

General Description

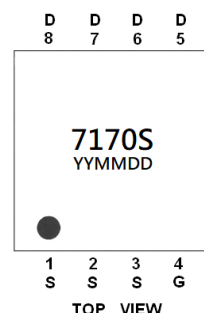
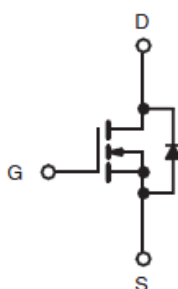
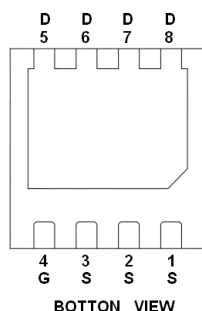
AFN7170S, N-Channel enhancement mode MOSFET, uses Advanced Trench Technology to provide excellent $R_{DS(ON)}$, low gate charge.

These devices are particularly suited for low voltage power management, such as smart phone and notebook computer and other battery powered circuits, and low in-line power loss are needed in commercial industrial surface mount applications.

Features

- $I_D=9A, R_{DS(ON)}= 37m\Omega@V_{GS}=10V$
- $I_D=8A, R_{DS(ON)}= 40m\Omega@V_{GS}=4.5V$
- Super high density cell design for extremely low $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability
- DFN3X3-8L package design

Pin Description (DFN3X3-8L)



Application

- Primary Side Switch
- Synchronous Rectification
- DC/DC Converters & DC/AC Inverters
- Boost Converters

Pin Define

| Pin | Symbol | Description |
|-----|--------|-------------|
| 1~3 | S | Source |
| 4 | G | Gate |
| 5~8 | D | Drain |

Ordering Information

| Part Ordering No. | Part Marking | Package | Unit | Quantity |
|-------------------|--------------|-----------|-------------|----------|
| AFN7170SFN338RG | 7170S | DFN3X3-8L | Tape & Reel | 5000 EA |

※ YY year code

※ MM month code

※ DD date code

※ AFN7170SFN338RG : 13" Tape & Reel ; Pb- Free ; Halogen -Free



Absolute Maximum Ratings

(T_A=25°C Unless otherwise noted)

| Parameter | Symbol | Typical | Unit |
|---|------------------|----------------------|------|
| Drain-Source Voltage | V _{DSS} | 100 | V |
| Gate –Source Voltage | V _{GSS} | ±20 | V |
| Continuous Drain Current(T _J =150°C) | I _D | T _A =25°C | 9 |
| | | T _A =70°C | 8 |
| Pulsed Drain Current | I _{DM} | 20 | A |
| Continuous Source Current(Diode Conduction) | I _S | 1.5 | A |
| Power Dissipation | P _D | T _A =25°C | 2.8 |
| | | T _A =70°C | 1.8 |
| Operating Junction Temperature | T _J | 150 | °C |
| Storage Temperature Range | T _{STG} | -55/150 | °C |
| Thermal Resistance-Junction to Ambient | R _{θJA} | 62.5 | °C/W |

