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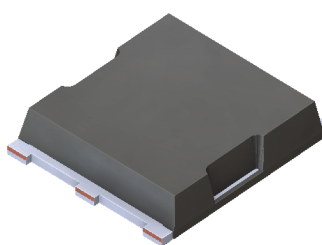
# FDBL0260N100

## N-Channel PowerTrench® MOSFET 100 V, 200 A, 2.6 mΩ

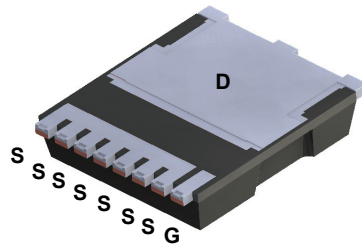
- Max  $R_{DS(on)}$  = 2.6 mΩ at  $V_{GS} = 10$  V,  $I_D = 80$  A
- Max  $Q_{g(tot)}$  = 116 nC at  $V_{GS} = 10$  V,  $I_D = 80$  A
- UIS Capability
- RoHS Compliant

### Applications

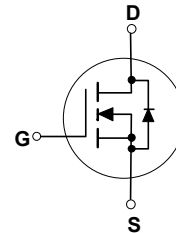
- Industrial Motor Drive
- Industrial Power Supply
- Industrial Automation
- Battery Operated tools
- Battery Protection
- Solar Inverters
- UPS and Energy Inverters
- Energy Storage
- Load Switch



TOP



BOTTOM



MO-299A

### MOSFET Maximum Ratings $T_C = 25^\circ\text{C}$ unless otherwise noted.

| Symbol         | Parameter   | Ratings     | Units            |
|----------------|---|-------------|------------------|
| $V_{DS}$       | Drain to Source Voltage                                     | 100         | V                |
| $V_{GS}$       | Gate to Source Voltage                                      | ±20         | V                |
| $I_D$          | Drain Current -Continuous $T_C = 25^\circ\text{C}$ (Note 5) | 200         | A                |
|                | -Continuous $T_C = 100^\circ\text{C}$ (Note 5)              | 140         |                  |
|                | -Pulsed (Note 4)  | 1000        |                  |
| $E_{AS}$       | Single Pulse Avalanche Energy (Note 3)                      | 866         | mJ               |
| $P_D$          | Power Dissipation $T_C = 25^\circ\text{C}$                  | 250         | W                |
|                | Power Dissipation $T_A = 25^\circ\text{C}$ (Note 1a)        | 3.5         |                  |
| $T_J, T_{STG}$ | Operating and Storage Junction Temperature Range            | -55 to +175 | $^\circ\text{C}$ |

### Thermal Characteristics

|                 |   |     |                           |
|-----------------|---|-----|---------------------------|
| $R_{\theta JC}$ | Thermal Resistance, Junction to Case (Note 1)     | 0.6 | $^\circ\text{C}/\text{W}$ |
| $R_{\theta JA}$ | Thermal Resistance, Junction to Ambient (Note 1a) | 43  |                           |

### Package Marking and Ordering Information

| Device Marking | Device       | Package | Reel Size | Tape Width | Quantity |
|----------------|--------------|---------|-----------|------------|----------|
| FDBL0260N100   | FDBL0260N100 | MO-299A | -         | -          | -        |

## Electrical Characteristics $T_J = 25\text{ }^\circ\text{C}$ unless otherwise noted.

| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Units |
|--------|-----------|-----------------|------|------|------|-------|
|--------|-----------|-----------------|------|------|------|-------|

### Off Characteristics

|                                      |   |   |     |    |           |                      |
|--------------------------------------|---|---|-----|----|-----------|----------------------|
| $BV_{DSS}$                           | Drain to Source Breakdown Voltage         | $I_D = 250\text{ }\mu\text{A}, V_{GS} = 0\text{ V}$                       | 100 |    |           | V                    |
| $\frac{\Delta BV_{DSS}}{\Delta T_J}$ | Breakdown Voltage Temperature Coefficient | $I_D = 250\text{ }\mu\text{A}$ , referenced to $25\text{ }^\circ\text{C}$ |     | 53 |           | mV/ $^\circ\text{C}$ |
| $I_{DSS}$                            | Zero Gate Voltage Drain Current           | $V_{DS} = 80\text{ V}, V_{GS} = 0\text{ V}$                               |     |    | 1         | $\mu\text{A}$        |
| $I_{GSS}$                            | Gate to Source Leakage Current            | $V_{GS} = \pm 20\text{ V}, V_{DS} = 0\text{ V}$                           |     |    | $\pm 100$ | nA                   |

