



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of "Quality Parts,Customers Priority,Honest Operation,and Considerate Service",our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

Email & Skype: info@chipsmall.com Web: www.chipsmall.com

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China





Is Now Part of



ON Semiconductor®

To learn more about ON Semiconductor, please visit our website at

www.onsemi.com

ON Semiconductor and the ON Semiconductor logo are trademarks of Semiconductor Components Industries, LLC dba ON Semiconductor or its subsidiaries in the United States and/or other countries. ON Semiconductor owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of ON Semiconductor's product/patent coverage may be accessed at www.onsemi.com/site/pdf/Patent-Marking.pdf. ON Semiconductor reserves the right to make changes without further notice to any products herein. ON Semiconductor makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does ON Semiconductor assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. Buyer is responsible for its products and applications using ON Semiconductor products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by ON Semiconductor. "Typical" parameters which may be provided in ON Semiconductor data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. ON Semiconductor does not convey any license under its patent rights nor the rights of others. ON Semiconductor products are not designed, intended, or authorized for use as a critical component in life support systems or any FDA Class 3 medical devices or medical devices with a same or similar classification in a foreign jurisdiction or any devices intended for implantation in the human body. Should Buyer purchase or use ON Semiconductor products for any such unintended or unauthorized application, Buyer shall indemnify and hold ON Semiconductor and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that ON Semiconductor was negligent regarding the design or manufacture of the part. ON Semiconductor is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.



December 2015

FDP075N15A / FDB075N15A

N-Channel PowerTrench[®] MOSFET

150 V, 130 A, 7.5 mΩ

Features

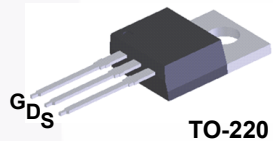
- $R_{DS(on)} = 6.25 \text{ m}\Omega$ (Typ.) @ $V_{GS} = 10 \text{ V}$, $I_D = 100 \text{ A}$
- Fast Switching
- Low Gate Charge
- High Performance Trench Technology for Extremely Low $R_{DS(on)}$
- High Power and Current Handling Capability
- RoHS Compliant

Description

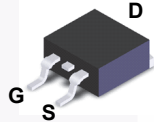
This N-Channel MOSFET is produced using Fairchild Semiconductor's advanced PowerTrench[®] process that has been tailored to minimize the on-state resistance while maintaining superior switching performance.

Applications

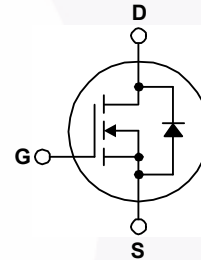
- Synchronous Rectification for ATX / Server / Telecom PSU
- Battery Protection Circuit
- Motor Drives and Uninterruptible Power Supplies
- Micro Solar Inverter



TO-220



D²-PAK



MOSFET Maximum Ratings $T_C = 25^\circ\text{C}$ unless otherwise noted.

| Symbol | Parameter | FDP075N15A_F102 FDB075N15A | Unit |
|----------------|--|--|------------------|
| V_{DSS} | Drain to Source Voltage | 150 | V |
| V_{GSS} | Gate to Source Voltage | - DC | ± 20 |
| | | - AC (f > 1 Hz) | ± 30 |
| I_D | Drain Current | - Continuous ($T_C = 25^\circ\text{C}$) | 130* |
| | | - Continuous ($T_C = 100^\circ\text{C}$) | 92 |
| I_{DM} | Drain Current | - Pulsed (Note 1) | 522 |
| E_{AS} | Single Pulsed Avalanche Energy | (Note 2) | 588 |
| dv/dt | Peak Diode Recovery dv/dt | (Note 3) | 6.0 |
| P_D | Power Dissipation | ($T_C = 25^\circ\text{C}$) | 333 |
| | | - Derate Above 25°C | 2.22 |
| T_J, T_{STG} | Operating and Storage Temperature Range | -55 to +175 | $^\circ\text{C}$ |
| T_L | Maximum Lead Temperature for Soldering, 1/8" from Case for 5 Seconds | 300 | $^\circ\text{C}$ |

* Package limitation current is 120 A.

Thermal Characteristics

| Symbol | Parameter | FDP075N15A_F102 FDB075N15A | Unit |
|-----------------|--|-------------------------------|---------------------------|
| $R_{\theta JC}$ | Thermal Resistance, Junction to Case, Max. | 0.45 | $^\circ\text{C}/\text{W}$ |
| $R_{\theta JA}$ | Thermal Resistance, Junction to Ambient (Minimum Pad of 2-oz Copper), Max. | 62.5 | |
| | Thermal Resistance, Junction to Ambient, D2-PAK (1 in ² Pad of 2-oz Copper), Max. | 40 | |

Package Marking and Ordering Information

| Part Number | Top Mark | Package | Packing Method | Reel Size | Tape Width | Quantity |
|-----------------|------------|---------------------|----------------|-----------|------------|-----------|
| FDP075N15A_F102 | FDP075N15A | TO-220 | Tube | N/A | N/A | 50 units |
| FDB075N15A | FDB075N15A | D ² -PAK | Tape and Reel | 330 mm | 24 mm | 800 units |

