

# GSM4134W

## 30V N-Channel Enhancement Mode MOSFET

### Product Description

GSM4134W, 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.

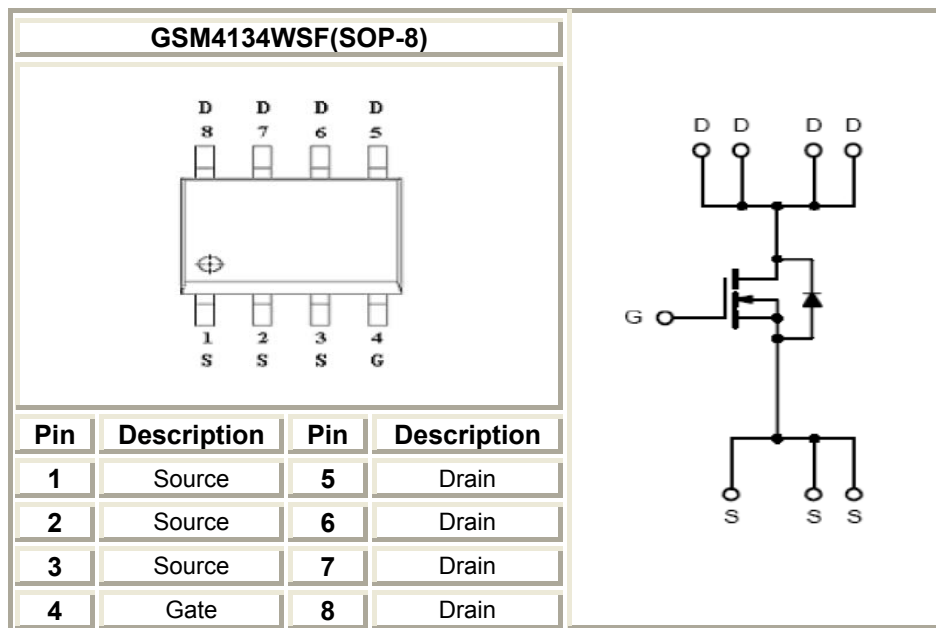
### Features

- 30V/12A,  $R_{DS(ON)}=16m\Omega@V_{GS}=10V$
- 30V/10A,  $R_{DS(ON)}=18m\Omega@V_{GS}=4.5V$
- Super high density cell design for extremely low  $R_{DS(ON)}$
- SOP-8P package design

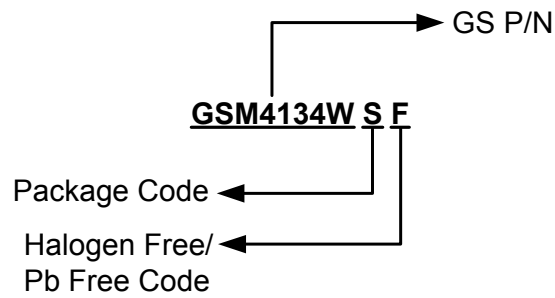
### Applications

- DC/DC Converter
- Load Switch
- Power Management in Notebook Computer

### Packages & Pin Assignments

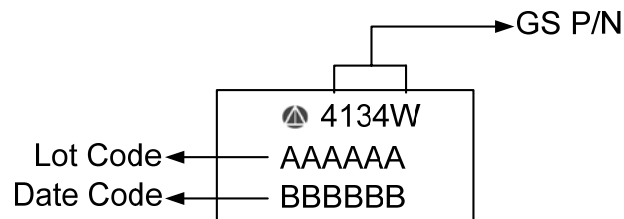


## Ordering Information



| Part Number | Package | Quantity Reel |
|-------------|---------|---------------|
| GSM4134WSF  | SOP-8P  | 3000 PCS      |

## Marking Information



## Absolute Maximum Ratings

(T<sub>A</sub>=25°C unless otherwise noted)

