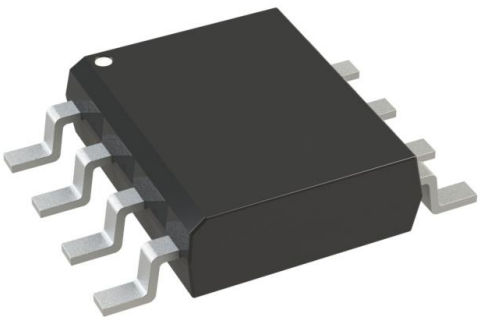
# DMN6066SSD-13 Datasheet





| | |
|---|---|
| DiGi Electronics Part Number | DMN6066SSD-13-DG |
| Manufacturer | Diodes Incorporated |
| Manufacturer Product Number | DMN6066SSD-13 |
| Description | MOSFET 2N-CH 60V 3.3A 8SO |
| Detailed Description | Mosfet Array 60V 3.3A 1.8W Surface Mount 8-SO |



Tel: +00 852-30501935

RFQ Email: Info@DiGi-Electronics.com

## Purchase and inquiry

| Manufacturer Product Number: | Manufacturer: |
| --- | --- |
| DMN6066SSD-13 | Diodes Incorporated |
| Series: | Product Status: |
| - | Active |
| Technology: | Configuration: |
| MOSFET (Metal Oxide) | 2 N-Channel (Dual) |
| FET Feature: | Drain to Source Voltage (Vdss): |
| Logic Level Gate | 60V |
| Current - Continuous Drain (Id) @ 25°C: | Rds On (Max) @ Id, Vgs: |
| 3.3A | 66mOhm @ 4.5A, 10V |
| Vgs(th) (Max) @ Id: | Gate Charge (Qg) (Max) @ Vgs: |
| 3V @ 250µA | 10.3nC @ 10V |
| Input Capacitance (Ciss) (Max) @ Vds: | Power - Max: |
| 502pF @ 30V | 1.8W |
| Operating Temperature: | Mounting Type: |
| -55°C ~ 150°C (TJ) | Surface Mount |
| Package / Case: | Supplier Device Package: |
| 8-SOIC (0.154", 3.90mm Width) | 8-SO |
| Base Product Number: | |
| DMN6066 | |

## Environmental & Export classification

| RoHS Status: | Moisture Sensitivity Level (MSL): |
| --- | --- |
| ROHS3 Compliant | 1 (Unlimited) |
| REACH Status: | ECCN: |
| REACH Unaffected | EAR99 |
| HTSUS: | |
| 8541.29.0095 | |

Lead-free Green

**DMN6066SSD**

## 60V DUAL N-CHANNEL ENHANCEMENT MODE MOSFET

## Product Summary

| $BV_{DSS}$ | $R_{DS(ON)}$ | $I_D$ $T_A$ = +25°C |
|---|---|---|
| 60V | 66mΩ @ $V_{GS}$ = 10V | 4.4A |
| | 97mΩ @ $V_{GS}$ = 4.5V | 3.6A |

## Features and Benefits

- Low On-Resistance
- Fast Switching Speed
- 100% Unclamped Inductive Switch (UIS) Test in Production
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **For automotive applications requiring specific change control (i.e.: parts qualified to AEC-Q100/101/104/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please refer to the related automotive grade (Q-suffix) part. A listing can be found at https://www.diodes.com/products/automotive/automotive-products/.**
- **This part is qualified to JEDEC standards (as references in AEC-Q) for High Reliability. https://www.diodes.com/quality/product-definitions/**

## Description and Applications

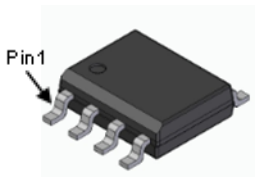
This MOSFET is designed to minimize the on-state resistance yet maintain superior switching performance, making it ideal for high-efficiency power-management applications.