Electrical Characteristics $T_C = 25^\circ\text{C}$ unless otherwise noted.

| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Unit |
|--------|-----------|-----------------|------|------|------|------|
|--------|-----------|-----------------|------|------|------|------|

Off Characteristics

| | | | | | | |
|--------------------------------|---|---|-----|-----|-----------|---------------------|
| BV_{DSS} | Drain to Source Breakdown Voltage | $I_D = 250 \mu\text{A}, V_{GS} = 0 \text{ V}$ | 150 | - | - | V |
| $\Delta BV_{DSS} / \Delta T_J$ | Breakdown Voltage Temperature Coefficient | $I_D = 250 \mu\text{A}$, Referenced to 25°C | - | 0.1 | - | V/ $^\circ\text{C}$ |
| I_{DSS} | Zero Gate Voltage Drain Current | $V_{DS} = 120 \text{ V}, V_{GS} = 0 \text{ V}$ $V_{DS} = 120 \text{ V}, T_C = 150^\circ\text{C}$ | - | - | 1 500 | μA |
| I_{GSS} | Gate to Body Leakage Current | $V_{GS} = \pm 20 \text{ V}, V_{DS} = 0 \text{ V}$ | - | - | ± 100 | nA |

On Characteristics

| | | | | | | |
|--------------|--------------------------------------|--|-----|------|-----|------------|
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{GS} = V_{DS}, I_D = 250 \mu\text{A}$ | 2.0 | - | 4.0 | V |
| $R_{DS(on)}$ | Static Drain to Source On Resistance | $V_{GS} = 10 \text{ V}, I_D = 100 \text{ A}$ | - | 6.25 | 7.5 | m Ω |
| g_{FS} | Forward Transconductance | $V_{DS} = 10 \text{ V}, I_D = 100 \text{ A}$ | - | 164 | - | S |

Dynamic Characteristics

| | | | | | | |
|---------------|-----------------------------------|--|----------|------|------|----------|
| C_{iss} | Input Capacitance | $V_{DS} = 75 \text{ V}, V_{GS} = 0 \text{ V},$ $f = 1 \text{ MHz}$ | - | 5525 | 7350 | pF |
| C_{oss} | Output Capacitance | | - | 516 | 685 | pF |
| C_{rSS} | Reverse Transfer Capacitance | | - | 21 | - | pF |
| $C_{oss(er)}$ | Energy Related Output Capacitance | $V_{DS} = 75 \text{ V}, V_{GS} = 0 \text{ V}$ | - | 909 | - | pF |
| $Q_{g(tot)}$ | Total Gate Charge at 10V | $V_{DS} = 75 \text{ V}, I_D = 100 \text{ A},$ $V_{GS} = 10 \text{ V}$ | - | 77 | 100 | nC |
| Q_{gs} | Gate to Source Gate Charge | | - | 26 | - | nC |
| Q_{gs2} | Gate Charge Threshold to Plateau | | - | 11 | - | nC |
| Q_{gd} | Gate to Drain "Miller" Charge | | (Note 4) | - | 16 | - |
| ESR | Equivalent Series Resistance(G-S) | $f = 1 \text{ MHz}$ | - | 2.29 | - | Ω |

Switching Characteristics

| | | | | | | |
|--------------|---------------------|--|----------|----|-----|----|
| $t_{d(on)}$ | Turn-On Delay Time | $V_{DD} = 75 \text{ V}, I_D = 100 \text{ A},$ $V_{GS} = 10 \text{ V}, R_G = 4.7 \Omega$ | - | 28 | 66 | ns |
| t_r | Turn-On Rise Time | | - | 37 | 84 | ns |
| $t_{d(off)}$ | Turn-Off Delay Time | | - | 62 | 134 | ns |
| t_f | Turn-Off Fall Time | | (Note 4) | - | 21 | 52 |

Drain-Source Diode Characteristics

| | | | | | | |
|----------|--|---|---|------|------|----|
| I_S | Maximum Continuous Drain to Source Diode Forward Current | - | - | 130* | A | |
| I_{SM} | Maximum Pulsed Drain to Source Diode Forward Current | - | - | 520 | A | |
| V_{SD} | Drain to Source Diode Forward Voltage | $V_{GS} = 0 \text{ V}, I_{SD} = 100 \text{ A}$ | - | - | 1.25 | V |
| t_{rr} | Reverse Recovery Time | $V_{GS} = 0 \text{ V}, V_{DD} = 75 \text{ V}, I_{SD} = 100 \text{ A},$ $di_F/dt = 100 \text{ A}/\mu\text{s}$ | - | 97 | - | ns |
| Q_{rr} | Reverse Recovery Charge | | - | 264 | - | nC |

Notes:

1. Repetitive rating: pulse-width limited by maximum junction temperature.
2. Starting $T_J = 25^\circ\text{C}$, $L = 3 \text{ mH}$, $I_{AS} = 19.8 \text{ A}$.
3. $I_{SD} \leq 100 \text{ A}$, $di/dt \leq 200 \text{ A}/\mu\text{s}$, $V_{DD} \leq BV_{DSS}$, starting $T_J = 25^\circ\text{C}$.
4. Essentially independent of operating temperature typical characteristics.

