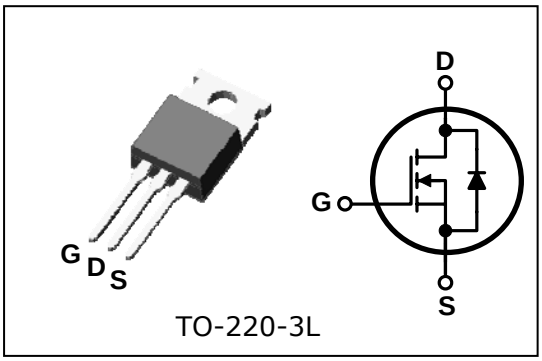
SWITCHING REGULATOR APPLICATIONS

Features

- High Voltage: BV_{DSS}=85V(Min.)
- Low C_{rss} : C_{rss}=24.4pF(Typ.)
- Low gate charge : Qg=55.7nC(Typ.)
- Low $R_{DS(on)}$:$R_{DS(on)}$=5.2mΩ(Typ.)

PIN Connection



Ordering Information

Type No.	Marking	Package Code
HGS120N85C	HGS120N85C	TO-220-3L

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

Characteristic	Symbol		Rating	Unit
Drain-source voltage	V_{DSS}		85	V
Gate-source voltage	V_{GSS}		±20	V
Drain current (DC) *	I_D	T_C=25℃	120	A
		T_C=100℃	73	A
Drain current (Pulsed) *	I_{DM}		480	A
Drain power dissipation	P_D		150	W
Avalanche current (Single) ②	I_{AS}		120	A
Single pulsed avalanche energy ②	E_{AS}		300	mJ
Avalanche current (Repetitive) ①	I_{AR}		120	A
Repetitive avalanche energy ①	E_{AR}		8.6	mJ
Junction temperature	T_J		150	°C
Storage temperature range	T_{stg}		-55~150	°C

* Limited by maximum junction temperature

Characteristic		Symbol	Typ.	Max	Unit
Thermal resistance	Junction-case	$R_{th(J-C)}$	-	5.0	℃/W
	Junction-ambient	$R_{th(J-A)}$	-	60	

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Electrical Characteristics (T_C=25°C unless otherwise noted)

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Drain-source breakdown voltage	$V_{(BR)DSS}$	I_D=250 μA, V_{GS}=0V	85	90	-	V
Gate threshold voltage	$V_{GS(th)}$	I_D=250 μA, V_{GS}= V_{DS}	2.5	-	3.5	V
Drain-source cut-off current	I_{DSS}	V_{DS}=85V, V_{GS}=0V	-	-	1	μA
Gate leakage current	I_{GSS}	V_{DS}=0V, V_{GS}=±20V	-	-	±100	nA
Drain-source on-resistance ④	$R_{DS(on)}$	V_{GS}=10V, I_D=20A	-	5.2	6	mΩ
Forward transfer conductance ④	g_{fs}	V_{DS}=10V, I_D=20A	-	5	-	S
Input capacitance	C_{iss}	V_{GS}=0V, V_{DS}=40V f=1 MHz	-	3730	-	pF
Output capacitance	C_{oss}		-	670	-	
Reverse transfer capacitance	C_{rss}		-	24.4	-	
Turn-on delay time	$t_{d(on)}$	V_{DD}=40V, I_D=10.0A R_G=10Ω ③④	-	16.5	-	ns
Rise time	t_r		-	13.7	-	
Turn-off delay time	$t_{d(off)}$		-	35.9	-	
Fall time	t_f		-	13.5	-	
Total gate charge	Q_g	V_{DS}=40V, V_{GS}=10V I_D=20.0A ③④	-	55.7	-	nC
Gate-source charge	Q_{gs}		-	14.5	-	
Gate-drain charge	Q_{gd}		-	14	-	

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	-	-	120	A
Source current (Pulsed) ①	I_{SP}		-	-	480	
Forward voltage ④	V_{SD}	V_{GS}=0V, I_S=18A	-	-	1.4	V
Reverse recovery time	t_{rr}	I_S=20A, V_{GS}=0V dI_S/dt=100A/μs	-	40	-	ns
Reverse recovery charge	Q_{rr}		-	115	-	nC

Note ;

① Repetitive rating : Pulse width limited by maximum junction temperature

② L=2.0mH, I_{AS}=10A, V_{DD}=50V, R_G=25Ω , Starting T_J = 25℃

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

④ Essentially independent of operating temperature

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Electrical Characteristic Curves

