



芯普微科技

# MPVP12N65

Power MOSFET

## SWITCHING REGULATOR APPLICATIONS

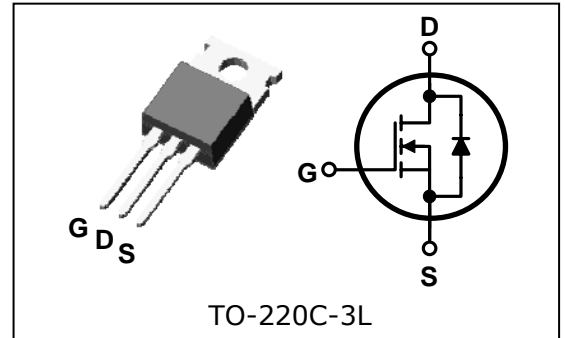
### Features

- High Voltage:  $BV_{DSS}=650V(\text{Min.})$
- Low  $C_{rSS}$  :  $C_{rSS}=13.8pF(\text{Typ.})$
- Low gate charge :  $Q_g=42nC(\text{Typ.})$
- Low  $R_{DS(on)}$  :  $R_{DS(on)}=0.65\Omega(\text{Max.})$

### Ordering Information

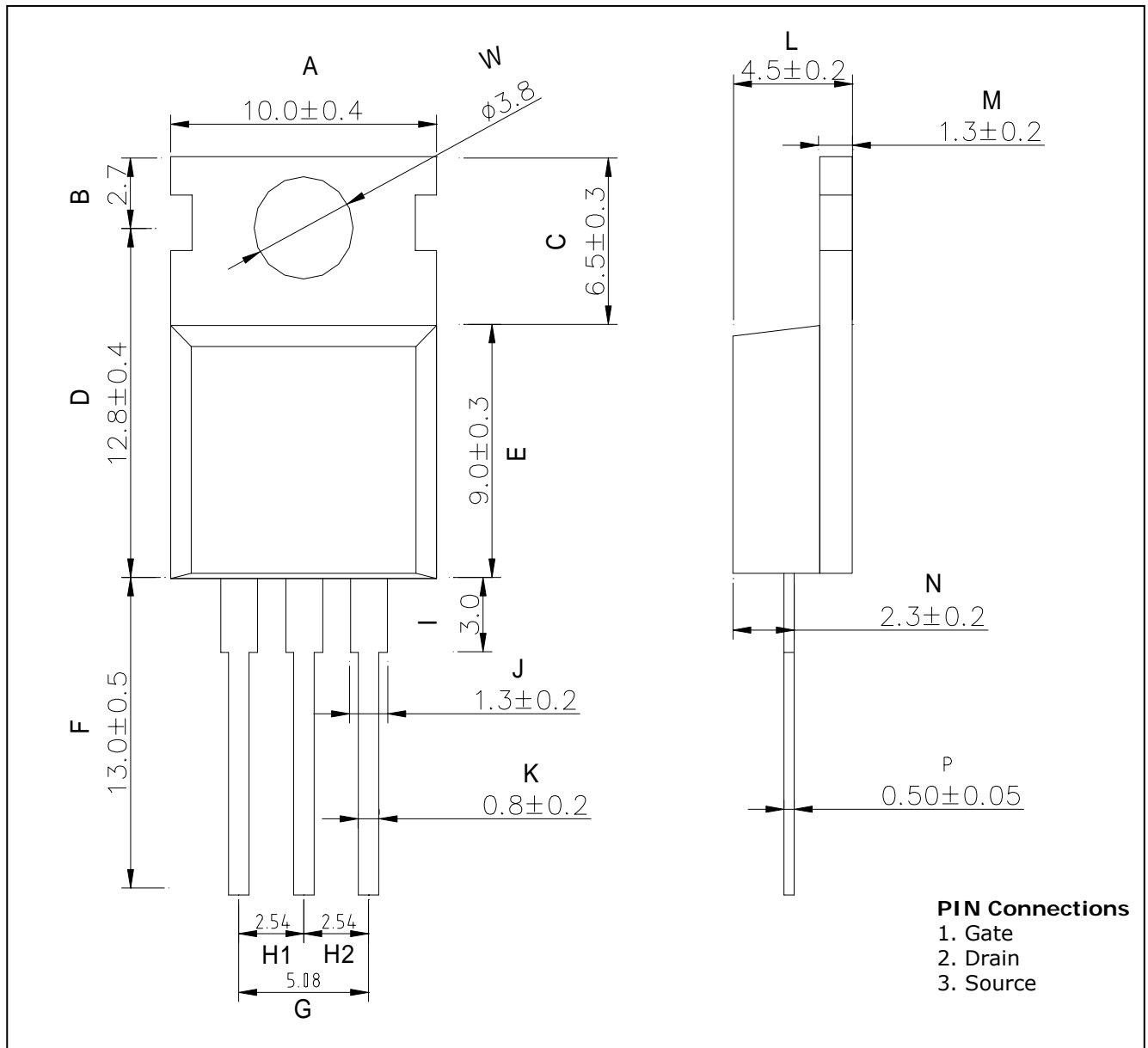
Type No.	Marking	Package Code
MPVP12N65	MPVP12N65	TO-220C-3L

