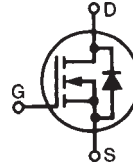


# PolarHV™ Power MOSFET

N-Channel Enhancement Mode  
Fast Recovery Diode  
Avalanche Rated

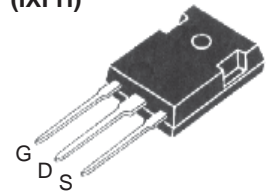
**IXFH26N60P**  
**IXFT26N60P**  
**IXFV26N60P**  
**IXFV26N60PS**

$V_{DSS} = 600 \text{ V}$   
 $I_{D25} = 26 \text{ A}$   
 $R_{DS(on)} \leq 270 \text{ m}\Omega$   
 $t_{rr} \leq 200 \text{ ns}$

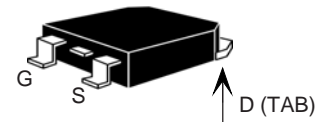


| Symbol     | Test Conditions   | Maximum Ratings |                  |
|------------|---|-----------------|------------------|
| $V_{DSS}$  | $T_J = 25^\circ\text{C}$ to $150^\circ\text{C}$   | 600             | V                |
| $V_{DGR}$  | $T_J = 25^\circ\text{C}$ to $150^\circ\text{C}$ ; $R_{GS} = 1 \text{ M}\Omega$  | 600             | V                |
| $V_{GSS}$  | Continuous  | $\pm 30$        | V                |
| $V_{GSM}$  | Transient   | $\pm 40$        | V                |
| $I_{D25}$  | $T_C = 25^\circ\text{C}$  | 26              | A                |
| $I_{DM}$   | $T_C = 25^\circ\text{C}$ , pulse width limited by $T_{JM}$  | 65              | A                |
| $I_{AR}$   | $T_C = 25^\circ\text{C}$  | 13              | A                |
| $E_{AR}$   | $T_C = 25^\circ\text{C}$  | 40              | mJ               |
| $E_{AS}$   | $T_C = 25^\circ\text{C}$  | 1.2             | J                |
| $dv/dt$    | $I_S \leq I_{DM}$ , $di/dt \leq 100 \text{ A}/\mu\text{s}$ , $V_{DD} \leq V_{DSS}$<br>$T_J \leq 150^\circ\text{C}$ , $R_G = 5 \Omega$ | 10              | V/ns             |
| $P_D$      | $T_C = 25^\circ\text{C}$  | 460             | W                |
| $T_J$      |   | -55 ... +150    | $^\circ\text{C}$ |
| $T_{JM}$   |   | 150             | $^\circ\text{C}$ |
| $T_{stg}$  |   | -55 ... +150    | $^\circ\text{C}$ |
| $T_L$      | 1.6 mm (0.062 in.) from case for 10 s   | 300             | $^\circ\text{C}$ |
| $T_{SOLD}$ | Plastic body for 10 s   | 260             | $^\circ\text{C}$ |
| $M_d$      | Mounting torque (TO-3P&TO-247)  | 1.13/10         | Nm/lb.in.        |
| $F_c$      | Mounting force (PLUS220)  | 11..65/2.5..15  | N/lb             |
| Weight     | TO-247  | 6.0             | g                |
|            | TO-268  | 5.0             | g                |
|            | PLUS220 & PLUS220SMD  | 4.0             | g                |

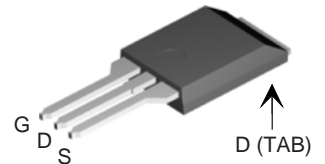
TO-247 (IXFH)



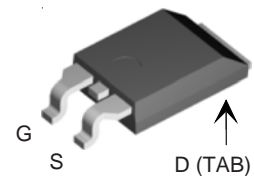
TO-268 (IXFT)



PLUS220 (IXFV)



PLUS220SMD (IXFV...S)