Typical Performance Characteristics

Figure 1. On-Region Characteristics

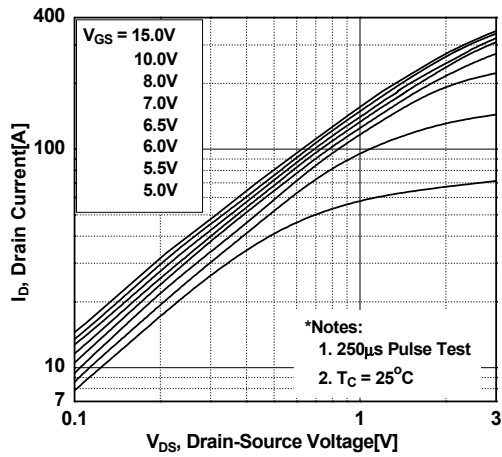


Figure 2. Transfer Characteristics

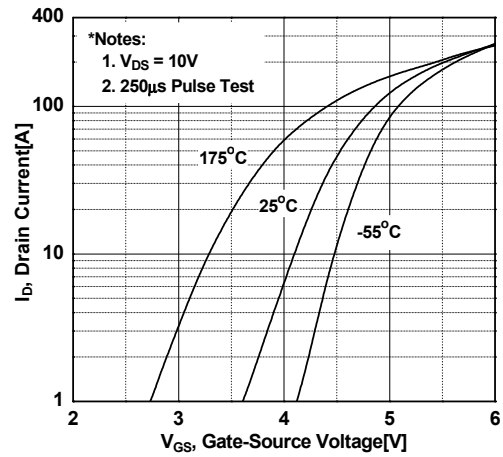


Figure 3. On-Resistance Variation vs. Drain Current and Gate Voltage

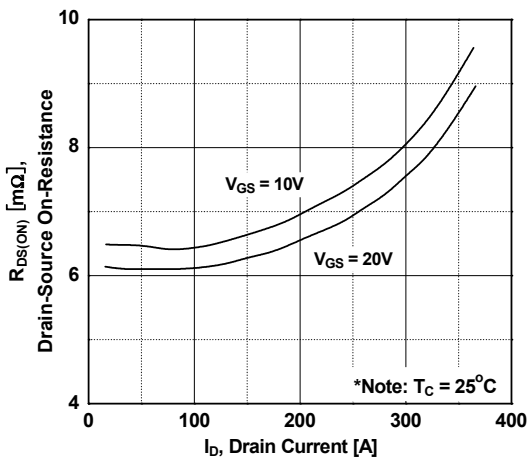


Figure 4. Body Diode Forward Voltage Variation vs. Source Current and Temperature

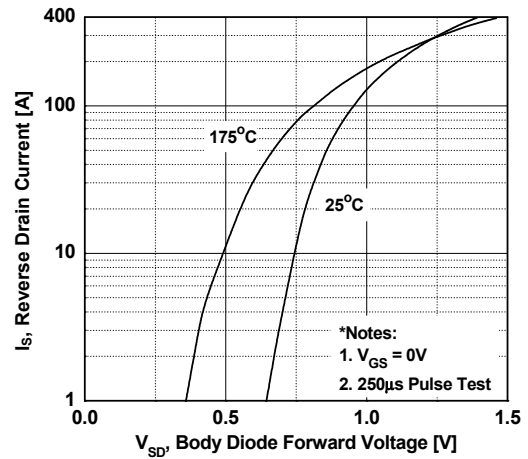


Figure 5. Capacitance Characteristics

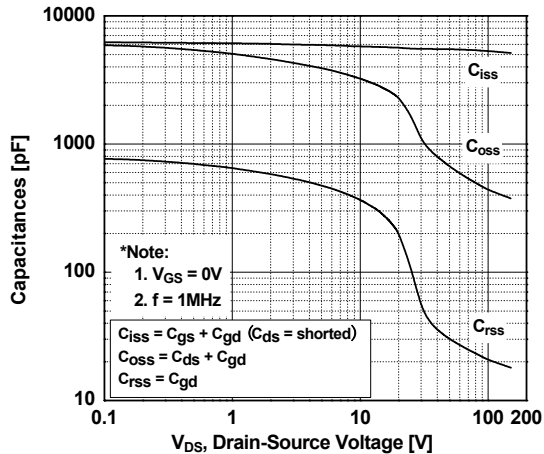
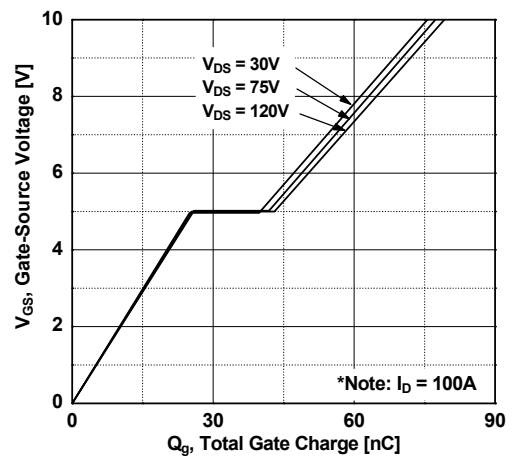


