

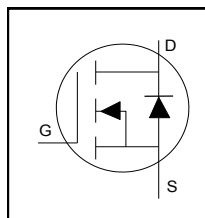
## Application

- 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

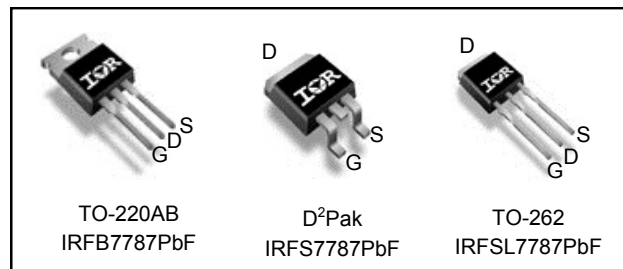
## Benefits

- 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

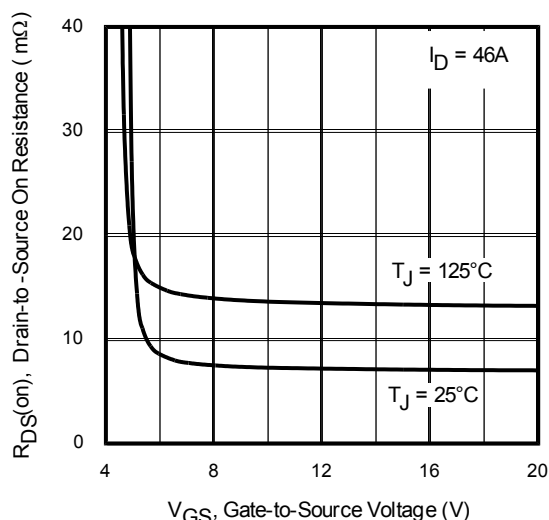


|                          |       |
|--------------------------|-------|
| $V_{DS}$                 | 75V   |
| $R_{DS(on)}$ typ.<br>max | 6.9mΩ |
|                          | 8.4mΩ |
| $I_D$                    | 76A   |

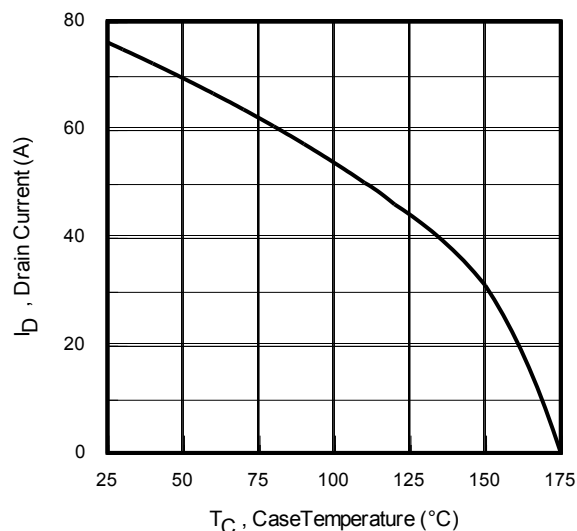


|          |          |          |
|----------|----------|----------|
| <b>G</b> | <b>D</b> | <b>S</b> |
| Gate     | Drain    | Source   |

| Base part number | Package Type | Standard Pack      |          | Orderable Part Number |
|------------------|--------------|--------------------|----------|-----------------------|
|                  |              | Form               | Quantity |                       |
| IRFB7787PbF      | TO-220       | Tube               | 50       | IRFB7787PbF           |
| IRFSL7787PbF     | TO-262       | Tube               | 50       | IRFSL7787PbF          |
| IRFS7787PbF      | D²-Pak       | Tube               | 50       | IRFS7787PbF           |
|                  |              | Tape and Reel Left | 800      | IRFS7787TRLpBF        |



**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, $V_{GS} @ 10\text{V}$         | 76                  | A     |
| $I_D @ T_C = 100^\circ\text{C}$ | Continuous Drain Current, $V_{GS} @ 10\text{V}$         | 54                  |       |
| $I_{DM}$                        | Pulsed Drain Current ①                                  | 280                 |       |
| $P_D @ T_C = 25^\circ\text{C}$  | Maximum Power Dissipation                               | 125                 | W     |
|                                 | Linear Derating Factor                                  | 0.83                | 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

|                              |                                 |                          |    |
|------------------------------|---------------------------------|--------------------------|----|
| $E_{AS}$ (Thermally limited) | Single Pulse Avalanche Energy ② | 144                      | mJ |
| $E_{AS}$ (Thermally limited) | Single Pulse Avalanche Energy ③ | 209                      |    |
| $I_{AR}$                     | 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                 | —    | 1.2  | °C/W  |
| $R_{\theta CS}$ | Case-to-Sink, Flat Greased Surface | 0.50 | —    |       |
| $R_{\theta JA}$ | Junction-to-Ambient ⑧              | —    | 62   |       |

## 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    | 75   | —    | —    | V     | $V_{GS} = 0\text{V}$ , $I_D = 250\mu\text{A}$                            |
| $\Delta V_{(BR)DSS}/\Delta T_J$ | Breakdown Voltage Temp. Coefficient  | —    | 0.06 | —    | V/°C  | Reference to $25^\circ\text{C}$ , $I_D = 1\text{mA}$ ①                   |
| $R_{DS(on)}$                    | Static Drain-to-Source On-Resistance | —    | 6.9  | 8.4  | mΩ    | $V_{GS} = 10\text{V}$ , $I_D = 46\text{A}$                               |
|                                 |                                      | —    | 8.2  | —    |       | $V_{GS} = 6.0\text{V}$ , $I_D = 23\text{A}$                              |
| $V_{GS(th)}$                    | Gate Threshold Voltage               | 2.1  | —    | 3.7  | V     | $V_{DS} = V_{GS}$ , $I_D = 100\mu\text{A}$                               |
| $I_{DSS}$                       | Drain-to-Source Leakage Current      | —    | —    | 1.0  | μA    | $V_{DS} = 75\text{V}$ , $V_{GS} = 0\text{V}$                             |
|                                 |                                      | —    | —    | 150  |       | $V_{DS} = 75\text{V}$ , $V_{GS} = 0\text{V}$ , $T_J = 125^\circ\text{C}$ |
| $I_{GSS}$                       | 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                      | —    | 2.1  | —    | Ω     |                                                                          |

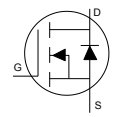
## Notes:

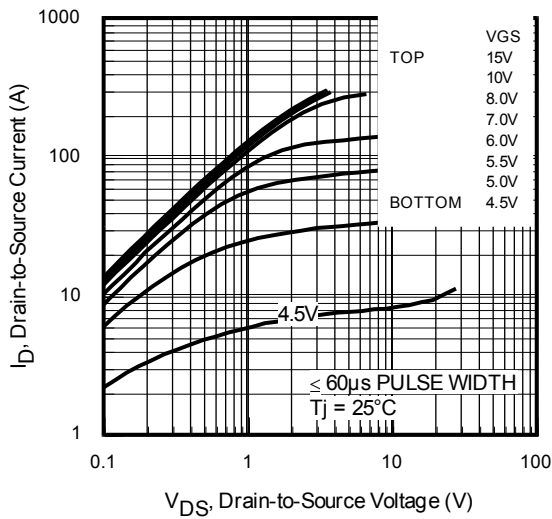
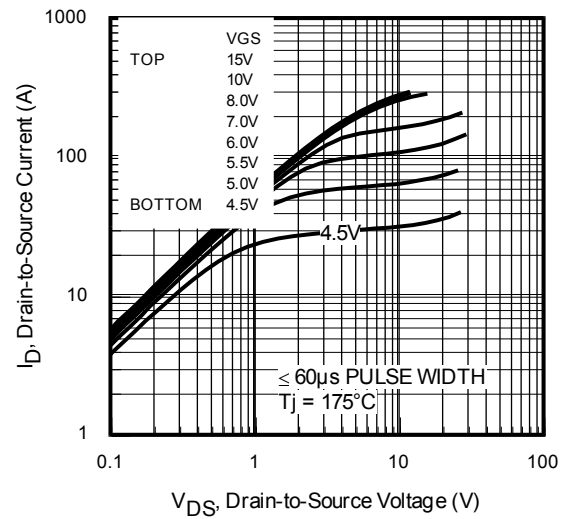
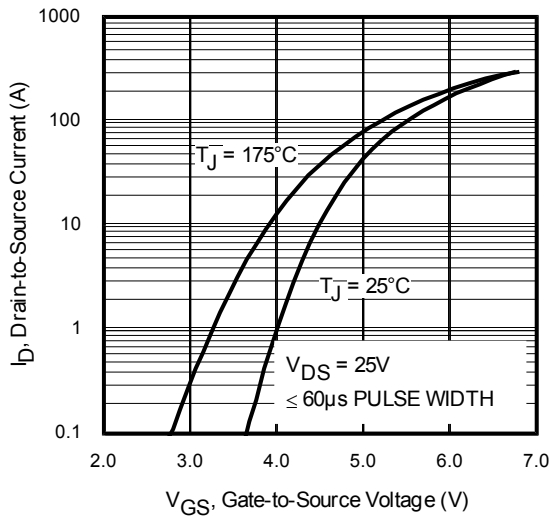
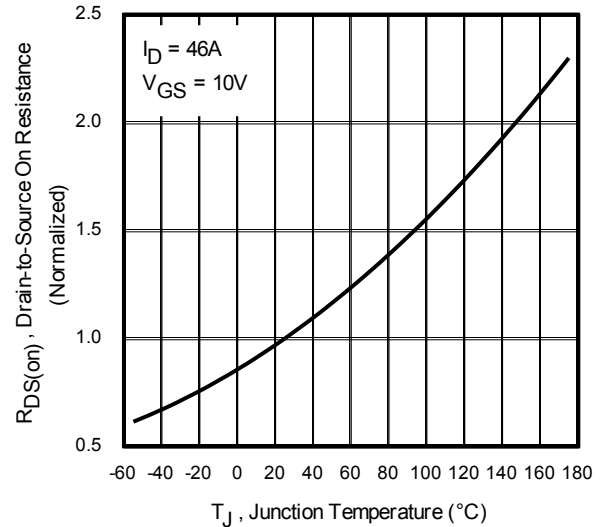
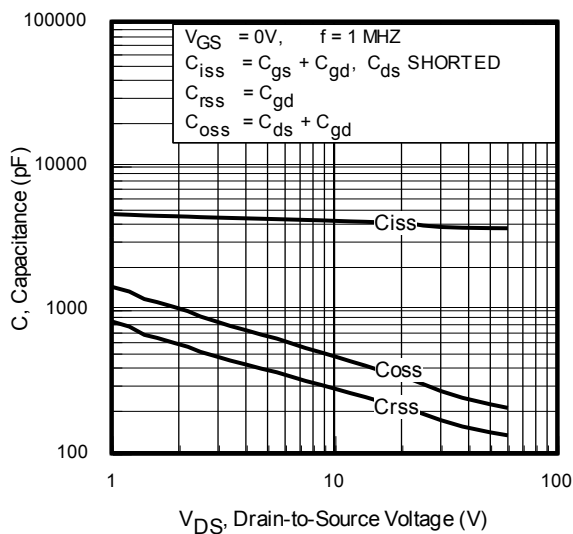
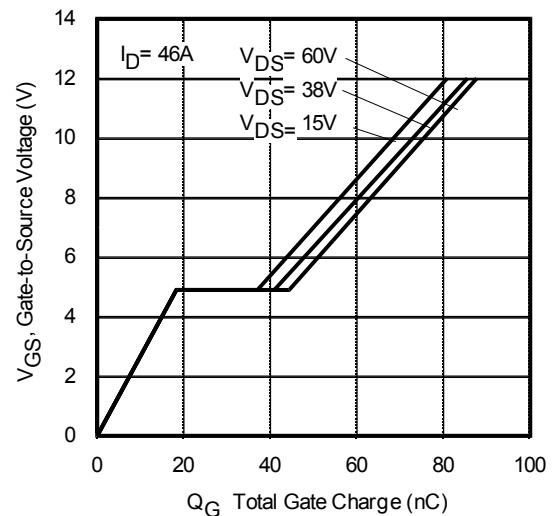
- ① Repetitive rating; pulse width limited by max. junction temperature.
- ② Limited by  $T_{Jmax}$ , starting  $T_J = 25^\circ\text{C}$ ,  $L = 0.138\text{mH}$ ,  $R_G = 50\Omega$ ,  $I_{AS} = 46\text{A}$ ,  $V_{GS} = 10\text{V}$ .
- ③  $I_{SD} \leq 46\text{A}$ ,  $di/dt \leq 425\text{A}/\mu\text{s}$ ,  $V_{DD} \leq V_{(BR)DSS}$ ,  $T_J \leq 175^\circ\text{C}$ .
- 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 Limited by  $T_{Jmax}$ , starting  $T_J = 25^\circ\text{C}$ ,  $L = 1\text{mH}$ ,  $R_G = 50\Omega$ ,  $I_{AS} = 20\text{A}$ ,  $V_{GS} = 10\text{V}$ .
- ⑨ 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>