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

| Symbol       | Test Conditions<br>( $T_J = 25^\circ\text{C}$ , unless otherwise specified)                                      | Characteristic Values |      |                      |
|--------------|--|-----------------------|------|----------------------|
|              |  | Min.                  | Typ. | Max.                 |
| $BV_{DSS}$   | $V_{GS} = 0 \text{ V}$ , $I_D = 250 \mu\text{A}$   | 600                   |      | V                    |
| $V_{GS(th)}$ | $V_{DS} = V_{GS}$ , $I_D = 4 \text{ mA}$   | 2.5                   |      | V                    |
| $I_{GSS}$    | $V_{GS} = \pm 30 \text{ V}$ , $V_{DS} = 0 \text{ V}$   |                       |      | $\pm 100 \text{ nA}$ |
| $I_{DSS}$    | $V_{DS} = V_{DSS}$<br>$V_{GS} = 0 \text{ V}$<br>$T_J = 125^\circ\text{C}$  |                       |      | 25 $\mu\text{A}$     |
|              |  |                       |      | 250 $\mu\text{A}$    |
| $R_{DS(on)}$ | $V_{GS} = 10 \text{ V}$ , $I_D = 0.5 I_{D25}$<br>Pulse test, $t \leq 300 \mu\text{s}$ , duty cycle $d \leq 2 \%$ |                       |      | 270 $\text{m}\Omega$ |

### Features

- Fast Recovery diode
- Unclamped Inductive Switching (UIS) rated
- International standard packages
- Low package inductance
- easy to drive and to protect

### Advantages

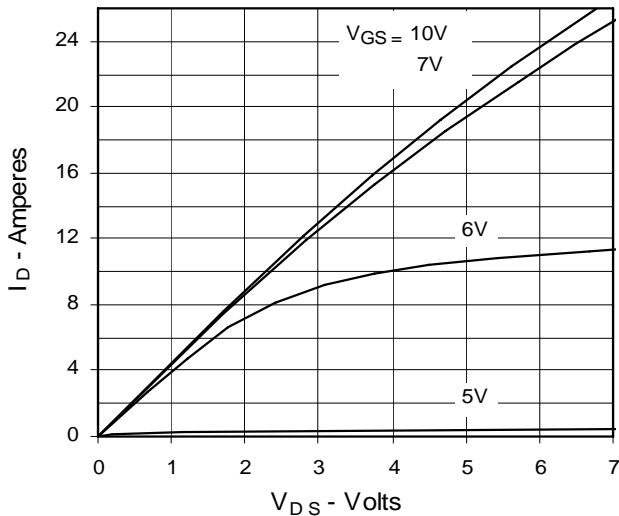
- Easy to mount
- Space savings
- High power density

| Symbol       | Test Conditions  | Characteristic Values<br>( $T_J = 25^\circ\text{C}$ , unless otherwise specified) |      |                         |
|--------------|--|---|------|-------------------------|
|              |  | Min.  | Typ. | Max.                    |
| $g_{fs}$     | $V_{DS} = 20\text{ V}; I_D = 0.5 I_{D25}$ , pulse test                       | 16  | 26   | S                       |
| $C_{iss}$    | $V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$                |   | 4150 | pF                      |
| $C_{oss}$    |  |   | 400  | pF                      |
| $C_{rss}$    |  |   | 27   | pF                      |
| $t_{d(on)}$  | $V_{GS} = 10\text{ V}, V_{DS} = 0.5 I_{D25}$<br>$R_G = 5\ \Omega$ (External) |   | 25   | ns                      |
| $t_r$        |  |   | 27   | ns                      |
| $t_{d(off)}$ |  |   | 75   | ns                      |
| $t_f$        |  |   | 21   | ns                      |
| $Q_{g(on)}$  | $V_{GS} = 10\text{ V}, V_{DS} = 0.5 V_{DSS}, I_D = 0.5 I_{D25}$              |   | 72   | nC                      |
| $Q_{gs}$     |  |   | 27   | nC                      |
| $Q_{gd}$     |  |   | 24   | nC                      |
| $R_{thJC}$   |  |   |      | 0.27 $^\circ\text{C/W}$ |
| $R_{thCs}$   | (PLUS220 & TO-247)   |   | 0.21 | $^\circ\text{C/W}$      |

