



General Description

AFN4910W, 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, and low in-line power loss are needed in commercial industrial surface mount applications.

Features

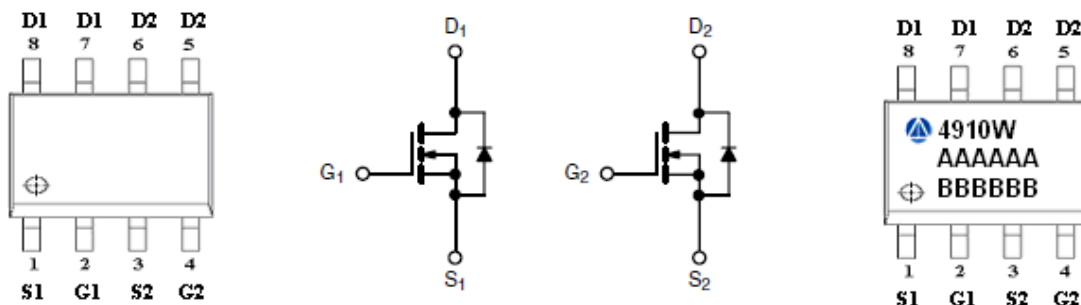
N1 Channel

- 40V/10A, $R_{DS(ON)} = 19m\Omega @ V_{GS}=10V$
- 40V/ 8A, $R_{DS(ON)} = 25m\Omega @ V_{GS}=4.5V$

N2 Channel

- 40V/10A, $R_{DS(ON)} = 10m\Omega @ V_{GS}=10V$
- 40V/ 8A, $R_{DS(ON)} = 12m\Omega @ V_{GS}=4.5V$

Pin Description (SOP-8P)



Application

- Car Charger
- POL, IBC
- Secondary Side

Pin Define

| Pin | Symbol | Description |
|-----|--------|-------------|
| 1 | S1 | Source 1 |
| 2 | G1 | Gate 1 |
| 3 | S2 | Source 2 |
| 4 | G2 | Gate 2 |
| 5 | D2 | Drain 2 |
| 6 | D2 | Drain 2 |
| 7 | D1 | Drain 1 |
| 8 | D1 | Drain 1 |

Ordering Information

| Part Ordering No. | Part Marking | Package | Unit | Quantity |
|-------------------|--------------|---------|-------------|----------|
| AFN4910WS8RG | 4910W | SOP-8P | Tape & Reel | 2500 EA |

- ※ A Lot code
- ※ B Date code
- ※ AFN4910WS8RG : 13" Tape & Reel ; Pb- Free ; Halogen -Free



Absolute Maximum Ratings

(T_A=25°C Unless otherwise noted)

| Parameter | Symbol | Value | | Unit |
|---|------------------|----------------------|-----|------|
| | | N1 | N2 | |
| Drain-Source Voltage | V _{DSS} | 40 | 40 | V |
| Gate –Source Voltage | V _{GSS} | ±20 | ±20 | V |
| Continuous Drain Current(T _J =150°C) | I _D | T _A =25°C | 10 | A |
| | | T _A =70°C | 8 | |
| Pulsed Drain Current | I _{DM} | 20 | 30 | A |
| Avalanche Current | I _{AS} | 10 | 20 | A |
| Avalanche Energy | E _{AS} | 5 | 10 | mJ |
| Continuous Source Current(Diode Conduction) | I _S | 1.8 | 1.8 | A |
| Power Dissipation | P _D | T _A =25°C | 2.8 | W |
| | | 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 |

