



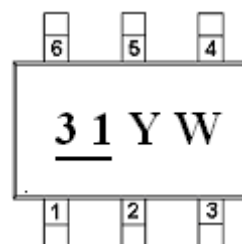
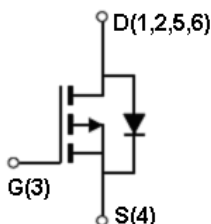
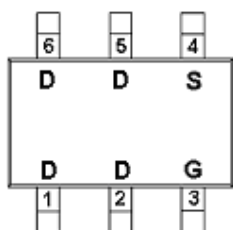
General Description

AFP3431W, P-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

- -30V/-5.0A, $R_{DS(ON)}=60m\Omega@V_{GS}=-10.0V$
- -30V/-3.2A, $R_{DS(ON)}=75m\Omega@V_{GS}=-4.5V$
- -30V/-2.0A, $R_{DS(ON)}=85m\Omega@V_{GS}=-2.5V$
- Super high density cell design for extremely low $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability
- TSOP-6 package design

Pin Description (TSOP-6)



Application

- Power Management in Note book
- DC-DC System
- LCD Panel

Pin Define

| Pin | Symbol | Description |
|-----|--------|-------------|
| 1 | D | Drain |
| 2 | D | Drain |
| 3 | G | Gate |
| 4 | S | Source |
| 5 | D | Drain |
| 6 | D | Drain |

Ordering Information

| Part Ordering No. | Part Marking | Package | Unit | Quantity |
|-------------------|--------------|---------|-------------|----------|
| AFP3431WTS6RG | <u>31</u> YW | TSOP-6 | Tape & Reel | 3000 EA |

- ※ 31 parts code
- ※ Y year code (0 ~ 9)
- ※ W week code (A ~ Z = 1 ~ 26 / a ~ z = 27 ~ 52)
- ※ AFP3431WTS6RG : 7" Tape & Reel ; Pb- Free ; Halogen -Free



Absolute Maximum Ratings

(T_A=25°C Unless otherwise noted)

| Parameter | Symbol | Value | Unit |
|---|------------------|----------------------|------|
| Drain-Source Voltage | V _{DSS} | -30 | V |
| Gate-Source Voltage | V _{GSS} | ±12 | V |
| Continuous Drain Current(T _J =150°C) | I _D | T _A =25°C | -5.0 |
| | | T _A =70°C | -3.2 |
| Pulsed Drain Current | I _{DM} | -15 | A |
| Continuous Source Current(Diode Conduction) | I _S | -1.5 | A |
| Power Dissipation | P _D | T _A =25°C | 2.0 |
| | | T _A =70°C | 1.3 |
| Operating Junction Temperature | T _J | 150 | °C |
| Storage Temperature Range | T _{STG} | -55/150 | °C |
| Thermal Resistance-Junction to Ambient | R _{θJA} | 120 | °C/W |

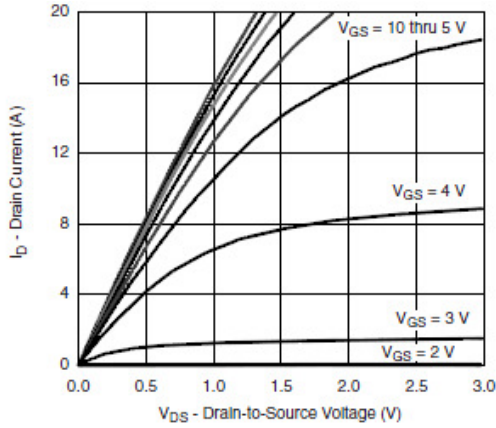
Electrical Characteristics

(T_A=25°C Unless otherwise noted)