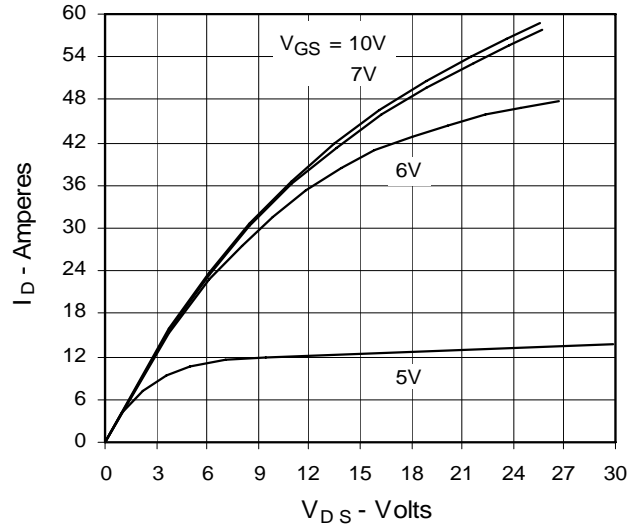
| Symbol   | Test Conditions   | Characteristic Values<br>( $T_J = 25^\circ\text{C}$ , unless otherwise specified) |      |               |
|----------|---|---|------|---------------|
|          |   | Min.  | Typ. | Max.          |
| $I_s$    | $V_{GS} = 0\text{ V}$   |   |      | 26 A          |
| $I_{SM}$ | Repetitive  |   |      | 78 A          |
| $V_{SD}$ | $I_F = I_s, V_{GS} = 0\text{ V}$ , pulse test   |   |      | 1.5 V         |
| $t_{rr}$ | $I_F = 25\text{ A}, -di/dt = 100\text{ A}/\mu\text{s}$<br>$V_R = 100\text{ V}; V_{GS} = 0\text{ V}$ |   | 150  | 200 ns        |
| $I_{RM}$ |   |   | 7    | A             |
| $Q_{RM}$ |   |   | 0.7  | $\mu\text{C}$ |

### Characteristic Curves

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



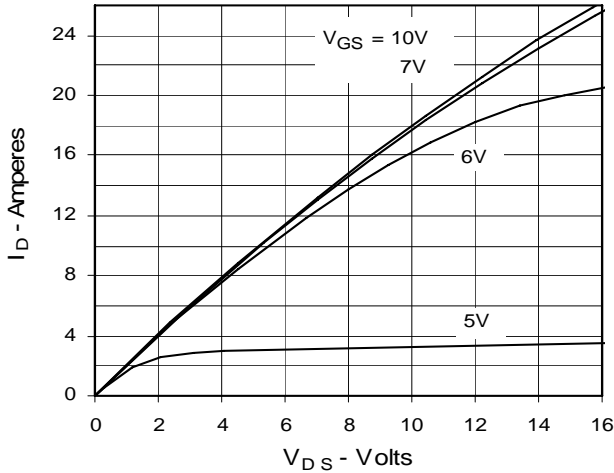
**Fig. 2. Extended Output Characteristics**  
@ 25°C



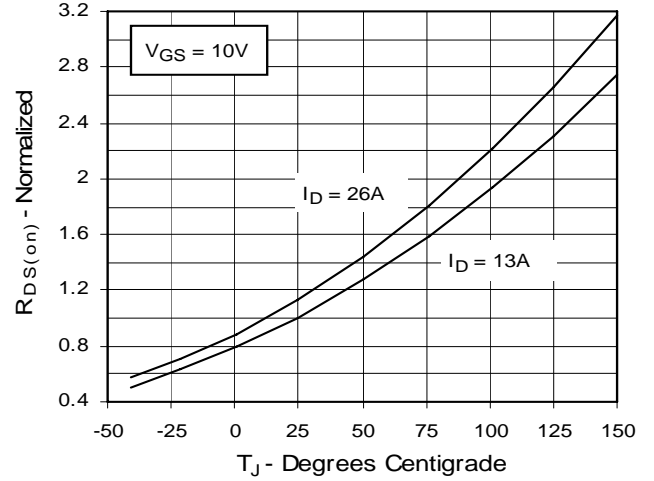
IXYS reserves the right to change limits, test conditions, and dimensions.

