

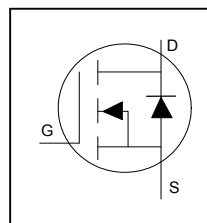
## Application

- Brushed Motor drive applications
- BLDC Motor drive applications
- Battery powered circuits
- Half-bridge and full-bridge topologies
- Synchronous rectifier applications
- Resonant mode power supplies
- OR-ing and redundant power switches
- DC/DC and AC/DC converters
- DC/AC Inverters

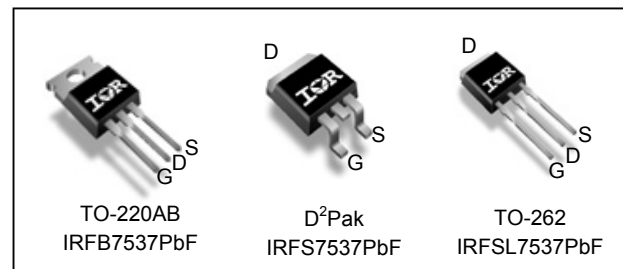
## Benefits

- Improved Gate, Avalanche and Dynamic dV/dt Ruggedness
- Fully Characterized Capacitance and Avalanche SOA
- Enhanced body diode dV/dt and dI/dt Capability
- Lead-Free, RoHS Compliant

HEXFET® Power MOSFET

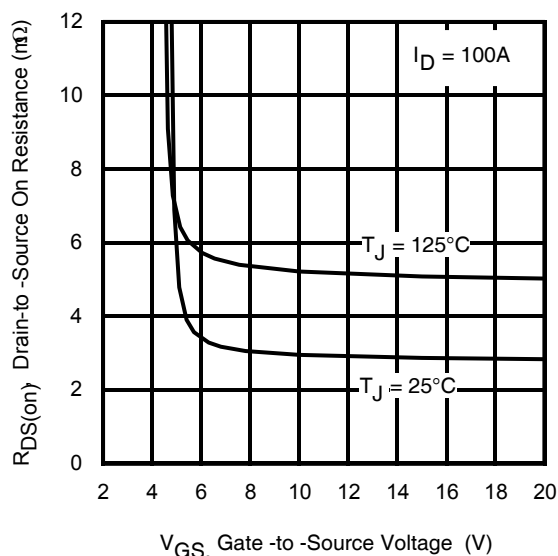


|                   |        |
|-------------------|--------|
| $V_{DS}$          | 60V    |
| $R_{DS(on)}$ typ. | 2.75mΩ |
| max               | 3.30mΩ |
| $I_D$             | 173A   |

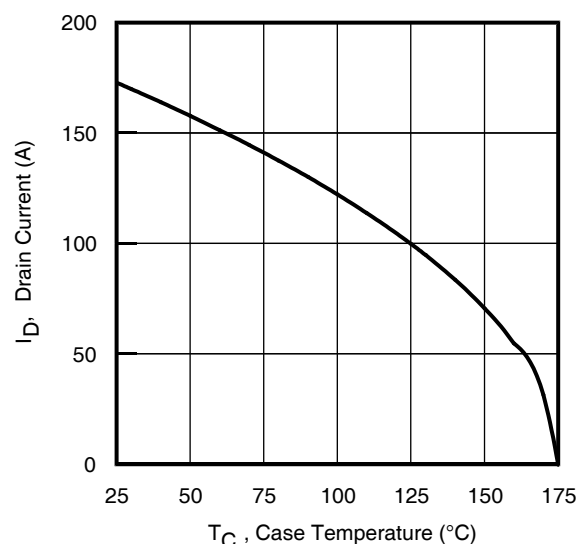


|          |          |          |
|----------|----------|----------|
| <b>G</b> | <b>D</b> | <b>S</b> |
| Gate     | Drain    | Source   |

| Base part number | Package Type | Standard Pack      |          | Orderable Part Number |
|------------------|--------------|--------------------|----------|-----------------------|
|                  |              | Form               | Quantity |                       |
| IRFB7537PbF      | TO-220       | Tube               | 50       | IRFB7537PbF           |
| IRFSL7537PbF     | TO-262       | Tube               | 50       | IRFSL7537PbF          |
| IRFS7537PbF      | D²-Pak       | Tube               | 50       | IRFS7537PbF           |
|                  |              | Tape and Reel Left | 800      | IRFS7537TRLpBF        |



**Fig 1.** Typical On-Resistance vs. Gate Voltage



**Fig 2.** Maximum Drain Current vs. Case Temperature

# Absolute Maximum Rating

| Symbol                          | Parameter                                               | Max.                | Units |
|---------------------------------|---------------------------------------------------------|---------------------|-------|
| $I_D @ T_C = 25^\circ\text{C}$  | Continuous Drain Current, $V_{GS} @ 10\text{V}$         | 173                 | A     |
| $I_D @ T_C = 100^\circ\text{C}$ | Continuous Drain Current, $V_{GS} @ 10\text{V}$         | 122                 |       |
| $I_{DM}$                        | Pulsed Drain Current ①                                  | 700                 |       |
| $P_D @ T_C = 25^\circ\text{C}$  | Maximum Power Dissipation                               | 230                 | W     |
|                                 | Linear Derating Factor                                  | 1.5                 | W/°C  |
| $V_{GS}$                        | Gate-to-Source Voltage                                  | $\pm 20$            | V     |
| $T_J$<br>$T_{STG}$              | Operating Junction and<br>Storage Temperature Range     | -55 to + 175        | °C    |
|                                 | Soldering Temperature, for 10 seconds (1.6mm from case) | 300                 |       |
|                                 | Mounting Torque, 6-32 or M3 Screw                       | 10 lbf·in (1.1 N·m) |       |

# Avalanche Characteristics

|                  |                                 |                          |    |
|------------------|---------------------------------|--------------------------|----|
| $E_{AS}$         | Single Pulse Avalanche Energy ② | 270                      | mJ |
| $E_{AS (L=1mH)}$ | Single Pulse Avalanche Energy ③ | 554                      |    |
| $I_{AR}$         | Avalanche Current ①             | See Fig 15, 16, 23a, 23b | A  |
| $E_{AR}$         | Repetitive Avalanche Energy ①   |                          | mJ |

# Thermal Resistance

| Symbol          | Parameter                                              | Typ. | Max. | Units |
|-----------------|--------------------------------------------------------|------|------|-------|
| $R_{\theta JC}$ | Junction-to-Case ⑦                                     | —    | 0.65 | °C/W  |
| $R_{\theta CS}$ | Case-to-Sink, Flat Greased Surface                     | 0.50 | —    |       |
| $R_{\theta JA}$ | Junction-to-Ambient (TO-220)                           | —    | 62   |       |
| $R_{\theta JA}$ | Junction-to-Ambient (PCB Mount) (D <sup>2</sup> -Pak)⑧ | —    | 40   |       |

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

| Symbol                          | Parameter                            | Min. | Typ. | Max. | Units | Conditions                                                               |
|---------------------------------|--------------------------------------|------|------|------|-------|--------------------------------------------------------------------------|
| $V_{(BR)DSS}$                   | Drain-to-Source Breakdown Voltage    | 60   | —    | —    | V     | $V_{GS} = 0\text{V}$ , $I_D = 250\mu\text{A}$                            |
| $\Delta V_{(BR)DSS}/\Delta T_J$ | Breakdown Voltage Temp. Coefficient  | —    | 40   | —    | mV/°C | Reference to $25^\circ\text{C}$ , $I_D = 1\text{mA}$ ①                   |
| $R_{DS(on)}$                    | Static Drain-to-Source On-Resistance | —    | 2.75 | 3.30 | mΩ    | $V_{GS} = 10\text{V}$ , $I_D = 100\text{A}$                              |
|                                 |                                      | —    | 3.50 | —    |       | $V_{GS} = 6.0\text{V}$ , $I_D = 50\text{A}$                              |
| $V_{GS(th)}$                    | Gate Threshold Voltage               | 2.1  | —    | 3.7  | V     | $V_{DS} = V_{GS}$ , $I_D = 150\mu\text{A}$                               |
| $I_{DSS}$                       | Drain-to-Source Leakage Current      | —    | —    | 1.0  | μA    | $V_{DS} = 60\text{V}$ , $V_{GS} = 0\text{V}$                             |
|                                 |                                      | —    | —    | 150  |       | $V_{DS} = 60\text{V}$ , $V_{GS} = 0\text{V}$ , $T_J = 125^\circ\text{C}$ |
| $I_{GSS}$                       | Gate-to-Source Forward Leakage       | —    | —    | 100  | nA    | $V_{GS} = 20\text{V}$                                                    |
|                                 | Gate-to-Source Reverse Leakage       | —    | —    | -100 |       | $V_{GS} = -20\text{V}$                                                   |
| $R_G$                           | Gate Resistance                      | —    | 2.0  | —    | Ω     |                                                                          |

