

NDPL180N10B

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



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Features

- Ultra Low On-Resistance
- Low Gate Charge
- High Speed Switching
- 100% Avalanche Test
- Pb-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 _{GS}	±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	2.1 200	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

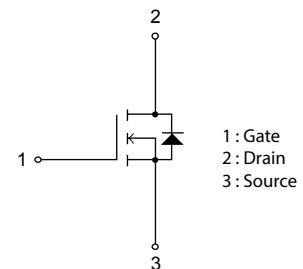
Parameter	Symbol	Value	Unit
Junction to Case Steady State	R _{θJC}	0.75	°C/W
Junction to Ambient (Note 3)	R _{θJA}	71.4	

Note 3 : Insertion mounted

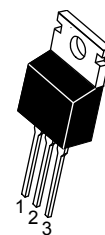
V _{DSS}	R _{DS(on)} Max	I _D Max
100V	3.0mΩ@ 15V	180A
	3.5mΩ@ 10V	

Electrical Connection

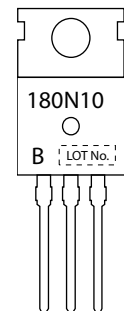
N-Channel



Marking



TO-220-3L



ORDERING INFORMATION

See detailed ordering and shipping information on page 5 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	g_{FS}	$V_{DS}=10V, I_D=50A$		150		S
Static Drain to Source On-State Resistance	$R_{DS(on)1}$	$I_D=50A, V_{GS}=15V$		2.5	3.0	$m\Omega$
	$R_{DS(on)2}$	$I_D=50A, V_{GS}=10V$		2.7	3.5	$m\Omega$
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		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	$V_{DS}=48V, V_{GS}=10V, I_D=100A$		95		nC
Gate to Source Charge	Q_{gs}			31		nC
Gate to Drain "Miller" Charge	Q_{gd}			26		nC
Forward Diode Voltage	V_{SD}	$I_S=100A, V_{GS}=0V$		0.9	1.5	V
Reverse Recovery Time	t_{rr}	See Fig.3		150		ns
Reverse Recovery Charge	Q_{rr}	$I_S=100A, V_{GS}=0V, V_{DD}=50V, di/dt=100A/\mu s$		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

