

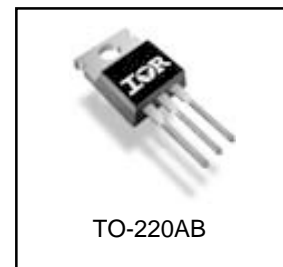
Applications

- High frequency DC-DC converters

| | | |
|------------------------|-------------------------------|----------------------|
| V_{DSS} | R_{DS(on) max} | I_D |
| 200V | 0.040Ω | 56A |

Benefits

- Low Gate-to-Drain Charge to Reduce Switching Losses
- Fully Characterized Capacitance Including Effective C_{OSS} to Simplify Design, (See App. Note AN1001)
- Fully Characterized Avalanche Voltage and Current



Absolute Maximum Ratings

| | Parameter | Max. | Units |
|---|---|--------------------|-------|
| I _D @ T _C = 25°C | Continuous Drain Current, V _{GS} @ 10V | 56 | A |
| I _D @ T _C = 100°C | Continuous Drain Current, V _{GS} @ 10V | 40 | |
| I _{DM} | Pulsed Drain Current ① | 220 | |
| P _D @ T _C = 25°C | Power Dissipation | 380 | W |
| | Linear Derating Factor | 2.5 | W/°C |
| V _{GS} | Gate-to-Source Voltage | ± 20 | V |
| dv/dt | Peak Diode Recovery dv/dt ③ | 10 | V/ns |
| T _J | Operating Junction and | -55 to + 175 | °C |
| T _{STG} | Storage Temperature Range | | |
| | Soldering Temperature, for 10 seconds | | |
| | Mounting torque, 6-32 or M3 screw | 10 lbf•in (1.1N•m) | |

Thermal Resistance

| | Parameter | Typ. | Max. | Units |
|------------------|-------------------------------------|------|------|-------|
| R _{θJC} | Junction-to-Case | — | 0.40 | °C/W |
| R _{θCS} | Case-to-Sink, Flat, Greased Surface | 0.50 | — | |
| R _{θJA} | Junction-to-Ambient | — | 62 | |

Notes ① through ⑤ are on page 8

www.irf.com

IRFB260N

International
IR Rectifier

Static @ $T_J = 25^\circ\text{C}$ (unless otherwise specified)

| | Parameter | Min. | Typ. | Max. | Units | Conditions |
|---------------------------------|--------------------------------------|------|------|-------|----------|---|
| $V_{(BR)DSS}$ | Drain-to-Source Breakdown Voltage | 200 | — | — | V | $V_{GS} = 0V, I_D = 250\mu A$ |
| $\Delta V_{(BR)DSS}/\Delta T_J$ | Breakdown Voltage Temp. Coefficient | — | 0.26 | — | V/°C | Reference to $25^\circ\text{C}, I_D = 1\text{mA}$ |
| $R_{DS(on)}$ | Static Drain-to-Source On-Resistance | — | — | 0.040 | Ω | $V_{GS} = 10V, I_D = 34A$ ④ |
| $V_{GS(th)}$ | Gate Threshold Voltage | 2.0 | — | 4.0 | V | $V_{DS} = V_{GS}, I_D = 250\mu A$ |
| I_{DSS} | Drain-to-Source Leakage Current | — | — | 25 | μA | $V_{DS} = 200V, V_{GS} = 0V$ |
| | | — | — | 250 | | $V_{DS} = 160V, V_{GS} = 0V, T_J = 150^\circ\text{C}$ |
| I_{GSS} | Gate-to-Source Forward Leakage | — | — | 100 | nA | $V_{GS} = 20V$ |
| | Gate-to-Source Reverse Leakage | — | — | -100 | | $V_{GS} = -20V$ |

