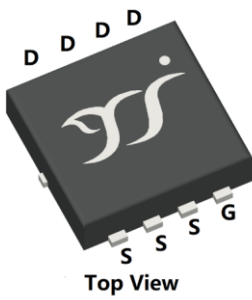
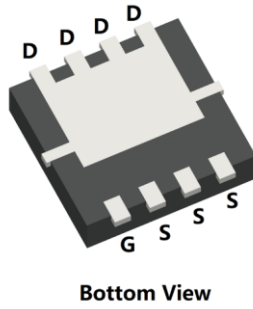




## N-Channel Enhancement Mode Field Effect Transistor

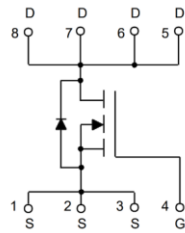


Top View



Bottom View

PDFN3333-8L



## Product Summary

|                                   |              |
|-----------------------------------|--------------|
| • $V_{DS}$                        | 80V          |
| • $I_D$                           | 36A          |
| • $R_{DS(ON)}$ (at $V_{GS}=10V$ ) | $<17m\Omega$ |
| • 100% EAS Tested                 |              |
| • 100% $\nabla V_{DS}$ Tested     |              |
| • ESD Level (HBM)                 | H1B          |

## General Description

- Excellent package for heat dissipation
- High density cell design for low  $R_{DS(ON)}$
- Moisture Sensitivity Level 1
- Epoxy Meets UL 94 V-0 Flammability Rating
- Halogen Free

## Applications

- 48V Port

## Limiting Values

| Parameter                              | Conditions                                                                                     |                                                           | Symbol                           | Min | Max  | Unit |
|----------------------------------------|------------------------------------------------------------------------------------------------|-----------------------------------------------------------|----------------------------------|-----|------|------|
| Drain-source Voltage                   |                                                                                                |                                                           | V <sub>DS</sub>                  | -   | 80   | V    |
| Gate-source Voltage                    |                                                                                                |                                                           | V <sub>GS</sub>                  | -20 | 20   |      |
| Continuous Drain Current (Note 1,2)    | Steady-State                                                                                   | T <sub>A</sub> =25°C,V <sub>GS</sub> =10V                 | I <sub>D</sub>                   | -   | 8    | A    |
|                                        |                                                                                                | T <sub>A</sub> =100°C,V <sub>GS</sub> =10V                |                                  | -   | 5.6  |      |
| Continuous Drain Current (Note 1,3)    | Steady-State                                                                                   | T <sub>C</sub> =25°C,V <sub>GS</sub> =10V,Chip limitation |                                  | -   | 36   |      |
|                                        |                                                                                                | T <sub>C</sub> =100°C,V <sub>GS</sub> =10V                |                                  | -   | 25.4 |      |
| Pulsed Drain Current                   | T <sub>C</sub> =25°C,t <sub>p</sub> ≤10μs                                                      |                                                           | I <sub>DM</sub>                  | -   | 144  |      |
| Maximum Body-Diode Continuous Current  | T <sub>C</sub> =25°C                                                                           |                                                           | I <sub>S</sub>                   |     | 36   |      |
| Avalanche Energy (non-repetitive)      | T <sub>J</sub> =25°C,V <sub>G</sub> =10V, R <sub>G</sub> =25Ω, L=0.3mH, I <sub>AS</sub> =12.6A |                                                           | EAS                              | -   | 23.8 | mJ   |
| Total Power Dissipation (Note 1,2)     | Steady-State                                                                                   | T <sub>A</sub> =25°C                                      | P <sub>D</sub>                   | -   | 2.3  | W    |
|                                        |                                                                                                | T <sub>A</sub> =100°C                                     |                                  | -   | 1.15 |      |
| Total Power Dissipation (Note 1,3)     | Steady-State                                                                                   | T <sub>C</sub> =25°C                                      |                                  | -   | 48.3 |      |
|                                        |                                                                                                | T <sub>C</sub> =100°C                                     |                                  | -   | 24.1 |      |
| Junction and Storage Temperature Range |                                                                                                |                                                           | T <sub>J</sub> ,T <sub>STG</sub> | -55 | 175  | °C   |