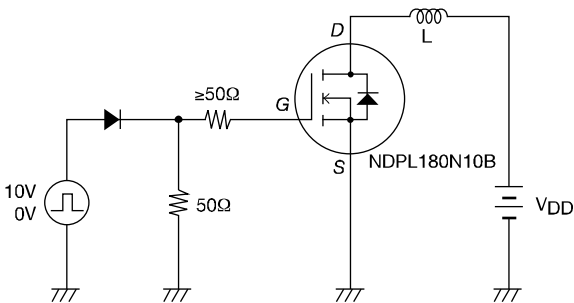


Fig.2 Switching Time Test Circuit

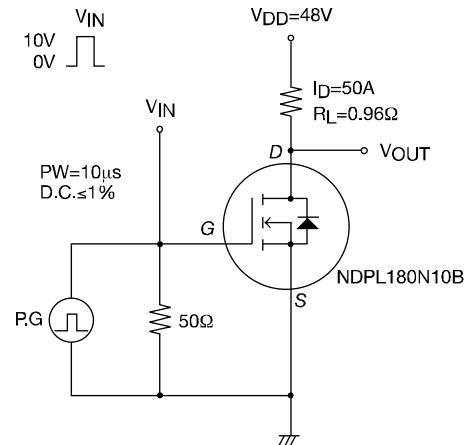
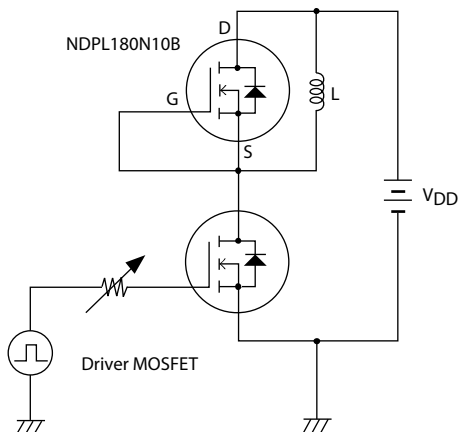
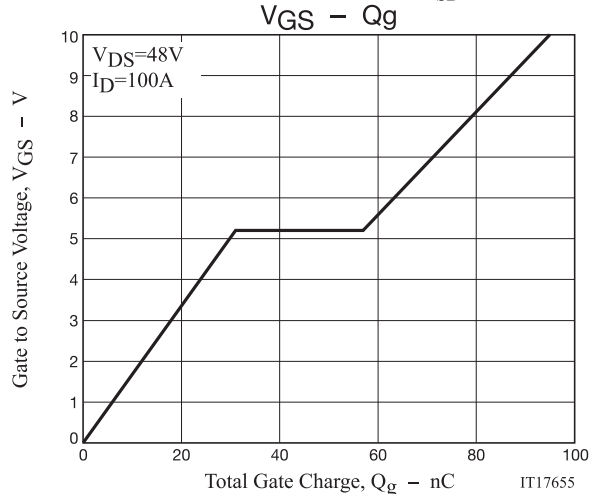
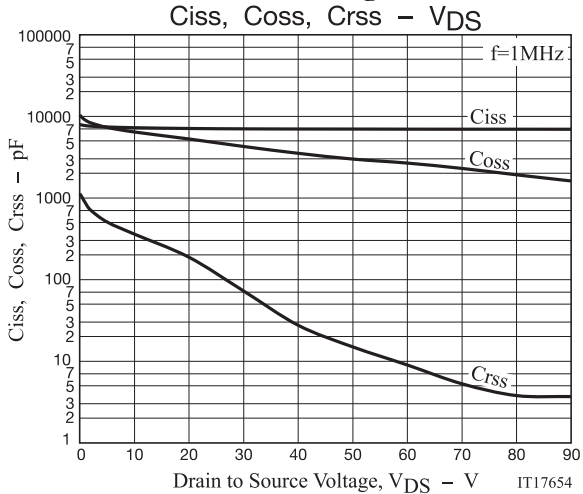
