

NDBA180N10B

Power MOSFET 100V, 2.8mΩ, 180A, N-Channel



ON Semiconductor®

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Features

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

Specifications

Absolute Maximum Ratings at Ta = 25°C (Note 1)

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	180	A
Drain Current (DC) Limited by Package	I _{DL}	100	A
Drain Current (Pulse) PW≤10μs, duty cycle≤1%	I _{DP}	600	A
Power Dissipation Tc=25°C	P _D	200	W
Junction Temperature	T _j	175	°C
Storage Temperature	T _{stg}	-55 to +175	°C
Source Current (Body Diode)	I _S	100	A
Avalanche Energy (Single Pulse) (Note 2)	E _{AS}	451	mJ
Lead Temperature for Soldering Purposes, 3mm from Case for 10 Seconds	T _L	260	°C

Note 1 : 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.

2 : V_{DD}=48V, L=100μH, I_{AV}=70A (Fig.1)

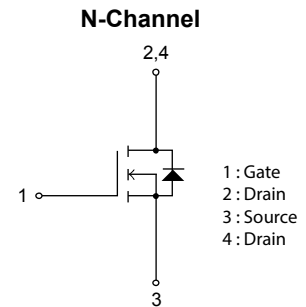
Thermal Resistance Ratings

Parameter	Symbol	Value	Unit
Junction to Case Steady State	R _{θJC}	0.75	°C/W
Junction to Ambient (Note 3)	R _{θJA}	62.5	

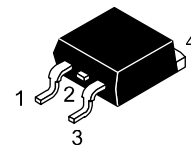
Note 3 : Surface mounted on FR4 board using recommended footprint

V _{DSS}	R _{DS(on)} Max	I _D Max
100V	2.8mΩ@ 15V	180A
	3.3mΩ@ 10V	

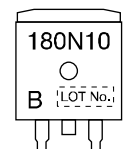
Electrical Connection



Marking



TO-263
CASE 418AJ



ORDERING INFORMATION

See detailed ordering and shipping information on page 6 of this data sheet.

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Electrical Characteristics at Ta = 25°C (Note 4)

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}	$V_{GS}=\pm 20V, V_{DS}=0V$			± 200	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=10V, I_D=1mA$	2		4	V
Forward Transconductance	gFS	$V_{DS}=10V, I_D=50A$		150		S
Static Drain to Source On-State Resistance	$R_{DS(on)1}$	$I_D=50A, V_{GS}=15V$		2.3	2.8	$m\Omega$
	$R_{DS(on)2}$	$I_D=50A, V_{GS}=10V$		2.5	3.3	$m\Omega$
Input Capacitance	C_{iss}	$V_{DS}=50V, f=1MHz$		6,950		pF
Output Capacitance	C_{oss}			3,000		pF
Reverse Transfer Capacitance	C_{rss}			15		pF
Turn-ON Delay Time	$t_{d(on)}$		See Fig.2		95	
Rise Time	t_r			320		ns
Turn-OFF Delay Time	$t_{d(off)}$			185		ns
Fall Time	t_f			130		ns
Total Gate Charge	Qg	$V_{DS}=48V, V_{GS}=10V, I_D=100A$		95		nC
Gate to Source Charge	Qgs			31		nC
Gate to Drain "Miller" Charge	Qgd			26		nC
Forward Diode Voltage	V_{SD}		$I_S=100A, V_{GS}=0V$		0.9	1.5
Reverse Recovery Time	t_{rr}	See Fig.3		150		ns
Reverse Recovery Charge	Qrr	$I_S=100A, V_{GS}=0V, V_{DD}=50V, di/dt=100A/\mu s$		580		nC
Reverse Recovery Charge	Qrr	$I_S=100A, V_{GS}=0V, V_{DD}=50V, di/dt=100A/\mu s$		580		nC