### PIN Connection



### Outline Dimensions

unit : mm





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Power MOSFET

## Absolute maximum ratings

(Tc=25°C)

Characteristic	Symbol	Rating	Unit	
Drain-source voltage	$V_{DSS}$	650	V	
Gate-source voltage	$V_{GSS}$	±30	V	
Drain current (DC)*	$I_D$	(Tc=25°C)	12	A
		(Tc=100°C)	7.1	A
Drain current (Pulsed)*	$I_{DM}$	48	A	
Drain power dissipation	$P_D$	215	W	
Avalanche current (Single) ②	$I_{AS}$	12	A	
Single pulsed avalanche energy ②	$E_{AS}$	700	mJ	
Avalanche current (Repetitive) ①	$I_{AR}$	12	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	$R_{th(J-C)}$	-	2.7	°C/W
	Junction-ambient	$R_{th(J-a)}$	-	62.5	



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## 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 cut-off current	$I_{DSS}$	$V_{DS}=650V, V_{GS}=0V$	-	-	1	$\mu A$	
Gate leakage current	$I_{GSS}$	$V_{DS}=0V, V_{GS}=\pm 30V$	-	-	$\pm 100$	nA	
Drain-source on-resistance ④	$R_{DS(on)}$	$V_{GS}=10V, I_D=6.0A$	-	-	0.65	$\Omega$	
Forward transfer conductance ④	$g_{fs}$	$V_{DS}=10V, I_D=6.0A$	-	10	-	S	
Input capacitance	$C_{iss}$	$V_{GS}=0V, V_{DS}=25V$ $f=1MHz$	-	2213	2951	pF	
Output capacitance	$C_{oss}$		-	170	226		
Reverse transfer capacitance	$C_{rss}$		-	13.8	18.4		
Turn-on delay time	$t_{d(on)}$	$V_{DD}=300V, I_D=12A$ $R_G=25\Omega$	-	30	-	ns	
Rise time	$t_r$		-	85	-		
Turn-off delay time	$t_{d(off)}$		③④	-	140		-
Fall time	$t_f$		-	90	-		
Total gate charge	$Q_g$	$V_{DS}=400V, V_{GS}=10V$ $I_D=12A$	-	42	-	nC	
Gate-source charge	$Q_{gs}$		③④	-	6		-
Gate-drain charge	$Q_{gd}$		-	16	-		

## Source-Drain Diode Ratings and Characteristics

(Tc=25°C)

