# NDBA100N10B

## Power MOSFET
## 100V, 6.9mΩ, 100A, N-Channel

ON Semiconductor®

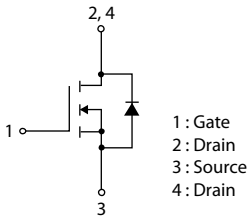
www.onsemi.com

### Features

- Low On-Resistance
- Low Gate Charge
- High Speed Switching
- 100% Avalanche Tested
- Pb-Free, Halogen Free and RoHS Compliance

| $V_{DSS}$ | $R_{DS(on)}$ Max | $I_D$ Max |
|---|---|---|
| 100V | 6.9 mΩ@15V | 100A |
| | 8.2 mΩ@10V | |

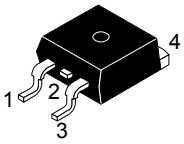
### Electrical Connection
**N-Channel**




### Specifications

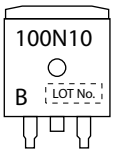
**Absolute Maximum Ratings** at Ta = 25°C

| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Drain to Source Voltage | $V_{DSS}$ | 100 | V |
| Gate to Source Voltage | $V_{GSS}$ | ±20 | V |
| Drain Current (DC) | $I_D$ | 100 | A |
| Drain Current (Pulse)<br>PW≤10μs, duty cycle≤1% | $I_{DP}$ | 400 | A |
| Power Dissipation<br>Tc=25°C | $P_D$ | 110 | W |
| Junction Temperature | Tj | 175 | °C |
| Storage Temperature | Tstg | –55 to +175 | °C |
| Source Current (Body Diode) | $I_S$ | 100 | A |
| Avalanche Energy (Single Pulse) *1 | $E_{AS}$ | 147 | mJ |
| Lead Temperature for Soldering<br>Purposes, 3mm from Case for 10 Seconds | $T_L$ | 260 | °C |




**TO-263**
**CASE 418AJ**

### Marking



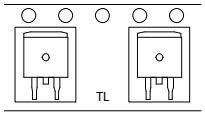

### Thermal Resistance Ratings

| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Junction to Case Steady State | $R_{\theta JC}$ | 1.36 | °C/W |
| Junction to Ambient *2 | $R_{\theta JA}$ | 62.5 | |

Note : *1 $V_{DD}$=48V, L=100μH, $I_{AV}$=40A (Fig.1)

*2 Surface mounted on FR4 board using recommended footprint

### Packing Type : TL




Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

### ORDERING INFORMATION

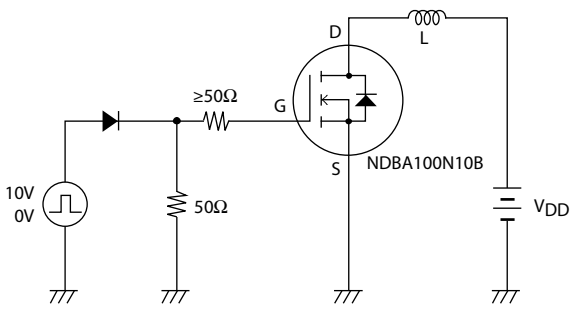
See detailed ordering and shipping information on page 5 of this data sheet.