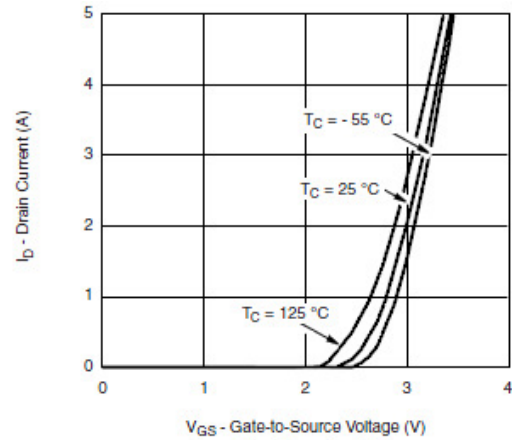
| Parameter | Symbol | Conditions | Min. | Typ | Max. | Unit |
|---------------------------------|----------------------|---|-------|------|------|------|
| Static | | | | | | |
| Drain-Source Breakdown Voltage | V _{(BR)DSS} | V _{GS} =0V, I _D =-250μA | -30 | | | V |
| Gate Threshold Voltage | V _{GS(th)} | V _{DS} =V _{GS} , I _D =-250μA | -0.55 | | -1.1 | |
| Gate Leakage Current | I _{GSS} | V _{DS} =0V, V _{GS} =±12V | | | ±100 | nA |
| Zero Gate Voltage Drain Current | I _{DSS} | V _{DS} =-24V, V _{GS} =0V | | | -1 | μA |
| | | V _{DS} =-24V, V _{GS} =0V T _A =85°C | | | -30 | |
| On-State Drain Current | I _{D(on)} | V _{DS} ≤ -5V, V _{GS} =-4.5V | -6 | | | A |
| | | V _{DS} ≤ -5V, V _{GS} =-2.5V | -3 | | | |
| Drain-Source On-Resistance | R _{DS(on)} | V _{GS} =-10.0V, I _D =-5.0A | | 43 | 60 | mΩ |
| | | V _{GS} =-4.5V, I _D =-3.2A | | 49 | 75 | |
| | | V _{GS} =-2.5V, I _D =-2.0A | | 63 | 85 | |
| Forward Transconductance | g _{FS} | V _{DS} =-5V, I _D =-2.8A | | 6.5 | | S |
| Diode Forward Voltage | V _{SD} | I _S =-1.0A, V _{GS} =0V | | -0.7 | -1.3 | V |
| Dynamic | | | | | | |
| Total Gate Charge | Q _g | V _{DS} =-15V, V _{GS} =-10V I _D ≡-4.0A | | 10 | 18 | nC |
| Gate-Source Charge | Q _{gs} | | | 1.6 | | |
| Gate-Drain Charge | Q _{gd} | | | 3.0 | | |
| Input Capacitance | C _{iss} | V _{DS} =-15V, V _{GS} =0V f=1MHz | | 450 | | pF |
| Output Capacitance | C _{oss} | | | 95 | | |
| Reverse Transfer Capacitance | C _{rss} | | | 55 | | |
| Turn-On Time | t _{d(on)} | V _{DD} =-15V, R _L =15Ω I _D ≡-1.0A, V _{GEN} =-10V R _G =6Ω | | 8 | 18 | ns |
| | t _r | | | 8 | 18 | |
| Turn-Off Time | t _{d(off)} | | | 25 | 50 | |
| | t _f | | | 25 | 35 | |