IXYS MOSFETs and IGBTs are covered by 4,835,592 4,931,844 5,049,961 5,237,481 6,162,665 6,404,065 B1 6,683,344 6,727,585  
 one or more of the following U.S. patents: 4,850,072 5,017,508 5,063,307 5,381,025 6,259,123 B1 6,534,343 6,710,405 B2 6,759,692  
 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

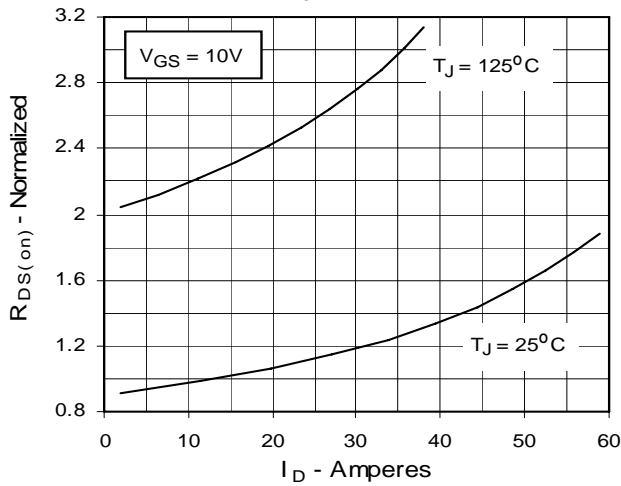
**Fig. 3. Output Characteristics @ 125°C**



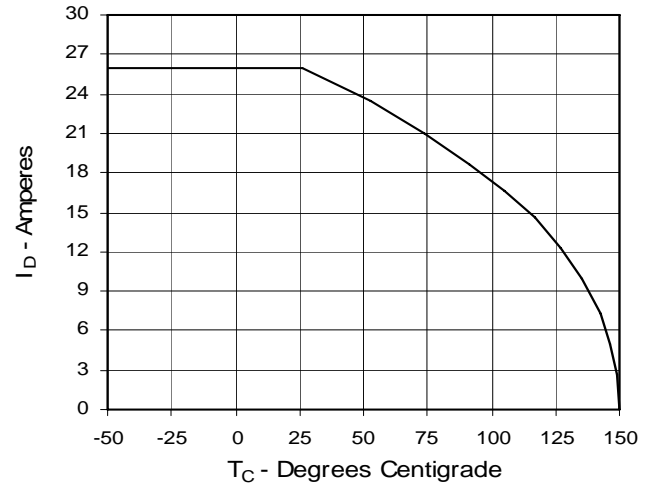
**Fig. 4.  $R_{DS(on)}$  Normalized to 0.5  $I_{D25}$  Value vs. Junction Temperature**



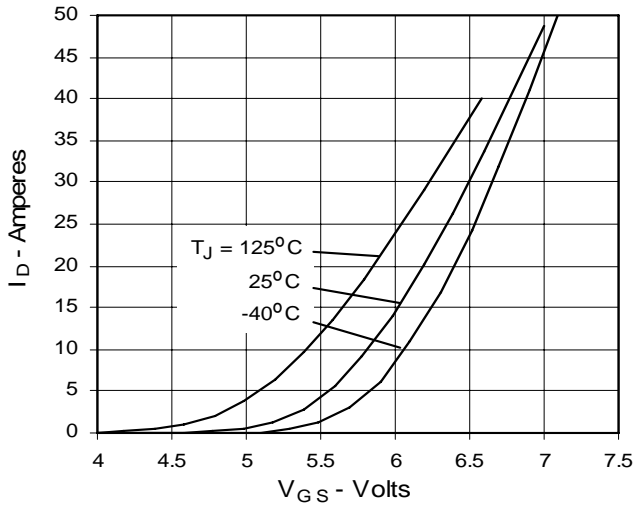
**Fig. 5.  $R_{DS(on)}$  Normalized to 0.5  $I_{D25}$  Value vs.  $I_D$**



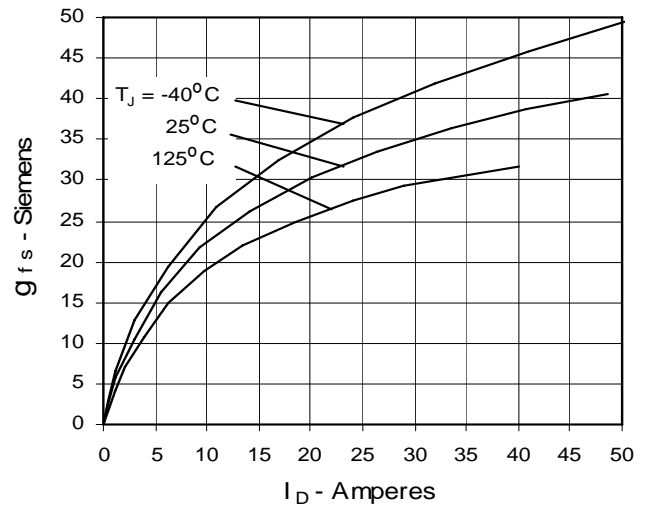
**Fig. 6. Drain Current vs. Case Temperature**



