

GSMD25N15

150V N-Channel MOSFETs

Product Description

These N-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode.

These devices are well suited for high efficiency fast switching applications.

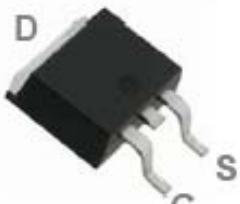
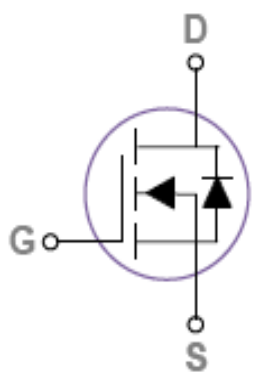
Features

- 150V, 25A, $R_{DS(ON)}=65m\Omega@V_{GS}=10V$
- Improved dv/dt capability
- Fast switching
- V_{GS} Guaranteed $\pm 25V$
- Green Device Available
- TO-252-2L package design

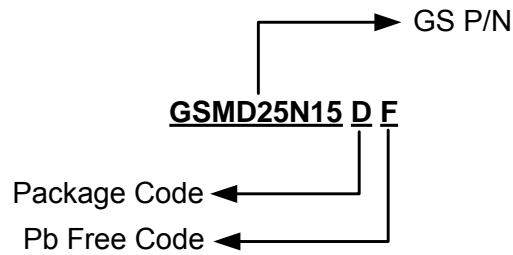
Applications

- Notebook
- Load Switch
- LED Applications
- Li battery pack application

Packages & Pin Assignments

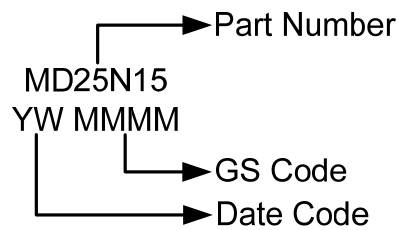
| GSMD25N15DF (TO-252-2L) | |
|---|---|
|  <p>Top View</p> |  |
| Description | |
| Gate | |
| Source | |
| Drain | |

Ordering Information



| Part Number | Package | Quantity Reel |
|-------------|-----------|---------------|
| GSMD25N15DF | TO-252-2L | 2500 PCS |

Marking Information



Absolute Maximum Ratings

T_A=25°C Unless otherwise noted

| Symbol | Parameter | Typical | Unit |
|------------------|--|-----------------------|------|
| V _{DS} | Drain-Source Voltage | 150 | V |
| V _{GS} | Gate-Source Voltage | ±25 | V |
| I _D | Continuous Drain Current | T _A =25°C | 25 |
| | | T _A =100°C | 16 |
| I _{DM} | Pulsed Drain Current | 100 | A |
| P _D | Power Dissipation (T _A =25°C) | 83 | W |
| | Power Dissipation (Derate above 25°C) | 0.66 | W/°C |
| T _J | Operating Junction Temperature Range | -55 to +150 | °C |
| T _{STG} | Storage Temperature Range | -55 to +150 | °C |
| R _{θJA} | Thermal Resistance-Junction to Ambient | 35 | °C/W |
| R _{θJC} | Thermal Resistance-Junction to Case | 1.5 | °C/W |

Note 1: Repetitive Rating : Pulsed width limited by maximum junction temperature.

