

# NDPL180N10B



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## Advance Information

## Power MOSFET 100V, 3.0mΩ, 180A, N-Channel

### Features

- Ultra Low On-Resistance
- Low Gate Charge
- High Speed Switching
- 100% Avalanche Test
- Pb-Free and RoHS Compliance

### Specifications

#### Absolute Maximum Ratings at $T_a = 25^\circ\text{C}$

Parameter	Symbol	Value	Unit
Drain to Source Voltage	$V_{DSS}$	100	V
Gate to Source Voltage	$V_{GSS}$	$\pm 20$	V
Drain Current (DC)	$I_D$	180	A
Drain Current (DC) Limited by Package	$I_{DL}$	100	A
Drain Current (Pulse) $PW \leq 10\mu\text{s}$ , duty cycle $\leq 1\%$	$I_{DP}$	600	A
Power Dissipation $T_c = 25^\circ\text{C}$	$P_D$	2.1 200	W $^\circ\text{C}$
Junction Temperature	$T_J$	175	$^\circ\text{C}$
Storage Temperature	$T_{stg}$	-55 to +175	$^\circ\text{C}$
Source Current (Body Diode)	$I_S$	100	A
Avalanche Energy (Single Pulse) *1	$E_{AS}$	451	mJ
Lead Temperature for Soldering Purposes, 3mm from Case for 10 Seconds	$T_L$	260	$^\circ\text{C}$

### Thermal Resistance Ratings

Parameter	Symbol	Value	Unit
Junction to Case Steady State	$R_{\theta JC}$	0.75	$^\circ\text{C}/\text{W}$
Junction to Ambient *2	$R_{\theta JA}$	71.4	

Note: \*1  $V_{DD} = 48\text{V}$ ,  $L = 100\mu\text{H}$ ,  $I_{AV} = 70\text{A}$  (Fig.1)

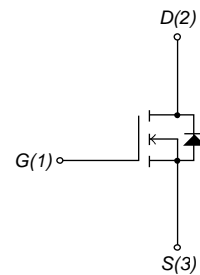
\*2 Insertion mounted

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.

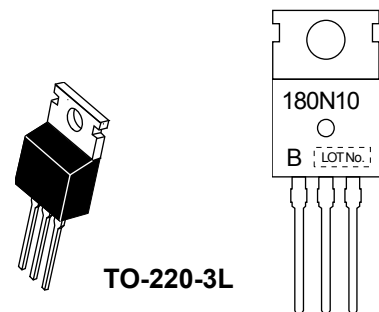
$V_{DSS}$	$R_{DS(on)}$ Max	$I_D$ Max
100V	3.0 mΩ@15V	180A
	3.5 mΩ@10V	

### Electrical Connection

#### N-Channel



### Marking



TO-220-3L

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.