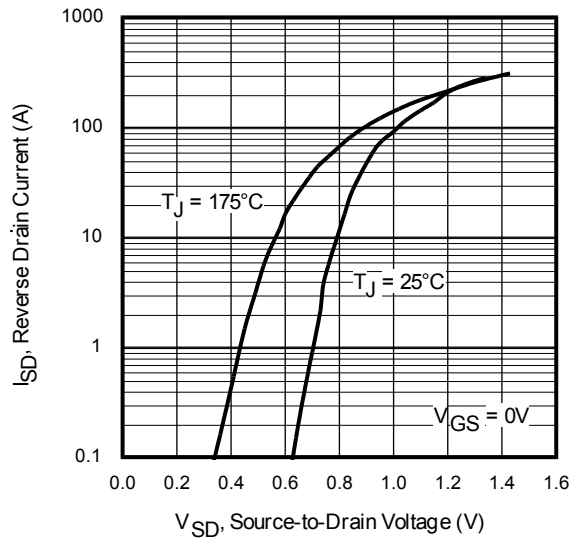
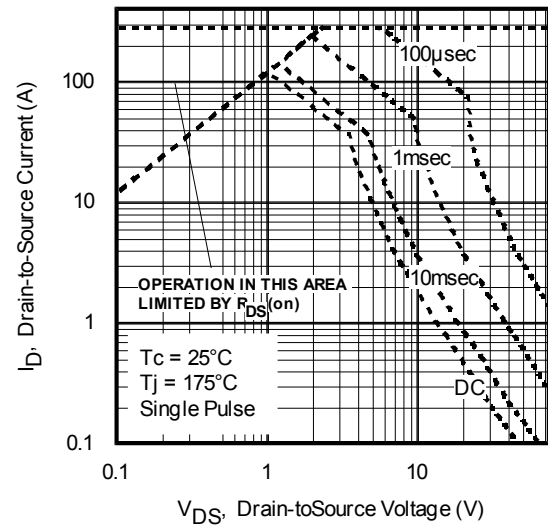
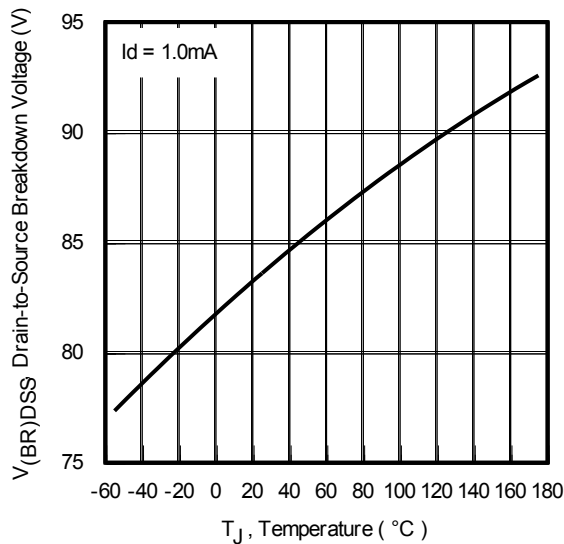
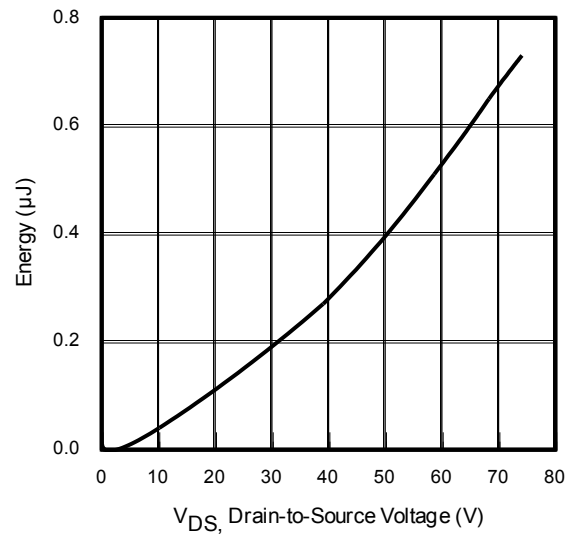
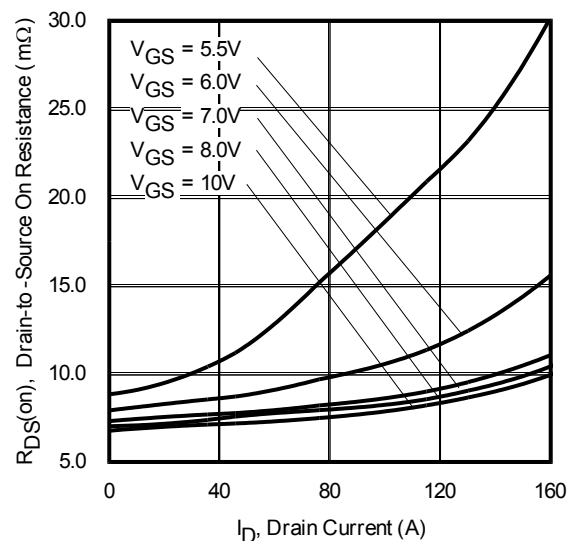
**Dynamic Electrical Characteristics @  $T_J = 25^\circ\text{C}$  (unless otherwise specified)**

