

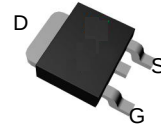
## Features

- -100V/-15A,  
 $R_{DS(ON)} = 150\text{m}\Omega$  (typ.) @  $V_{GS} = -10\text{V}$   
 $R_{DS(ON)} = 170\text{m}\Omega$  (typ.) @  $V_{GS} = -4.5\text{V}$
- Reliable and Rugged
- Lead Free and Green Devices Available (RoHS Compliant)
- 100% UIS +  $R_g$  Tested

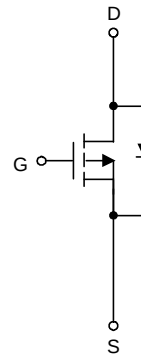
## Applications

- Power Management in Desktop Computer or DC/DC Converters.

## Pin Configuration



Top View of TO-252-2



P-Channel MOSFET

## Absolute Maximum Ratings

| Symbol                                                       | Parameter                              |                       | Rating     | Unit |
|--------------------------------------------------------------|----------------------------------------|-----------------------|------------|------|
| Common Ratings (T <sub>A</sub> =25°C Unless Otherwise Noted) |                                        |                       |            |      |
| V <sub>DSS</sub>                                             | Drain-Source Voltage                   |                       | -100       | V    |
| V <sub>GSS</sub>                                             | Gate-Source Voltage                    |                       | ±20        |      |
| T <sub>J</sub>                                               | Maximum Junction Temperature           |                       | 150        | °C   |
| T <sub>STG</sub>                                             | Storage Temperature Range              |                       | -55 to 150 | °C   |
| I <sub>S</sub>                                               | Diode Continuous Forward Current       |                       | -15        | A    |
| I <sub>DP</sub>                                              | 300µs Pulse Drain Current Tested       | T <sub>C</sub> =25°C  | -45        | A    |
|                                                              |                                        | T <sub>C</sub> =100°C | -34        |      |
| I <sub>D</sub>                                               | Continuous Drain Current               | T <sub>C</sub> =25°C  | -15        | A    |
|                                                              |                                        | T <sub>C</sub> =100°C | -11.5      |      |
| P <sub>D</sub>                                               | Maximum Power Dissipation              | T <sub>C</sub> =25°C  | 50         | W    |
|                                                              |                                        | T <sub>C</sub> =100°C | 20         |      |
| R <sub>θJC</sub>                                             | Thermal Resistance-Junction to Case    |                       | 2.5        | °C/W |
| R <sub>θJA</sub>                                             | Thermal Resistance-Junction to Ambient |                       | 50         | °C/W |

Note : \* Current limited by bond wire.

## Electrical Characteristics ( $T_A = 25^{\circ}\text{C}$ unless otherwise noted)

| Symbol                           | Parameter                        | Test Conditions                                            | XPD15P10CR |       |      | Unit |
|----------------------------------|----------------------------------|------------------------------------------------------------|------------|-------|------|------|
|                                  |                                  |                                                            | Min.       | Typ.  | Max. |      |
| Static Characteristics           |                                  |                                                            |            |       |      |      |
| BV <sub>DSS</sub>                | Drain-Source Breakdown Voltage   | V <sub>GS</sub> =0V, I <sub>DS</sub> =-250μA               | -100       | -     | -    | V    |
| I <sub>DSS</sub>                 | Zero Gate Voltage Drain Current  | V <sub>DS</sub> =-80V, V <sub>GS</sub> =0V                 | -          | -     | -1   | μA   |
|                                  |                                  | T <sub>J</sub> =85°C                                       | -          | -     | -30  |      |
| V <sub>GS(th)</sub>              | Gate Threshold Voltage           | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>DS</sub> =-250μA | -1.1       | -     | -2.2 | V    |
| I <sub>GSS</sub>                 | Gate Leakage Current             | V <sub>GS</sub> =±16V, V <sub>DS</sub> =0V                 | -          | -     | ±100 | nA   |
| R <sub>DS(ON)</sub> <sup>a</sup> | Drain-Source On-state Resistance | V <sub>GS</sub> =-10V, I <sub>DS</sub> =-7.8A              | -          | 150   | 195  | mΩ   |
|                                  |                                  | V <sub>GS</sub> =-4.5V, I <sub>DS</sub> =-6A               | -          | 170   | 220  |      |
| Diode Characteristics            |                                  |                                                            |            |       |      |      |
| V <sub>SD</sub> <sup>a</sup>     | Diode Forward Voltage            | I <sub>SD</sub> =-1A, V <sub>GS</sub> =0V                  | -          | -0.75 | -1.1 | V    |
| t <sub>rr</sub>                  | Reverse Recovery Time            | I <sub>DS</sub> =-7.8A,                                    | -          | 34    | -    | ns   |
| Q <sub>rr</sub>                  | Reverse Recovery Charge          | dI <sub>SD</sub> /dt=100A/μs                               | -          | 59    | -    | nC   |