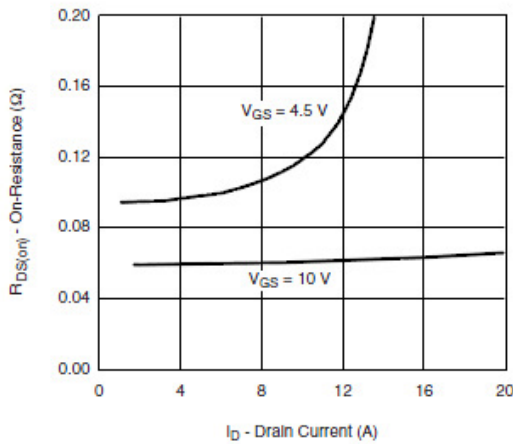
Typical Characteristics



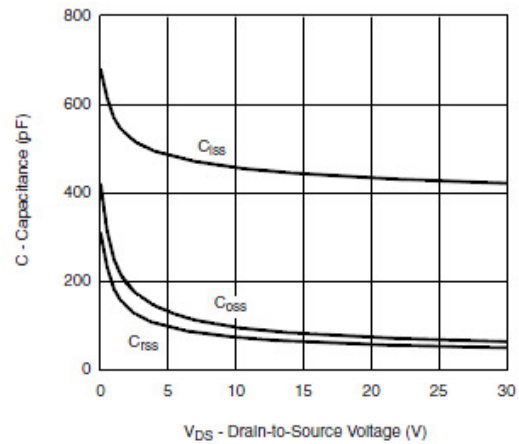
Output Characteristics



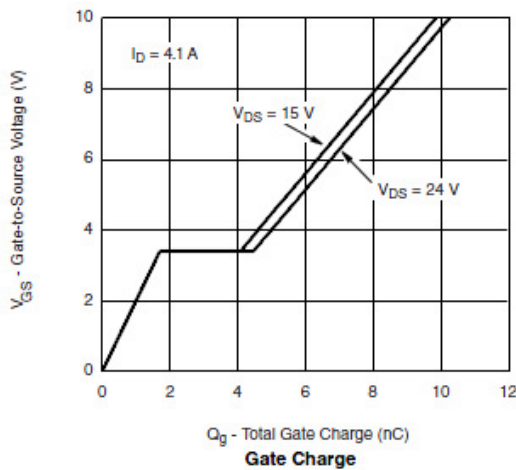
Transfer Characteristics



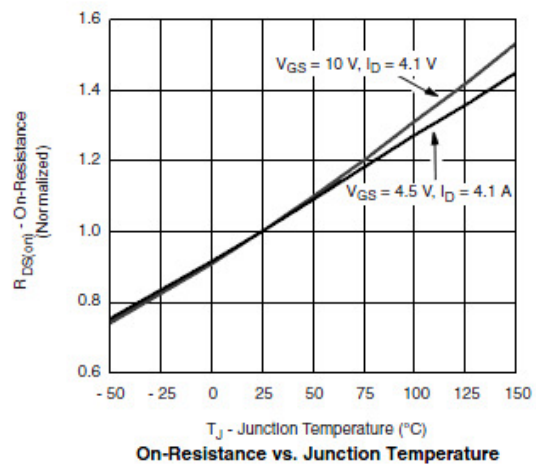
On-Resistance vs. Drain Current and Gate Voltage



