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

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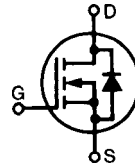


# MegaMOS™ FET

**IXTH 50N20**  
**IXTM 50N20**

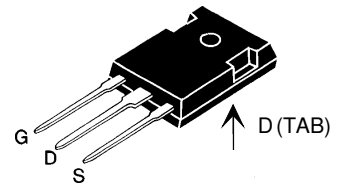
$V_{DSS} = 200\text{ V}$   
 $I_{D25} = 50\text{ A}$   
 $R_{DS(on)} = 45\text{ m}\Omega$

## N-Channel Enhancement Mode

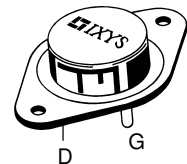


| Symbol  | Test Conditions   | Maximum Ratings             |                  |
|---|---|-----------------------------|------------------|
| $V_{DSS}$   | $T_J = 25^\circ\text{C}$ to $150^\circ\text{C}$                               | 200                         | V                |
| $V_{DGR}$   | $T_J = 25^\circ\text{C}$ to $150^\circ\text{C}$ ; $R_{GS} = 1\text{ M}\Omega$ | 200                         | V                |
| $V_{GS}$  | Continuous  | $\pm 20$                    | V                |
| $V_{GSM}$   | Transient   | $\pm 30$                    | V                |
| $I_{D25}$   | $T_C = 25^\circ\text{C}$  | 50                          | A                |
| $I_{DM}$  | $T_C = 25^\circ\text{C}$ , pulse width limited by $T_{JM}$                    | 200                         | A                |
| $P_D$   | $T_C = 25^\circ\text{C}$  | 300                         | W                |
| $T_J$   |   | -55 ... +150                | $^\circ\text{C}$ |
| $T_{JM}$  |   | 150                         | $^\circ\text{C}$ |
| $T_{stg}$   |   | -55 ... +150                | $^\circ\text{C}$ |
| $M_d$   | Mounting torque   | 1.13/10                     | Nm/lb.in.        |
| <b>Weight</b>   |   | TO-204 = 18 g, TO-247 = 6 g |                  |
| Maximum lead temperature for soldering<br>1.6 mm (0.062 in.) from case for 10 s |   | 300                         | $^\circ\text{C}$ |

### TO-247 AD (IXTH)



### TO-204 AE (IXTM)



G = Gate, D = Drain,  
S = Source, TAB = Drain

### Features

- International standard packages
- Low  $R_{DS(on)}$  HDMOS™ process
- Rugged polysilicon gate cell structure
- Low package inductance (< 5 nH)
  - easy to drive and to protect
- Fast switching times

### Applications

- Switch-mode and resonant-mode power supplies
- Motor controls
- Uninterruptible Power Supplies (UPS)
- DC choppers

### Advantages

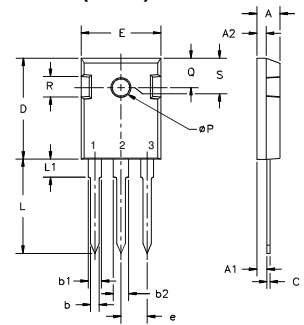
- Easy to mount with 1 screw (TO-247) (isolated mounting screw hole)
- Space savings
- High power density

| Symbol       | Test Conditions   | Characteristic Values<br>( $T_J = 25^\circ\text{C}$ , unless otherwise specified) |      |   |
|--------------|---|---|------|---|
|              |   | min.  | typ. | max.                                      |
| $V_{DSS}$    | $V_{GS} = 0\text{ V}$ , $I_D = 250\text{ }\mu\text{A}$  | 200   |      | V   |
| $V_{GS(th)}$ | $V_{DS} = V_{GS}$ , $I_D = 250\text{ }\mu\text{A}$  | 2   |      | V   |
| $I_{GSS}$    | $V_{GS} = \pm 20\text{ V}_{DC}$ , $V_{DS} = 0$  |   |      | $\pm 100\text{ nA}$                       |
| $I_{DSS}$    | $V_{DS} = 0.8 \cdot V_{DSS}$ , $V_{GS} = 0\text{ V}$  |   |      | $200\text{ }\mu\text{A}$<br>$1\text{ mA}$ |
| $R_{DS(on)}$ | $V_{GS} = 10\text{ V}$ , $I_D = 0.5 I_{D25}$<br>Pulse test, $t \leq 300\text{ }\mu\text{s}$ , duty cycle $d \leq 2\%$ |   |      | $0.045\text{ }\Omega$                     |

