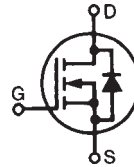


PolarHV™ Power MOSFET

N-Channel Enhancement Mode
Fast Recovery Diode
Avalanche Rated

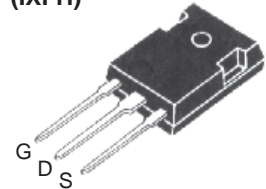
IXFH 16N80P
IXFT 16N80P
IXFV 16N80P
IXFV 16N80PS

$V_{DSS} = 800 \text{ V}$
 $I_{D25} = 16 \text{ A}$
 $R_{DS(on)} \leq 600 \text{ m}\Omega$
 $t_{rr} \leq 250 \text{ ns}$

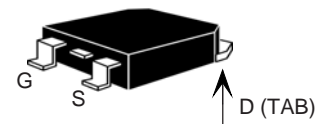


| Symbol | Test Conditions | Maximum Ratings | |
|------------|---|-----------------|------------------|
| | | | |
| V_{DSS} | $T_J = 25^\circ\text{C}$ to 150°C | 800 | V |
| V_{DGR} | $T_J = 25^\circ\text{C}$ to 150°C ; $R_{GS} = 1 \text{ M}\Omega$ | 800 | V |
| V_{GSS} | Continuous | ± 30 | V |
| V_{GSM} | Transient | ± 40 | V |
| I_{D25} | $T_C = 25^\circ\text{C}$ | 16 | A |
| I_{DM} | $T_C = 25^\circ\text{C}$, pulse width limited by T_{JM} | 40 | A |
| I_{AR} | $T_C = 25^\circ\text{C}$ | 8 | A |
| E_{AR} | $T_C = 25^\circ\text{C}$ | 30 | mJ |
| E_{AS} | $T_C = 25^\circ\text{C}$ | 1.0 | J |
| dv/dt | $I_S \leq I_{DM}$, $di/dt \leq 100 \text{ A}/\mu\text{s}$, $V_{DD} \leq V_{DSS}$ $T_J \leq 150^\circ\text{C}$, $R_G = 5 \Omega$ | 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-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 |

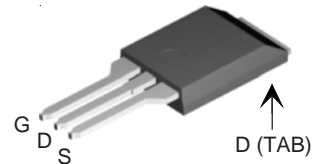
TO-247 (IXFH)



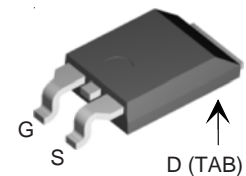
TO-268 (IXFT)



PLUS220 (IXFV)



PLUS220SMD (IXFV...S)



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

| Symbol | Test Conditions | Characteristic Values | | |
|--------------|---|-----------------------|------|----------------------|
| | | Min. | Typ. | Max. |
| BV_{DSS} | $V_{GS} = 0 \text{ V}$, $I_D = 250 \mu\text{A}$ | 800 | | V |
| $V_{GS(th)}$ | $V_{DS} = V_{GS}$, $I_D = 4 \text{ mA}$ | 3.0 | | V |
| I_{GSS} | $V_{GS} = \pm 30 \text{ V}$, $V_{DS} = 0 \text{ V}$ | | | $\pm 100 \text{ nA}$ |
| I_{DSS} | $V_{DS} = V_{DSS}$ $V_{GS} = 0 \text{ V}$ $T_J = 125^\circ\text{C}$ | | | 25 μA |
| | | | | 250 μA |
| $R_{DS(on)}$ | $V_{GS} = 10 \text{ V}$, $I_D = 0.5 I_{D25}$ Pulse test, $t \leq 300 \mu\text{s}$, duty cycle $d \leq 2\%$ | | | 600 $\text{m}\Omega$ |