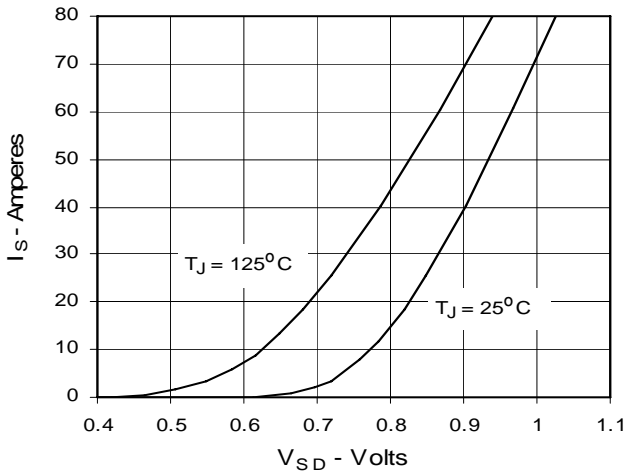
**Fig. 7. Input Admittance**



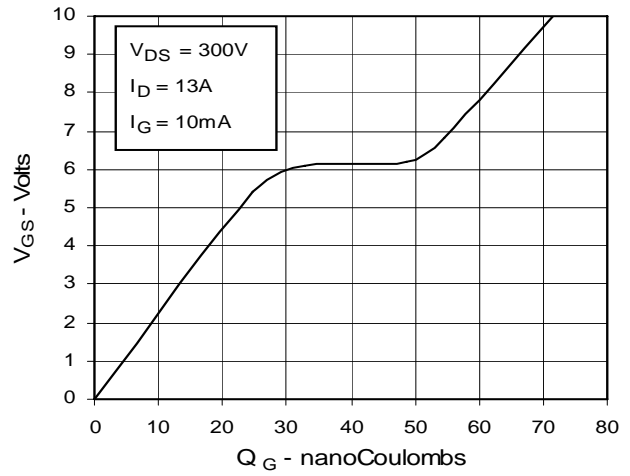
**Fig. 8. Transconductance**



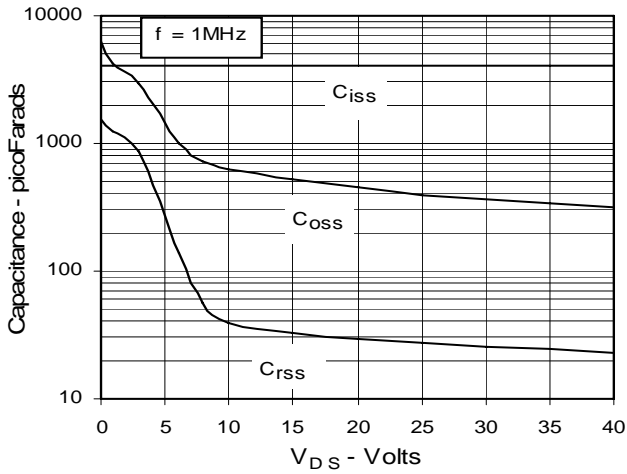
**Fig. 9. Source Current vs. Source-To-Drain Voltage**