- Motor controls
- Backlighting
- DC-DC converters
- Power-management functions

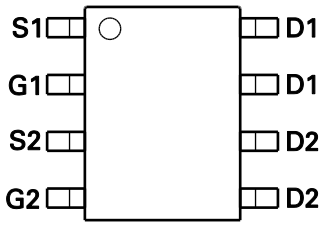
## Mechanical Data

- Package: SO-8
- Package Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals Connections: See Diagram Below
- Terminals: Finish - Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.074 grams (Approximate)

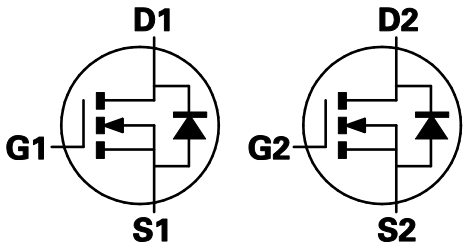
SO-8




Top View




Top View



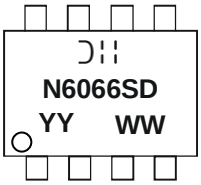

Equivalent Circuit

## Ordering Information

| Orderable Part Number | Package | Packing | |
|---|---|---|---|
| | | Qty. | Carrier |
| DMN6066SSD-13 | SO-8 | 2,500 | Tape & Reel |

Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
2. See https://www.diodes.com/quality/lead-free/ for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
4. For packaging details, go to our website at https://www.diodes.com/design/support/packaging/diodes-packaging/.

## Marking Information




= Manufacturer's Marking
N6066SD = Product Type Marking Code
YYWW = Date Code Marking
YY or YY= Year (ex: 24 = 2024)
WW = Week (01 to 53)

## Maximum Ratings (@$T_A$ = +25°C, unless otherwise specified.)

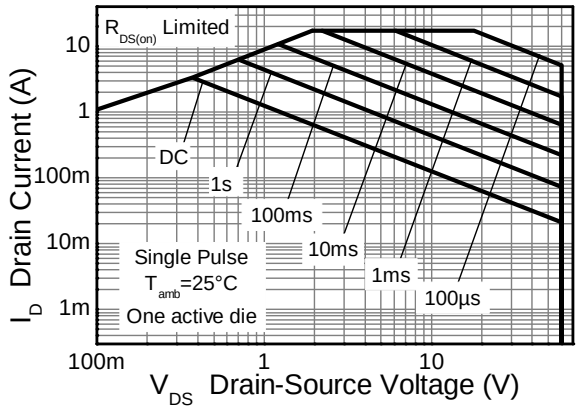
| Characteristic | | | Symbol | Value | Unit |
|---|---|---|---|---|---|
| Drain-Source Voltage | | | $V_{DSS}$ | 60 | V |
| Gate-Source Voltage | | (Note 5) | $V_{GS}$ | ±20 | V |
| Single Pulsed Avalanche Energy | | (Note 12) | $E_{AS}$ | 37.5 | mJ |
| Single Pulsed Avalanche Current | | (Note 12) | $I_{AS}$ | 5.0 | A |
| Continuous Drain Current | $V_{GS}$ = 10V | (Note 8) | $I_D$ | 4.4 | A |
| | | $T_A$ = +70°C (Note 8) | | 3.5 | |
| | | (Note 6) | | 3.3 | |
| Pulsed Drain Current | $V_{GS}$ = 10V | (Note 8) | $I_{DM}$ | 17.0 | A |
| Continuous Source Current (Body Diode) | | (Note 7) | $I_S$ | 3.2 | A |
| Pulsed Source Current (Body Diode) | | (Note 7) | $I_{SM}$ | 17.0 | A |