## Thermal Resistance

| Parameter                                       |              | Symbol          | Typ | Max | Units         |
|-------------------------------------------------|--------------|-----------------|-----|-----|---------------|
| Thermal Resistance Junction-to-Ambient (Note 2) | Steady-State | $R_{\theta JA}$ | -   | 65  | $^{\circ}C/W$ |
| Thermal Resistance Junction-to-Case             | Steady-State | $R_{\theta JC}$ | -   | 3.1 |               |



# YJQ017G08H

## ■ Electrical Characteristics

| Parameter                         | Symbol       | Conditions                                                          | Min | Typ  | Max       | Units      |
|-----------------------------------|--------------|---------------------------------------------------------------------|-----|------|-----------|------------|
| <b>Static Parameter</b>           |              |                                                                     |     |      |           |            |
| Drain-Source Breakdown Voltage    | $BV_{DSS}$   | $V_{GS}=0V, I_D=10mA, T_j=25^{\circ}C$                              | 80  | -    | -         | V          |
| Zero Gate Voltage Drain Current   | $I_{DSS}$    | $V_{DS}=64V, V_{GS}=0V, T_j=25^{\circ}C$                            | -   | -    | 1         | $\mu A$    |
|                                   |              | $V_{DS}=64V, V_{GS}=0V, T_j=150^{\circ}C$                           | -   | -    | 100       |            |
| Gate-Source Leakage Current       | $I_{GSS}$    | $V_{GS}=\pm 20V, V_{DS}=0V, T_j=25^{\circ}C$                        | -   | -    | $\pm 100$ | nA         |
| Gate Threshold Voltage            | $V_{GS(th)}$ | $V_{DS}=V_{GS}, I_D=250\mu A, T_j=25^{\circ}C$                      | 2.2 | 3    | 3.8       | V          |
| Static Drain-Source On-Resistance | $R_{DS(ON)}$ | $V_{GS}=10V, I_D=20A, T_j=25^{\circ}C$                              | -   | 12.8 | 17        | m $\Omega$ |
| Diode Forward Voltage             | $V_{SD}$     | $I_S=20A, V_{GS}=0V, T_j=25^{\circ}C$                               | -   | 0.9  | 1.2       | V          |
| Gate Resistance                   | $R_G$        | $f=1MHz, T_j=25^{\circ}C$                                           | -   | 0.8  | -         | $\Omega$   |
| <b>Dynamic Parameters</b>         |              |                                                                     |     |      |           |            |
| Input Capacitance                 | $C_{iss}$    | $V_{DS}=40V, V_{GS}=0V, f=1MHz, T_j=25^{\circ}C$                    | -   | 688  | -         | $pF$       |
| Output Capacitance                | $C_{oss}$    |                                                                     | -   | 195  | -         |            |
| Reverse Transfer Capacitance      | $C_{rss}$    |                                                                     | -   | 6.4  | -         |            |
| Total Gate Charge                 | $Q_g$        | $V_{GS}=10V, V_{DS}=40V, I_D=20A, T_j=25^{\circ}C$                  | -   | 13.6 | -         | nC         |
| Gate-Source Charge                | $Q_{gs}$     |                                                                     | -   | 3.3  | -         |            |
| Gate-Drain Charge                 | $Q_{gd}$     |                                                                     | -   | 5.2  | -         |            |
| Reverse Recovery Charge           | $Q_{rr}$     | $I_F=20A, di/dt=100A/\mu s, V_{GS}=0V, V_R=40V, T_j=25^{\circ}C$    | -   | 32.3 | -         | nC         |
| Reverse Recovery Time             | $t_{rr}$     |                                                                     | -   | 32   | -         | ns         |
| Turn-on Delay Time                | $t_{D(on)}$  | $V_{GS}=10V, V_{DS}=40V, I_D=20A, R_{GEN}=3\Omega, T_j=25^{\circ}C$ | -   | 8.6  | -         | ns         |
| Turn-on Rise Time                 | $t_r$        |                                                                     | -   | 11.2 | -         |            |
| Turn-off Delay Time               | $t_{D(off)}$ |                                                                     | -   | 15   | -         |            |
| Turn-off Fall Time                | $t_f$        |                                                                     | -   | 4.8  | -         |            |

Note:

1. The entire application environment impacts the thermal resistance values shown, they are not constants and are only valid for the particular conditions noted.
2. The value of  $R_{\theta JA}$  is measured with the device mounted on the 40mm\*40mm\*1.1mm single layer FR-4 PCB board with 1 in<sup>2</sup> pad of 2oz. Copper, in the still air environment with  $T_A=25^{\circ}C$ . The maximum allowed junction temperature of 175 $^{\circ}C$ . The value in any given application depends on the user's specific board design.
3. Thermal resistance from junction to soldering point (on the exposed drain pad).