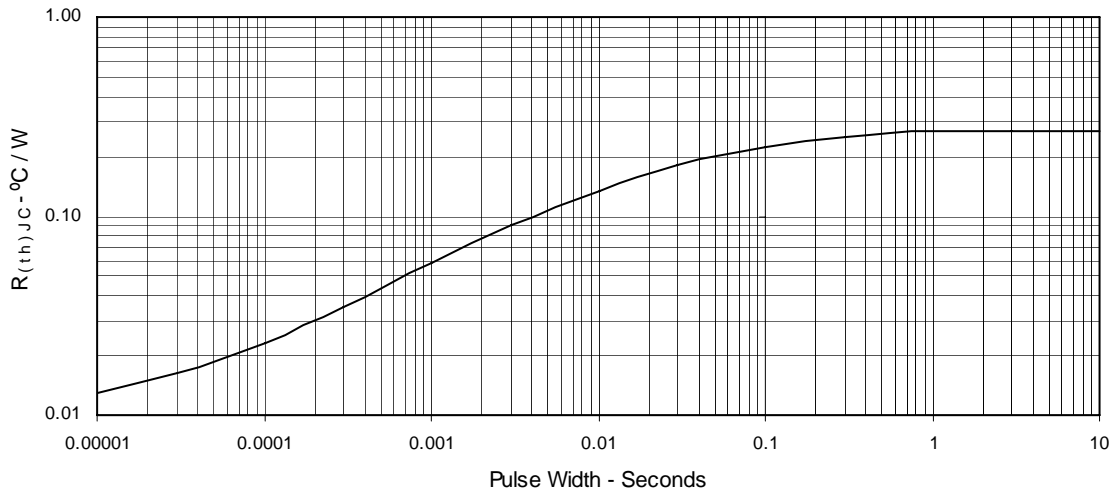
**Fig. 10. Gate Charge**



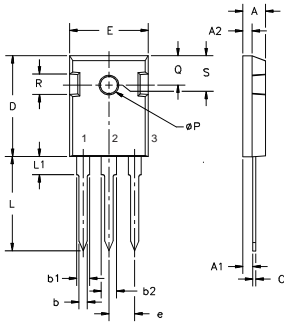
**Fig. 11. Capacitance**



**Fig. 12. Maximum Transient Thermal Resistance**

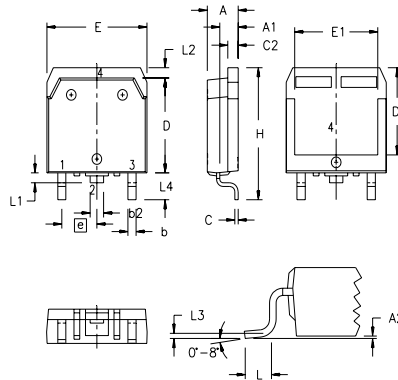


**TO-247 AD (IXFH) Outline**



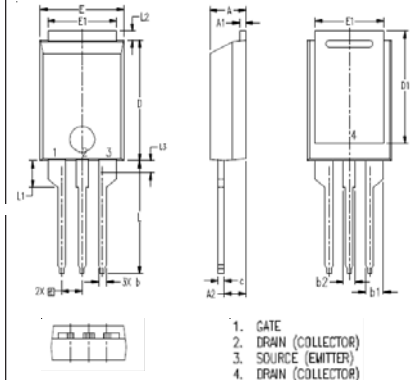
| Dim.           | Millimeter |       | Inches  |       |
|----------------|------------|-------|---------|-------|
|                | Min.       | Max.  | Min.    | Max.  |
| A              | 4.7        | 5.3   | .185    | .209  |
| A <sub>1</sub> | 2.2        | 2.54  | .087    | .102  |
| A <sub>2</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  |
| ∅P             | 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-268 (IXFT) Outline**



| SYM            | INCHES   |      | MILLIMETERS |       |
|----------------|----------|------|-------------|-------|
|                | MIN      | MAX  | MIN         | MAX   |
| A              | .193     | .201 | 4.90        | 5.10  |
| A <sub>1</sub> | .106     | .114 | 2.70        | 2.90  |
| A <sub>2</sub> | .001     | .010 | 0.02        | 0.25  |
| b              | .045     | .057 | 1.15        | 1.45  |
| b <sub>2</sub> | .075     | .083 | 1.90        | 2.10  |
| C              | .016     | .026 | 0.40        | 0.65  |
| C <sub>2</sub> | .057     | .063 | 1.45        | 1.60  |
| D              | .543     | .551 | 13.80       | 14.00 |
| D <sub>1</sub> | .488     | .500 | 12.40       | 12.70 |
| E              | .624     | .632 | 15.85       | 16.05 |
| E <sub>1</sub> | .524     | .535 | 13.30       | 13.60 |
| e              | .215 BSC |      | 5.45 BSC    |       |
| H              | .736     | .752 | 18.70       | 19.10 |
| L              | .094     | .106 | 2.40        | 2.70  |
| L <sub>1</sub> | .047     | .055 | 1.20        | 1.40  |
| L <sub>2</sub> | .039     | .045 | 1.00        | 1.15  |
| L <sub>3</sub> | .010 BSC |      | 0.25 BSC    |       |
| L <sub>4</sub> | .150     | .161 | 3.80        | 4.10  |