Note 4 : 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

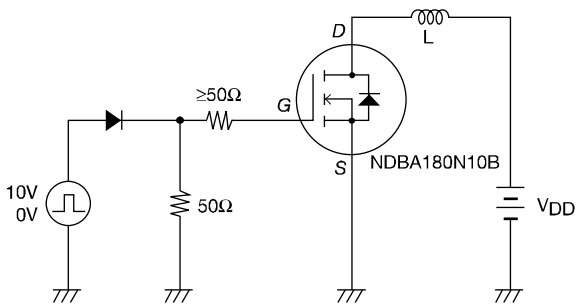


Fig.2 Switching Time Test Circuit

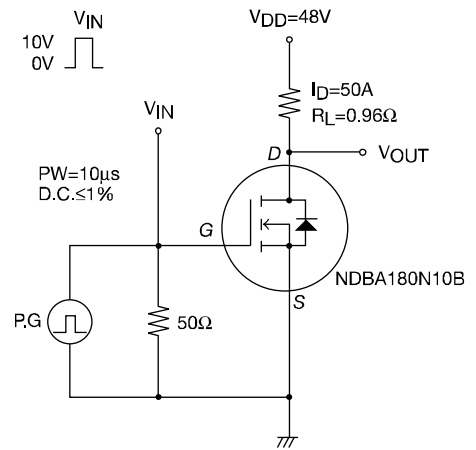
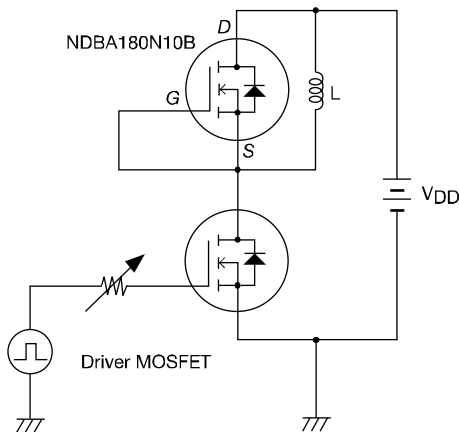
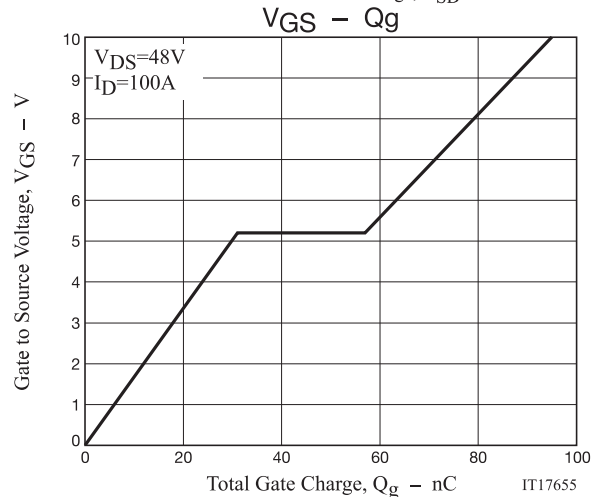