## ■ Typical Electrical and Thermal Characteristics Diagrams

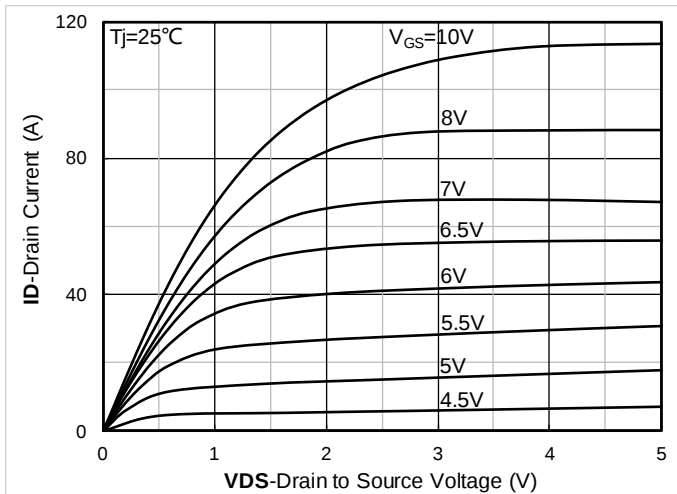


Figure 1. Output Characteristics; typical values

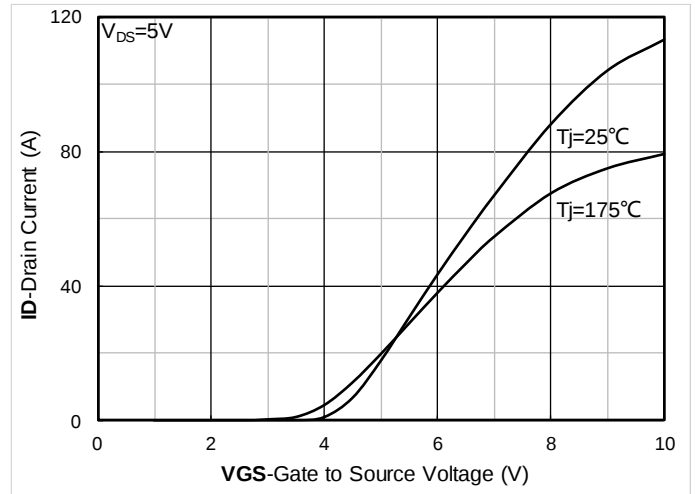


Figure 2. Transfer Characteristics; typical values

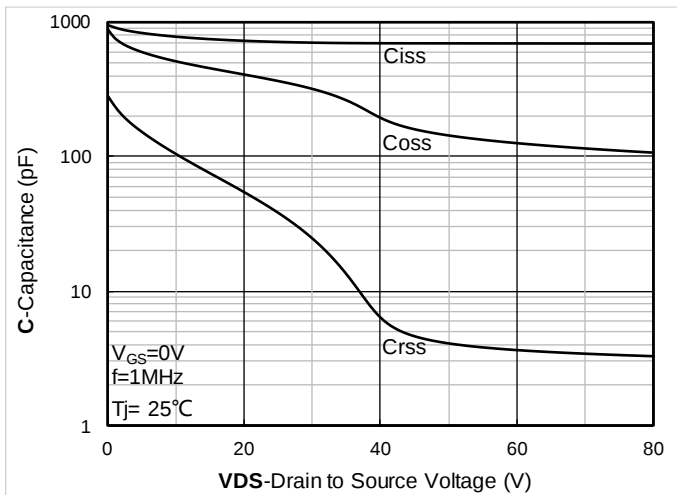


Figure 3. Capacitance Characteristics; typical values

