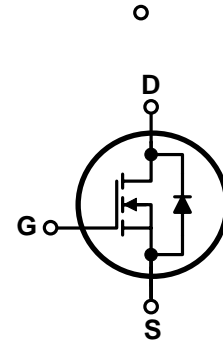




650V N-Channel MOSFET



Features

- High Voltage: $BV_{DSS}=650V(\text{Min.})$
- Low C_{rSS} : $C_{rSS}=5.8pF(\text{Typ.})$
- Low gate charge : $Q_g=13nC(\text{Typ.})$
- Low $R_{DS(on)}$: $R_{DS(on)}=2.5\Omega(\text{Max.})$

Product Summary

BVDSS	RDSON	ID
650V	2.1 Ω	4 A



TO-220F-3L

Absolute maximum ratings

($T_c=25^\circ C$)

Characteristic	Symbol	Rating	Unit
Drain-source voltage	V_{DSS}	650	V
Gate-source voltage	V_{GSS}	± 30	V
Drain current (DC)	I_D	($T_c=25^\circ C$)	4
		($T_c=100^\circ C$)	2.53
Drain current (Pulsed) *	I_{DM}	16	A
Drain Power dissipation	P_D	32	W
Avalanche current (Single) ②	I_{AS}	4	A
Single pulsed avalanche energy ②	E_{AS}	225	mJ
Avalanche current (Repetitive) ①	I_{AR}	4	A
Repetitive avalanche energy ①	E_{AR}	10	mJ
Junction temperature	T_J	150	$^\circ C$
Storage temperature range	T_{stg}	-55~150	

* Limited by maximum junction temperature

Characteristic	Symbol	Typ.	Max	Unit
Thermal resistance	Junction-case	$R_{th(J-C)}$	-	3.9
	Junction-ambient	$R_{th(J-a)}$	-	62.5



650V N-Channel MOSFET

Electrical Characteristics

(Tc=25°C)

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Drain-source breakdown voltage	BV_{DSS}	$I_D=250\mu A, V_{GS}=0$	650	-	-	V
Gate-threshold voltage	$V_{GS(th)}$	$I_D=250\mu A, V_{DS}=V_{GS}$	2.0	-	4.0	V
Drain-source leakage current	I_{DSS}	$V_{DS}=650V, V_{GS}=0V$	-	-	1	μA
Gate-source leakage	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 30V$	-	-	± 100	nA
Drain-Source on-resistance ④	$R_{DS(on)}$	$V_{GS}=10V, I_D=2.0A$	-	2.1	2.5	Ω
Forward transfer admittance ④	g_{fs}	$V_{DS}=10V, I_D=2.0A$	-	4.0	-	S
Input capacitance	C_{iss}	$V_{GS}=0V, V_{DS}=25V, f=1MHz$	-	670	848	pF
Output capacitance	C_{oss}		-	57	71	
Reverse transfer capacitance	C_{rss}		-	9.8	12.2	
Turn-on delay time	$t_{d(on)}$	$V_{DD}=300V, I_D=4A$ $R_G=25\Omega$	-	10	-	ns
Rise time	t_r		-	42	-	
Turn-off delay time	$t_{d(off)}$ ③④		-	38	-	
Fall time	t_f		-	46	-	
Total gate charge	Q_g	$V_{DS}=480V, V_{GS}=10V$ $I_D=4A$	-	12	15	nC
Gate-source charge	Q_{gs}		-	4	-	
Gate-drain charge	Q_{gd} ③④		-	3	-	

Source-Drain Diode Ratings and Characteristics

(Tc=25°C)

Characteristic	Symbol	Test Condition	Min	Typ	Max	Unit
Continuous source current	I_S	Integral reverse diode in the MOSFET	-	-	4	A
Source current (Pulsed) ①	I_{SM}		-	-	16	
Forward voltage ④	V_{SD}	$V_{GS}=0V, I_S=4A$	-	-	1.4	V
Reverse recovery time	t_{rr}	$I_S=4A$ $di_s/dt=100A/us$	-	300	-	ns
Reverse recovery charge	Q_{rr}		-	2.2	-	μC

Note ;

- ① Repetitive Rating : Pulse Width Limited by Maximum Junction Temperature
- ② $L=25.9mH, I_{AS}=4A, V_{DD}=50V, R_G=27\Omega$, Starting $T_J = 25^\circ C$
- ③ Pulse Test : Pulse Width < 300us, Duty cycle $\leq 2\%$
- ④ Essentially independent of operating temperature



