

| Symbol       | Test Conditions<br>( $T_J = 25^\circ\text{C}$ Unless Otherwise Specified)                                                                          | Characteristic Values |      |                        |
|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|------|------------------------|
|              |                                                                                                                                                    | Min.                  | Typ. | Max.                   |
| $g_{fs}$     | $V_{DS} = 20\text{V}$ , $I_D = 0.5 \cdot I_{D25}$ , Note 1                                                                                         | 13                    | 21   | S                      |
| $C_{iss}$    | $V_{GS} = 0\text{V}$ , $V_{DS} = 25\text{V}$ , $f = 1\text{MHz}$                                                                                   |                       | 14   | nF                     |
| $C_{oss}$    |                                                                                                                                                    |                       | 725  | pF                     |
| $C_{rss}$    |                                                                                                                                                    |                       | 50   | pF                     |
| $R_{Gi}$     | Gate Input Resistance                                                                                                                              |                       | 1.5  | $\Omega$               |
| $t_{d(on)}$  | <b>Resistive Switching Times</b><br>$V_{GS} = 10\text{V}$ , $V_{DS} = 0.5 \cdot V_{DSS}$ , $I_D = 0.5 \cdot I_{D25}$<br>$R_G = 1\Omega$ (External) |                       | 56   | ns                     |
| $t_r$        |                                                                                                                                                    |                       | 55   | ns                     |
| $t_{d(off)}$ |                                                                                                                                                    |                       | 76   | ns                     |
| $t_f$        |                                                                                                                                                    |                       | 58   | ns                     |
| $Q_{g(on)}$  | $V_{GS} = 10\text{V}$ , $V_{DS} = 0.5 \cdot V_{DSS}$ , $I_D = 0.5 \cdot I_{D25}$                                                                   |                       | 255  | nC                     |
| $Q_{gs}$     |                                                                                                                                                    |                       | 87   | nC                     |
| $Q_{gd}$     |                                                                                                                                                    |                       | 98   | nC                     |
| $R_{thJC}$   |                                                                                                                                                    |                       |      | $0.13^\circ\text{C/W}$ |
| $R_{thCS}$   |                                                                                                                                                    | 0.15                  |      | $^\circ\text{C/W}$     |