N1 Channel 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 | 40 | | | V |
| Gate Threshold Voltage | V _{GS(th)} | V _{DS} =V _{GS} , I _D =250uA | 1.0 | | 3.0 | |
| Gate Leakage Current | I _{GSS} | V _{DS} =0V, V _{GS} =±20V | | | ±100 | nA |
| Zero Gate Voltage Drain Current | I _{DSS} | V _{DS} =40V, V _{GS} =0V | | | 1 | uA |
| | | V _{DS} =40V, V _{GS} =0V T _J =85°C | | | 10 | |
| On-State Drain Current | I _{D(on)} | V _{DS} ≥ 5V, V _{GS} =10V | 20 | | | A |
| Drain-Source On-Resistance | R _{DSON} | V _{GS} =10V, I _D =10A | | 15.8 | 19 | mΩ |
| | | V _{GS} =4.5V, I _D =8A | | 21.5 | 25 | |
| Forward Transconductance | g _{FS} | V _{DS} =15V, I _D =5.0A | | 25 | | S |
| Diode Forward Voltage | V _{SD} | I _S =2A, V _{GS} =0V | | 0.85 | 1.2 | V |
| Dynamic | | | | | | |
| Total Gate Charge | Q _g | V _{DS} =20V, V _{GS} =4.5V I _D = 10A | | 5 | 10 | nC |
| Gate-Source Charge | Q _{gs} | | | 1.5 | | |
| Gate-Drain Charge | Q _{gd} | | | 1.5 | | |
| Input Capacitance | C _{iss} | V _{DS} =20V, V _{GS} =0V f=1MHz | | 600 | | pF |
| Output Capacitance | C _{oss} | | | 100 | | |
| Reverse Transfer Capacitance | C _{rss} | | | 45 | | |
| Turn-On Time | t _{d(on)} | V _{DD} =20V, R _L =2Ω I _D ≧10A, V _{GEN} =10V R _G =1Ω | | 7 | 15 | ns |
| | t _r | | | 9 | 20 | |
| Turn-Off Time | t _{d(off)} | | | 16 | 30 | |
| | t _f | | | 8 | 18 | |



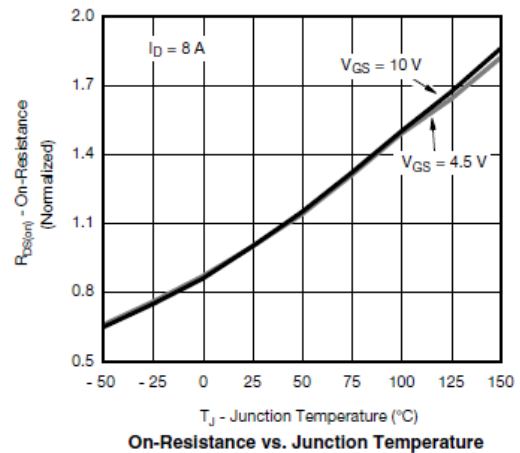
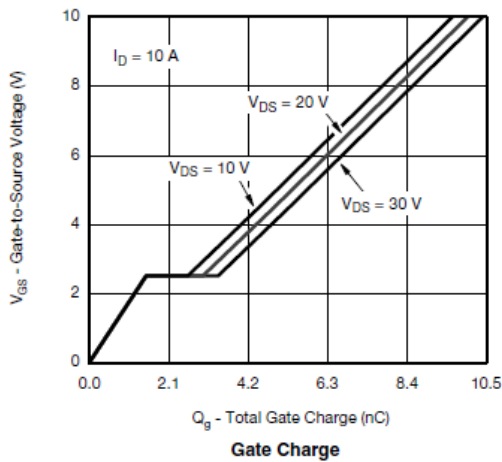
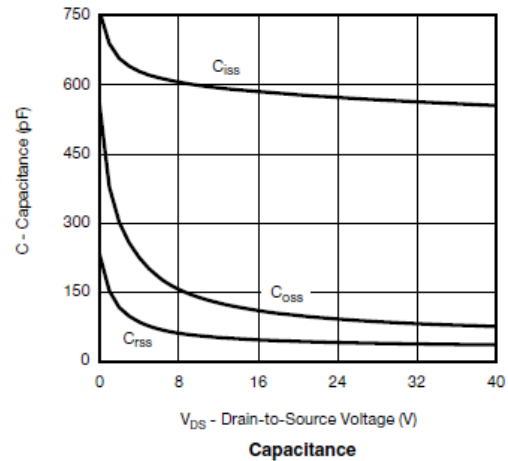
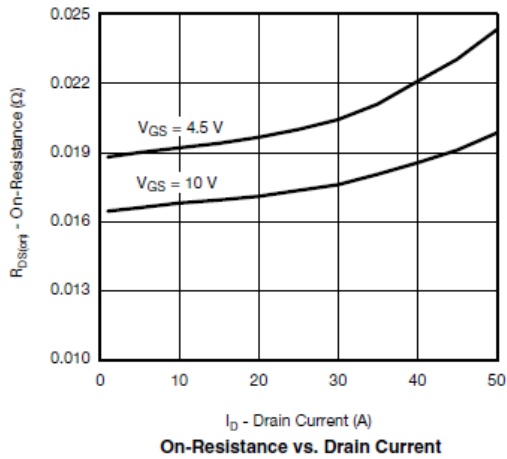
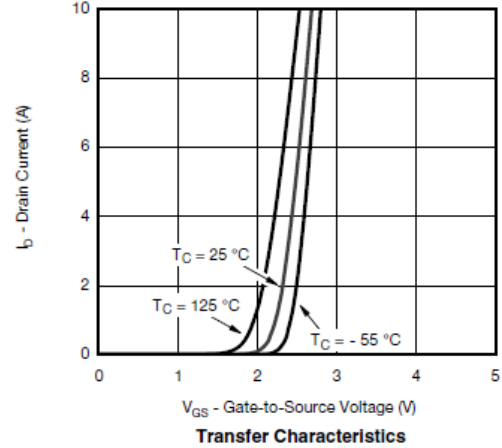
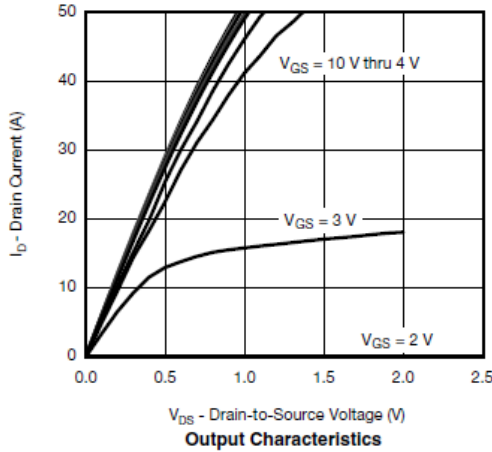
N2 Channel Electrical Characteristics