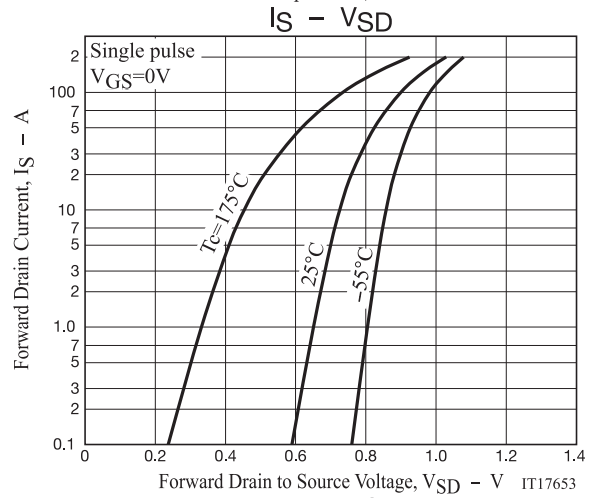
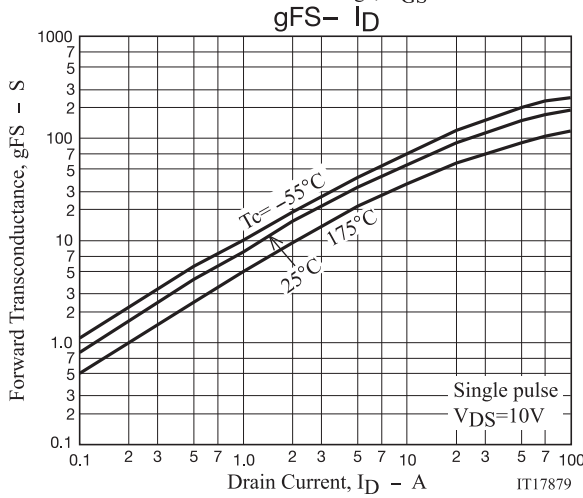
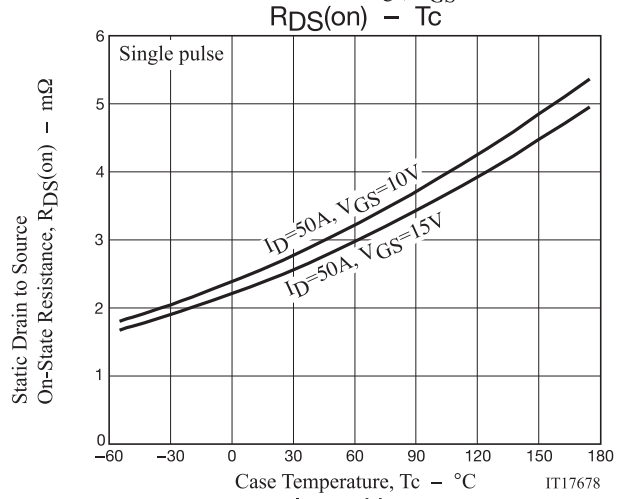
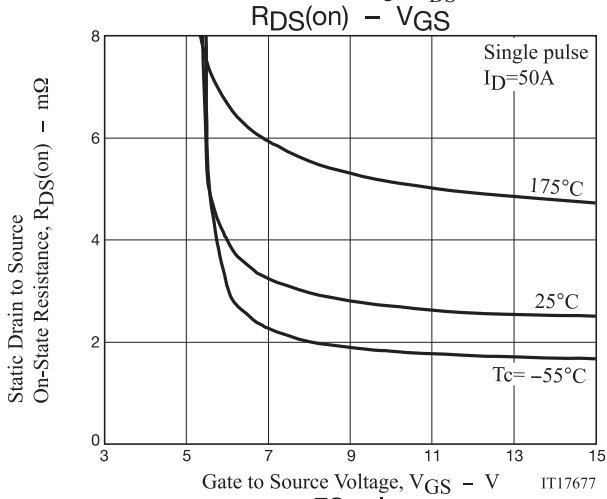
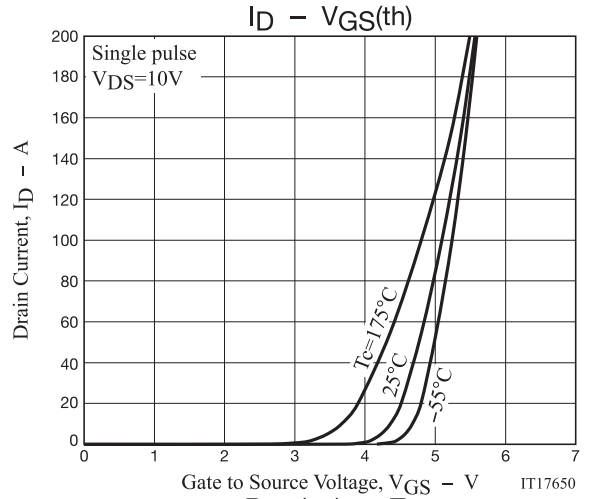
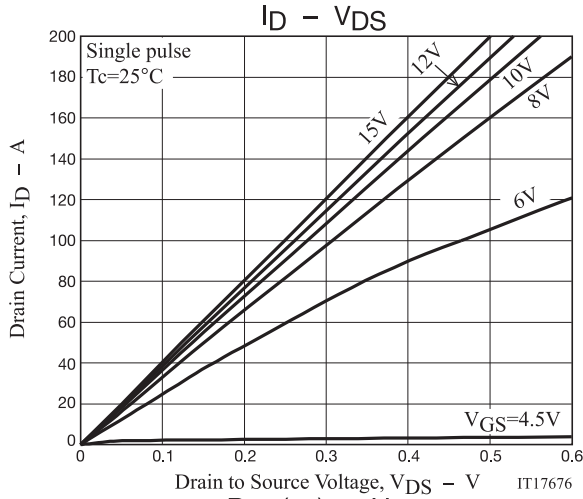