| Symbol       | Test Conditions   | Characteristic Values<br>( $T_J = 25^\circ\text{C}$ , unless otherwise specified) |      |      |    |
|--------------|---|---|------|------|----|
|              |   | min.  | typ. | max. |    |
| $g_{fs}$     | $V_{DS} = 10\text{ V}; I_D = 0.5 \cdot I_{D25}$ , pulse test  | 20  | 32   | S    |    |
| $C_{iss}$    | $V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$   |   | 4600 | pF   |    |
| $C_{oss}$    |   |   | 800  | pF   |    |
| $C_{rss}$    |   |   | 285  | pF   |    |
| $t_{d(on)}$  | $V_{GS} = 10\text{ V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 0.5 I_{D25}$<br>$R_G = 2\ \Omega$ , (External) |   | 18   | 25   | ns |
| $t_r$        |   |   | 15   | 20   | ns |
| $t_{d(off)}$ |   |   | 72   | 90   | ns |
| $t_f$        |   |   | 16   | 25   | ns |
| $Q_{g(on)}$  | $V_{GS} = 10\text{ V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 0.5 I_{D25}$                                   |   | 190  | 220  | nC |
| $Q_{gs}$     |   |   | 35   | 50   | nC |
| $Q_{gd}$     |   |   | 95   | 110  | nC |
| $R_{thJC}$   |   |   | 0.42 | K/W  |    |
| $R_{thCK}$   |   | 0.25  |      | K/W  |    |

| Symbol   | Test Conditions   | Characteristic Values<br>( $T_J = 25^\circ\text{C}$ , unless otherwise specified) |      |       |
|----------|---|---|------|-------|
|          |   | min.  | typ. | max.  |
| $I_S$    | $V_{GS} = 0\text{ V}$ 50N20   |   |      | 50 A  |
| $I_{SM}$ | Repetitive;<br>pulse width limited by $T_{JM}$  |   |      | 200 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 |
| $t_{rr}$ | $I_F = I_S, -di/dt = 100\text{ A}/\mu\text{s}, V_R = 100\text{ V}$                                    | 400   |      | ns    |

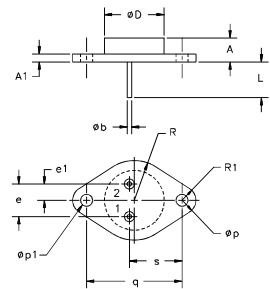
### TO-247 AD (IXTH) Outline



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

| Dim.           | Millimeter |       | Inches |       |
|----------------|------------|-------|--------|-------|
|                | Min.       | Max.  | 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  |
| L1             |            | 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-204AE (IXTM) Outline



Pins 1 - Gate 2 - Source  
Case - Drain

| Dim.            | Millimeter |       | Inches |      |
|-----------------|------------|-------|--------|------|
|                 | Min.       | Max.  | Min.   | Max. |
| A               | 6.4        | 11.4  | .250   | .450 |
| A <sub>1</sub>  | 1.53       | 3.42  | .060   | .135 |
| Øb              | 1.45       | 1.60  | .057   | .063 |
| ØD              |            | 22.22 |        | .875 |
| e               | 10.67      | 11.17 | .420   | .440 |
| e <sub>1</sub>  | 5.21       | 5.71  | .205   | .225 |
| L               | 11.18      | 12.19 | .440   | .480 |
| Øp              | 3.84       | 4.19  | .151   | .165 |
| Øp <sub>1</sub> | 3.84       | 4.19  | .151   | .165 |
| q               | 30.15      | BSC   | 1.187  | BSC  |
| R               | 12.58      | 13.33 | .495   | .525 |
| R <sub>1</sub>  | 3.33       | 4.77  | .131   | .188 |
| s               | 16.64      | 17.14 | .655   | .675 |

