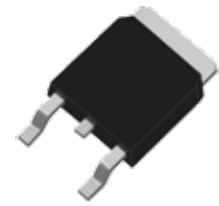


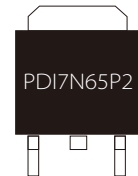
FEATURES

- | Low Gate Charge
- | Low ON Resistance
- | Improved dv/dt Capability
- | 100% Avalanche Tested


TO-252

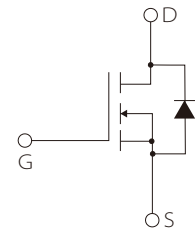
APPLICATION

- | Switching Mode Power Supplies (SMPS)
- | PWM Motor Controls
- | AC to DC Converters
- | LED Lighting
- | Adapter


Marking

APPROVALS

| | |
|-------------|------------------------------------|
| RoHS | Compliance with 2011/65/EU |
| HF | Compliance with IEC61249-2-21:2003 |


Schematic Symbol

ABSOLUTE MAXIMUM RATINGS (T_A=25°C)

| Parameter | Symbol | Value | Unit |
|--|-----------------------------------|-----------------------|--------------------|
| Drain-Source Voltage | V _{DSS} | 650 | V |
| Continuous Drain Current | I _D | T _C =25°C | 7 ⁽¹⁾ |
| | | T _C =100°C | 4.4 ⁽¹⁾ |
| Drain current pulsed ⁽²⁾ | I _{DM} | 28 ⁽¹⁾ | A |
| Gate-Source Voltage | V _{GS} | ±30 | V |
| Single pulsed Avalanche Energy ⁽³⁾ | E _{AS} | 343 | mJ |
| Peak diode Recovery dv/dt ⁽⁴⁾ | dv/dt | 5 | V/ns |
| Total power dissipation (@T _C =25°C) | P _D | 265 | W |
| Derating Factor above 25°C | P _D | 2.1 | W/°C |
| Operating Junction Temperature & Storage Temperature | T _{STG} , T _J | -55 to +150 | °C |
| Maximum lead temperature for soldering purpose | T _L | 260 | °C |
| Thermal resistance, Junction to case (Maximum) | R _{thjc} | 0.47 | °C/W |
| Thermal resistance, Junction to ambient (Maximum) | R _{thja} | 110 | °C/W |

Notes

1. Drain current is limited by maximum junction temperature.
2. Repetitive rating : pulse width limited by junction temperature.
3. L = 12mH, I_{AS} = 3A, V_{DD} = 50V, R_G=25Ω, Starting at T_J = 25°C
4. I_{SD} ≤ I_{DR}, di/dt = 100A/us, V_{DD} ≤ BV_{DSS}, Starting at T_J = 25°C

ELECTRICAL CHARACTERISTICS (T_A = 25°C)

| Parameter | Symbol | Test Conditions | Min. | Typ. | Max. | Unit |
|---|--------------------------------------|--|------|------|------|------|
| Off Characteristics | | | | | | |
| Drain-source Breakdown Voltage | V _{(BR)DSS} | V _{GS} =0V, I _D =250μA | 650 | | | V |
| Breakdown voltage temperature coefficient | ΔBV _{DSS} / ΔT _J | I _D =250μA, referenced to 25°C | | 0.65 | | V/°C |
| Zero Gate Voltage Drain current | I _{DSS} | V _{DS} =650V, V _{GS} =0V | | | 1 | μA |
| | | V _{DS} =520V, T _C =125°C | | | 50 | μA |
| Gate Leakage Current | I _{GSS} | V _{GS} =30V, V _{DS} =0V | | | 100 | nA |
| | | V _{GS} =-30V, V _{DS} =0V | | | -100 | nA |
| Off Characteristics | | | | | | |
| Gate Threshold Voltage | V _{GS(th)} | V _{DS} =V _{GS} , I _D =250μA | 2.5 | 3.5 | 4.5 | V |
| Drain-Source On-Resistance (note2) | R _{DS(on)} | V _{GS} =10V, I _D =3.5A | | 1.05 | 1.3 | Ω |
| Forward Tran conductance | gFS | V _{DS} =30V, I _D =3.5A | | 8.5 | | S |
| Dynamic Characteristics | | | | | | |
| Input capacitance | C _{ISS} | V _{DS} = 25V, V _{GS} = 0V, f=1MHz | | 1243 | | pF |
| Output capacitance | C _{OSS} | | | 87 | | pF |
| Reverse Transfer capacitance | C _{rss} | | | 6.5 | | pF |
| Turn-on Delay Time | td(on) | V _{DS} =320V, I _D =7A, R _G =25Ω V _{GS} =10V | | 21 | | ns |
| Rising time | tf | | | 23 | | ns |
| Turn-off Delay Time | td(off) | | | 70 | | ns |
| Input capacitance | tf | | | 23 | | ns |
| Total gate charge | Q _g | V _{DS} =520V, I _D =7A, V _{GS} =10V | | 26 | | nC |
| Gate-source charge | Q _{gs} | | | 6 | | nC |
| Gate-drain charge | Q _{gd} | | | 8.8 | | nC |
| Gate Resistance | R _g | V _{DS} =0V, Scan F mode | | 2.6 | | Ω |
| Continuous source current | I _S | Integral reverse p-n Junction diode in the MOSFET | | | 7 | A |
| Pulsed source current | I _{SM} | | | | 28 | A |
| Diode forward voltage drop. | V _{SD} | I _S =7A, V _{GS} =0V | | | 13 | V |
| Reverse recovery time | Trr | I _S =7A, V _{GS} =0V, dI _F /dt=100A/us | | 395 | | ns |
| Reverse recovery Charge | Qrr | | | | 2.6 | |
| Peak Reverse Recovery Current | Irrm | I _S =7A, dI _F /dt=100A/us | | 13.5 | | A |