(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 =250μA | 40 | | | V |
| Gate Threshold Voltage | V _{GS(th)} | V _{DS} =V _{GS} , I _D =250μA | 1.0 | | 3.0 | |
| Gate Leakage Current | I _{GSS} | V _{DS} =0V, V _{GS} =±20V | | | ±100 | nA |
| Zero Gate Voltage Drain Current | I _{DSS} | V _{DS} =32V, V _{GS} =0V | | | 1 | μA |
| | | V _{DS} =32V, V _{GS} =0V T _J =85°C | | | 10 | |
| On-State Drain Current | I _{D(on)} | V _{DS} ≥ 5V, V _{GS} =10V | 30 | | | A |
| Drain-Source On-Resistance | R _{DS(on)} | V _{GS} =10V, I _D =10A | | 8.8 | 10 | mΩ |
| | | V _{GS} =4.5V, I _D =8A | | 10.2 | 12 | |
| Forward Transconductance | g _{FS} | V _{DS} =15V, I _D =12.4A | | 56 | | S |
| Diode Forward Voltage | V _{SD} | I _S =1.5A, V _{GS} =0V | | 0.85 | 1.2 | V |
| Dynamic | | | | | | |
| Total Gate Charge | Q _g | V _{DS} =10V, V _{GS} =4.5V I _D = 8A | | 15 | 30 | nC |
| Gate-Source Charge | Q _{gs} | | | 6.8 | | |
| Gate-Drain Charge | Q _{gd} | | | 5.2 | | |
| Input Capacitance | C _{iss} | V _{DS} =20V, V _{GS} =0V f=1MHz | | 2000 | | pF |
| Output Capacitance | C _{oss} | | | 260 | | |
| Reverse Transfer Capacitance | C _{rss} | | | 150 | | |
| Turn-On Time | t _{d(on)} | V _{DD} =20V, R _L =2Ω I _D ≅8A, V _{GEN} =10V R _G =1Ω | | 10 | 20 | ns |
| | t _r | | | 15 | 30 | |
| Turn-Off Time | t _{d(off)} | | | 30 | 60 | |
| | t _f | | | 10 | 20 | |

