# NDPL180N10B

# ON Semiconductor®

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# 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

VDSS	R <sub>DS</sub> (on) Max	ID Max
400)/	3.0mΩ@ 15V	4004
100V	3.5mΩ@ 10V	180A

# **Specifications**

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

Parameter	Symbol	Value	Unit
Drain to Source Voltage	V <sub>DSS</sub>	100	V
Gate to Source Voltage	V <sub>GSS</sub>	±20	V
Drain Current (DC)	ID	180	Α
Drain Current (DC) Limited by Package	I <sub>DL</sub>	100	Α
Drain Current (Pulse) PW≤10μs, duty cycle≤1%	I <sub>DP</sub>	600	А
Power Dissipation	on		W
Tc=25°C	PD	200	VV
Junction Temperature	Tj	175	°C
Storage Temperature	Tstg	-55 to +175	°C
Source Current (Body Diode)	Is	100	Α
Avalanche Energy (Single Pulse) *1	EAS	451	mJ
Lead Temperature for Soldering Purposes, 3mm from Case for 10 Seconds	TL	260	°C

# **Thermal Resistance Ratings**

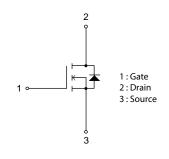
Parameter	Symbol	Value	Unit	
Junction to Case Steady State	tate R <sub>0</sub> JC 0.75			
Junction to Ambient *2	$R_{\theta JA}$	71.4	°C/W	

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

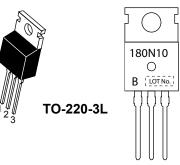
\*2 Insertion mounted

## **Electrical Connection**

#### **N-Channel**



# Marking



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.

# NDPL180N10B

#### **Electrical Characteristics** at Ta = 25°C

Parameter	Complete and	Conditions	Value			Unit
Parameter Symbol Conditions		Conditions	min typ		max	
Drain to Source Breakdown Voltage	V(BR)DSS	I <sub>D</sub> =10mA, V <sub>GS</sub> =0V	100			V
Zero-Gate Voltage Drain Current	IDSS	V <sub>DS</sub> =100V, V <sub>GS</sub> =0V			10	μА
Gate to Source Leakage Current	IGSS	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V			±200	nA
Gate Threshold Voltage	V <sub>GS</sub> (th)	V <sub>DS</sub> =10V, I <sub>D</sub> =1mA	2		4	V
Forward Transconductance	9FS	V <sub>DS</sub> =10V, I <sub>D</sub> =50A		150		S
Static Drain to Source On-State Resistance	R <sub>DS</sub> (on)1	I <sub>D</sub> =50A, V <sub>GS</sub> =15V		2.5	3.0	mΩ
	R <sub>DS</sub> (on)2	I <sub>D</sub> =50A, V <sub>GS</sub> =10V		2.7	3.5	mΩ
Input Capacitance	Ciss			6,950		pF
Output Capacitance	Coss	V <sub>DS</sub> =50V, f=1MHz		3,000		pF
Reverse Transfer Capacitance	Crss			15		pF
Turn-ON Delay Time	t <sub>d</sub> (on)			95		ns
Rise Time	t <sub>r</sub>	050		320		ns
Turn-OFF Delay Time	t <sub>d</sub> (off)	See Fig.2		185		ns
Fall Time	tf			130		ns
Total Gate Charge	Qg			95		nC
Gate to Source Charge	Qgs	V <sub>DS</sub> =48V, V <sub>GS</sub> =10V, I <sub>D</sub> =100A		31		nC
Gate to Drain "Miller" Charge	Qgd			26		nC
Forward Diode Voltage	V <sub>SD</sub>	I <sub>S</sub> =100A, V <sub>GS</sub> =0V		0.9	1.5	V
Reverse Recovery Time	t <sub>rr</sub>	See Fig.3		150		ns
Reverse Recovery Charge	Q <sub>rr</sub>	I <sub>S</sub> =100A, V <sub>GS</sub> =0V, V <sub>DD</sub> =50V, di/dt=100A/μs		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

