WFJ8N65B

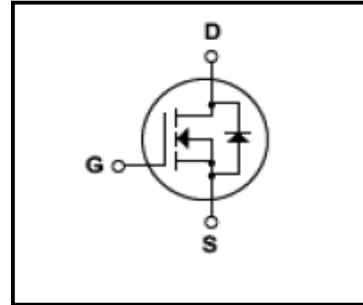## *Silicon N-Channel MOSFET*

## Features

- ☒ 7.5A,650V,$R_{DS(on)}$(Max1.3Ω)@V_{GS}=10V
- ☒ Ultra-low Gate charge(Typical 25nC)
- ☒ Fast Switching Capability
- ☒ 100%Avalanche Tested
- ☒ Isolation Voltage (V_{ISO}=4000V AC)
- ☒ Maximum Junction Temperature Range(150℃)

General Description

This Power MOSFET is produced using Winsemi's advanced planar stripe, VDMOS technology. this latest technology has been especially designed to minimize on-state resistance, have a high rugged avalanche characteristics .This devices is specially well suited for half bridge and full bridge resonant topology line a electronic lamp ballast, high efficiency switched mode power supplies, active power factor correction.

TO-262
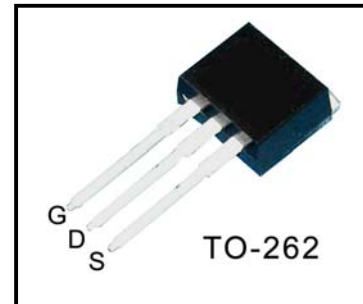
Absolute Maximum Ratings

Symbol	Parameter		Value	Units
V_{DSS}	Drain Source Voltage		650	V
I_D	Continuous Drain Current(@Tc=25℃)		7.5*	A
	Continuous Drain Current(@Tc=100℃)		4.3*	A
I_{DM}	Drain Current Pulsed	(Note1)	32*	A
V_{GS}	Gate to Source Voltage		±30	V
E_{AS}	Single Pulsed Avalanche Energy	(Note2)	230	mJ
E_{AR}	Repetitive Avalanche Energy	(Note1)	14.7	mJ
dv/dt	Peak Diode Recovery dv /dt	(Note3)	4.5	V/ ns
P_D	Total Power Dissipation(@Tc=25℃)		147	W
	Derating Factor above 25℃		0.38	W/℃
T_J,T_{stg}	Junction and Storage Temperature		-40~150	℃
T_L	Channel Temperature		300	℃

*Drain current limited by junction temperature

Thermal Characteristics

Symbol	Parameter	Value			Units
		Min	Typ	Max	
R_{QJC}	Thermal Resistance , Junction -to -Case	-	-	0.85	℃/W
R_{QJA}	Thermal Resistance , Junction-to -Ambient	-	-	62.5	℃/W

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Electrical Characteristics(Tc=25℃)

Characteristics		Symbol	Test Condition	Min	Type	Max	Unit
Gate leakage current		I_{GSS}	$V_{GS}=\pm30V, V_{DS}=0V$	-	-	±100	nA
Gate-source breakdown voltage		$V_{(BR)GSS}$	$I_G=\pm10\ \mu A, V_{DS}=0V$	±30	-	-	V
Drain cut -off current		I_{DSS}	$V_{DS}=650V, V_{GS}=0V, Tc=25℃$	-	-	10	μA
			$V_{DS}=500V, Tc=125℃$	-	-	100	μA
Drain -source breakdown voltage		$V_{(BR)DSS}$	$I_D=250\ \mu A, V_{GS}=0V$	650	-	-	V
Breakdown Voltage Temperature Coefficient		$\Delta BV_{DSS}/\Delta T_J$	$I_D=250\ \mu A$, referenced to 25℃	-	0.70	-	V/℃
Gate threshold voltage		$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\ \mu A$	2	-	4	V
Drain -source ON resistance		$R_{DS(ON)}$	$V_{GS}=10V, I_D=3.75A$	-	1.1	1.3	Ω
Forward Transconductance		gfs	$V_{DS}=40V, I_D=3.75A$	-	6.2	-	S
Input capacitance		C_{iss}	$V_{DS}=25V,$	-	965	1255	pF
Reverse transfer capacitance		C_{rss}	$V_{GS}=0V,$	-	12	16	pF
Output capacitance		C_{oss}	f=1MHz	-	105	135	pF
Switching time	Turn-On Rise time	tr	$V_{DD}=300V,$	-	60	130	ns
	Turn-On time	$T_d(on)$	$I_D=7.5A$	-	16.5	45	ns
	Turn-Off Fall time	tf	$R_G=25Ω$	-	64.5	140	ns
	Turn-Off time	$T_d(off)$	(Note4,5)	-	81	170	ns
Total gate charge(gate-source plus gate-drain)		Qg	$V_{DD}=480V,$ $V_{GS}=10V,$	-	28	36	nC
Gate-source charge		Qgs	$I_D=7.5A$	-	4.5	-	nC
Gate-drain("miller") Charge		Qgd	(Note4,5)	-	12	-	nC