## Thermal Characteristics (@$T_A$ = +25°C, unless otherwise specified.)

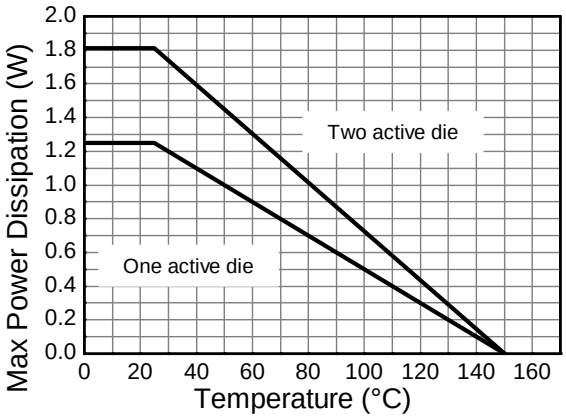
| Characteristic | | Symbol | Value | Unit |
|---|---|---|---|---|
| Power Dissipation<br>Linear Derating Factor | (Notes 6 & 9) | $P_D$ | 1.25<br>10 | W<br>mW/°C |
| | (Notes 6 & 10) | | 1.8<br>14.3 | |
| | (Notes 7 & 9) | | 2.14<br>17.2 | |
| Thermal Resistance, Junction to Ambient | (Notes 6 & 9) | $R_{\theta JA}$ | 100 | °C/W |
| | (Notes 6 & 10) | | 70 | |
| | (Notes 7 & 9) | | 58 | |
| Thermal Resistance, Junction to Lead | (Notes 9 & 11) | $R_{\theta JL}$ | 55 | |
| Operating and Storage Temperature Range | | $T_J$, $T_{STG}$ | -55 to +150 | °C |

Notes:
5. AEC-Q101 $V_{GS}$ maximum is ±16V.
6. For a device surface mounted on 25mm x 25mm x 1.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions; the device is measured when operating in a steady-state condition.
7. Same as Note 6, except the device is measured at t ≤ 10 sec.
8. Same as Note 6, except the device is pulsed with D = 0.02 and pulse width 300µs. The pulse current is limited by the maximum junction temperature.
9. For a dual device with one active die.
10. For a device with two active dies running at equal power.
11. Thermal resistance from junction to solder-point (at the end of the drain lead).
12. UIS in production with L = 3.0mH, $I_{AS}$ = 5.0A, $R_G$ = 25Ω, $V_{DD}$ = 50V, starting $T_J$ = +25°C.