# Notes:

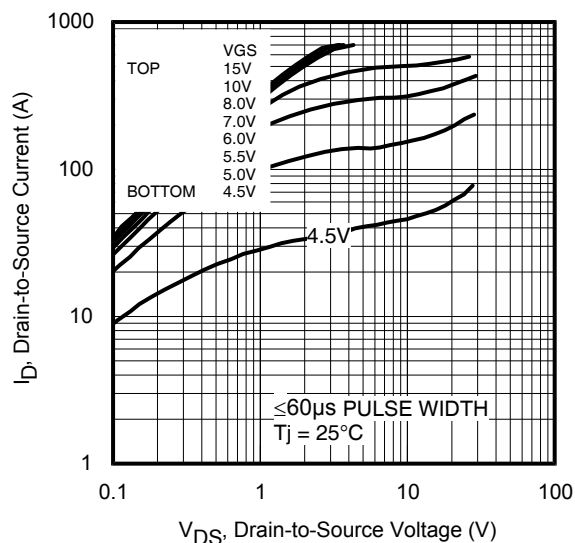
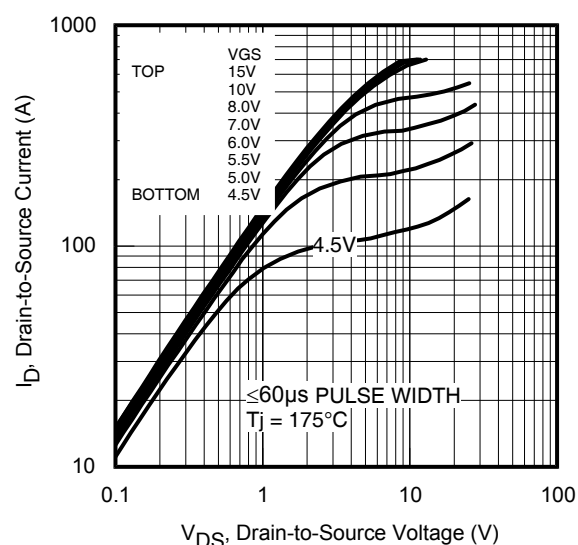
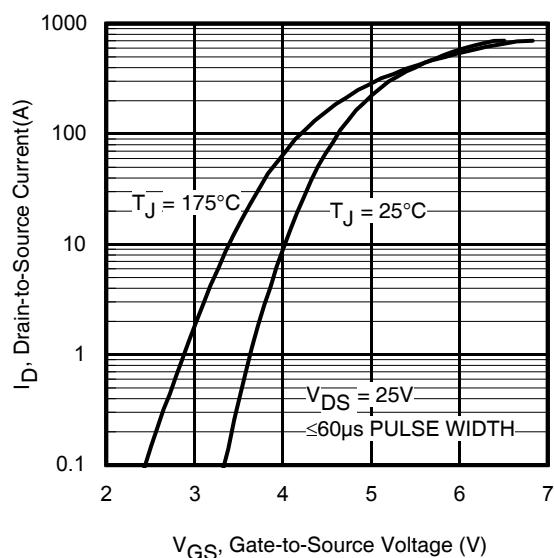
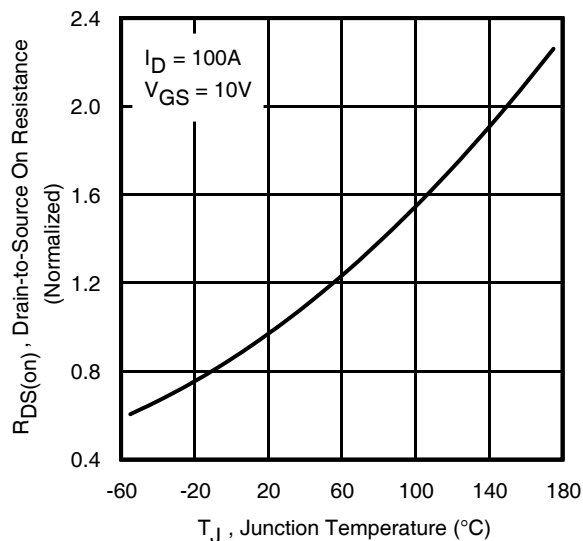
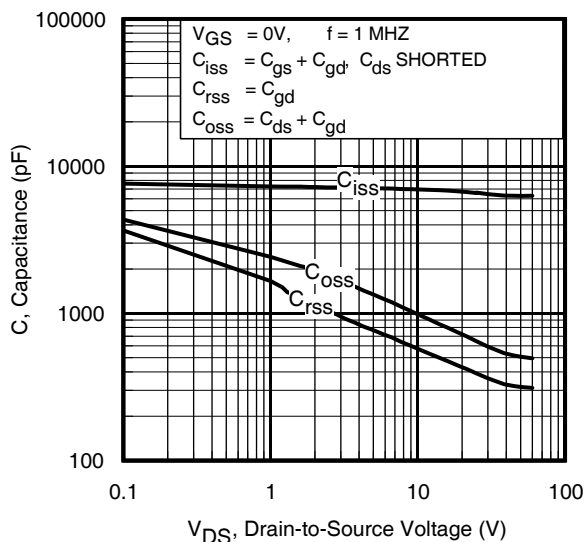
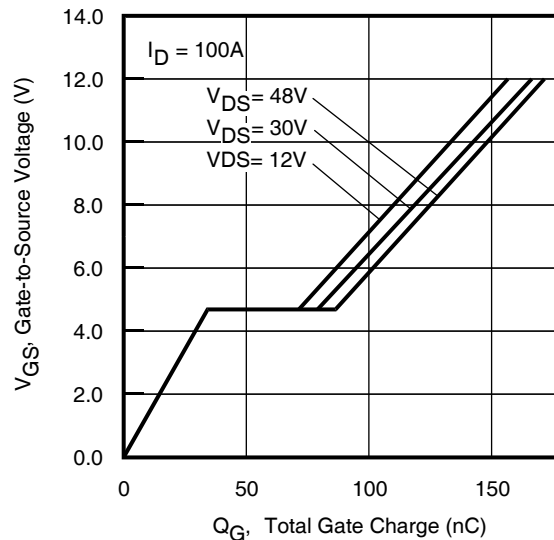
- ① Repetitive rating; pulse width limited by max. junction temperature.
- ② Limited by  $T_{Jmax}$ , starting  $T_J = 25^\circ\text{C}$ ,  $L = 54\mu\text{H}$ ,  $R_G = 50\Omega$ ,  $I_{AS} = 100\text{A}$ ,  $V_{GS} = 10\text{V}$ .
- ③  $I_{SD} \leq 100\text{A}$ ,  $di/dt \leq 1130\text{A}/\mu\text{s}$ ,  $V_{DD} \leq V_{(BR)DSS}$ ,  $T_J \leq 175^\circ\text{C}$ .
- ④ Pulse width  $\leq 400\mu\text{s}$ ; duty cycle  $\leq 2\%$ .
- ⑤  $C_{oss}$  eff. (TR) is a fixed capacitance that gives the same charging time as  $C_{oss}$  while  $V_{DS}$  is rising from 0 to 80%  $V_{DSS}$ .
- ⑥  $C_{oss}$  eff. (ER) is a fixed capacitance that gives the same energy as  $C_{oss}$  while  $V_{DS}$  is rising from 0 to 80%  $V_{DSS}$ .
- ⑦  $R_\theta$  is measured at  $T_J$  approximately  $90^\circ\text{C}$ .
- ⑧ When mounted on 1" square PCB (FR-4 or G-10 Material). For recommended footprint and soldering techniques refer to application note #AN-994.: <http://www.irf.com/technical-info/appnotes/an-994.pdf>
- ⑨ Limited by  $T_{Jmax}$ , starting  $T_J = 25^\circ\text{C}$ ,  $L = 1\text{mH}$ ,  $R_G = 50\Omega$ ,  $I_{AS} = 33\text{A}$ ,  $V_{GS} = 10\text{V}$ .