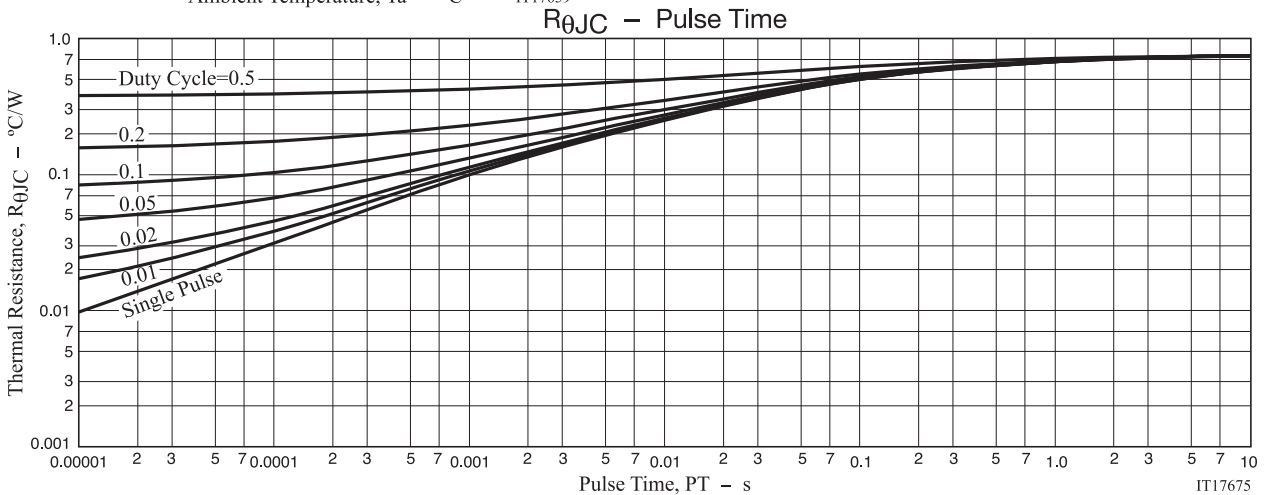
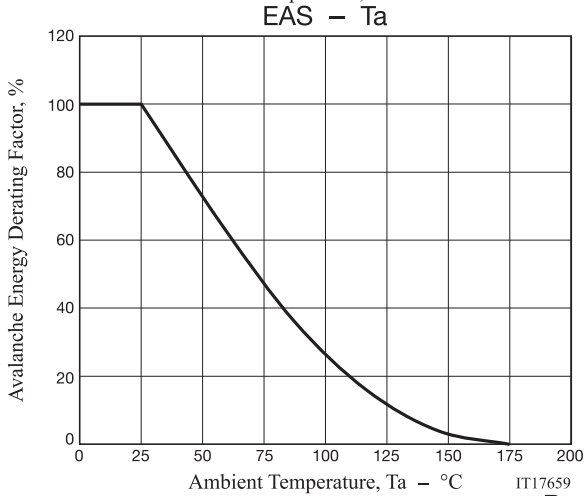
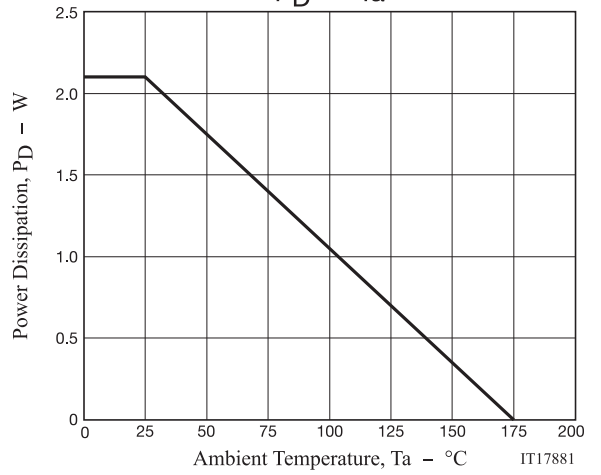
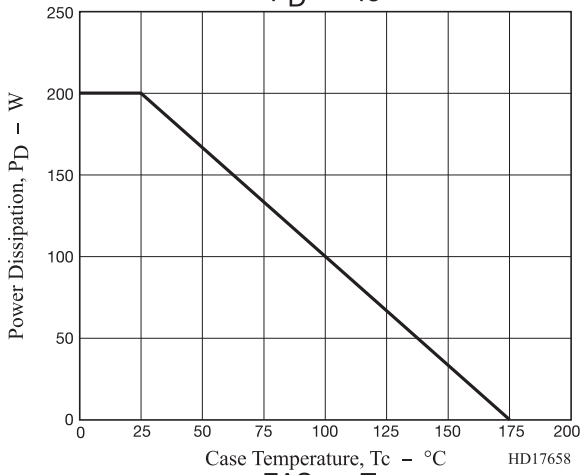
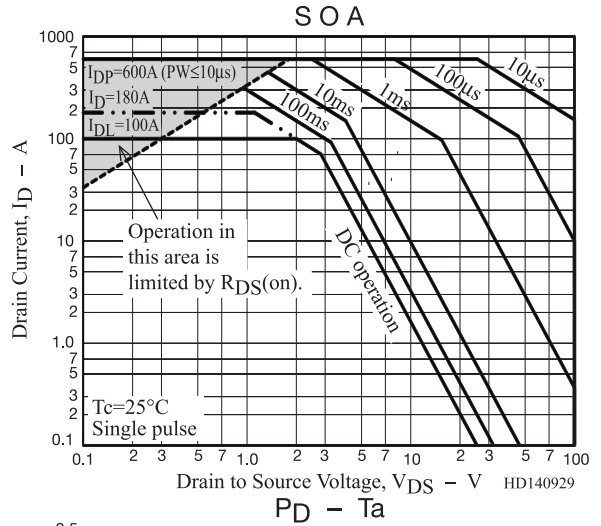
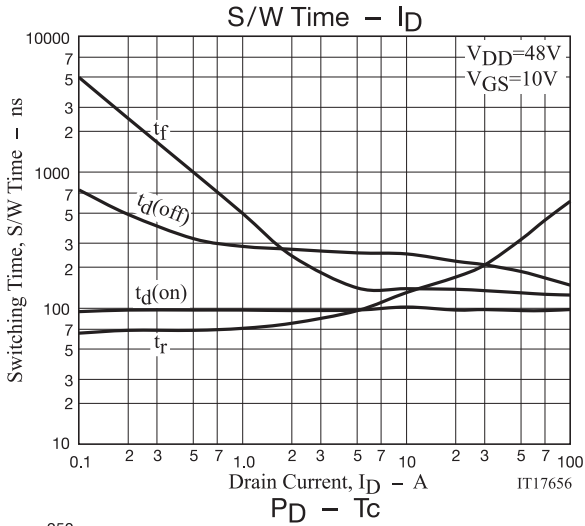
Fig.3 Reverse Recovery Time Test Circuit