Capacitance



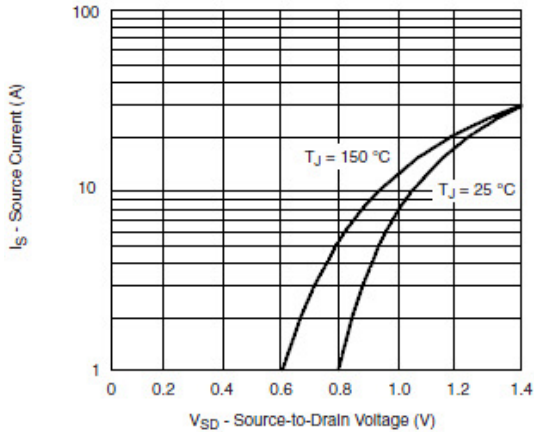
Gate Charge



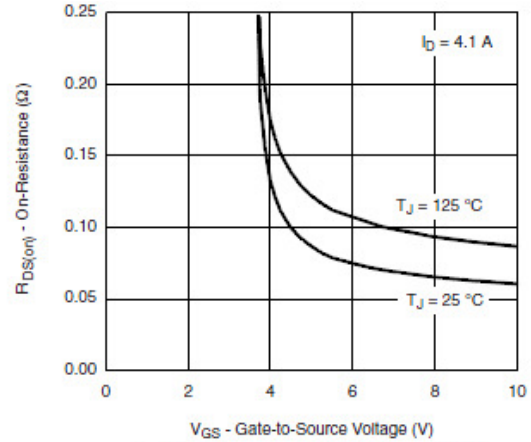
On-Resistance vs. Junction Temperature



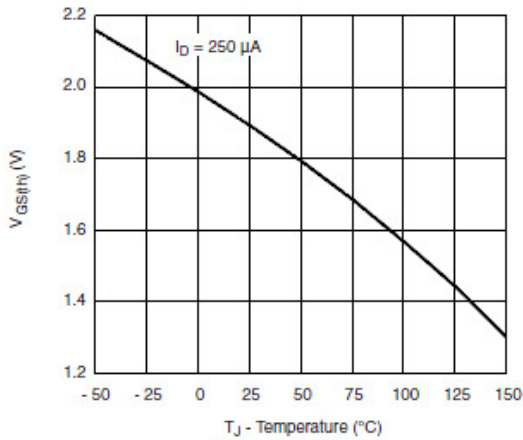
Typical Characteristics



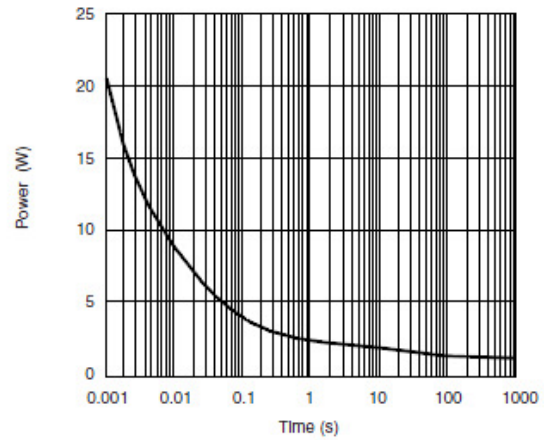
Source-Drain Diode Forward Voltage



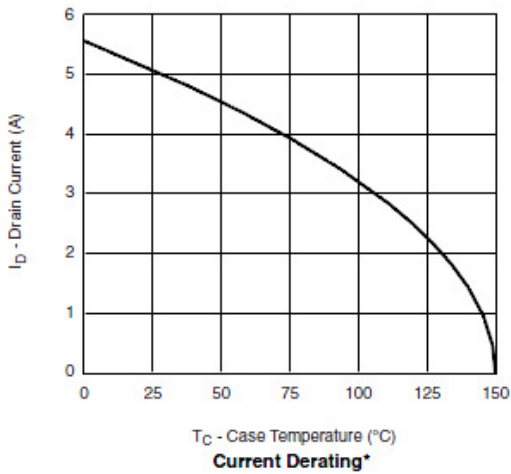
On-Resistance vs. Gate-to-Source Voltage



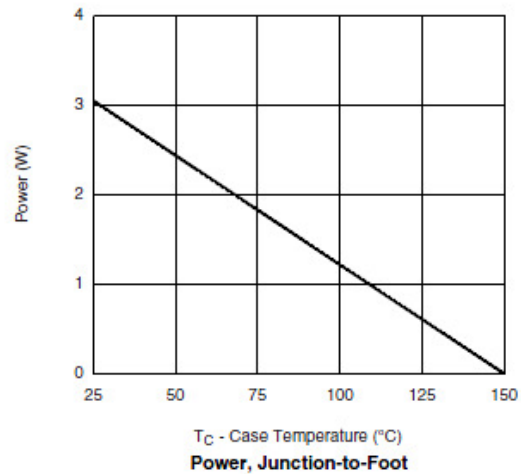
Threshold Voltage



Single Pulse Power



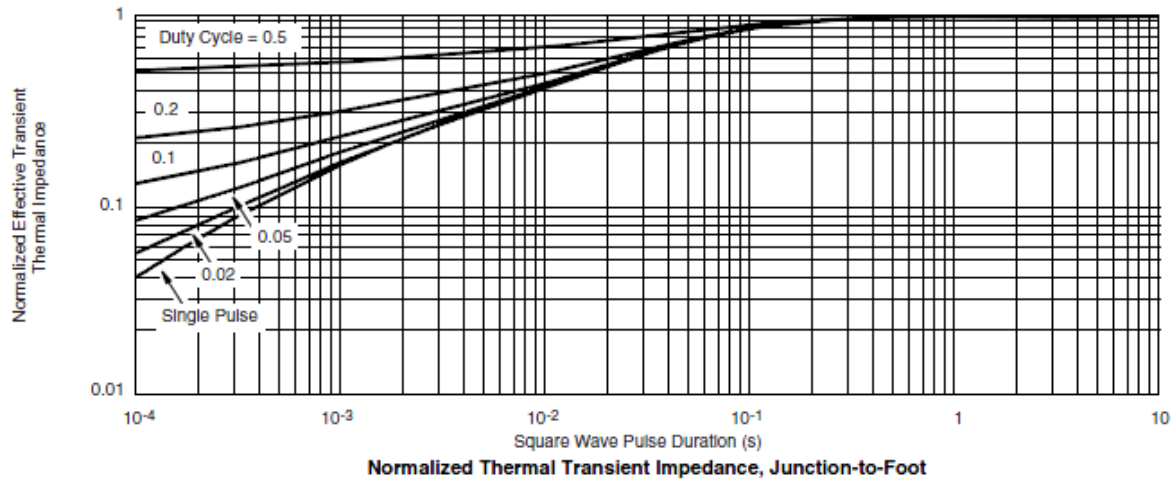
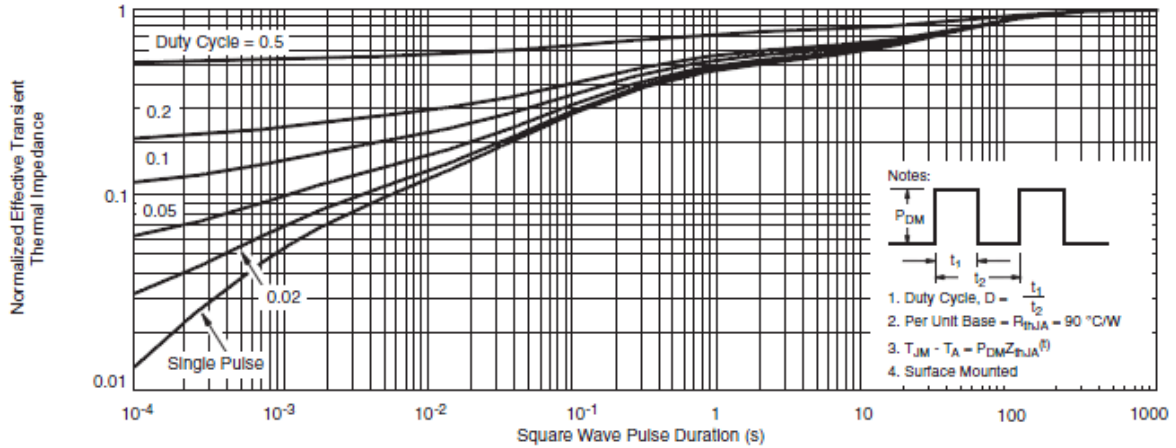
Current Derating*