### On Characteristics

|  |  |   |   |     |     |                      |
|--|--|---|---|-----|-----|----------------------|
| $V_{GS(th)}$                           | Gate to Source Threshold Voltage                         | $V_{GS} = V_{DS}, I_D = 250\text{ }\mu\text{A}$                           | 2 | 2.7 | 4   | V                    |
| $r_{DS(on)}$                           | Static Drain to Source On Resistance                     | $V_{GS} = 10\text{ V}, I_D = 80\text{ A}$                                 |   | 2.1 | 2.6 | m $\Omega$           |
| $\frac{\Delta V_{GS(th)}}{\Delta T_J}$ | Gate to Source Threshold Voltage Temperature Coefficient | $I_D = 250\text{ }\mu\text{A}$ , referenced to $25\text{ }^\circ\text{C}$ |   | -13 |     | mV/ $^\circ\text{C}$ |
| $g_{FS}$                               | Forward Transconductance                                 | $V_{DS} = 10\text{ V}, I_D = 80\text{ A}$                                 |   | 170 |     | S                    |

### Dynamic Characteristics

|           |                              |  |  |      |      |          |
|-----------|------------------------------|--|--|------|------|----------|
| $C_{iss}$ | Input Capacitance            | $V_{DS} = 50\text{ V}, V_{GS} = 0\text{ V},$<br>$f = 1\text{ MHz}$ |  | 6175 | 9265 | pF       |
| $C_{oss}$ | Output Capacitance           |  |  | 1330 | 1995 | pF       |
| $C_{rss}$ | Reverse Transfer Capacitance |  |  | 40   | 60   | pF       |
| $R_g$     | Gate Resistance              | $V_{GS} = 0.5\text{ V}, f = 1\text{ MHz}$                          |  | 2.6  |      | $\Omega$ |

### Switching Characteristics

|              |                               |   |  |    |     |    |
|--------------|-------------------------------|---|--|----|-----|----|
| $t_{d(on)}$  | Turn-On Delay Time            | $V_{DD} = 50\text{ V}, I_D = 80\text{ A},$<br>$V_{GS} = 10\text{ V}, R_{GEN} = 6\text{ }\Omega$ |  | 26 | 42  | ns |
| $t_r$        | Rise Time                     |   |  | 34 | 54  | ns |
| $t_{d(off)}$ | Turn-Off Delay Time           |   |  | 47 | 75  | ns |
| $t_f$        | Fall Time                     |   |  | 19 | 34  | ns |
| $Q_{g(TOT)}$ | Total Gate Charge             | $V_{GS} = 0\text{ to }10\text{ V}$  | $V_{DD} = 50\text{ V},$<br>$I_D = 80\text{ A}$ | 83 | 116 | nC |
| $Q_{g(th)}$  | Threshold Gate Charge         | $V_{GS} = 0\text{ to }2\text{ V}$   |  | 11 | 16  | nC |
| $Q_{gs}$     | Gate to Source Gate Charge    |   |  | 28 |     | nC |
| $Q_{gd}$     | Gate to Drain "Miller" Charge |   |  | 16 |     | nC |

### Drain-Source Diode Characteristics

|          |  |   |   |     |      |    |
|----------|--|---|---|-----|------|----|
| $I_S$    | Maximum Continuous Drain to Source Diode Forward Current |   | - | -   | 200  | A  |
| $I_{SM}$ | Maximum Pulsed Drain to Source Diode Forward Current     |   | - | -   | 1000 | A  |
| $V_{SD}$ | Source to Drain Diode Forward Voltage                    | $V_{GS} = 0\text{ V}, I_S = 80\text{ A}$ (Note 2)     |   | 0.8 | 1.3  | V  |
|          |  | $V_{GS} = 0\text{ V}, I_S = 40\text{ A}$ (Note 2)     |   | 0.8 | 1.2  |    |
| $t_{rr}$ | Reverse Recovery Time                                    | $I_F = 80\text{ A}, di/dt = 100\text{ A}/\mu\text{s}$ |   | 71  | 113  | ns |
| $Q_{rr}$ | Reverse Recovery Charge                                  |   |   | 121 | 194  | nC |