Characteristic	Symbol	Test Condition	Min	Typ	Max	Unit
Source current (DC)	$I_S$	Integral reverse diode in the MOSFET	-	-	12	A
Source current (Pulsed) ①	$I_{SM}$		-	-	48	
Forward voltage ④	$V_{SD}$	$V_{GS}=0V, I_S=12A$	-	-	1.4	V
Reverse recovery time	$t_{rr}$	$I_S=12A, V_{GS}=0,$ $di_s/dt=100A/\mu s$	-	500	-	ns
Reverse recovery charge	$Q_{rr}$		-	4.3	-	$\mu C$

Note ;

- ① Repetitive Rating : Pulse Width Limited by Maximum Junction Temperature
- ② L=10mH,  $I_{AS}=12, V_{DD}=50V, R_G=25\Omega$ , Starting  $T_J = 25^\circ C$
- ③ Pulse Test : Pulse Width < 300us, Duty cycle  $\leq 2\%$
- ④ Essentially independent of operating temperature



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## Electrical Characteristic Curves

Fig. 1  $I_D - V_{DS}$

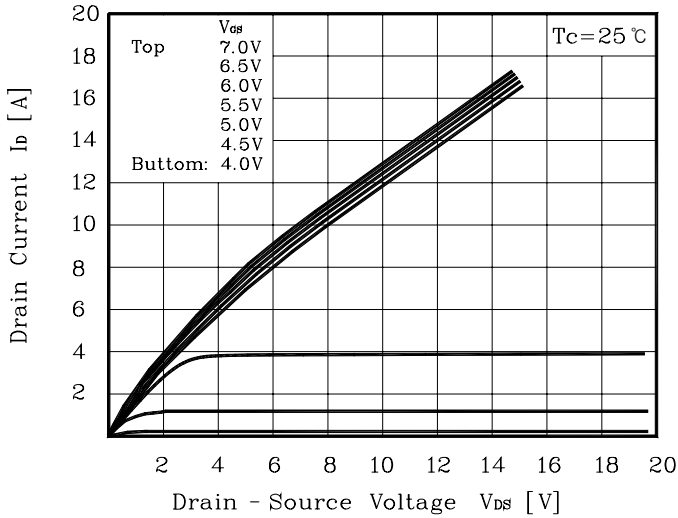


Fig. 2  $I_D - V_{GS}$

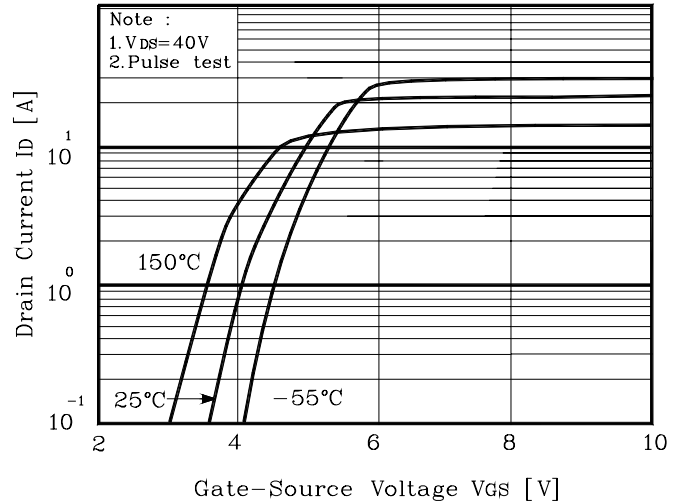


Fig. 3  $R_{DS(on)} - I_D$

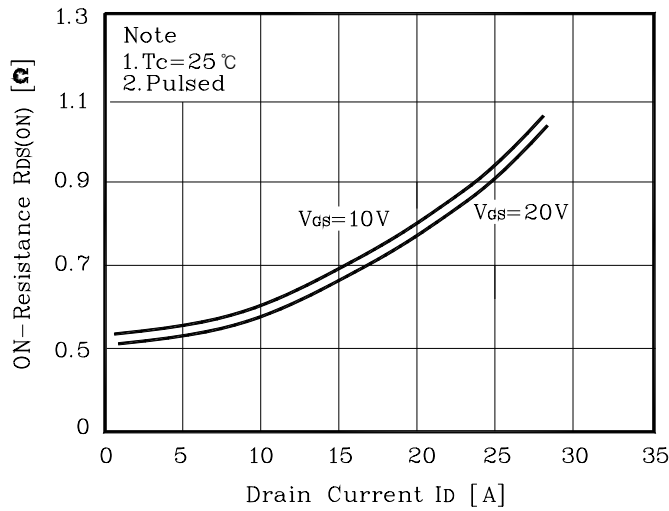


Fig. 4  $I_S - V_{SD}$

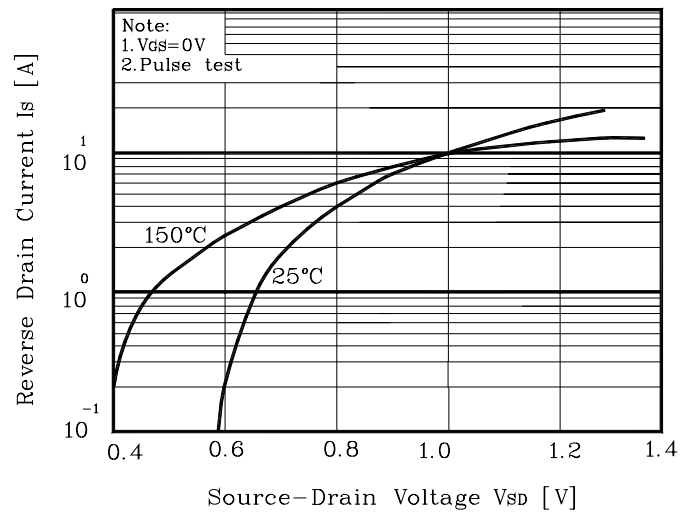


Fig. 5 Capacitance -  $V_{DS}$

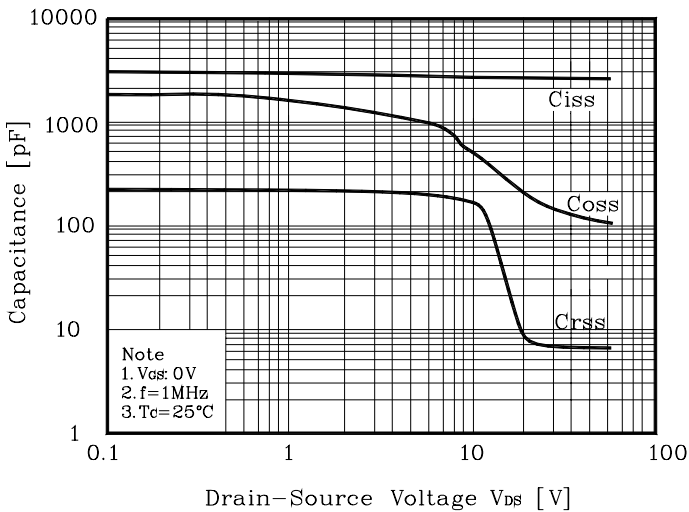
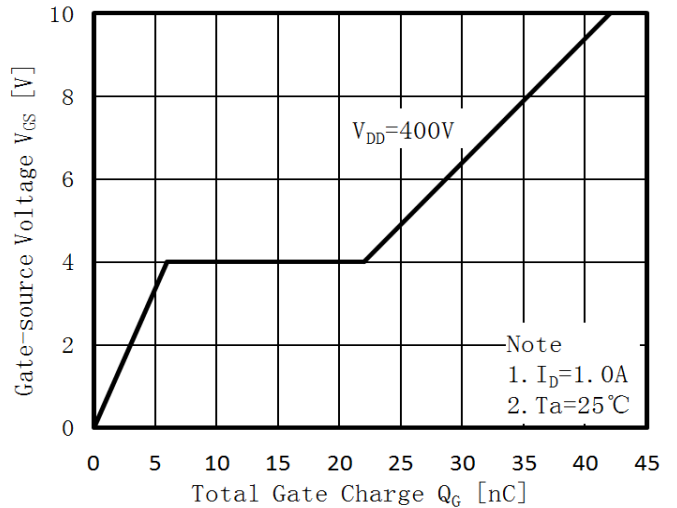