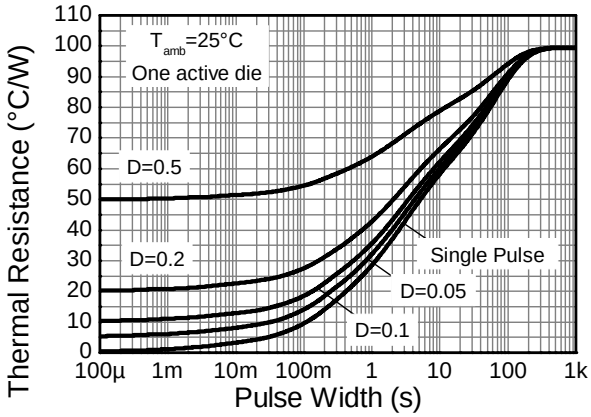
## Thermal Characteristics



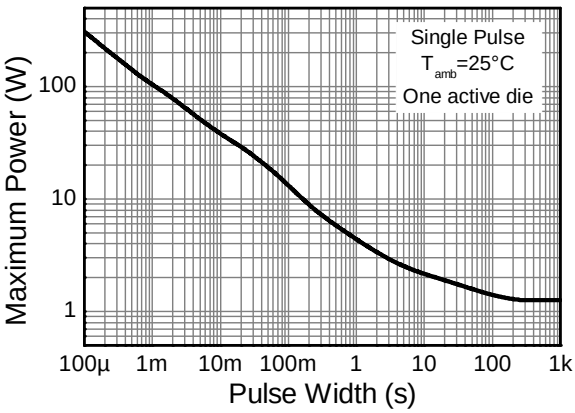

**Safe Operating Area**




**Derating Curve**




**Transient Thermal Impedance**



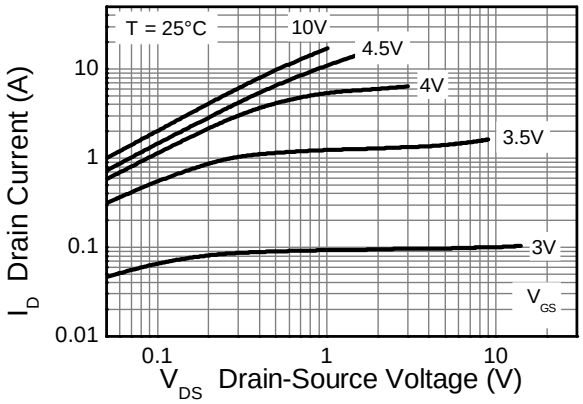

**Pulse Power Dissipation**

## Electrical Characteristics (@$T_A$ = +25°C, unless otherwise specified.)

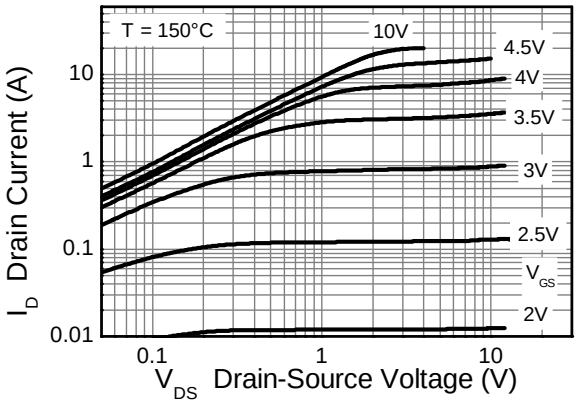
| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
|---|---|---|---|---|---|---|
| **OFF CHARACTERISTICS** | | | | | | |
| Drain-Source Breakdown Voltage | $BV_{DSS}$ | 60 | — | — | V | $I_D$ = 250µA, $V_{GS}$ = 0V |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | — | — | 0.5 | µA | $V_{DS}$ = 60V, $V_{GS}$ = 0V |
| Gate-Source Leakage | $I_{GSS}$ | — | — | ±100 | nA | $V_{GS}$ = ±20V, $V_{DS}$ = 0V |
| **ON CHARACTERISTICS** | | | | | | |
| Gate Threshold Voltage | $V_{GS(th)}$ | 1.0 | — | 3.0 | V | $I_D$ = 250µA, $V_{DS}$ = $V_{GS}$ |
| Static Drain-Source On-Resistance (Note 13) | $R_{DS(ON)}$ | — | 48 | 66 | mΩ | $V_{GS}$ = 10V, $I_D$ = 4.5A |
| | | | 68 | 97 | | $V_{GS}$ = 4.5V, $I_D$ = 3.5A |
| Forward Transconductance (Notes 13 & 14) | $g_{fs}$ | — | 19.2 | — | S | $V_{DS}$ = 15V, $I_D$ = 6A |
| Diode Forward Voltage (Note 13) | $V_{SD}$ | — | 0.89 | 1.15 | V | $I_S$ = 4.5A, $V_{GS}$ = 0V |