Source-Drain Ratings and Characteristics(Ta=25℃)

Characteristics	Symbol	Test Condition	Min	Type	Max	Unit
Continuous drain reverse current	I_{DR}	-	-	-	7.5	A
Pulse drain reverse current	I_{DRP}	-	-	-	30	A
Forward voltage(diode)	V_{DSF}	$I_{DR}=7.5A, V_{GS}=0V$	-	-	1.4	V
Reverse recovery time	trr	$I_{DR}=7.5A, V_{GS}=0V,$	-	365	-	ns
Reverse recovery charge	Qrr	$dI_{DR}/dt=100\ A/\mu s$	-	3.4	-	μC

Note 1.Repeativity rating :pulse width limited by junction temperature

2.L=19.5mH $I_{AS}=7.5A, V_{DD}=50V, R_G=0Ω$,Starting $T_J=25℃$

3.$I_{SD}≤7.5.A,di/dt≤300A/us, V_{DD}<BV_{DSS}$,STARTING $T_J=25℃$

4.Pulse Test:Pulse Width≤300us,Duty Cycle≤2%

5. Essentially independent of operating temperature.

This transistor is an electrostatic sensitive device

Please handle with caution

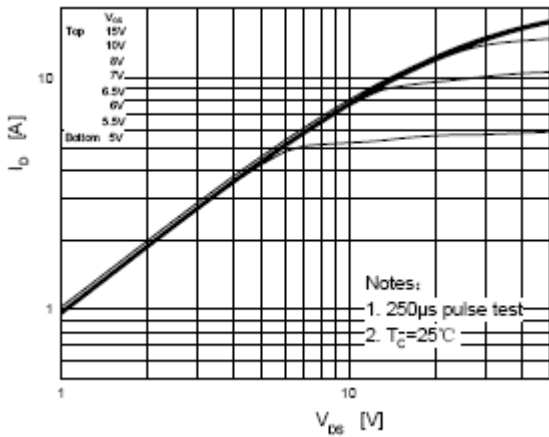*Steady, keep you advance*

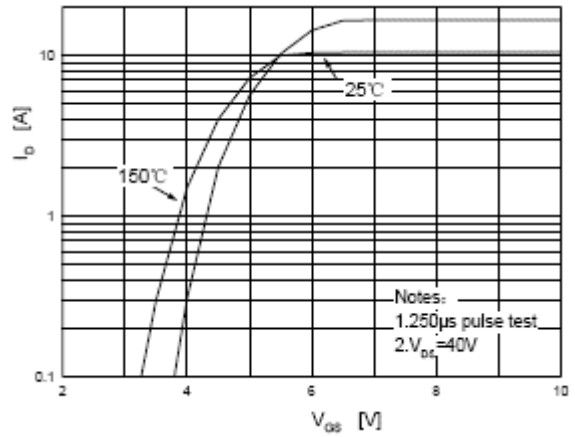**Fig.1 On Region Characteristics**
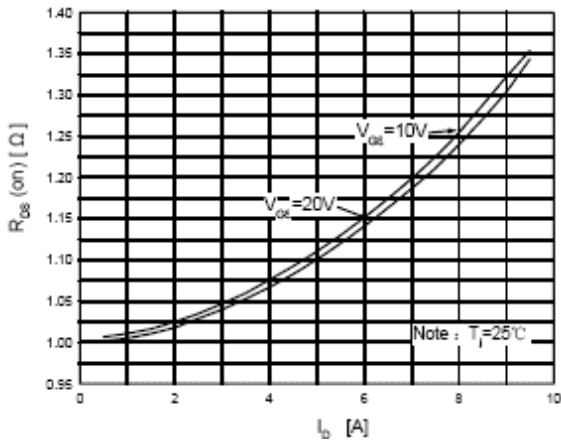