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 ($T_J = 25^\circ\text{C}$, unless otherwise specified) | | |
|--------------|---|---|------|-------------------------|
| | | Min. | Typ. | Max. |
| g_{fs} | $V_{DS} = 20\text{ V}; I_D = 0.5 I_{D25}$, pulse test | 9 | 16 | S |
| C_{iss} | $V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$ | | 4600 | pF |
| C_{oss} | | | 330 | pF |
| C_{rss} | | | 23 | pF |
| $t_{d(on)}$ | $V_{GS} = 10\text{ V}, V_{DS} = V_{DSS}, I_D = 0.5 I_{D25}$ $R_G = 5\ \Omega$ (External) | | 27 | ns |
| t_r | | | 32 | ns |
| $t_{d(off)}$ | | | 75 | ns |
| t_f | | | 29 | ns |
| $Q_{g(on)}$ | $V_{GS} = 10\text{ V}, V_{DS} = 0.5 V_{DSS}, I_D = 0.5 I_{D25}$ | | 71 | nC |
| Q_{gs} | | | 21 | nC |
| Q_{gd} | | | 23 | nC |
| R_{thJC} | (TO-247) | | | 0.27 $^\circ\text{C/W}$ |
| R_{thCS} | | | 0.21 | $^\circ\text{C/W}$ |

| Source-Drain Diode | | Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified) | | |
|--------------------|---|---|------|---------------|
| Symbol | Test Conditions | Min. | Typ. | Max. |
| I_S | $V_{GS} = 0\text{ V}$ | | | 16 A |
| I_{SM} | Repetitive | | | 48 A |
| V_{SD} | $I_F = I_S, V_{GS} = 0\text{ V}$, pulse test | | | 1.5 V |
| t_{rr} | $I_F = 25\text{ A}, -di/dt = 100\text{ A}/\mu\text{s}$ $V_R = 100\text{ V}; V_{GS} = 0\text{ V}$ | | 150 | 250 ns |
| I_{RM} | | | 7 | A |
| Q_{RM} | | | 0.7 | μC |

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 7,005,734 B2
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 7,063,975 B2
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 7,071,537