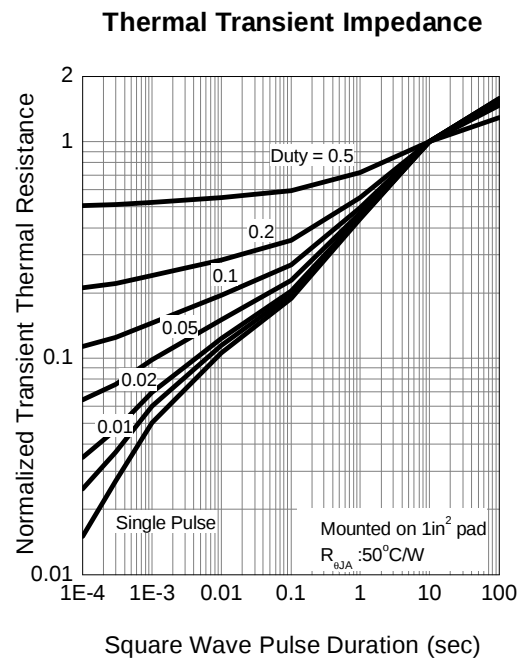
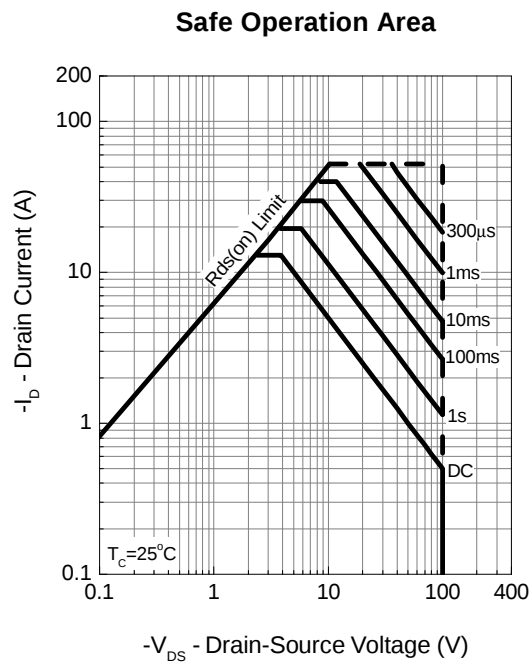
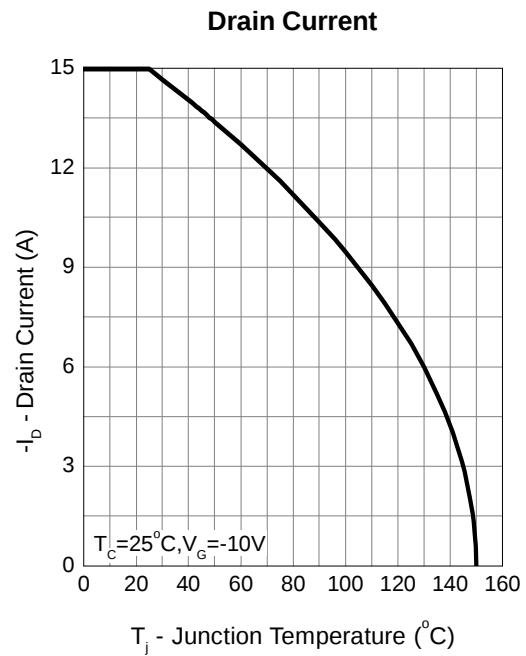
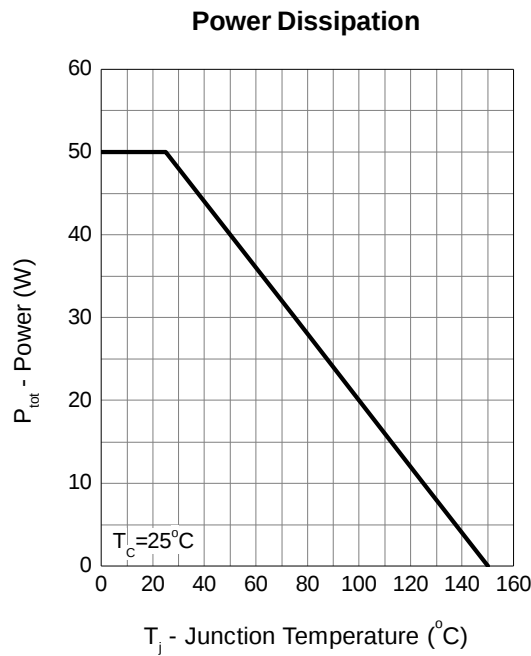
**Electrical Characteristics (Cont.)** ( $T_A = 25^\circ\text{C}$  unless otherwise noted)