Fig.2 Transfer Characteristics

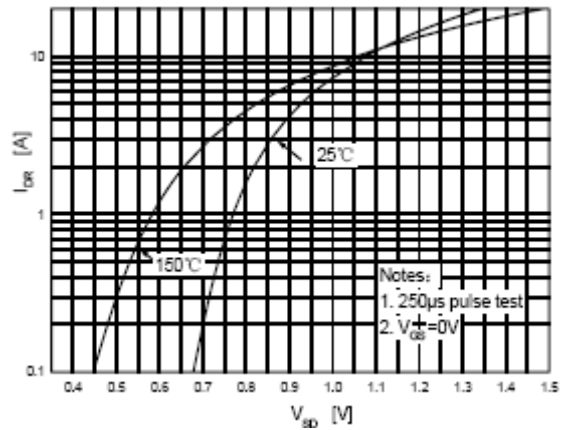**Fig.3 On-Resistance Variation vs Drain Current and Gate Voltage**

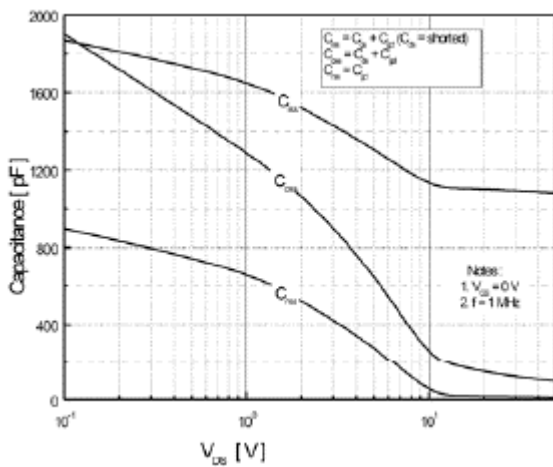**Fig.4 Body Diode Forward Voltage Variation with Source Current and Temperature**
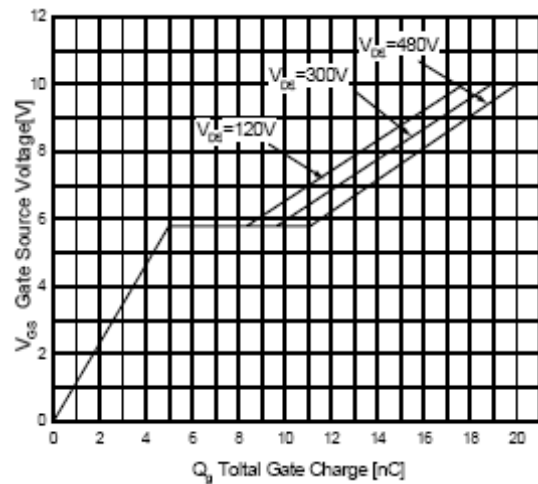