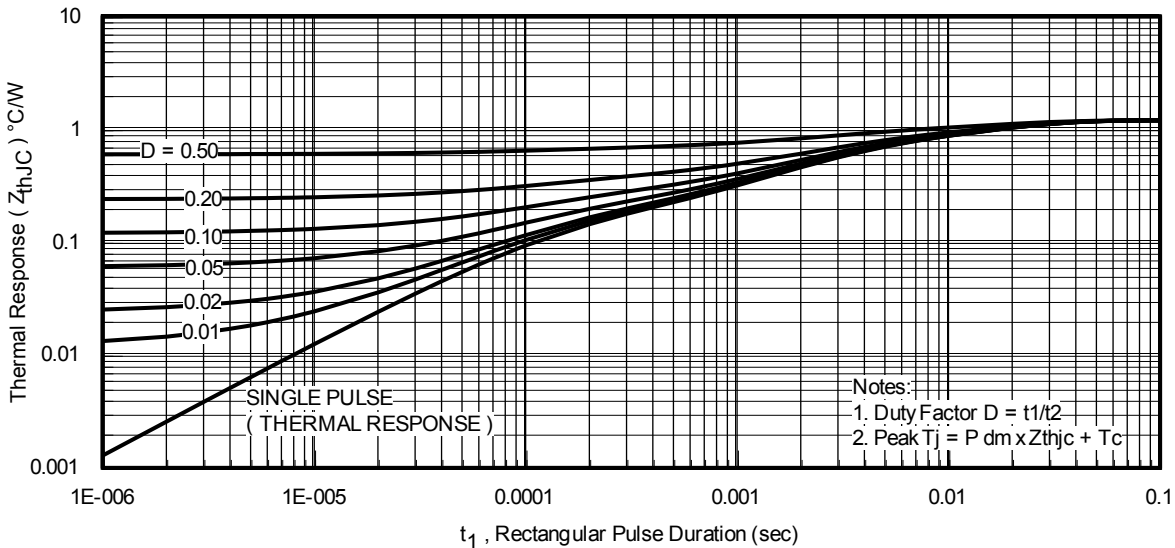
| Symbol                      | Parameter                                     | Min. | Typ. | Max. | Units | Conditions                                                                                                                                                          |
|-----------------------------|-----------------------------------------------|------|------|------|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| $g_{fs}$                    | Forward Transconductance                      | 154  | —    | —    | S     | $V_{DS} = 10V, I_D = 46A$                                                                                                                                           |
| $Q_g$                       | Total Gate Charge                             | —    | 73   | 109  | nC    | $I_D = 46A$<br>$V_{DS} = 38V$<br>$V_{GS} = 10V$                                                                                                                     |
| $Q_{gs}$                    | Gate-to-Source Charge                         | —    | 18   | —    |       |                                                                                                                                                                     |
| $Q_{gd}$                    | Gate-to-Drain Charge                          | —    | 23   | —    |       |                                                                                                                                                                     |
| $Q_{sync}$                  | Total Gate Charge Sync. ( $Q_g - Q_{gd}$ )    | —    | 50   | —    |       |                                                                                                                                                                     |
| $t_{d(on)}$                 | Turn-On Delay Time                            | —    | 11   | —    | ns    | $V_{DD} = 38V$<br>$I_D = 46A$<br>$R_G = 2.7\Omega$<br>$V_{GS} = 10V^{(4)}$                                                                                          |
| $t_r$                       | Rise Time                                     | —    | 48   | —    |       |                                                                                                                                                                     |
| $t_{d(off)}$                | Turn-Off Delay Time                           | —    | 51   | —    |       |                                                                                                                                                                     |
| $t_f$                       | Fall Time                                     | —    | 39   | —    |       |                                                                                                                                                                     |
| $C_{iss}$                   | Input Capacitance                             | —    | 4020 | —    | pF    | $V_{GS} = 0V$<br>$V_{DS} = 25V$<br>$f = 1.0MHz$ , See Fig.7<br>$V_{GS} = 0V, V_{DS} = 0V \text{ to } 60V^{(6)}$<br>$V_{GS} = 0V, V_{DS} = 0V \text{ to } 60V^{(5)}$ |
| $C_{oss}$                   | Output Capacitance                            | —    | 330  | —    |       |                                                                                                                                                                     |
| $C_{rss}$                   | Reverse Transfer Capacitance                  | —    | 205  | —    |       |                                                                                                                                                                     |
| $C_{oss \text{ eff. (ER)}}$ | Effective Output Capacitance (Energy Related) | —    | 295  | —    |       |                                                                                                                                                                     |
| $C_{oss \text{ eff. (TR)}}$ | Output Capacitance (Time Related)             | —    | 380  | —    |       |                                                                                                                                                                     |

**Diode Characteristics**

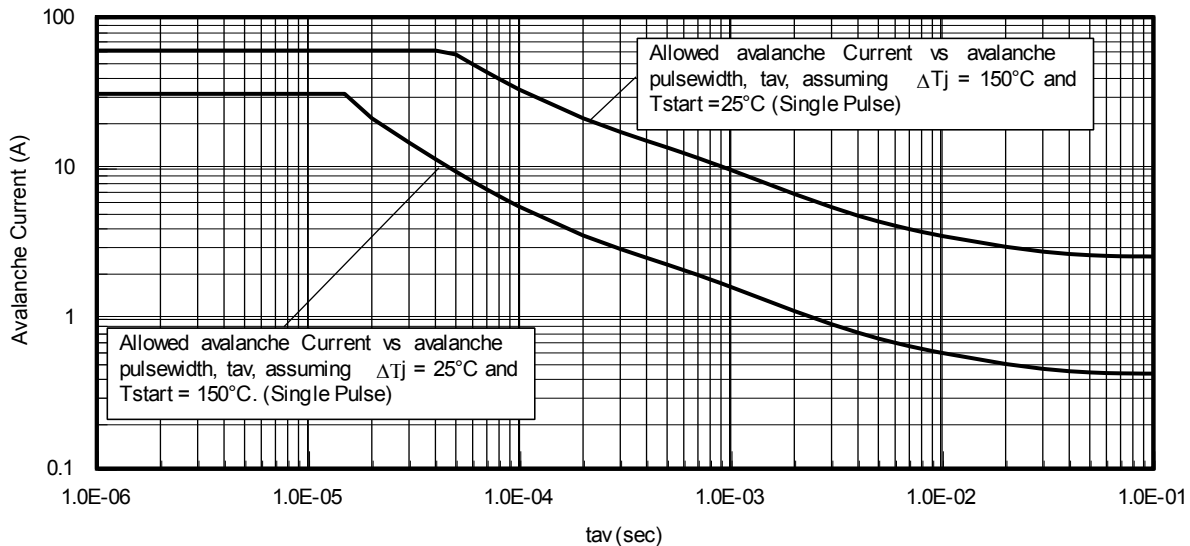
| Symbol    | Parameter                              | Min. | Typ.     | Max. | Units | Conditions                                                                                                                                                         |
|-----------|----------------------------------------|------|----------|------|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| $I_S$     | Continuous Source Current (Body Diode) | —    | —        | 76   | A     | MOSFET symbol showing the integral reverse p-n junction diode.                 |
| $I_{SM}$  | Pulsed Source Current (Body Diode) ①   | —    | —        | 280  |       |                                                                                                                                                                    |
| $V_{SD}$  | Diode Forward Voltage                  | —    | —        | 1.2  | V     | $T_J = 25^\circ\text{C}, I_S = 46A, V_{GS} = 0V$ ④                                                                                                                 |
| $dv/dt$   | Peak Diode Recovery $dv/dt$ ③          | —    | 10       | —    | V/ns  | $T_J = 175^\circ\text{C}, I_S = 46A, V_{DS} = 75V$ ③                                                                                                               |
| $t_{rr}$  | Reverse Recovery Time                  | —    | 33<br>39 | —    | ns    | $T_J = 25^\circ\text{C}$ $V_{DD} = 64V$<br>$T_J = 125^\circ\text{C}$ $I_F = 46A$ ,<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                | —    | 42<br>61 | —    |       |                                                                                                                                                                    |
| $I_{RRM}$ | Reverse Recovery Current               | —    | 2.2      | —    | 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**