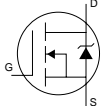
Dynamic @ $T_J = 25^\circ\text{C}$ (unless otherwise specified)

| | Parameter | Min. | Typ. | Max. | Units | Conditions |
|------------------------|---------------------------------|------|------|------|-------|---|
| g_{fs} | Forward Transconductance | 29 | — | — | S | $V_{DS} = 50V, I_D = 34A$ |
| Q_g | Total Gate Charge | — | 150 | 220 | nC | $I_D = 34A$ $V_{DS} = 160V$ $V_{GS} = 10V$ ④ |
| Q_{gs} | Gate-to-Source Charge | — | 24 | 37 | | |
| Q_{gd} | Gate-to-Drain ("Miller") Charge | — | 67 | 100 | | |
| $t_{d(on)}$ | Turn-On Delay Time | — | 17 | — | | |
| t_r | Rise Time | — | 64 | — | ns | $V_{DD} = 100V$ $I_D = 34A$ $R_G = 1.8\Omega$ $V_{GS} = 10V$ ④ |
| $t_{d(off)}$ | Turn-Off Delay Time | — | 52 | — | | |
| t_f | Fall Time | — | 50 | — | | |
| C_{iss} | Input Capacitance | — | 4220 | — | pF | $V_{GS} = 0V$ $V_{DS} = 25V$ $f = 1.0\text{MHz}$ $V_{GS} = 0V, V_{DS} = 1.0V, f = 1.0\text{MHz}$ $V_{GS} = 0V, V_{DS} = 160V, f = 1.0\text{MHz}$ $V_{GS} = 0V, V_{DS} = 0V \text{ to } 160V$ ⑤ |
| C_{oss} | Output Capacitance | — | 580 | — | | |
| C_{rss} | Reverse Transfer Capacitance | — | 140 | — | | |
| C_{oss} | Output Capacitance | — | 5080 | — | | |
| C_{oss} | Output Capacitance | — | 230 | — | | |
| $C_{oss \text{ eff.}}$ | Effective Output Capacitance | — | 500 | — | | |

Avalanche Characteristics

| | Parameter | Typ. | Max. | Units |
|----------|--------------------------------|------|------|-------|
| E_{AS} | Single Pulse Avalanche Energy② | — | 450 | mJ |
| I_{AR} | Avalanche Current① | — | 34 | A |
| E_{AR} | Repetitive Avalanche Energy① | — | 38 | mJ |

Diode Characteristics

| | Parameter | Min. | Typ. | Max. | Units | Conditions |
|----------|--|---|------|------|---------|--|
| I_S | Continuous Source Current (Body Diode) | — | — | 56 | A | MOSFET symbol showing the integral reverse p-n junction diode.  |
| I_{SM} | Pulsed Source Current (Body Diode) ① | — | — | 220 | | |
| V_{SD} | Diode Forward Voltage | — | — | 1.3 | V | $T_J = 25^\circ\text{C}, I_S = 34A, V_{GS} = 0V$ ④ |
| t_{rr} | Reverse Recovery Time | — | 240 | 360 | ns | $T_J = 25^\circ\text{C}, I_F = 34A$ |
| Q_{rr} | Reverse Recovery Charge | — | 2.1 | 3.2 | μC | $di/dt = 100A/\mu s$ ④ |
| t_{on} | Forward Turn-On Time | Intrinsic turn-on time is negligible (turn-on is dominated by $L_S + L_D$) | | | | |