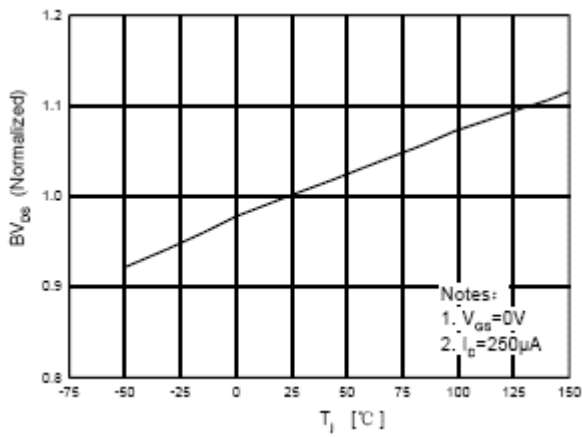**Fig.5 Capacitance Characteristics**

Fig.6 Gate Charge Characteristics

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Fig.7 Breakdown Voltage Variation Vs.Temperature
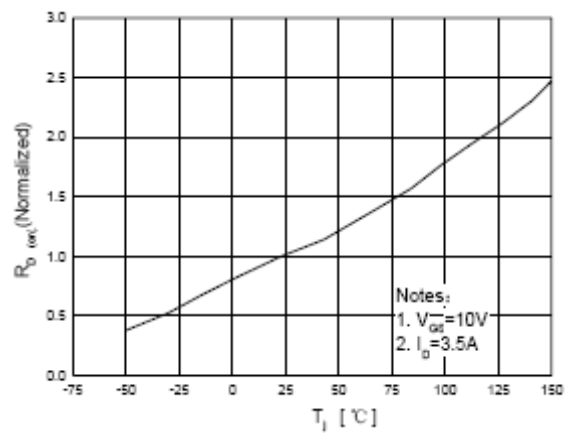
Fig.8 On-Resistance Variation Vs.Temperature
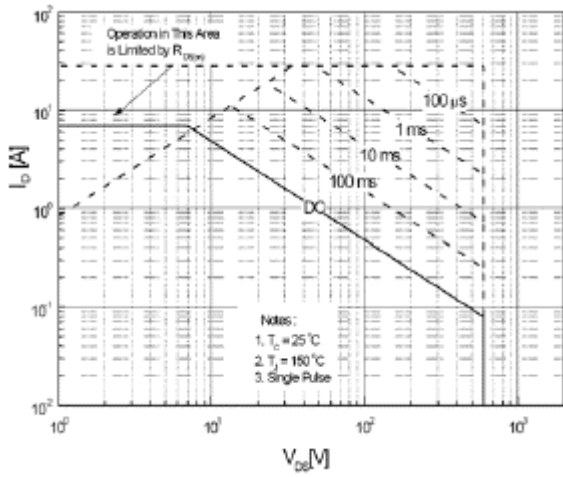
Fig.9 Maximum Safe Operation Area

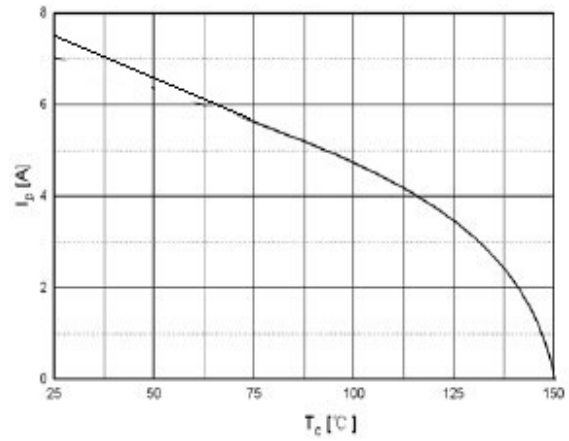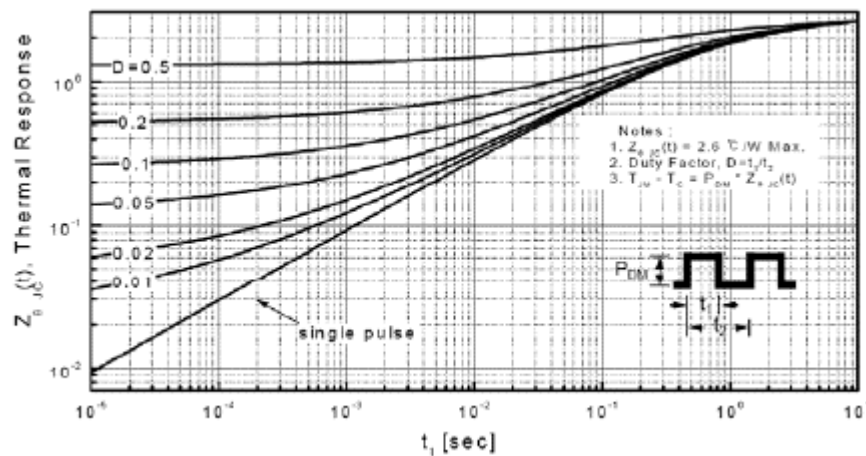**Fig.10 Maximum Drain Current vs.case Temperature**

