MPVP10N65

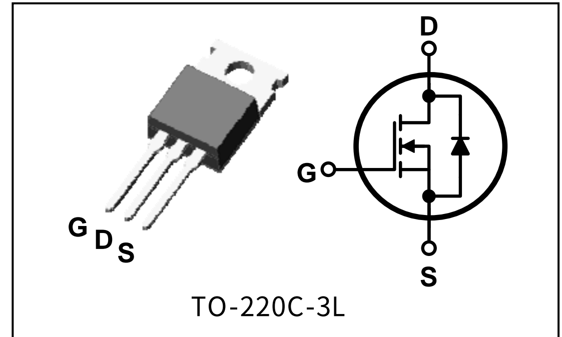
Power MOSFET

SWITCHING REGULATOR APPLICATIONS

Features

- High Voltage : BV_{DSS}=650V(Min.)
- Low C_{rss} : C_{rss}=13pF(Typ.)
- Low gate charge : Qg=35nC(Typ.)
- Low $R_{DS(on)}$: $R_{DS(on)}$=0.9Ω(Max.)

PIN Connection



Ordering Information

Type No.	Marking	Package Code
MPVP10N65	MPVP10N65	TO-220C-3L

Outline Dimensions

unit : mm

Φ3.6~3.7
10.01~10.11
1.28~1.32
15.58~15.82
12.85~12.95
9.12~9.27
28.6~28.95
13.03~13.13
3.14 Typ.
1.22~1.32
0.75~0.85
2.49~2.59
2.49~2.59
0.48~0.52
1 2 3
4.42~4.57
2.87 Max.

PIN Connections
1. Gate
2. Drain
3. Source

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

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°C	10	A
			T_C=100°C	5.5	A
Drain current (Pulsed) *		I_{DM}		40	A
Power dissipation		P_D		50	W
Avalanche current (Single)	②	I_{AS}		10	A
Single pulsed avalanche energy	②	E_{AS}		480	mJ
Avalanche current (Repetitive)	①	I_{AR}		10	A
Repetitive avalanche energy	①	E_{AR}		11.6	mJ
Junction temperature		T_J		150	°C
Storage temperature range		T_{stg}		-55~150	

* Limited by maximum junction temperature

Characteristic		Symbol	Typ.	Max.	Unit
Thermal resistance	Junction-case	$R_{th(J-C)}$	-	2.5	°C/W
	Junction-ambient	$R_{th(J-A)}$	-	62.5	

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}=0V	650	-	-	V
Gate threshold voltage	$V_{GS(th)}$	I_D=250uA, V_{DS}=V_{GS}	2.0	-	4.0	V
Drain-source cut-off current	I_{DSS}	V_{DS}=650V, V_{GS}=0V	-	-	1	uA
Gate leakage current	I_{GSS}	V_{DS}=0V, V_{GS}=±30V	-	-	±100	nA
Drain-source on-resistance ④	$R_{DS(on)}$	V_{GS}=10V, I_D=5.0A	-	0.75	0.9	Ω
Forward transfer conductance ④	g_{fs}	V_{DS}=10V, I_D=5.0A	-	8.0	-	S
Input capacitance	C_{iss}	V_{GS}=0V, V_{DS}=25V f=1 MHz	-	1600	2350	pF
Output capacitance	C_{oss}		-	110	160	
Reverse transfer capacitance	C_{rss}		-	13	18	
Turn-on delay time	$t_{d(on)}$	V_{DD}=300V, I_D=10A R_G=25Ω ③④	-	23	-	ns
Rise time	t_r		-	69	-	
Turn-off delay time	$t_{d(off)}$		-	144	-	
Fall time	t_f		-	77	-	
Total gate charge	Q_g	V_{DS}=480V, V_{GS}=10V I_D=10A ③④	-	35	-	nC
Gate-source charge	Q_{gs}		-	5.0	-	
Gate-drain charge	Q_{gd}		-	13.3	-	

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	-	-	10	A
Source current (Pulsed) ①	I_{SM}		-	-	40	
Forward voltage ④	V_{SD}	V_{GS}=0V, I_S=10A	-	-	1.4	V
Reverse recovery time	t_{rr}	I_S=10A, V_{GS}=0V dI_F/dt=100A/us	-	420	-	ns
Reverse recovery charge	Q_{rr}		-	4.2	-	uC

Note ;