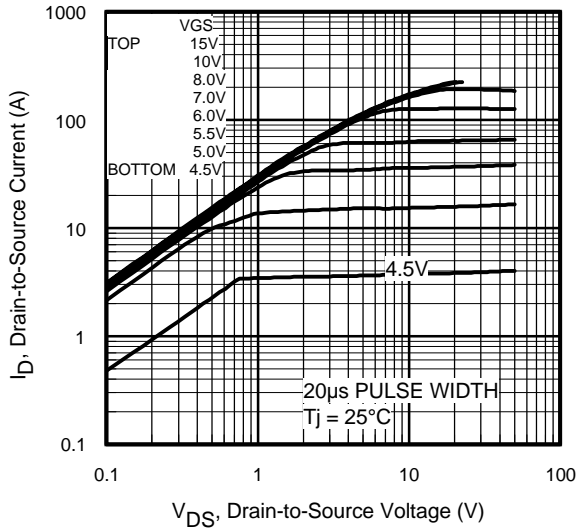


Fig 1. Typical Output Characteristics

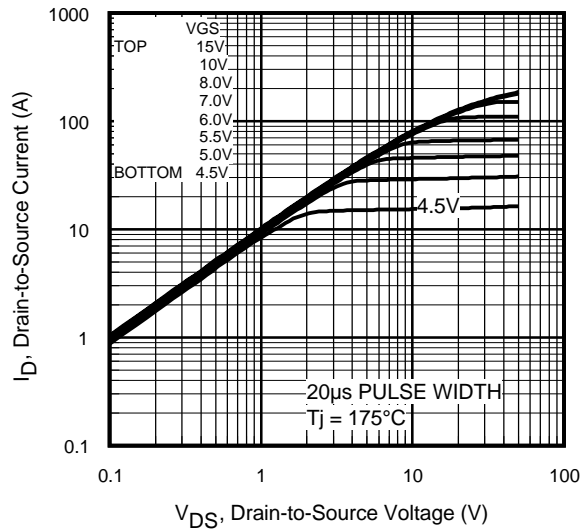


Fig 2. Typical Output Characteristics

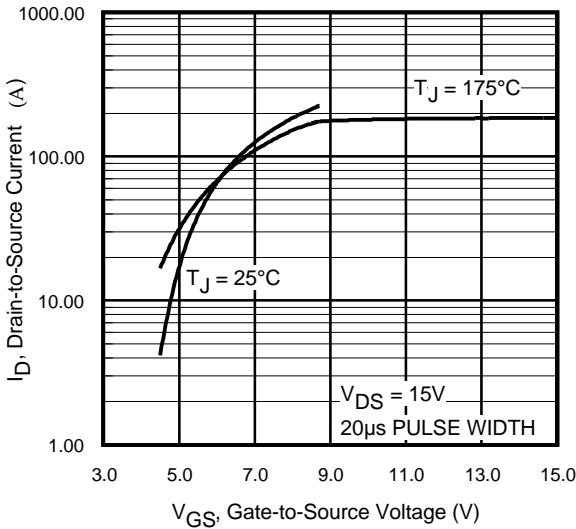


Fig 3. Typical Transfer Characteristics

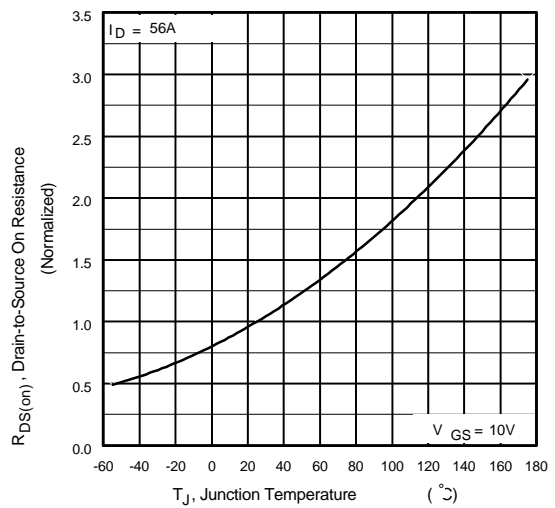


Fig 4. Normalized On-Resistance Vs. Temperature

IRFB260N

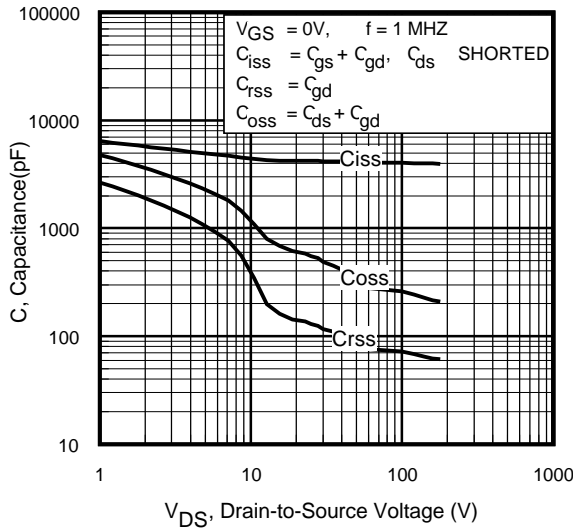