Fig. 6  $V_{GS} - Q_G$





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### Electrical Characteristic Curves

Fig. 7  $V_{DSS} - T_J$

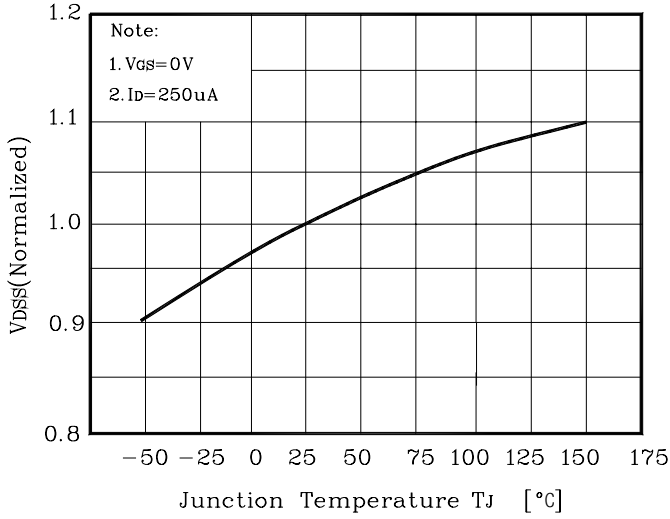


Fig.8  $R_{DS(on)} - T_J$