Power, Junction-to-Foot



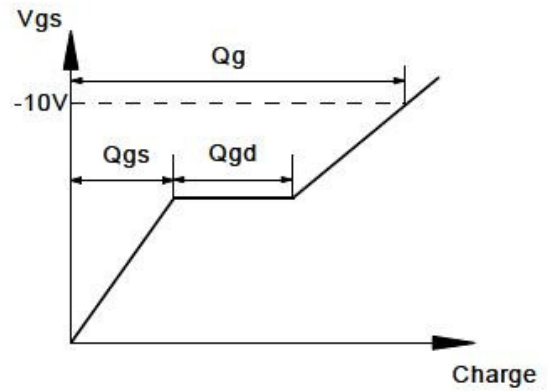
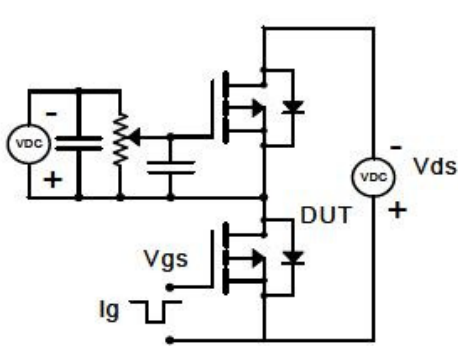
Typical Characteristics



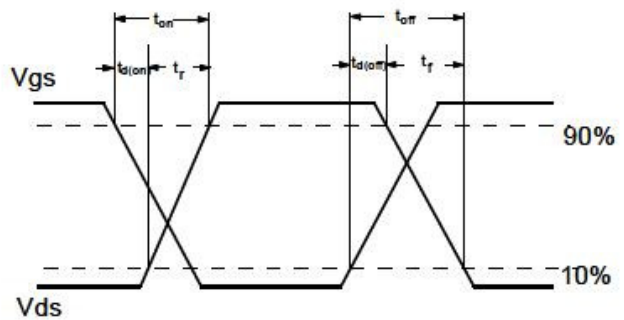
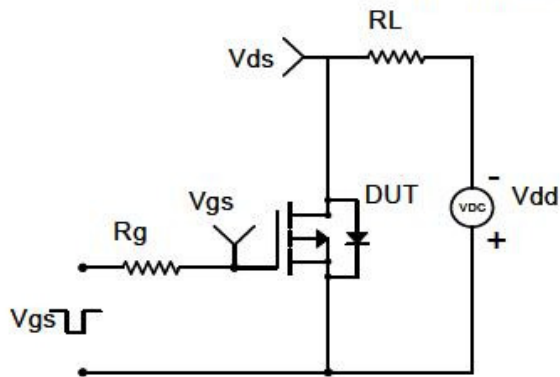