CHARACTERISTIC CURVES

Fig.1 Output characteristics

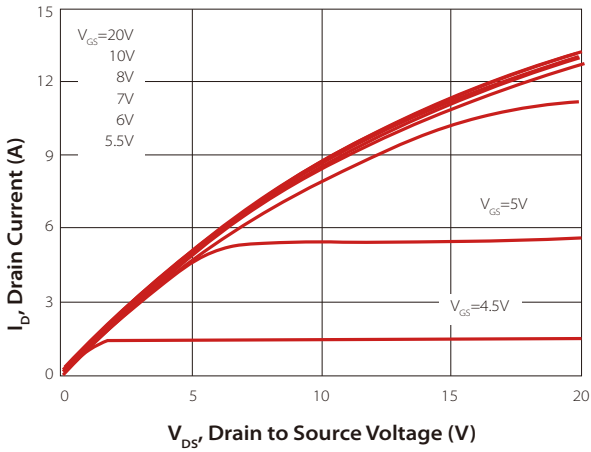


Fig.2 Reverse Characteristics

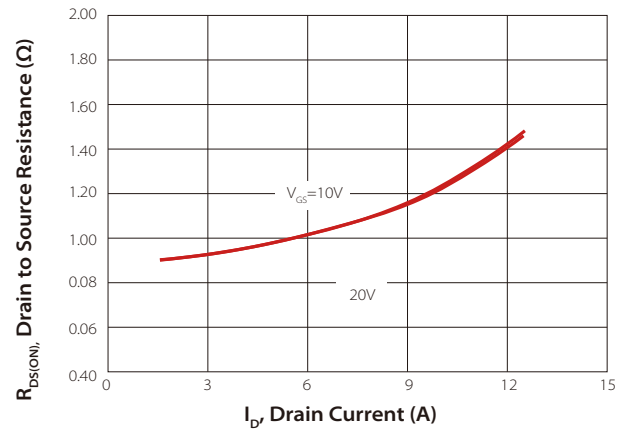


Fig.3 Gate charge characteristics

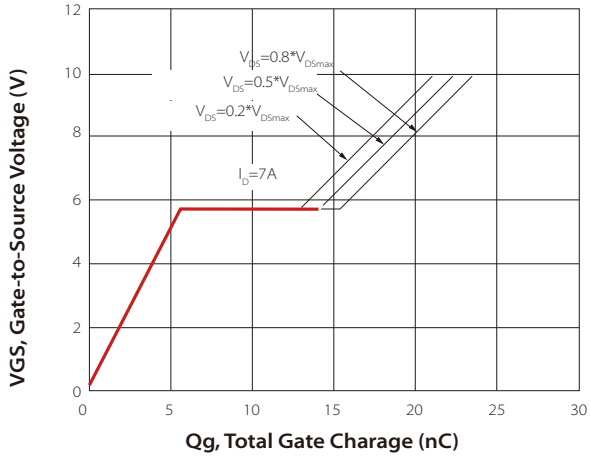