| Symbol                                   | Parameter                    | Test Conditions                                                                                                    | XPD15P10CR |      |      | Unit |
|------------------------------------------|------------------------------|--------------------------------------------------------------------------------------------------------------------|------------|------|------|------|
|                                          |                              |                                                                                                                    | Min.       | Typ. | Max. |      |
| Dynamic Characteristics <sup>b</sup>     |                              |                                                                                                                    |            |      |      |      |
| C <sub>iss</sub>                         | Input Capacitance            | V <sub>GS</sub> =0V,<br>V <sub>DS</sub> =-25V,<br>Frequency=1.0MHz                                                 | -          | 2577 | -    | pF   |
| C <sub>oss</sub>                         | Output Capacitance           |                                                                                                                    | -          | 66   | -    |      |
| C <sub>rss</sub>                         | Reverse Transfer Capacitance |                                                                                                                    | -          | 52   | -    |      |
| t <sub>d(ON)</sub>                       | Turn-on Delay Time           | V <sub>DD</sub> =-30V, R <sub>L</sub> =30Ω,<br>I <sub>DS</sub> =-1A, V <sub>GEN</sub> =-10V,<br>R <sub>G</sub> =6Ω | -          | 11   | 21   | ns   |
| t <sub>r</sub>                           | Turn-on Rise Time            |                                                                                                                    | -          | 10   | 19   |      |
| t <sub>d(OFF)</sub>                      | Turn-off Delay Time          |                                                                                                                    | -          | 55   | 100  |      |
| t <sub>f</sub>                           | Turn-off Fall Time           |                                                                                                                    | -          | 30   | 55   |      |
| Gate Charge Characteristics <sup>b</sup> |                              |                                                                                                                    |            |      |      |      |
| Q <sub>g</sub>                           | Total Gate Charge            | V <sub>DS</sub> =-50V, V <sub>GS</sub> =-10V,<br>I <sub>DS</sub> =-7.8A                                            | -          | 20.9 | 38   | nC   |
| Q <sub>gs</sub>                          | Gate-Source Charge           |                                                                                                                    | -          | 4.2  | -    |      |
| Q <sub>gd</sub>                          | Gate-Drain Charge            |                                                                                                                    | -          | 5.2  | -    |      |