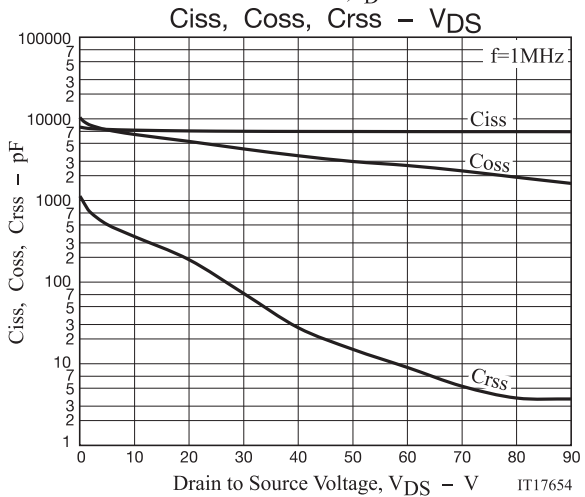
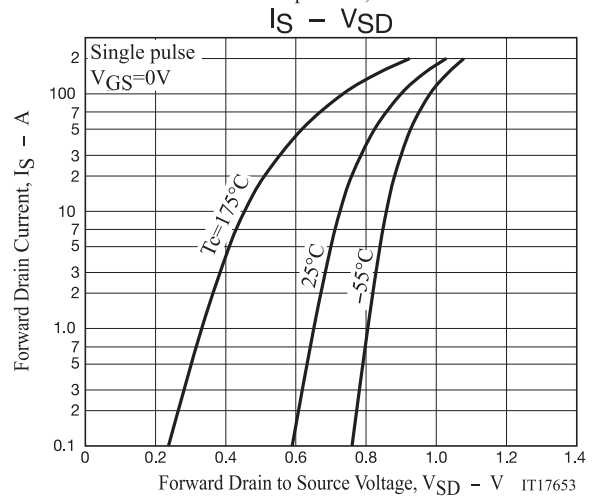
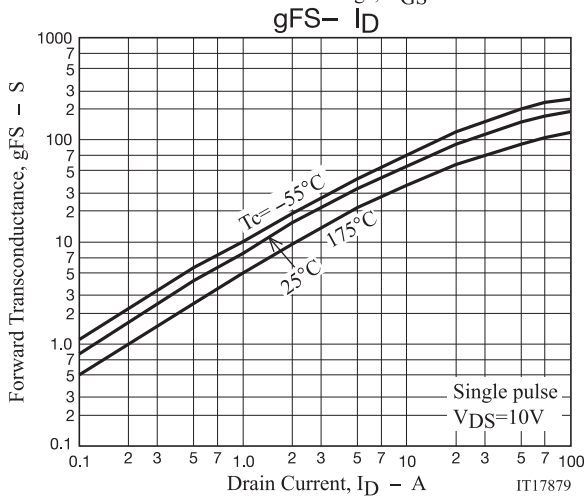
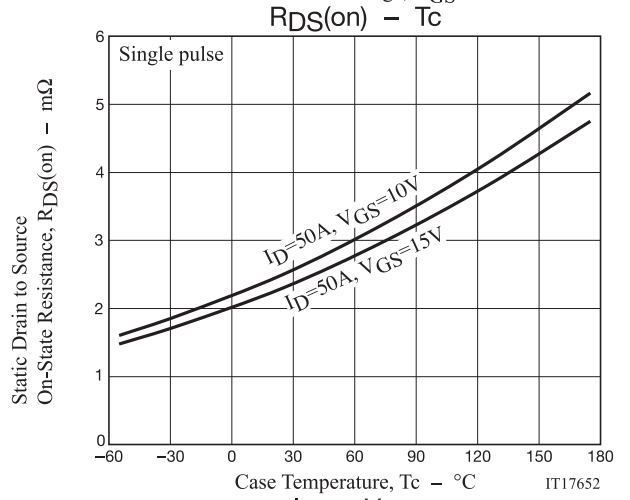
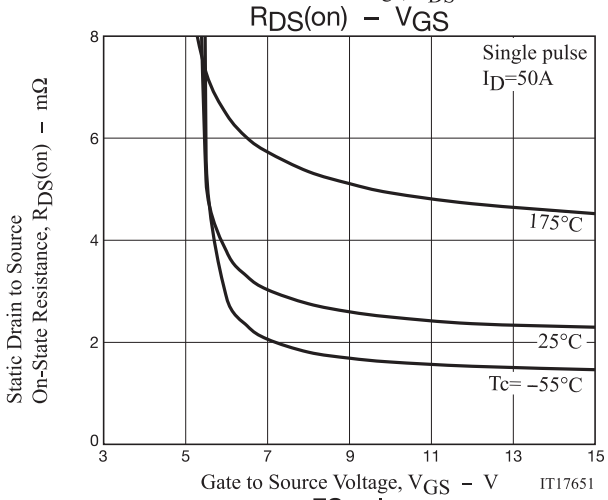
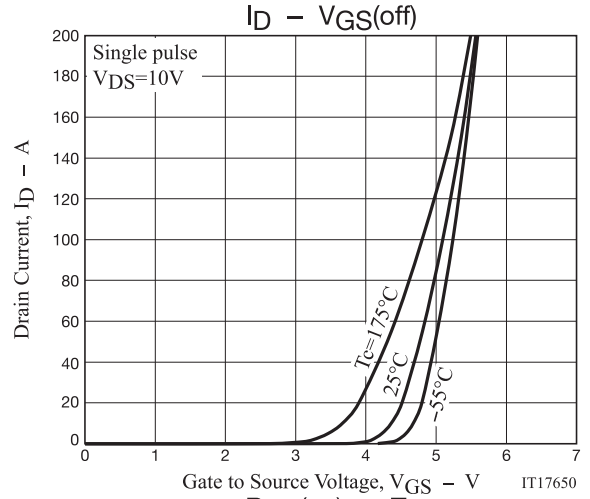
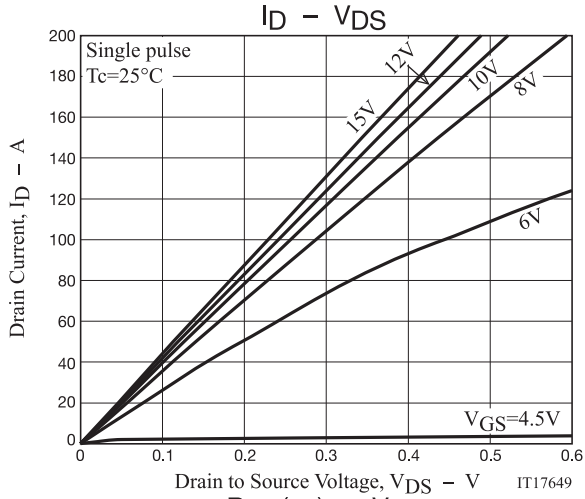


