



迈普拓科技

MPVD4N70

Power MOSFET

SWITCHING REGULATOR APPLICATIONS

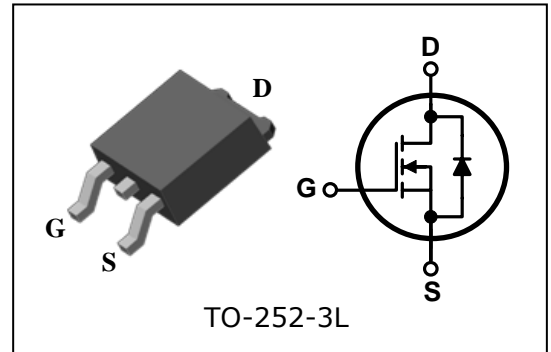
Features

- Drain-Source breakdown voltage: $BV_{DSS}=700V$ (Min.)
- Low gate charge: $Q_g=15.5nC$ (Typ.)
- Low drain-source On resistance: $R_{DS(on)}=3.0\Omega$ (Max.)
- 100% avalanche tested
- RoHS compliant device

Ordering Information

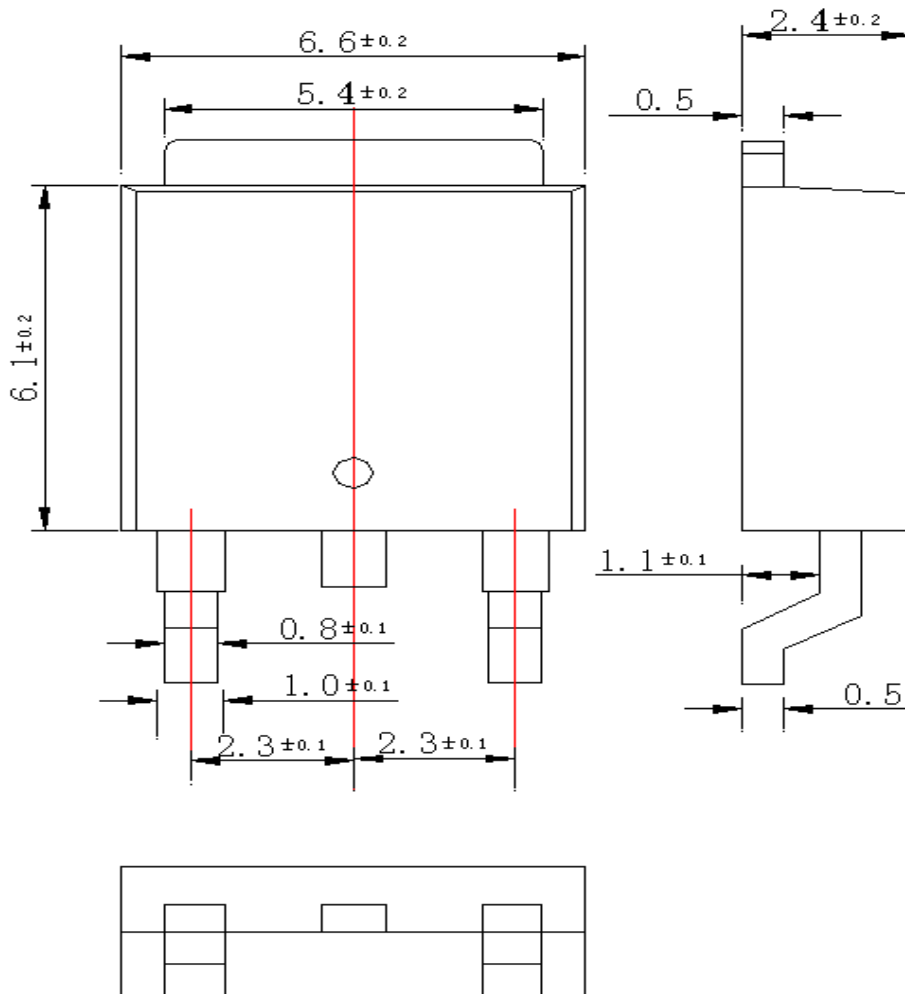
Type No.	Marking	Package Code
MPVD4N70	MPVD4N70	TO-252-3L