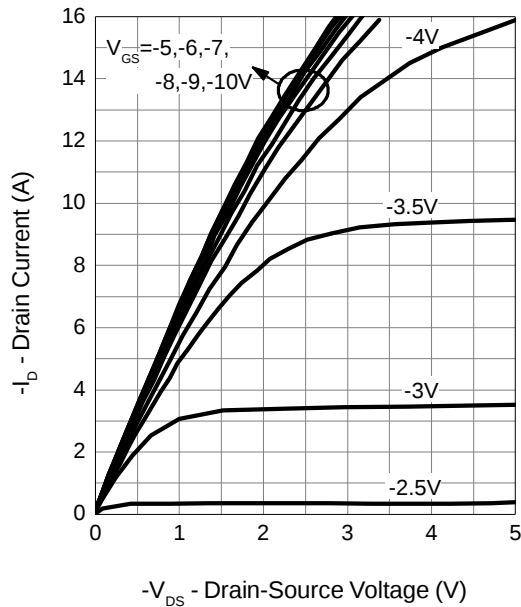
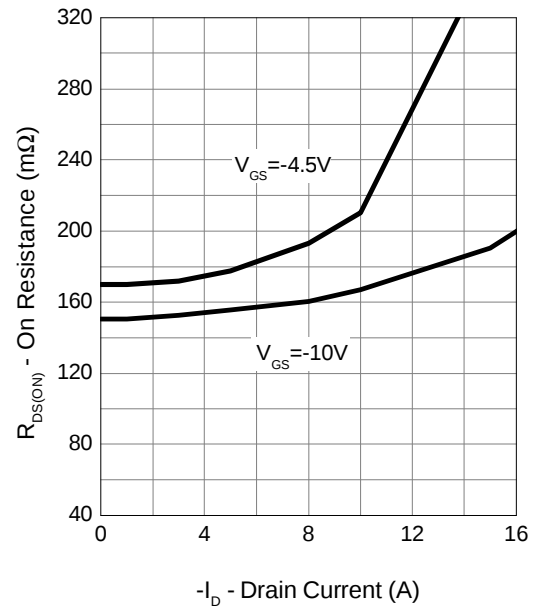
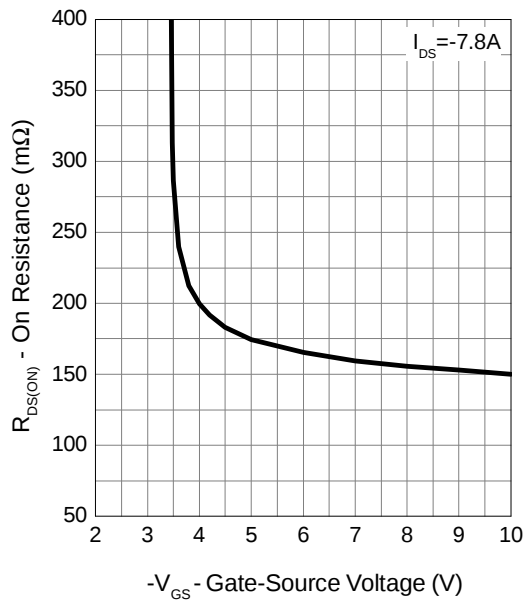
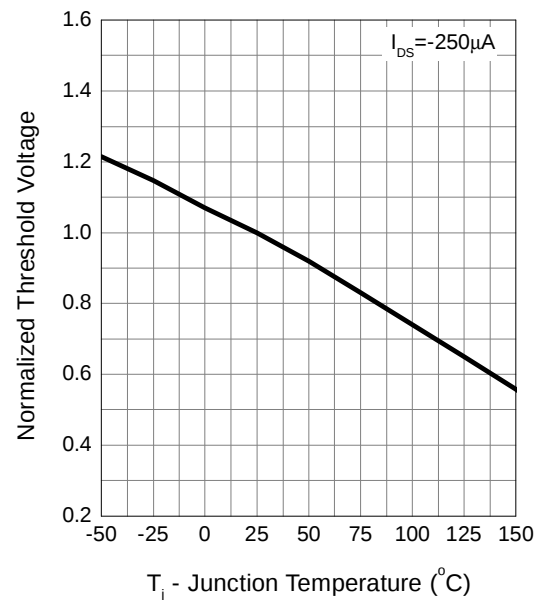
Note a : Pulse test ; pulse width $\leq 300\mu s$ , duty cycle $\leq 2\%$ .

