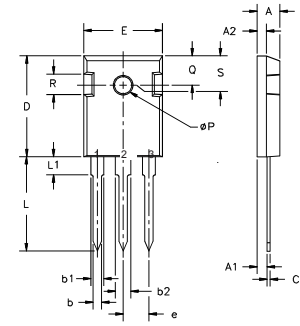


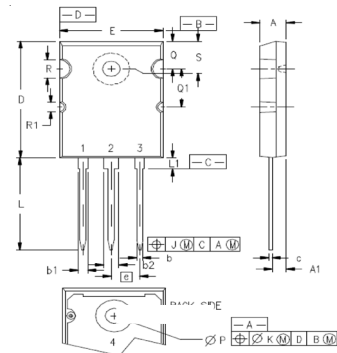
| Symbol       | Test Conditions                                                                                     | Characteristic Values<br>( $T_J = 25^\circ\text{C}$ , unless otherwise specified) |      |                        |
|--------------|-----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|------------------------|
|              |                                                                                                     | Min.                                                                              | Typ. | Max.                   |
| $g_{fs}$     | $V_{DS} = 10\text{ V}$ ; $I_D = 0.5 I_{D25}$ , pulse test                                           | 55                                                                                | 80   | S                      |
| $C_{iss}$    | $V_{GS} = 0\text{ V}$ , $V_{DS} = 25\text{ V}$ , $f = 1\text{ MHz}$                                 |                                                                                   | 5800 | pF                     |
| $C_{oss}$    |                                                                                                     |                                                                                   | 1730 | pF                     |
| $C_{rss}$    |                                                                                                     |                                                                                   | 400  | pF                     |
| $t_{d(on)}$  | $V_{GS} = 10\text{ V}$ , $V_{DS} = 0.5 V_{DSS}$ , $I_D = I_{D25}$<br>$R_G = 3.3\ \Omega$ (External) |                                                                                   | 30   | ns                     |
| $t_r$        |                                                                                                     |                                                                                   | 33   | ns                     |
| $t_{d(off)}$ |                                                                                                     |                                                                                   | 100  | ns                     |
| $t_f$        |                                                                                                     |                                                                                   | 28   | ns                     |
| $Q_{g(on)}$  | $V_{GS} = 10\text{ V}$ , $V_{DS} = 0.5 V_{DSS}$ , $I_D = 0.5 I_{D25}$                               |                                                                                   | 190  | nC                     |
| $Q_{gs}$     |                                                                                                     |                                                                                   | 40   | nC                     |
| $Q_{gd}$     |                                                                                                     |                                                                                   | 105  | nC                     |
| $R_{thJC}$   |                                                                                                     |                                                                                   |      | $0.21^\circ\text{C/W}$ |
| $R_{thCS}$   | TO-247                                                                                              |                                                                                   | 0.21 | $^\circ\text{C/W}$     |
| $R_{thCS}$   | TO-264                                                                                              |                                                                                   | 0.15 | $^\circ\text{C/W}$     |

| Source-Drain Diode |                                                                                                          | Characteristic Values<br>( $T_J = 25^\circ\text{C}$ , unless otherwise specified) |      |               |
|--------------------|----------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|---------------|
| Symbol             | Test Conditions                                                                                          | Min.                                                                              | Typ. | Max.          |
| $I_S$              | $V_{GS} = 0\text{ V}$                                                                                    |                                                                                   |      | 150 A         |
| $I_{SM}$           | Repetitive                                                                                               |                                                                                   |      | 340 A         |
| $V_{SD}$           | $I_F = I_S$ , $V_{GS} = 0\text{ V}$ ,<br>Pulse test, $t \leq 300\ \mu\text{s}$ , duty cycle $d \leq 2\%$ |                                                                                   |      | 1.5 V         |
| $t_{rr}$           | $I_F = 25\text{ A}$<br>$-di/dt = 100\text{ A}/\mu\text{s}$                                               |                                                                                   |      | 200 ns        |
| $Q_{RM}$           | $V_R = 100\text{ V}$                                                                                     |                                                                                   | 0.8  | $\mu\text{C}$ |