650V N-Channel MOSFET

Fig. 11 Gate Charge Test Circuit & Waveform

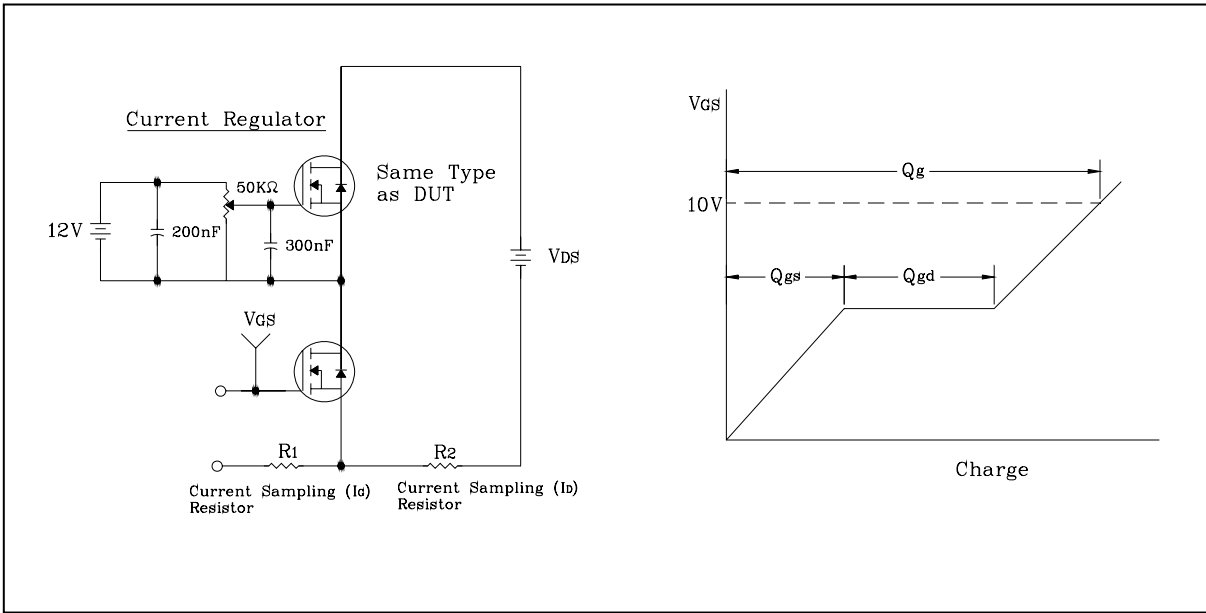


Fig. 12 Resistive Switching Test Circuit & Waveform

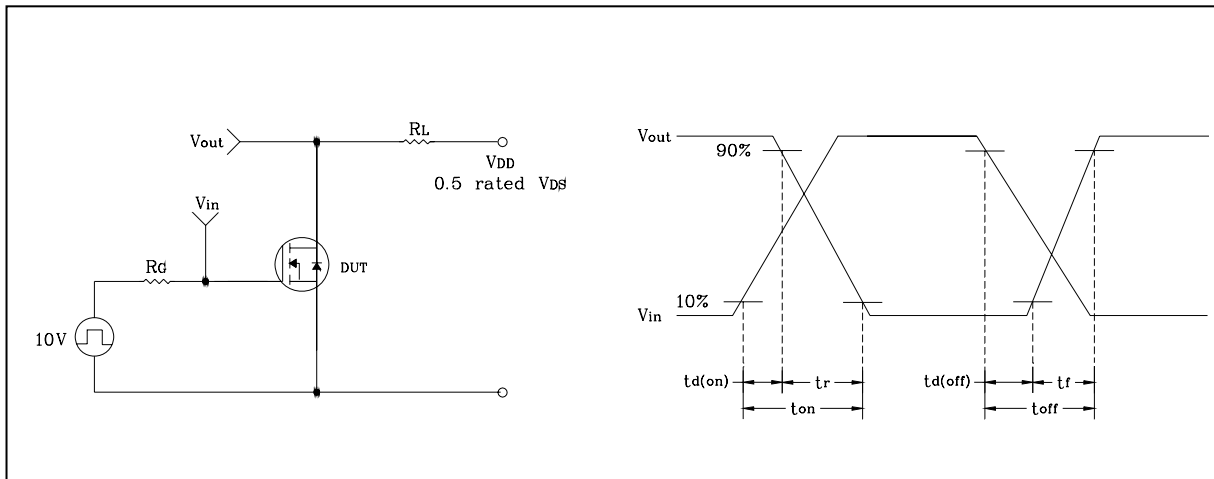
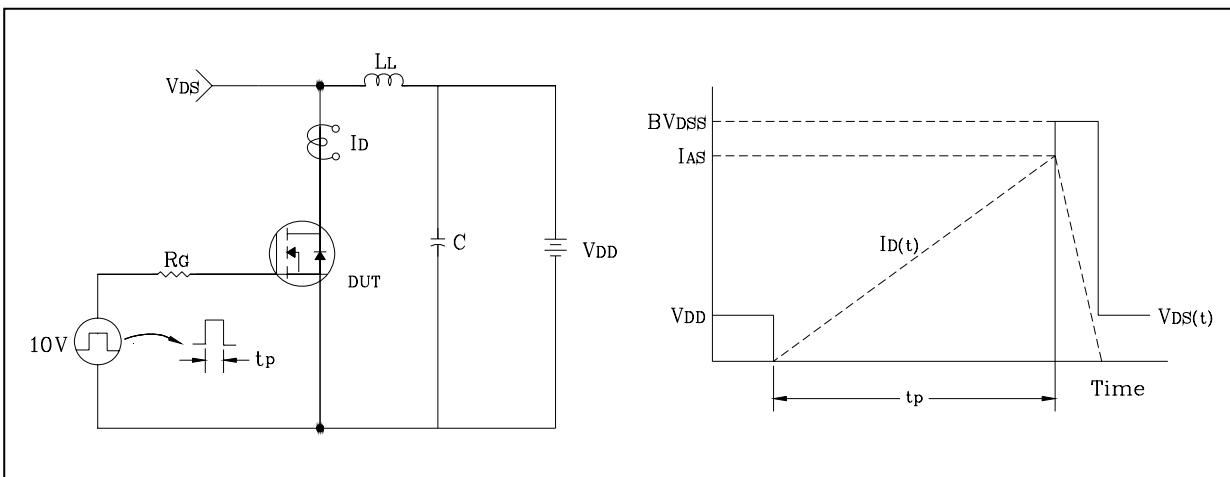