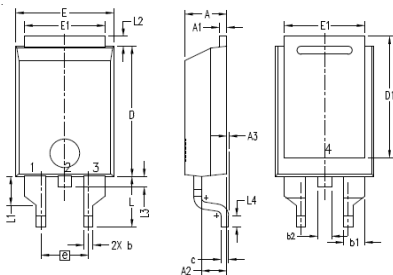
**PLUS220 (IXFV) Outline**



| SYM            | INCHES   |      | MILLIMETER |       |
|----------------|----------|------|------------|-------|
|                | MIN      | MAX  | MIN        | MAX   |
| A              | .169     | .185 | 4.30       | 4.70  |
| A <sub>1</sub> | .028     | .035 | 0.70       | 0.90  |
| A <sub>2</sub> | .098     | .118 | 2.50       | 3.00  |
| b              | .035     | .047 | 0.90       | 1.20  |
| b <sub>1</sub> | .080     | .095 | 2.03       | 2.41  |
| b <sub>2</sub> | .054     | .064 | 1.37       | 1.63  |
| c              | .028     | .035 | 0.70       | 0.90  |
| D              | .551     | .591 | 14.00      | 15.00 |
| D <sub>1</sub> | .512     | .539 | 13.00      | 13.70 |
| E              | .394     | .433 | 10.00      | 11.00 |
| E <sub>1</sub> | .331     | .346 | 8.40       | 8.80  |
| e              | .100 BSC |      | 2.54 BSC   |       |
| L              | .512     | .551 | 13.00      | 14.00 |
| L <sub>1</sub> | .118     | .138 | 3.00       | 3.50  |
| L <sub>2</sub> | .035     | .051 | 0.90       | 1.30  |
| L <sub>3</sub> | .047     | .059 | 1.20       | 1.50  |

1. GATE
2. DRAIN (COLLECTOR)
3. SOURCE (EMITTER)
4. DRAIN (COLLECTOR)

**PLUS220SMD (IXFV\_S) Outline**



| SYM            | INCHES   |      | MILLIMETER |       |
|----------------|----------|------|------------|-------|
|                | MIN      | MAX  | MIN        | MAX   |
| A              | .169     | .185 | 4.30       | 4.70  |
| A <sub>1</sub> | .028     | .035 | 0.70       | 0.90  |
| A <sub>2</sub> | .098     | .118 | 2.50       | 3.00  |
| A <sub>3</sub> | .000     | .010 | 0.00       | 0.25  |
| b              | .035     | .047 | 0.90       | 1.20  |
| b <sub>1</sub> | .080     | .095 | 2.03       | 2.41  |
| b <sub>2</sub> | .054     | .064 | 1.37       | 1.63  |
| c              | .028     | .035 | 0.70       | 0.90  |
| D              | .551     | .591 | 14.00      | 15.00 |
| D <sub>1</sub> | .512     | .539 | 13.00      | 13.70 |
| E              | .394     | .433 | 10.00      | 11.00 |
| E <sub>1</sub> | .331     | .346 | 8.40       | 8.80  |
| e              | .200 BSC |      | 5.08 BSC   |       |
| L              | .209     | .228 | 5.30       | 5.80  |
| L <sub>1</sub> | .118     | .138 | 3.00       | 3.50  |
| L <sub>2</sub> | .035     | .051 | 0.90       | 1.30  |
| L <sub>3</sub> | .047     | .059 | 1.20       | 1.50  |
| L <sub>4</sub> | .039     | .059 | 1.00       | 1.50  |

1. GATE
2. DRAIN (COLLECTOR)
3. SOURCE (EMITTER)
4. DRAIN (COLLECTOR)



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