**TO-247 (IXFH) Outline**


Terminals: 1 - Gate  
2 - Drain  
3 - Source  
Tab - Drain

| Dim.           | Millimeter<br>Min. | Max.  | Inches<br>Min. | Max.  |
|----------------|--------------------|-------|----------------|-------|
| A              | 4.7                | 5.3   | .185           | .209  |
| A <sub>1</sub> | 2.2                | 2.54  | .087           | .102  |
| A <sub>2</sub> | 2.2                | 2.6   | .059           | .098  |
| b              | 1.0                | 1.4   | .040           | .055  |
| b <sub>1</sub> | 1.65               | 2.13  | .065           | .084  |
| b <sub>2</sub> | 2.87               | 3.12  | .113           | .123  |
| C              | .4                 | .8    | .016           | .031  |
| D              | 20.80              | 21.46 | .819           | .845  |
| E              | 15.75              | 16.26 | .610           | .640  |
| e              | 5.20               | 5.72  | 0.205          | 0.225 |
| L              | 19.81              | 20.32 | .780           | .800  |
| L <sub>1</sub> |                    | 4.50  |                | .177  |
| ØP             | 3.55               | 3.65  | .140           | .144  |
| Q              | 5.89               | 6.40  | 0.232          | 0.252 |
| R              | 4.32               | 5.49  | .170           | .216  |
| S              | 6.15               | BSC   | 242            | BSC   |

**TO-264 (IXFK) Outline**


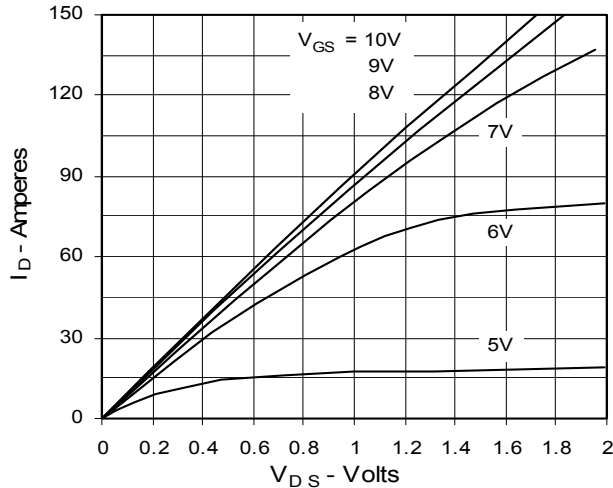
1 - GATE  
2, 4 - DRAIN (COLLECTOR)  
3 - SOURCE (EMITTER)

| SYM             | INCHES  |       | MILLIMETERS |       |
|-----------------|---------|-------|-------------|-------|
|                 | MIN     | MAX   | MIN         | MAX   |
| A               | .185    | .209  | 4.70        | 5.31  |
| A <sub>1</sub>  | .102    | .118  | 2.59        | 3.00  |
| b               | .037    | .055  | 0.94        | 1.40  |
| b <sub>1</sub>  | .087    | .102  | 2.21        | 2.59  |
| b <sub>2</sub>  | .110    | .126  | 2.79        | 3.20  |
| c               | .017    | .029  | 0.43        | 0.74  |
| D               | 1.007   | 1.047 | 25.58       | 26.59 |
| E               | .760    | .799  | 19.30       | 20.29 |
| e               | .215BSC |       | 5.46 BSC    |       |
| J               | .000    | .010  | 0.00        | 0.25  |
| K               | .000    | .010  | 0.00        | 0.25  |
| L               | .779    | .842  | 19.79       | 21.39 |
| L <sub>1</sub>  | .087    | .102  | 2.21        | 2.59  |
| ØP              | .122    | .138  | 3.10        | 3.51  |
| Q               | .240    | .256  | 6.10        | 6.50  |
| Q <sub>1</sub>  | .330    | .346  | 8.38        | 8.79  |
| ØR              | .155    | .187  | 3.94        | 4.75  |
| ØR <sub>1</sub> | .085    | .093  | 2.16        | 2.36  |
| S               | .243    | .253  | 6.17        | 6.43  |

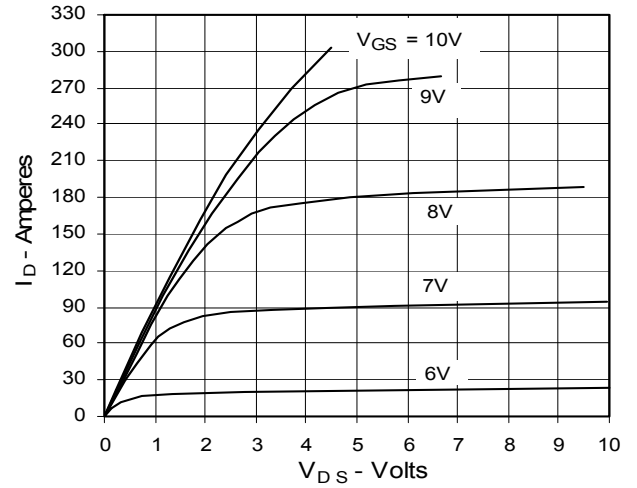
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4,881,106 5,034,796 5,187,117 5,486,715 6,306,728 B1 6,583,505 6,710,463 6,771,478 B2