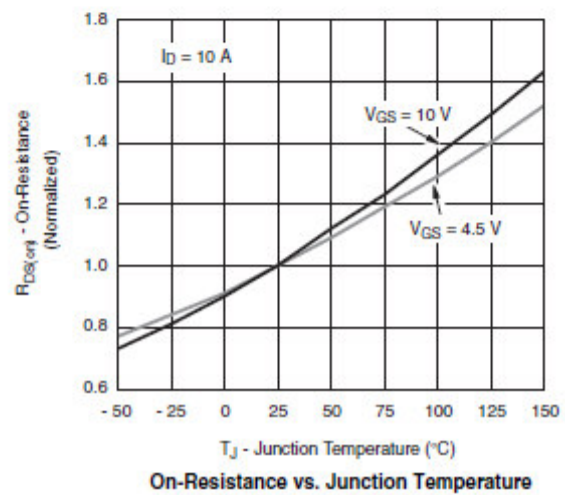
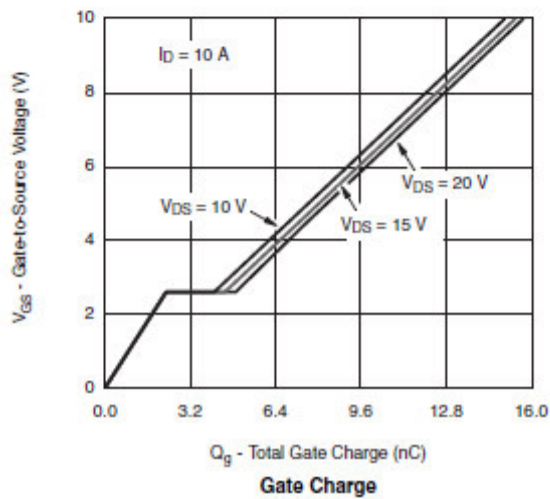
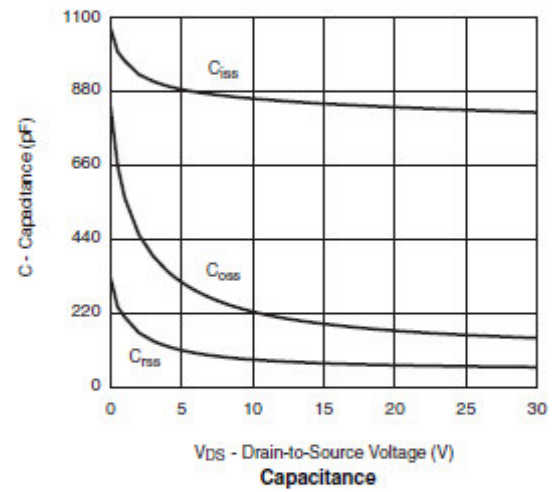
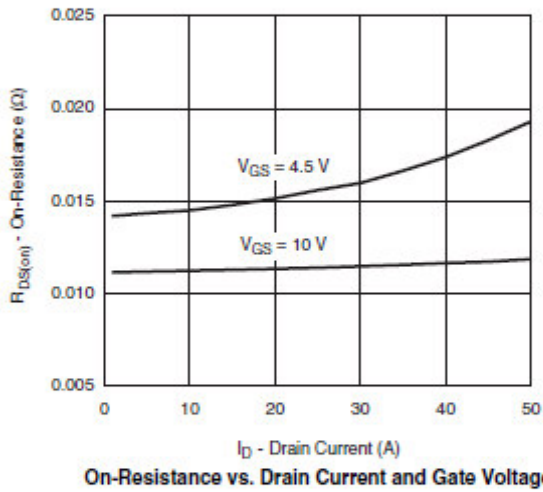
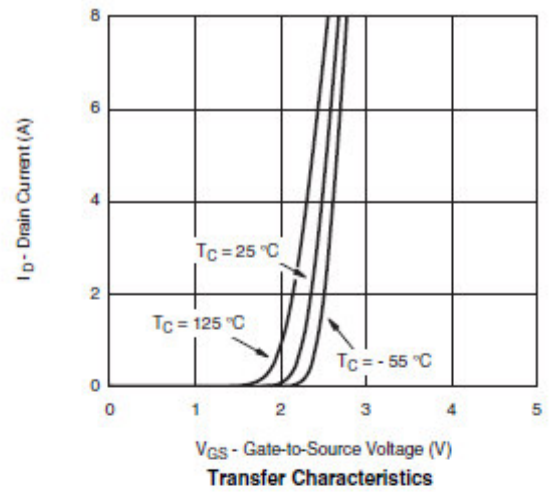
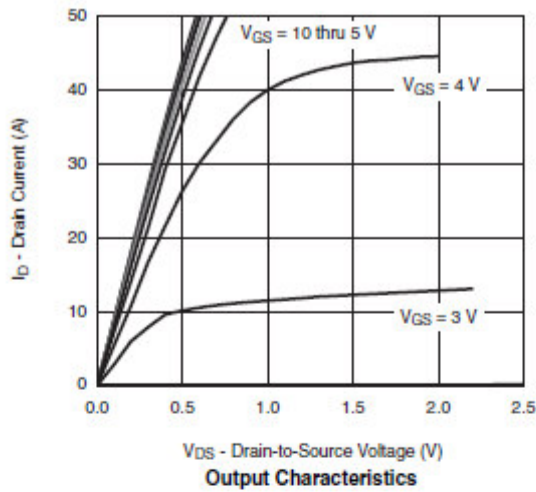
| Symbol           | Parameter                                       | Typical              | Unit  |   |
|------------------|---|----------------------|-------|---|
| V <sub>DSS</sub> | Drain-Source Voltage                            | 30                   | V     |   |
| V <sub>GSS</sub> | Gate-Source Voltage                             | ±20                  | V     |   |
| I <sub>D</sub>   | Continuous Drain Current(T <sub>J</sub> =150°C) | T <sub>A</sub> =25°C | 12    | A |
|                  |   | T <sub>A</sub> =70°C | 10    |   |
| I <sub>DM</sub>  | Pulsed Drain Current                            | 30                   | A     |   |
| I <sub>S</sub>   | Continuous Source Current(Diode Conduction)     | 2.0                  | A     |   |
| P <sub>D</sub>   | Power Dissipation                               | T <sub>A</sub> =25°C | 2.8   | W |
|                  |   | T <sub>A</sub> =70°C | 1.8   |   |
| T <sub>J</sub>   | Operating Junction Temperature                  | 150                  | °C    |   |
| T <sub>STG</sub> | Storage Temperature Range                       | -55/150              | °C    |   |
| R <sub>θJA</sub> | Thermal Resistance-Junction to Ambient          | 62.5                 | °C/ W |   |