Fig 5. Typical Capacitance Vs. Drain-to-Source Voltage

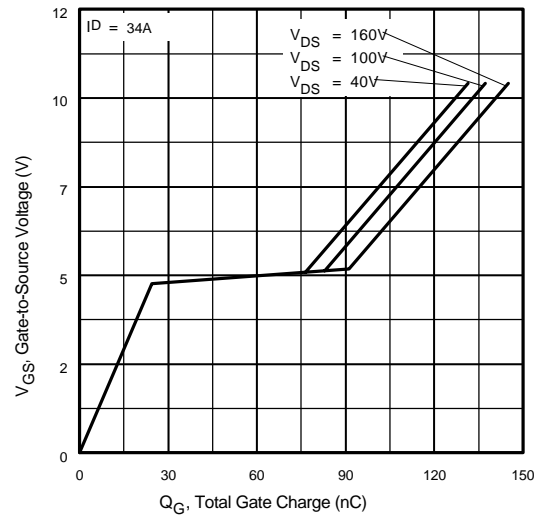


Fig 6. Typical Gate Charge Vs. Gate-to-Source Voltage

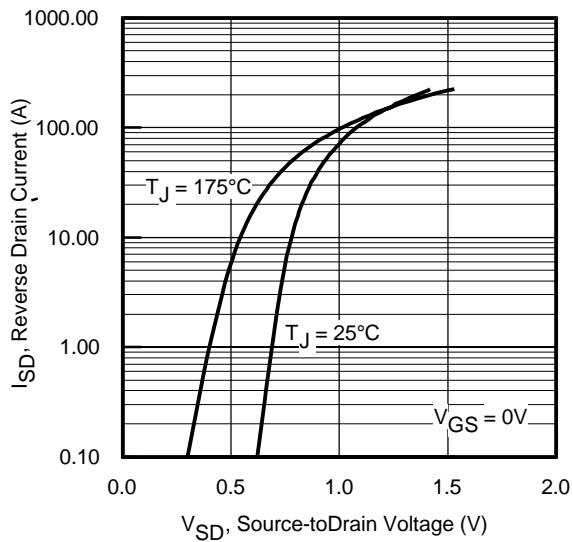


Fig 7. Typical Source-Drain Diode Forward Voltage

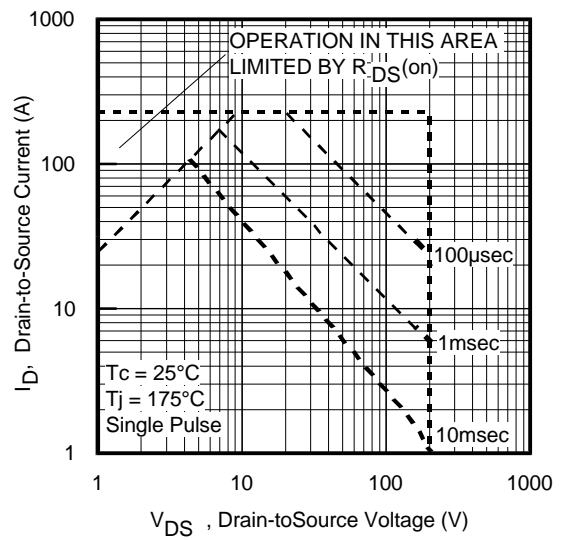


Fig 8. Maximum Safe Operating Area

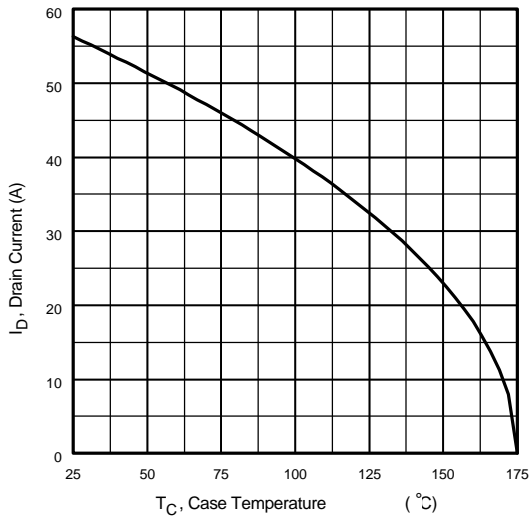


Fig 9. Maximum Drain Current Vs. Case Temperature