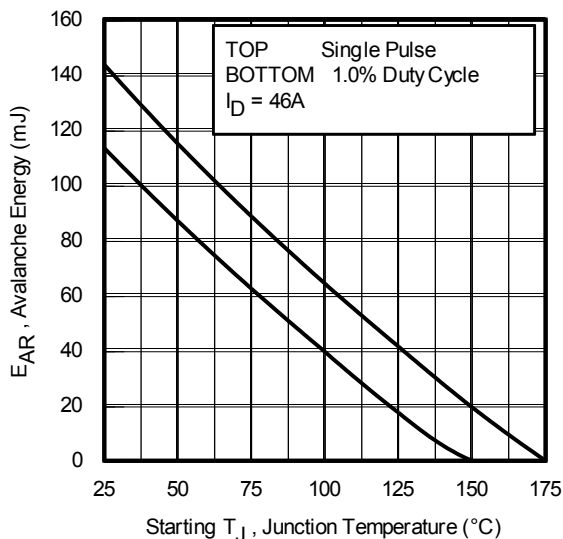

**Fig 9.** Typical Source-Drain Diode Forward Voltage

**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



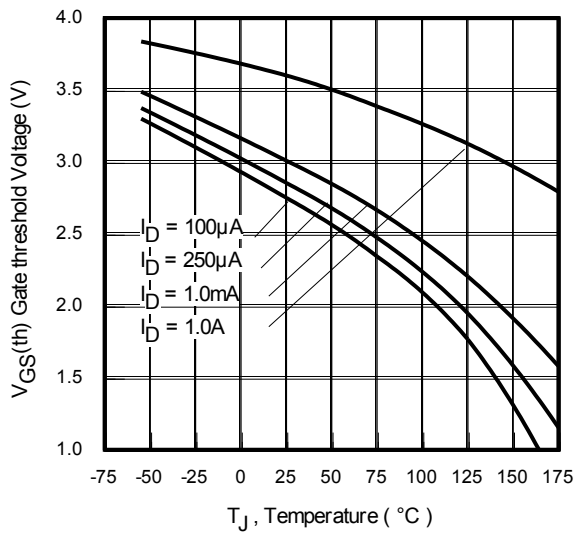
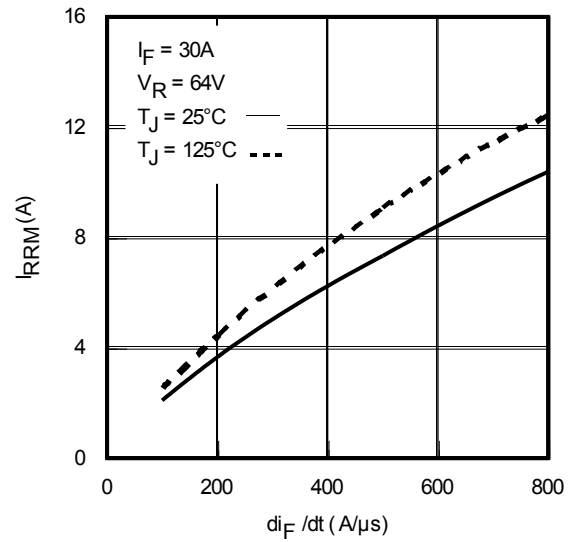
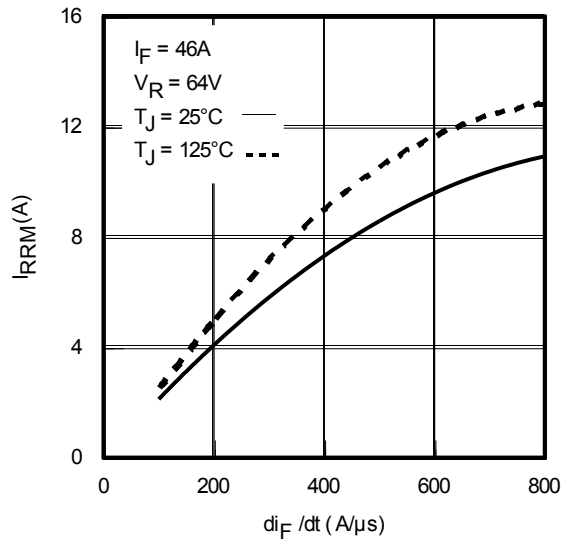
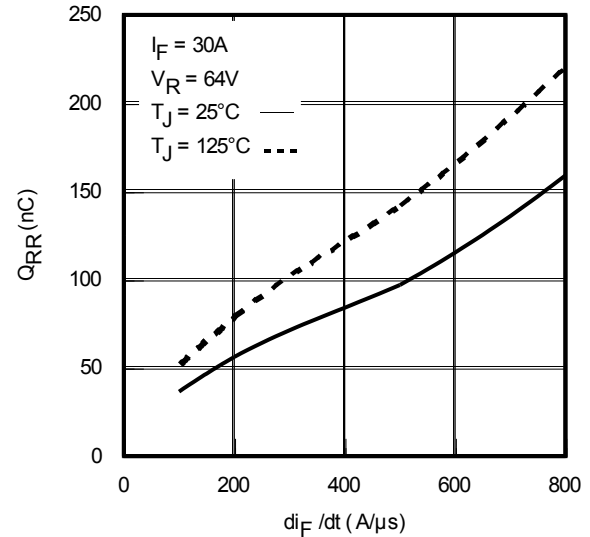
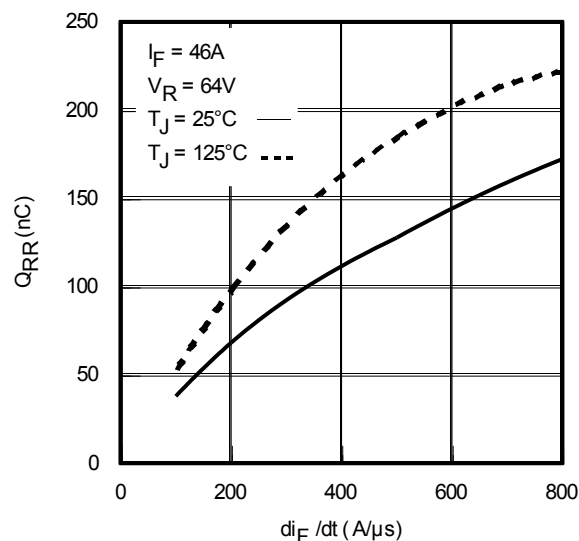
**Fig 15.** Avalanche Current vs. Pulse Width