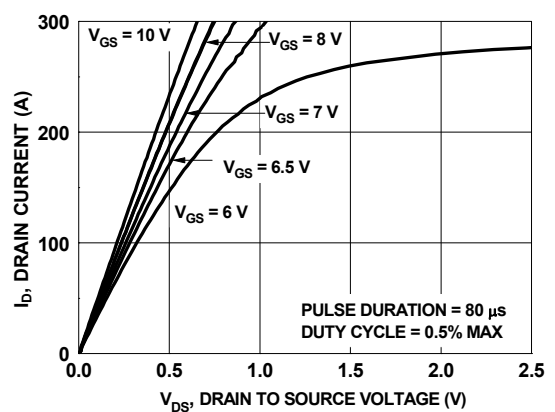
#### Notes:

- $R_{\theta JA}$  is the sum of the junction-to-case and case-to-ambient thermal resistance where the case thermal reference is defined as the solder mounting surface of the drain pins.  $R_{\theta JC}$  is guaranteed by design while  $R_{\theta CA}$  is determined by the user's board design.

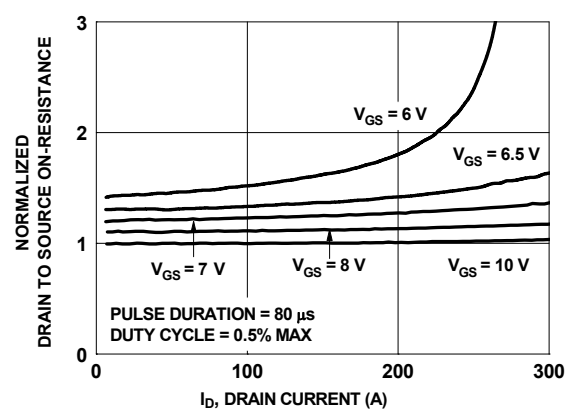
a)  $43\text{ }^\circ\text{C/W}$  when mounted on a  $1\text{ in}^2$  pad of 2 oz. copper.

- Pulse Test: Pulse Width < 300  $\mu\text{s}$ , Duty cycle < 2.0 %.
- $E_{AS}$  of 866 mJ is based on starting  $T_J = 25\text{ }^\circ\text{C}$ ,  $L = 0.3\text{ mH}$ ,  $I_{AS} = 76\text{ A}$ ,  $V_{DD} = 90\text{ V}$ ,  $V_{GS} = 10\text{ V}$ . 100% test at  $L = 0.1\text{ mH}$ ,  $I_{AS} = 110\text{ A}$ .
- Pulsed  $I_D$  please refer to Figure "Forward Bias Safe Operating Area" for more details.
- Computed continuous current limited to Max Junction Temperature only, actual continuous current will be limited by thermal & electro-mechanical application board design.

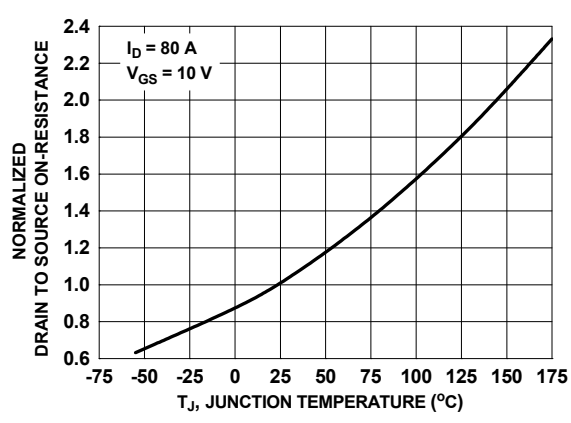
**Typical Characteristics**  $T_J = 25\text{ }^\circ\text{C}$  unless otherwise noted.