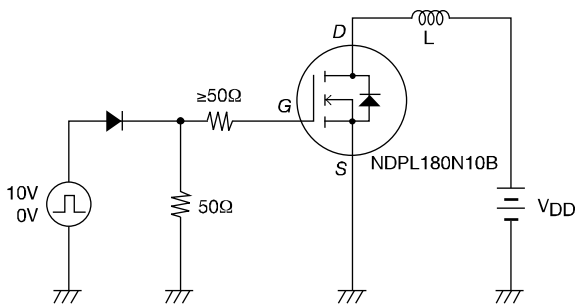
# NDPL180N10B

## Electrical Characteristics at $T_a = 25^\circ\text{C}$

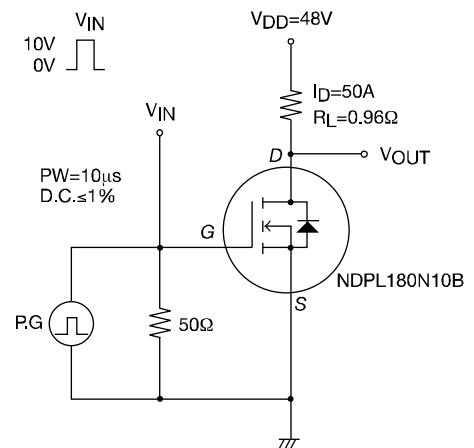
Parameter	Symbol	Conditions	Value			Unit
			min	typ	max	
Drain to Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D=10\text{mA}, V_{GS}=0\text{V}$	100			V
Zero-Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=100\text{V}, V_{GS}=0\text{V}$			10	$\mu\text{A}$
Gate to Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 20\text{V}, V_{DS}=0\text{V}$			$\pm 200$	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=10\text{V}, I_D=1\text{mA}$	2		4	V
Forward Transconductance	$g_{FS}$	$V_{DS}=10\text{V}, I_D=50\text{A}$		150		S
Static Drain to Source On-State Resistance	$R_{DS(on)1}$	$I_D=50\text{A}, V_{GS}=15\text{V}$		2.5	3.0	$\text{m}\Omega$
	$R_{DS(on)2}$	$I_D=50\text{A}, V_{GS}=10\text{V}$		2.7	3.5	$\text{m}\Omega$
Input Capacitance	$C_{iss}$	$V_{DS}=50\text{V}, f=1\text{MHz}$		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		ns
Rise Time	$t_r$			320		ns
Turn-OFF Delay Time	$t_{d(off)}$			185		ns
Fall Time	$t_f$			130		ns
Total Gate Charge	$Q_g$				95	
Gate to Source Charge	$Q_{gs}$	$V_{DS}=48\text{V}, V_{GS}=10\text{V}, I_D=100\text{A}$		31		nC
Gate to Drain "Miller" Charge	$Q_{gd}$			26		nC
Forward Diode Voltage	$V_{SD}$		$I_S=100\text{A}, V_{GS}=0\text{V}$		0.9	1.5
Reverse Recovery Time	$t_{rr}$	See Fig.3		150		ns
Reverse Recovery Charge	$Q_{rr}$	$I_S=100\text{A}, V_{GS}=0\text{V}, di/dt=100\text{A}/\mu\text{s}$		580		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.

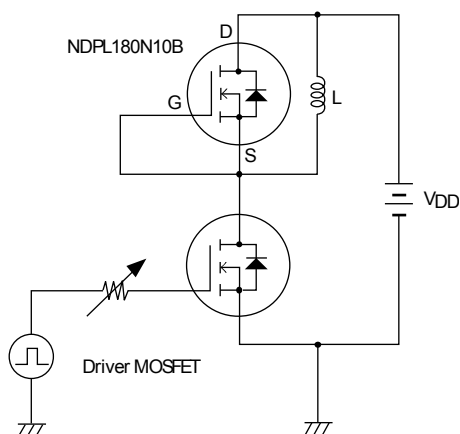
**Fig.1 Unclamped Inductive Switching Test Circuit**