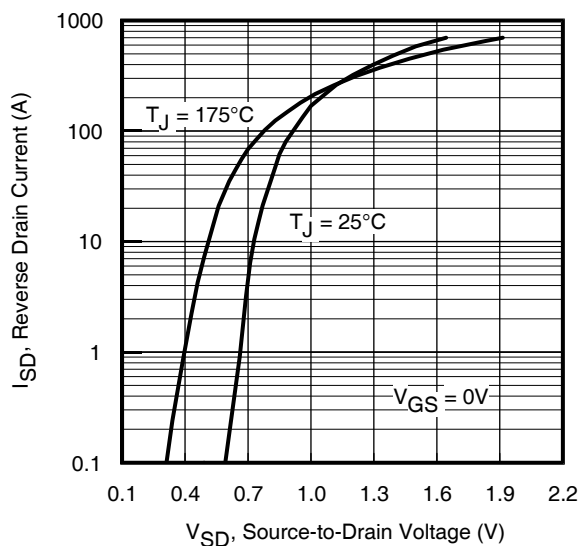
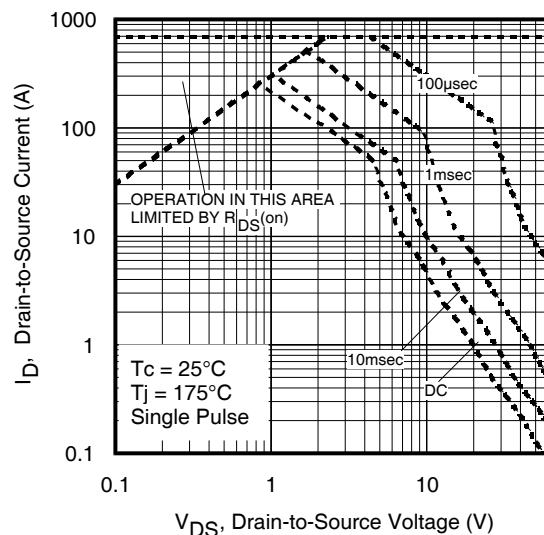
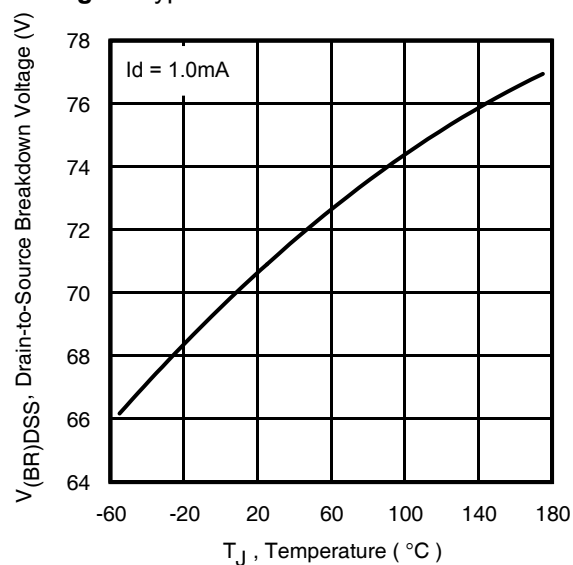
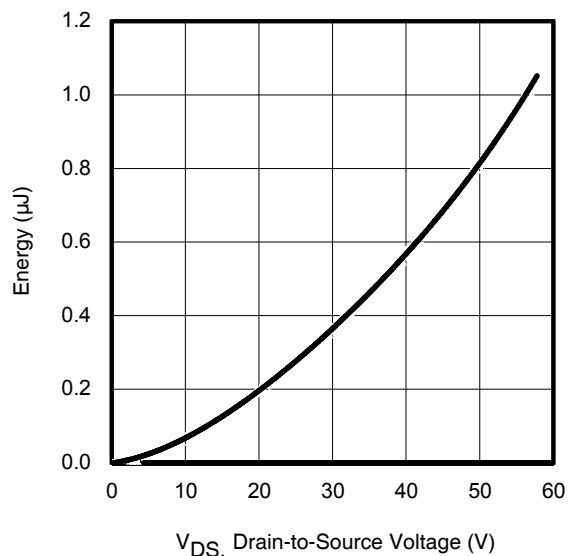
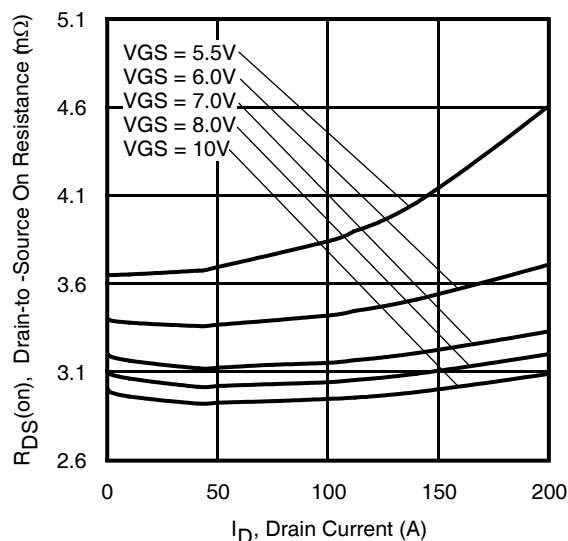
**Dynamic Electrical Characteristics @  $T_J = 25^\circ\text{C}$  (unless otherwise specified)**

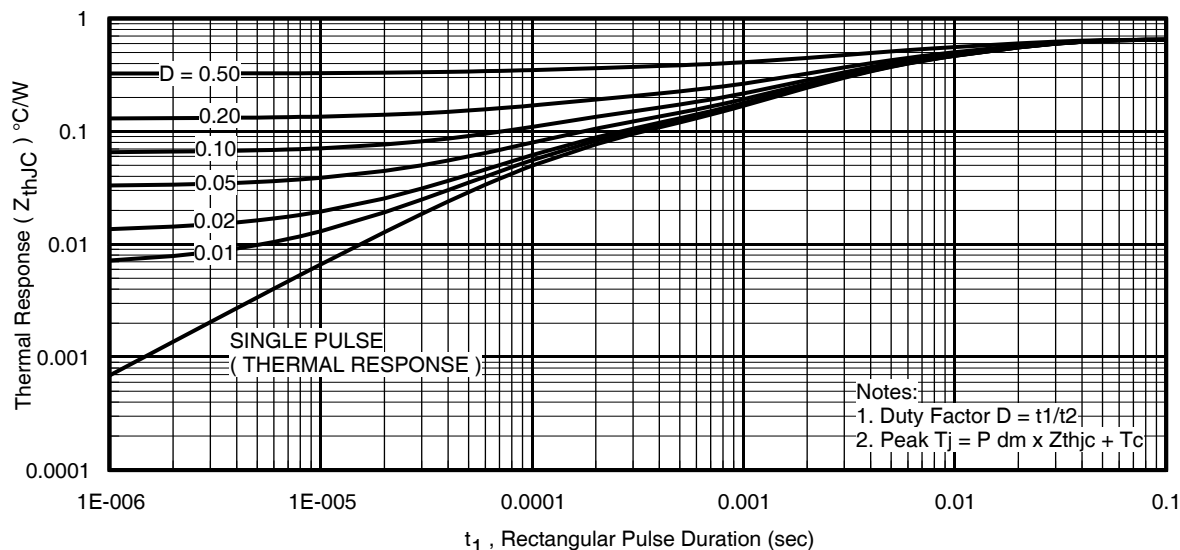
| Symbol                      | Parameter                                     | Min. | Typ. | Max. | Units | Conditions                                                                                                                                                          |
|-----------------------------|-----------------------------------------------|------|------|------|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| $g_{fs}$                    | Forward Transconductance                      | 190  | —    | —    | S     | $V_{DS} = 10V, I_D = 100A$                                                                                                                                          |
| $Q_g$                       | Total Gate Charge                             | —    | 142  | 210  | nC    | $I_D = 100A$<br>$V_{DS} = 30V$<br>$V_{GS} = 10V$                                                                                                                    |
| $Q_{gs}$                    | Gate-to-Source Charge                         | —    | 36   | —    |       |                                                                                                                                                                     |
| $Q_{gd}$                    | Gate-to-Drain Charge                          | —    | 43   | —    |       |                                                                                                                                                                     |
| $Q_{sync}$                  | Total Gate Charge Sync. ( $Q_g - Q_{gd}$ )    | —    | 99   | —    |       |                                                                                                                                                                     |
| $t_{d(on)}$                 | Turn-On Delay Time                            | —    | 15   | —    | ns    | $V_{DD} = 30V$<br>$I_D = 100A$<br>$R_G = 2.7\Omega$<br>$V_{GS} = 10V^{(4)}$                                                                                         |
| $t_r$                       | Rise Time                                     | —    | 105  | —    |       |                                                                                                                                                                     |
| $t_{d(off)}$                | Turn-Off Delay Time                           | —    | 82   | —    |       |                                                                                                                                                                     |
| $t_f$                       | Fall Time                                     | —    | 84   | —    |       |                                                                                                                                                                     |
| $C_{iss}$                   | Input Capacitance                             | —    | 7020 | —    | pF    | $V_{GS} = 0V$<br>$V_{DS} = 25V$<br>$f = 1.0MHz$ , See Fig.7<br>$V_{GS} = 0V, V_{DS} = 0V \text{ to } 48V^{(6)}$<br>$V_{GS} = 0V, V_{DS} = 0V \text{ to } 48V^{(5)}$ |
| $C_{oss}$                   | Output Capacitance                            | —    | 640  | —    |       |                                                                                                                                                                     |
| $C_{rss}$                   | Reverse Transfer Capacitance                  | —    | 395  | —    |       |                                                                                                                                                                     |
| $C_{oss \text{ eff. (ER)}}$ | Effective Output Capacitance (Energy Related) | —    | 665  | —    |       |                                                                                                                                                                     |
| $C_{oss \text{ eff. (TR)}}$ | Output Capacitance (Time Related)             | —    | 880  | —    |       |                                                                                                                                                                     |