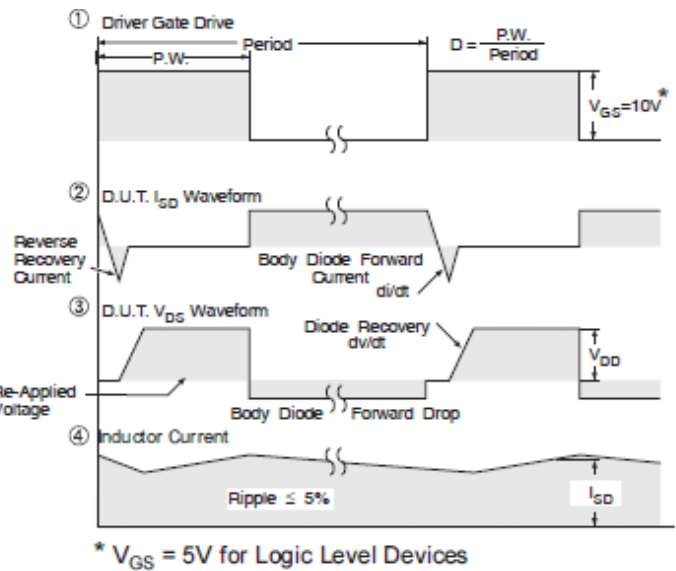
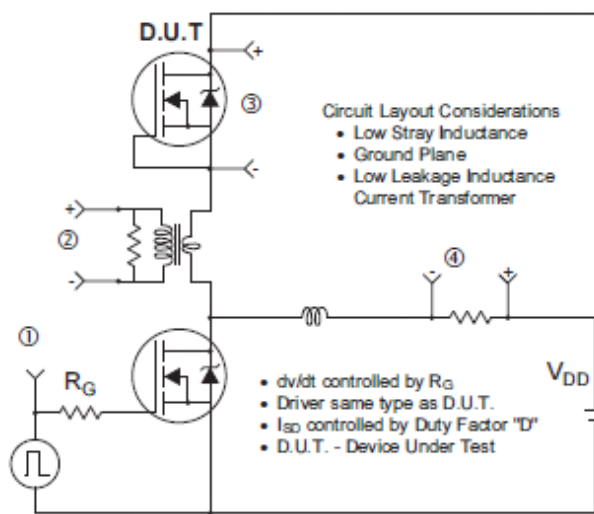


**Fig 16.** Maximum Avalanche Energy vs. Temperature

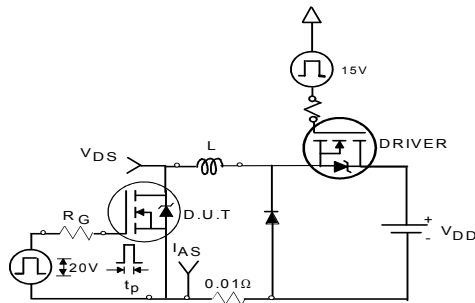
**Notes on Repetitive Avalanche Curves , Figures 15, 16:**  
(For further info, see AN-1005 at [www.irf.com](http://www.irf.com))

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 15, 16).  
 $t_{av}$  = Average time in avalanche.  
 $D$  = Duty cycle in avalanche =  $t_{av} \cdot f$   
 $Z_{thJC}(D, t_{av})$  = Transient thermal resistance, see Figures 14)  
 $P_{D(ave)} = 1/2 (1.3 \cdot BV \cdot I_{av}) = \Delta T / Z_{thJC}$   
 $I_{av} = 2\Delta T / [1.3 \cdot BV \cdot Z_{th}]$   
 $E_{AS(AR)} = P_{D(ave)} \cdot t_{av}$

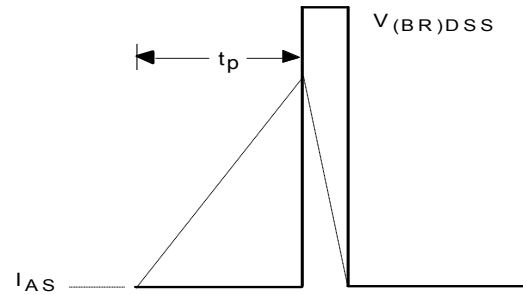

**Fig 17.** Threshold Voltage vs. Temperature

**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.  $di_F/dt$



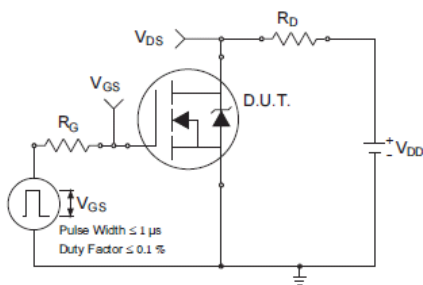
**Fig 22.** Peak Diode Recovery  $dv/dt$  Test Circuit for N-Channel HEXFET® Power MOSFETs



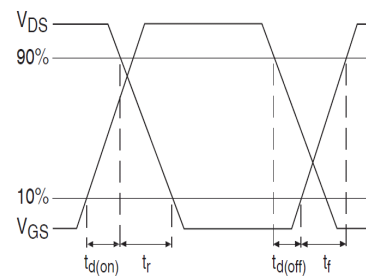
**Fig 23a.** Unclamped Inductive Test Circuit



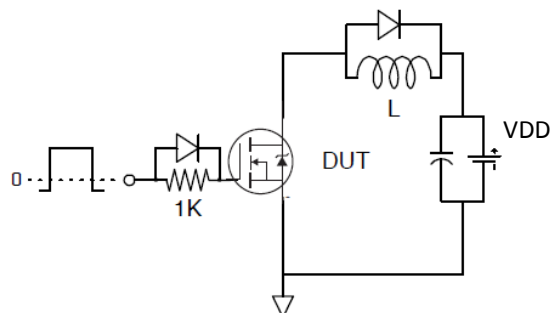
**Fig 23b.** Unclamped Inductive Waveforms