## Electrical Characteristics

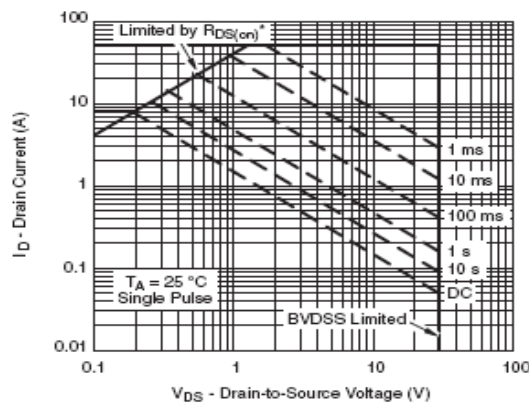
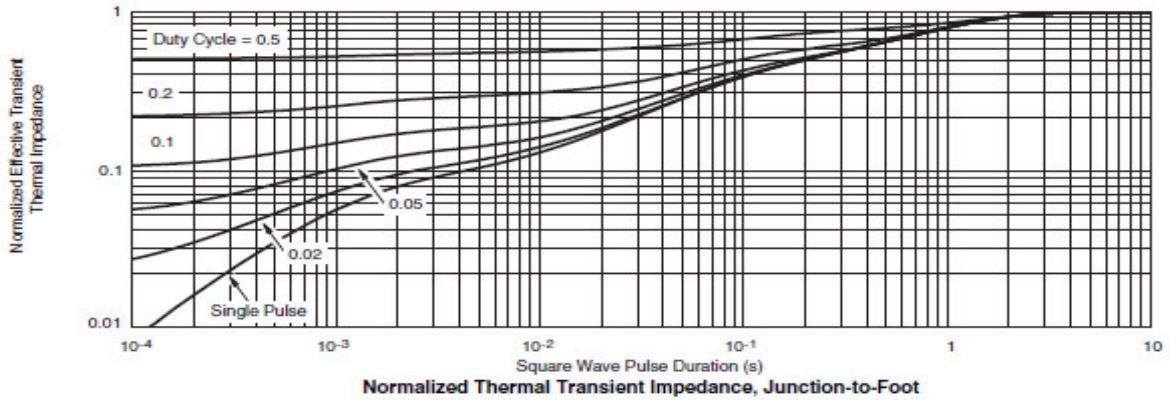
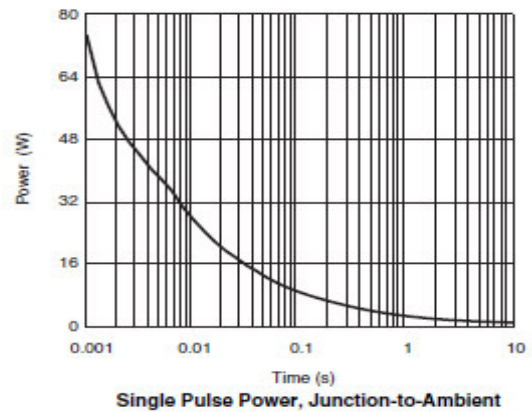
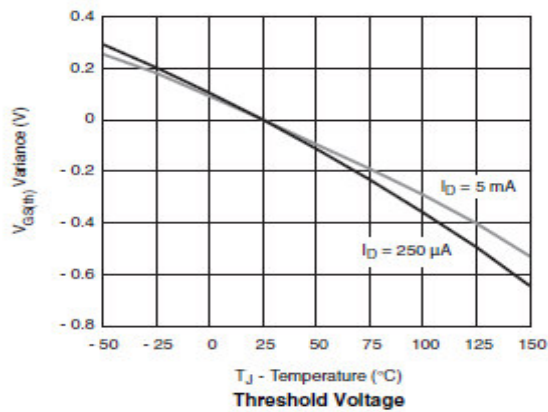
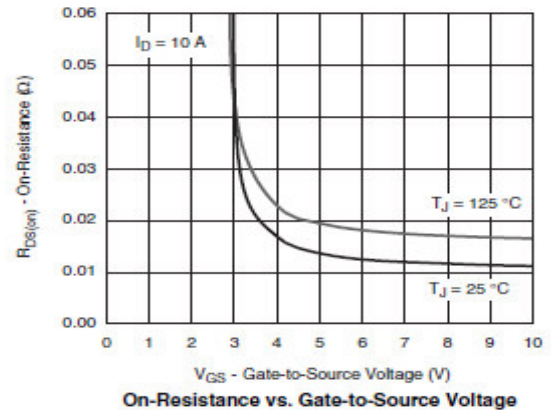
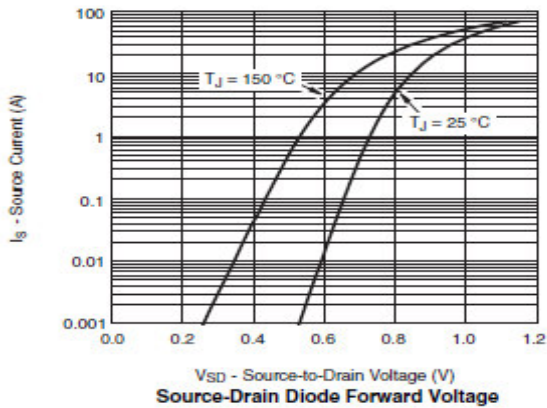
(T<sub>A</sub>=25°C unless otherwise noted)