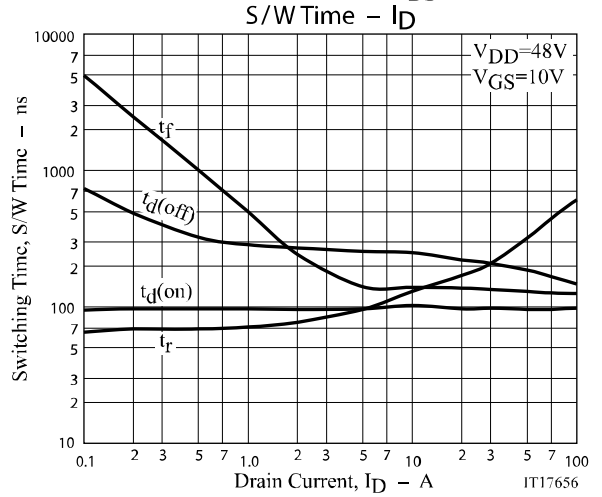
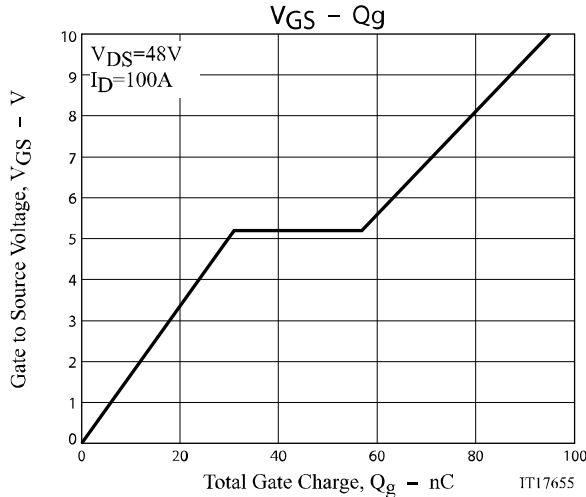
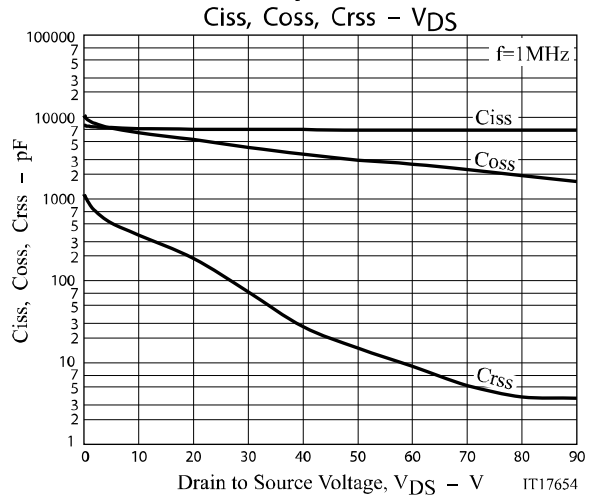
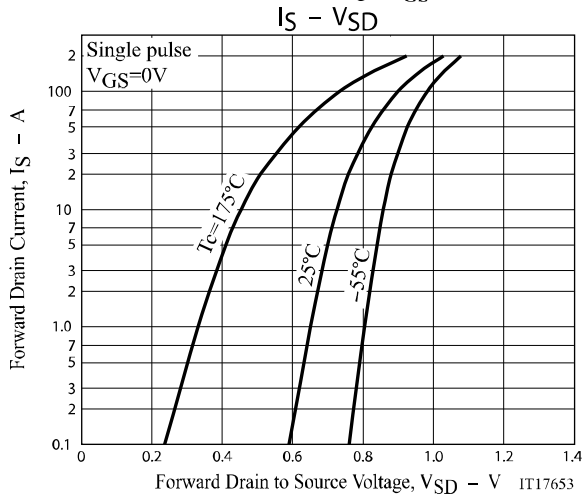