Fig.11 Transient Thermal Response Curve

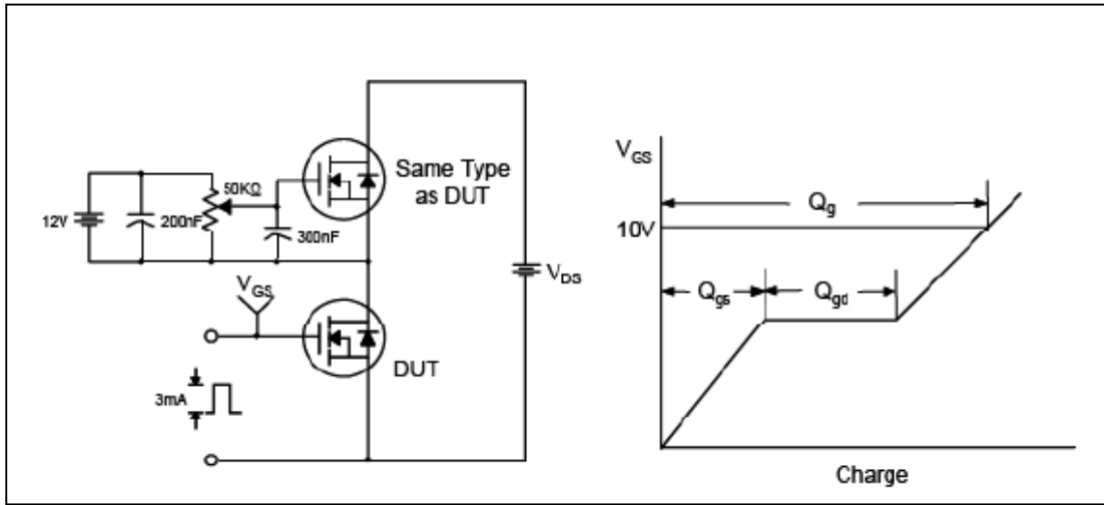*Steady, keep you advance*

Fig.12 Gate Test Circuit & Waveform
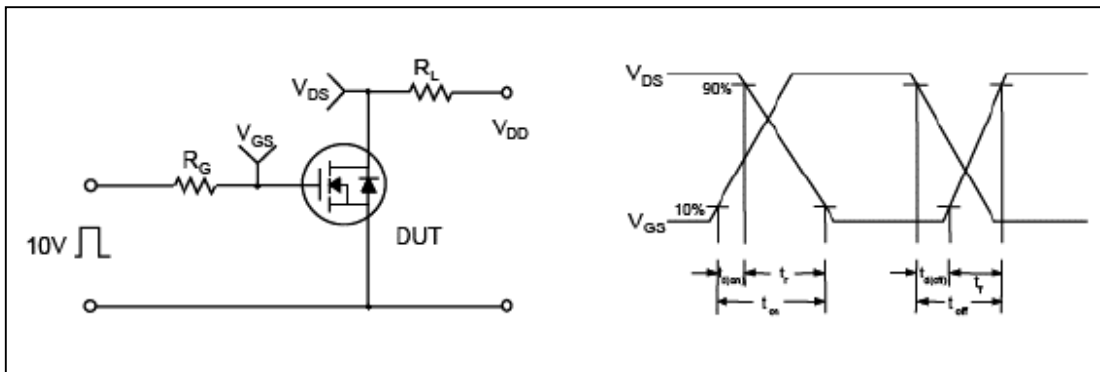
Fig.13 Resistive Switching Test Circuit & Waveform