Figure 6. Gate Charge Characteristics



Typical Performance Characteristics (Continued)

Figure 7. Breakdown Voltage Variation vs. Temperature

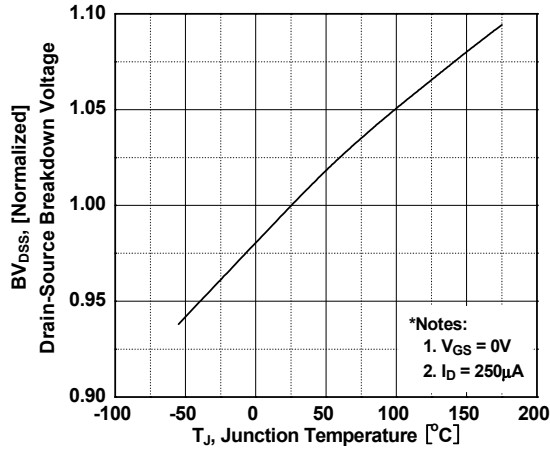


Figure 8. On-Resistance Variation vs. Temperature

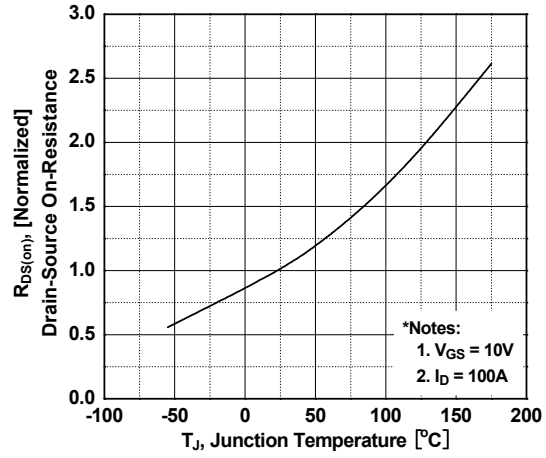


Figure 9. Maximum Safe Operating Area

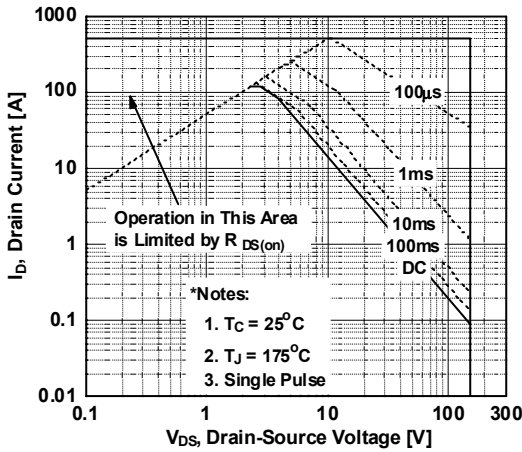


Figure 10. Maximum Drain Current vs. Case Temperature

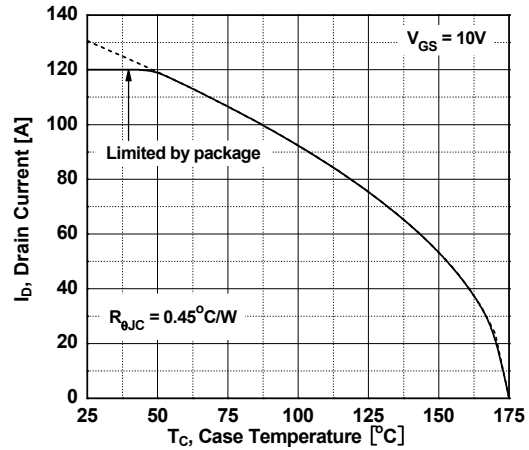


Figure 11. E_oss vs. Drain to Source Voltage

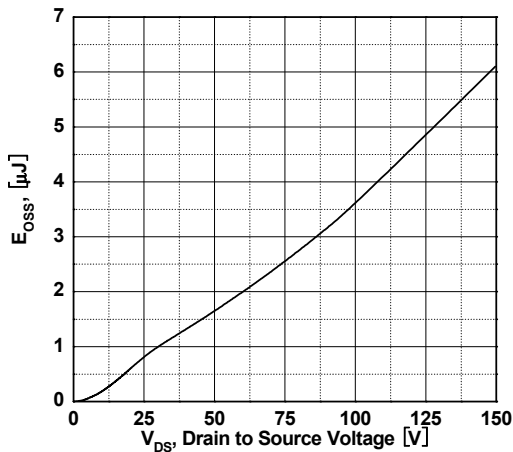
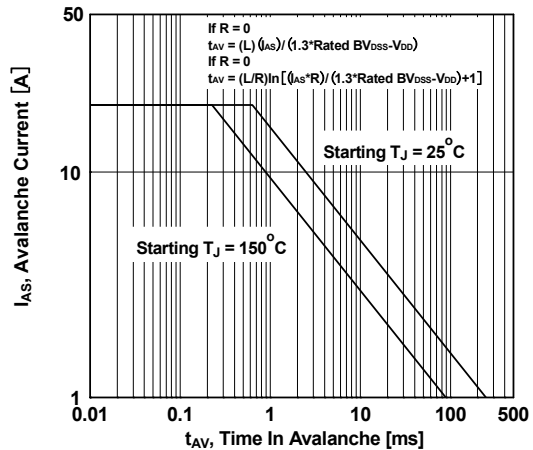
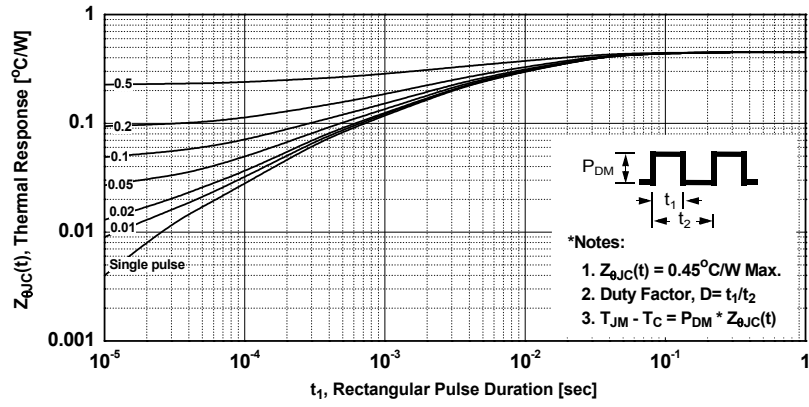