Electrical Characteristics

T_A=25°C Unless otherwise noted

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|-------------------------------------|---|---|-----|------|------|-------|
| Static | | | | | | |
| V _{(BR)DSS} | Drain-Source Breakdown Voltage | V _{GS} =0V, I _D =250uA | 150 | | | V |
| ΔBV _{DSS} /ΔT _J | BV _{DSS} Temperature Coefficient | Reference to 25°C, I _D =1mA | | 0.08 | | V/°C |
| V _{GS(th)} | Gate Threshold Voltage | V _{DS} =V _{GS} , I _D =250uA | 2 | 3 | 4 | V |
| ΔV _{GS(th)} | V _{GS(th)} Temperature Coefficient | | | -2.5 | | mV/°C |
| I _{GSS} | Gate Leakage Current | V _{DS} =0V, V _{GS} =±25V | | | ±100 | nA |
| I _{DSS} | Zero Gate Voltage Drain Current | V _{DS} =120V, V _{GS} =0V | | | 1 | uA |
| | | V _{DS} =120V, V _{GS} =0V, T _J =125°C | | | 30 | |
| I _S | Continuous Source Current | V _G =V _D =0V, Force Current | | | 25 | A |
| I _{SM} | Pulsed Source Current | | | | 100 | |
| R _{DS(on)} | Drain-Source On-Resistance | V _{GS} =10V, I _D =5A | | 52 | 65 | mΩ |
| | | V _{GS} =5V, I _D =3A | | 60 | 80 | |
| V _{SD} | Diode Forward Voltage | V _{GS} =0V, I _S =1A | | | 1.3 | V |
| t _{rr} | Reverse Recovery Time | V _{GS} =0V, I _S =1A, | | 55 | | ns |
| Q _{rr} | Reverse Recovery Charge | di/dt=100A/us | | 130 | | nC |
| Dynamic | | | | | | |
| Q _g | Total Gate Charge | V _{DS} =30V, V _{GS} =10V, I _D =5A | | 30 | | nC |
| Q _{gs} | Gate-Source Charge | | | 7 | | |
| Q _{gd} | Gate-Drain Charge | | | 9 | | |
| C _{iss} | Input Capacitance | V _{DS} =30V, V _{GS} =0V, f=1MHz | | 1350 | | pF |
| C _{oss} | Output Capacitance | | | 135 | | |
| C _{rss} | Reverse Transfer Capacitance | | | 60 | | |
| t _{d(on)} | Turn-On Time | V _{DD} =30V, I _D =1A, V _{GS} =10V, R _G =6Ω | | 14 | | ns |
| t _r | | | | 9 | | |
| t _{d(off)} | Turn-Off Time | | | 33 | | |
| t _f | | | | 12 | | |

Note 2: The data tested by pulsed, pulse width ≤ 300us, duty cycle ≤ 2%.

Note 3: Essentially independent of operating temperature.