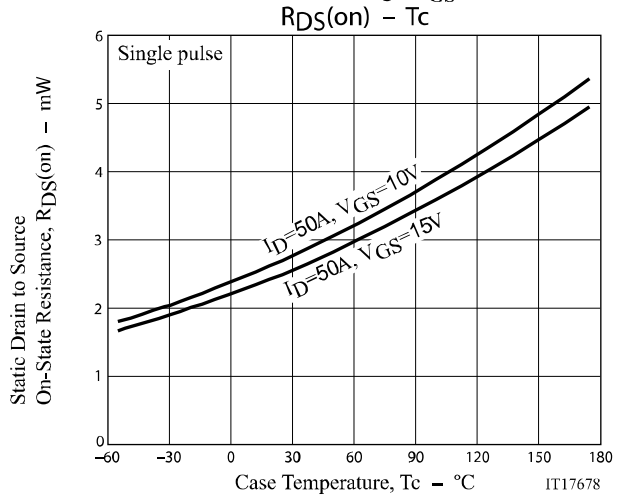
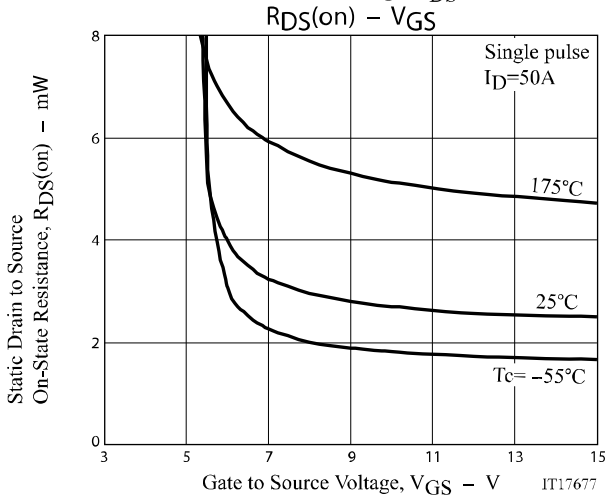
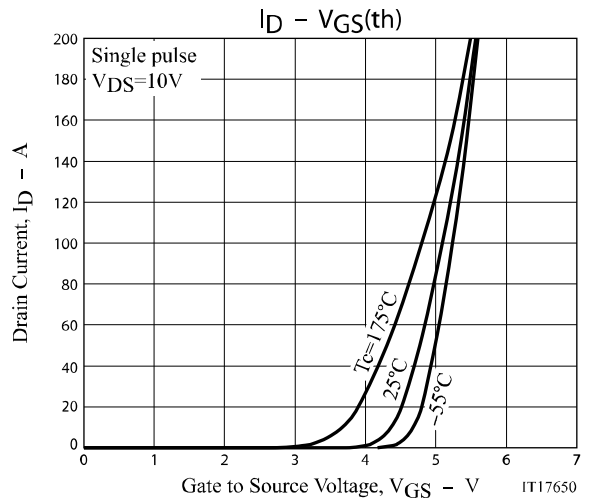
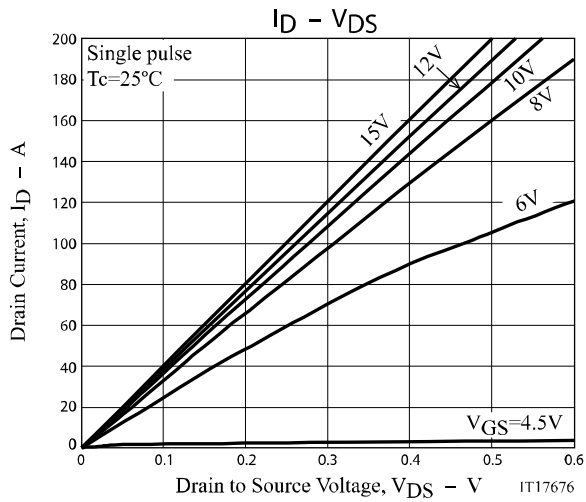
**Fig.2 Switching Time Test Circuit**