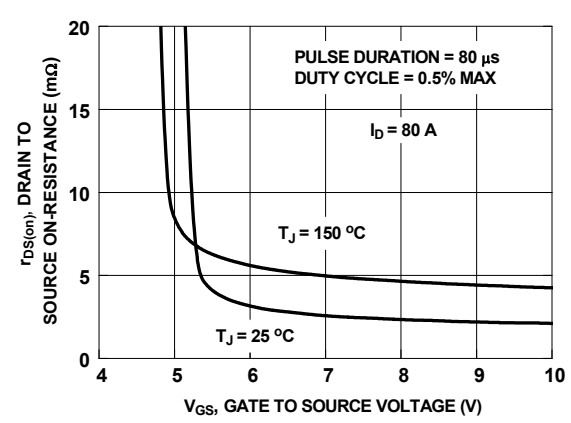
**Figure 1. On Region Characteristics**



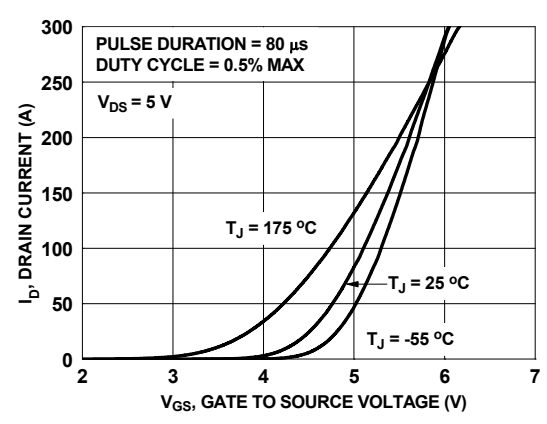
**Figure 2. Normalized On-Resistance vs. Drain Current and Gate Voltage**



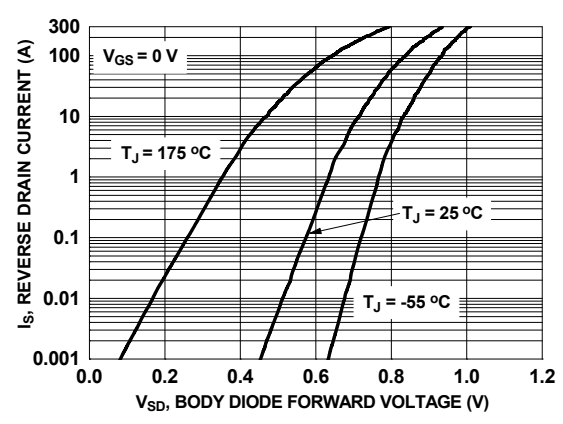
**Figure 3. Normalized On Resistance vs. Junction Temperature**