Fig.4 Capacitance Characteristics

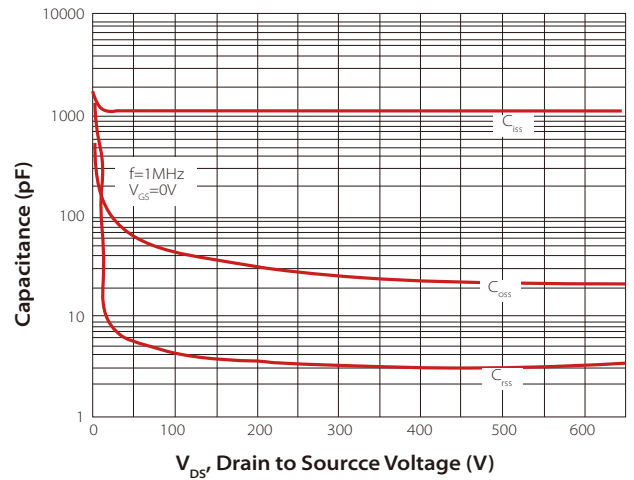


Fig.5 $R_{DS(ON)}$ vs junction temperature

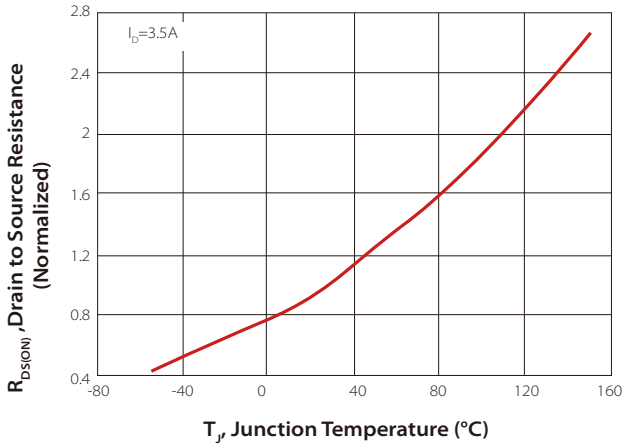


Fig. 6 BV_{DSS} vs junction temperature

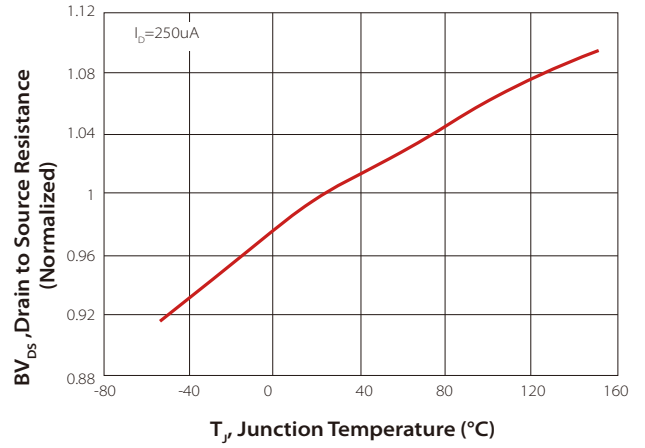