Fig. 1. Output Characteristics @ 25°C

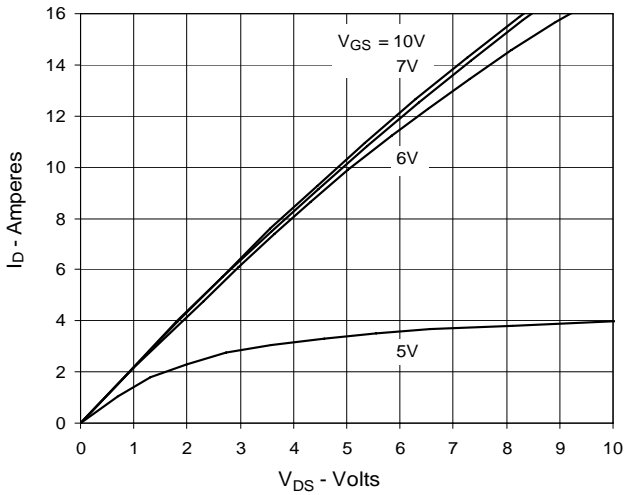


Fig. 2. Extended Output Characteristics @ 25°C

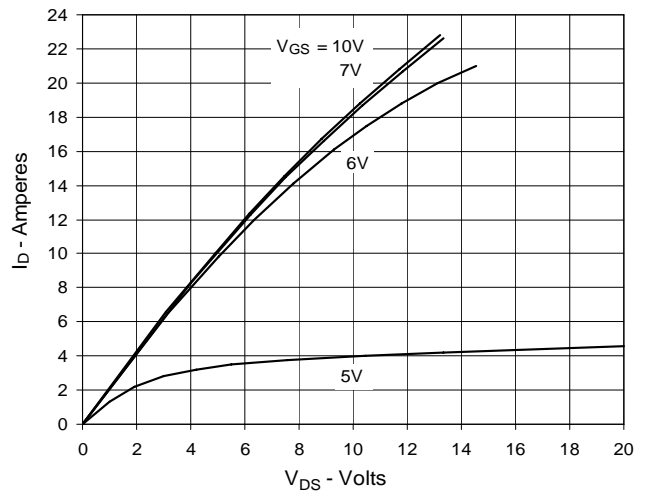


Fig. 3. Output Characteristics @ 125°C

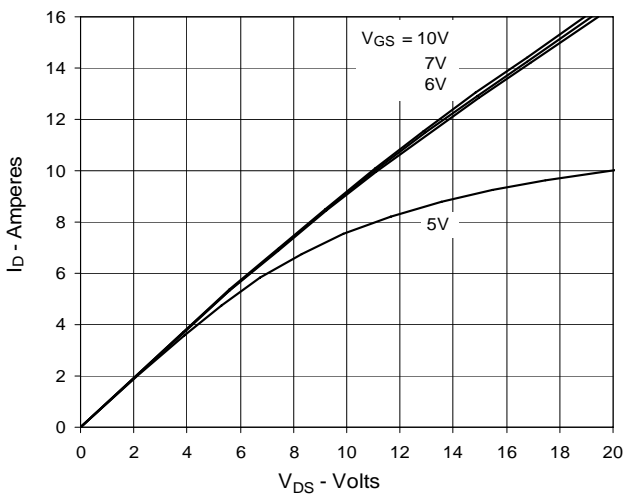


Fig. 4. $R_{DS(on)}$ Normalized to $I_D = 8A$ Value vs. Junction Temperature