PIN Connection



Outline Dimensions

unit : mm





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Power MOSFET

Absolute maximum ratings ($T_c=25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Rating	Unit	
Drain-source voltage	V_{DSS}	700	V	
Gate-source voltage	V_{GSS}	± 30	V	
Drain current (DC) *	I_D	$T_c=25^\circ\text{C}$	4	A
		$T_c=100^\circ\text{C}$	2.48	A
Drain current (Pulsed) *	I_{DM}	16	A	
Single avalanche current ^(Note 2)	I_{AS}	4.0	A	
Single pulsed avalanche energy ^(Note 2)	E_{AS}	81.5	mJ	
Repetitive avalanche current ^(Note 1)	I_{AR}	4.0	A	
Repetitive avalanche energy ^(Note 1)	E_{AR}	2.9	mJ	
Power dissipation	P_D	32	W	
Junction temperature	T_J	150	$^\circ\text{C}$	
Storage temperature range	T_{stg}	-55-150	$^\circ\text{C}$	

* Limited only maximum junction temperature

Thermal Characteristics

Characteristic	Symbol	Rating	Unit
Thermal resistance, junction to case	$R_{th(j-c)}$	Max. 2.6	$^\circ\text{C}/\text{W}$
Thermal resistance, junction to ambient	$R_{th(j-a)}$	Max. 62.5	



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Electrical Characteristics ($T_C=25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Drain-source breakdown voltage	BV_{DSS}	$I_D=250\mu\text{A}$, $V_{GS}=0\text{V}$	700	-	-	V
Gate threshold voltage	$V_{GS(th)}$	$I_D=250\mu\text{A}$, $V_{DS}=V_{GS}$	3	4	5	V
Drain-source cut-off current	I_{DSS}	$V_{DS}=700\text{V}$, $V_{GS}=0\text{V}$	-	-	1	μA
Gate leakage current	I_{GSS}	$V_{DS}=0\text{V}$, $V_{GS}=\pm 30\text{V}$	-	-	± 100	nA
Drain-source on-resistance	$R_{DS(ON)}$	$V_{GS}=10\text{V}$, $I_D=2.00\text{A}$	-	2.5	3.0	Ω
Forward transfer conductance (Note 3)	g_{fs}	$V_{DS}=10\text{V}$, $I_D=2.00\text{A}$	-	4	-	S
Input capacitance	C_{iss}	$V_{DS}=25\text{V}$, $V_{GS}=0\text{V}$, $f=1.0\text{MHz}$	-	703	878	pF
Output capacitance	C_{oss}		-	54.6	68.2	
Reverse transfer capacitance	C_{rss}		-	5.6	7.0	
Turn-on delay time (Note 3,4)	$t_{d(on)}$	$V_{DD}=325\text{V}$, $I_D=4.0\text{A}$, $R_G=25\Omega$	-	10		ns
Rise time (Note 3,4)	t		-	14	20	
Turn-off delay time (Note 3,4)	t		-	42		
Fall time (Note 3,4)	t		-	38		
Total gate charge (Note 3,4)	Q_g	$V_{DS}=400\text{V}$, $V_{GS}=10\text{V}$, $I_D=4.0\text{A}$	-	15.5		nC
Gate-source charge (Note 3,4)	Q_{gs}		-	2	-	
Gate-drain charge (Note 3,4)	Q_{gd}		-	6.0	-	

Source-Drain Diode Ratings and Characteristics ($T_C=25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Source current (DC)	I_S	Integral reverse diode in the MOSFET	-	-	4.0	A
Source current (Pulsed)	I_{SM}		-	-	16	A
Forward voltage	V_{SD}	$V_{GS}=0\text{V}$, $I_S=4.0\text{A}$	-	-	1.4	V
Reverse recovery time (Note 3,4)	t_{rr}	$I_S=5.5\text{A}$, $V_{GS}=0\text{V}$ $di_F/dt=100\text{A}/\mu\text{s}$	-	494	-	ns
Reverse recovery charge (Note 3,4)	Q_{rr}		-	2	-	μC

Note:

1. Repeated rating: Pulse width limited by safe operating area
2. $L=15\text{mH}$, $I_{AS}=5.5\text{A}$, $V_{DD}=50\text{V}$, $R_G=25\Omega$, Starting $T_J=25^\circ\text{C}$
3. Pulse test: Pulse width $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$
4. Essentially independent of operating temperature typical characteristics