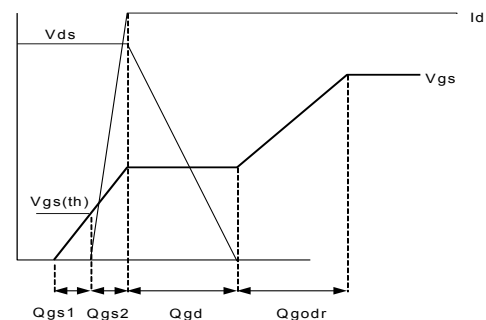
**Fig 24a.** Switching Time Test Circuit



**Fig 24b.** Switching Time Waveforms

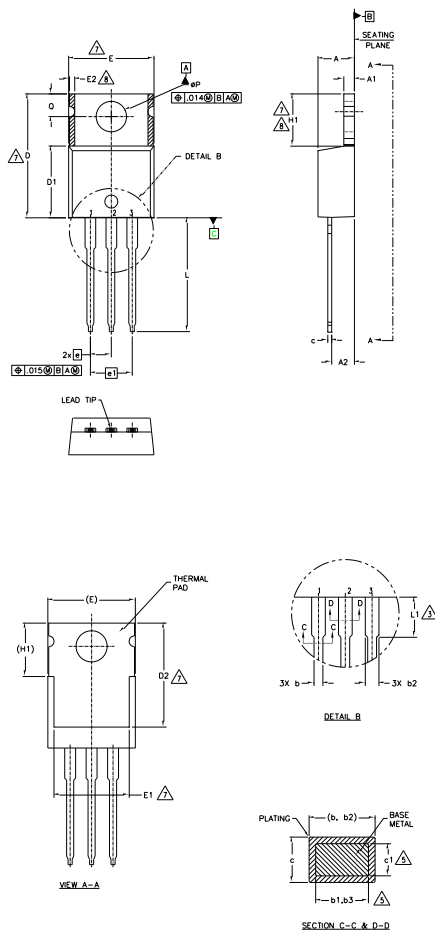


**Fig 25a.** Gate Charge Test Circuit



**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 | 5     |
| 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 |       |
| E1     | 6.86        | 8.89  | .270     | .350 | 4,7   |
| E2     | —           | 0.76  | —        | .030 | 7     |
| e      | 2.54 BSC    |       | .100 BSC |      | 8     |
| e1     | 5.08 BSC    |       | .200 BSC |      |       |
| H1     | 5.84        | 6.86  | .230     | .270 |       |
| L      | 12.70       | 14.73 | .500     | .580 | 7,8   |
| 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

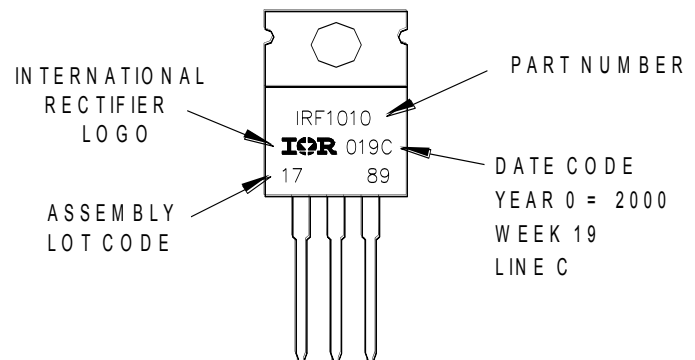
#### DIODES

- 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"

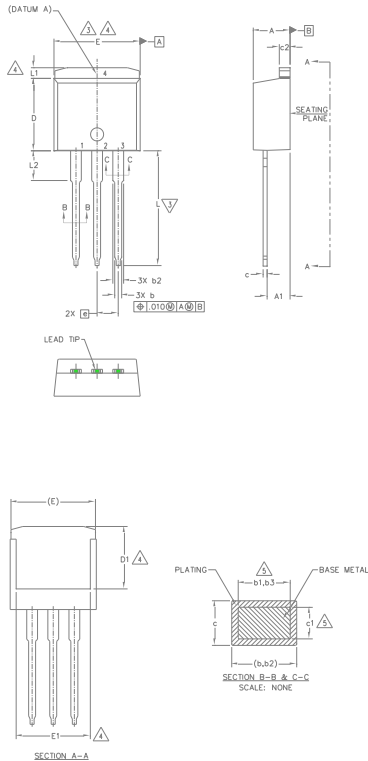
Note: "P" in assembly line position  
indicates "Lead - Free"



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 |       |
| 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 |       |
| D      | 8.38        | 9.65  | .330     | .380 | 3     |
| 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 |      |       |
| L      | 13.46       | 14.10 | .530     | .555 | 4     |
| 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

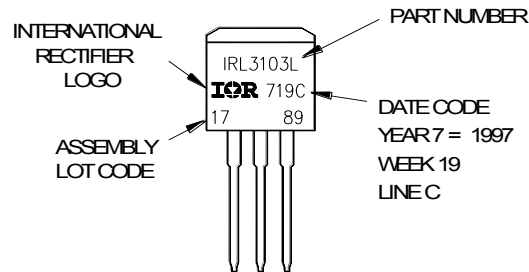
#### DIODES

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

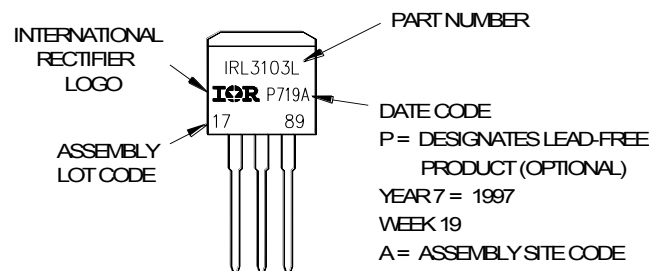
## TO-262 Part Marking Information

EXAMPLE THIS IS AN IRL3103L  
LOT CODE 1789  
ASSEMBLED ON VWV19, 1997  
IN THE ASSEMBLY LINE "C"

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

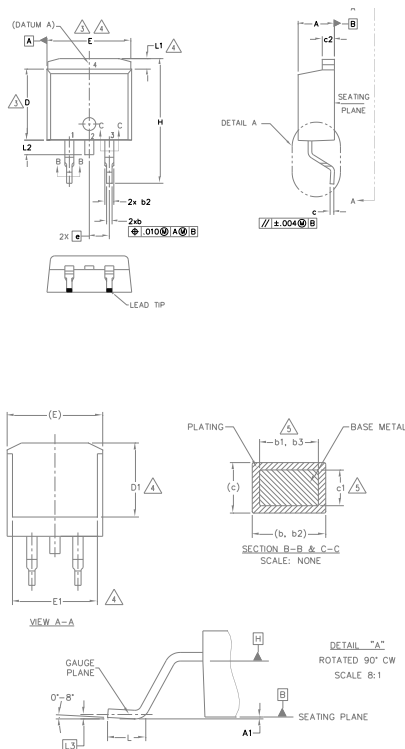


OR



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 |       |
| c1     | 0.38        | 0.58  | .015     | .023 | 5     |
| c2     | 1.14        | 1.65  | .045     | .065 |       |
| D      | 8.38        | 9.65  | .330     | .380 | 3     |
| 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     |
| H      | 14.61       | 15.88 | .575     | .625 |       |
| 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 [ .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, 4.— CATHODE
- 3.— ANODE