| Reverse-Recovery Time (Note 14) | $t_{rr}$ | — | 22.2 | — | ns | $I_S$ = 1.9A, di/dt = 100A/µs |
| Reverse-Recovery Charge (Note 14) | $Q_{rr}$ | — | 16.9 | — | nC | |
| **DYNAMIC CHARACTERISTICS (Note 14)** | | | | | | |
| Input Capacitance | $C_{iss}$ | — | 502 | — | pF | $V_{DS}$ = 30V, $V_{GS}$ = 0V<br>f = 1MHz |
| Output Capacitance | $C_{oss}$ | — | 45.7 | — | pF | |
| Reverse Transfer Capacitance | $C_{rss}$ | — | 27.1 | — | pF | |
| Total Gate Charge (Note 15) | $Q_g$ | — | 5.4 | — | nC | $V_{GS}$ = 4.5V |
| Total Gate Charge (Note 15) | $Q_g$ | — | 10.3 | — | nC | $V_{GS}$ = 10V<br>$V_{DS}$ = 30V<br>$I_D$ = 4.5A |
| Gate-Source Charge (Note 15) | $Q_{gs}$ | — | 1.7 | — | nC | |
| Gate-Drain Charge (Note 15) | $Q_{gd}$ | — | 3.2 | — | nC | |
| Turn-On Delay Time (Note 15) | $t_{D(on)}$ | — | 2.7 | — | ns | $V_{DD}$ = 30V, $V_{GS}$ = 10V<br>$I_D$ = 1A, $R_G \cong$ 6.0Ω |
| Turn-On Rise Time (Note 15) | $t_r$ | — | 2.4 | — | ns | |
| Turn-Off Delay Time (Note 15) | $t_{D(off)}$ | — | 14.7 | — | ns | |
| Turn-Off Fall Time (Note 15) | $t_f$ | — | 5.4 | — | ns | |

Notes: 13. Measured under pulsed conditions. Pulse width ≤ 300µs; duty cycle ≤ 2%.
14. For design aid only, not subject to production testing.
15. Switching characteristics are independent of operating junction temperatures.