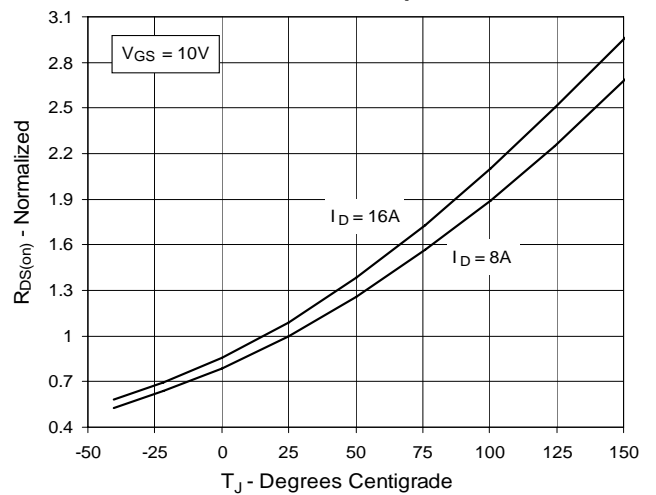


Fig. 5. $R_{DS(on)}$ Normalized to $I_D = 8A$ Value vs. Drain Current

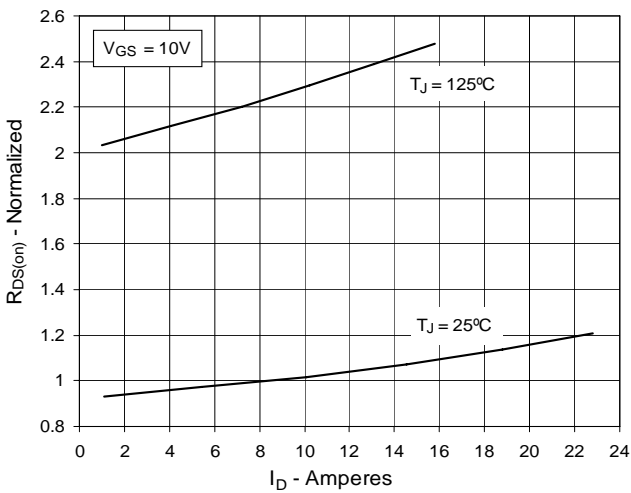


Fig. 6. Maximum Drain Current vs. Case Temperature

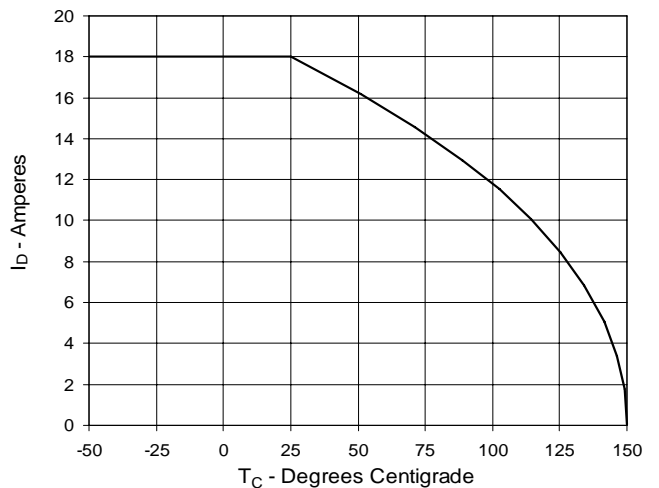


Fig. 7. Input Admittance

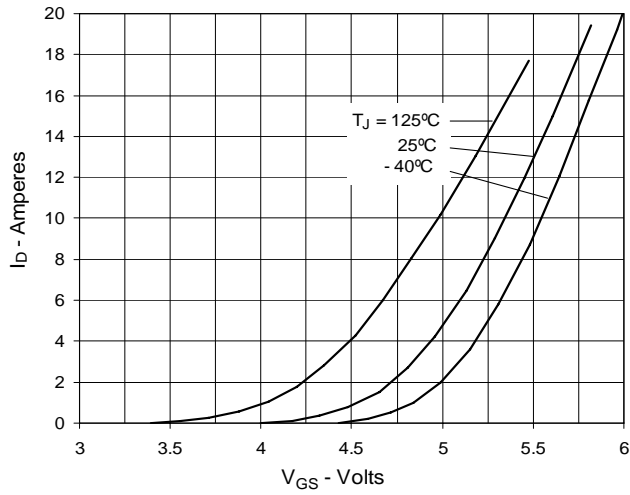


Fig. 8. Transconductance