Typical Performance Characteristics

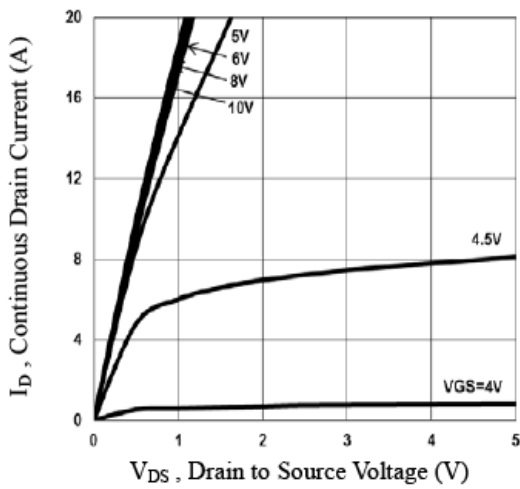


Fig.1 Output Characteristics

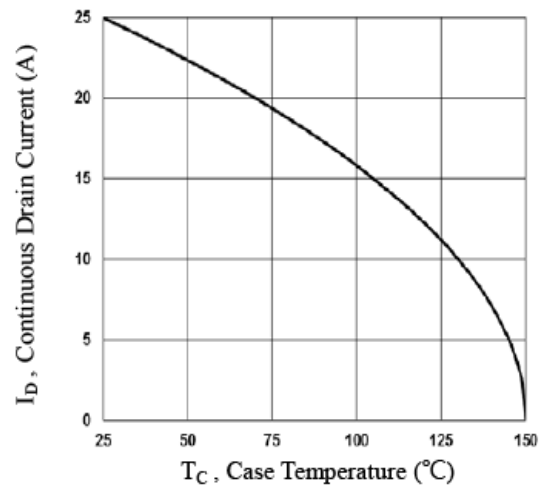


Fig.2 Continuous Drain Current vs. T_C

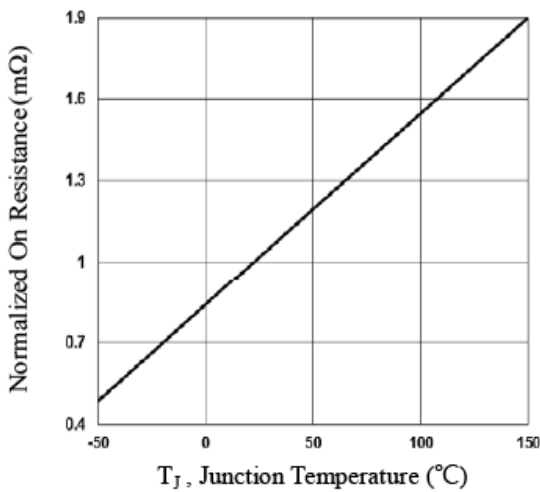


Fig.3 Normalized $R_{DS(on)}$ vs. T_J

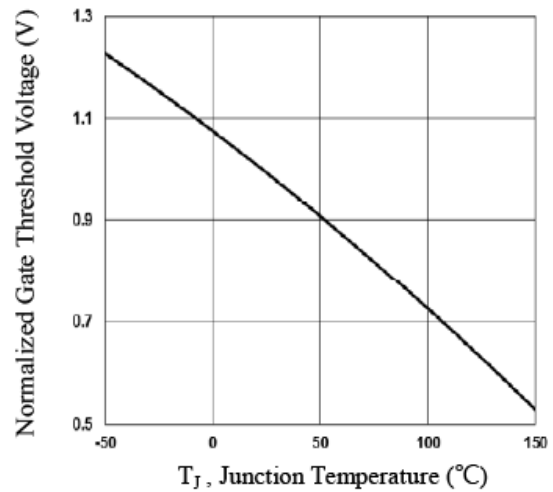


Fig.4 Normalized V_{th} vs. T_J

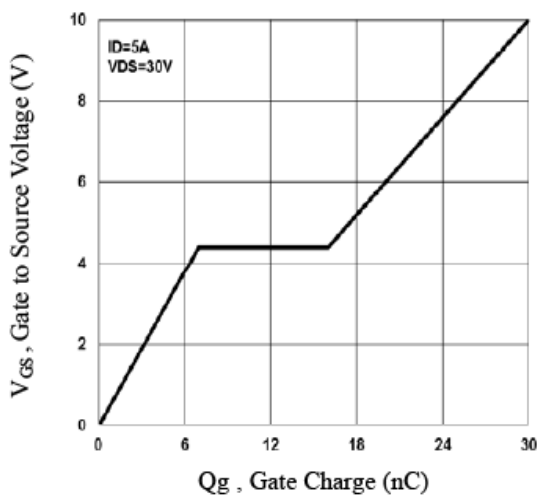


Fig.5 Gate Charge Waveform

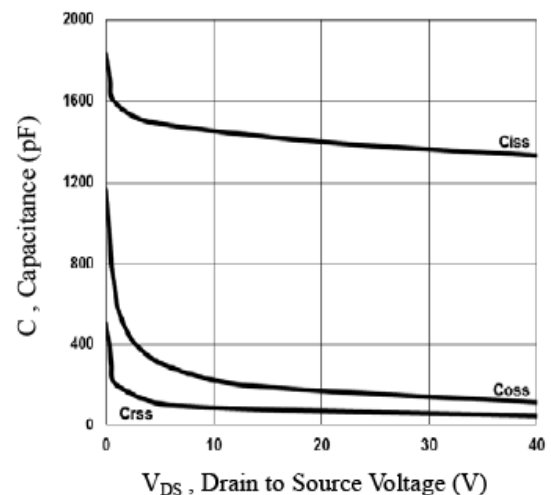


Fig.6 Capacitance Characteristics

Typical Performance Characteristics (Continue)