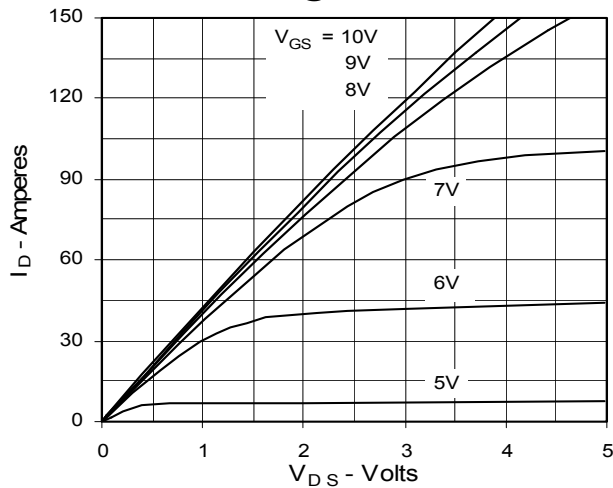
**Fig. 1. Output Characteristics**  
**@ 25°C**



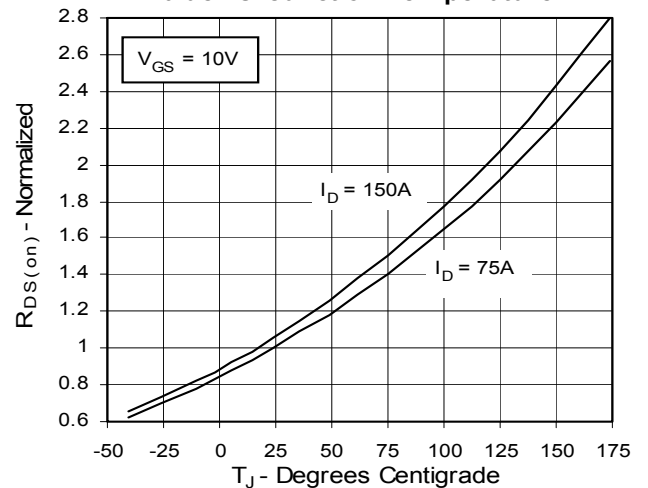
**Fig. 2. Extended Output Characteristics**  
**@ 25°C**



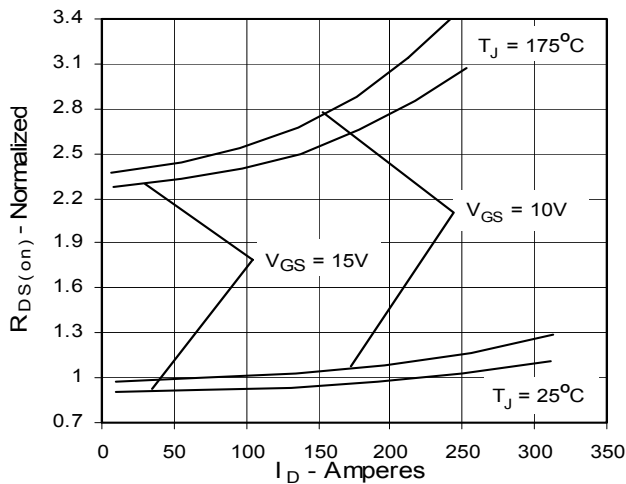
**Fig. 3. Output Characteristics**  
**@ 150°C**



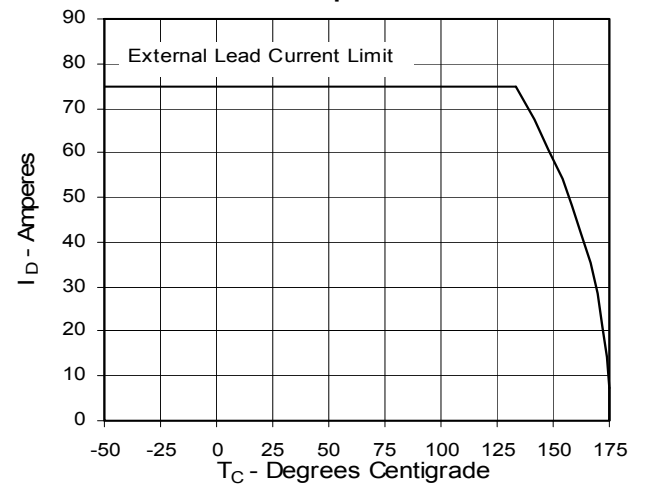
**Fig. 4.  $R_{DS(on)}$  Normalized to 0.5  $I_{D25}$**   
**Value vs. Junction Temperature**