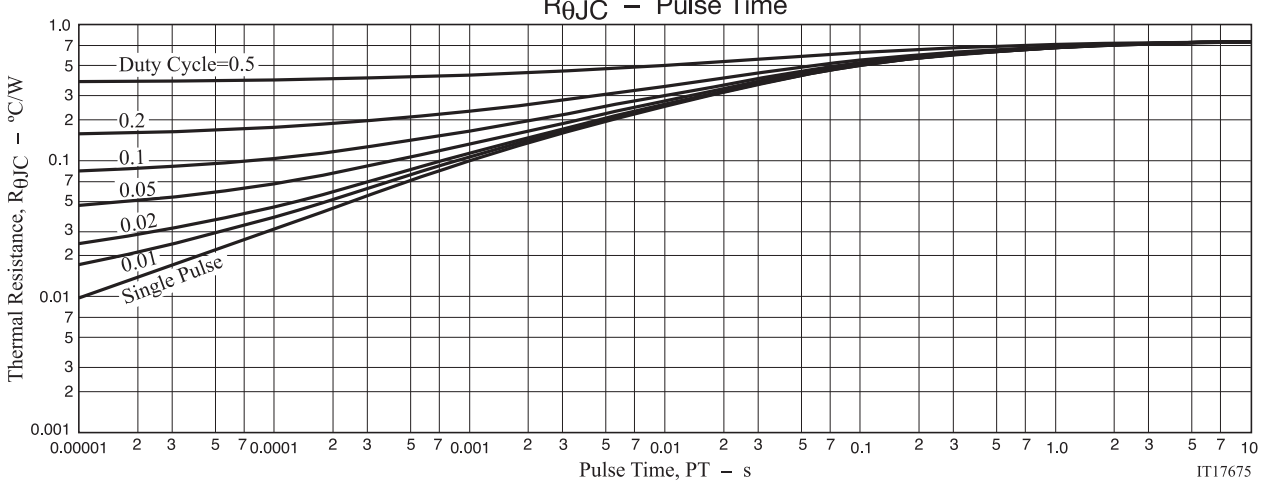
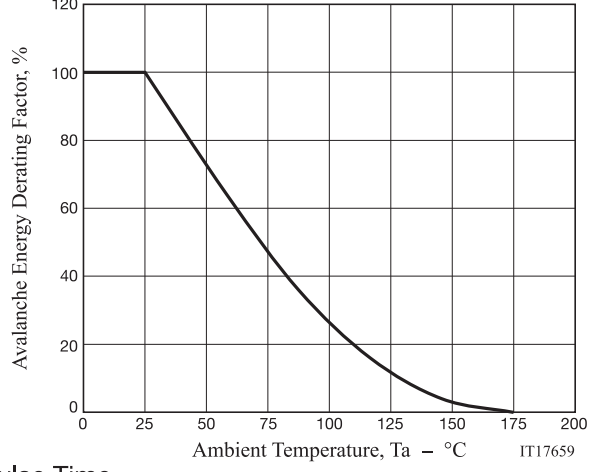
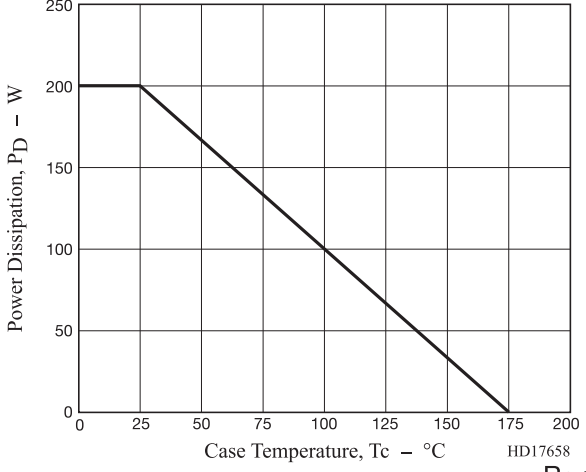
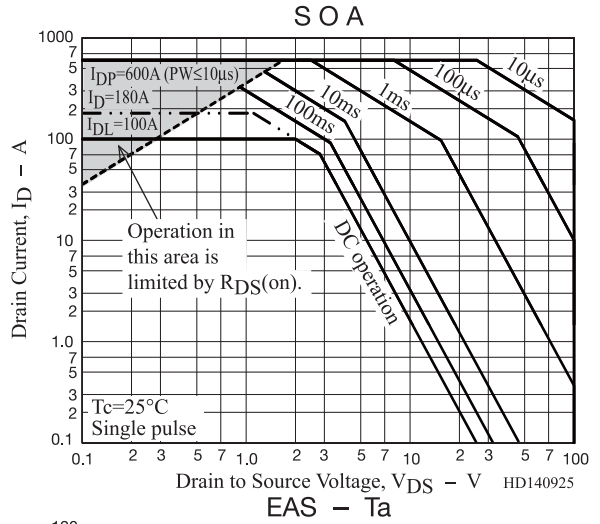
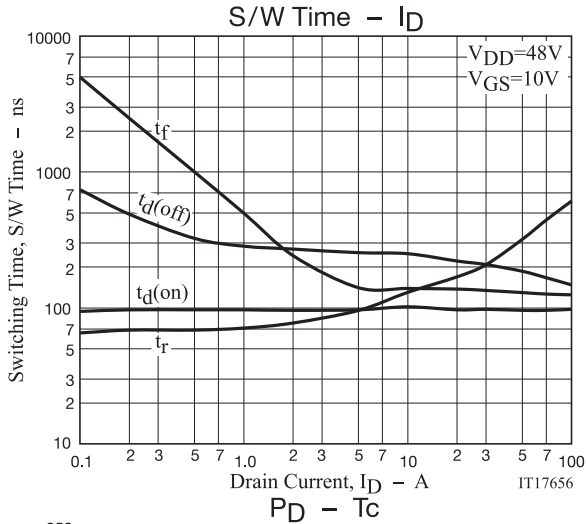
Fig.3 Reverse Recovery Time Test Circuit