Fig.7 Forward characteristics of reverse diode

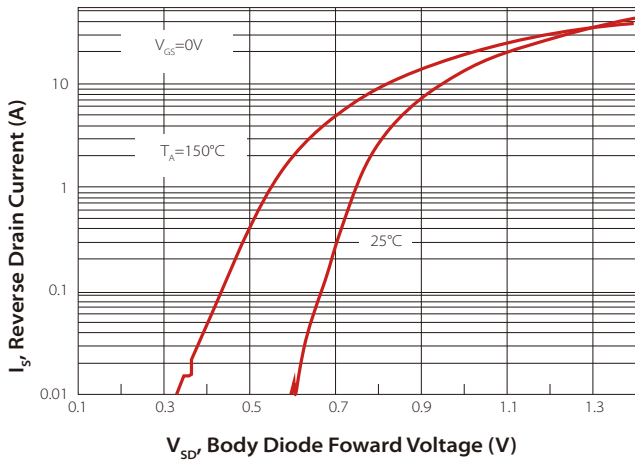


Fig.8 Transfer characteristics

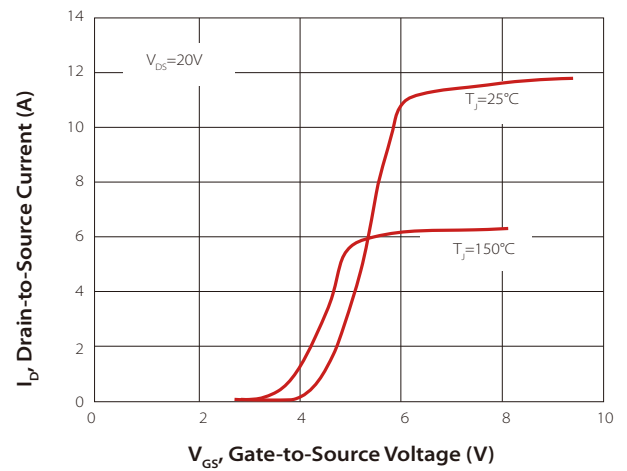


Fig.9 $V_{GS(TH)}$ vs junction temperature

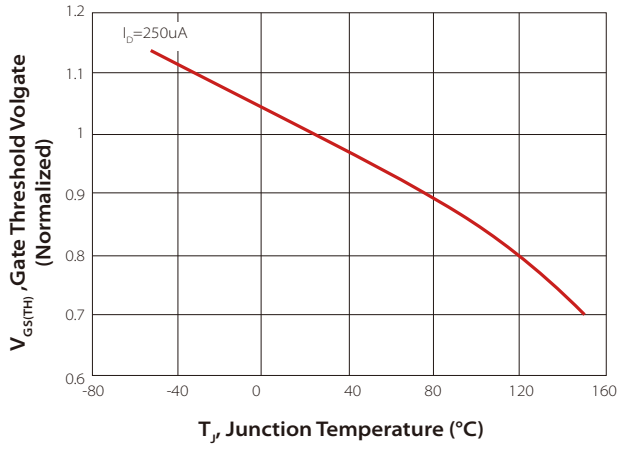