**Diode Characteristics**

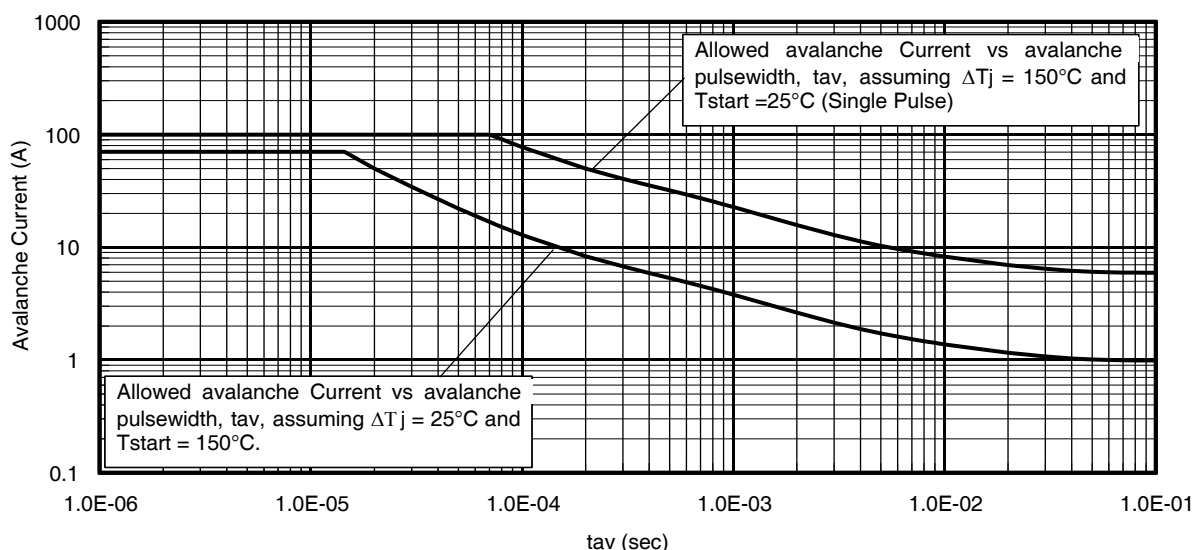
| Symbol    | Parameter                              | Min. | Typ.     | Max. | Units | Conditions                                                                                                                                                          |
|-----------|----------------------------------------|------|----------|------|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| $I_S$     | Continuous Source Current (Body Diode) | —    | —        | 173  | A     | MOSFET symbol showing the integral reverse p-n junction diode.                  |
| $I_{SM}$  | Pulsed Source Current (Body Diode) ①   | —    | —        | 700  |       |                                                                                                                                                                     |
| $V_{SD}$  | Diode Forward Voltage                  | —    | —        | 1.2  | V     | $T_J = 25^\circ\text{C}, I_S = 100A, V_{GS} = 0V$ ④                                                                                                                 |
| $dv/dt$   | Peak Diode Recovery $dv/dt$ ③          | —    | 10       | —    | V/ns  | $T_J = 175^\circ\text{C}, I_S = 100A, V_{DS} = 60V$                                                                                                                 |
| $t_{rr}$  | Reverse Recovery Time                  | —    | 39<br>41 | —    | ns    | $T_J = 25^\circ\text{C}$ $V_{DD} = 51V$<br>$T_J = 125^\circ\text{C}$ $I_F = 100A$ ,<br>$T_J = 25^\circ\text{C}$ $di/dt = 100A/\mu s$ ④<br>$T_J = 125^\circ\text{C}$ |
| $Q_{rr}$  | Reverse Recovery Charge                | —    | 46<br>56 | —    |       |                                                                                                                                                                     |
| $I_{RRM}$ | Reverse Recovery Current               | —    | 2.1      | —    | A     | $T_J = 25^\circ\text{C}$                                                                                                                                            |