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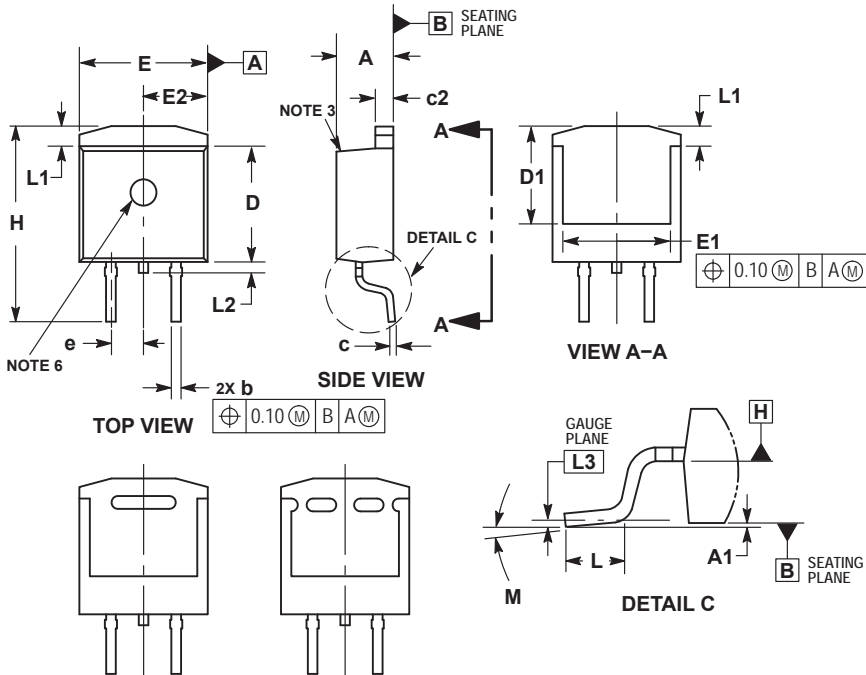