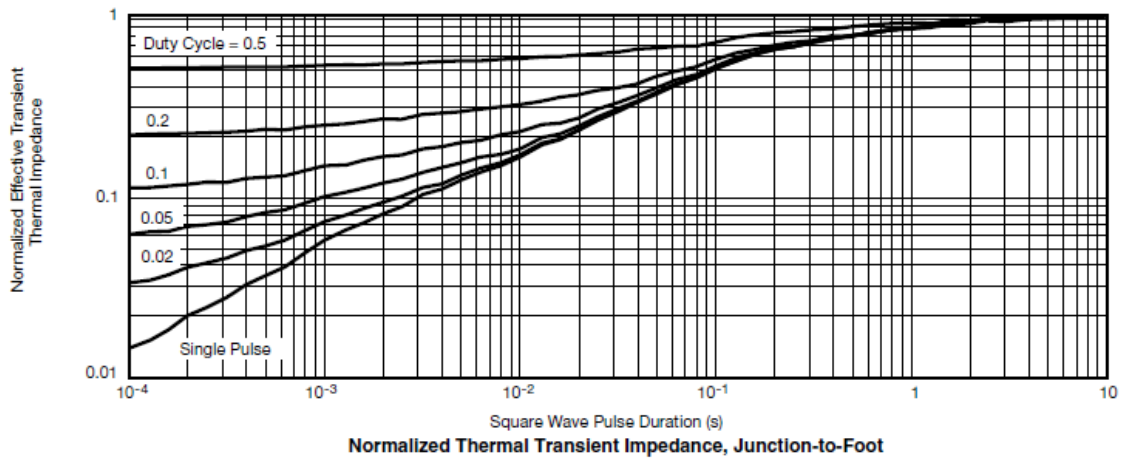
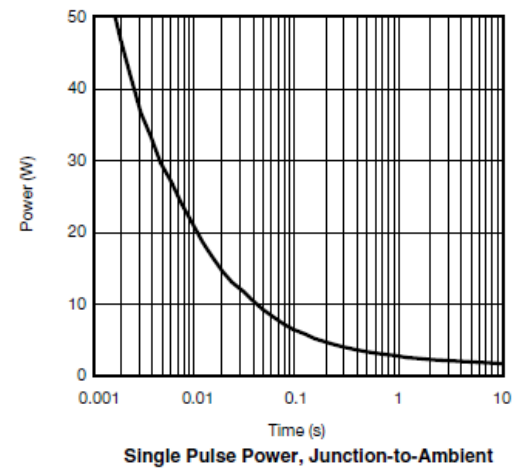
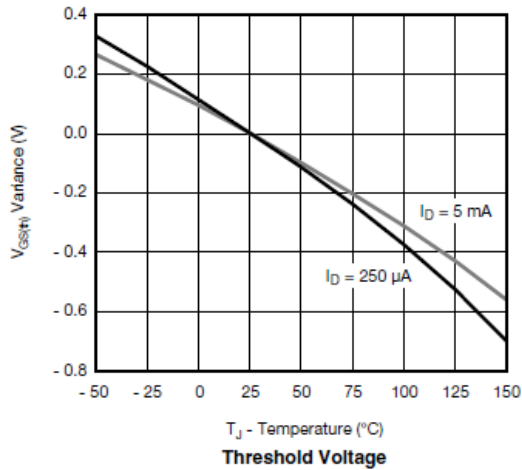
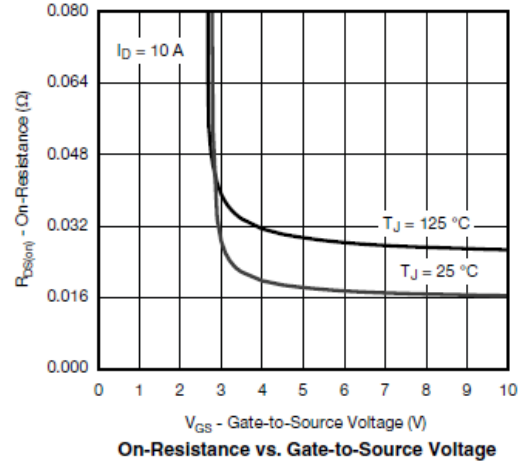
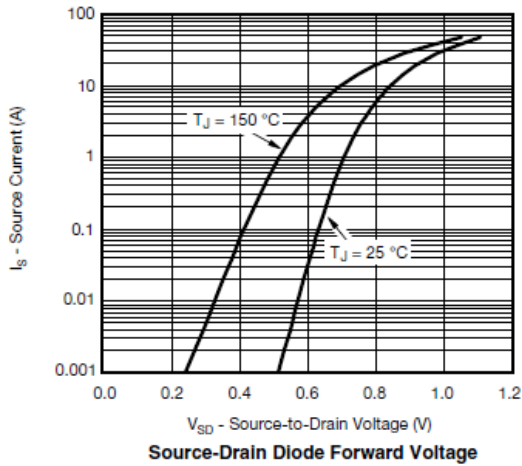