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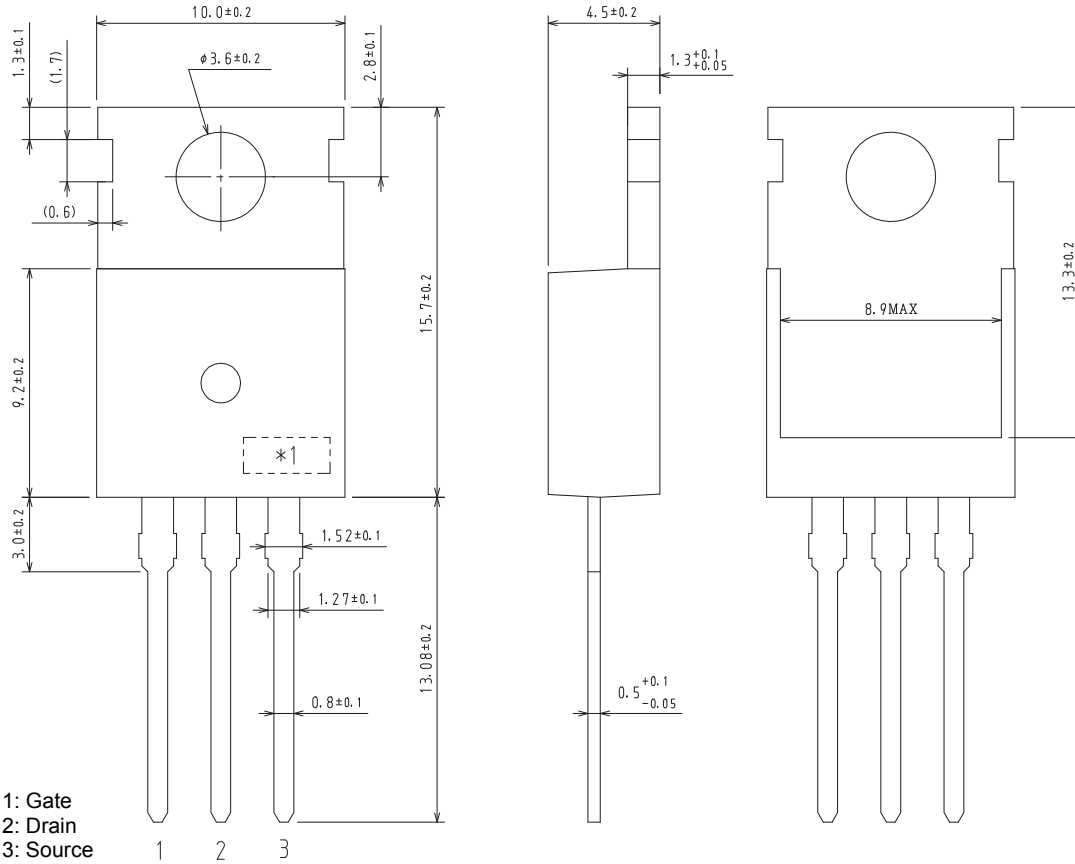


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Package Dimensions

unit : mm

TO-220, 3-Lead / TO-220-3L
CASE 221AU
ISSUE 0



1: Gate
2: Drain
3: Source

These dimension do not include mold protrusion

*1: Lot indication

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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