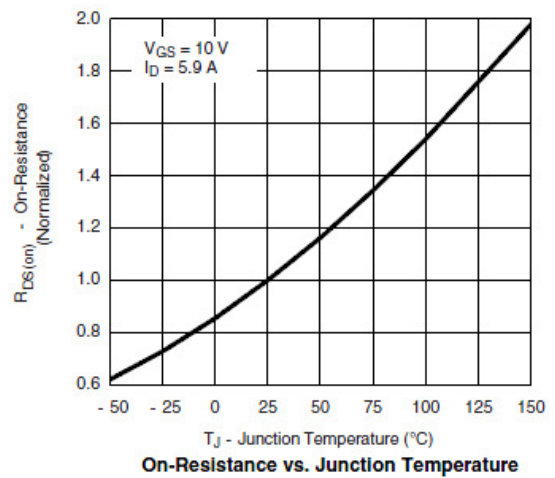
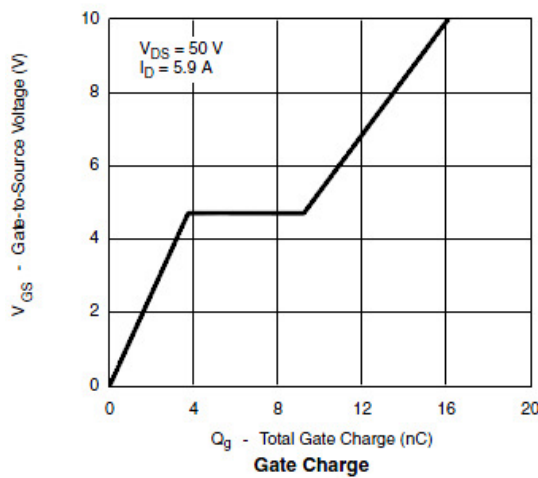
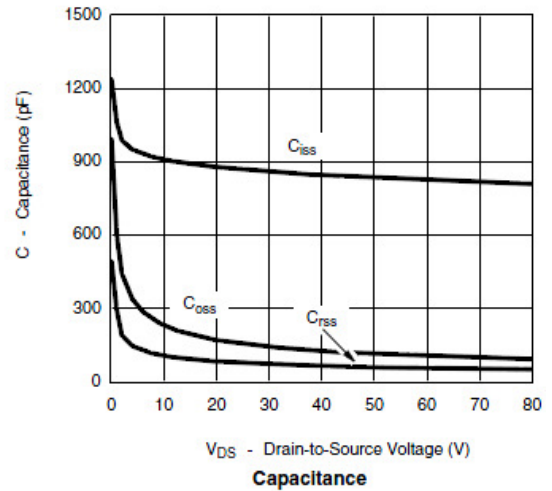
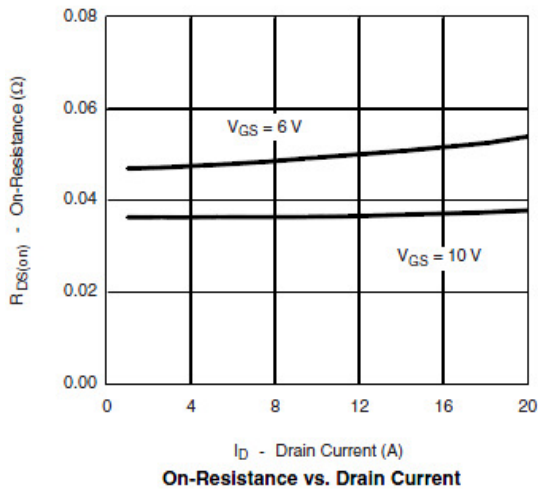
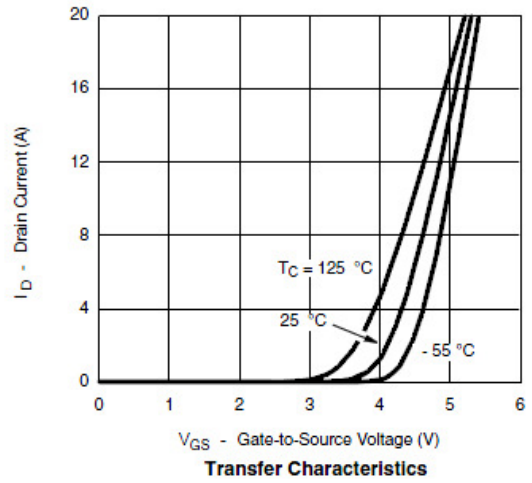
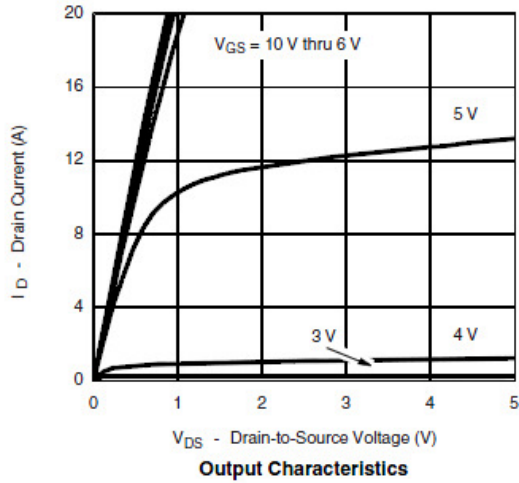
Electrical Characteristics