N1 Channel Typical Characteristics



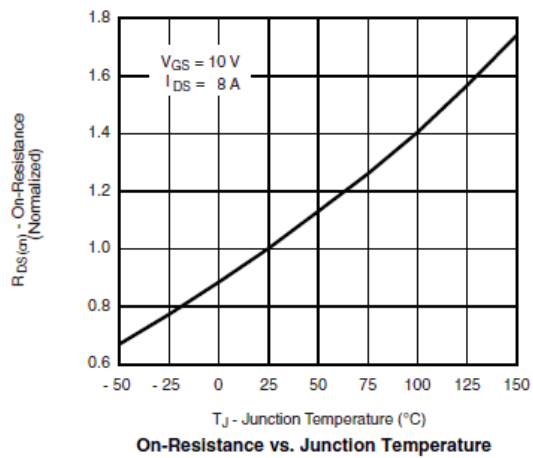
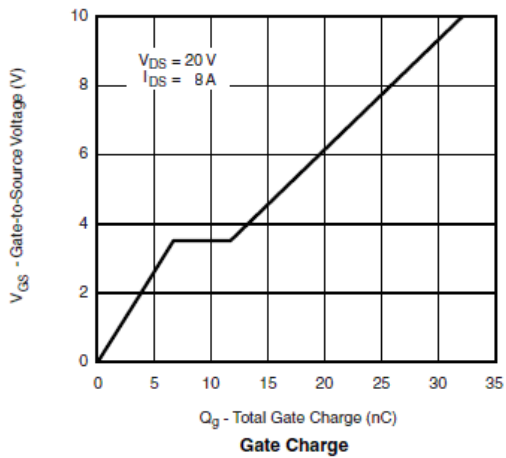
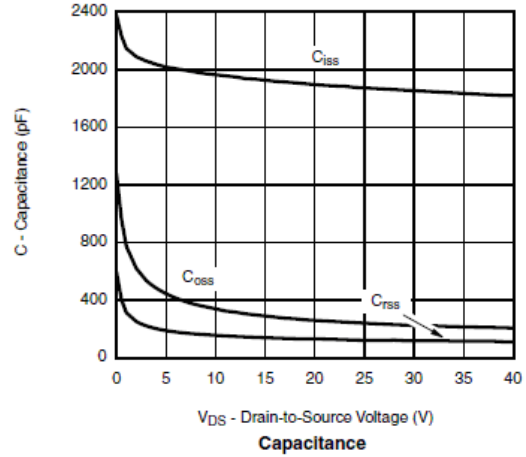
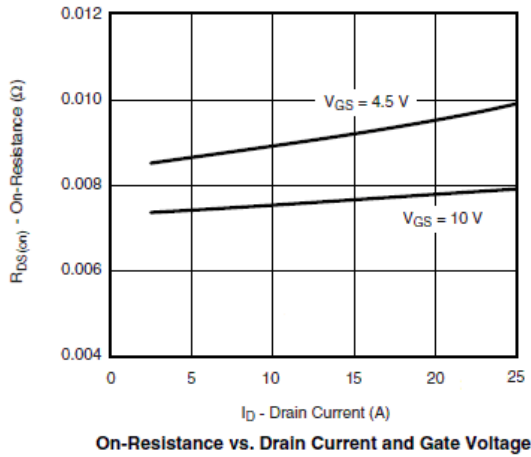
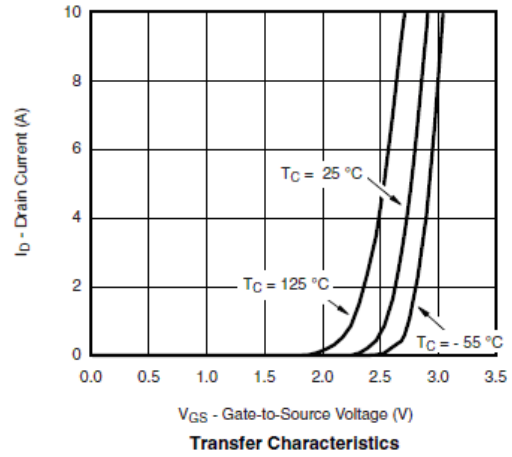
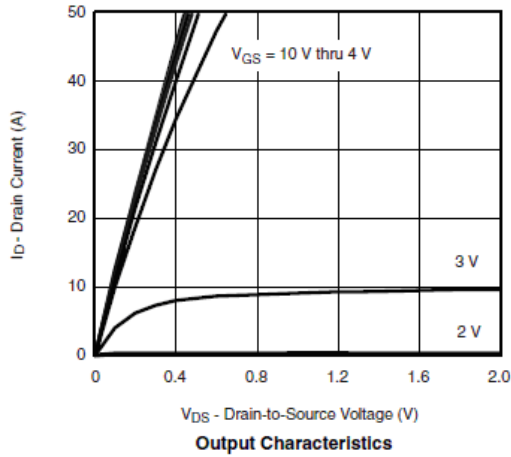