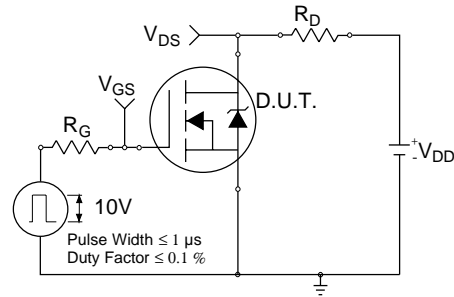


Fig 10a. Switching Time Test Circuit

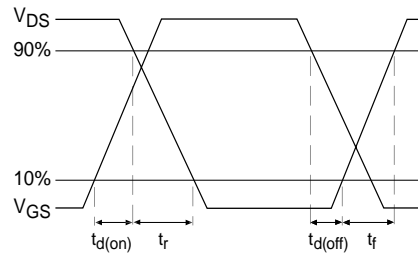


Fig 10b. Switching Time Waveforms

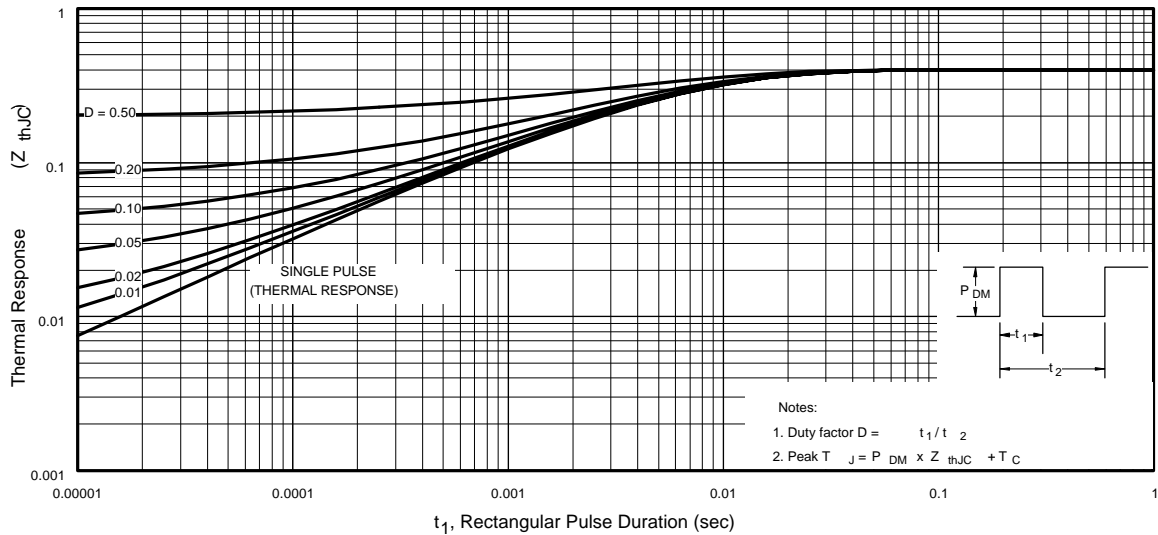


Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Case

IRFB260N

International
IR Rectifier

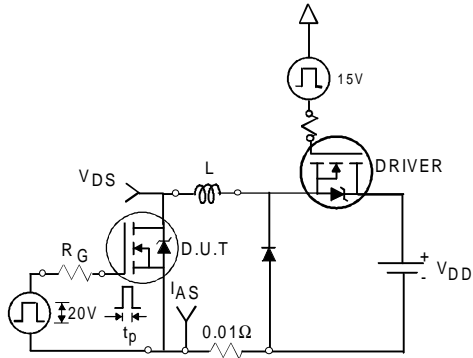


Fig 12a. Unclamped Inductive Test Circuit