**Figure 4. On-Resistance vs. Gate to Source Voltage**



**Figure 5. Transfer Characteristics**



**Figure 6. Source to Drain Diode Forward Voltage vs. Source Current**

**Typical Characteristics**  $T_J = 25\text{ }^\circ\text{C}$  unless otherwise noted.

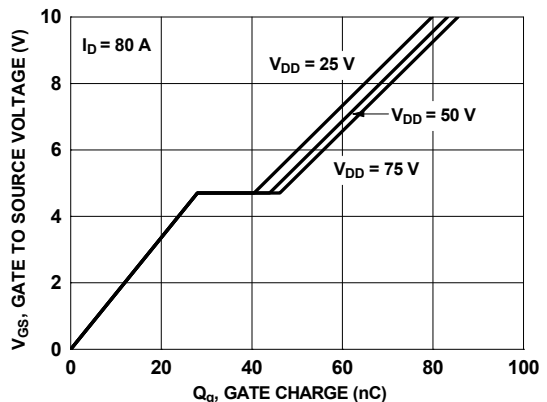


Figure 7. Gate Charge Characteristics

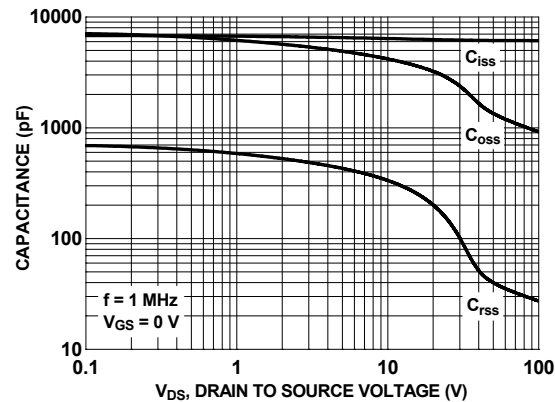


Figure 8. Capacitance vs. Drain to Source Voltage

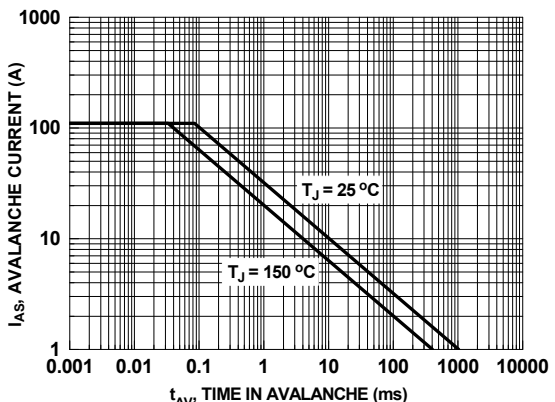


Figure 9. Unclamped Inductive Switching Capability

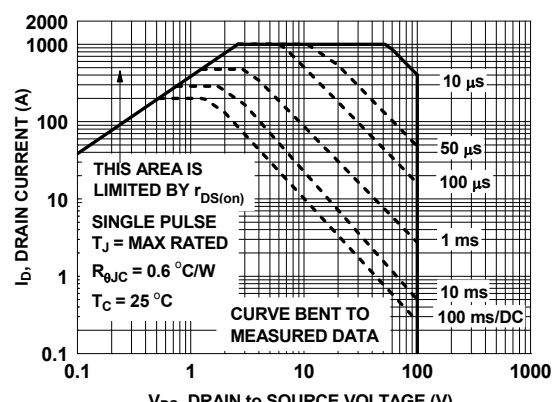


Figure 10. Forward Bias Safe Operating Area

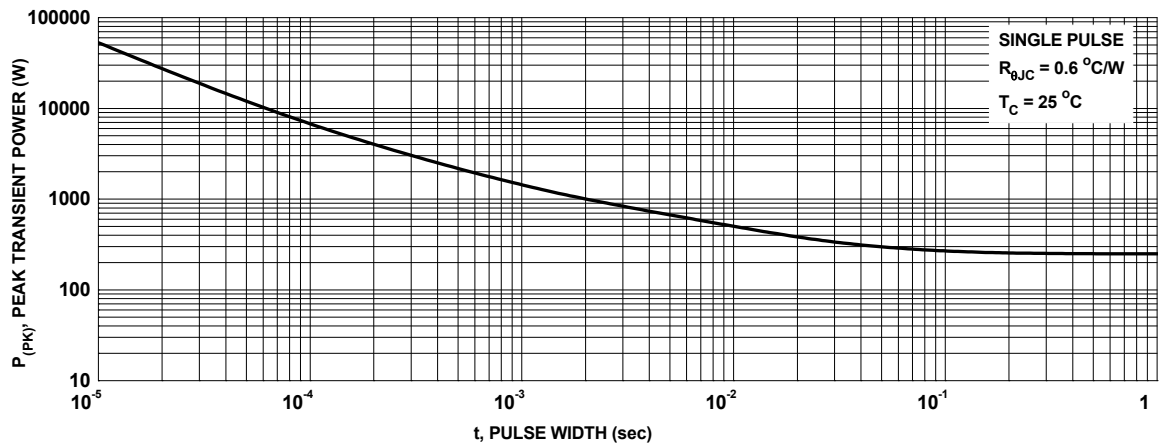


Figure 11. Single Pulse Maximum Power Dissipation

**Typical Characteristics**  $T_J = 25\text{ }^\circ\text{C}$  unless otherwise noted.

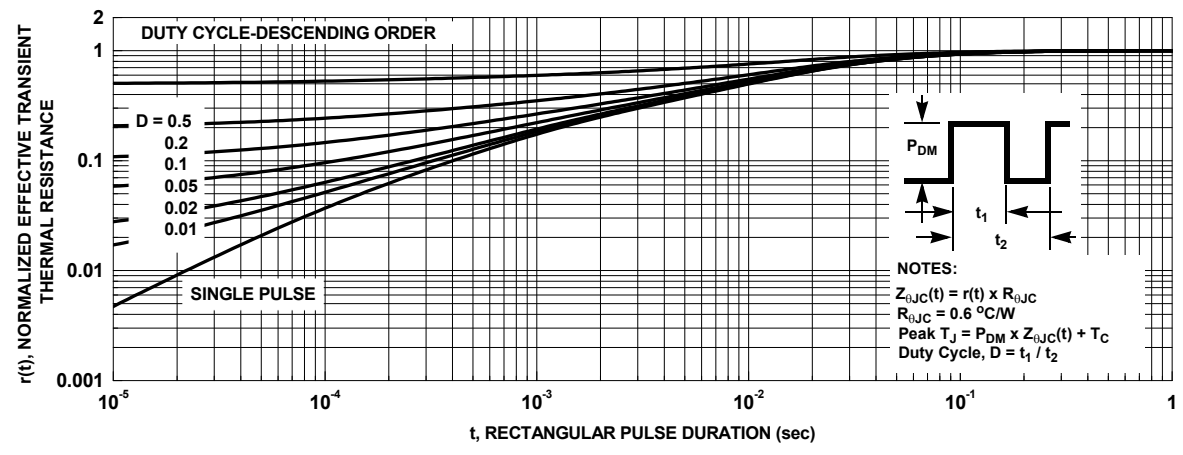
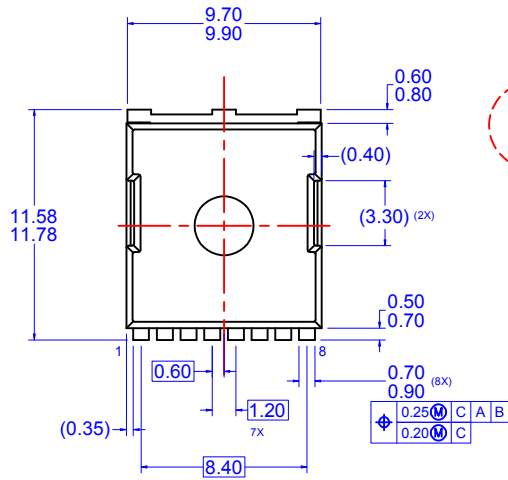
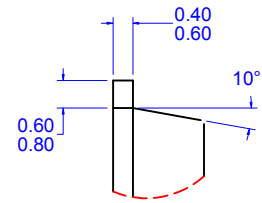
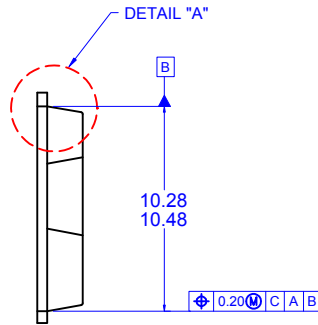


