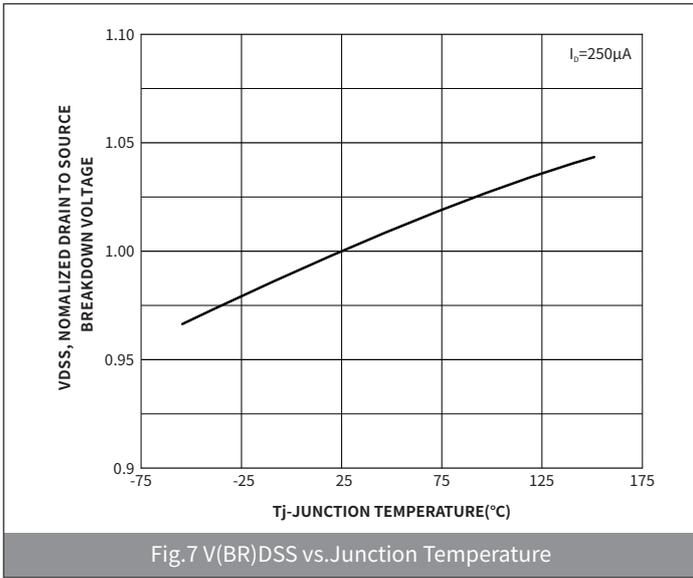
● Package Outline Dimensions (TO-220CB)

Symbol	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.40	4.60	0.173	0.181
A1	1.20	1.40	0.047	0.055
A2	2.25	2.55	0.088	0.100
b	0.70	0.90	0.028	0.035
b1	1.17	1.42	0.046	0.056
c	0.33	0.65	0.013	0.025
D	15.5	16.00	0.610	0.630
D1	8.95	9.75	0.352	0.383
D2	12.9	13.30	0.508	0.524
D3	15.45	16.15	0.608	0.636
E	9.80	10.15	0.386	0.400
E1	7.50	8.20	0.295	0.323
E2	8.55	8.85	0.337	0.348
e	2.54BSC		0.1BSC	
e1	5.08BSC		0.2BSC	
H	6.35	6.60	0.250	0.260
L	12.85	13.15	0.506	0.518
L1	2.30	2.70	0.090	0.106
L2	4.50	4.80	0.177	0.189
ΦP	3.50	3.75	0.138	0.148
Q	2.65	2.85	0.104	0.112
θ1	2°	7°	2°	7°

R+O 宏嘉诚科技
www.ichjc.com

1.Gate Charge Test Circuit & Waveforms

Vgs

10V

Qg

Qgs Qgd

Charge
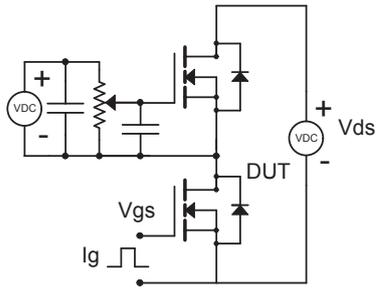
2. Resistive Switching Test Circuit & Waveforms

RL
Vds
Vgs DUT Vdd
Rg
Vgs

Vds

90%

10%

Vgs

$t_{d(on)}$ t_r $t_{d(off)}$ t_f

t_{on} t_{off}
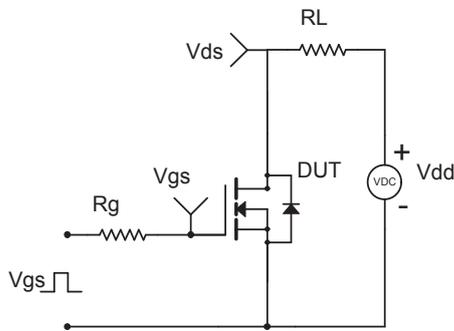
3.Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

L
Vds
Id
$\overline{Vgs}$ Vdd
Vgs
Rg
DUT
Vgs

$E_{AR}= 1/2\, L I_{AR}^2$

Vds

BV_{DSS}

Id

I_{AR}

Vgs
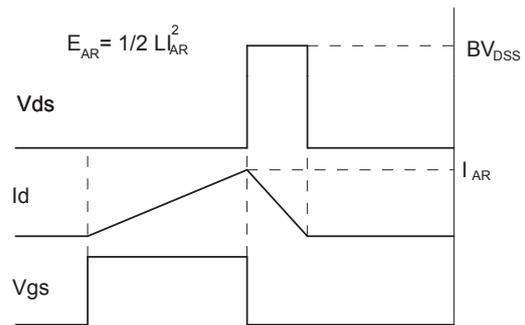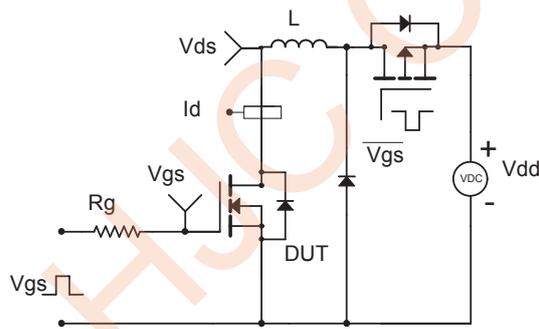
4.Diode Recovery Test Circuit & Waveforms

Vds +
DUT
Vds -
Isd L
Vgs Vdd
Ig

$Q_{rr} = -\int Idt$

Vgs

Isd I_F t_{rr} dI/dt

I_{RM}

Vds Vdd