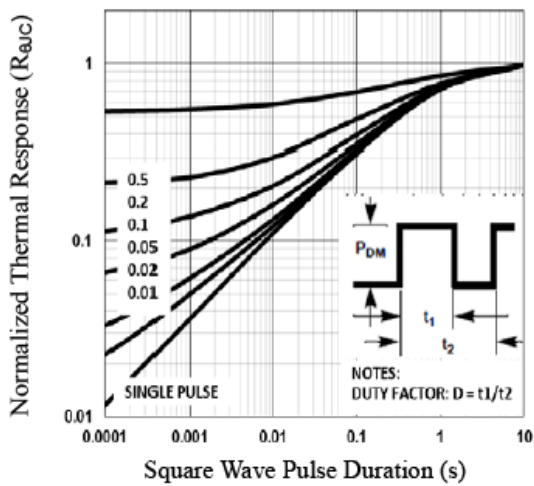


Fig.7 Normalized Transient Impedance

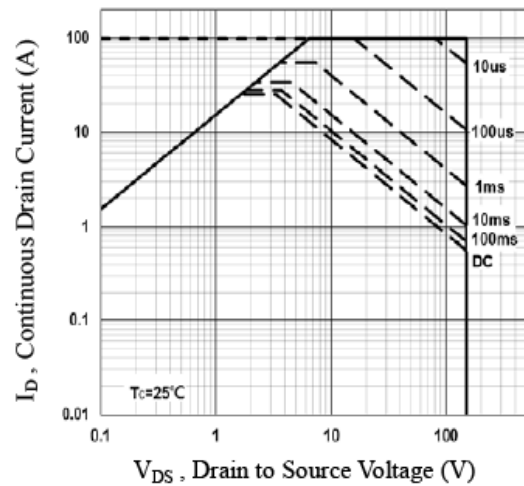
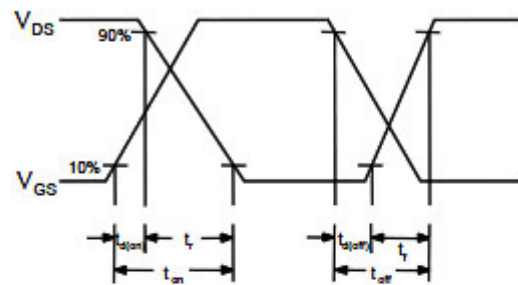
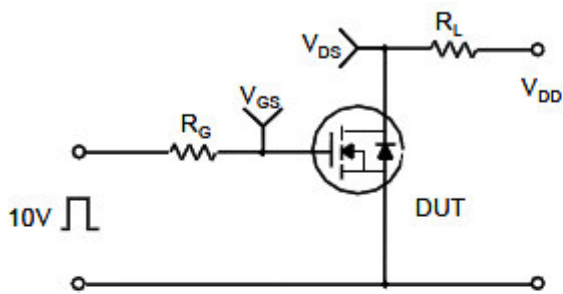
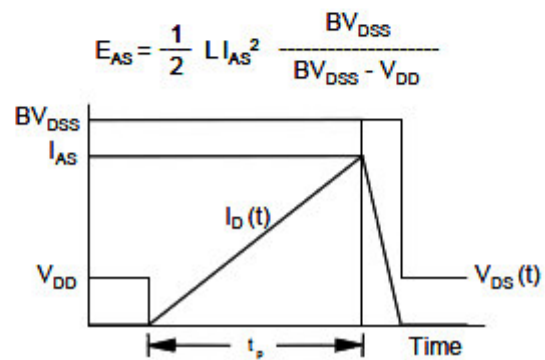
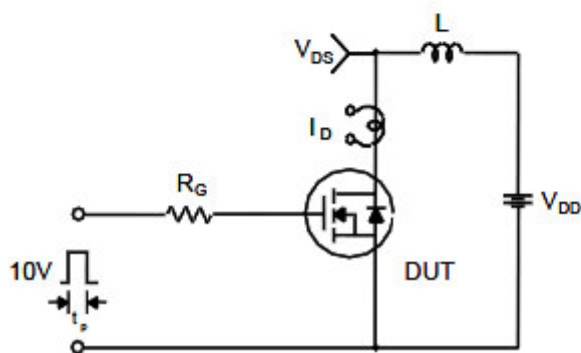