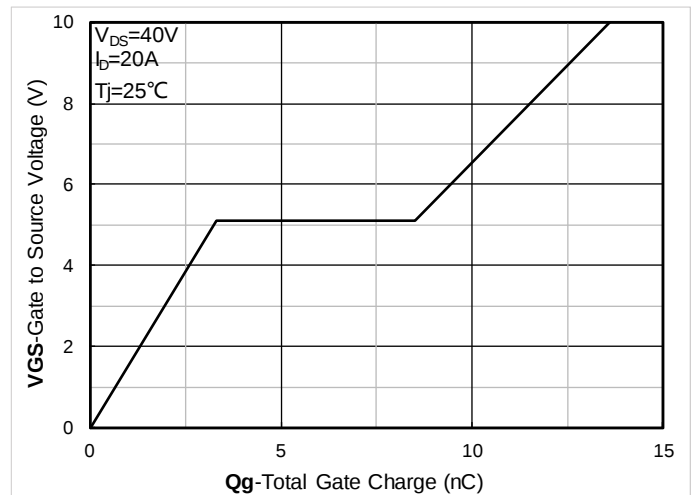


Figure 4. Gate Charge; typical values

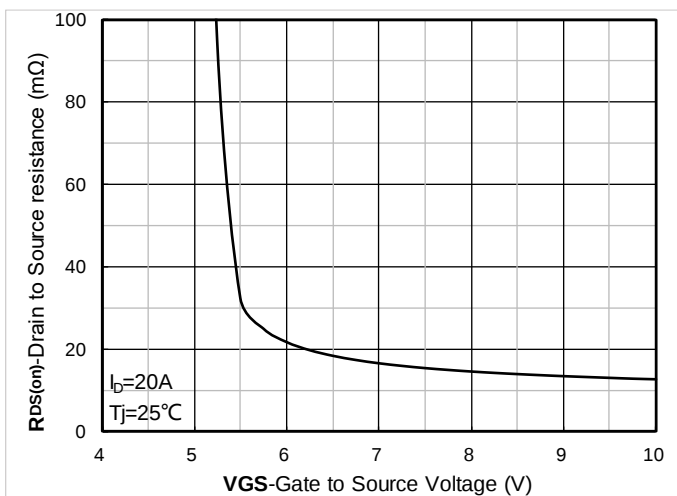


Figure 5. On-Resistance vs. Gate to Source Voltage; typical values

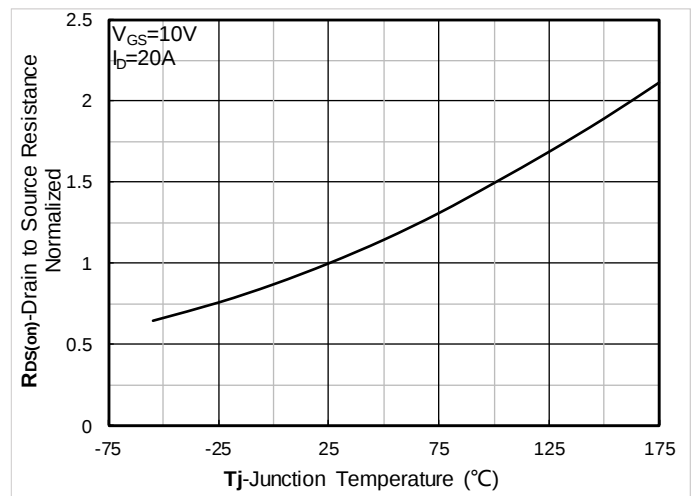


Figure 6. Normalized On-Resistance

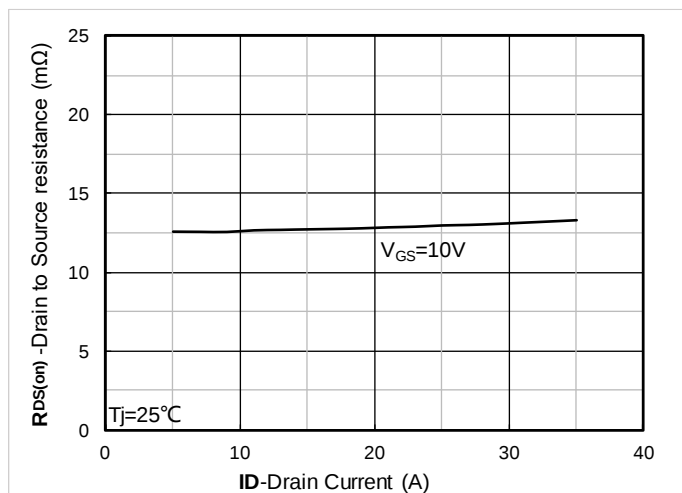


