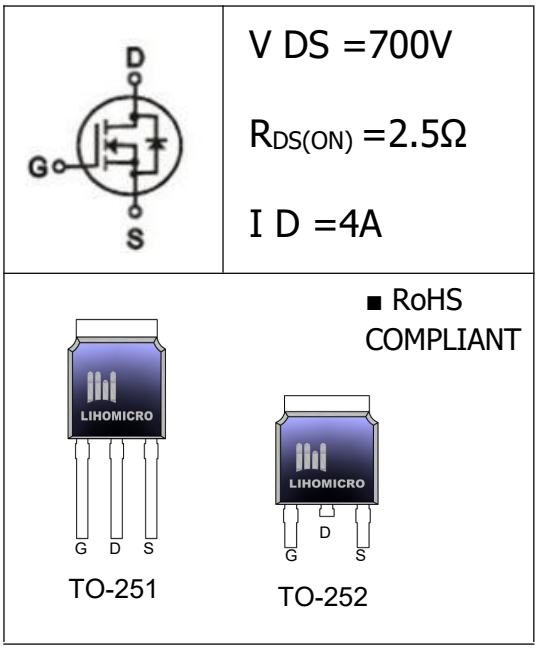
## ● General Description

The LH4N70F combines advanced trench MOSFET technology with a low resistance package to provide extremely low RDS(ON) . This device is ideal for load switch and battery protection applitions




## ● Features

- ■Low ON-resistance
- ■fast switching
- ■high input resistance
- ■RoHS compliant

## ●Application

- ■electronic ballast
- ■electronic transformer
- ■switch mode power supply

## ●Ordering Information:

| Part number | LH4N70F | LH4N70F |
|---|---|---|
| Package | TO-252 | TO-251 |
| Basic ordering unit (pcs) | 1000 | 1000 |
| Normal Package Material Ordering Code | LH4N70T5-TO252-TAP | LH4N70T1-TO251-TU |
| Halogen Free Ordering Code | LH4N70T5-TO252-TAP-HF | LH4N70T1-TO251-TU-HF |

## ●Absolute Maximum Ratings ($T_C$ =25℃)

| **Parameter** | **Symbol** | Rating | Unit |
|---|---|---|---|
| Drain-Source Voltage | $V_{DS}$ | 700 | V |
| Gate-Source Voltage | $V_{GS}$ | ±30 | V |
| Continuous Drain Current(TC=25℃) | $I_D$ | 4.0 | A |
| Continuous Drain Current TC=100℃ | $I_D$ | 2.5 | A |
| Pulsed Drain Current[1] | $I_{DM}$ | 16 | A |
| Total Power Dissipation(TC=25℃) | Ptot | 50 | W |
| Operating Junction Temperature | $T_J$ | 150 | ℃ |
| Storage Temperature | $T_{STG}$ | -55- 150 | ℃ |
| Single Pulse Avalanche Energy[2] | $E_{AS}$ | 260 | mJ |

## ●Electronic Characteristics

| Parameter | Symbol | Condition | Min. | Typ | Max. | Unit |
|---|---|---|---|---|---|---|
| Drain-Source Breakdown Voltage | $BV_{DSS}$ | $V_{GS}$=0V, $I_D$=250μA | 700 | | | V |
| Breakdown Voltage Temperature Coefficient | $\Delta BV_{DSS}/\Delta T_j$ | ID=250uA, Referenced to 25°C | | 0.6 | | V/°C |
| Gate Threshold Voltage | $V_{GS(TH)}$ | VGS=VDS, ID=250μA | 2.0 | | 4.0 | V |
| Drain-Source Leakage Current | $I_{DSS}$ | $V_{DS}$=600V, VGS =0V, Tj=25°C | | | 25 | uA |
| | | $V_{DS}$=480V, VGS =0V, Tj=125°C | | | 250 | |
| Gate- Source Leakage Current | $I_{GSS}$ | VGS =±30V | | | ±100 | nA |
| Static Drain-source On Resistance | $R_{DS(ON)}$ | VGS =10V, ID=2.0A | | 2.5 | 2.8 | Ω |
| Forward Transconductance[3] | gFS | VDS =40V, ID=2.0A | | 2.5 | | S |
| Reverse Diode dv/dt | dv/dt | ISD≤4A,Tj=25°C | | 5.5 | | V/ns |