$$E_{AS} = \frac{1}{2} L I_{AS}^2 \frac{BV_{DSS}}{BV_{DSS} - V_{DD}}$$
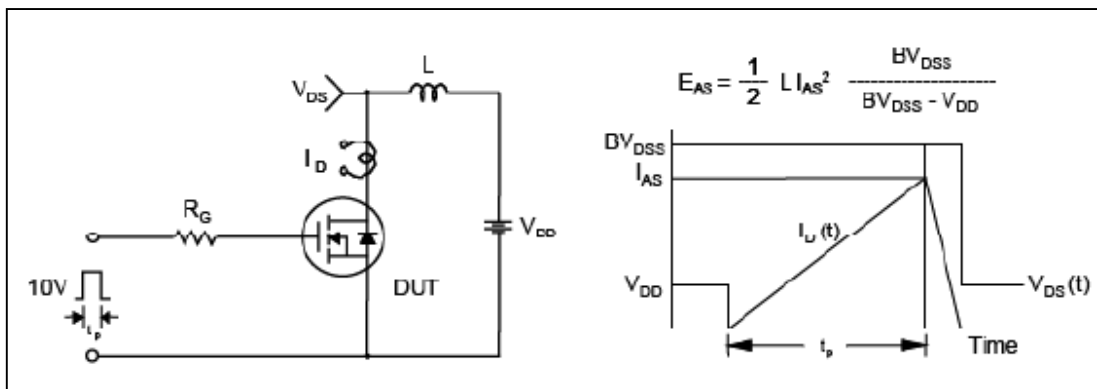
Fig.14 Unclamped Inductive Switching Test Circuit & Waveform

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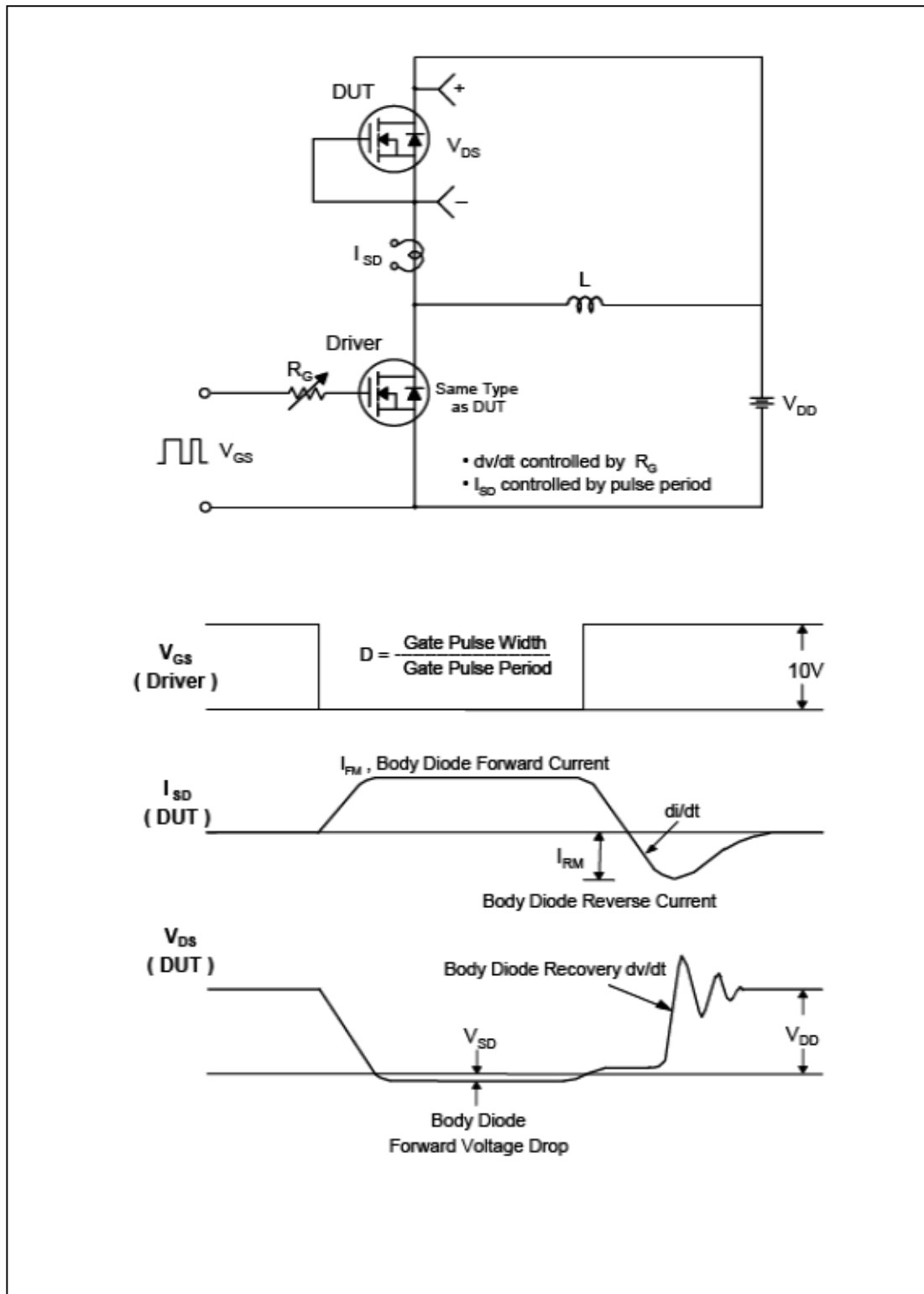
Fig.15 Peak Diode Recovery dv/dt Test Circuit & Waveform