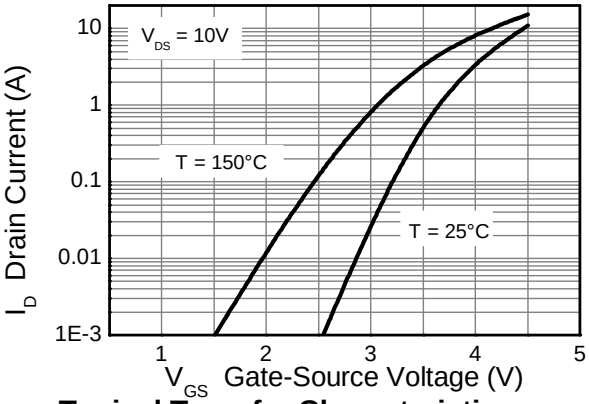
## Typical Characteristics



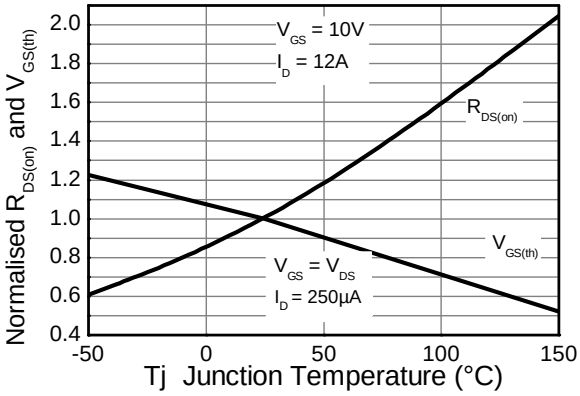

**Output Characteristics**



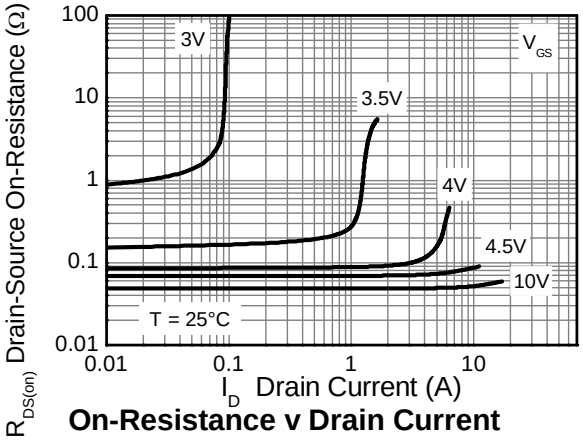

**Output Characteristics**



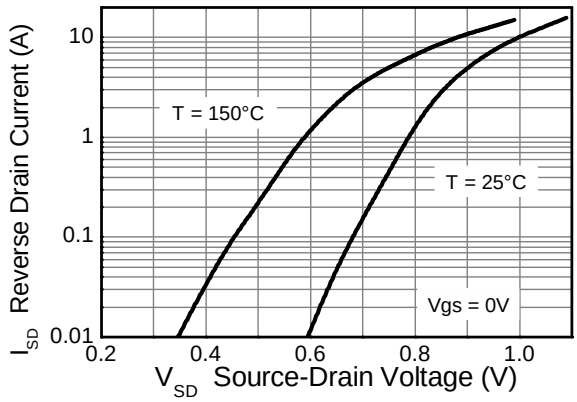

**Typical Transfer Characteristics**




**Normalised Curves v Temperature**

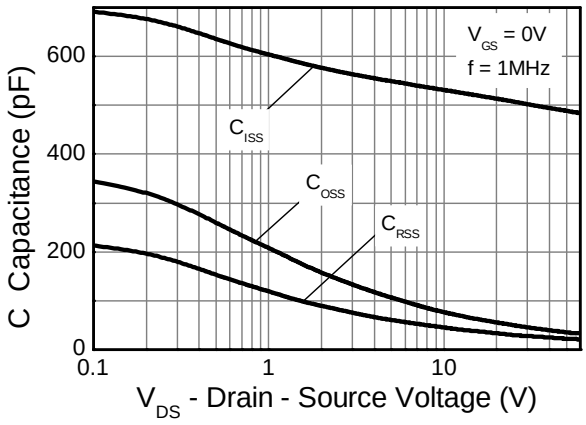



**On-Resistance v Drain Current**

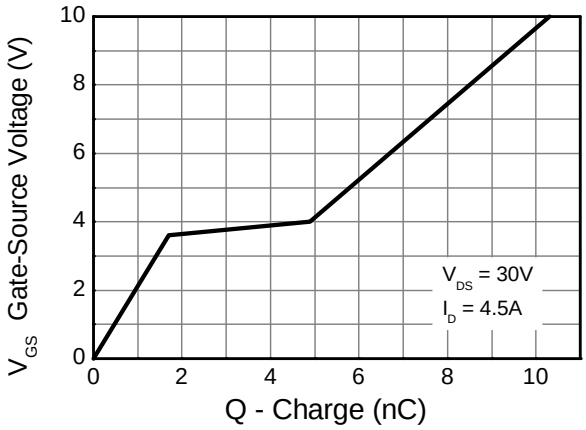



**Source-Drain Diode Forward Voltage**

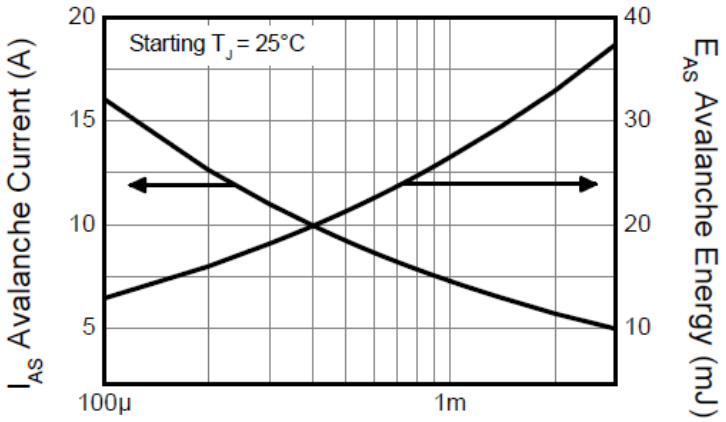
## Typical Characteristics (continued)