**Fig. 5.  $R_{DS(on)}$  Normalized to 0.5  $I_{D25}$**   
**Value vs. Drain Current**



**Fig. 6. Drain Current vs. Case Temperature**



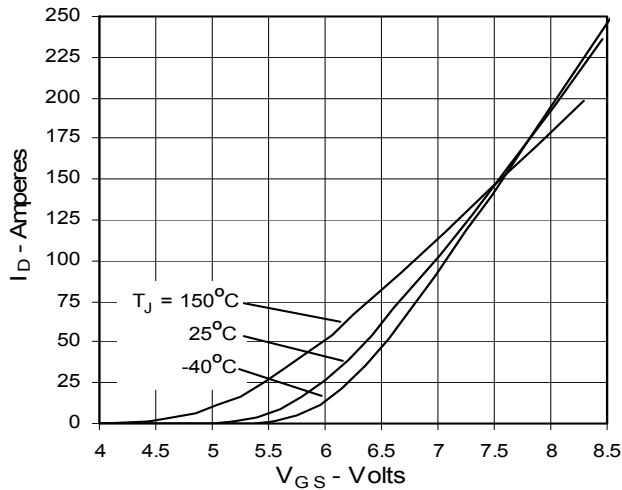
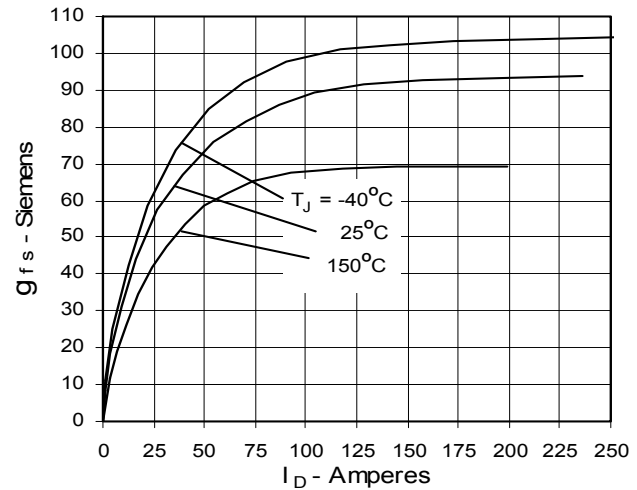
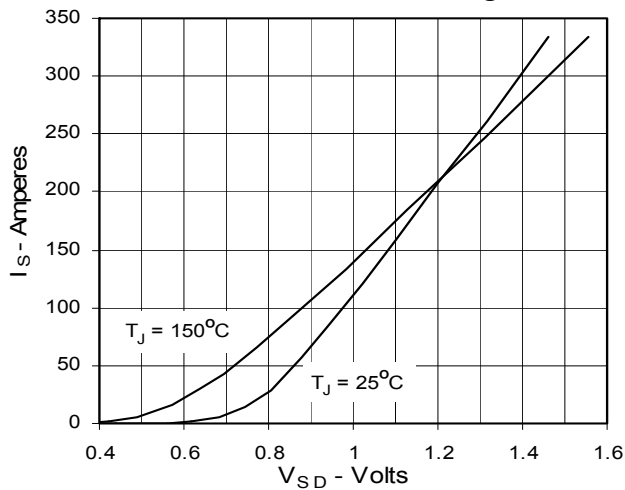
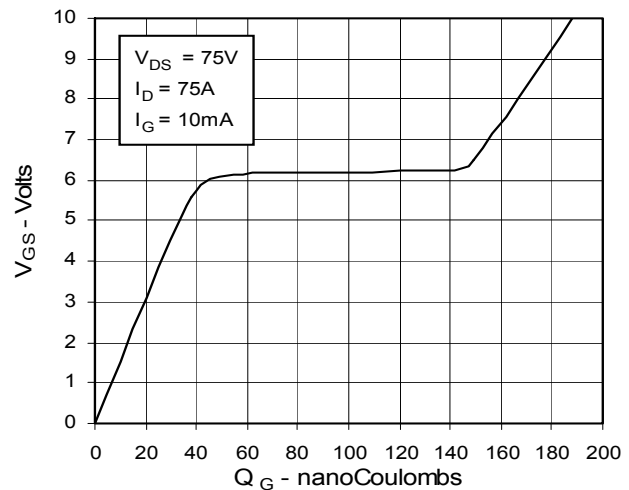
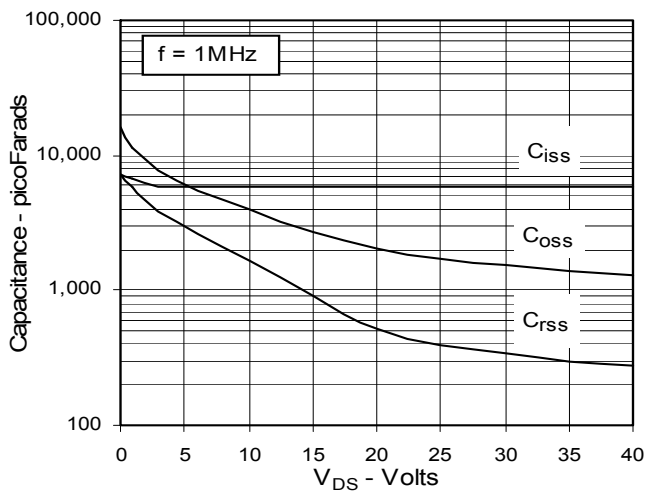
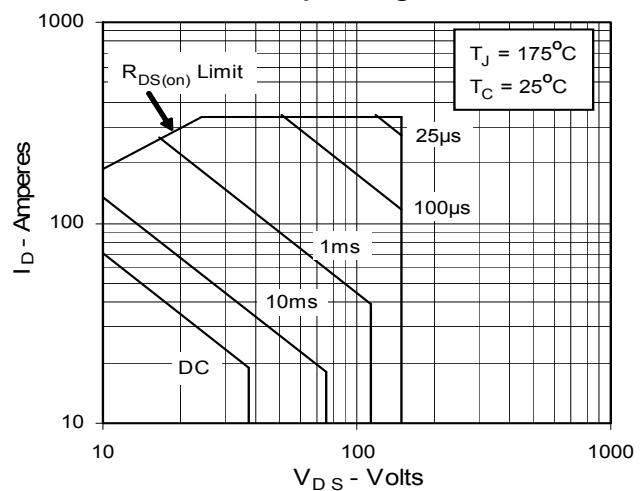
