NDBA070N10B

Advance Information

ON Semiconductor®

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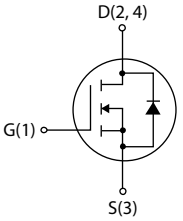
Power MOSFET
100V, 10.5mΩ, 70A, N-Channel

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	10.5 mΩ@15V	70A
	12.4 mΩ@10V	

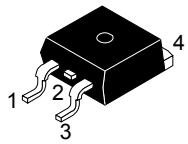
Electrical Connection
N-Channel



Specifications

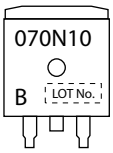
Absolute Maximum Ratings at Ta = 25°C

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	70	A
Drain Current (Pulse) PW≤10μs, duty cycle≤1%	I_{DP}	280	A
Power Dissipation Tc=25°C	P_D	72	W
Junction Temperature	Tj	175	°C
Storage Temperature	Tstg	–55 to +175	°C
Source Current (Body Diode)	I_S	70	A
Avalanche Energy (Single Pulse) *1	E_{AS}	82	mJ
Lead Temperature for Soldering Purposes, 3mm from Case for 10 Seconds	T_L	260	°C

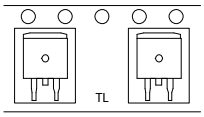


TO-263
CASE 418AJ

Marking



Packing Type:TL



Thermal Resistance Ratings

Parameter	Symbol	Value	Unit
Junction to Case Steady State	$R_{\theta JC}$	2.08	°C/W
Junction to Ambient *2	$R_{\theta JA}$	62.5	

Note : *1 V_{DD}=48V, L=100μH, I_{AV}=30A (Fig.1)

*2 Surface mounted on FR4 board using recommended footprint

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.

This document contains information on a new product. Specifications and information herein are subject to change without notice.

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			1	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=35A		50		S
Static Drain to Source On-State Resistance	$R_{DS}(on)1$	I_D=35A, V_{GS}=15V		8.7	10.5	mΩ
	$R_{DS}(on)2$	I_D=35A, V_{GS}=10V		9.5	12.4	mΩ
Input Capacitance	Ciss	V_{DS}=50V, f=1MHz		2,010		pF
Output Capacitance	Coss			840		pF
Reverse Transfer Capacitance	Crss			21		pF
Turn-ON Delay Time	$t_d(on)$	See Fig.2		30		ns
Rise Time	t_r			180		ns
Turn-OFF Delay Time	$t_d(off)$			55		ns
Fall Time	t_f			40		ns
Total Gate Charge	Qg	V_{DS}=48V, V_{GS}=10V, I_D=70A		26		nC
Gate to Source Charge	Qgs			9		nC
Gate to Drain “Miller” Charge	Qgd			8		nC
Forward Diode Voltage	V_{SD}	I_S=70A, V_{GS}=0V		1.1	1.5	V
Reverse Recovery Time	t_{rr}	See Fig.3		95		ns
Reverse Recovery Charge	Q_{rr}	I_S=70A, V_{GS}=0V, di/dt=100A/μs		240		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