**Capacitance v Drain-Source Voltage**

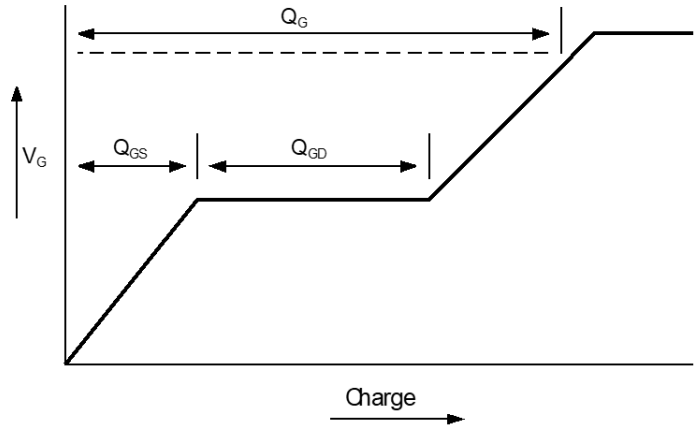



**Gate-Source Voltage v Gate Charge**

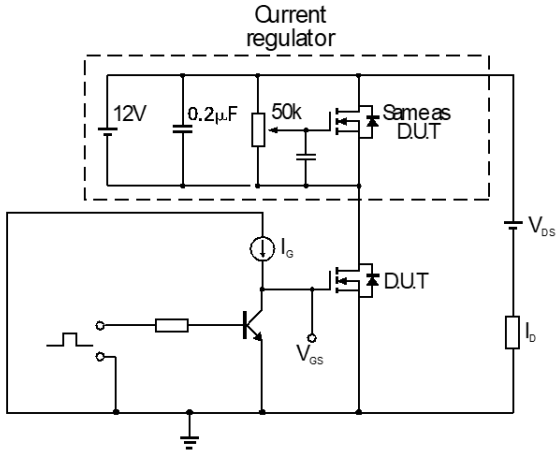



**Single-Pulsed Avalanche Rating**

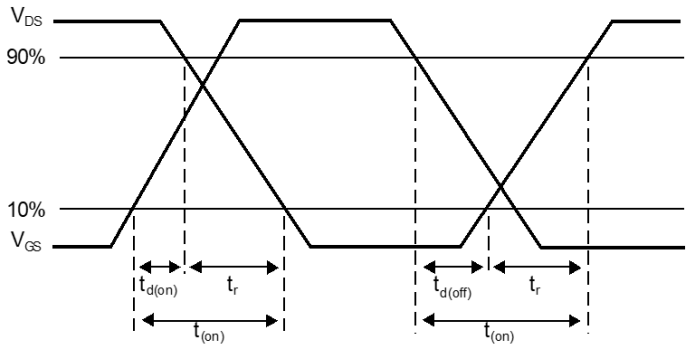
## Test Circuits



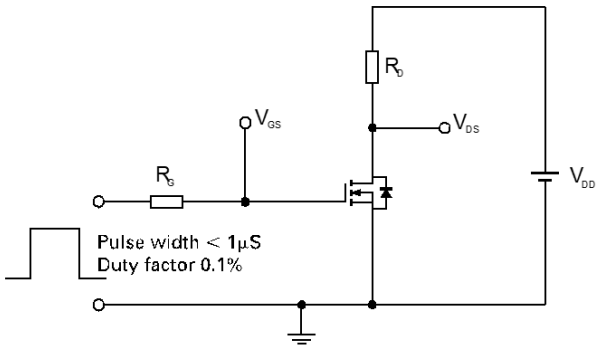

Basic gate charge waveform




Gate charge test circuit




Switching time waveforms

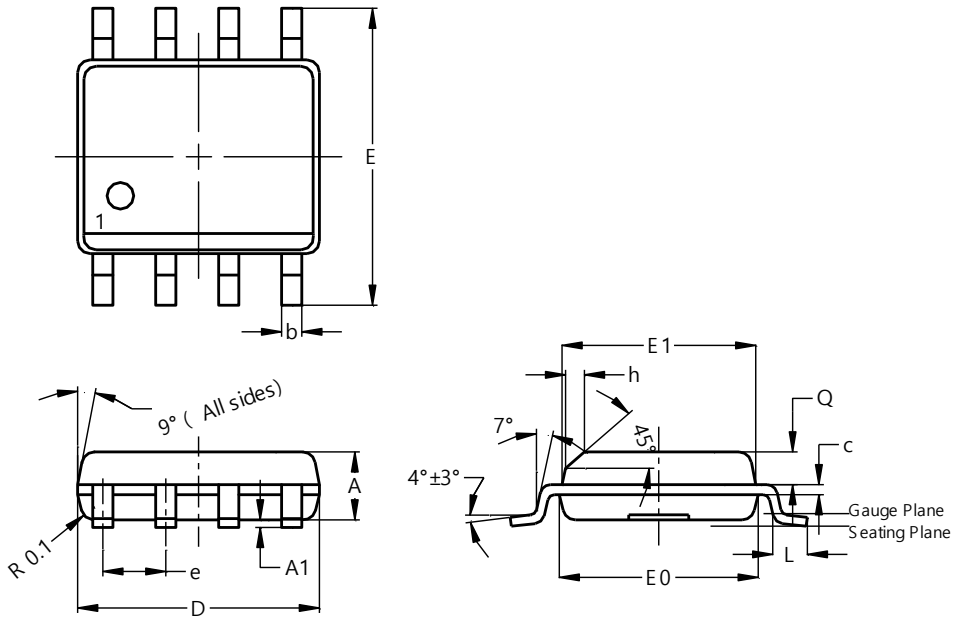



Switching time test circuit

## Package Outline Dimensions

Please see http://www.diodes.com/package-outlines.html for the latest version.