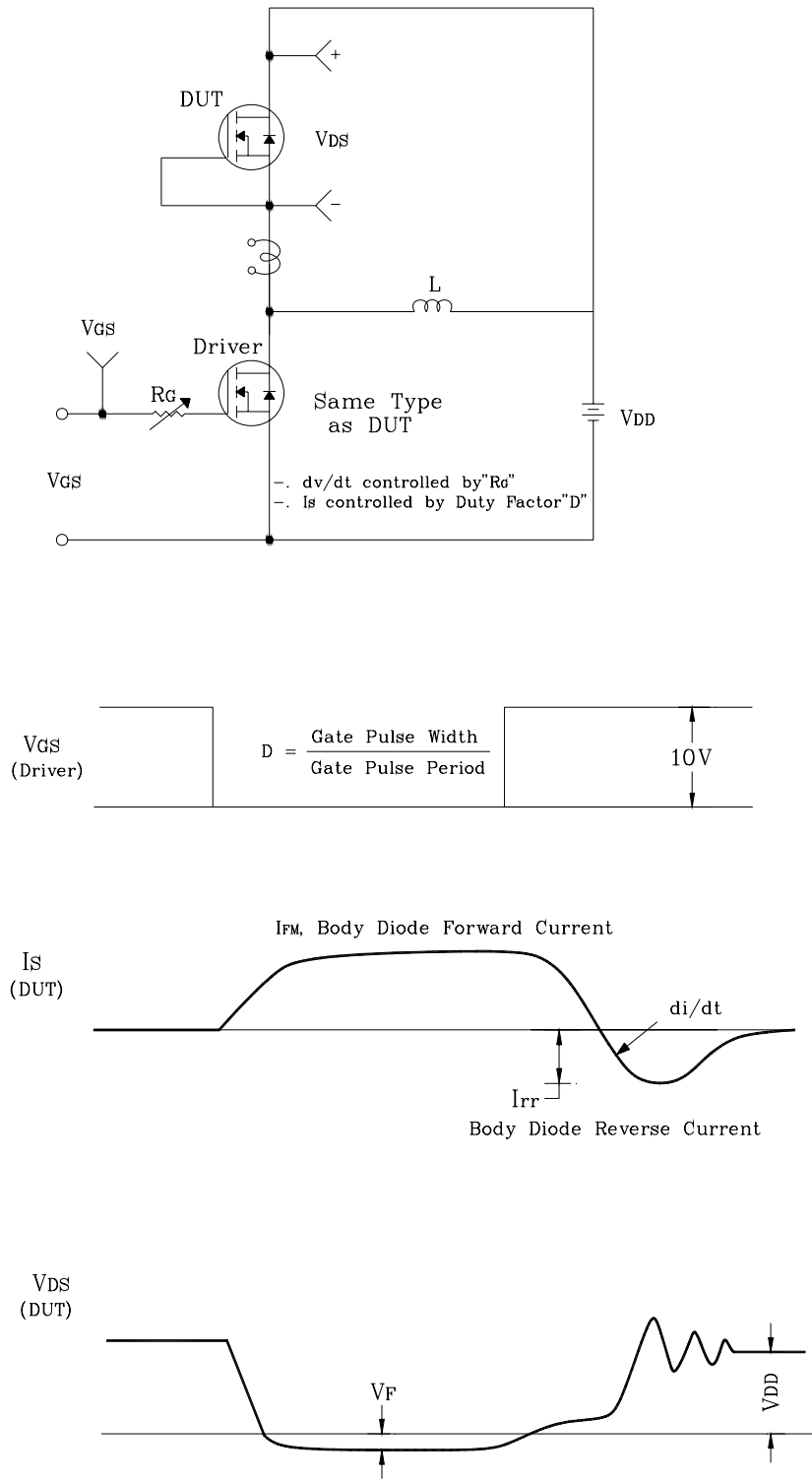
Fig. 13 E_{AS} Test Circuit & Waveform





650V N-Channel MOSFET

Fig. 14 Diode Reverse Recovery Time Test Circuit & Waveform