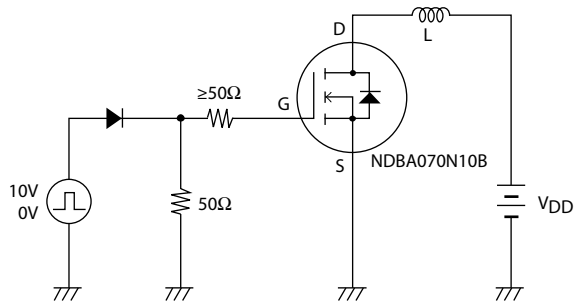


Fig.2 Switching Time Test Circuit

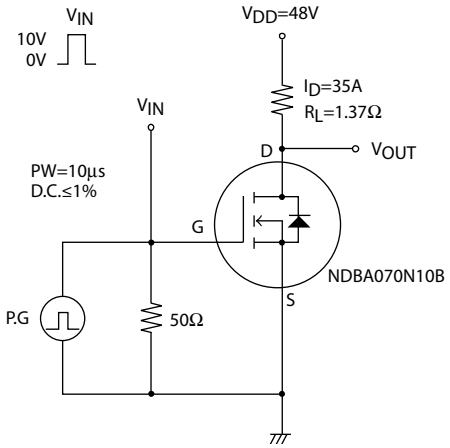
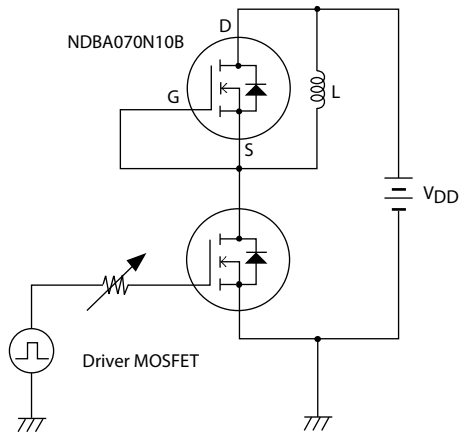
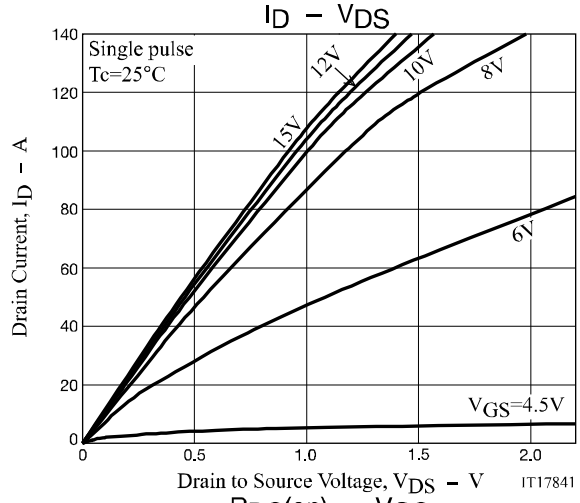
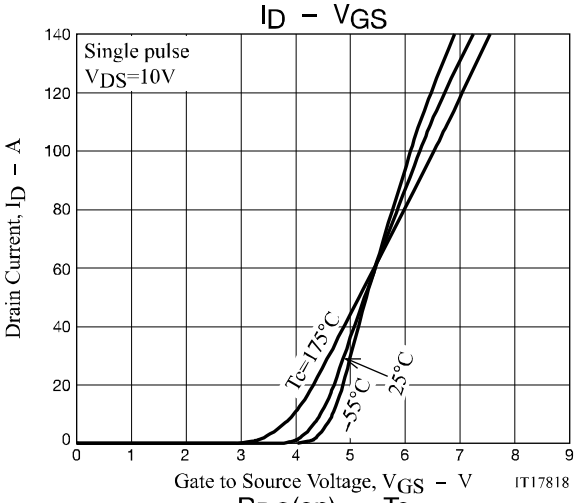
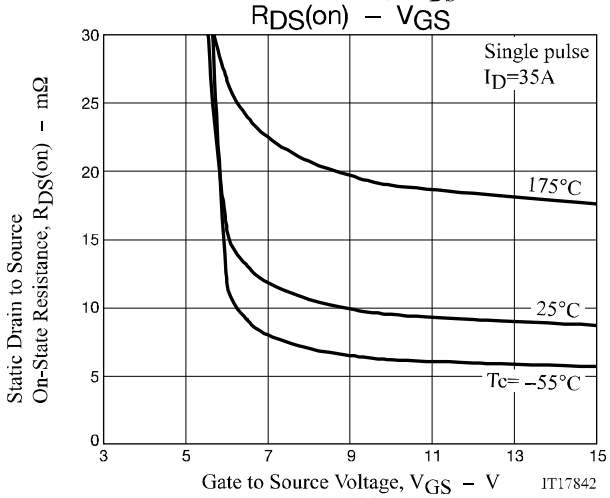


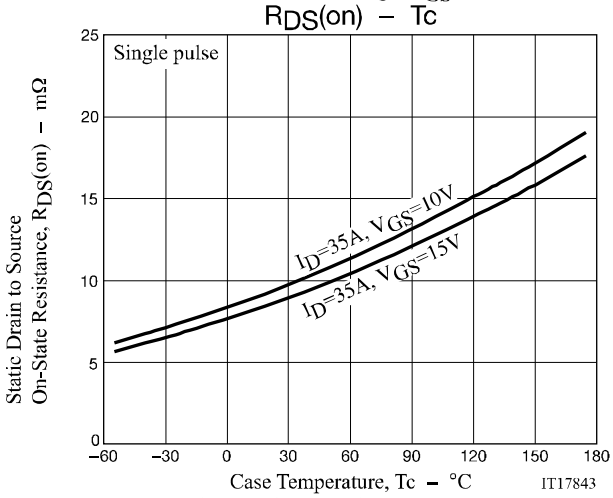
Fig.3 Reverse Recovery Time Test Circuit