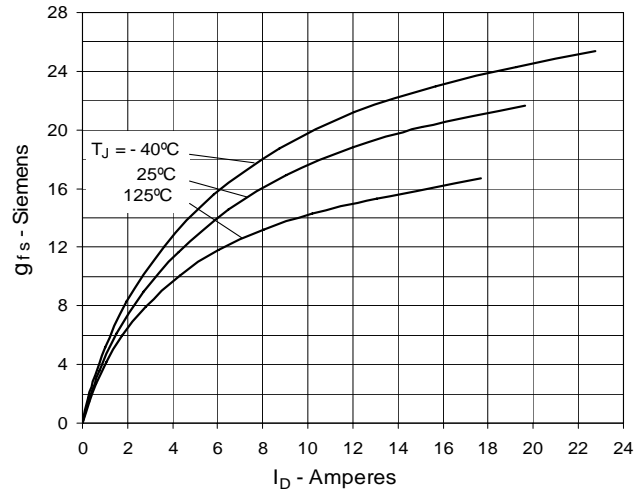


Fig. 9. Forward Voltage Drop of Intrinsic Diode

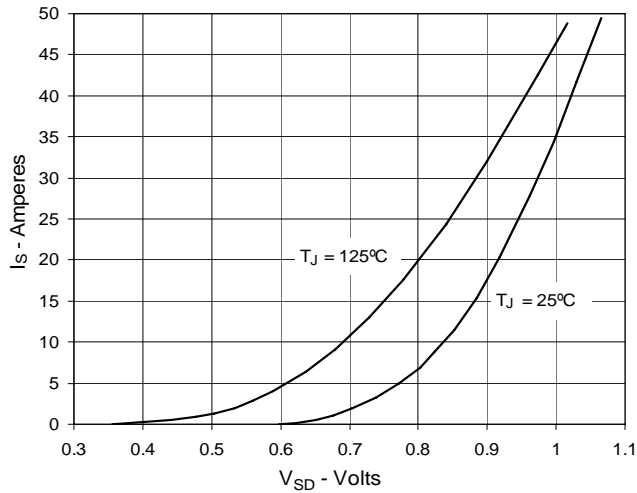


Fig. 10. Gate Charge

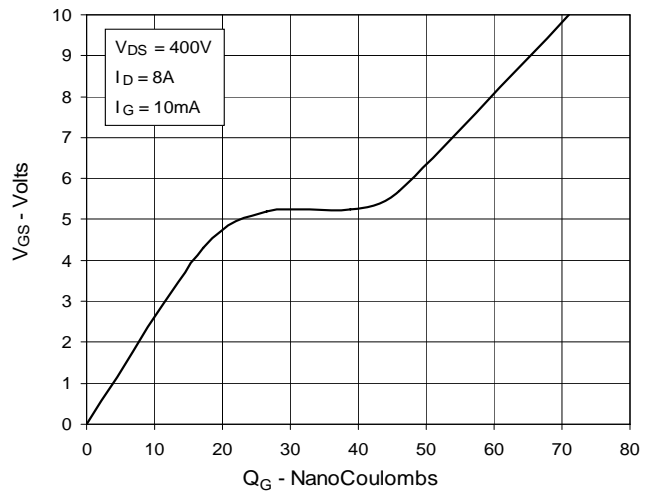


Fig. 11. Capacitance

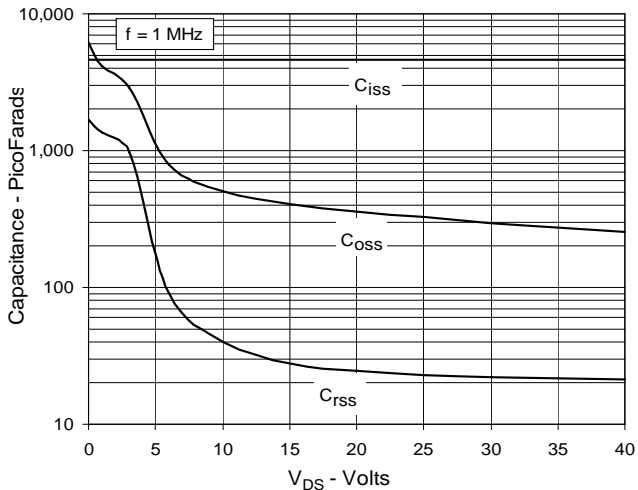
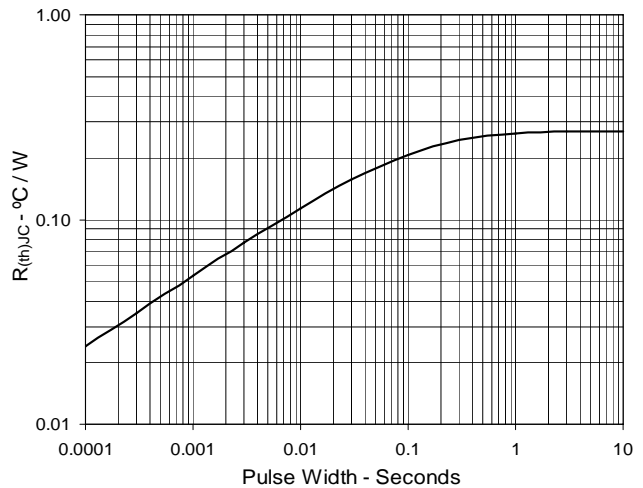
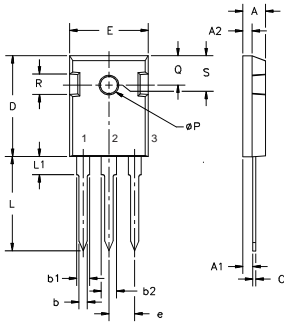