Figure 12. Unclamped Inductive Switching Capability



Typical Performance Characteristics (Continued)

Figure 13. Transient Thermal Response Curve



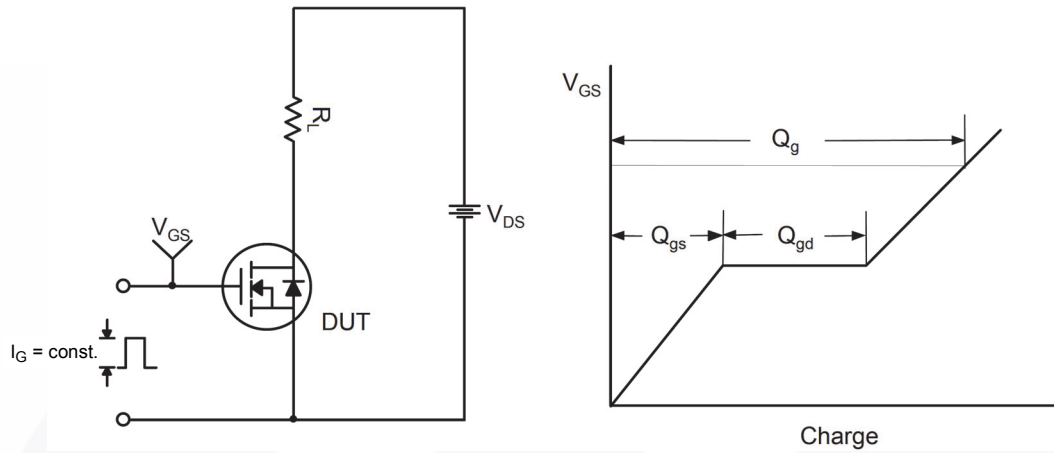


Figure 14. Gate Charge Test Circuit & Waveform

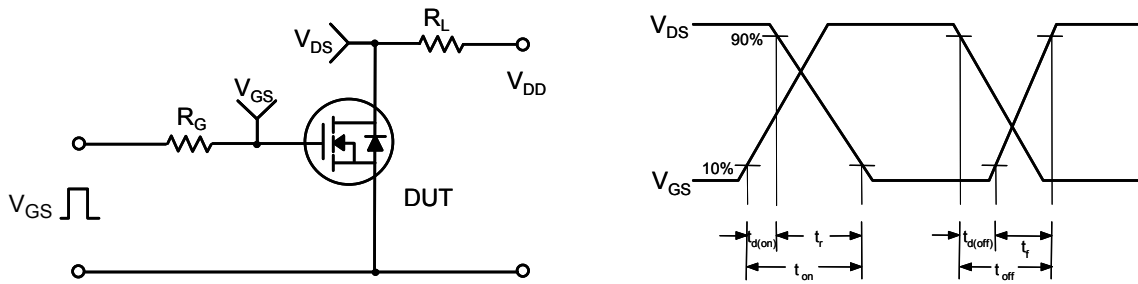