N1 Channel Typical Characteristics



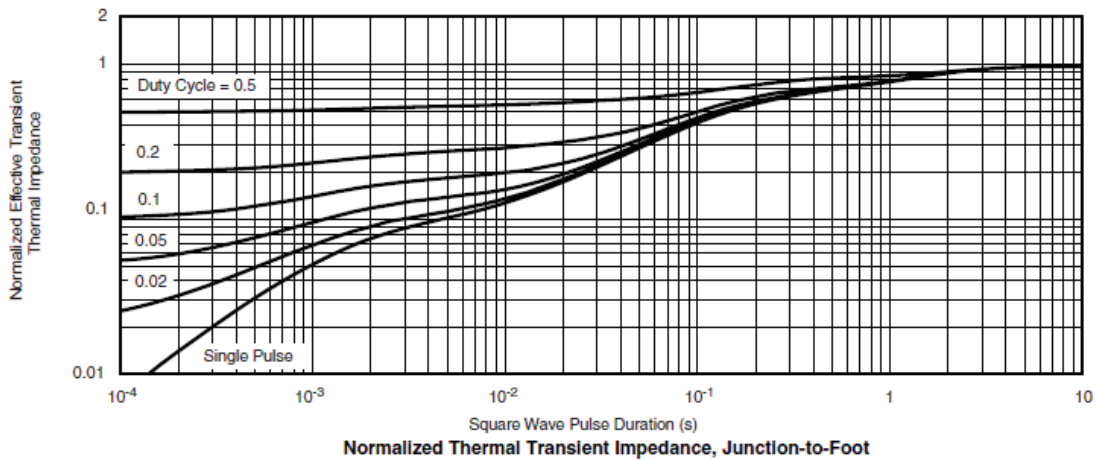
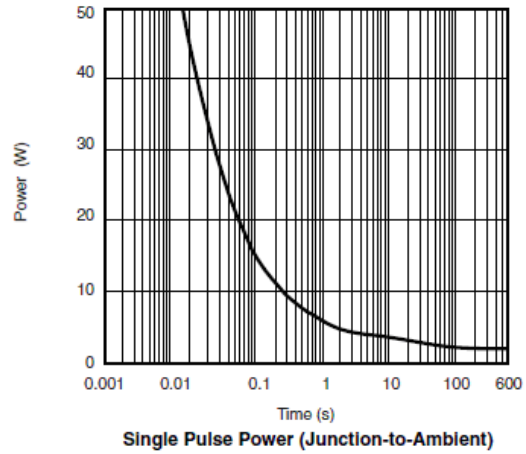
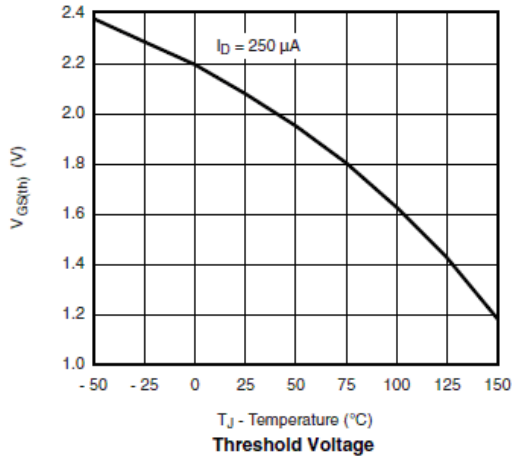
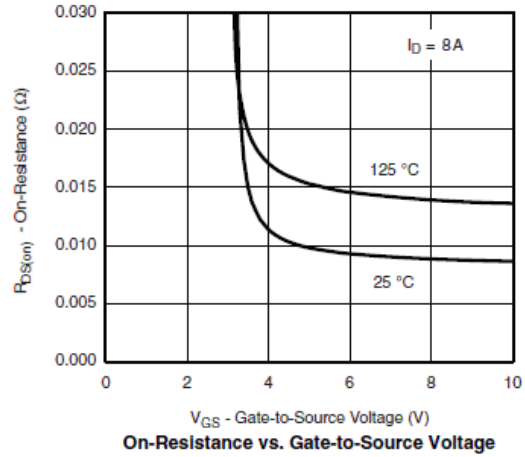
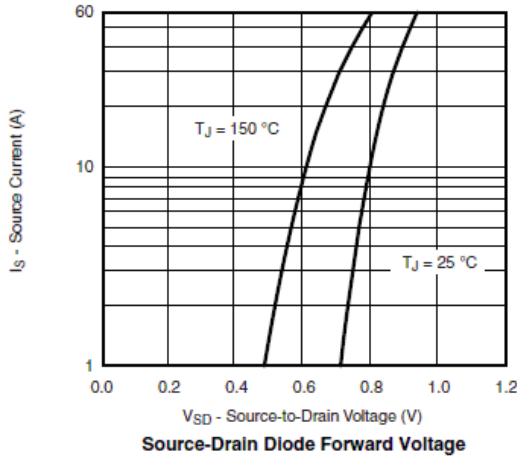