## Electrical Characteristics at Ta = 25°C

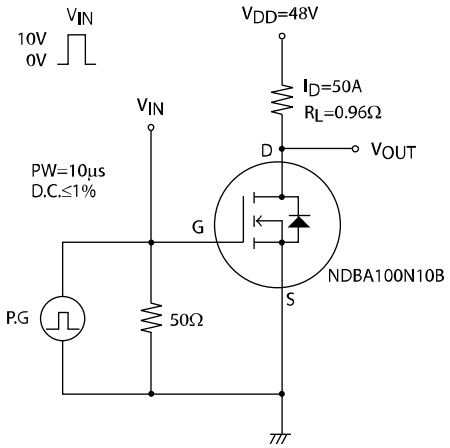
| Parameter | Symbol | Conditions | Value | | | Unit |
|---|---|---|---|---|---|---|
| | | | min | typ | max | |
| Drain to Source Breakdown Voltage | $V_{(BR)DSS}$ | $I_D$=10mA, $V_{GS}$=0V | 100 | | | V |
| Zero-Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$=100V, $V_{GS}$=0V | | | 10 | μA |
| Gate to Source Leakage Current | $I_{GSS}$ | $V_{GS}$=±20V, $V_{DS}$=0V | | | ±100 | nA |
| Gate Threshold Voltage | $V_{GS}(th)$ | $V_{DS}$=10V, $I_D$=1mA | 2 | | 4 | V |
| Forward Transconductance | $g_{FS}$ | $V_{DS}$=10V, $I_D$=50A | | 75 | | S |
| Static Drain to Source On-State Resistance | $R_{DS}(on)1$ | $I_D$=50A, $V_{GS}$=15V | | 5.7 | 6.9 | mΩ |
| | $R_{DS}(on)2$ | $I_D$=50A, $V_{GS}$=10V | | 6.3 | 8.2 | mΩ |
| Input Capacitance | Ciss | $V_{DS}$=50V, f=1MHz | | 2,950 | | pF |
| Output Capacitance | Coss | | | 1,250 | | pF |
| Reverse Transfer Capacitance | Crss | | | 20 | | pF |
| Turn-ON Delay Time | $t_d(on)$ | See Fig.2 | | 40 | | ns |
| Rise Time | $t_r$ | | | 385 | | ns |
| Turn-OFF Delay Time | $t_d(off)$ | | | 68 | | ns |
| Fall Time | $t_f$ | | | 52 | | ns |
| Total Gate Charge | Qg | $V_{DS}$=48V, $V_{GS}$=10V, $I_D$=100A | | 35 | | nC |
| Gate to Source Charge | Qgs | | | 13 | | nC |
| Gate to Drain “Miller” Charge | Qgd | | | 10 | | nC |
| Forward Diode Voltage | $V_{SD}$ | $I_S$=100A, $V_{GS}$=0V | | 1.1 | 1.5 | V |
| Reverse Recovery Time | $t_{rr}$ | See Fig.3 | | 130 | | ns |
| Reverse Recovery Charge | $Q_{rr}$ | $I_S$=100A, $V_{GS}$=0V, $V_{DD}$=50V, di/dt=100A/μs | | 400 | | nC |

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

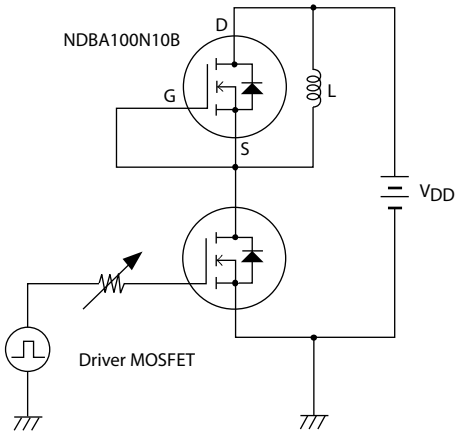
### Fig.1 Unclamped Inductive Switching Test Circuit