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Package Dimensions

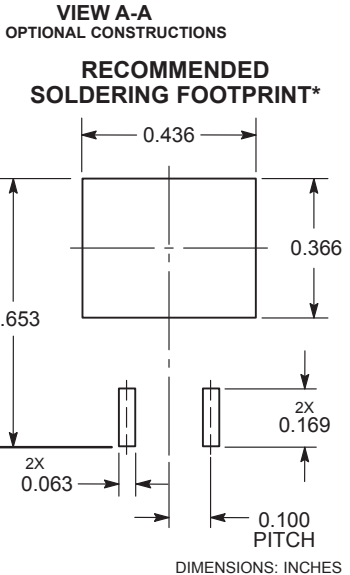
unit : mm

D²PAK-3 (TO-263, 3-LEAD)
CASE 418AJ
ISSUE B

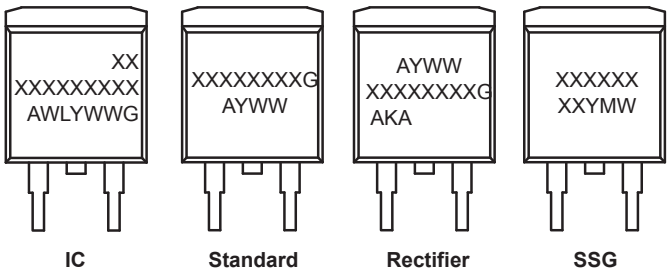


- NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
 2. CONTROLLING DIMENSION: INCHES.
 3. CHAMFER OPTIONAL
 4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH. MOLD FLASH SHALL NOT EXCEED 0.005 PER SIDE. THESE DIMENSIONS ARE MEASURED AT THE OUTERMOST EXTREMES OF THE PLASTIC BODY AT DATUM H.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

DIM	INCHES		MILLIMETERS	
	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°	



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

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

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

NDBA180N10B

ORDERING INFORMATION

Device	Package	Shipping	Note
NDBA180N10BT4H	D ² PAK-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 NDBA180N10B is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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