## ●Electronic Characteristics

| Parameter | Symbol | Condition | Min. | Typ | Max. | Unit |
|---|---|---|---|---|---|---|
| Input capacitance | Ciss | $V_{GS}$ = 0V, $V_{DS}$ = 25V F = 1.0MHZ | | 590 | 650 | pF |
| Output capacitance | Coss | | | 48 | 55 | |
| Reverse transfer capacitance | Crss | | | 5 | 12 | |
| Turn -Off Delay Time | Td(off) | $V_{DD}$=300V, $I_D$=4.0A $R_G$=25Ω | | 20 | | ns |
| Total Gate Charge | Qg | $I_D$ =4.0A, $V_{DS}$ = 520V $V_{GS}$ = 10V | | 14.3 | | nC |
| Gate-to-Source Charge | Qgs | | | 2.8 | | |
| Gate-to-Drain Charge | Qgd | | | 4.6 | | |
| Continuous Diode Forward Current | $I_S$ | | | | 4.0 | A |
| Diode Forward Voltage | $V_{SD}$ | Tj=25°C, Is=4.0A $V_{GS}$ =0V | | | 1.4 | V |
| Reverse Recovery Time | trr | Tj=25°C, If=4.0A di/dt=100A/μs | | 390 | | ns |
| Reverse Recovery Charge | Qrr | | | 1.5 | | uC |

●**Thermal resistance**

| Parameter | Symbol | Typ. | Max. | Unit |
|---|---|---|---|---|
| Thermal resistance, junction - case | $R_{thJC}$ | | 3.47 | °C/W |
| Thermal resistance, junction - ambient | $R_{thJA}$ | | 110 | °C/W |