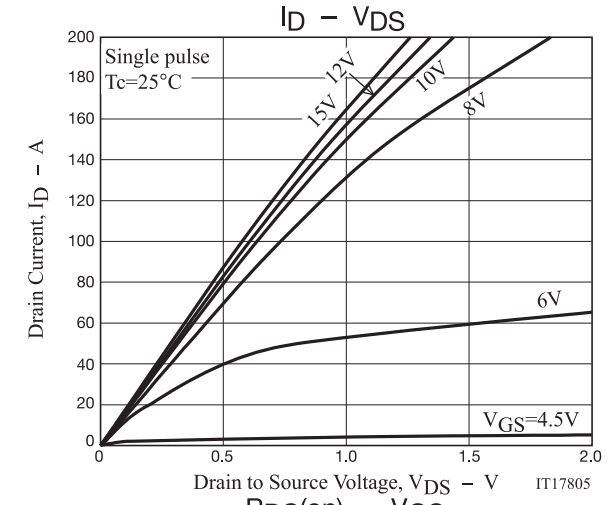


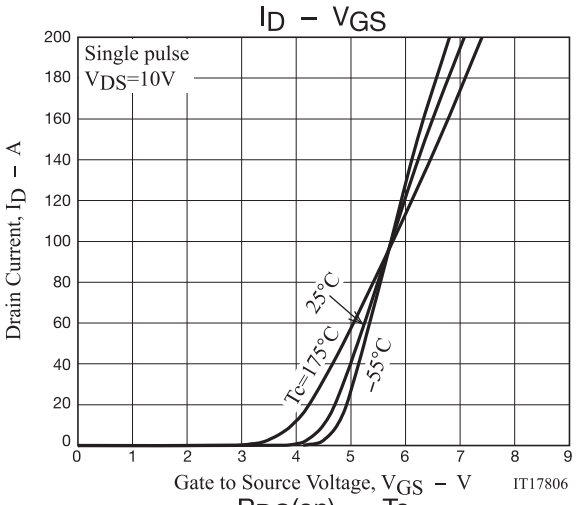

### Fig.2 Switching Time Test Circuit

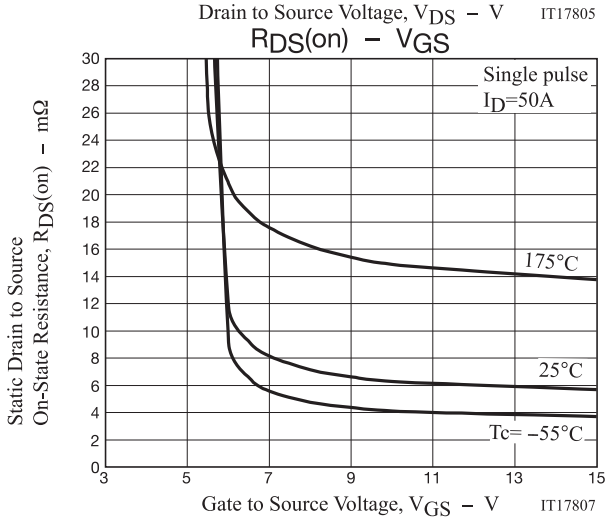


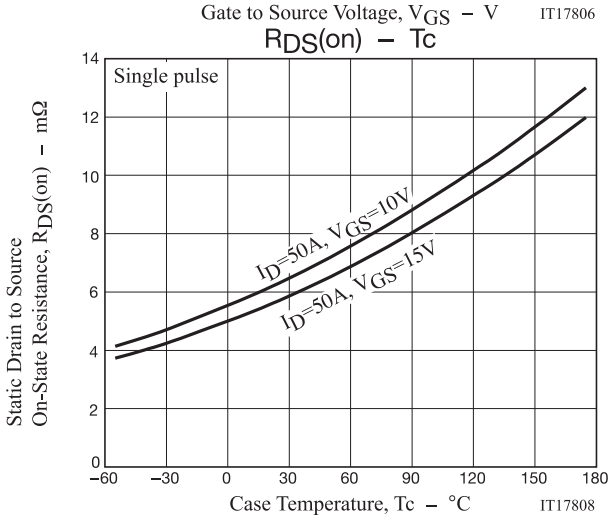

### Fig.3 Reverse Recovery Time Test Circuit

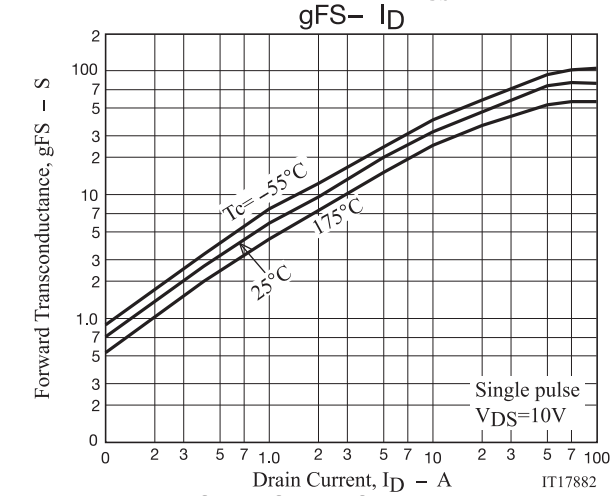


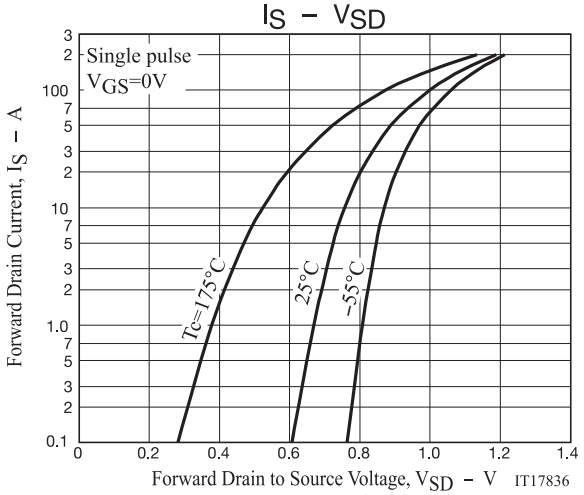


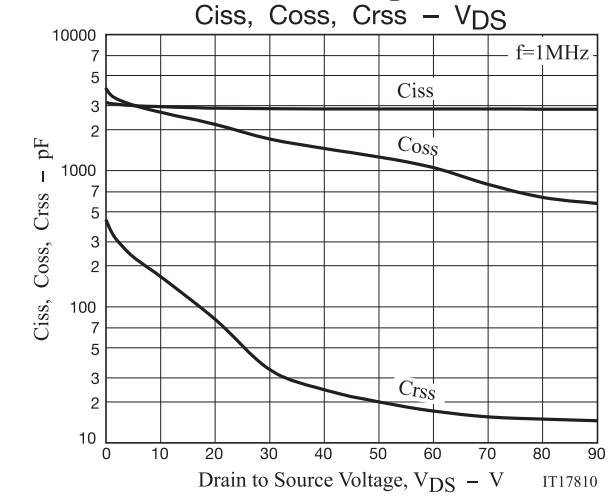



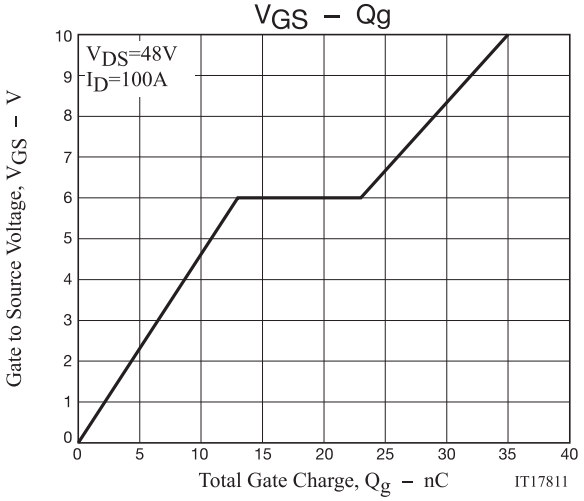



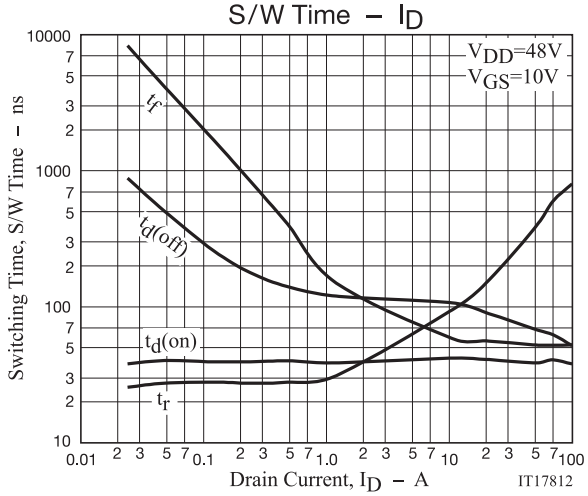



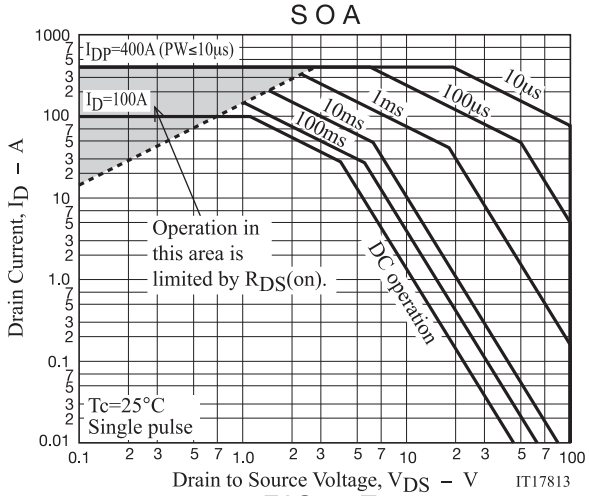



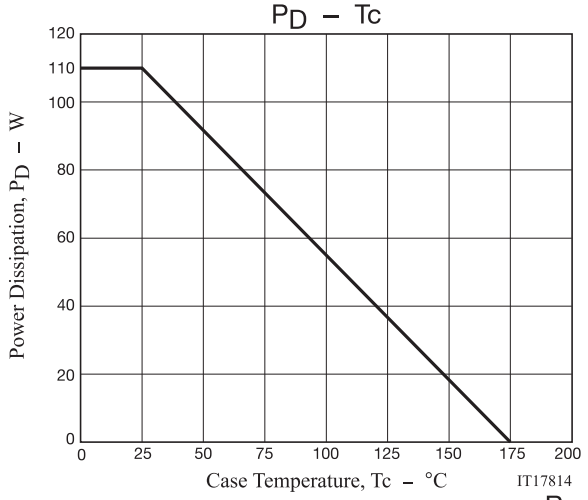
S/W Time – $I_D$



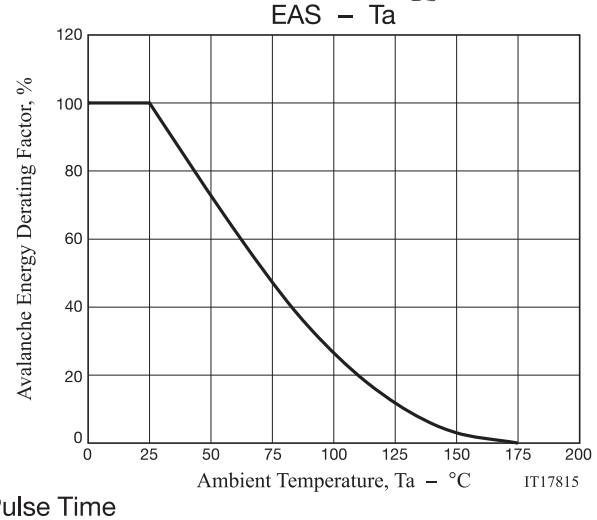

S O A



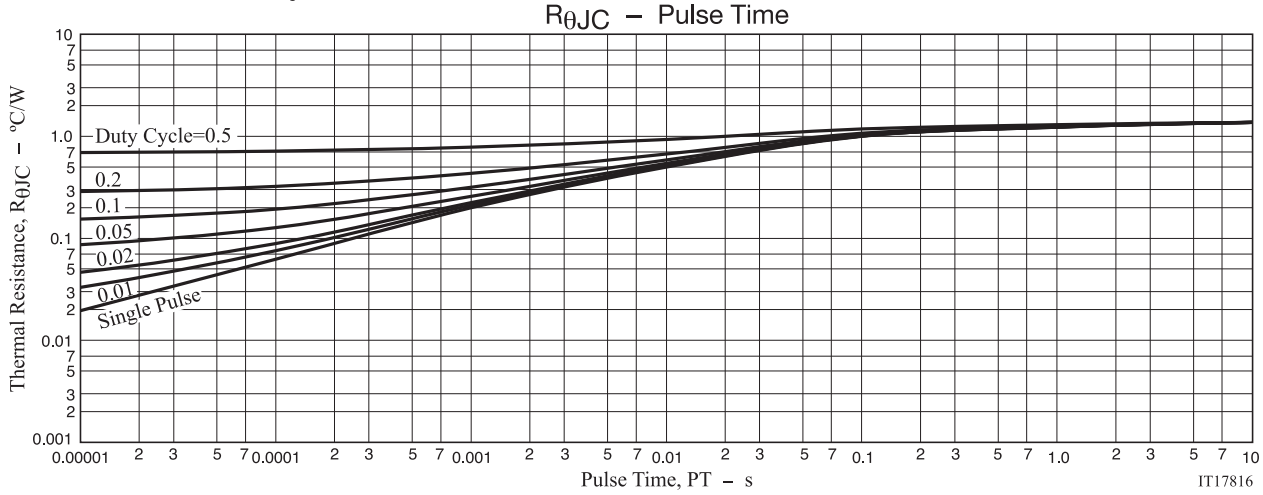

$P_D$ – Tc




EAS – Ta




$R_{\theta JC}$ – Pulse Time