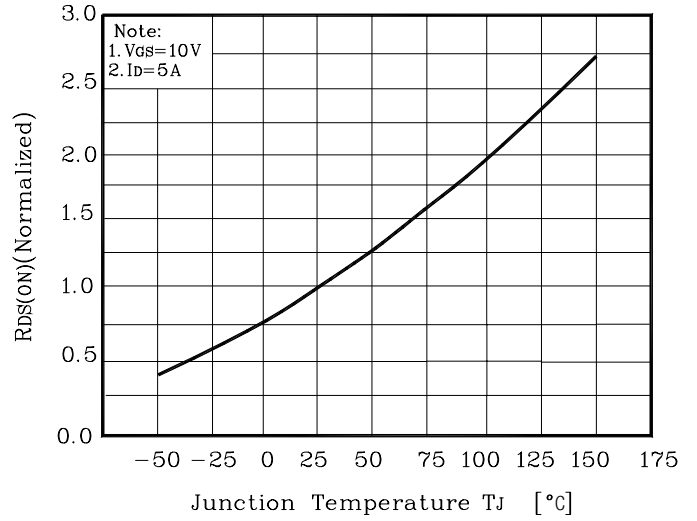


Fig. 9  $I_D - T_C$

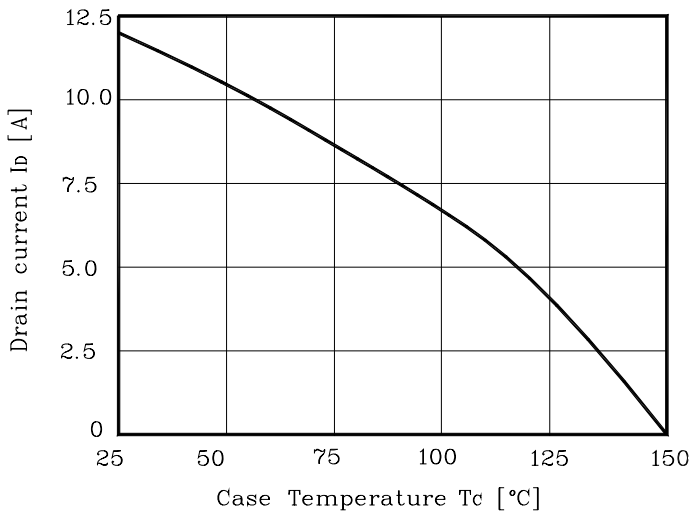


Fig. 10 Safe Operating Area

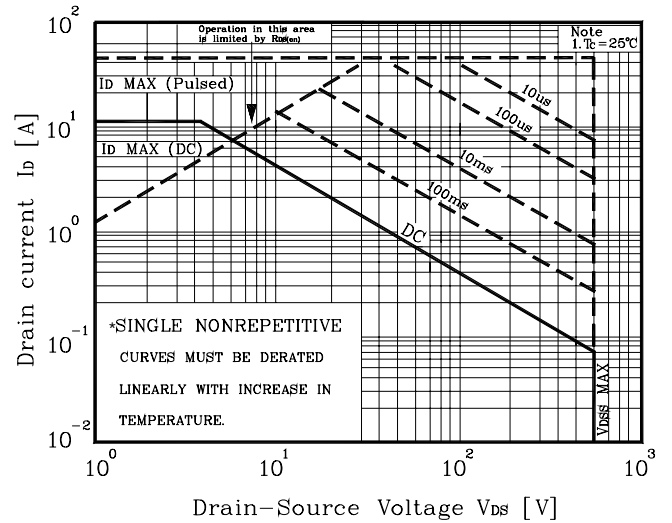


Fig. 10 Gate Charge Test Circuit & Waveform