(T_A=25°C Unless otherwise noted)

| Parameter | Symbol | Conditions | Min. | Typ | Max. | Unit |
|---------------------------------|----------------------|--|------|-----|------|------|
| Static | | | | | | |
| Drain-Source Breakdown Voltage | V _{(BR)DSS} | V _{GS} =0V, I _D =250uA | 100 | | | V |
| Gate Threshold Voltage | V _{GS(th)} | V _{DS} =V _{GS} , I _D =250uA | 1.0 | | 2.5 | |
| Gate Leakage Current | I _{GSS} | V _{DS} =0V, V _{GS} =±20V | | | ±100 | nA |
| Zero Gate Voltage Drain Current | I _{DSS} | V _{DS} =80V, V _{GS} =0V | | | 1 | uA |
| | | V _{DS} =80V, V _{GS} =0V T _J =85°C | | | 5 | |
| On-State Drain Current | I _{D(on)} | V _{DS} ≥ 5V, V _{GS} =4.5V | 20 | | | A |
| Drain-Source On-Resistance | R _{DS(on)} | V _{GS} =10V, I _D =9A | | 27 | 37 | mΩ |
| | | V _{GS} =4.5V, I _D =8A | | 30 | 40 | |
| Forward Transconductance | g _{FS} | V _{DS} =15V, I _D =6A | | 14 | | S |
| Diode Forward Voltage | V _{SD} | I _S =2A, V _{GS} =0V | | 0.8 | 1.3 | V |
| Dynamic | | | | | | |
| Total Gate Charge | Q _g | V _{DS} =50V, V _{GS} =10V I _D ≧6A | | 16 | 24 | nC |
| Gate-Source Charge | Q _{gs} | | | 4.0 | | |
| Gate-Drain Charge | Q _{gd} | | | 6.0 | | |
| Input Capacitance | C _{iss} | V _{DS} =50V, V _{GS} =0V f=1MHz | | 850 | | pF |
| Output Capacitance | C _{oss} | | | 90 | | |
| Reverse Transfer Capacitance | C _{rss} | | | 40 | | |
| Turn-On Time | t _{d(on)} | V _{DD} =50V, R _L =50Ω I _D ≧1.0A, V _{GEN} =10V R _G =6Ω | | 15 | 25 | ns |
| | t _r | | | 15 | 25 | |
| Turn-Off Time | t _{d(off)} | | | 35 | 55 | |
| | t _f | | | 20 | 35 | |