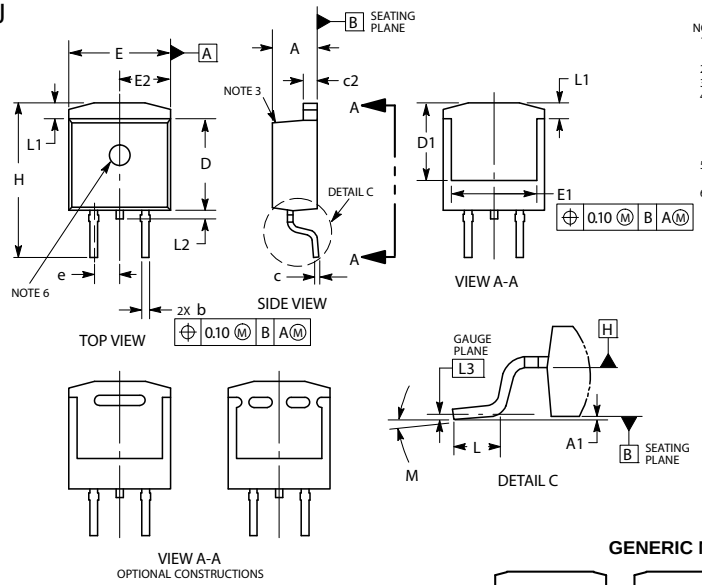


## Package Dimensions

NDBA100N10BT4H

## D²PAK-3 (TO-263, 3-LEAD)

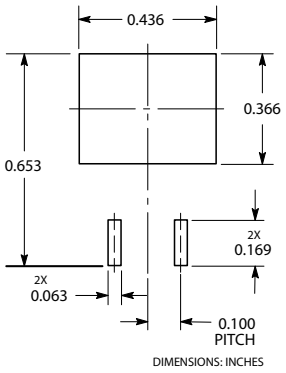
CASE 418AJ
ISSUE B




NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: INCHES.
3. CHAMFER OPTIONAL
4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH. MOLD FLASH SHALL NOT EXCEED 0.005 PER SIDE. THESE DIMENSIONS ARE MEASURED AT THE OUTERMOST EXTREMES OF THE PLASTIC BODY AT DATUM H.
5. THERMAL PAD CONTOUR IS OPTIONAL WITHIN DIMENSIONS E, L1, D1 AND E1.
6. OPTIONAL MOLD FEATURE

| | INCHES | | MILLIMETERS | |
|---|---|---|---|---|
| DIM | MIN | MAX | MIN | MAX |
| A | 0.160 | 0.190 | 4.06 | 4.83 |
| A1 | 0.000 | 0.010 | 0.00 | 0.25 |