**Fig 3.** Typical Output Characteristics

**Fig 4.** Typical Output Characteristics

**Fig 5.** Typical Transfer Characteristics

**Fig 6.** Normalized On-Resistance vs. Temperature

**Fig 7.** Typical Capacitance vs. Drain-to-Source Voltage

**Fig 8.** Typical Gate Charge vs. Gate-to-Source Voltage

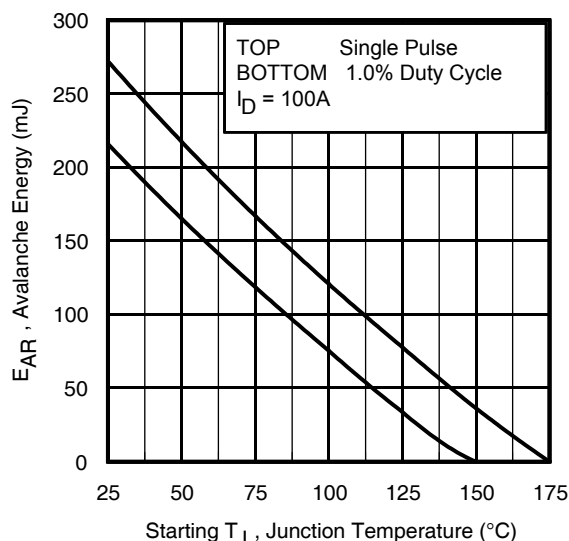

**Fig 9.** Typical Source-Drain Diode Forward Voltage

**Fig 10.** Maximum Safe Operating Area

**Fig 11.** Drain-to-Source Breakdown Voltage

**Fig 12.** Typical  $C_{oss}$  Stored Energy

**Fig 13.** Typical On-Resistance vs. Drain Current



**Fig 14.** Maximum Effective Transient Thermal Impedance, Junction-to-Case



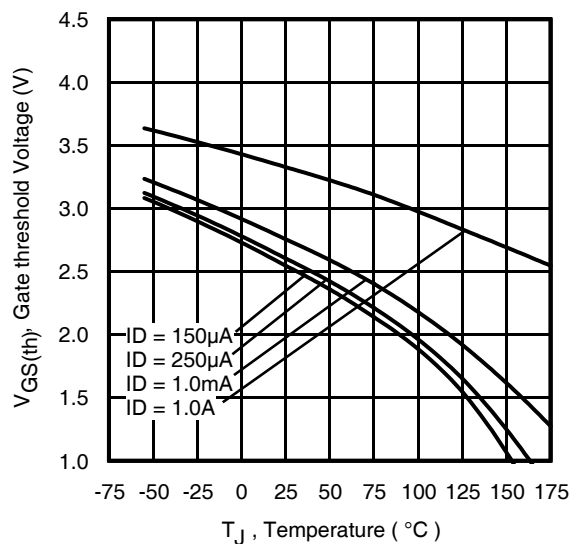
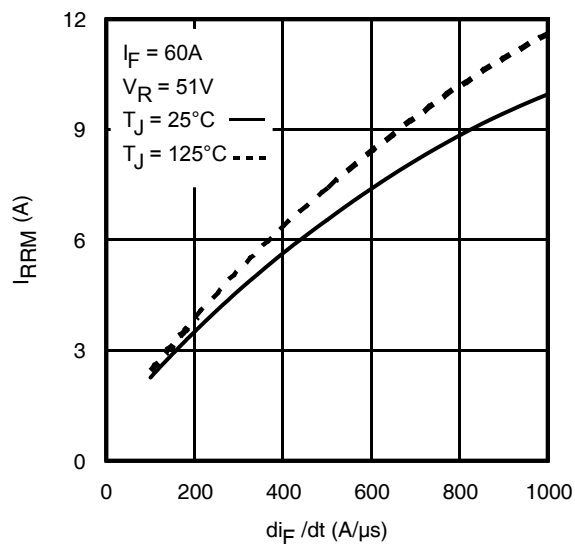
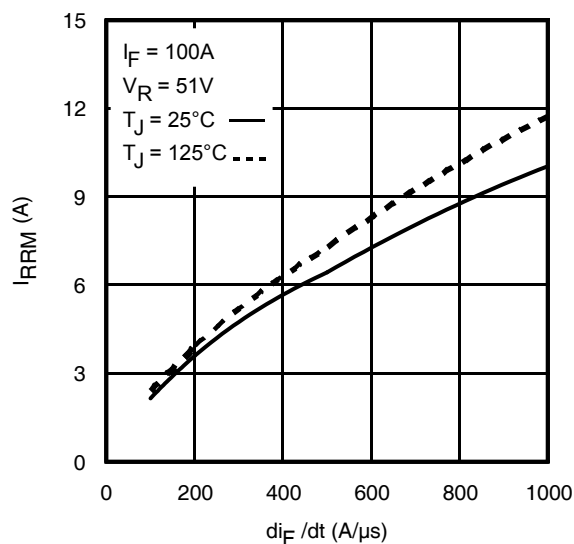
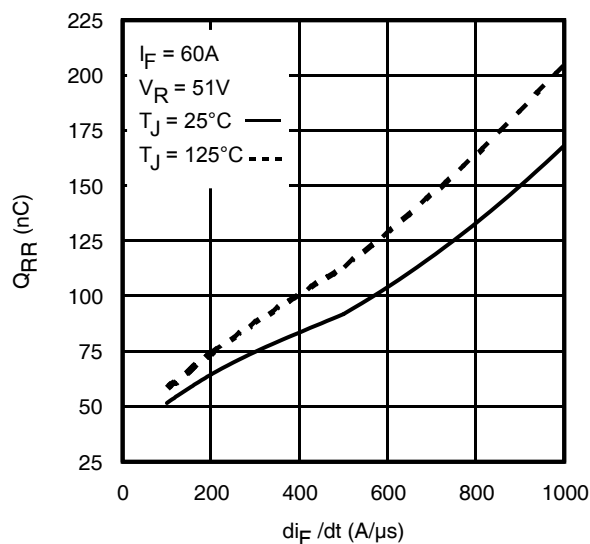
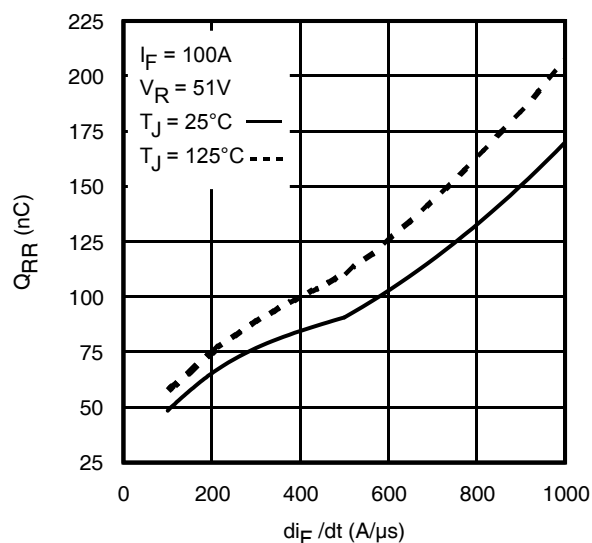
**Fig 15.** Avalanche Current vs. Pulse Width

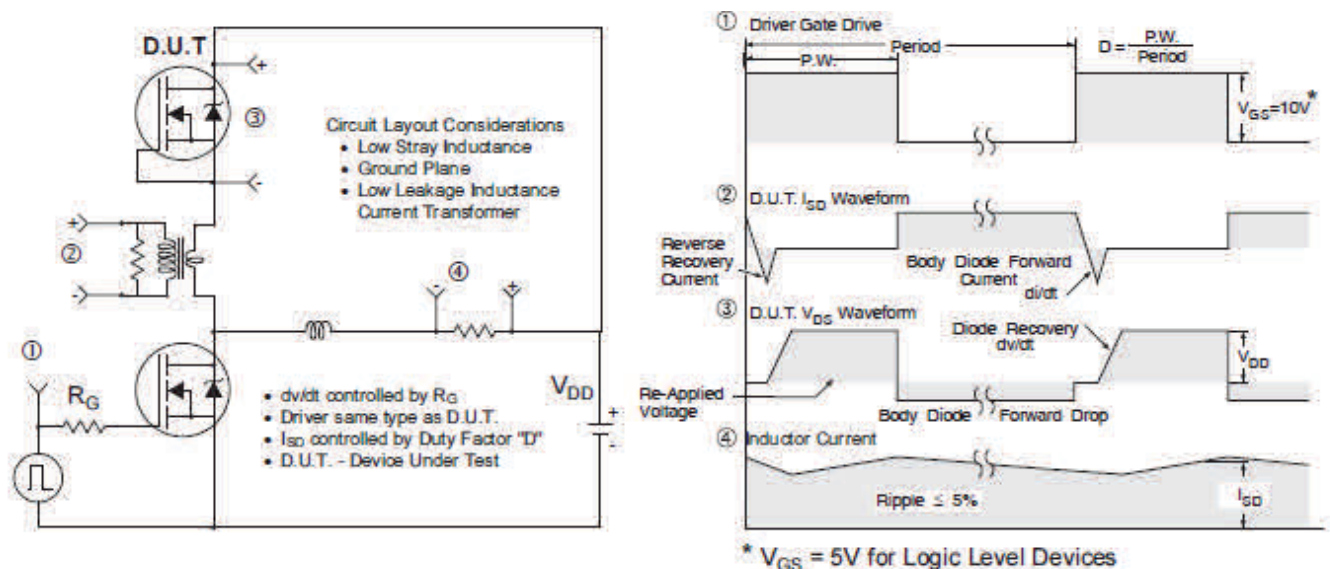


**Fig 16.** Maximum Avalanche Energy vs. Temperature

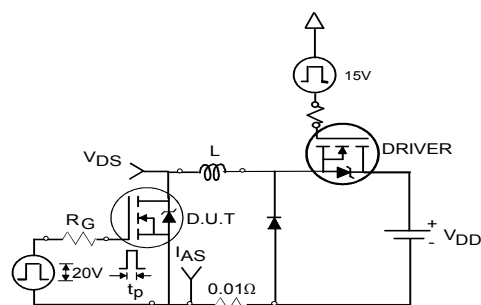
**Notes on Repetitive Avalanche Curves , Figures 15, 16:**  
(For further info, see AN-1005 at [www.irf.com](http://www.irf.com))

1. Avalanche failures assumption:  
Purely a thermal phenomenon and failure occurs at a temperature far in excess of  $T_{jmax}$ . This is validated for every part type.
2. Safe operation in Avalanche is allowed as long as  $T_{jmax}$  is not exceeded.
3. Equation below based on circuit and waveforms shown in Figures 23a, 23b.
4.  $P_{D(ave)}$  = Average power dissipation per single avalanche pulse.
5. BV = Rated breakdown voltage (1.3 factor accounts for voltage increase during avalanche).
6.  $I_{av}$  = Allowable avalanche current.
7.  $\Delta T$  = Allowable rise in junction temperature, not to exceed  $T_{jmax}$  (assumed as 25°C in Figure 14, 15).  
 $t_{av}$  = Average time in avalanche.  
 $D$  = Duty cycle in avalanche =  $t_{av} \cdot f$   
 $Z_{thJC}(D, t_{av})$  = Transient thermal resistance, see Figures 14)  
 $P_D(ave) = 1/2 (1.3 \cdot BV \cdot I_{av}) = \Delta T / Z_{thJC}$   
 $I_{av} = 2\Delta T / [1.3 \cdot BV \cdot Z_{th}]$   
 $E_{AS(AR)} = P_{D(ave)} \cdot t_{av}$