**Notes:**

1.Repetitive rating: Pulse width limited by maximum junction temperature

2.Starting Tj=25°C, $V_{DD}$=50V, L=10mH, $R_G$=25Ω, $I_{AS}$=4.0A

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

- Typical Characteristics

Fig1 Typical Output Characteristics, Tc=25℃

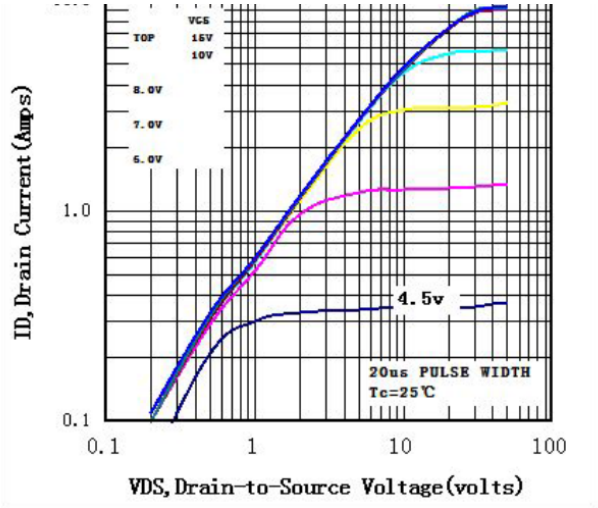



Fig2 Typical Output Characteristics, Tc=150℃

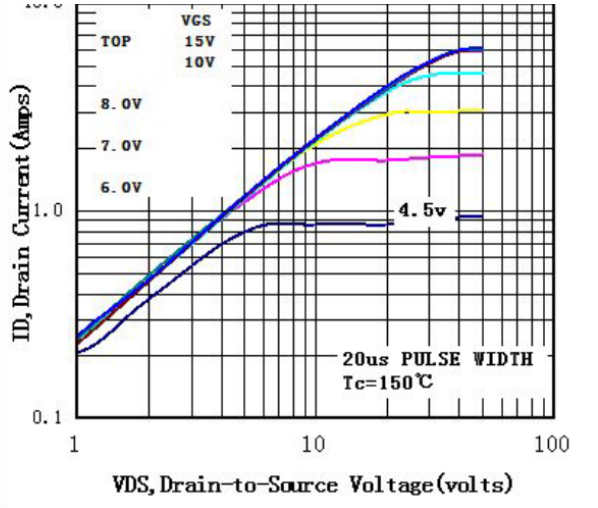



Fig3 Normalized Resistance Vs.Temperature

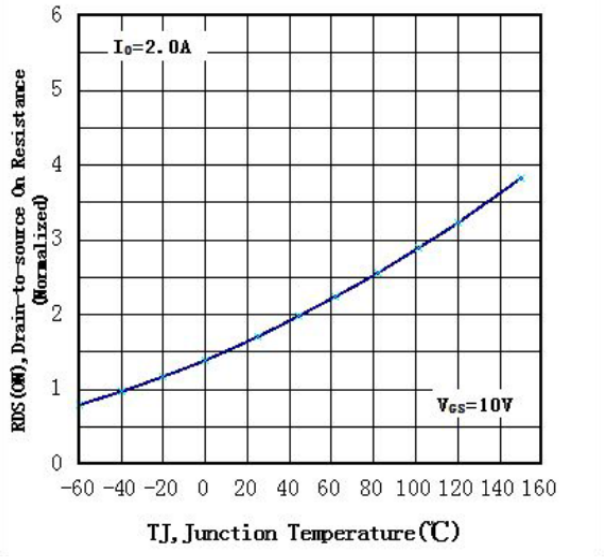



Fig4 Typical Source-Drain Diode Forward Voltage

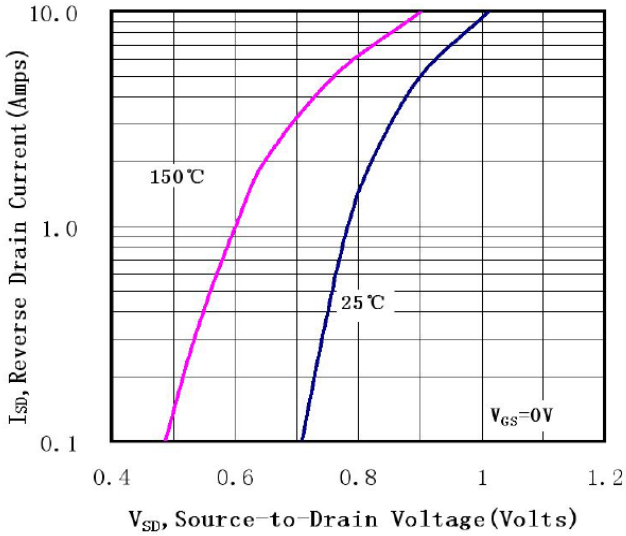



Fig5 Maximum Drain Current Vs.Case Temperature

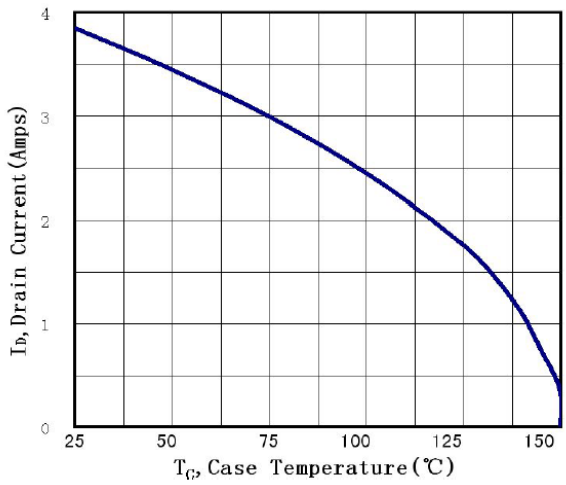
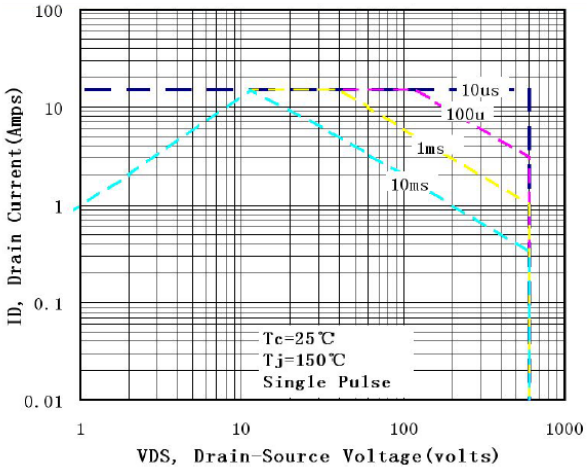