Fig. 10 Safe operating area

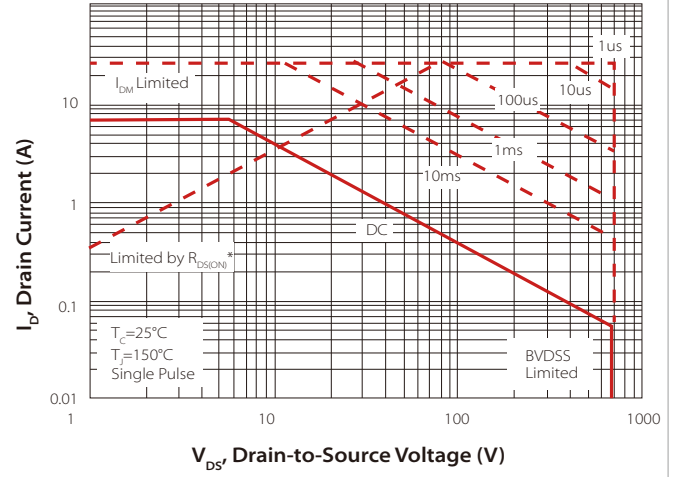


Fig.11 Transient thermal impedance

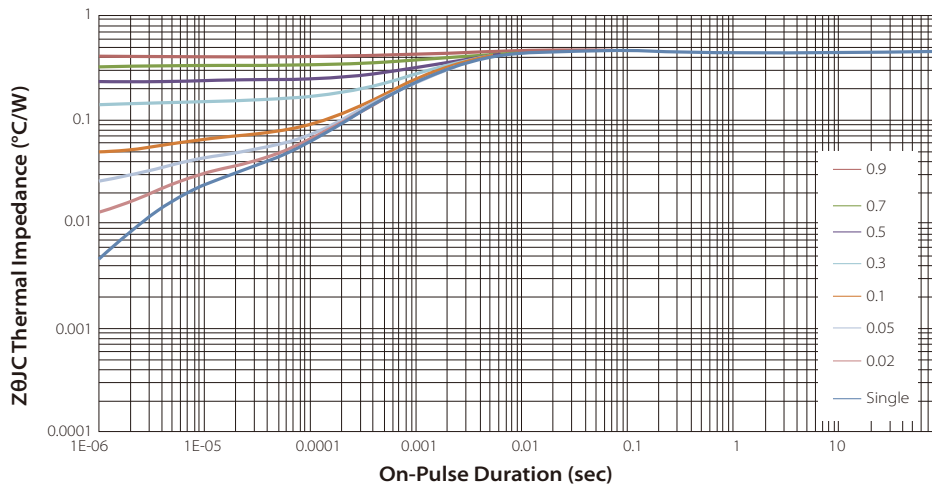


Fig.12 Gate charge test circuit & waveform

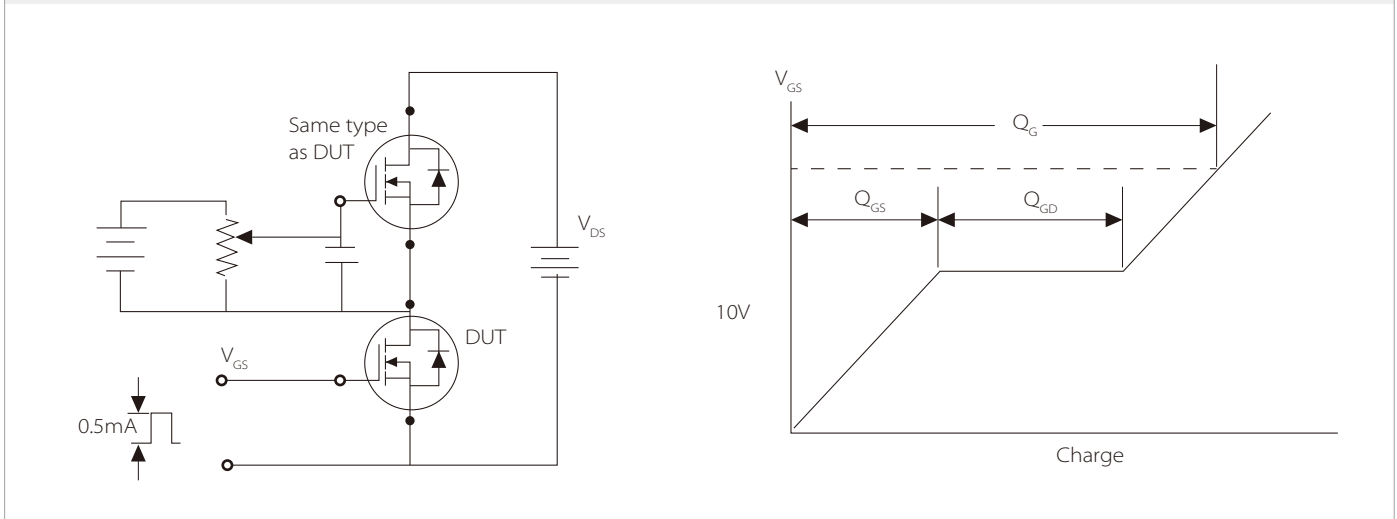


Fig.13 Switching time test circuit & waveform