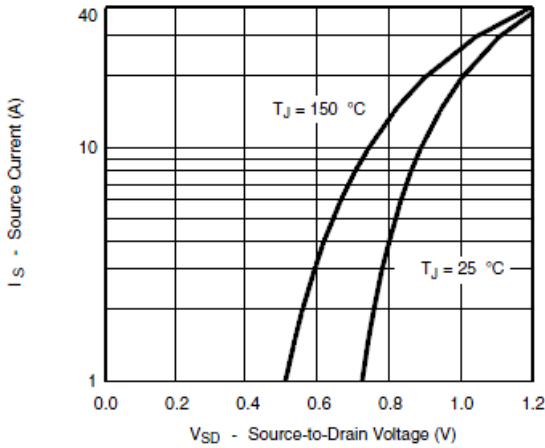


Typical Characteristics

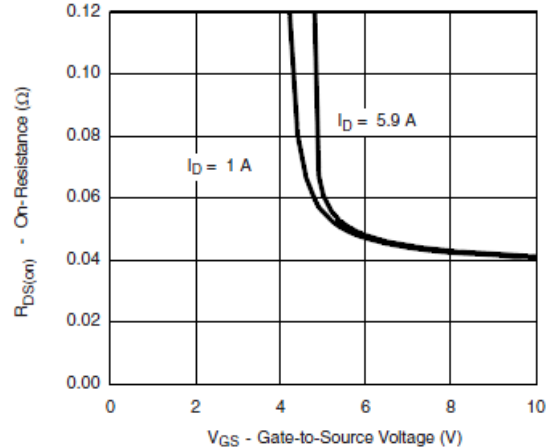




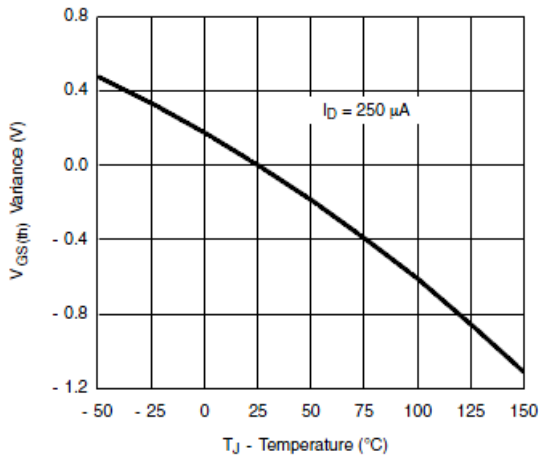
Typical Characteristics



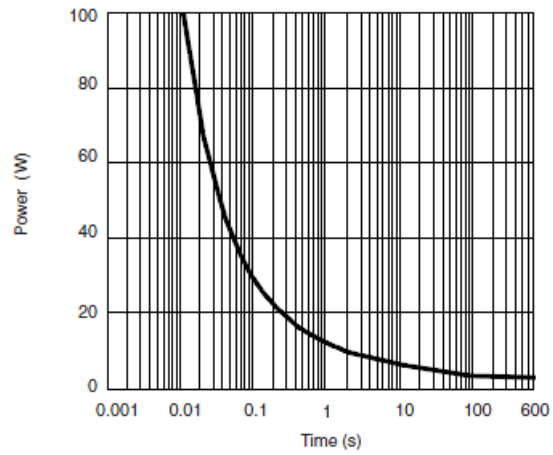
Source-Drain Diode Forward Voltage



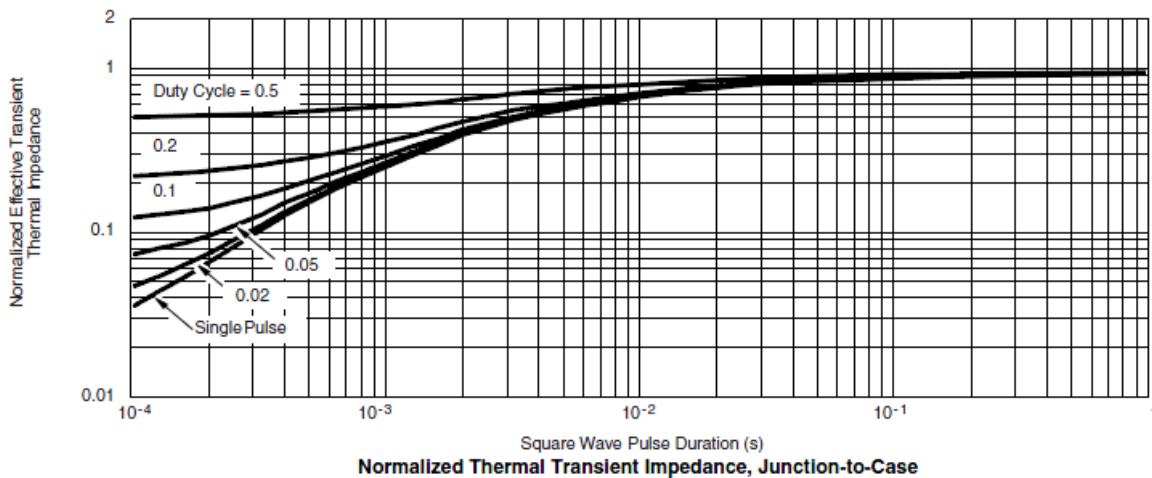
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