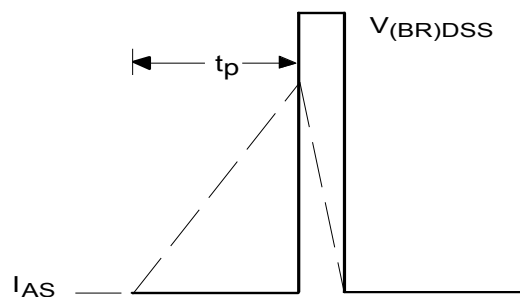

**Fig 17.** Threshold Voltage vs. Temperature

**Fig 18.** Typical Recovery Current vs.  $di_F/dt$ 

**Fig 19.** Typical Recovery Current vs.  $di_F/dt$ 

**Fig 20.** Typical Stored Charge vs.  $di_F/dt$ 

**Fig 21.** Typical Stored Charge vs.  $di_F/dt$



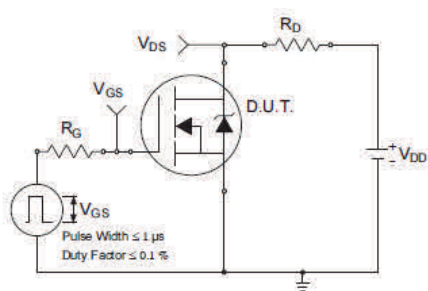
**Fig 22.** Peak Diode Recovery  $dv/dt$  Test Circuit for N-Channel HEXFET® Power MOSFETs



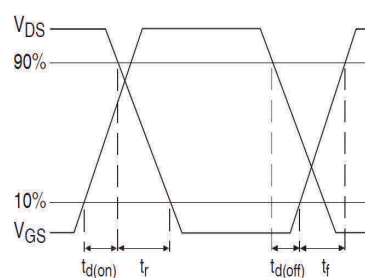
**Fig 23a.** Unclamped Inductive Test Circuit



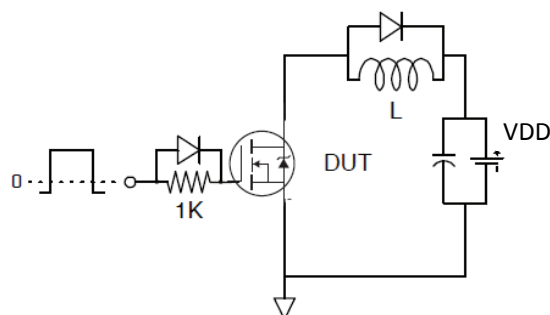
**Fig 23b.** Unclamped Inductive Waveforms



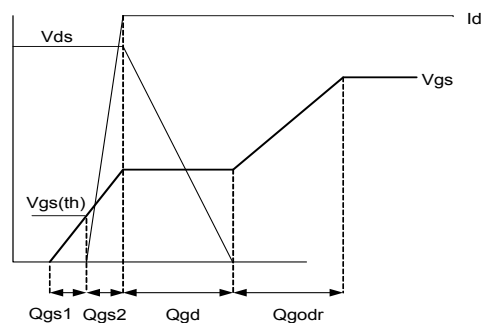
**Fig 24a.** Switching Time Test Circuit



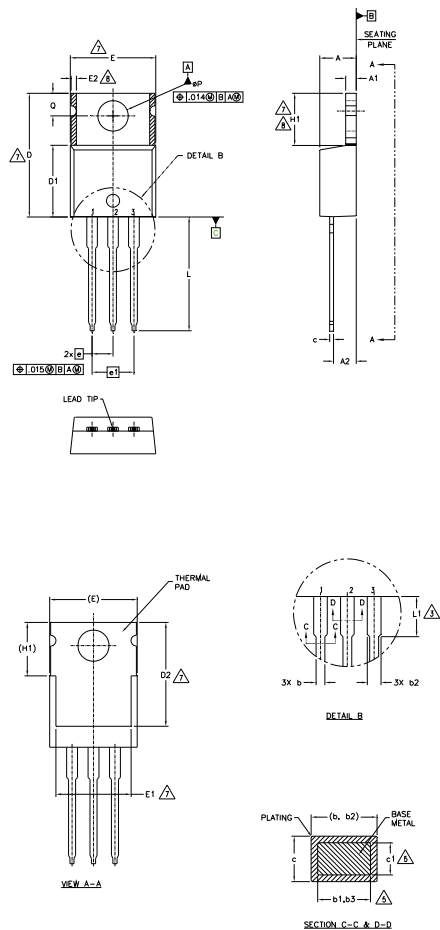
**Fig 24b.** Switching Time Waveforms



**Fig 25a.** Gate Charge Test Circuit



**Fig 25b.** Gate Charge Waveform

**TO-220AB Package Outline (Dimensions are shown in millimeters (inches))**

**NOTES:**

- 1.- DIMENSIONING AND TOLERANCING AS PER ASME Y14.5 M- 1994.
- 2.- DIMENSIONS ARE SHOWN IN INCHES [MILLIMETERS].
- 3.- LEAD DIMENSION AND FINISH UNCONTROLLED IN L1.
- 4.- DIMENSION D, D1 & E DO NOT INCLUDE MOLD FLASH. MOLD FLASH SHALL NOT EXCEED .005" (0.127) PER SIDE. THESE DIMENSIONS ARE MEASURED AT THE OUTERMOST EXTREMES OF THE PLASTIC BODY.
- 5.- DIMENSION b1, b3 & c1 APPLY TO BASE METAL ONLY.
- 6.- CONTROLLING DIMENSION : INCHES.
- 7.- THERMAL PAD CONTOUR OPTIONAL WITHIN DIMENSIONS E,H1,D2 & E1
- 8.- DIMENSION E2 X H1 DEFINE A ZONE WHERE STAMPING AND SINGULATION IRREGULARITIES ARE ALLOWED.
- 9.- OUTLINE CONFORMS TO JEDEC TO-220, EXCEPT A2 (max.) AND D2 (min.) WHERE DIMENSIONS ARE DERIVED FROM THE ACTUAL PACKAGE OUTLINE.

| SYMBOL | DIMENSIONS  |       |          |      | NOTES |     |
|--------|-------------|-------|----------|------|-------|-----|
|        | MILLIMETERS |       | INCHES   |      |       |     |
|        | MIN.        | MAX.  | MIN.     | MAX. |       |     |
| A      | 3.56        | 4.83  | .140     | .190 | 5     |     |
| A1     | 1.14        | 1.40  | .045     | .055 |       |     |
| A2     | 2.03        | 2.92  | .080     | .115 |       |     |
| b      | 0.38        | 1.01  | .015     | .040 |       |     |
| b1     | 0.38        | 0.97  | .015     | .038 |       |     |
| b2     | 1.14        | 1.78  | .045     | .070 | 5     |     |
| b3     | 1.14        | 1.73  | .045     | .068 |       |     |
| c      | 0.36        | 0.61  | .014     | .024 |       |     |
| c1     | 0.36        | 0.56  | .014     | .022 |       |     |
| D      | 14.22       | 16.51 | .560     | .650 |       | 4   |
| D1     | 8.38        | 9.02  | .330     | .355 | 7     |     |
| D2     | 11.68       | 12.88 | .460     | .507 |       |     |
| E      | 9.65        | 10.67 | .380     | .420 |       | 4,7 |
| E1     | 6.86        | 8.89  | .270     | .350 |       | 7   |
| E2     | —           | 0.76  | —        | .030 |       | 8   |
| e      | 2.54 BSC    |       | .100 BSC |      | 7,8   |     |
| e1     | 5.08 BSC    |       | .200 BSC |      |       |     |
| H1     | 5.84        | 6.86  | .230     | .270 |       |     |
| L      | 12.70       | 14.73 | .500     | .580 |       |     |
| L1     | 3.56        | 4.06  | .140     | .160 |       | 3   |
| ØP     | 3.54        | 4.08  | .139     | .161 |       |     |
| Q      | 2.54        | 3.42  | .100     | .135 |       |     |

