

SWITCHING REGULATOR APPLICATIONS

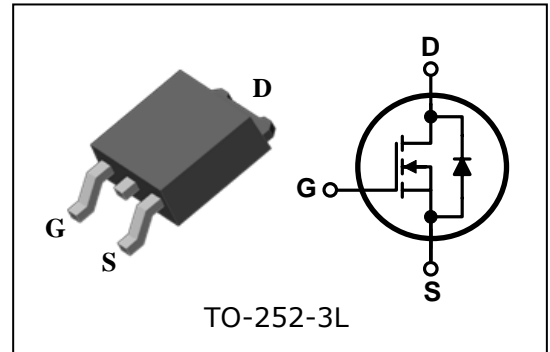
Features

- Drain-Source breakdown voltage: $BV_{DSS}=700V$ (Min.)
- Low gate charge: $Q_g=14nC$ (Typ.)
- Low drain-source On resistance: $R_{DS(on)}=3.0\Omega$ (Max.)
- 100% avalanche tested
- RoHS compliant device

Ordering Information

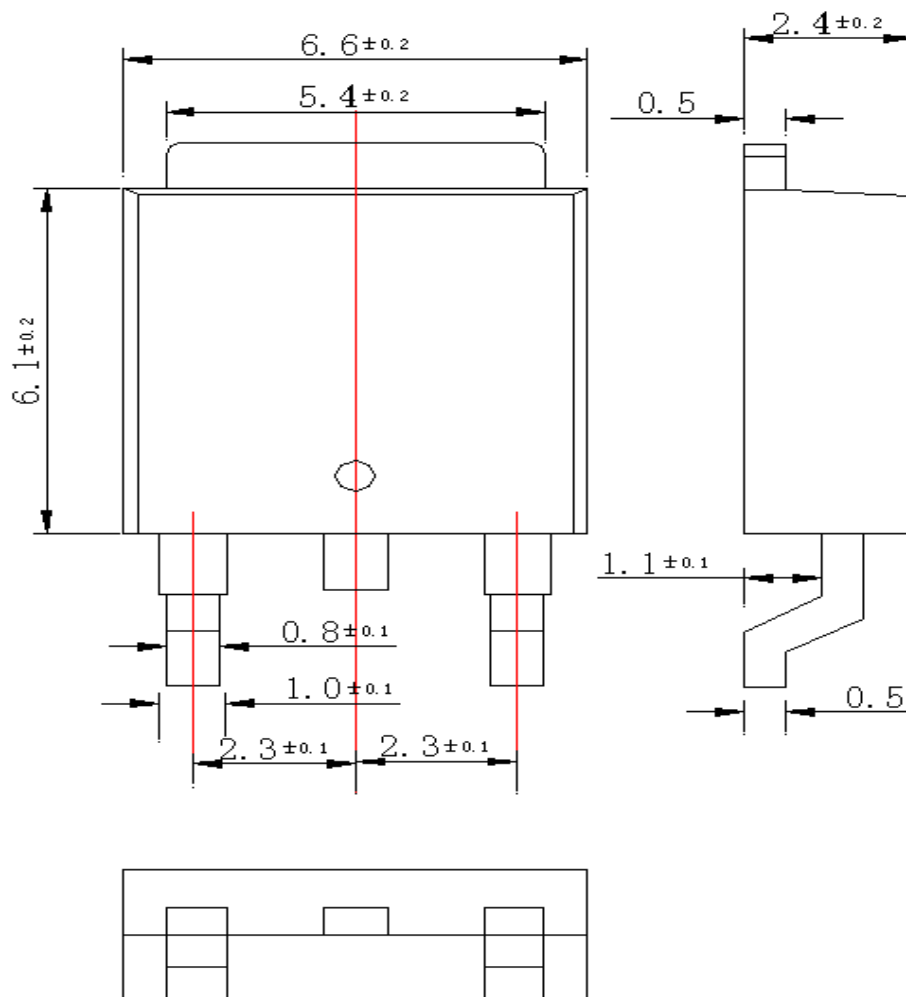
Type No.	Marking	Package Code
MU6N70	MU6N70	TO-252-3L

PIN Connection



Outline Dimensions

unit : mm



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	$T_c=25^\circ\text{C}$	5.5	A
		$T_c=100^\circ\text{C}$	3.48	A
Drain current (Pulsed) *	I_{DM}	22	A	
Single avalanche current ^(Note 2)	I_{AS}	5.5	A	
Single pulsed avalanche energy ^(Note 2)	E_{AS}	81.5	mJ	
Repetitive avalanche current ^(Note 1)	I_{AR}	5.5	A	
Repetitive avalanche energy ^(Note 1)	E_{AR}	2.9	mJ	
Power dissipation	P_D	48	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	

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	700	-	-	V
Gate threshold voltage	V _{GS(th)}	I _D =250uA, V _{DS} =V _{GS}	3	4	5	V
Drain-source cut-off current	I _{DSS}	V _{DS} =600V, V _{GS} =0V	-	-	1	uA
Gate leakage current	I _{GSS}	V _{DS} =0V, V _{GS} =±30V	-	-	±100	nA
Drain-source on-resistance	R _{DS(ON)}	V _{GS} =10V, I _D =2.75A	-	2.4	3.0	Ω
Forward transfer conductance (Note 3)	g _{fs}	V _{DS} =10V, I _D =2.75A	-	4	-	S
Input capacitance	C _{iss}	V _{DS} =25V, V _{GS} =0V, f=1.0MHz	-	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} =325V, I _D =5.5A, R _G =25Ω	-	10		ns
Rise time (Note 3,4)	t		-	42		
Turn-off delay time (Note 3,4)	t		-	38		
Fall time (Note 3,4)	t		-	46		
Total gate charge (Note 3,4)	Q _g	V _{DS} =520V, V _{GS} =10V, I _D =5.5A	-	14	20	nC
Gate-source charge (Note 3,4)	Q _{gs}		-	6	-	
Gate-drain charge (Note 3,4)	Q _{gd}		-	4	-	