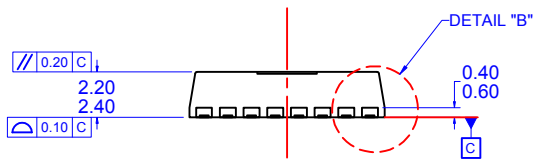
Figure 12. Junction-to-Case Transient Thermal Response Curve



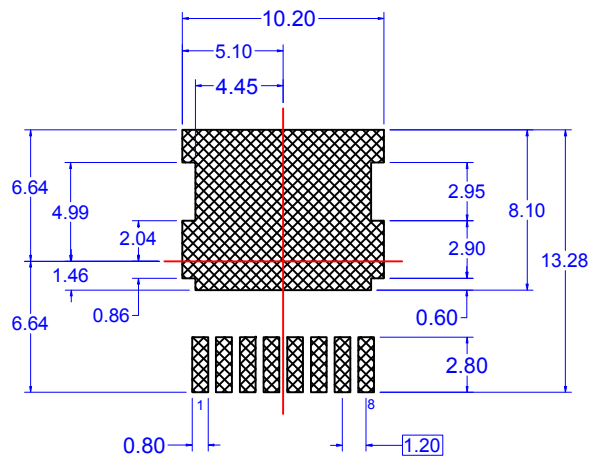
TOP VIEW



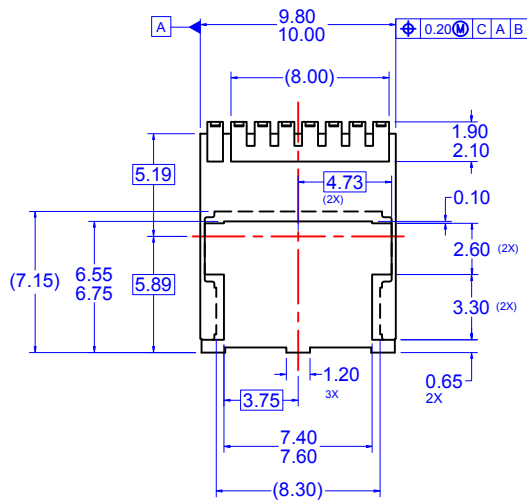
DETAIL "A"



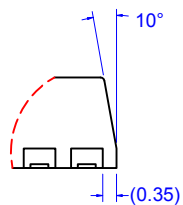
SIDE VIEW



LAND PATTERN RECOMMENDATION



BOTTOM VIEW



DETAIL "B"

- NOTES: UNLESS OTHERWISE SPECIFIED
- A) PACKAGE STANDARD REFERENCE: JEDEC MO-299, ISSUE A, DATED NOVEMBER 2009.
  - B) ALL DIMENSIONS ARE IN MILLIMETERS.
  - C) DIMENSIONS DO NOT INCLUDE BURRS OR MOLD FLASH. MOLD FLASH OR BURRS DOES NOT EXCEED 0.10MM.
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