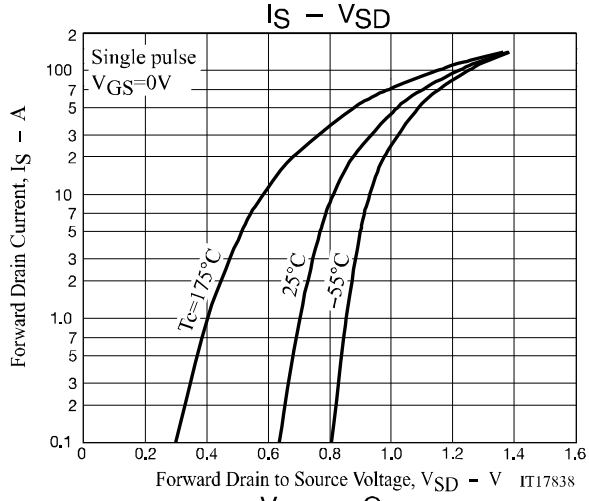


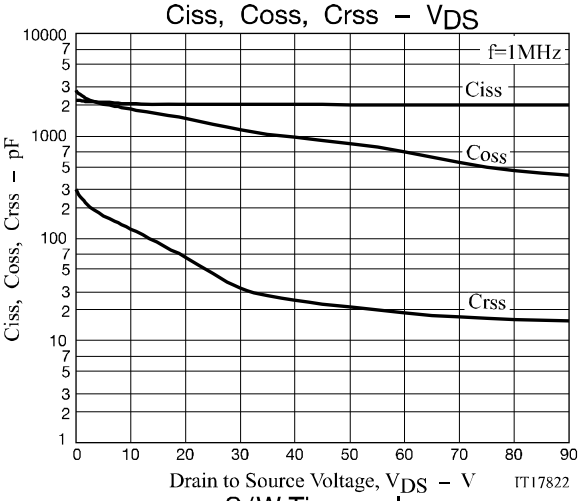

ID – VDS
Single pulse
Tc=25°C
12V
10V
8V
15V
6V
VGS=4.5V
Drain Current, ID – A
Drain to Source Voltage, VDS – V
IT17841

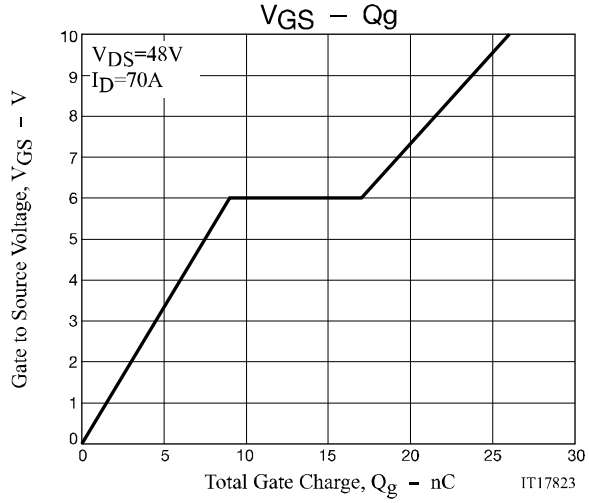

ID – VGS
Single pulse
VDS=10V
Tc=175°C
25°C
–55°C
Drain Current, ID – A
Gate to Source Voltage, VGS – V
IT17818

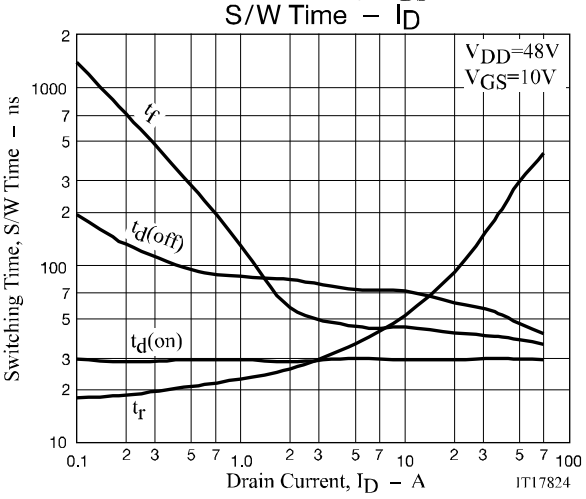

RDS(on) – VGS
Single pulse
ID=35A
175°C
25°C
Tc= –55°C
Static Drain to Source
On-State Resistance, RDS(on) – mΩ
Gate to Source Voltage, VGS – V
IT17842