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	-	-	5.5	A
Source current (Pulsed)	I _{SM}		-	-	22	A
Forward voltage	V _{SD}	V _{GS} =0V, I _S =5.5A	-	-	1.4	V
Reverse recovery time (Note 3,4)	t _{rr}	I _S =5.5A, V _{GS} =0V di _F /dt=100A/us	-	494	-	ns
Reverse recovery charge (Note 3,4)	Q _{rr}		-	2	-	uC

Note:

1. Repeated rating: Pulse width limited by safe operating area
2. L=15mH, I_{AS}=5.5A, V_{DD}=50V, R_G=25Ω, Starting T_J=25°C
3. Pulse test: Pulse width≤300us, Duty cycle≤2%
4. Essentially independent of operating temperature typical characteristics

Fig. 1 Gate Charge Test Circuit & Waveform

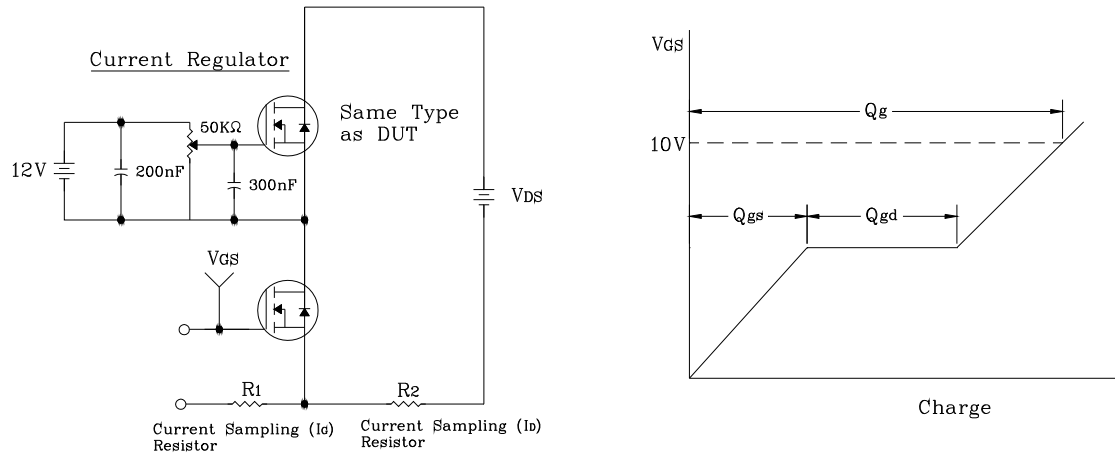


Fig. 2 Resistive Switching Test Circuit & Waveform

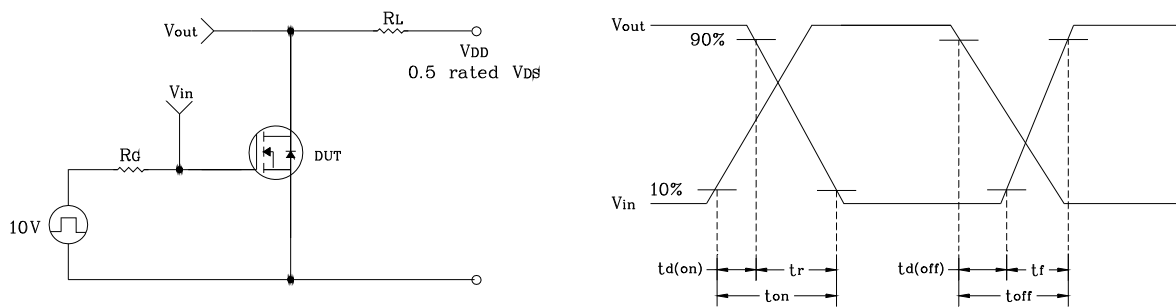


Fig. 3 E_{AS} Test Circuit & Waveform

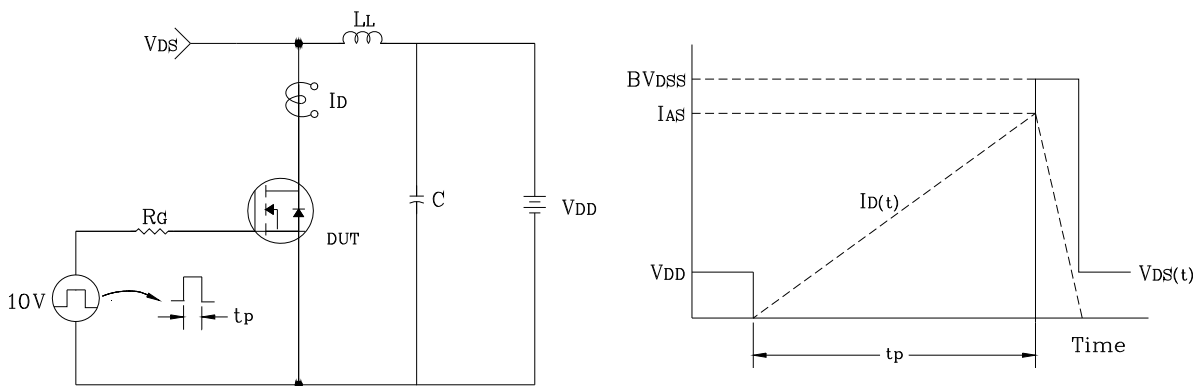


Fig. 4 Diode Reverse Recovery Time Test Circuit & Waveform