- 特性曲线

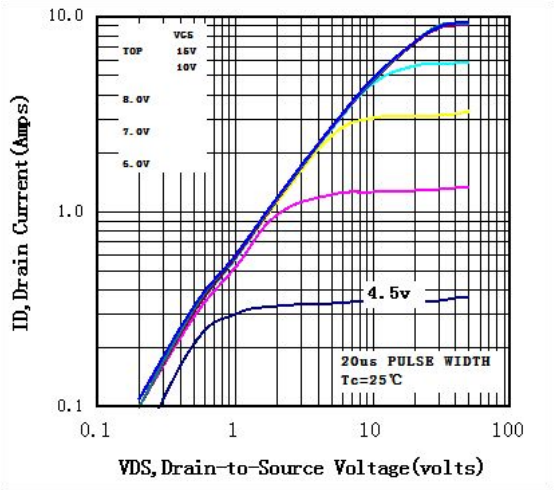

Fig1 Typical Output Characteristics, Tc=25℃

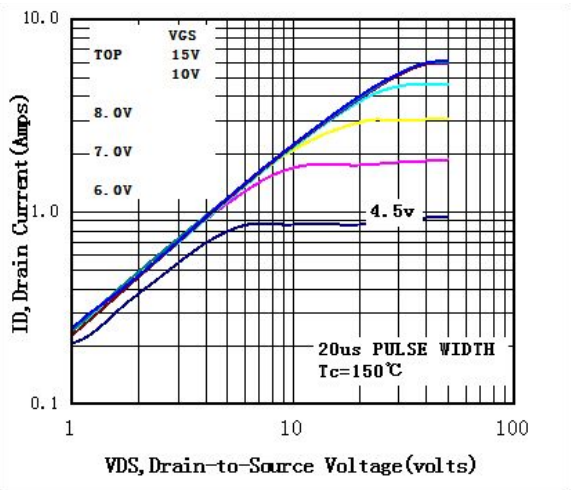

Fig2 Typical Output Characteristics, Tc=150℃

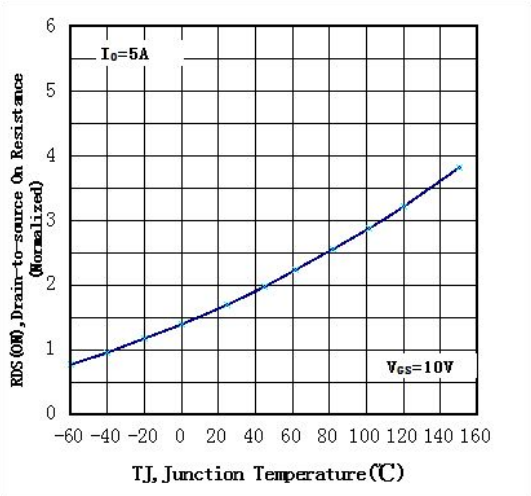

Fig3 Normalized Resistance Vs.Temperature

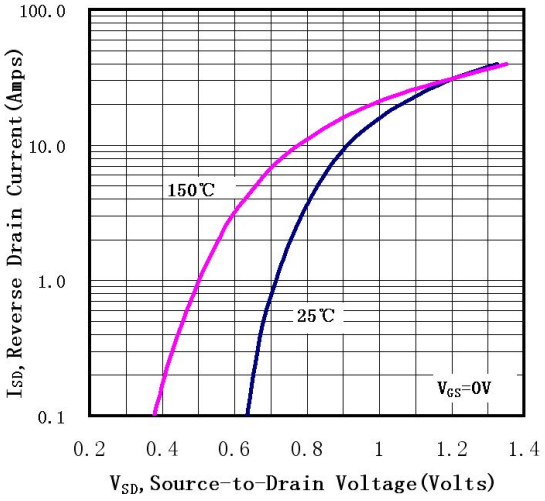

Fig4 Typical Source-Drain Diode Forward Voltage

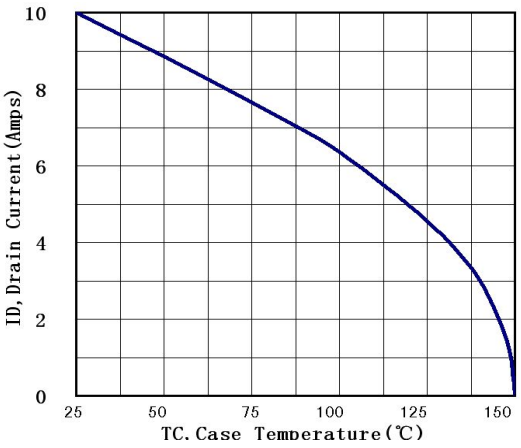

Fig5 Maximum Drain Current Vs.Case Temperature

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Fig. 11 Gate Charge Test Circuit & Waveform