| b | 0.020 | 0.039 | 0.51 | 0.99 |
| c | 0.012 | 0.029 | 0.30 | 0.74 |
| c2 | 0.045 | 0.065 | 1.14 | 1.65 |
| D | 0.330 | 0.380 | 8.38 | 9.65 |
| D1 | 0.260 | ----- | 6.60 | ----- |
| E | 0.380 | 0.420 | 9.65 | 10.67 |
| E1 | 0.245 | ----- | 6.22 | ----- |
| e | 0.100 BSC | | 2.54 BSC | |
| H | 0.575 | 0.625 | 14.60 | 15.88 |
| L | 0.070 | 0.110 | 1.78 | 2.79 |
| L1 | ----- | 0.066 | ----- | 1.68 |
| L2 | ----- | 0.070 | ----- | 1.78 |
| L3 | 0.010 BSC | | 0.25 BSC | |
| M | 0° | 8° | 0° | 8° |

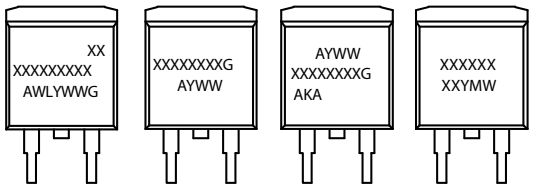
### RECOMMENDED SOLDERING FOOTPRINT*




DIMENSIONS: INCHES

*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

### GENERIC MARKING DIAGRAMS*




XXXXXX = Specific Device Code
A = Assembly Location
WL = Wafer Lot
Y = Year
WW = Work Week
W = Week Code (SSG)
M = Month Code (SSG)
G = Pb-Free Package
AKA = Polarity Indicator

*This information is generic. Please refer to device data sheet for actual part marking. Pb –Free indicator, "G" or microdot " ▪ ", may or may not be present.

## ORDERING INFORMATION

| Device | Package | Shipping | note |
|---|---|---|---|
| NDBA100N10BT4H | D²PAK-3 (TO-263, 3-LEAD) | 800 pcs. / Tape & Reel | Pb-Free and Halogen Free |

† For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D. http://www.onsemi.com/pub_link/Collateral/BRD8011-D.PDF

Note on usage : Since the NDBA100N10B is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.