#### HEXFET

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

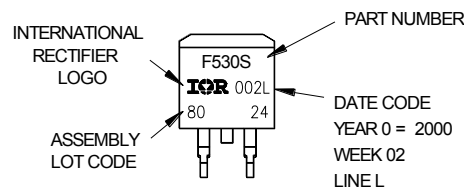
#### IGBTs, CoPACK

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

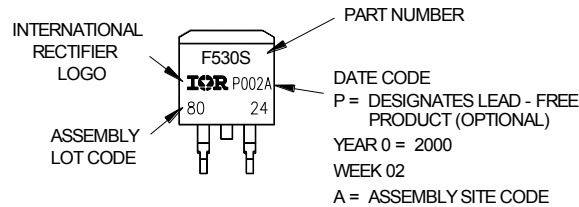
## D<sup>2</sup>Pak (TO-263AB) Part Marking Information

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"

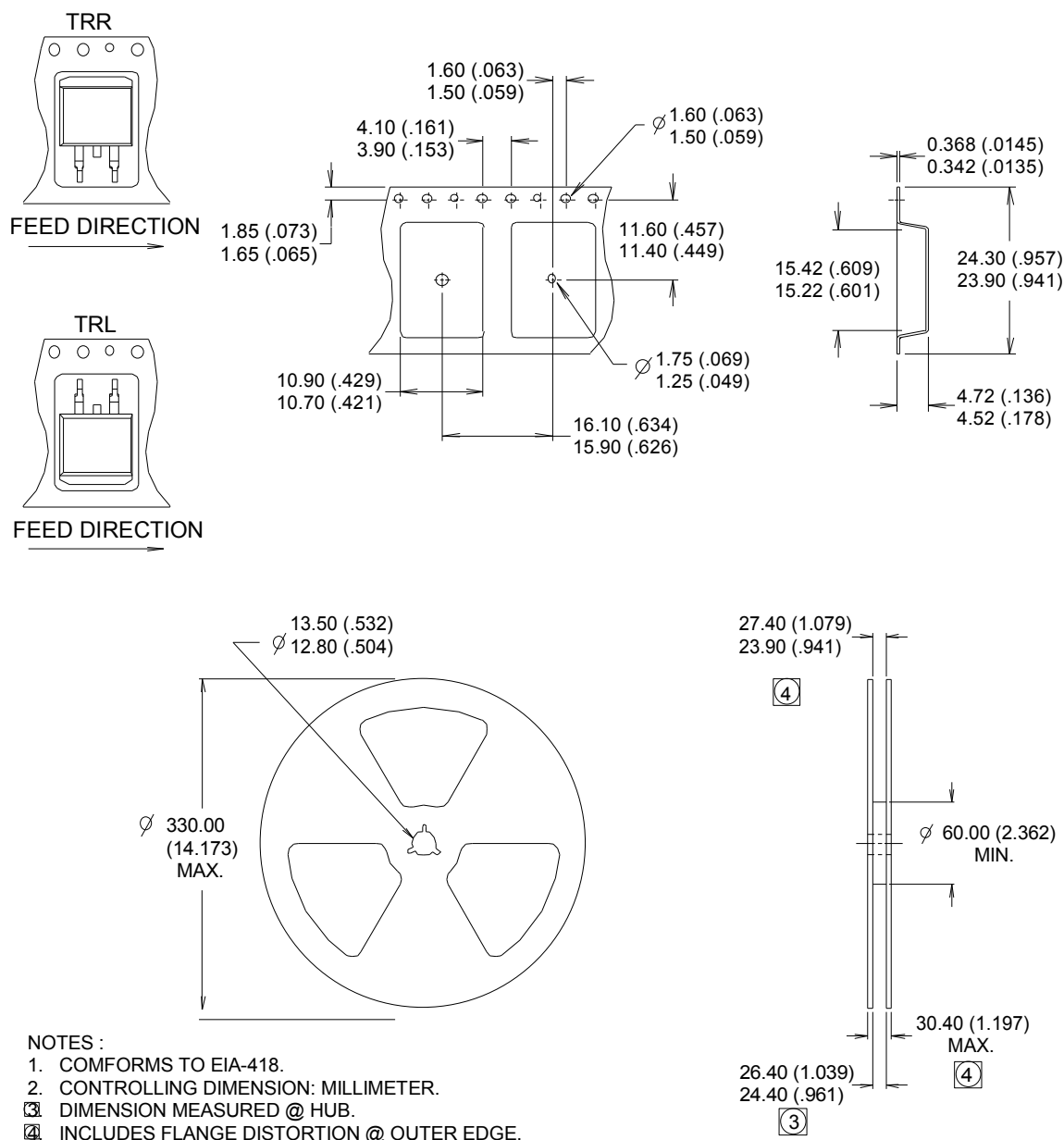


OR



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>

| Qualification Level        | Industrial<br>(per JEDEC JESD47F) <sup>††</sup> |                                       |
|----------------------------|-------------------------------------------------|---------------------------------------|
| Moisture Sensitivity Level | TO-220                                          | N/A                                   |
|                            | D <sup>2</sup> Pak                              | MSL1                                  |
|                            | TO-262                                          | (per JEDEC J-STD-020D <sup>††</sup> ) |
| RoHS Compliant             | 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       | Comment                                                                                                                                                                                                                                                                                                                         |
|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 03/05/2015 | <ul style="list-style-type: none"> <li>Updated E<sub>AS</sub> (L = 1mH) = 209mJ on page 2</li> <li>Updated note 9 "Limited by T<sub>Jmax</sub>, starting T<sub>J</sub> = 25°C, L = 1mH, R<sub>G</sub> = 50Ω, I<sub>AS</sub> = 20A, V<sub>GS</sub> = 10V" on page 2</li> <li>Updated package outline on page 9,10,11.</li> </ul> |
| 04/21/15   | <ul style="list-style-type: none"> <li>Updated Vsd curve Fig 9 on page 5</li> </ul>                                                                                                                                                                                                                                             |

International  
 Rectifier

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