Fig. 1 Output Characteristics

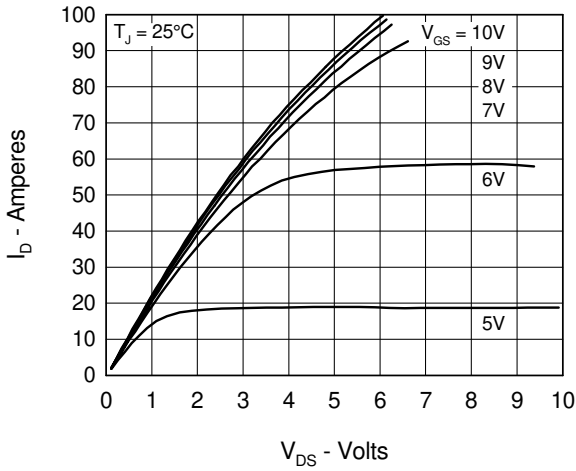


Fig. 2 Input Admittance

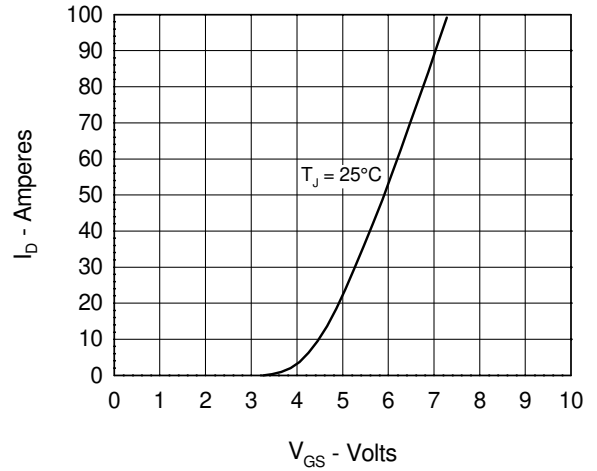


Fig. 3  $R_{DS(on)}$  vs. Drain Current

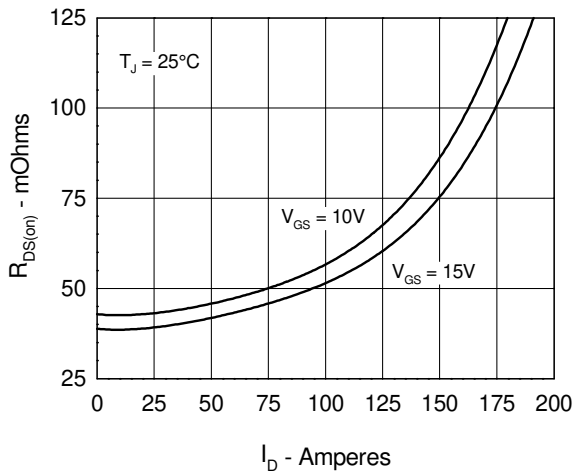


Fig. 4 Temperature Dependence of Drain to Source Resistance

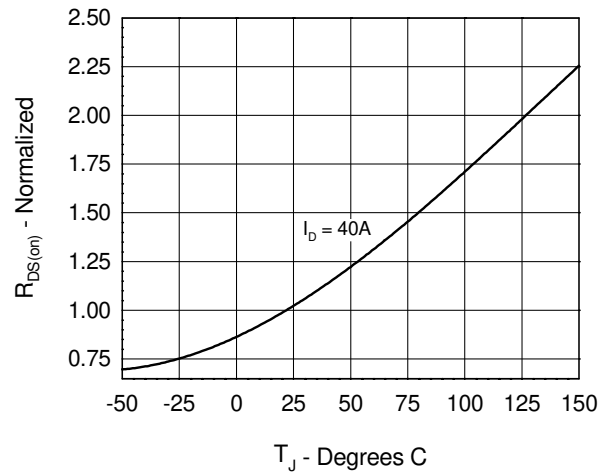


Fig. 5 Drain Current vs. Case Temperature

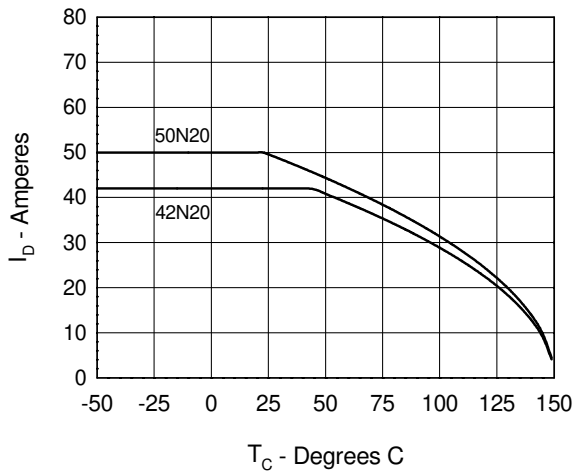
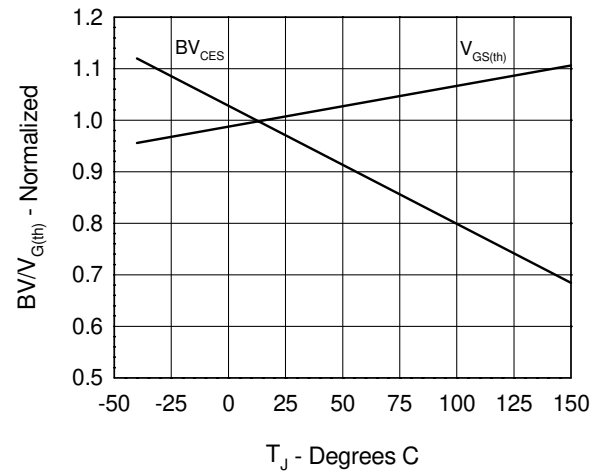
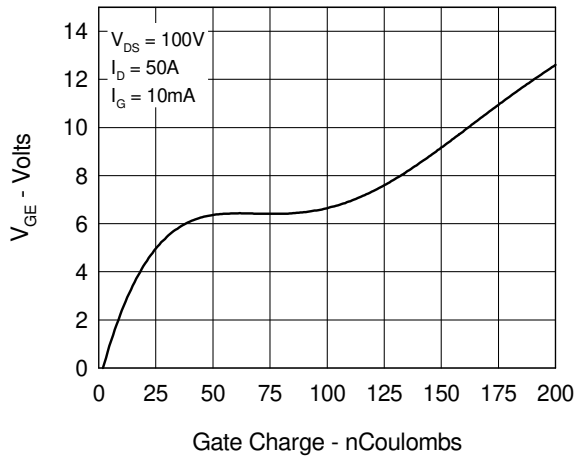