N2 Channel Typical Characteristics





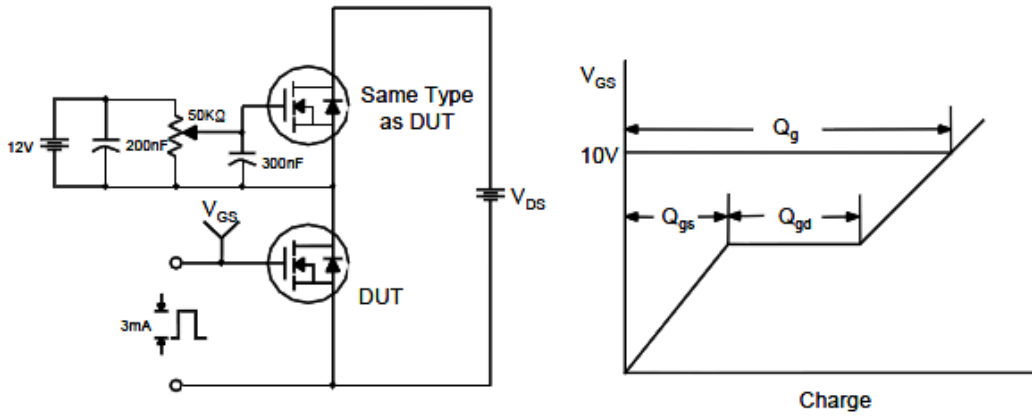
N2 Channel Typical Characteristics



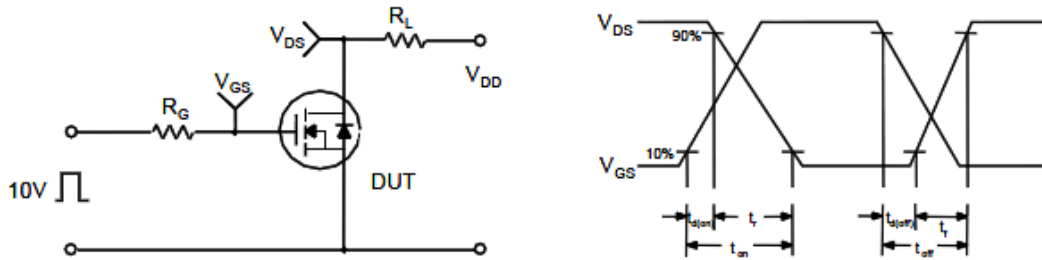


Typical Characteristics

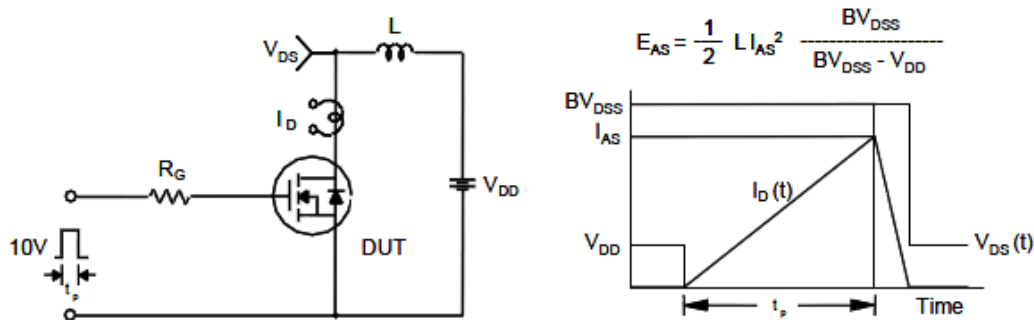
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

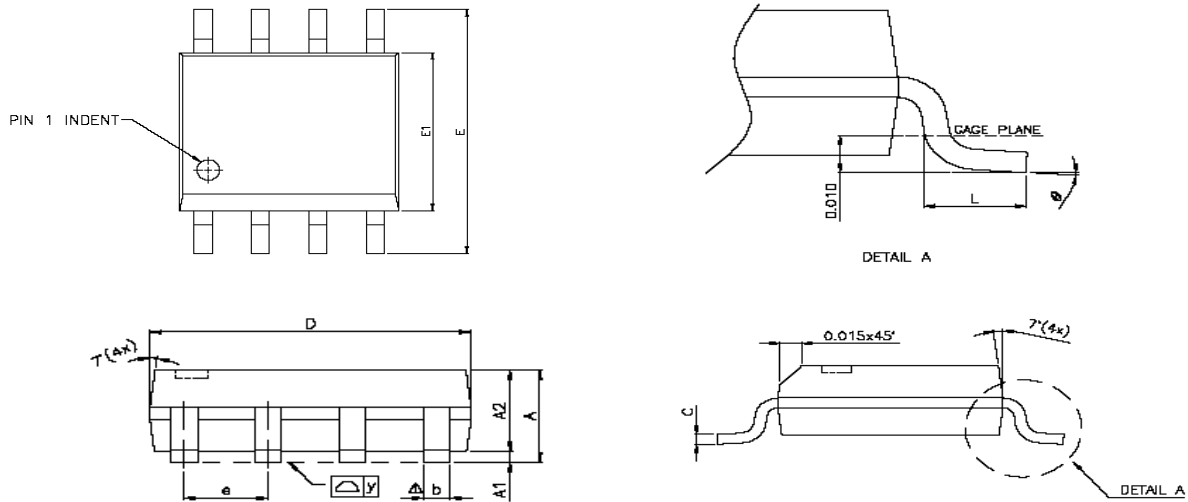


Unclamped Inductive Switching Test Circuit & Waveforms





Package Information (SOP-8P)



| SYMBOLS | DIMENSIONS IN MILLIMETERS | | | DIMENSIONS IN INCHES | | |
|---------------|---------------------------|------|-------|----------------------|-------|--------|
| | MIN | NOM | MAX | MIN | NOM | MAX |
| A | 1.47 | 1.60 | 1.73 | 0.058 | 0.063 | 0.068 |
| A1 | 0.10 | — | 0.25 | 0.004 | — | 0.010 |
| A2 | — | 1.45 | — | — | 0.057 | — |
| b | 0.33 | 0.41 | 0.51 | 0.013 | 0.016 | 0.020 |
| C | 0.19 | 0.20 | 0.25 | 0.0075 | 0.008 | 0.0098 |
| D | 4.80 | 4.85 | 4.95 | 0.189 | 0.191 | 0.195 |
| E | 5.80 | 6.00 | 6.20 | 0.228 | 0.236 | 0.244 |
| E1 | 3.80 | 3.90 | 4.00 | 0.150 | 0.154 | 0.157 |
| e | — | 1.27 | — | — | 0.050 | — |
| L | 0.38 | 0.71 | 1.27 | 0.015 | 0.028 | 0.050 |
| Δ y | — | — | 0.076 | — | — | 0.003 |
| \varnothing | 0° | — | 8° | 0° | — | 8° |

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