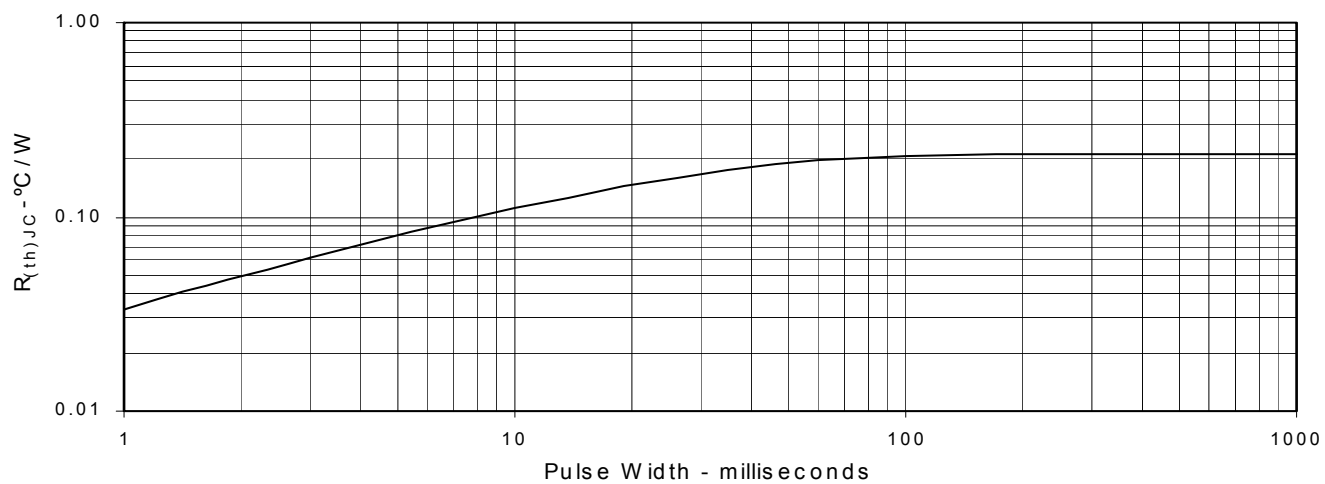
**Fig. 7. Input Admittance**

**Fig. 8. Transconductance**

**Fig. 9. Source Current vs. Source-To-Drain Voltage**

**Fig. 10. Gate Charge**

**Fig. 11. Capacitance**

**Fig. 12. Forward-Bias Safe Operating Area**


Fig. 13. Maximum Transient Thermal Resistance





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