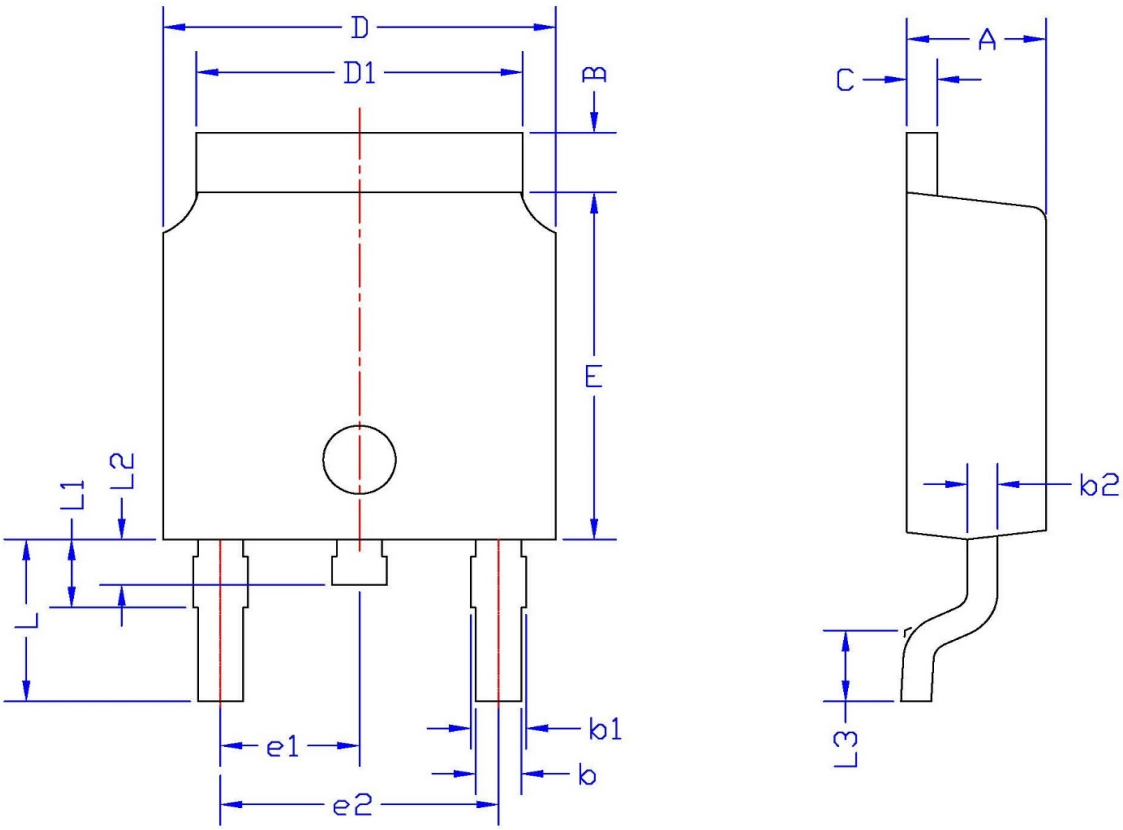

Fig6 Maximum Safe Operating Area



**•Dimensions（TO-252）**

UNIT:mm

| SYMBOL | min | max | SYMBOL | min | max |
|---|---|---|---|---|---|
| A | 2.10 | 2.50 | L2 | 0.60 | 1.20 |
| b | 0.50 | 0.90 | L3 | 1.20 | 1.80 |
| b1 | 0.70 | 1.20 | B | 0.80 | 1.30 |
| b2 | 0.40 | 0.70 | C | 0.40 | 0.70 |
| D | 6.20 | 6.80 | D1 | 5.10 | 5.60 |
| E | 5.80 | 6.40 | e1 | 2.10 | 2.45 |
| L | 3.60 | 4.60 | e2 | 4.40 | 4.80 |
| L1 | 0.80 | 1.60 | | | |



**•Dimensions（TO-251）**

UNIT:mm

| SYMBOL | min | max | SYMBOL | min | max |
|---|---|---|---|---|---|
| A | 2.10 | 2.50 | B | 0.80 | 1.30 |
| b | 0.50 | 0.90 | C | 0.40 | 0.70 |
| b1 | 0.70 | 1.20 | D1 | 5.10 | 5.60 |
| b2 | 0.40 | 0.70 | e1 | 2.10 | 2.45 |
| D | 6.20 | 6.80 | e2 | 4.40 | 4.80 |
| E | 5.80 | 6.40 | | | |
| L | 3.60 | 9.80 | | | |
| L1 | 0.80 | 1.60 | | | |