① Repetitive rating : Pulse width limited by maximum junction temperature

② L=10mH, I_{AS}=10A, V_{DD}=50V, R_G=25Ω, Starting T_J=25℃

③ Pulse Test : Pulse width≤300us, Duty cycle≤2%

④ Essentially independent of operating temperature

Fig. 11 Gate Charge Test Circuit & Waveform

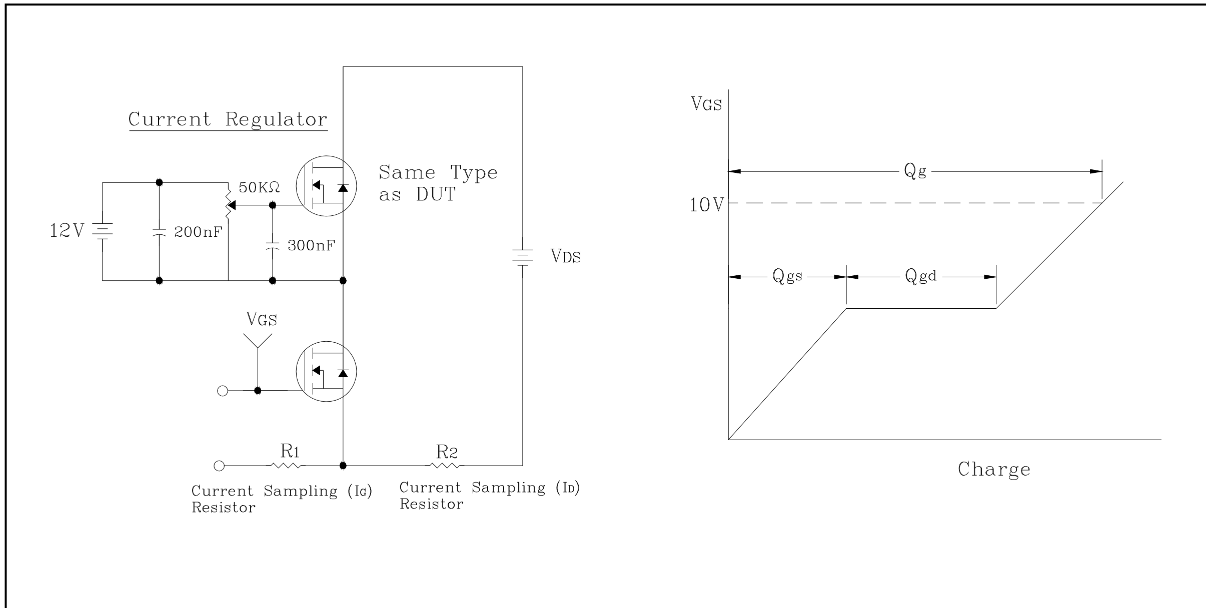


Fig. 12 Resistive Switching Test Circuit & Waveform

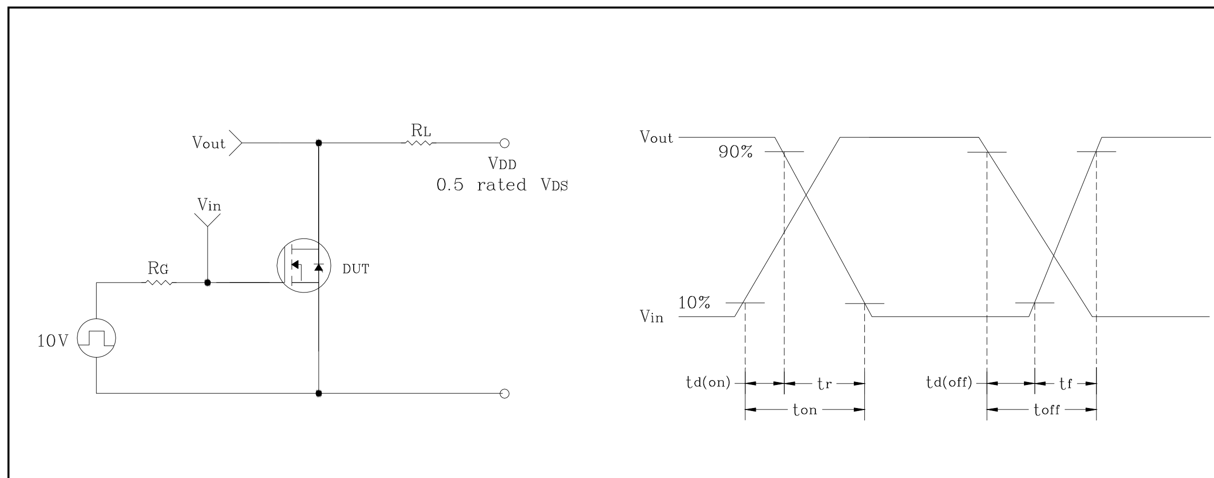


Fig. 13 E_{AS} Test Circuit & Waveform

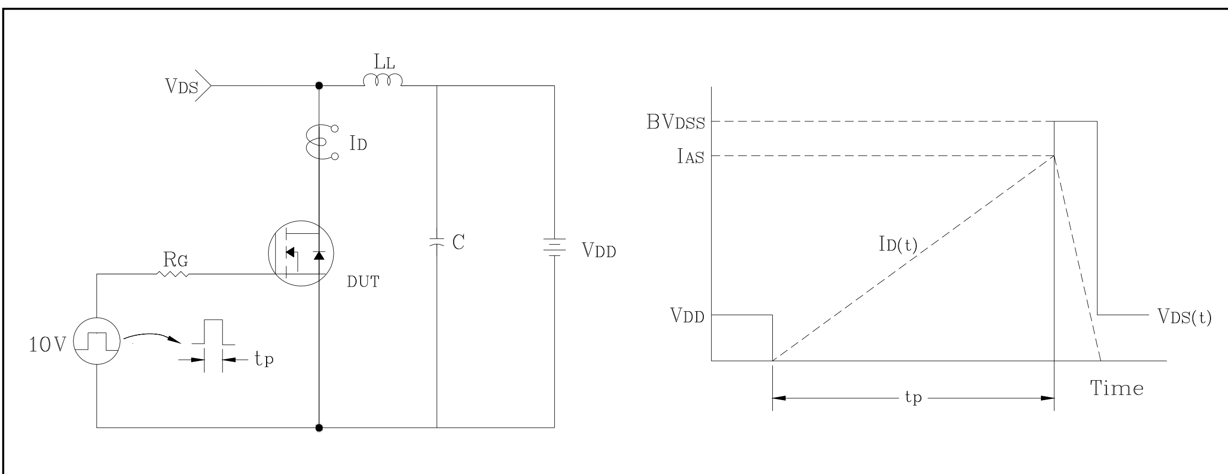


Fig. 14 Diode Reverse Recovery Time Test Circuit & Waveform