## Source-Drain Diode

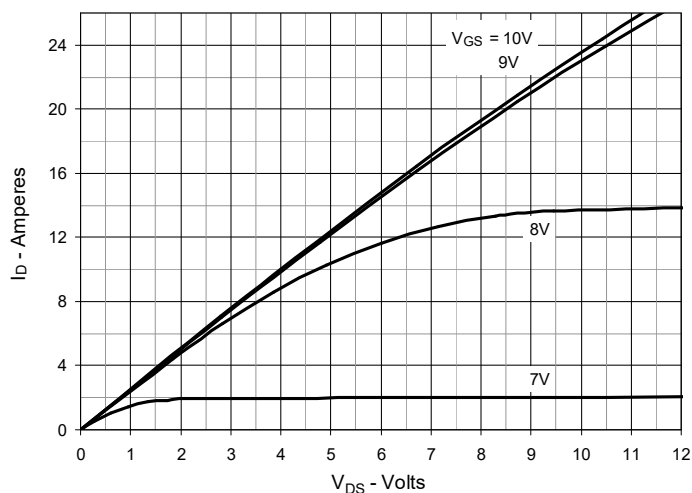
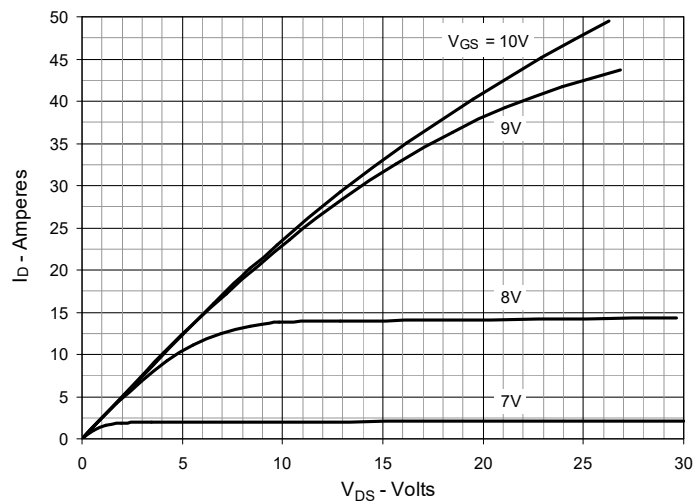
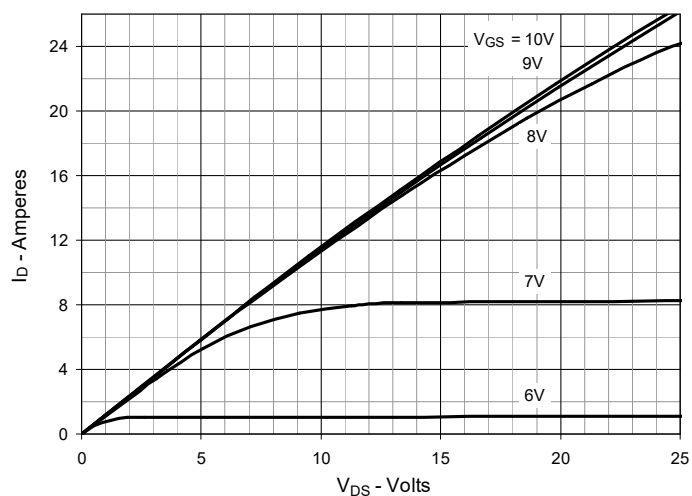
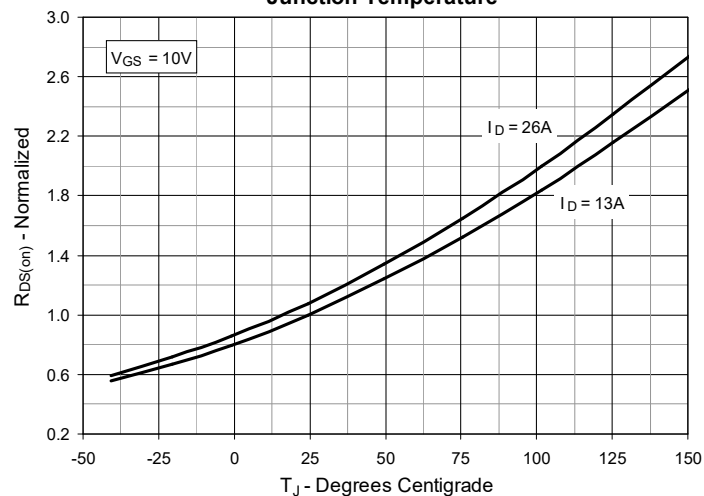
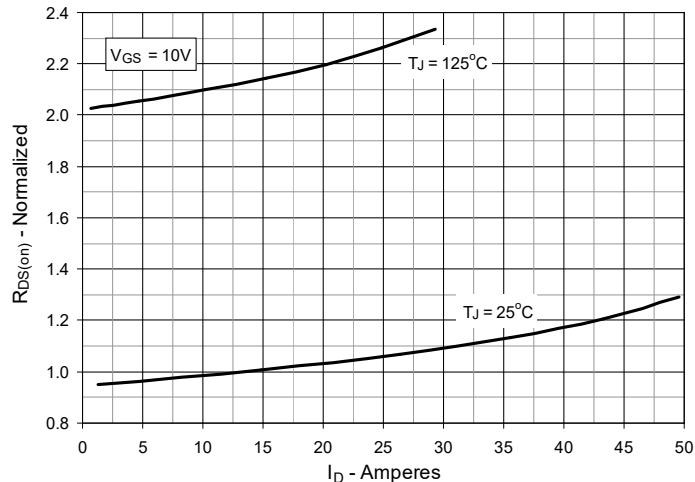
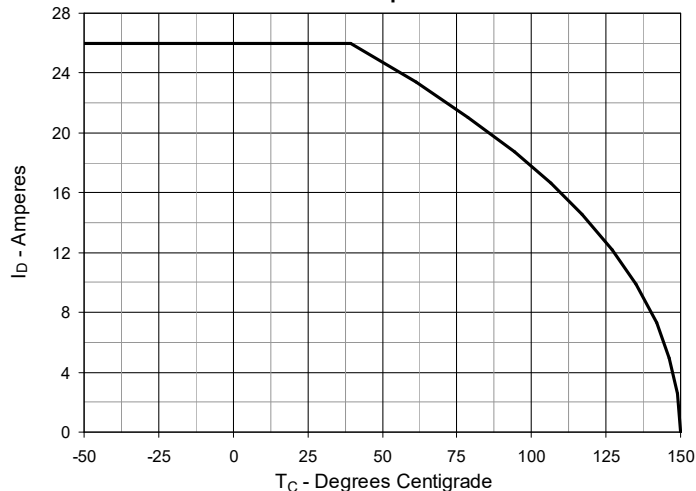
| Symbol   | Test Conditions<br>( $T_J = 25^\circ\text{C}$ , Unless Otherwise Specified)                           | Characteristic Values |      |               |
|----------|-------------------------------------------------------------------------------------------------------|-----------------------|------|---------------|
|          |                                                                                                       | Min.                  | Typ. | Max.          |
| $I_S$    | $V_{GS} = 0\text{V}$                                                                                  |                       |      | 26 A          |
| $I_{SM}$ | Repetitive, Pulse Width Limited by $T_{JM}$                                                           |                       |      | 104 A         |
| $V_{SD}$ | $I_F = I_S$ , $V_{GS} = 0\text{V}$ , Note 1                                                           |                       |      | 1.5 V         |
| $t_{rr}$ | $I_F = 13\text{A}$ , $-di/dt = 100\text{A}/\mu\text{s}$<br>$V_R = 100\text{V}$ , $V_{GS} = 0\text{V}$ |                       |      | 300 ns        |
| $Q_{RM}$ |                                                                                                       |                       | 1.3  | $\mu\text{C}$ |
| $I_{RM}$ |                                                                                                       |                       | 12.0 | A             |