Note b : Guaranteed by design, not subject to production testing.

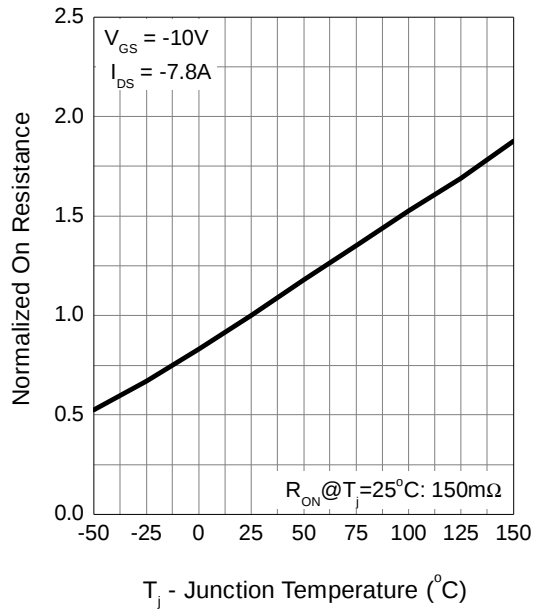
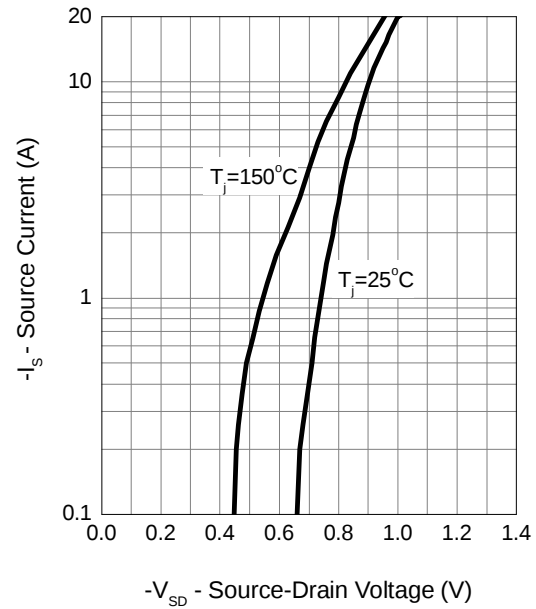
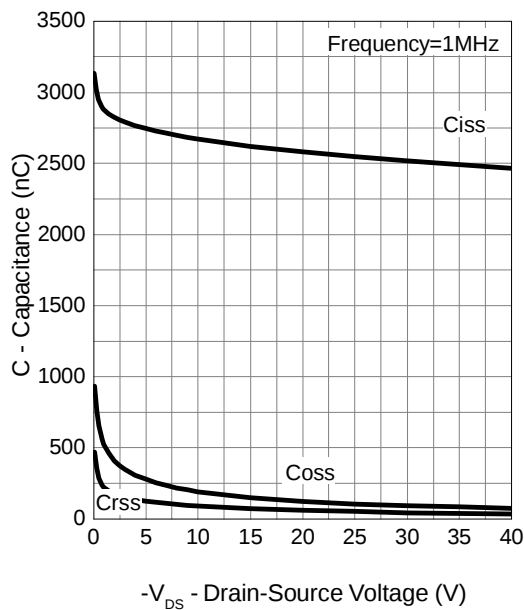
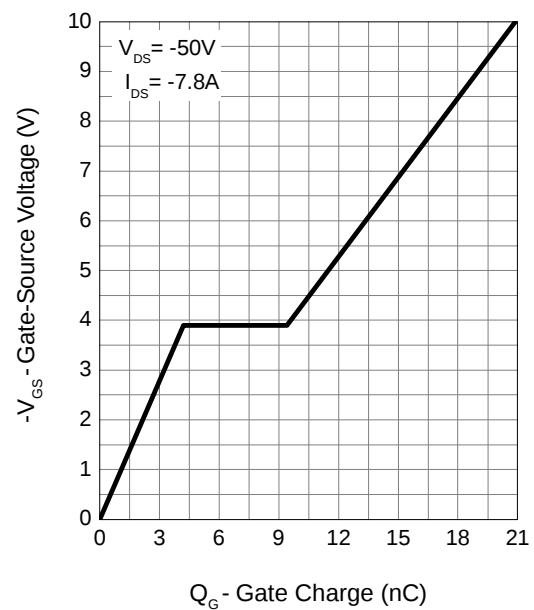
## Typical Operating Characteristics