Fig. 12. Maximum Transient Thermal Resistance

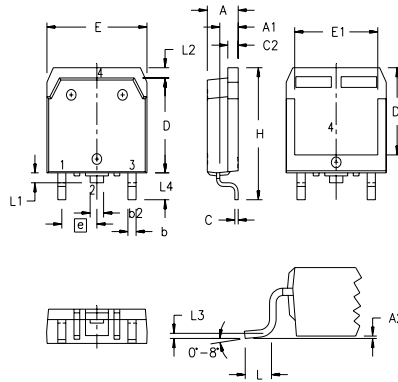


TO-247 AD (IXFH) Outline



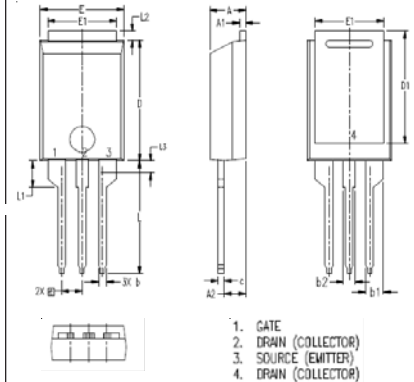
| Dim. | Millimeter | | Inches | |
|----------------|------------|-------|---------|-------|
| | Min. | Max. | Min. | Max. |
| A | 4.7 | 5.3 | .185 | .209 |
| A ₁ | 2.2 | 2.54 | .087 | .102 |
| A ₂ | 2.2 | 2.6 | .059 | .098 |
| b | 1.0 | 1.4 | .040 | .055 |
| b ₁ | 1.65 | 2.13 | .065 | .084 |
| b ₂ | 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 ₁ | .106 | .114 | 2.70 | 2.90 |
| A ₂ | .001 | .010 | 0.02 | 0.25 |
| b | .045 | .057 | 1.15 | 1.45 |
| b ₂ | .075 | .083 | 1.90 | 2.10 |
| C | .016 | .026 | 0.40 | 0.65 |
| C ₂ | .057 | .063 | 1.45 | 1.60 |
| D | .543 | .551 | 13.80 | 14.00 |
| D ₁ | .488 | .500 | 12.40 | 12.70 |
| E | .624 | .632 | 15.85 | 16.05 |
| E ₁ | .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 ₁ | .047 | .055 | 1.20 | 1.40 |
| L ₂ | .039 | .045 | 1.00 | 1.15 |
| L ₃ | .010 BSC | | 0.25 BSC | |
| L ₄ | .150 | .161 | 3.80 | 4.10 |

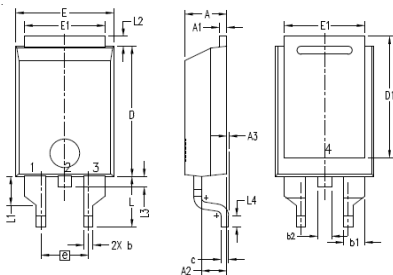
PLUS220 (IXFV) Outline



| SYM | INCHES | | MILLIMETER | |
|----------------|----------|------|------------|-------|
| | MIN | MAX | MIN | MAX |
| A | .169 | .185 | 4.30 | 4.70 |
| A ₁ | .028 | .035 | 0.70 | 0.90 |
| A ₂ | .098 | .118 | 2.50 | 3.00 |
| b | .035 | .047 | 0.90 | 1.20 |
| b ₁ | .080 | .095 | 2.03 | 2.41 |
| b ₂ | .054 | .064 | 1.37 | 1.63 |
| c | .028 | .035 | 0.70 | 0.90 |
| D | .551 | .591 | 14.00 | 15.00 |
| D ₁ | .512 | .539 | 13.00 | 13.70 |
| E | .394 | .433 | 10.00 | 11.00 |
| E ₁ | .331 | .346 | 8.40 | 8.80 |
| e | .100 BSC | | 2.54 BSC | |
| L | .512 | .551 | 13.00 | 14.00 |
| L ₁ | .118 | .138 | 3.00 | 3.50 |
| L ₂ | .035 | .051 | 0.90 | 1.30 |
| L ₃ | .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 ₁ | .028 | .035 | 0.70 | 0.90 |
| A ₂ | .098 | .118 | 2.50 | 3.00 |
| A ₃ | .000 | .010 | 0.00 | 0.25 |
| b | .035 | .047 | 0.90 | 1.20 |
| b ₁ | .080 | .095 | 2.03 | 2.41 |
| b ₂ | .054 | .064 | 1.37 | 1.63 |
| c | .028 | .035 | 0.70 | 0.90 |
| D | .551 | .591 | 14.00 | 15.00 |
| D ₁ | .512 | .539 | 13.00 | 13.70 |
| E | .394 | .433 | 10.00 | 11.00 |
| E ₁ | .331 | .346 | 8.40 | 8.80 |
| e | .200 BSC | | 5.08 BSC | |
| L | .209 | .228 | 5.30 | 5.80 |
| L ₁ | .118 | .138 | 3.00 | 3.50 |
| L ₂ | .035 | .051 | 0.90 | 1.30 |
| L ₃ | .047 | .059 | 1.20 | 1.50 |
| L ₄ | .039 | .059 | 1.00 | 1.50 |

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



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