**SO-8**

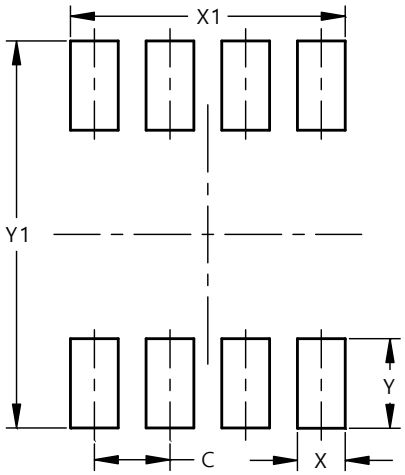



| SO-8 | | | |
|---|---|---|---|
| **Dim** | **Min** | **Max** | **Typ** |
| **A** | 1.40 | 1.50 | 1.45 |
| **A1** | 0.10 | 0.20 | 0.15 |
| **b** | 0.30 | 0.50 | 0.40 |
| **c** | 0.15 | 0.25 | 0.20 |
| **D** | 4.85 | 4.95 | 4.90 |
| **E** | 5.90 | 6.10 | 6.00 |
| **E1** | 3.80 | 3.90 | 3.85 |
| **E0** | 3.85 | 3.95 | 3.90 |
| **e** | -- | -- | 1.27 |
| **h** | -- | -- | 0.35 |
| **L** | 0.62 | 0.82 | 0.72 |
| **Q** | 0.60 | 0.70 | 0.65 |
| **All Dimensions in mm** | | | |

## Suggested Pad Layout

Please see http://www.diodes.com/package-outlines.html for the latest version.

**SO-8**




| Dimensions | Value (in mm) |
|---|---|
| **C** | 1.27 |
| **X** | 0.802 |
| **X1** | 4.612 |
| **Y** | 1.505 |
| **Y1** | 6.50 |

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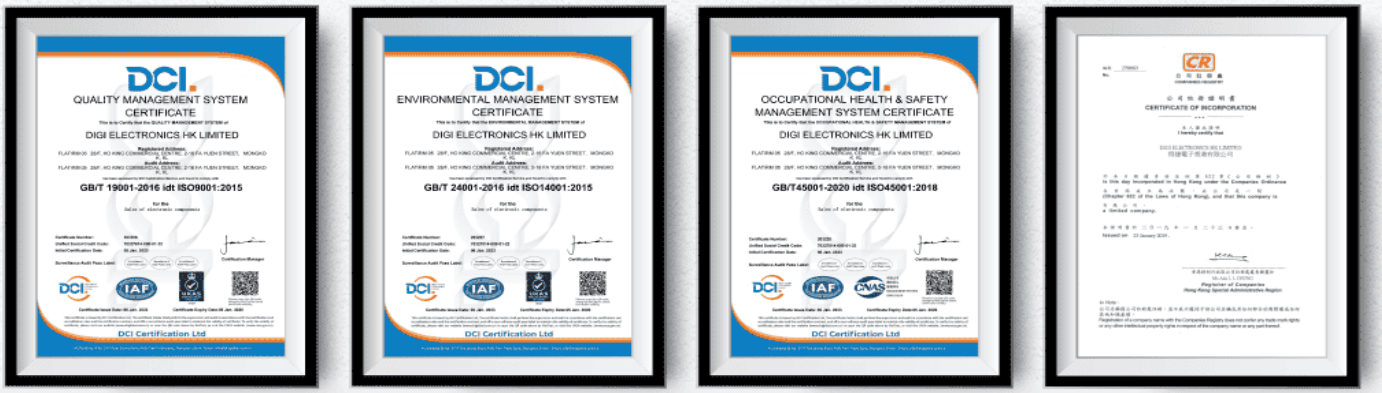



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