Figure 7.  $R_{DS(on)}$  vs. Drain Current; typical values

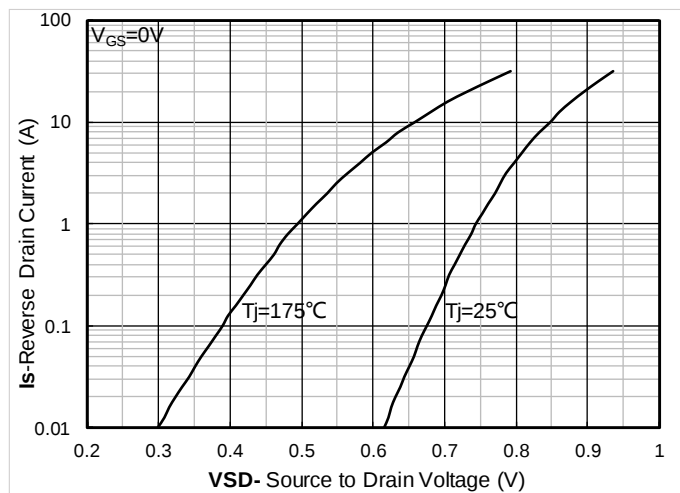


Figure 8. Forward characteristics of reverse diode; typical values

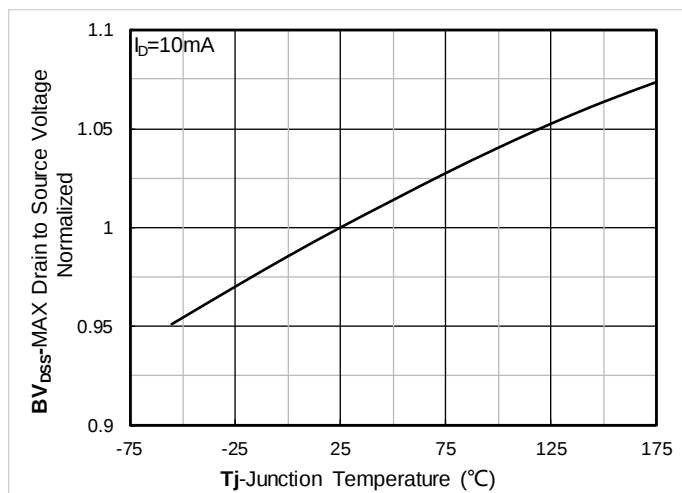


Figure 9. Normalized breakdown voltage

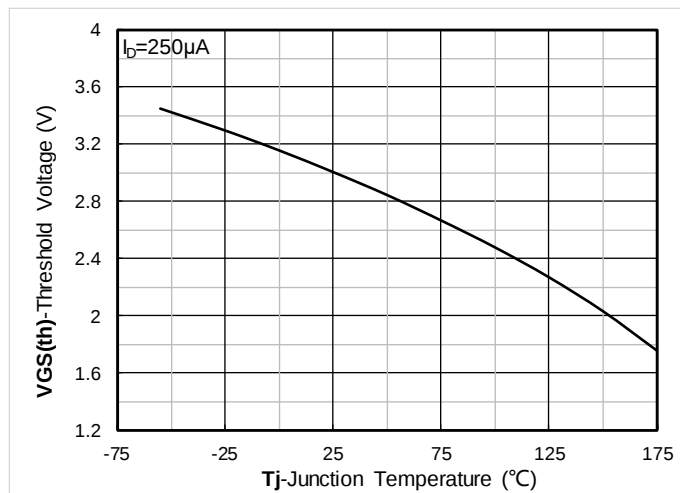


Figure 10. Gate Threshold voltage; typical values