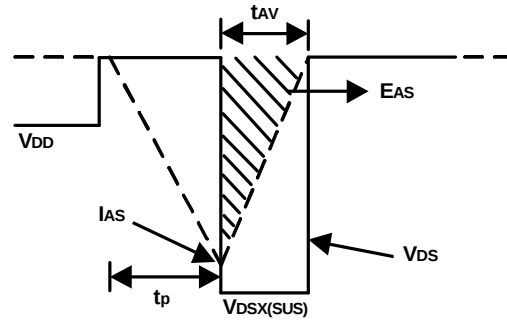
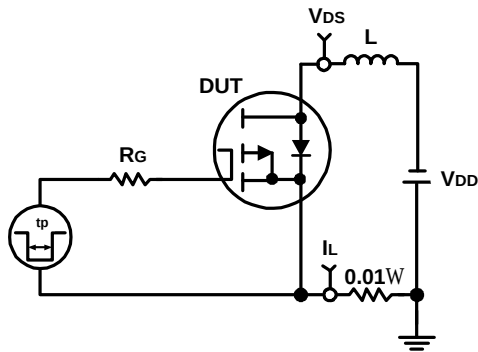
## Typical Operating Characteristics (Cont.)

**Output Characteristics**

**Drain-Source On Resistance**

**Gate-Source On Resistance**

**Gate Threshold Voltage**


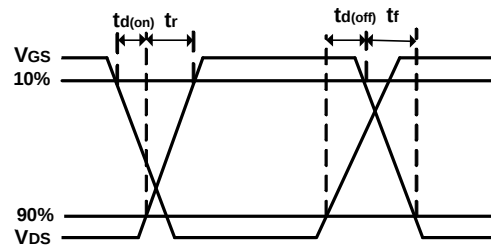
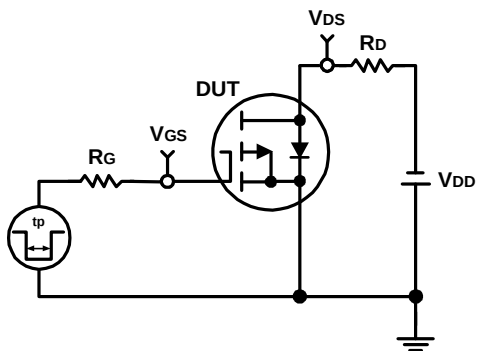
## Typical Operating Characteristics (Cont.)