Figure 15. Resistive Switching Test Circuit & Waveforms



Figure 16. Unclamped Inductive Switching Test Circuit & Waveforms

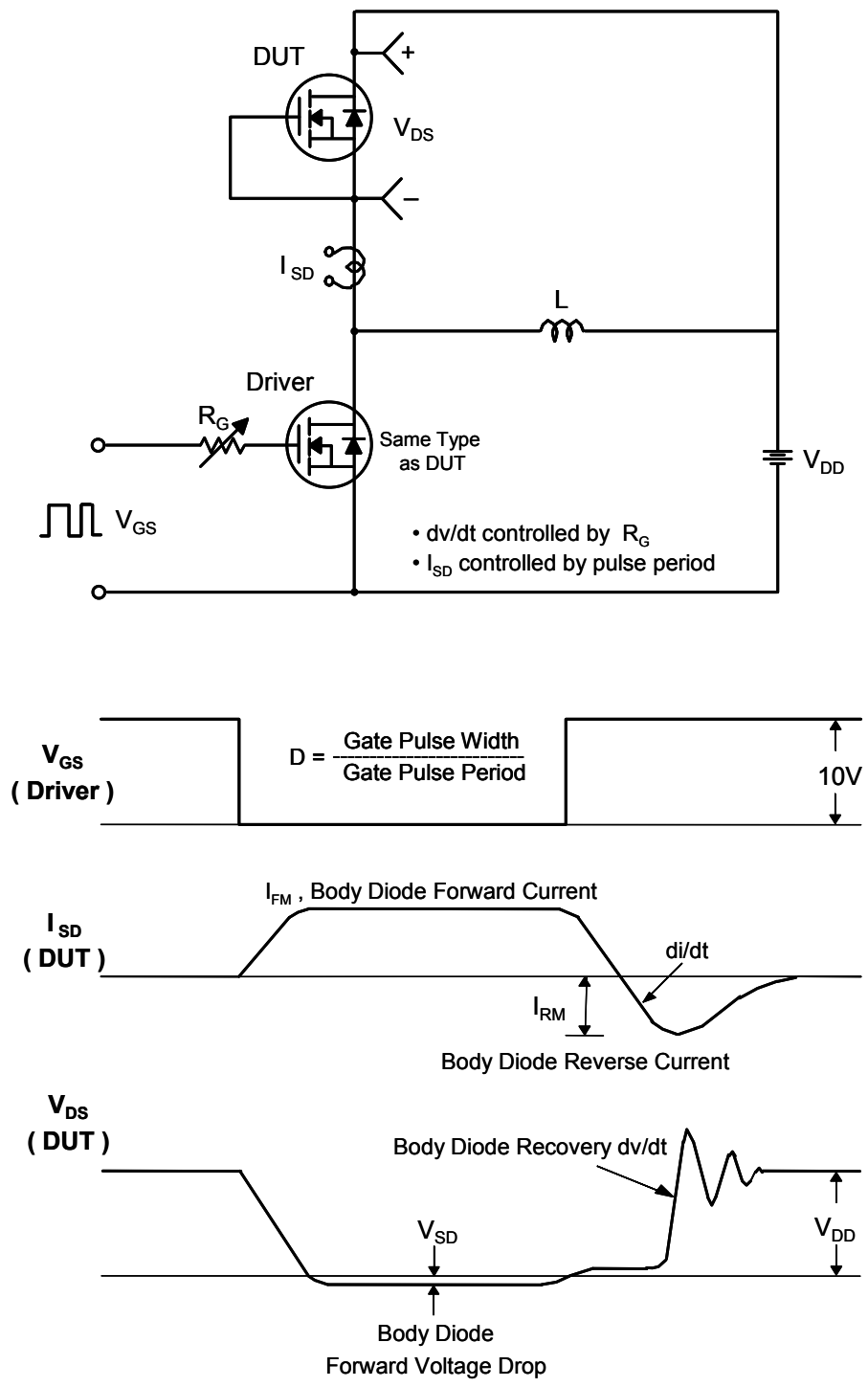
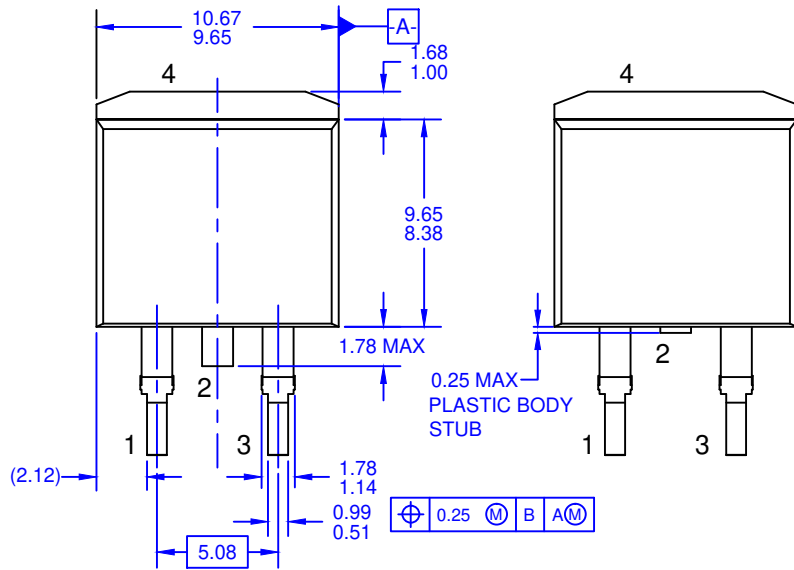
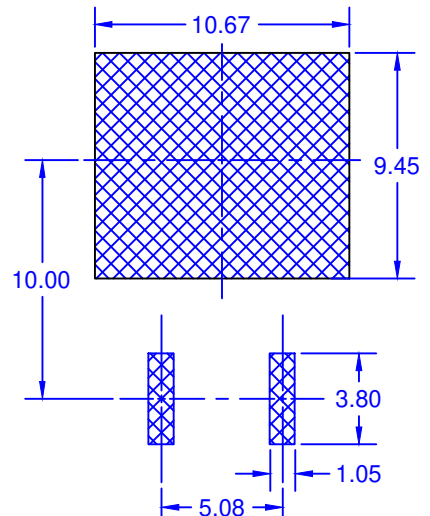