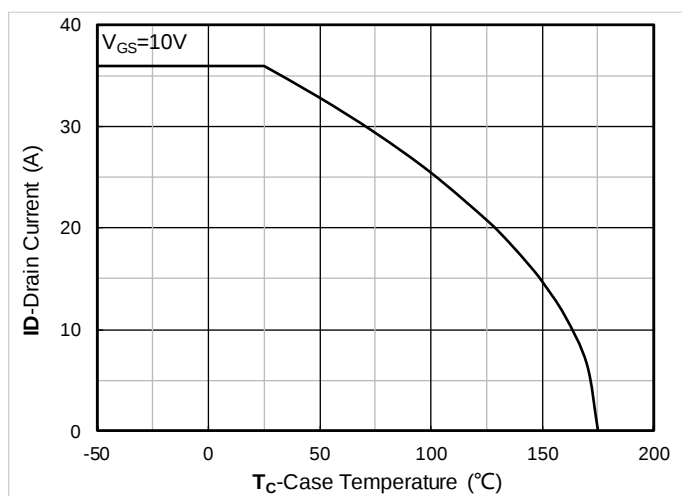


Figure 11. Current dissipation

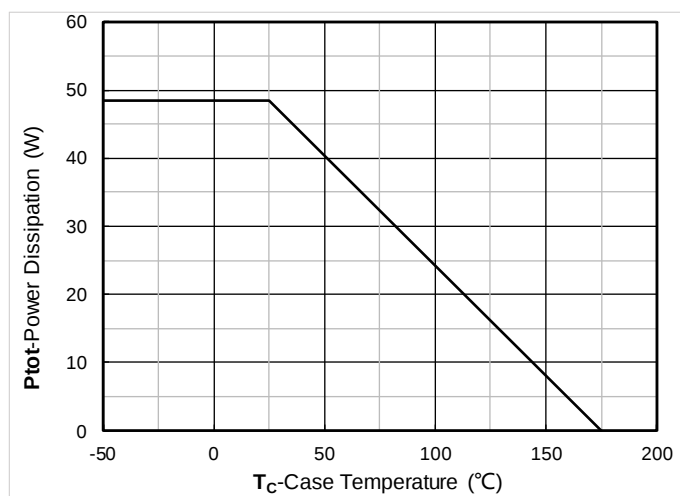


Figure 12. Power dissipation

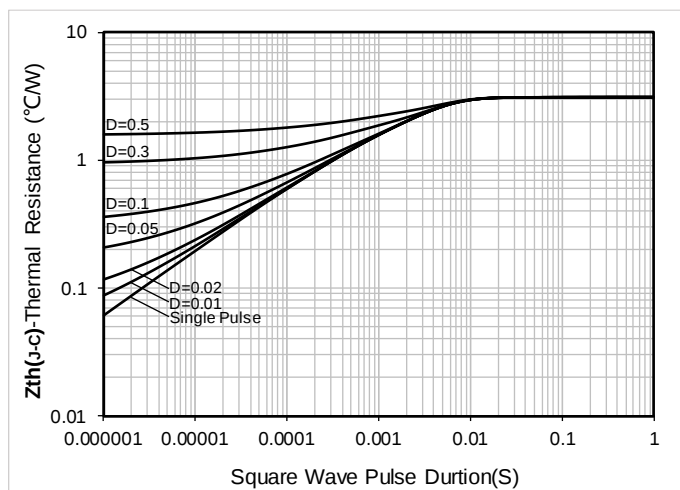


Figure 13. Maximum Transient Thermal Impedance

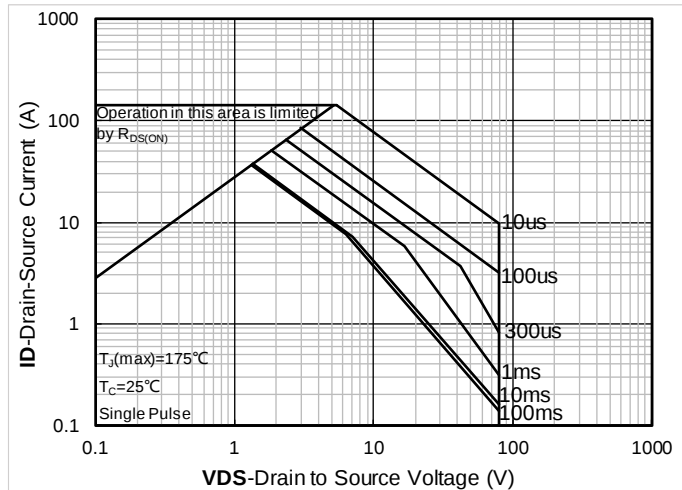
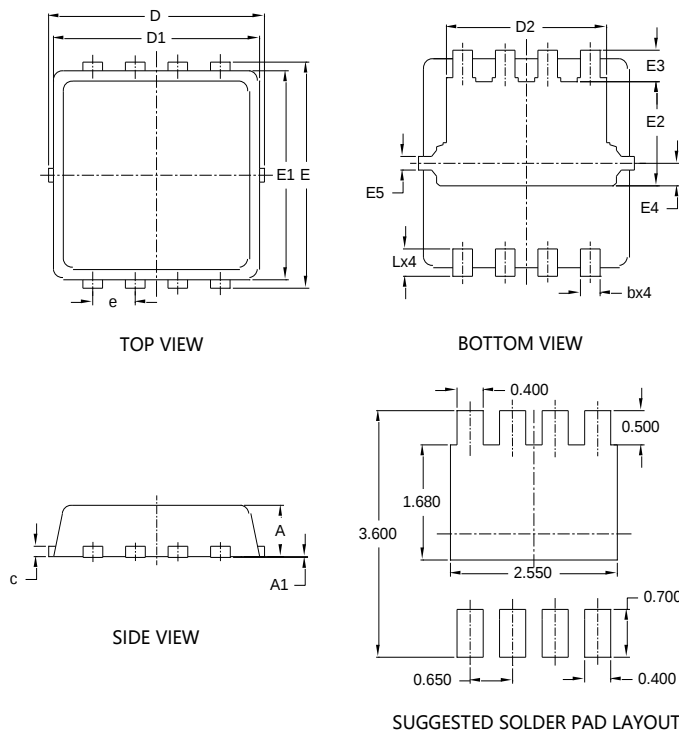