| Symbol               | Parameter                       | Conditions   | Min | Typ | Max  | Unit |
|----------------------|---------------------------------|--|-----|-----|------|------|
| <b>Static</b>        |                                 |  |     |     |      |      |
| V <sub>(BR)DSS</sub> | Drain-Source Breakdown Voltage  | V <sub>GS</sub> =0V, I <sub>D</sub> =250μA   | 30  |     |      | V    |
| V <sub>GS(th)</sub>  | Gate Threshold Voltage          | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA   | 0.5 |     | 1.8  | V    |
| I <sub>GSS</sub>     | Gate Leakage Current            | V <sub>DS</sub> =0V, V <sub>GS</sub> =±20V   |     |     | ±100 | nA   |
| I <sub>DSS</sub>     | Zero Gate Voltage Drain Current | V <sub>DS</sub> =30V, V <sub>GS</sub> =0V  |     |     | 1    | μA   |
|                      |                                 | V <sub>DS</sub> =30V, V <sub>GS</sub> =0V, T <sub>J</sub> =85°C  |     |     | 10   |      |
| I <sub>D(on)</sub>   | On-State Drain Current          | V <sub>DS</sub> ≥5V, V <sub>GS</sub> =10V  | 15  |     |      | A    |
| R <sub>DS(on)</sub>  | Drain-Source On-Resistance      | V <sub>GS</sub> =10V, I <sub>D</sub> =12A  |     | 13  | 16   | mΩ   |
|                      |                                 | V <sub>GS</sub> =4.5V, I <sub>D</sub> =10A   |     | 14  | 18   |      |
| g <sub>FS</sub>      | Forward Transconductance        | V <sub>DS</sub> =15V, I <sub>D</sub> =10A  |     | 24  |      | S    |
| V <sub>SD</sub>      | Diode Forward Voltage           | I <sub>S</sub> =3.0A, V <sub>GS</sub> =0V  |     | 0.8 | 1.3  | V    |
| <b>Dynamic</b>       |                                 |  |     |     |      |      |
| C <sub>iss</sub>     | Input Capacitance               | V <sub>DS</sub> =15V,<br>V <sub>GS</sub> =0V, f=1MHz   |     | 800 |      | pF   |
| C <sub>oss</sub>     | Output Capacitance              |  |     | 180 |      |      |
| C <sub>rss</sub>     | Reverse Transfer Capacitance    |  |     | 70  |      |      |
| Q <sub>g</sub>       | Total Gate Charge               | V <sub>DS</sub> =15V,<br>V <sub>GS</sub> =4.5V, I <sub>D</sub> =10A  |     | 8   | 12   | nC   |
| Q <sub>gs</sub>      | Gate-Source Charge              |  |     | 2.0 |      |      |
| Q <sub>gd</sub>      | Gate-Drain Charge               |  |     | 2.3 |      |      |
| t <sub>d(on)</sub>   | Turn-On Time                    | V <sub>DD</sub> =15V,<br>R <sub>L</sub> =1.5Ω, I <sub>D</sub> =10A,<br>V <sub>GEN</sub> =10V, R <sub>G</sub> =1Ω |     | 8   | 15   | ns   |
| T <sub>r</sub>       |                                 |  |     | 8   | 15   |      |
| t <sub>d(off)</sub>  | Turn-Off Time                   |  |     | 16  | 28   |      |
| T <sub>f</sub>       |                                 |  |     | 8   | 16   |      |

## Typical Performance Characteristics



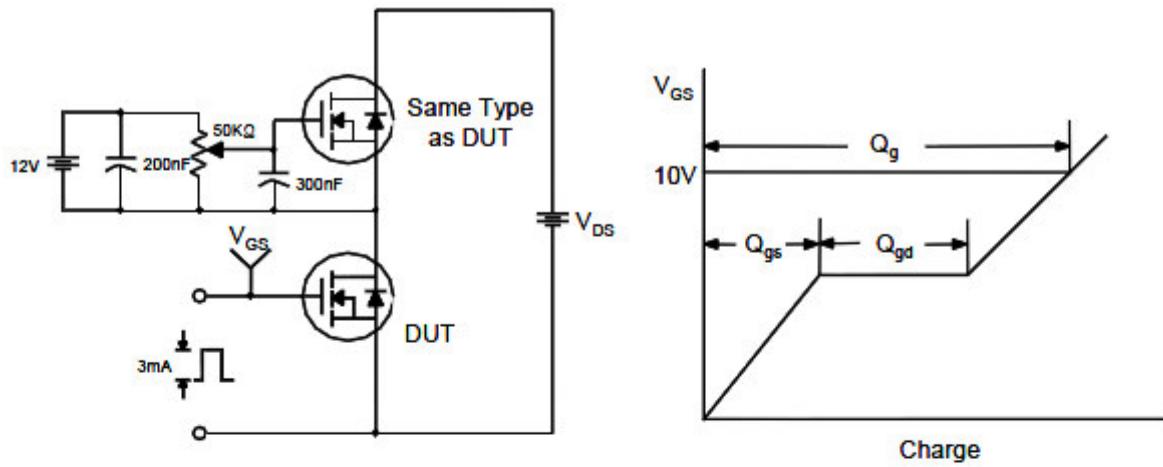
## Typical Performance Characteristics (continue)