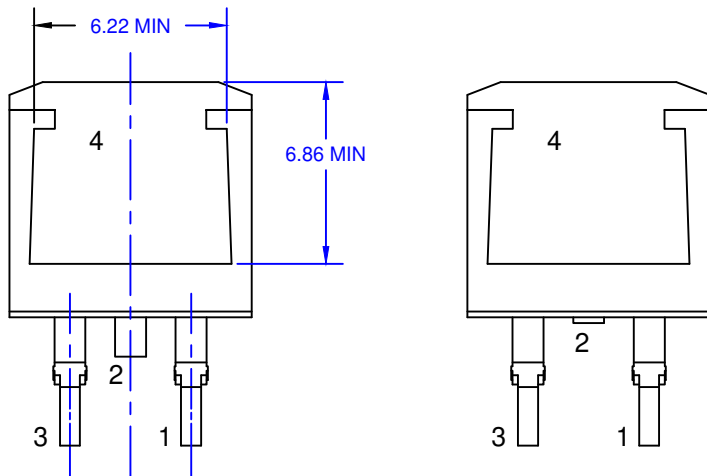
Figure 17. Peak Diode Recovery dv/dt Test Circuit & Waveforms



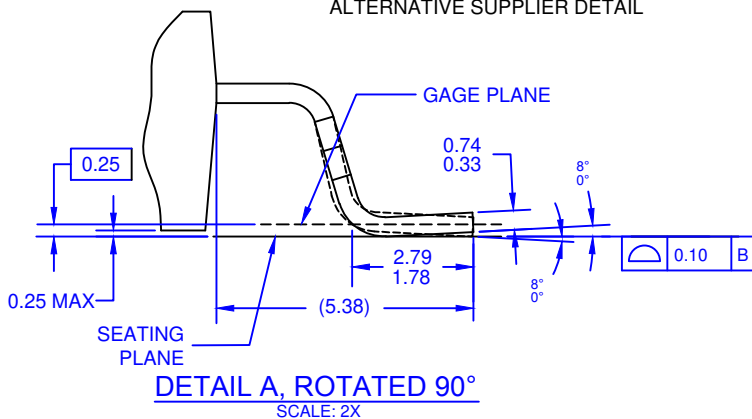
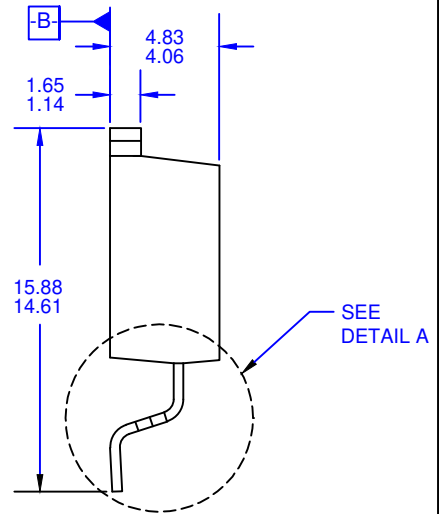
FRONT VIEW - DIODE PRODUCTS VERSION
ALTERNATIVE SUPPLIER DETAIL