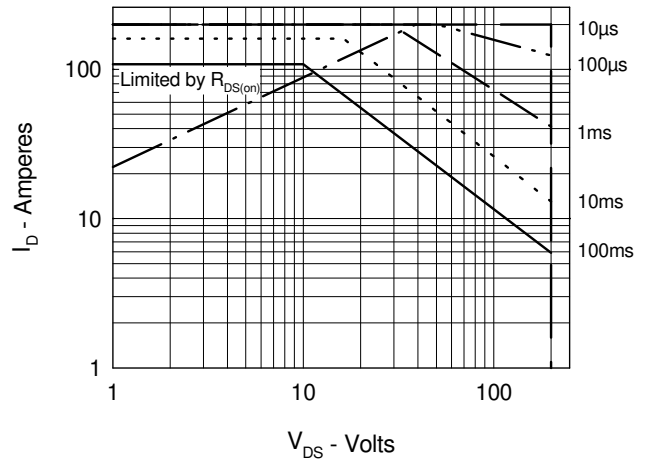
Fig. 6 Temperature Dependence of Breakdown and Threshold Voltage



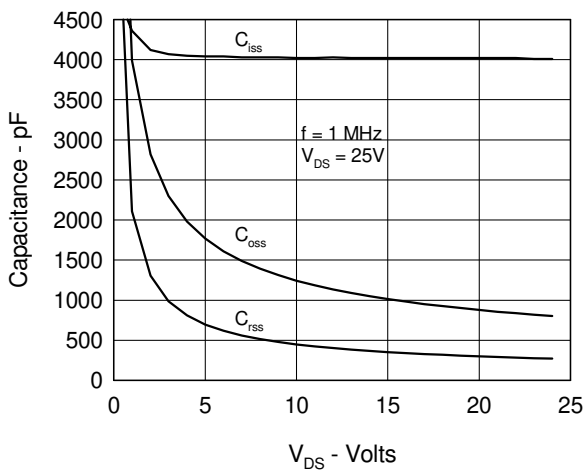
**Fig.7 Gate Charge Characteristic Curve**



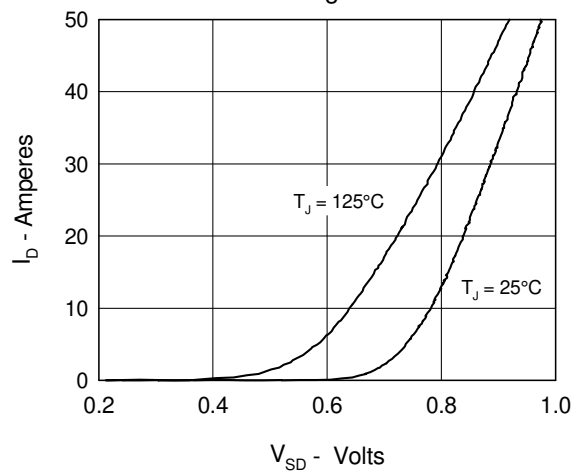
**Fig.8 Forward Bias Safe Operating Area**



**Fig.9 Capacitance Curves**



**Fig.10 Source Current vs. Source to Drain Voltage**



**Fig.11 Transient Thermal Impedance**