**LEAD ASSIGNMENTS**
**HEXFET**

- 1.- GATE
- 2.- DRAIN
- 3.- SOURCE

**IGBTs, CoPACK**

- 1.- GATE
- 2.- COLLECTOR
- 3.- EMITTER

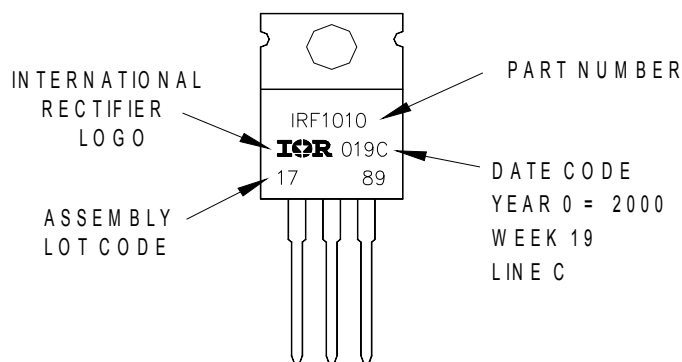
**DIODES**

- 1.- ANODE
- 2.- CATHODE
- 3.- ANODE

**TO-220AB Part Marking Information**

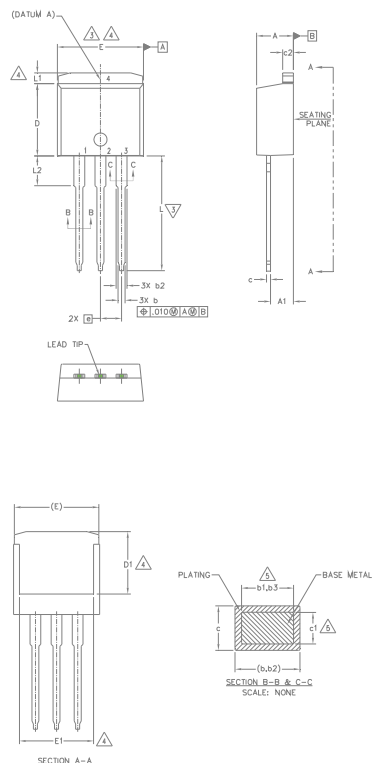
EXAMPLE: THIS IS AN IRF1010  
 LOT CODE 1789  
 ASSEMBLED ON WW 19, 2000  
 IN THE ASSEMBLY LINE "C"

Note: "P" in assembly line position  
 indicates "Lead - Free"



TO-220AB packages are not recommended for Surface Mount Application.

Note: For the most current drawing please refer to IR website at <http://www.irf.com/package/>

**TO-262 Package Outline (Dimensions are shown in millimeters (inches))**


| SYMBOL | DIMENSIONS  |       |        |      | NOTES |
|--------|-------------|-------|--------|------|-------|
|        | MILLIMETERS |       | INCHES |      |       |
|        | MIN.        | MAX.  | MIN.   | MAX. |       |
| A      | 4.06        | 4.83  | .160   | .190 | 5     |
| A1     | 2.03        | 3.02  | .080   | .119 |       |
| b      | 0.51        | 0.99  | .020   | .039 |       |
| b1     | 0.51        | 0.89  | .020   | .035 |       |
| b2     | 1.14        | 1.78  | .045   | .070 | 5     |
| b3     | 1.14        | 1.73  | .045   | .068 |       |
| c      | 0.38        | 0.74  | .015   | .029 | 5     |
| c1     | 0.38        | 0.58  | .015   | .023 |       |
| c2     | 1.14        | 1.65  | .045   | .065 | 3     |
| D      | 8.38        | 9.65  | .330   | .380 |       |
| D1     | 6.86        | —     | .270   | —    | 4     |
| E      | 9.65        | 10.67 | .380   | .420 | 3,4   |
| E1     | 6.22        | —     | .245   | —    | 4     |
| e      | 2.54        | BSC   | .100   | BSC  | 4     |
| L      | 13.46       | 14.10 | .530   | .555 |       |
| L1     | —           | 1.65  | —      | .065 |       |
| L2     | 3.56        | 3.71  | .140   | .146 |       |

**NOTES:**

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M-1994
2. DIMENSIONS ARE SHOWN IN MILLIMETERS [INCHES]
3. DIMENSION D & E DO NOT INCLUDE MOLD FLASH. MOLD FLASH SHALL NOT EXCEED 0.127 [0.005"] PER SIDE. THESE DIMENSIONS ARE MEASURED AT THE OUTMOST EXTREMES OF THE PLASTIC BODY.
4. THERMAL PAD CONTOUR OPTIONAL WITHIN DIMENSION E, L1, D1 & E1.
5. DIMENSION b1 AND c1 APPLY TO BASE METAL ONLY.
6. CONTROLLING DIMENSION: INCH.
7. OUTLINE CONFORM TO JEDEC TO-262 EXCEPT A1(max.), b(min.) AND D1(min.) WHERE DIMENSIONS DERIVED THE ACTUAL PACKAGE OUTLINE.

**LEAD ASSIGNMENTS**
**IGBTs, CoPACK**

1. GATE
2. COLLECTOR
3. EMITTER
4. COLLECTOR

**HEXFET**

1. GATE
2. DRAIN
3. SOURCE
4. DRAIN

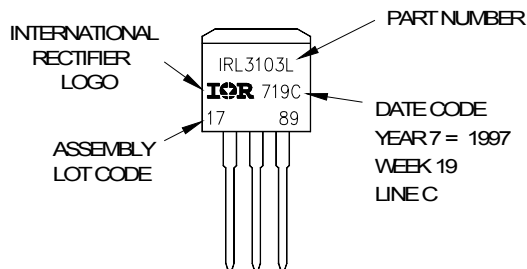
**DIODES**

1. ANODE (TWO DIE) / OPEN (ONE DIE)
2. 4. CATHODE
3. ANODE

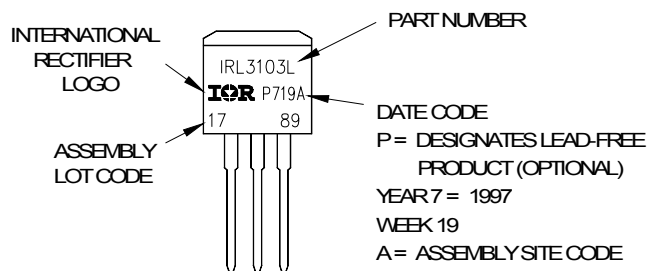
**TO-262 Part Marking Information**

EXAMPLE THIS IS AN IRL3103L  
LOT CODE 1789  
ASSEMBLED ON VVV19, 1997  
IN THE ASSEMBLY LINE "C"

Note: "P" in assembly line position indicates "Lead - Free"

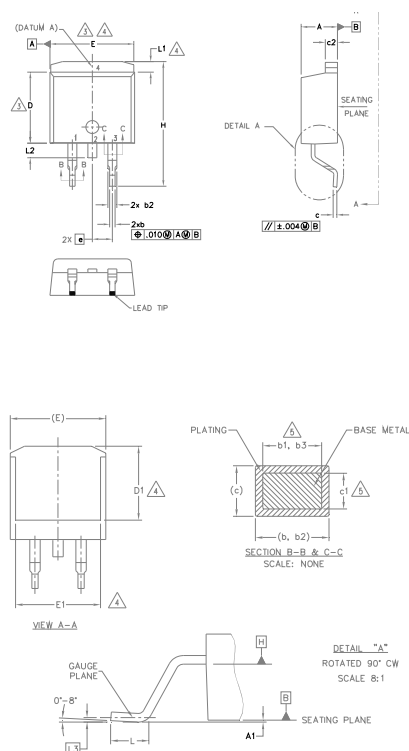


OR



Note: For the most current drawing please refer to IR website at <http://www.irf.com/package/>