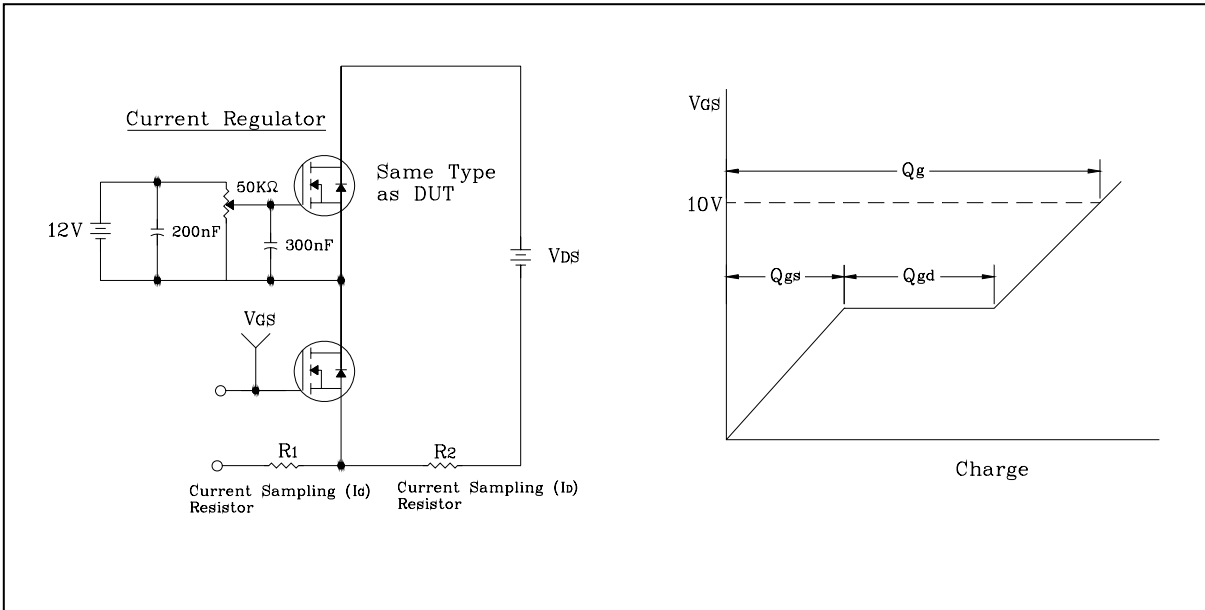


Fig. 11 Resistive Switching Test Circuit & Waveform

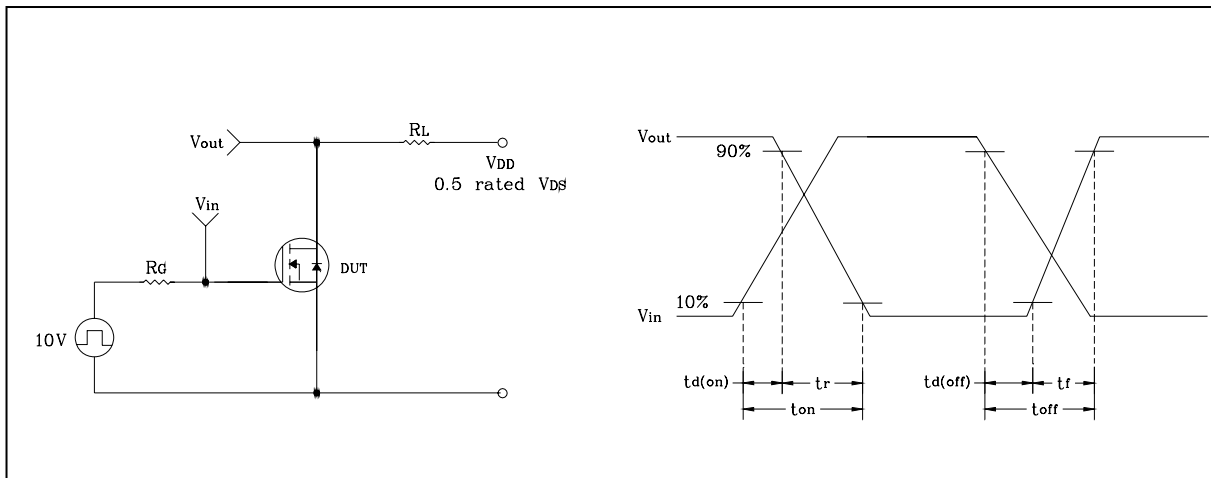


Fig. 12 E<sub>AS</sub> Test Circuit & Waveform