RDS(on) – Tc
Single pulse
ID=35A, VGS=10V
ID=35A, VGS=15V
Static Drain to Source
On-State Resistance, RDS(on) – mΩ
Case Temperature, Tc – °C
IT17843

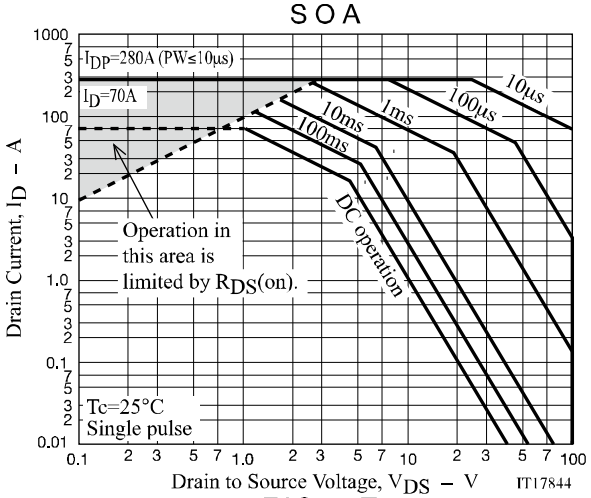

IS – VSD
Single pulse
VGS=0V
Tc=175°C
25°C
–55°C
Forward Drain Current, IS – A
Forward Drain to Source Voltage, VSD – V
IT17838


Ciss, Coss, Crss – VDS
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain to Source Voltage, VDS – V
IT17822

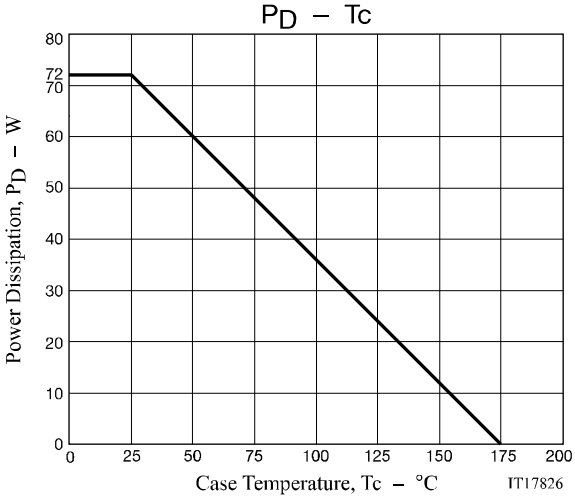

VGS – Qg
VDS=48V
ID=70A
Gate to Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT17823


S/W Time – ID
VDD=48V
VGS=10V
tf
td(off)
td(on)
tr
Switching Time, S/W Time – ns
Drain Current, ID – A
IT17824