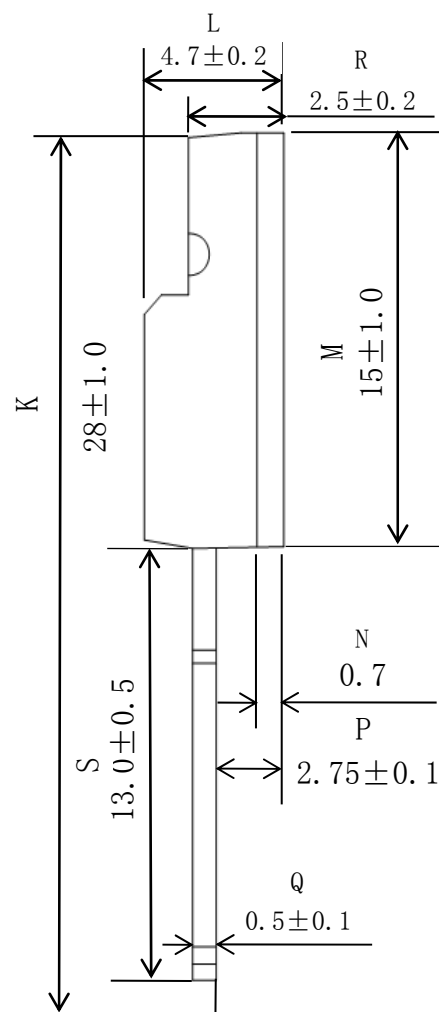
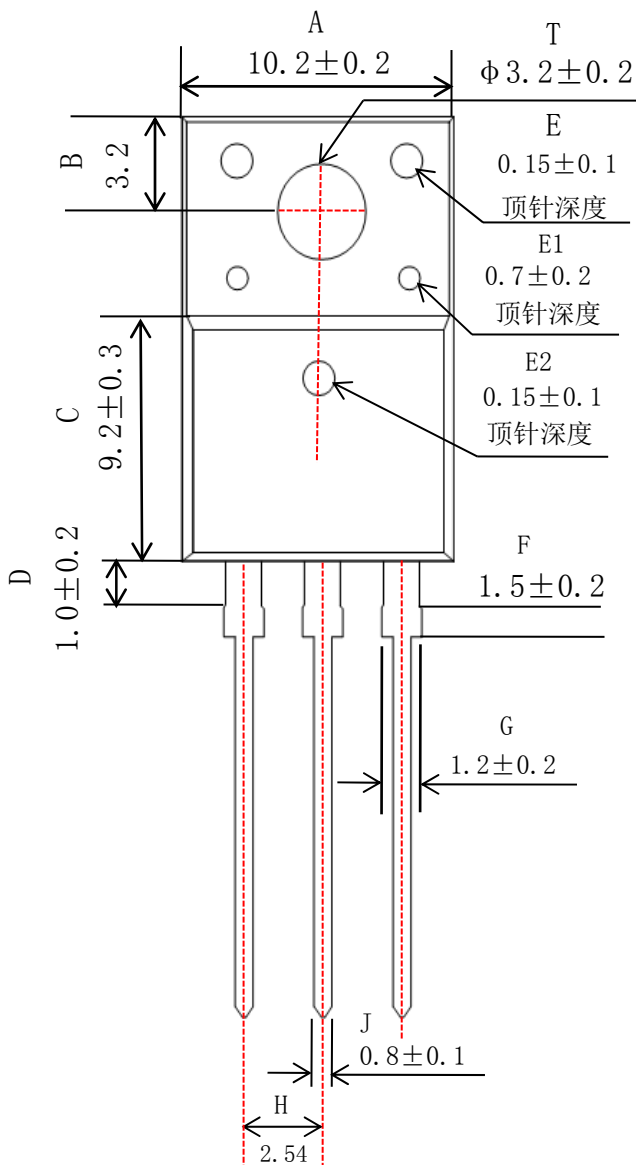


WLP4N65F

650V N-Channel MOSFET

Outline Dimensions

unit : mm



未注公差 : ± 0.2

PIN Connections

1. Gate
2. Drain
3. Source