Note 1. Pulse test,  $t \leq 300\mu\text{s}$ , duty cycle,  $d \leq 2\%$ .

IXYS Reserves the Right to Change Limits, Test Conditions, and Dimensions.

IXYS MOSFETs and IGBTs are covered by one or more of the following U.S. patents:

|           |           |           |           |              |              |              |              |              |             |
|-----------|-----------|-----------|-----------|--------------|--------------|--------------|--------------|--------------|-------------|
| 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 | 7,157,338B2 |
| 4,860,072 | 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 @  $T_J = 25^\circ\text{C}$** 

**Fig. 2. Extended Output Characteristics @  $T_J = 25^\circ\text{C}$** 

**Fig. 3. Output Characteristics @  $T_J = 125^\circ\text{C}$** 

**Fig. 4.  $R_{DS(on)}$  Normalized to  $I_D = 13\text{A}$  Value vs. Junction Temperature**

**Fig. 5.  $R_{DS(on)}$  Normalized to  $I_D = 13\text{A}$  Value vs. Drain Current**

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


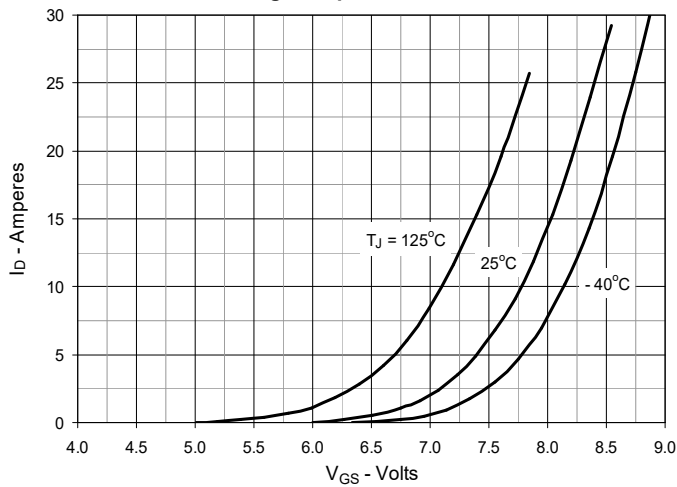
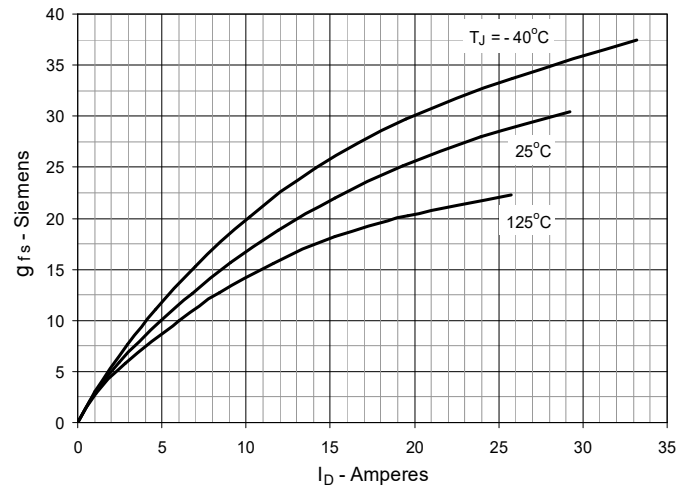
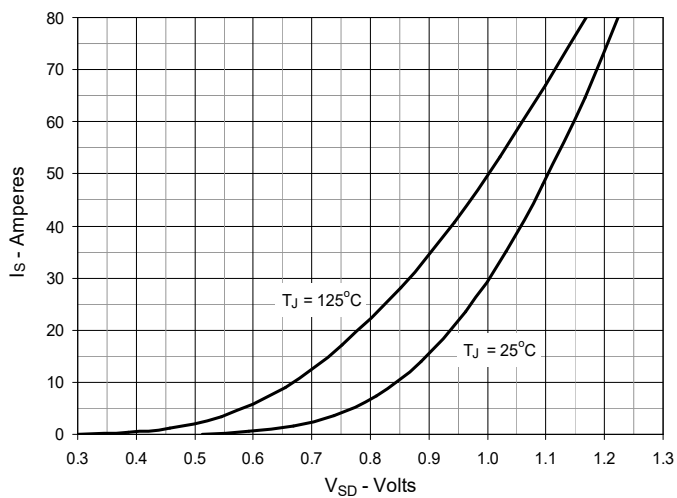
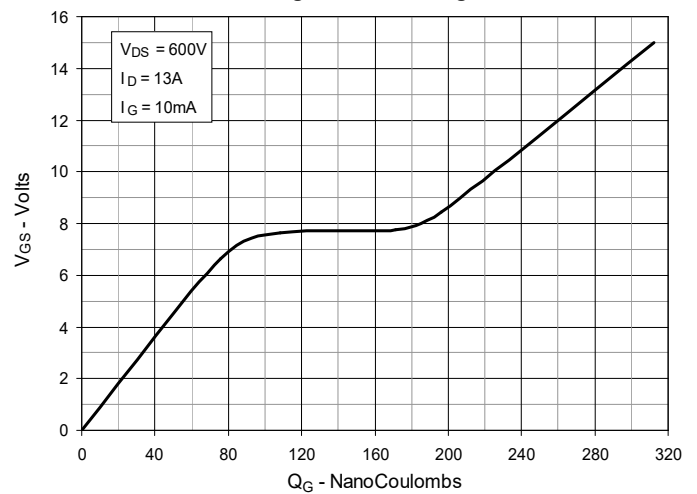
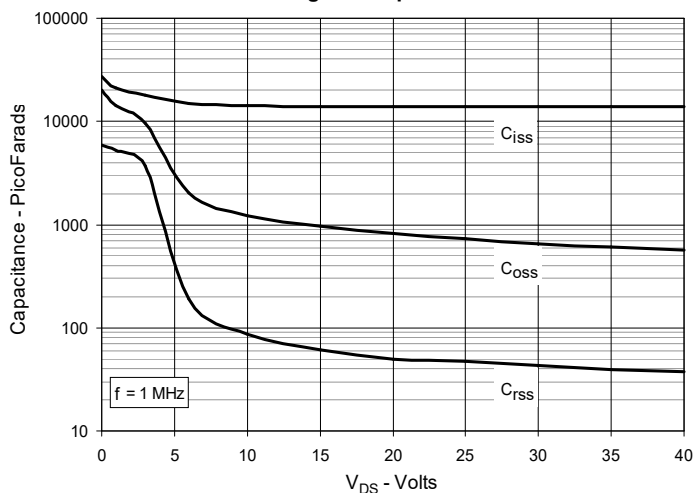
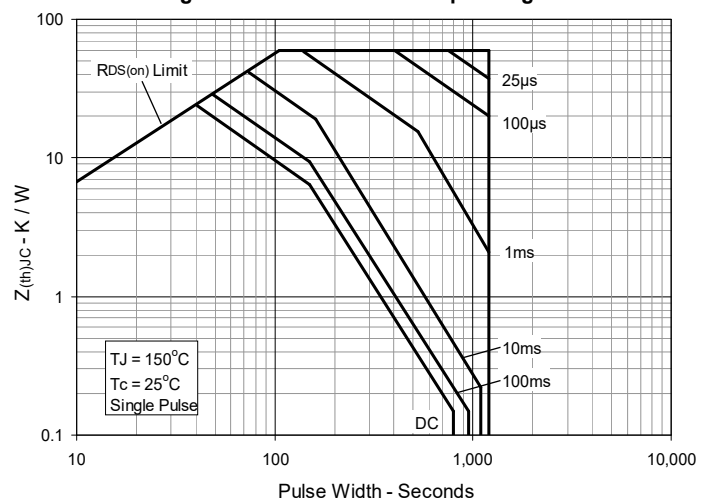
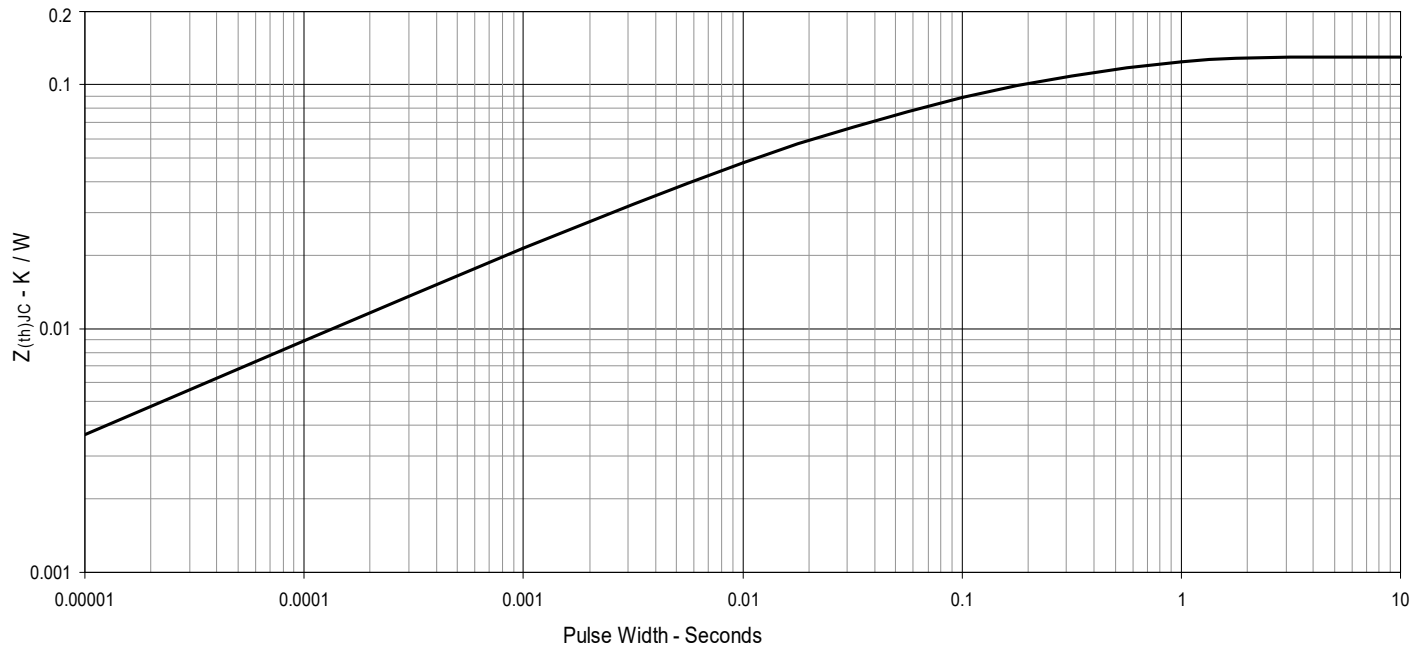
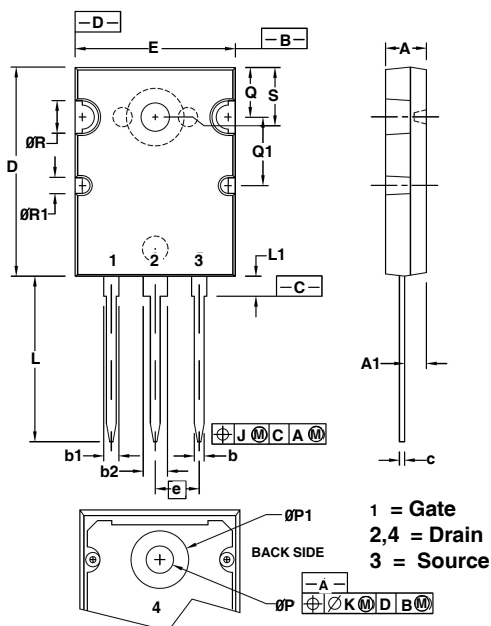
**Fig. 7. Input Admittance**