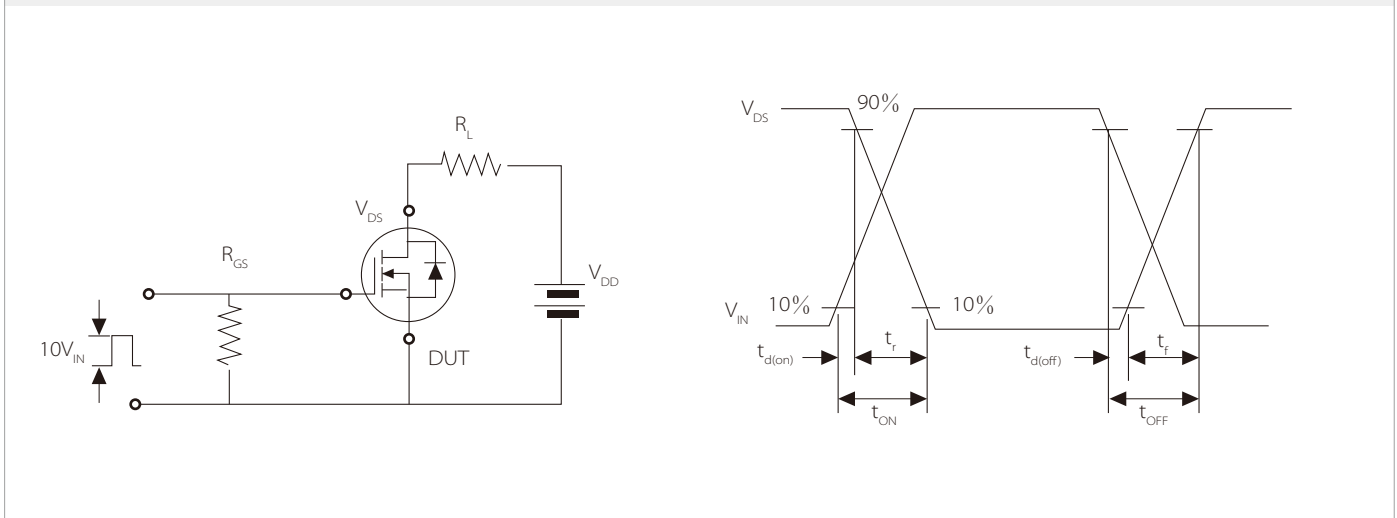


Fig.14 Unclamped Inductive switching test circuit & waveform

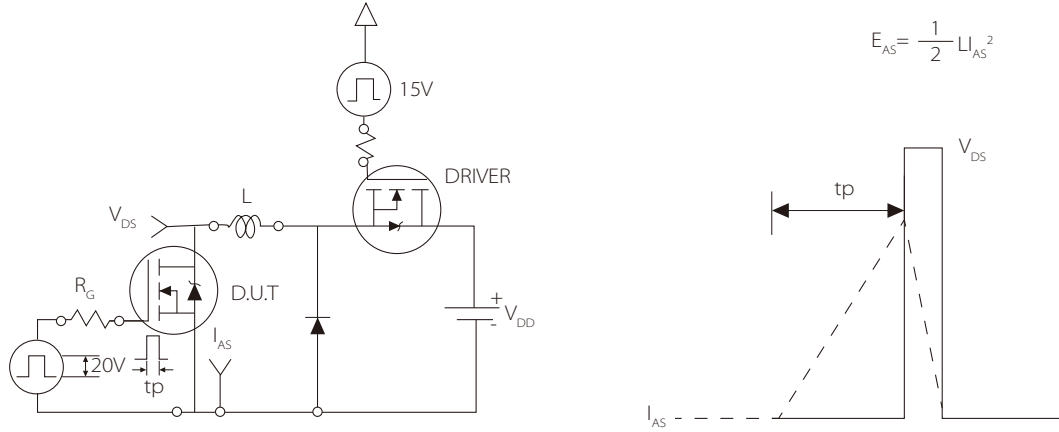
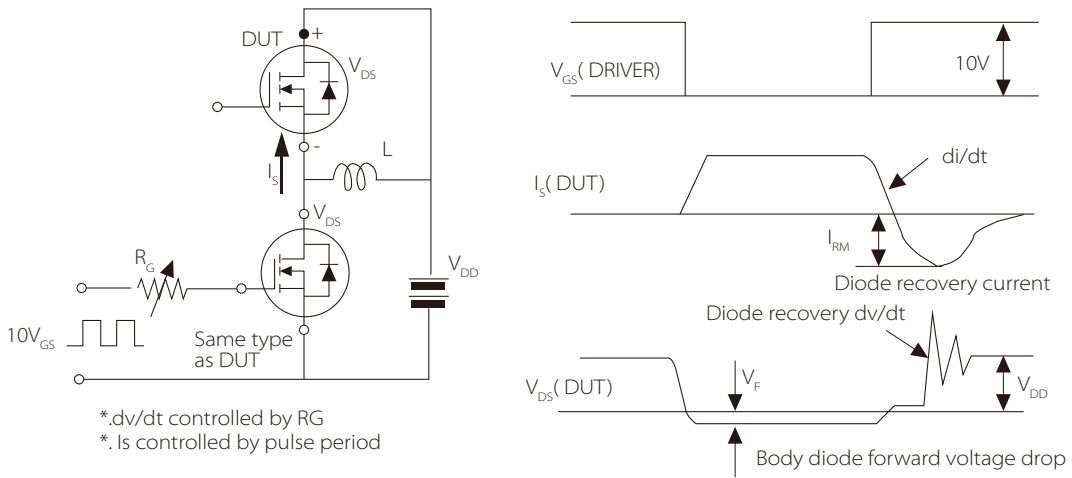
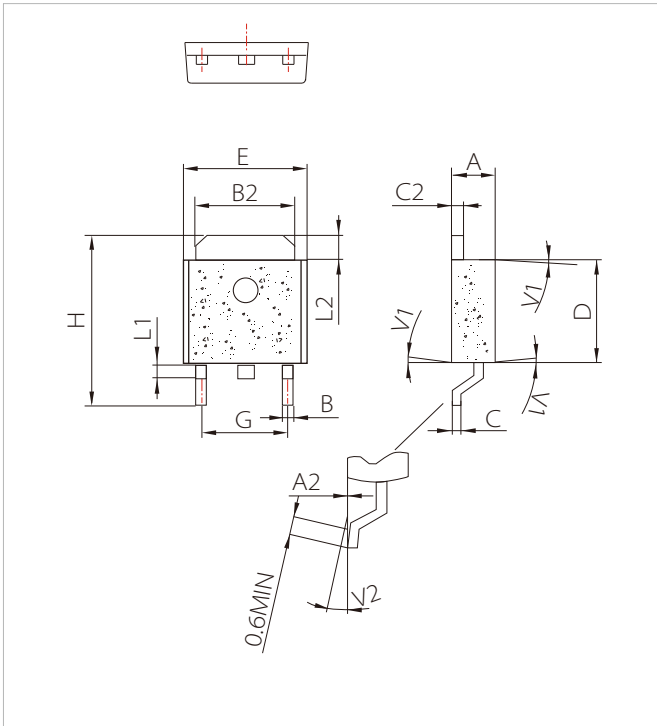