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TO-262   Package Dimension

Unit:mm
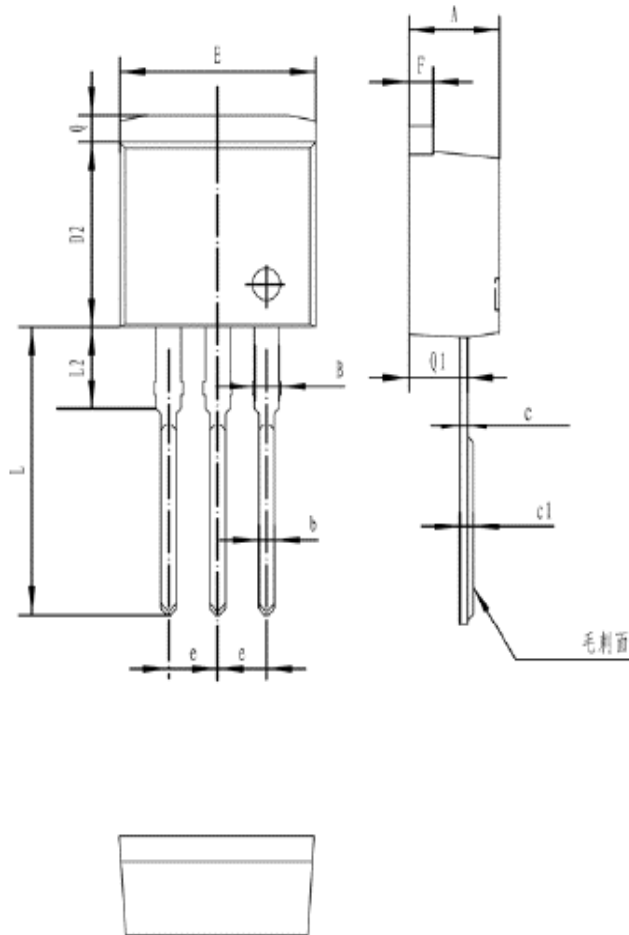
符号 symbol	MIN	MAX
A	4.40	4.90
B	1.10	1.40
b	0.70	0.95
c	0.30	0.60
c1	0.33	0.63
D2	8.20	9.20
E	9.60	10.50
e	2.39	2.69
F	1.20	1.35
L	13.11	14.61
L2	3.55	4.05
Q	1.10	1.40
Q1	2.65	2.85

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