## D<sup>2</sup>Pak (TO-263AB) Package Outline (Dimensions are shown in millimeters (inches))



| SYMBOL | DIMENSIONS  |       |        |      | NOTES |
|--------|-------------|-------|--------|------|-------|
|        | MILLIMETERS |       | INCHES |      |       |
|        | MIN.        | MAX.  | MIN.   | MAX. |       |
| A      | 4.06        | 4.83  | .160   | .190 | 5     |
| A1     | 0.00        | 0.254 | .000   | .010 |       |
| b      | 0.51        | 0.99  | .020   | .039 |       |
| b1     | 0.51        | 0.89  | .020   | .035 |       |
| b2     | 1.14        | 1.78  | .045   | .070 |       |
| b3     | 1.14        | 1.73  | .045   | .068 | 5     |
| c      | 0.38        | 0.74  | .015   | .029 | 5     |
| c1     | 0.38        | 0.58  | .015   | .023 |       |
| c2     | 1.14        | 1.65  | .045   | .065 | 3,4   |
| D      | 8.38        | 9.65  | .330   | .380 |       |
| D1     | 6.86        | —     | .270   | —    | 4     |
| E      | 9.65        | 10.67 | .380   | .420 | 3,4   |
| E1     | 6.22        | —     | .245   | —    |       |
| e      | 2.54        | BSC   | .100   | BSC  | 4     |
| H      | 14.61       | 15.88 | .575   | .625 | 4     |
| L      | 1.78        | 2.79  | .070   | .110 |       |
| L1     | —           | 1.68  | —      | .066 |       |
| L2     | —           | 1.78  | —      | .070 |       |
| L3     | 0.25        | BSC   | .010   | BSC  |       |

### NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M-1994
2. DIMENSIONS ARE SHOWN IN MILLIMETERS [INCHES].
3. DIMENSION D & E DO NOT INCLUDE MOLD FLASH. MOLD FLASH SHALL NOT EXCEED 0.127 [0.005"] PER SIDE. THESE DIMENSIONS ARE MEASURED AT THE OUTMOST EXTREMES OF THE PLASTIC BODY AT DATUM H.
4. THERMAL PAD CONTOUR OPTIONAL WITHIN DIMENSION E, L1, D1 & E1.
5. DIMENSION b1, b3 AND c1 APPLY TO BASE METAL ONLY.
6. DATUM A & B TO BE DETERMINED AT DATUM PLANE H.
7. CONTROLLING DIMENSION: INCH.
8. OUTLINE CONFORMS TO JEDEC OUTLINE TO-263AB.

### LEAD ASSIGNMENTS

#### DIODES

1. - ANODE (TWO DIE) / OPEN (ONE DIE)
2. - CATHODE
3. - ANODE

#### HEXFET

1. - GATE
2. 4. - DRAIN
3. - SOURCE

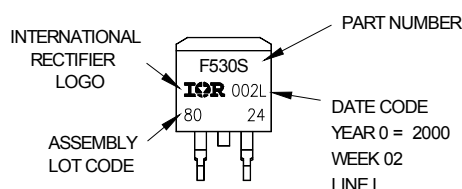
#### IGBTs, CoPACK

1. - GATE
2. 4. - COLLECTOR
3. - EMITTER

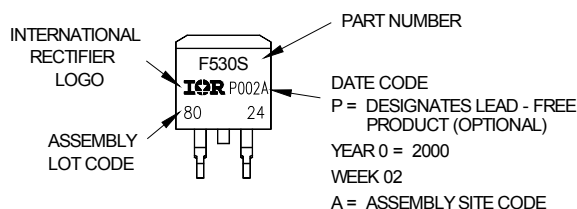
## D<sup>2</sup>Pak (TO-263AB) Part Marking Information

EXAMPLE: THIS IS AN IRF530S WITH  
LOT CODE 8024  
ASSEMBLED ON VVV 02, 2000  
IN THE ASSEMBLY LINE "L"

Note: "P" in assembly line position  
indicates "Lead - Free"

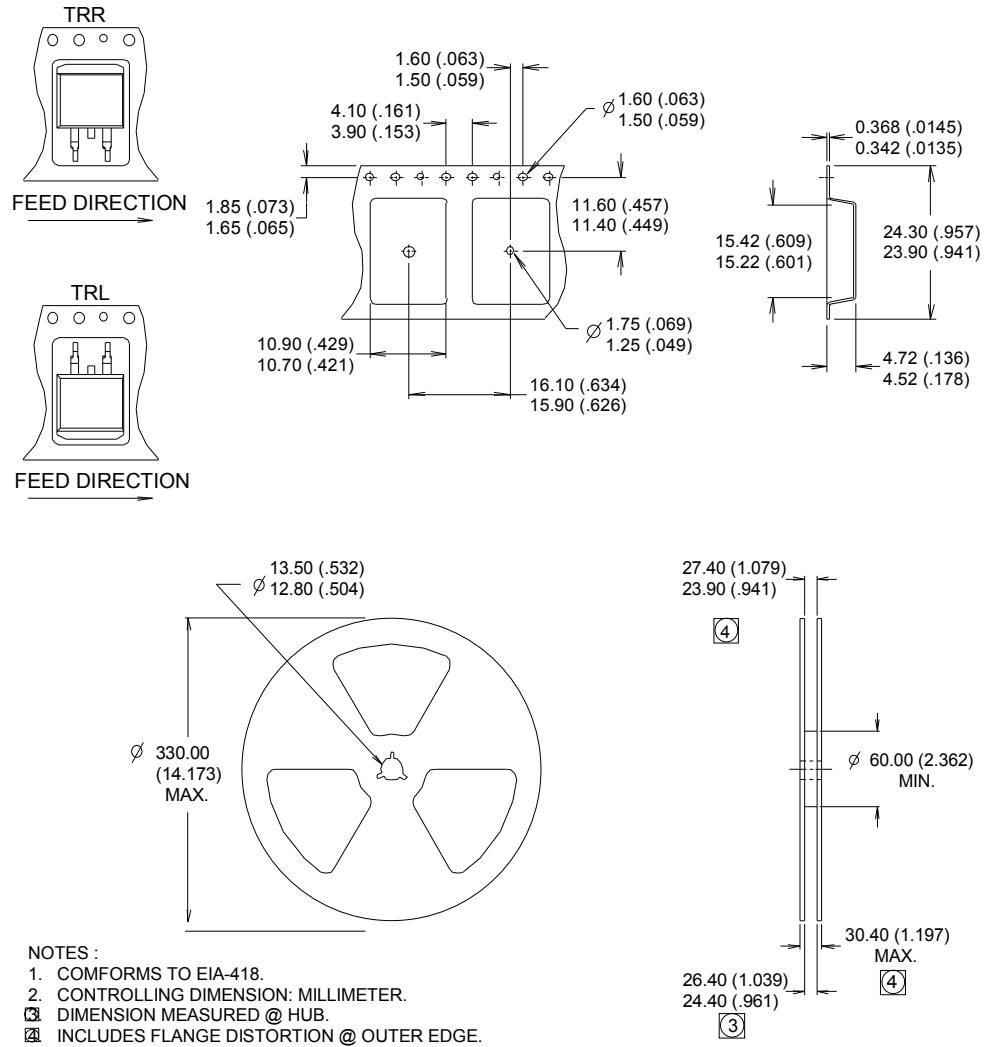


OR



Note: For the most current drawing please refer to IR website at <http://www.irf.com/package/>

# D<sup>2</sup>Pak (TO-263AB) Tape & Reel Information (Dimensions are shown in millimeters (inches))



Note: For the most current drawing please refer to IR website at <http://www.irf.com/package/>

**Qualification Information<sup>†</sup>**

|                                   |                                                 |      |
|-----------------------------------|-------------------------------------------------|------|
| <b>Qualification Level</b>        | Industrial<br>(per JEDEC JESD47F) <sup>††</sup> |      |
| <b>Moisture Sensitivity Level</b> | TO-220                                          | N/A  |
|                                   | D <sup>2</sup> Pak                              | MSL1 |
|                                   | TO-262                                          | N/A  |
| <b>RoHS Compliant</b>             | Yes                                             |      |

† Qualification standards can be found at International Rectifier's web site: <http://www.irf.com/product-info/reliability/>

†† Applicable version of JEDEC standard at the time of product release.

**Revision History**

| Date     | Comments                                                                                                                                                                                                                                                                                                                                                                             |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 10/07/14 | <ul style="list-style-type: none"> <li>Updated <math>E_{AS} (L=1mH) = 554mJ</math> on page 2</li> <li>Updated note 9 "Limited by <math>T_{Jmax}</math>, starting <math>T_J = 25^{\circ}C</math>, <math>L = 1mH</math>, <math>R_G = 50\Omega</math>, <math>I_{AS} = 33A</math>, <math>V_{GS} = 10V</math>". on page 2</li> <li>Updated package outline on page 9,10,11,12.</li> </ul> |

International  
 Rectifier

**IR WORLD HEADQUARTERS:** 101 N. Sepulveda Blvd., El Segundo, California 90245, USA

To contact International Rectifier, please visit <http://www.irf.com/whoto-call/>