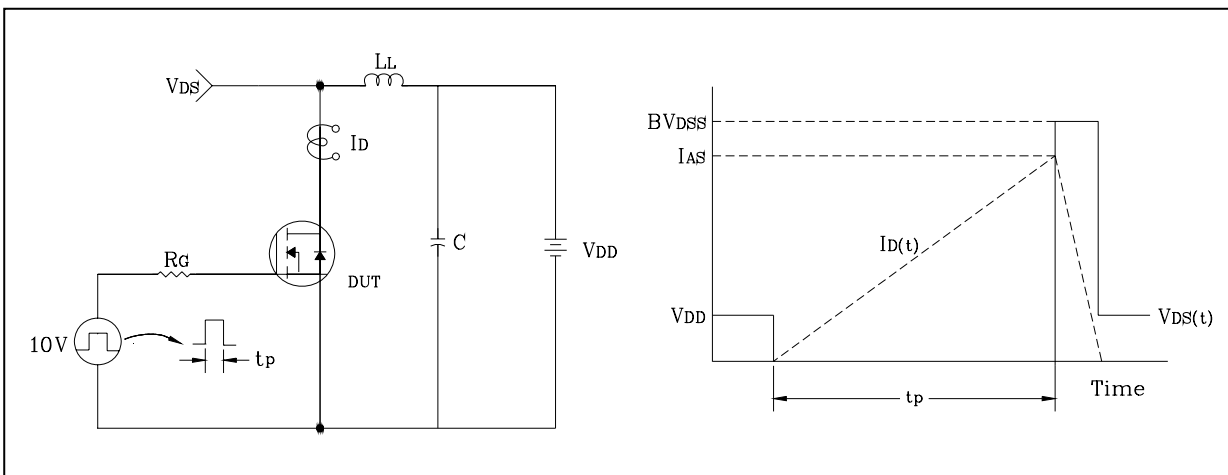
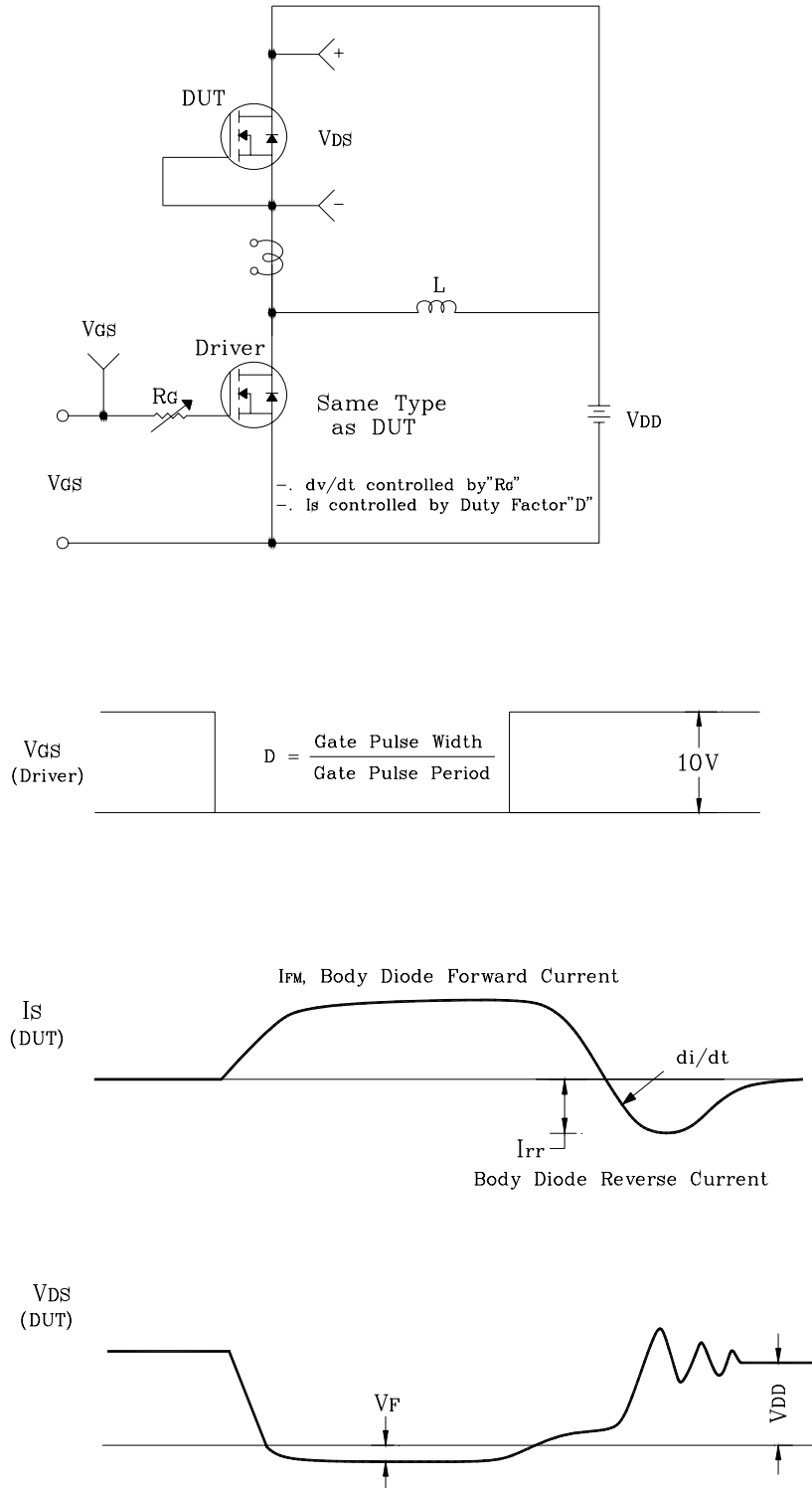


Fig. 13 Diode Reverse Recovery Time Test Circuit & Waveform



单击下面可查看定价，库存，交付和生命周期等信息

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