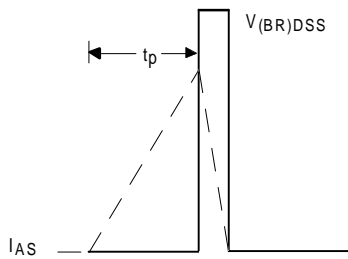


Fig 12b. Unclamped Inductive Waveforms

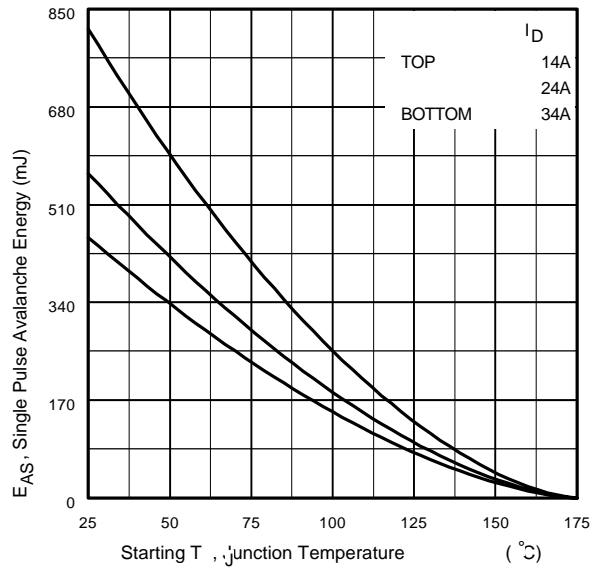


Fig 12c. Maximum Avalanche Energy Vs. Drain Current

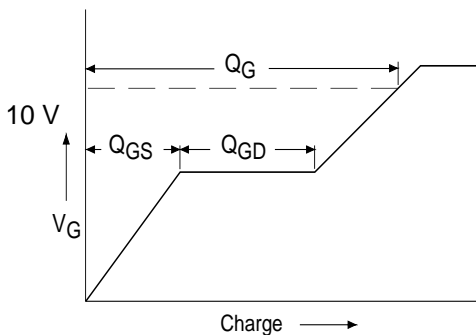


Fig 13a. Basic Gate Charge Waveform

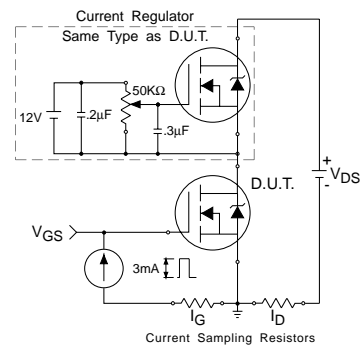
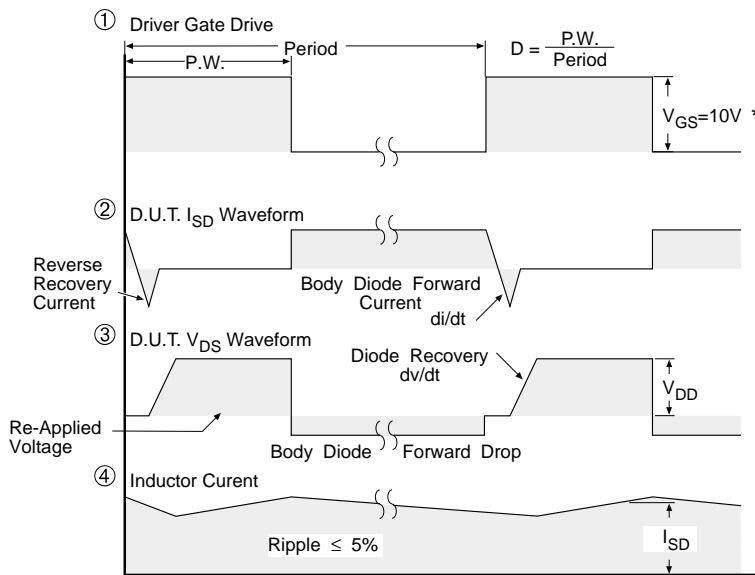
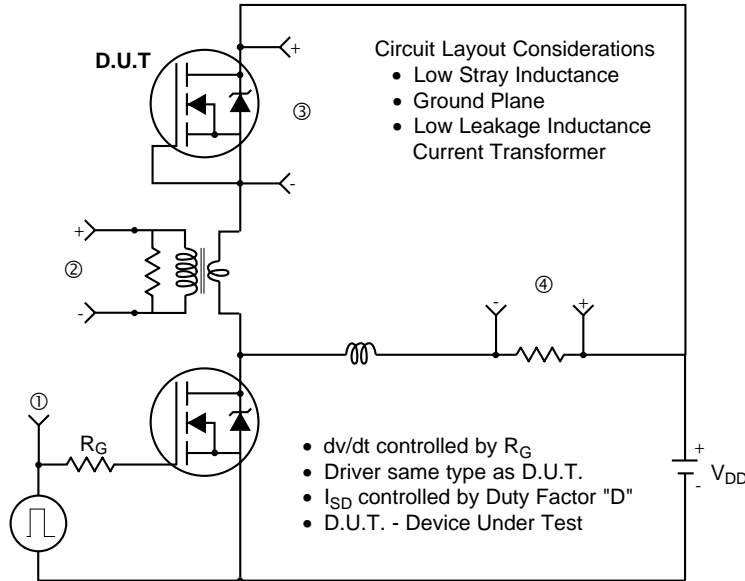