Typical Characteristics

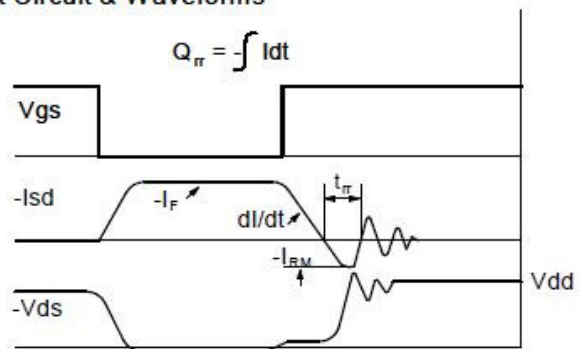
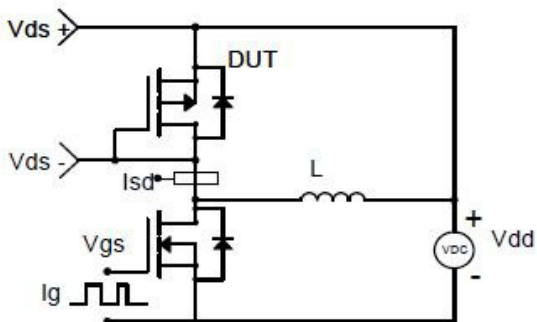
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

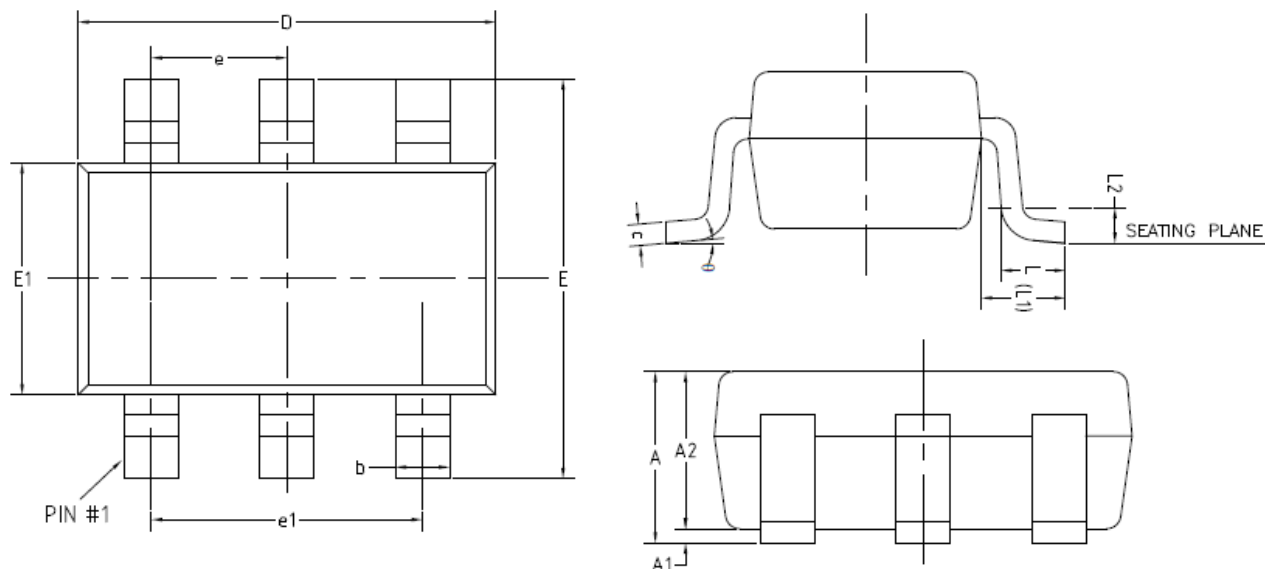


Diode Recovery Test Circuit & Waveforms





Package Information (TSOP-6)



COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

| SYMBOL | MIN | NOM | MAX |
|----------|-----------|------|------|
| A | 0.70 | — | 0.90 |
| A1 | 0 | — | 0.10 |
| A2 | 0.70 | 0.75 | 0.80 |
| b | 0.35 | — | 0.50 |
| c | 0.08 | — | 0.20 |
| D | 2.82 | 2.92 | 3.02 |
| E | 2.65 | 2.80 | 2.95 |
| E1 | 1.60 | 1.65 | 1.70 |
| e | 0.95(BSC) | | |
| e1 | 1.90(BSC) | | |
| L | 0.30 | 0.45 | 0.60 |
| L1 | 0.59REF | | |
| L2 | 0.25BSC | | |
| θ | 0° | — | 8° |

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