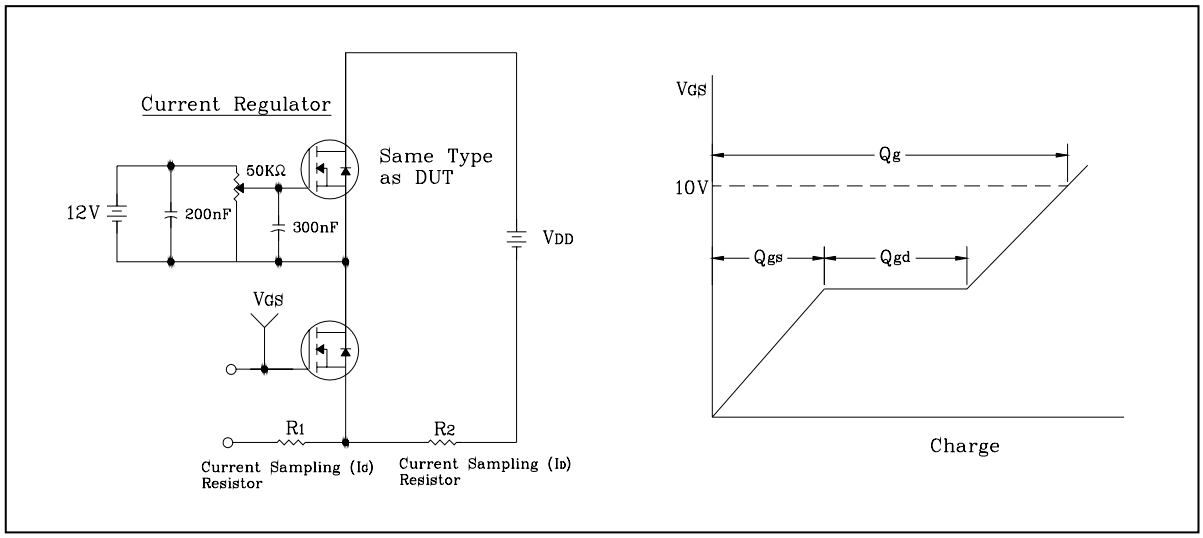


Fig. 12 Resistive Switching Test Circuit & Waveform

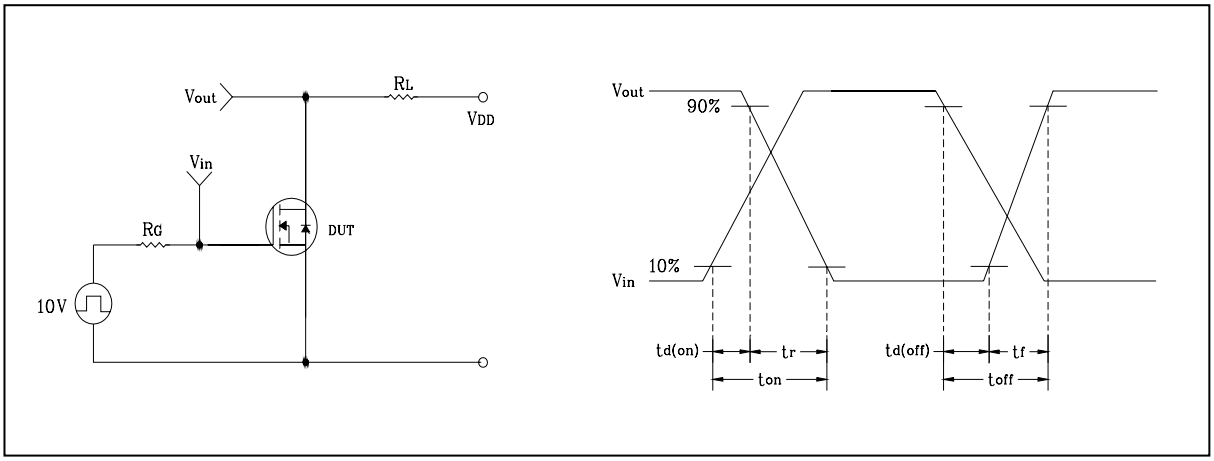
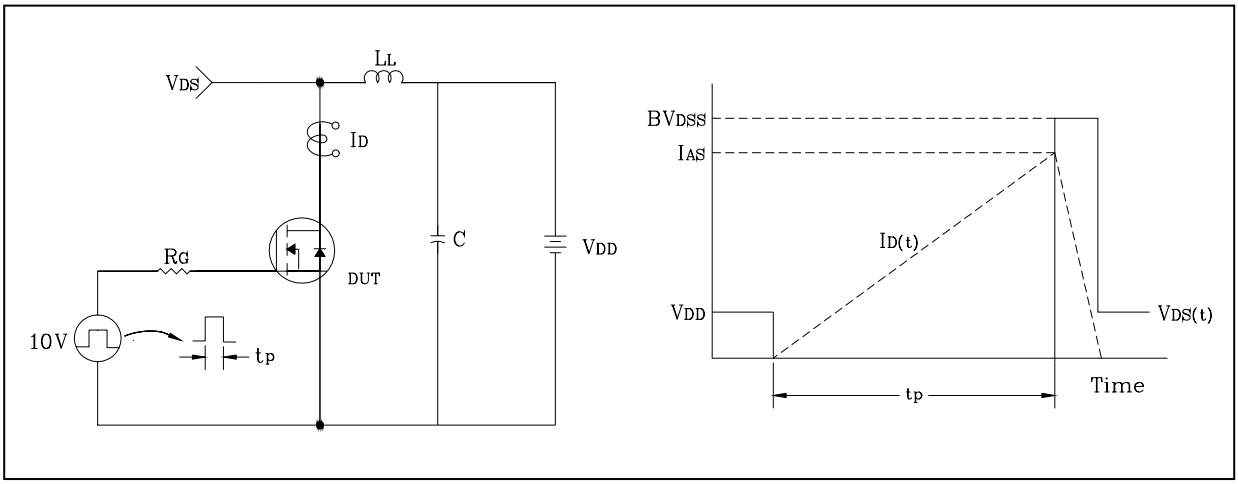