**Drain-Source On Resistance**

**Source-Drain Diode Forward**

**Capacitance**

**Gate Charge**


## Avalanche Test Circuit and Waveforms

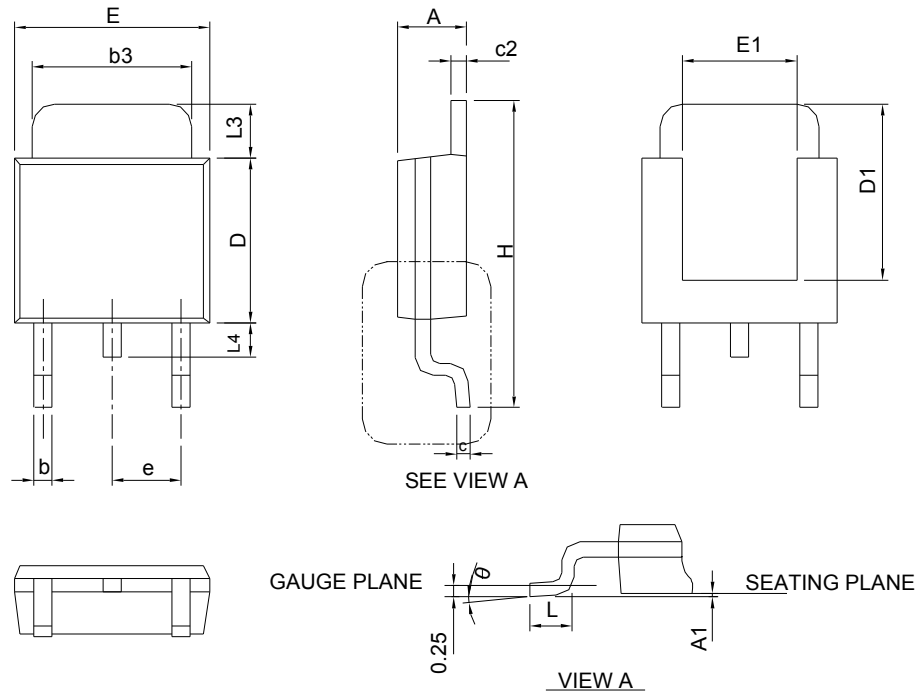


## Switching Time Test Circuit and Waveforms



## Package Information

### TO-252-2



| SYMBOL | TO-252-2    |       |           |       |
|--------|-------------|-------|-----------|-------|
|        | MILLIMETERS |       | INCHES    |       |
|        | MIN.        | MAX.  | MIN.      | MAX.  |
| A      | 2.18        | 2.39  | 0.086     | 0.094 |
| A1     | -           | 0.13  | -         | 0.005 |
| b      | 0.50        | 0.89  | 0.020     | 0.035 |
| b3     | 4.95        | 5.46  | 0.195     | 0.215 |
| c      | 0.46        | 0.61  | 0.018     | 0.024 |
| c2     | 0.46        | 0.89  | 0.018     | 0.035 |
| D      | 5.33        | 6.22  | 0.210     | 0.245 |
| D1     | 4.57        | 6.00  | 0.180     | 0.236 |
| E      | 6.35        | 6.73  | 0.250     | 0.265 |
| E1     | 3.81        | 6.00  | 0.150     | 0.236 |
| e      | 2.29 BSC    |       | 0.090 BSC |       |
| H      | 9.40        | 10.41 | 0.370     | 0.410 |
| L      | 0.90        | 1.78  | 0.035     | 0.070 |
| L3     | 0.89        | 2.03  | 0.035     | 0.080 |
| L4     | -           | 1.02  | -         | 0.040 |
| θ      | 0°          | 8°    | 0°        | 8°    |

Note : Follow JEDEC TO-252 .

### RECOMMENDED LAND PATTERN