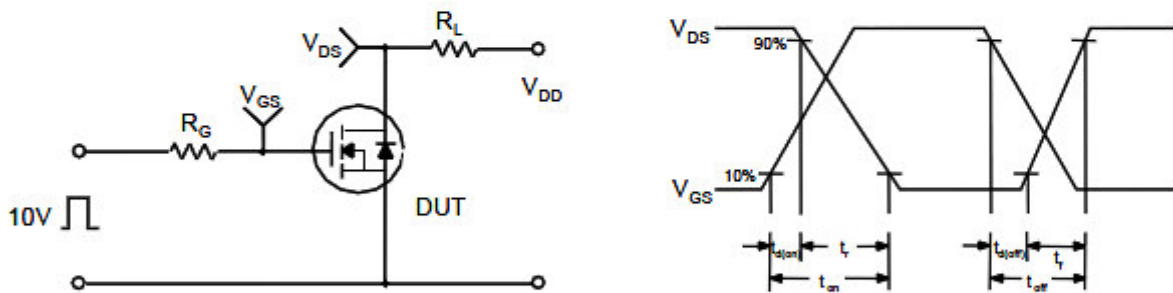
\*  $V_{GS} >$  minimum  $V_{GS}$  at which  $R_{DS(on)}$  is specified  
**Safe Operating Area, Junction-to-Ambient**

## Typical Characteristics

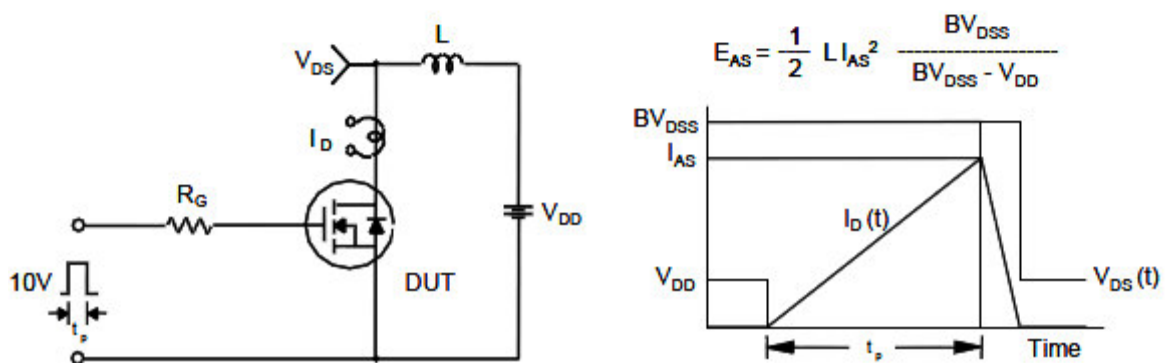
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

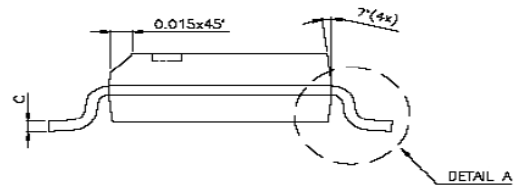
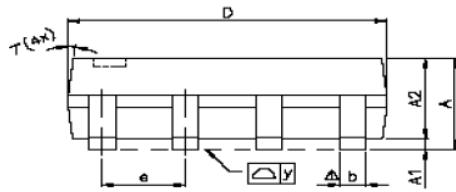
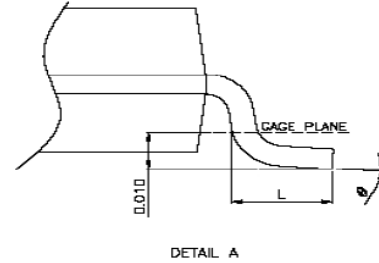
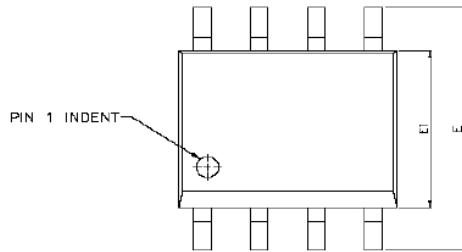


Unclamped Inductive Switching Test Circuit & Waveforms



Package Dimension

# SOP-8P PLASTIC PACKAGE



## Dimensions





| SYMBOL     | Millimeters |      |       | 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  |
| $\Delta y$ | -           | -    | 0.076 | -      | -     | 0.003  |
| $\theta$   | 0°          | -    | 8°    | 0°     | -     | 8°     |







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