Fig.8 Maximum Safe Operation Area

Resistive Switching Test Circuit & Waveforms



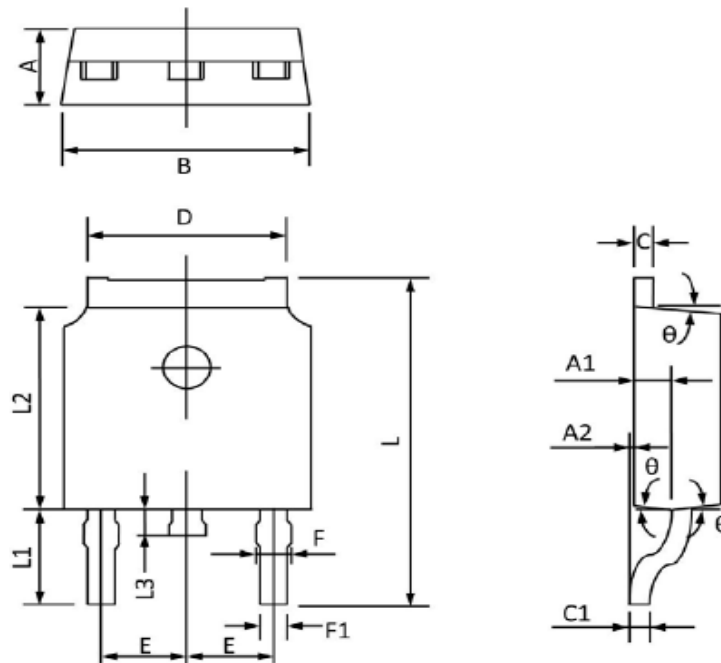
Unclamped Inductive Switching Test Circuit & Waveforms



$$E_{AS} = \frac{1}{2} L I_{AS}^2 \frac{BV_{DSS}}{BV_{DSS} - V_{DD}}$$

Package Dimension

TO-252-2L










| Dimensions | | | | |
|------------|-------------|-------|--------|-------|
| Symbol | Millimeters | | Inches | |
| | Min | Max | Min | Max |
| A | 2.20 | 2.40 | 0.087 | 0.094 |
| A1 | 0.91 | 1.11 | 0.036 | 0.044 |
| A2 | 0.00 | 0.15 | 0.000 | 0.006 |
| B | 6.40 | 6.80 | 0.252 | 0.268 |
| C | 0.46 | 0.58 | 0.018 | 0.023 |
| C1 | 0.46 | 0.58 | 0.018 | 0.023 |
| D | 5.10 | 5.50 | 0.201 | 0.217 |
| E | 2.186 | 2.386 | 0.086 | 0.094 |
| F | 0.60 | 0.94 | 0.024 | 0.037 |
| F1 | 0.50 | 0.86 | 0.020 | 0.034 |
| L | 9.40 | 10.40 | 0.370 | 0.409 |
| L1 | 2.40 | 3.00 | 0.094 | 0.118 |
| L2 | 5.40 | 6.20 | 0.213 | 0.244 |
| L3 | 0.60 | 1.20 | 0.024 | 0.047 |
| θ | 3° | 9° | 3° | 9° |



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CONTACT US

| GS Headquarter | |
|---|--|
|  | 4F.,No.43-1,Lane11,Sec.6,Minquan E.Rd Neihu District Taipei City 114, Taiwan (R.O.C) |
|  | 886-2-2657-9980 |
|  | 886-2-2657-3630 |
|  | sales_twn@gs-power.com |

| Shenzhen Branch(China) | |
|---|---|
|  | 1113 B Building, Happiness Washington, Baoan Nan Road, Luohu District, Shenzhen City, China |
|  | 0755-22208941 |
|  | sales_cn@gs-power.com |

| RD Division | |
|---|--------------------------------------|
|  | 824 Bolton Drive Milpitas. CA. 95035 |
|  | 1-408-457-0587 |