Fig 13b. Gate Charge Test Circuit

Peak Diode Recovery dv/dt Test Circuit



* $V_{GS} = 5V$ for Logic Level Devices

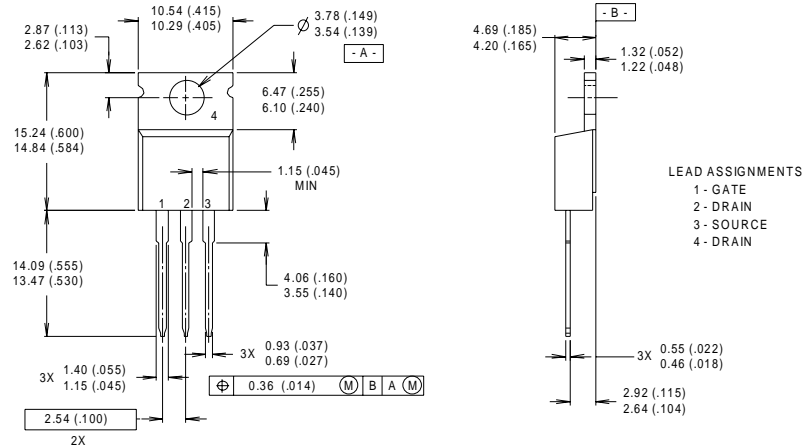
Fig 14. For N-Channel HEXFET® Power MOSFETs

IRFB260N

International
IR Rectifier

TO-220AB Package Outline

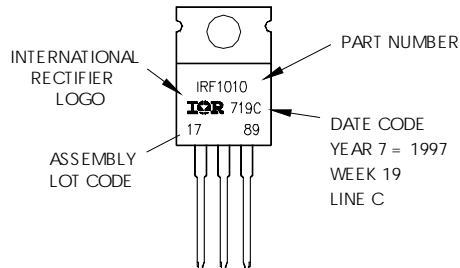
Dimensions are shown in millimeters (inches)



- NOTES:**
- 1 DIMENSIONING & TOLERANCING PER ANSI Y14.5M, 1982.
 - 2 CONTROLLING DIMENSION : INCH
 - 3 OUTLINE CONFORMS TO JEDEC OUTLINE TO-220AB.
 - 4 HEATSINK & LEAD MEASUREMENTS DO NOT INCLUDE BURRS.

TO-220AB Part Marking Information

EXAMPLE: THIS IS AN IRF1010
LOT CODE 1789
ASSEMBLED ON WW 19, 1997
IN THE ASSEMBLY LINE "C"



Notes:

- ① Repetitive rating; pulse width limited by max. junction temperature.
- ② Starting $T_J = 25^\circ\text{C}$, $L = 0.78\text{mH}$
 $R_G = 25\Omega$, $I_{AS} = 34\text{A}$.
- ③ $I_{SD} \leq 34$, $di/dt \leq 480\text{A}/\mu\text{s}$, $V_{DD} \leq V_{(BR)DSS}$,
 $T_J \leq 175^\circ\text{C}$
- ④ Pulse width $\leq 300\mu\text{s}$; duty cycle $\leq 2\%$.
- ⑤ C_{OSS} eff. is a fixed capacitance that gives the same charging time as C_{OSS} while V_{DS} is rising from 0 to 80% V_{DSS}

Data and specifications subject to change without notice.
This product has been designed and qualified for the Industrial market.
Qualification Standards can be found on IR's Web site.

International
IR Rectifier

IR WORLD HEADQUARTERS: 233 Kansas St., El Segundo, California 90245, USA Tel: (310) 252-7105
TAC Fax: (310) 252-7903

Visit us at www.irf.com for sales contact information.08/01

www.irf.com

This datasheet has been downloaded from:

www.DatasheetCatalog.com

Datasheets for electronic components.



LittleDiode supplies new, hard to find or obsolete electronic components and semiconductors all over the world.

With over two million different components listed you are sure to find the part you need.

Feel free to visit us today at our online store:

LittleDiode.com

Looking forward to providing you with the best possible service.