Fig. 13 E_{AS} Test Circuit & Waveform



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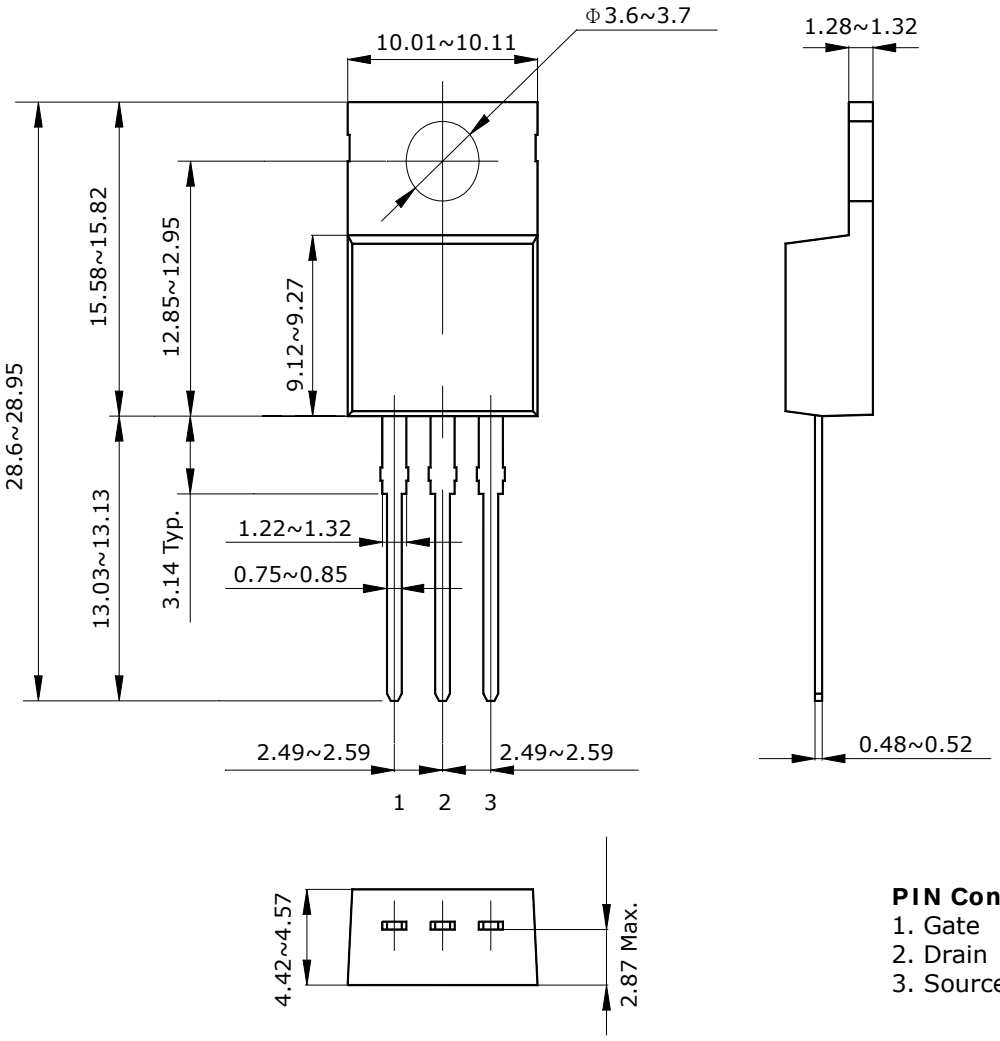
TO-220-3L Package Information

unit : mm



PIN Connections
1. Gate
2. Drain
3. Source

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