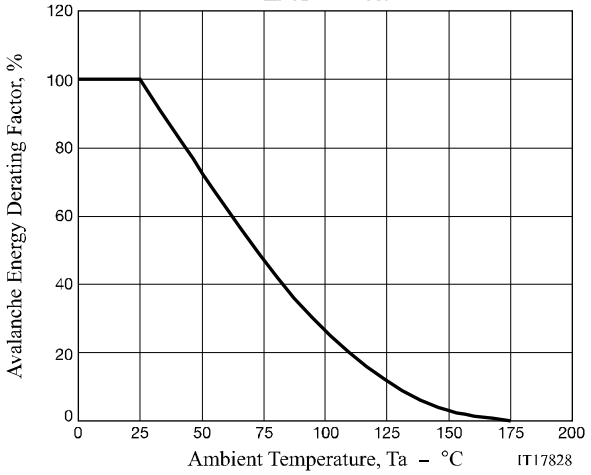
S O A



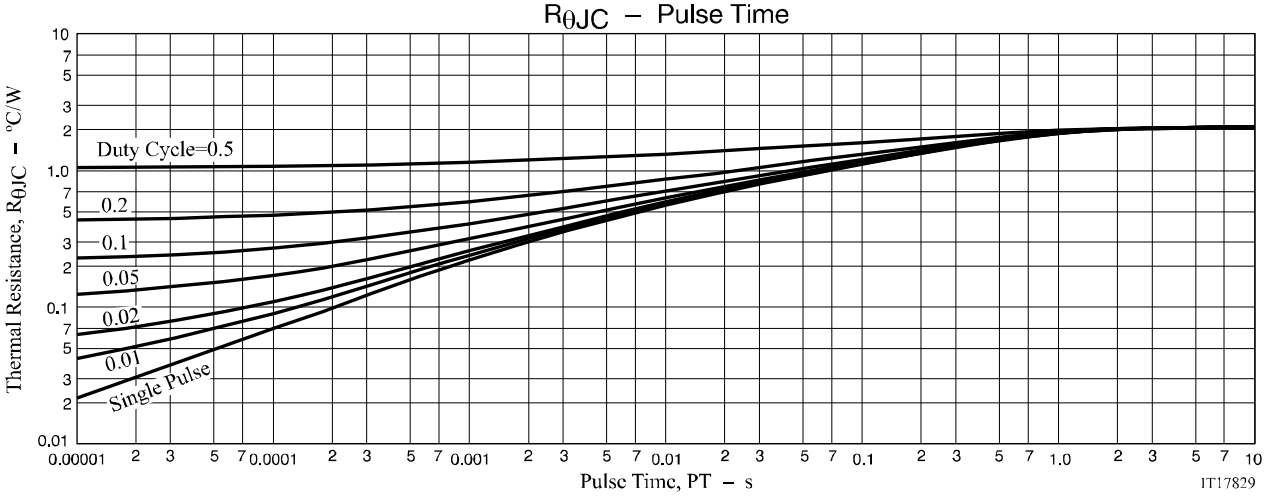
PD – Tc



EAS – Ta



RθJC – Pulse Time

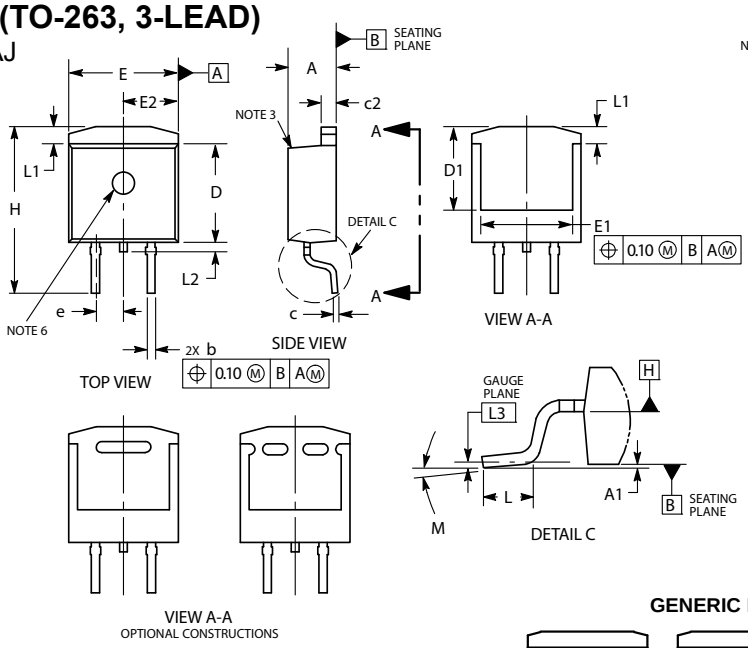


Package Dimensions

NDBA070N10BT4H

D²PAK-3 (TO-263, 3-LEAD)

CASE 418AJ
ISSUE B

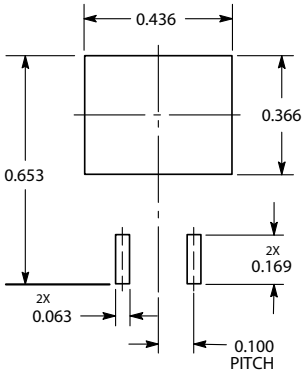


NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: INCHES.
3. CHAMFER OPTIONAL
4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH. MOLD FLASH SHALL NOT EXCEED 0.005 PER SIDE. THESE DIMENSIONS ARE MEASURED AT THE OUTERMOST EXTREMES OF THE PLASTIC BODY AT DATUM H.
5. THERMAL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

VIEW A-A
OPTIONAL CONSTRUCTIONS

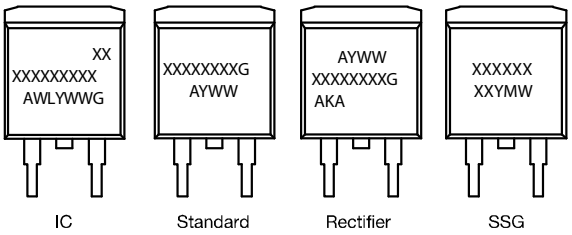
RECOMMENDED SOLDERING FOOTPRINT*



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
NDBA070N10BT4H	TO-263	800 pcs. / reel	Pb-Free and Halogen Free

Note on usage : Since the NDBA070N10B is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.