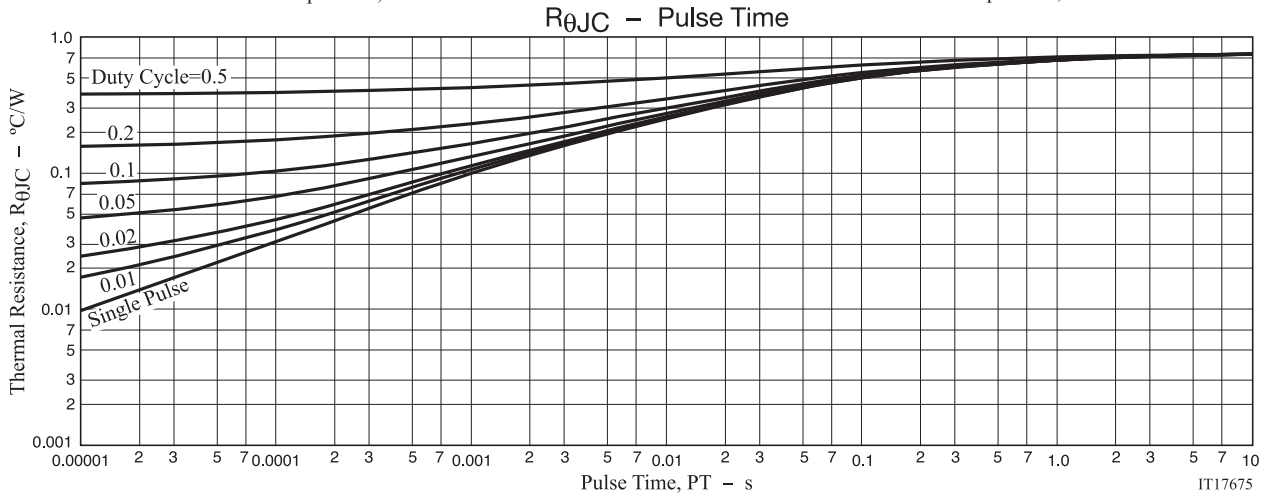
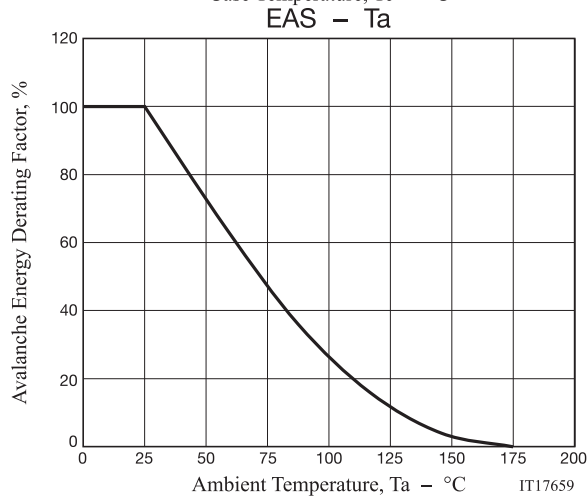
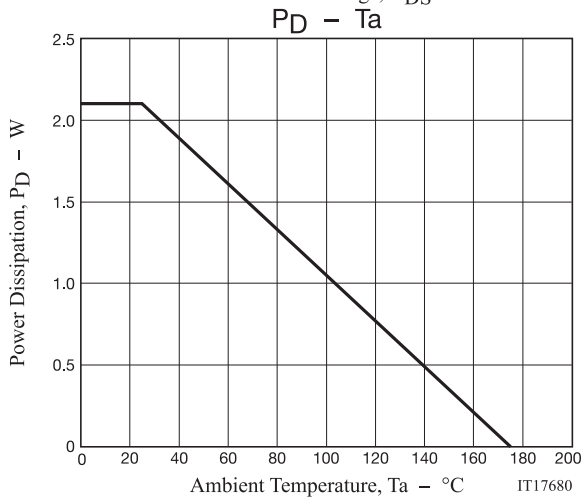
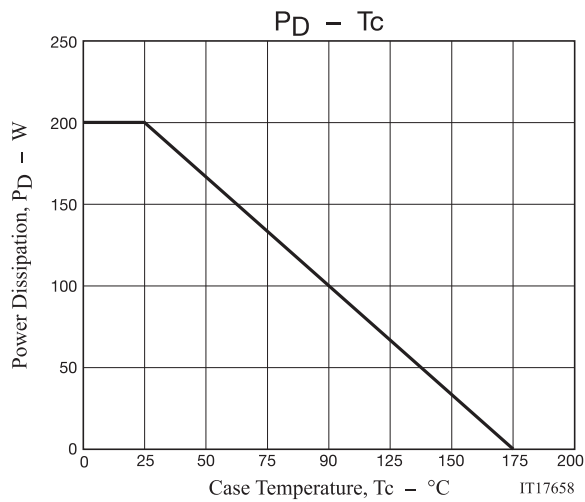
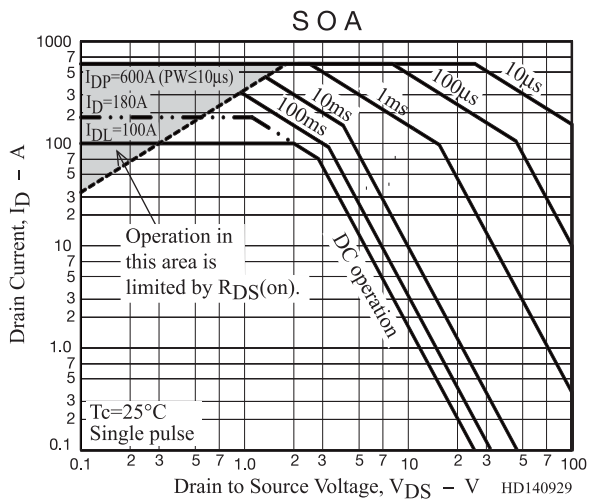
**Fig.3 Reverse Recovery Time Test Circuit**