Fig. 1 Gate Charge Test Circuit & Waveform

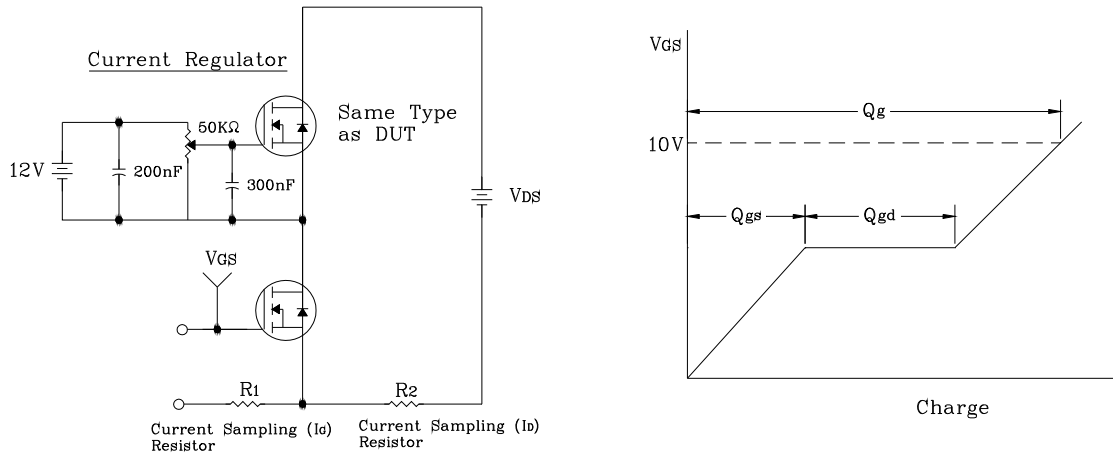


Fig. 2 Resistive Switching Test Circuit & Waveform

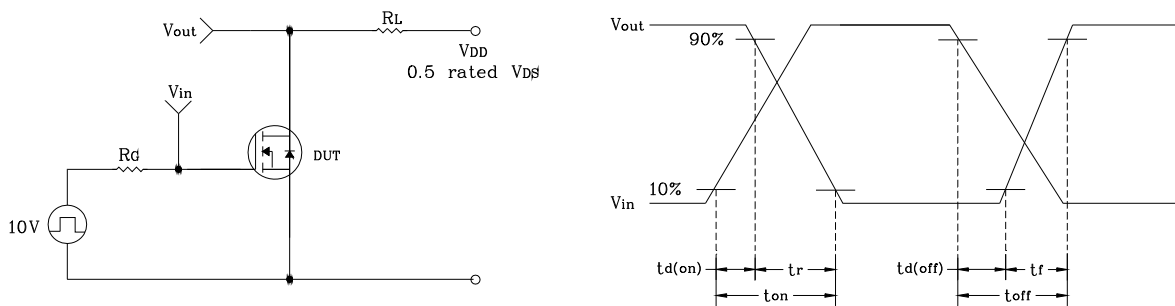


Fig. 3 E_{AS} Test Circuit & Waveform

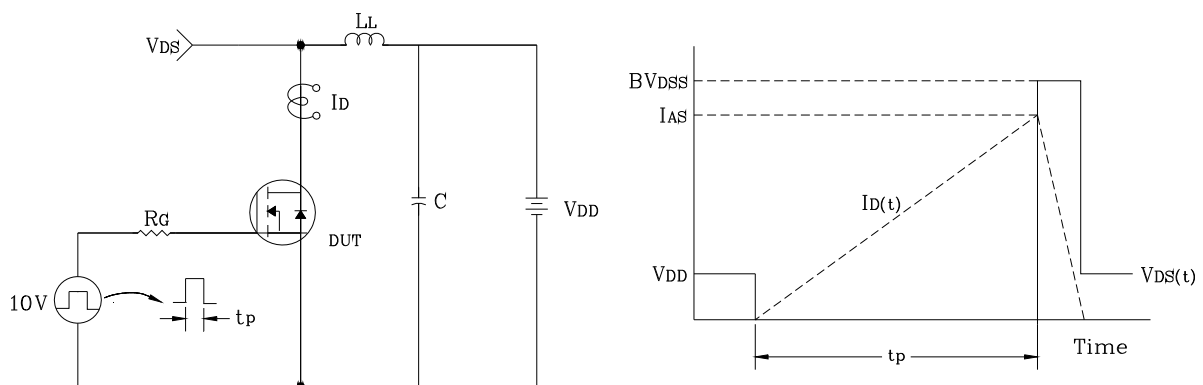


Fig. 4 Diode Reverse Recovery Time Test Circuit & Waveform