LAND PATTERN RECOMMENDATION
UNLESS NOTED, ALL DIMS TYPICAL



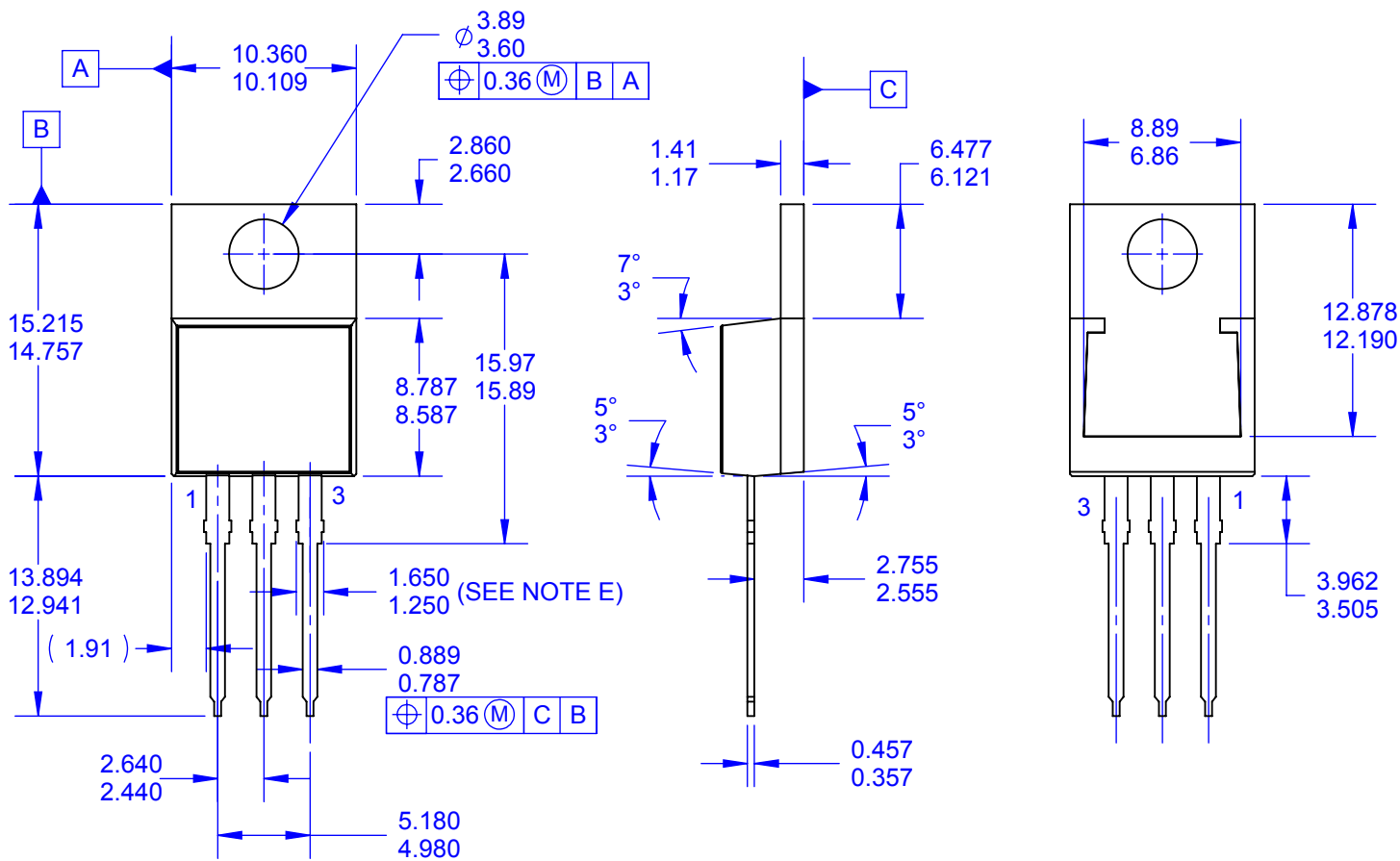
BACK VIEW - DIODE PRODUCTS VERSION
ALTERNATIVE SUPPLIER DETAIL



NOTES: UNLESS OTHERWISE SPECIFIED

- A) ALL DIMENSIONS ARE IN MILLIMETERS.
- B) REFERENCE JEDEC, TO-263, VARIATION AB.
- C) DIMENSIONING AND TOLERANCING PER ASME Y14.5 - 2009.
- D) LOCATION OF THE PIN HOLE MAY VARY (LOWER LEFT CORNER, LOWER CENTER AND CENTER OF THE PACKAGE).
- E) LANDPATTERN RECOMMENDATION PER IPC TO254P1524X482-3N
- F) FILENAME: TO263A02REV8





NOTES:

- A. PACKAGE REFERENCE: JEDEC TO220 VARIATION AB
- B. ALL DIMENSIONS ARE IN MILLIMETERS.
- C. DIMENSION AND TOLERANCE AS PER ASME Y14.5-2009.
- D. DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLD FLASH AND TIE BAR PROTRUSIONS.
- E. MAX WIDTH FOR F102 DEVICE = 1.35mm.
- F. DRAWING FILE NAME: TO220T03REV4.
- G. FAIRCHILD SEMICONDUCTOR.

ON Semiconductor and  are trademarks of Semiconductor Components Industries, LLC dba ON Semiconductor or its subsidiaries in the United States and/or other countries. ON Semiconductor owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of ON Semiconductor's product/patent coverage may be accessed at www.onsemi.com/site/pdf/Patent-Marking.pdf. ON Semiconductor reserves the right to make changes without further notice to any products herein. ON Semiconductor makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does ON Semiconductor assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. Buyer is responsible for its products and applications using ON Semiconductor products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by ON Semiconductor. "Typical" parameters which may be provided in ON Semiconductor data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. ON Semiconductor does not convey any license under its patent rights nor the rights of others. ON Semiconductor products are not designed, intended, or authorized for use as a critical component in life support systems or any FDA Class 3 medical devices or medical devices with a same or similar classification in a foreign jurisdiction or any devices intended for implantation in the human body. Should Buyer purchase or use ON Semiconductor products for any such unintended or unauthorized application, Buyer shall indemnify and hold ON Semiconductor and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that ON Semiconductor was negligent regarding the design or manufacture of the part. ON Semiconductor is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:

Literature Distribution Center for ON Semiconductor
19521 E. 32nd Pkwy, Aurora, Colorado 80011 USA
Phone: 303-675-2175 or 800-344-3860 Toll Free USA/Canada
Fax: 303-675-2176 or 800-344-3867 Toll Free USA/Canada
Email: orderlit@onsemi.com

N. American Technical Support: 800-282-9855 Toll Free
USA/Canada
Europe, Middle East and Africa Technical Support:
Phone: 421 33 790 2910
Japan Customer Focus Center
Phone: 81-3-5817-1050

ON Semiconductor Website: www.onsemi.com
Order Literature: <http://www.onsemi.com/orderlit>
For additional information, please contact your local
Sales Representative