Fig.15 Peak diode recovery dv/dt test circuit & waveform



TO-252 PACKAGE MECHANICAL DATA



| Ref. | Dimensions | | | | | |
|------|-------------|------|------|--------|-------|-------|
| | Millimeters | | | Inches | | |
| | Min. | Typ. | Max. | Min. | Typ. | Max. |
| A | 2.20 | | 2.40 | 0.086 | | 0.095 |
| A2 | 0.03 | | 0.23 | 0.001 | | 0.009 |
| B | 0.55 | | 0.65 | 0.022 | | 0.026 |
| B2 | 5.10 | | 5.40 | 0.200 | | 0.213 |
| C | 0.45 | | 0.62 | 0.018 | | 0.024 |
| C2 | 0.48 | | 0.62 | 0.019 | | 0.024 |
| D | 6.00 | | 6.20 | 0.236 | | 0.244 |
| E | 6.40 | | 6.70 | 0.252 | | 0.264 |
| G | 4.40 | | 4.70 | 0.173 | 0.1 | 0.185 |
| H | 9.35 | | 10.6 | 0.368 | | 0.417 |
| L1 | 1.30 | | 1.70 | 0.051 | 0.143 | 0.067 |
| L2 | 1.37 | | 1.50 | 0.054 | | 0.059 |
| L1 | | 4° | | | 0.130 | |
| V2 | 0° | | 8° | 0° | | 8° |

ORDERING INFORMATION

| Part Number | Component Package | QTY/Reel | Reel Size |
|-------------|-------------------|----------|-----------|
| SNMD7N65 | TO-252 | 5000PCS | 13" |

Headquarters

No.3387 Shendu Road Pujiang
I&E Park
Minhang Shanghai China
201000

Hotline

400-021-5756

Web

<https://www.semiware.com>

Sales Center

Tel: 86-21-3463-7458
Email: sales18@semiware.com

Customer Service

Tel: 86-21-5484-1001
Email: sales17@semiware.com

Technical Support

Tel: 86-21-3463-7654
Email: fae01@semiware.com

Complaint & Suggestions

Tel: 86-21-3463-7172
Ext: 8868
Email: cs03@semiware.com

By QR Code

Website



Wechat

To find your local partner within Semiware's global network: www.semiware.com

© 2022 Semiware Semiconductor Inc.

The content of this document has been carefully checked and understood. However, neither Semiware nor its subsidiaries assume any liability whatsoever for any errors or inaccuracies of this document and the consequences thereof. Published specifications are subject to change without notice. Product suitability for any area of application must ultimately be determined by the customer. In all cases, products must never be operated outside their published specifications. Semiware does not guarantee the availability of all published products. This disclaimer shall be governed by substantive Chinese law and resulting disputes shall be settled by the courts at the place of business of Semiware. Latest publications and a complete disclaimer can be downloaded from the Semiware website. All trademarks recognized.