Figure 14. Safe Operation Area



## YJQ017G08H

### ■ PDFN3333-8L-B-0.75mm Package information

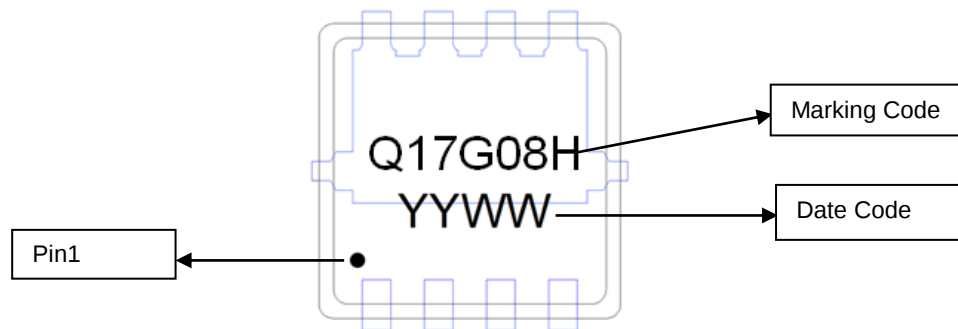


| SYMBOL | DIMENSIONS |       |            |       |
|--------|------------|-------|------------|-------|
|        | INCHES     |       | Millimeter |       |
|        | MIN.       | MAX.  | MIN.       | MAX.  |
| A      | 0.028      | 0.033 | 0.700      | 0.850 |
| A1     | 0.000      | 0.002 | 0.000      | 0.050 |
| b      | 0.008      | 0.016 | 0.200      | 0.400 |
| c      | 0.004      | 0.010 | 0.100      | 0.250 |
| D      | 0.124      | 0.136 | 3.150      | 3.450 |
| D1     | 0.118      | 0.130 | 3.000      | 3.300 |
| D2     | 0.089      | 0.104 | 2.250      | 2.650 |
| E      | 0.124      | 0.136 | 3.150      | 3.450 |
| E1     | 0.114      | 0.126 | 2.900      | 3.200 |
| E2     | 0.052      | 0.068 | 1.320      | 1.720 |
| E3     | 0.011      | 0.026 | 0.280      | 0.650 |
| E4     | 0.013 REF  |       | 0.330 REF  |       |
| E5     | 0.008 REF  |       | 0.200 REF  |       |
| e      | 0.026 BSC  |       | 0.650 BSC  |       |
| L      | 0.012      | 0.020 | 0.300      | 0.500 |

NOTE:  
1. PACKAGE BODY SIZES EXCLUDE MOLD FLASH AND GATE BURRS.  
2. TOLERANCE 0.1mm UNLESS OTHERWISE SPECIFIED.  
3. THE PAD LAYOUT IS FOR REFERENCE PURPOSES ONLY.

UNIT: mm

## ■ Marking Information



**Note:**

1. All marking is at middle of the product body
2. All marking is in laser printing
3. YYWW is date code, "YY" is year, "WW" is week
4. Body color: Black



## Disclaimer

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