Single Pulse Power



Normalized Thermal Transient Impedance, Junction-to-Case



Typical Characteristics

Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

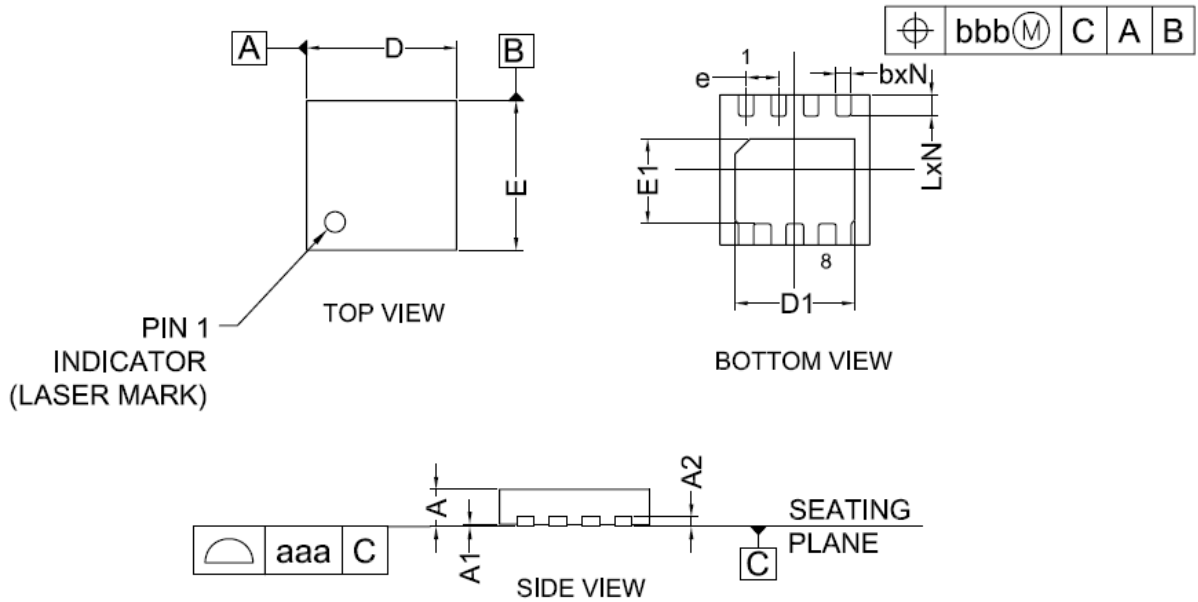


Unclamped Inductive Switching Test Circuit & Waveforms





Package Information (DFN3X3-8L)



| SYMBOL | MIN | TYP | MAX |
|--------|---------|------|------|
| A | 0.70 | 0.75 | 0.80 |
| A1 | 0.00 | 0.02 | 0.05 |
| A2 | 0.203 | | |
| b | 0.25 | 0.30 | 0.35 |
| D | 2.90 | 3.00 | 3.10 |
| D1 | 2.35 | 2.40 | 2.45 |
| E | 2.90 | 3.00 | 3.10 |
| E1 | 1.65 | 1.70 | 1.75 |
| e | 0.65BSC | | |
| L | 0.37 | 0.42 | 0.47 |
| N | 8 | | |
| aaa | 0.08 | | |
| bbb | 0.10 | | |

COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

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