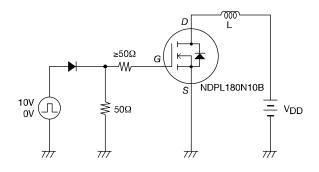


Fig.2 Switching Time Test Circuit

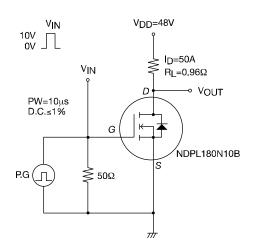
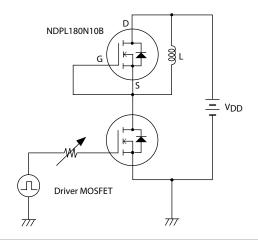
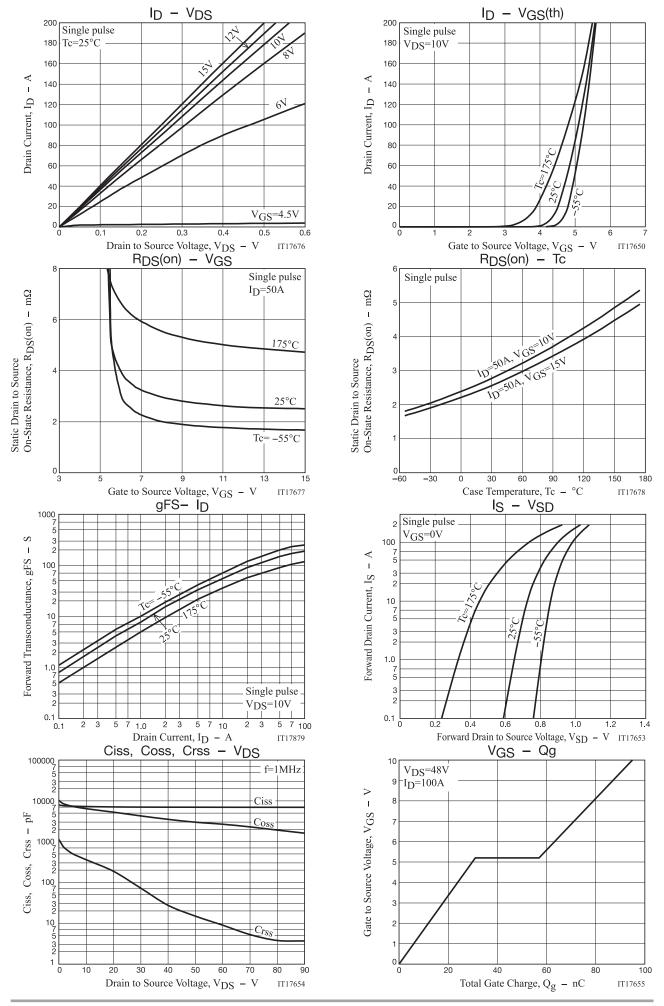
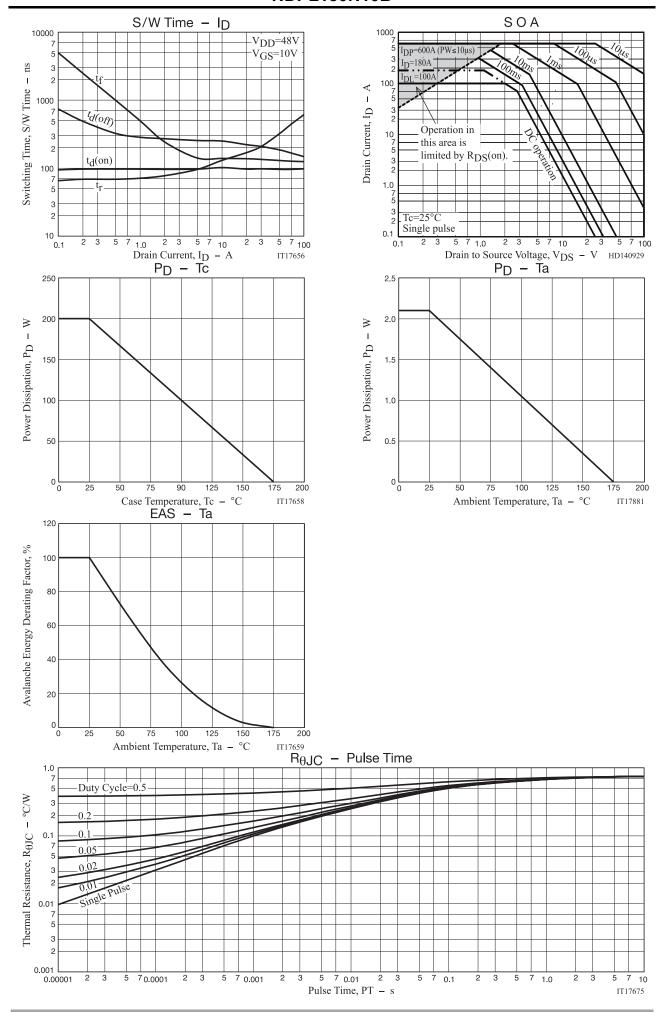


Fig.3 Reverse Recovery Time Test Circuit







#### **Package Dimensions**

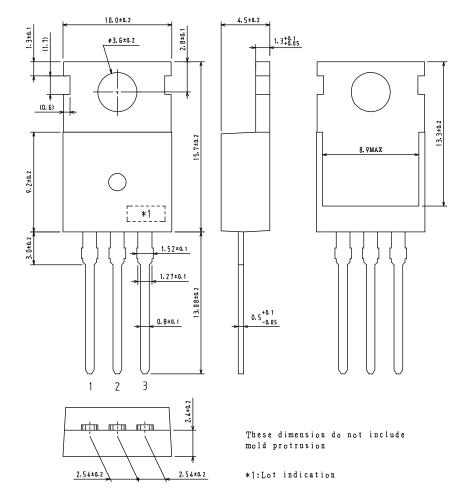
NDPL180N10BG

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