**Fig. 8. Transconductance**

**Fig. 9. Forward Voltage Drop of Intrinsic Diode**

**Fig. 10. Gate Charge**

**Fig. 11. Capacitance**

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


Fig. 13 Maximum Transient Thermal Impedance

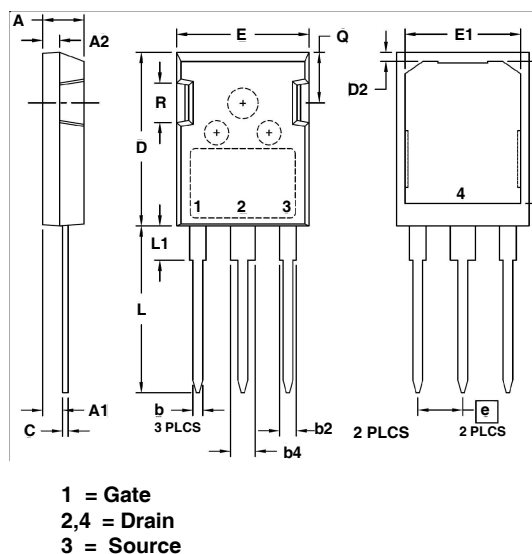


## TO-264 Outline



| SYMBOL | INCHES   |       | MILLIMETERS |       |
|--------|----------|-------|-------------|-------|
|        | MIN      | MAX   | MIN         | MAX   |
| A      | .185     | .209  | 4.70        | 5.31  |
| A1     | .102     | .118  | 2.59        | 3.00  |
| b      | .037     | .055  | 0.94        | 1.40  |
| b1     | .087     | .102  | 2.21        | 2.59  |
| b2     | .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      | .215 BSC |       | 5.46 BSC    |       |
| J      | .000     | .010  | 0.00        | 0.25  |
| K      | .000     | .010  | 0.00        | 0.25  |
| L      | .779     | .842  | 19.79       | 21.39 |
| L1     | .087     | .102  | 2.21        | 2.59  |
| ØP     | .122     | .138  | 3.10        | 3.51  |
| ØP1    | .270     | .290  | 6.86        | 7.37  |
| Q      | .240     | .256  | 6.10        | 6.50  |
| Q1     | .330     | .346  | 8.38        | 8.79  |
| ØR     | .155     | .187  | 3.94        | 4.75  |
| ØR1    | .085     | .093  | 2.16        | 2.36  |
| S      | .243     | .253  | 6.17        | 6.43  |

## PLUS247™ Outline



| SYM | INCHES   |      | MILLIMETERS |       |
|-----|----------|------|-------------|-------|
|     | MIN      | MAX  | MIN         | MAX   |
| A   | .190     | .205 | 4.83        | 5.21  |
| A1  | .090     | .100 | 2.29        | 2.54  |
| A2  | .075     | .085 | 1.91        | 2.16  |
| b   | .045     | .055 | 1.14        | 1.40  |
| b2  | .075     | .087 | 1.91        | 2.20  |
| b4  | .115     | .126 | 2.92        | 3.20  |
| C   | .024     | .031 | 0.61        | 0.80  |
| D   | .819     | .840 | 20.80       | 21.34 |
| D1  | .650     | .690 | 16.51       | 17.53 |
| D2  | .035     | .050 | 0.89        | 1.27  |
| E   | .620     | .635 | 15.75       | 16.13 |
| E1  | .520     | .560 | 13.08       | 14.22 |
| e   | .215 BSC |      | 5.45 BSC    |       |
| L   | .780     | .810 | 19.81       | 20.57 |
| L1  | .150     | .170 | 3.81        | 4.32  |
| Q   | .220     | .244 | 5.59        | 6.20  |
| R   | .170     | .190 | 4.32        | 4.83  |



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