# NDPL180N10B



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# NDPL180N10B

## Package Dimensions

NDPL180N10BG

### TO-220, 3-Lead / TO-220-3L

CASE 221AU

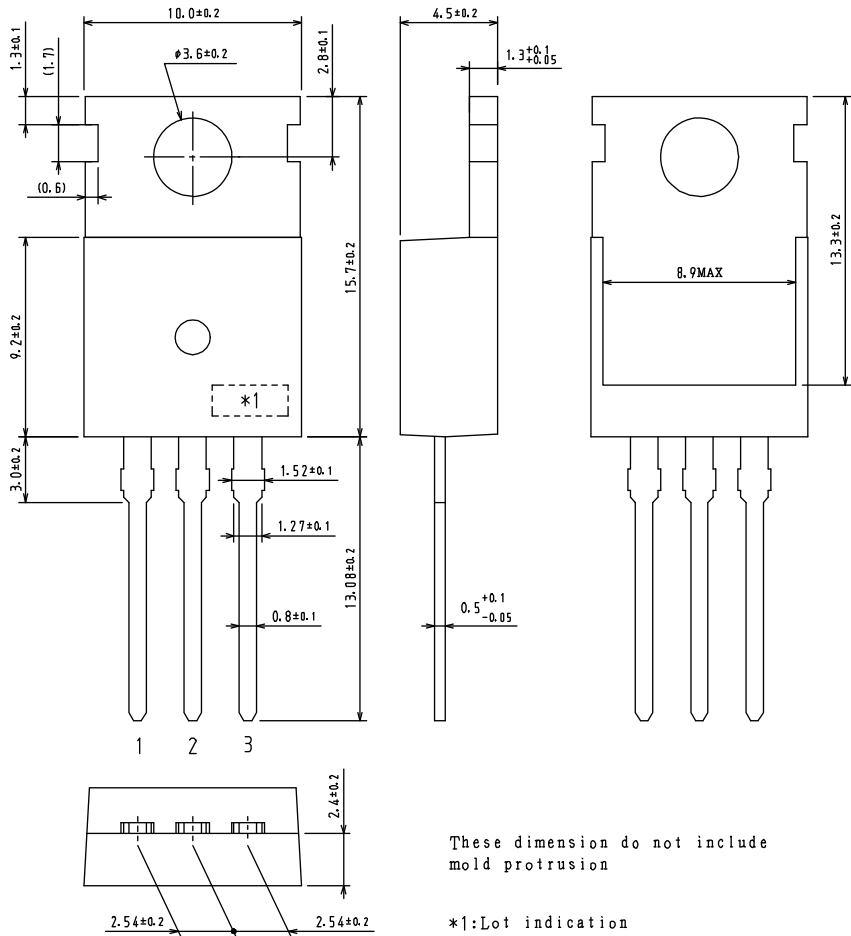
ISSUE O

unit : mm

1: Gate

2: Drain

3: Source



## ORDERING INFORMATION

Device	Package	Shipping	Note
NDPL180N10BG	TO-220-3L SC-46 TO-220AB	50 pcs. / tube	Pb-Free

Note on usage : Since the NDPL180N10B is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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