

# NDPL070N10B

## Power MOSFET 100V, 10.8mΩ, 70A, N-Channel

This N-Channel Power MOSFET is produced using ON Semiconductor's trench technology, which is specifically designed to minimize gate charge and ultra low on resistance. This device is suitable for applications with low gate charge driving or ultra low on resistance requirements.

### Features

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

### Applications

- Battery Protection
- Motor Drive
- Primary Side Switch
- Secondary Side Synchronous Rectification

### SPECIFICATION

#### ABSOLUTE MAXIMUM RATINGS at $T_a = 25^\circ\text{C}$ (Note 1)

Parameter	Symbol	Value	Unit
Drain to Source Voltage	$V_{DSS}$	100	V
Gate to Source Voltage	$V_{GSS}$	$\pm 20$	V
Drain Current (DC)	$I_D$	70	A
Drain Current (Pulse) $PW \leq 10\mu\text{s}$ , duty cycle $\leq 1\%$	$I_{DP}$	280	A
Power Dissipation $T_c = 25^\circ\text{C}$	$P_D$	2.1 72	W
Junction Temperature	$T_j$	175	$^\circ\text{C}$
Storage Temperature	$T_{stg}$	-55 to +175	$^\circ\text{C}$
Source Current (Body Diode)	$I_S$	70	A
Avalanche Energy (Single Pulse) (Note 2)	$E_{AS}$	82	mJ
Lead Temperature for Soldering Purposes, 3mm from Case for 10 Seconds	$T_L$	260	$^\circ\text{C}$

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 :  $V_{DD} = 48\text{V}$ ,  $L = 100\mu\text{H}$ ,  $I_{AV} = 30\text{A}$  (Fig.1)

### Thermal Resistance Ratings

Parameter	Symbol	Value	Unit
Junction to Case Steady State	$R_{\theta JC}$	2.08	$^\circ\text{C}/\text{W}$
Junction to Ambient (Note 3)	$R_{\theta JA}$	71.4	$^\circ\text{C}/\text{W}$

Note 3 : Insertion mounted

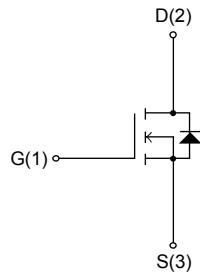


ON Semiconductor®

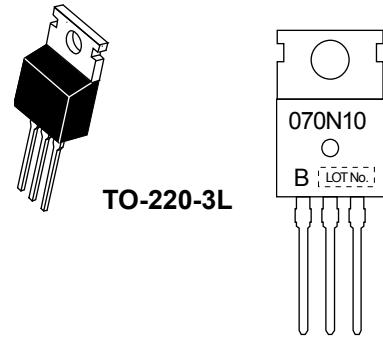
www.onsemi.com

$V_{DSS}$	$R_{DS(on)}$ Max	$I_D$ Max
100V	10.8 mΩ@15V	
	12.8 mΩ@10V	70A

### ELECTRICAL CONNECTION N-Channel



### MARKING



TO-220-3L

### ORDERING INFORMATION

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

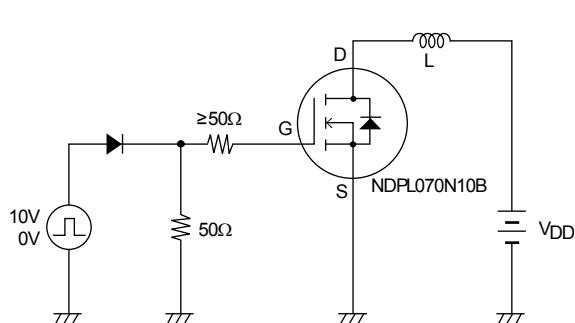
# NDPL070N10B

## ELECTRICAL CHARACTERISTICS at $T_a = 25^\circ\text{C}$ (Note 4)

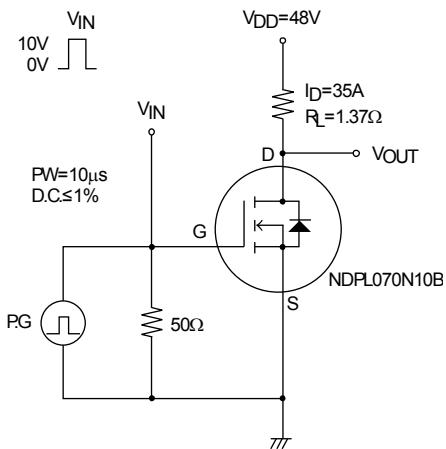
Parameter	Symbol	Conditions	Value			Unit
			min	typ	max	
Drain to Source Breakdown Voltage	$V(\text{BR})_{\text{DSS}}$	$I_D=10\text{mA}, V_{GS}=0\text{V}$	100			V
Zero-Gate Voltage Drain Current	$I_{\text{DSS}}$	$V_{DS}=100\text{V}, V_{GS}=0\text{V}$			10	$\mu\text{A}$
Gate to Source Leakage Current	$I_{\text{GSS}}$	$V_{GS}=\pm 20\text{V}, V_{DS}=0\text{V}$			$\pm 100$	nA
Gate Threshold Voltage	$V_{GS(\text{th})}$	$V_{DS}=10\text{V}, I_D=1\text{mA}$	2		4	V
Forward Transconductance	$g_{\text{FS}}$	$V_{DS}=10\text{V}, I_D=35\text{A}$		50		S
Static Drain to Source On-State Resistance	$R_{DS(\text{on})1}$	$I_D=35\text{A}, V_{GS}=15\text{V}$		9.0	10.8	$\text{m}\Omega$
	$R_{DS(\text{on})2}$	$I_D=35\text{A}, V_{GS}=10\text{V}$		9.8	12.8	$\text{m}\Omega$
Input Capacitance	$C_{\text{iss}}$	$V_{DS}=50\text{V}, f=1\text{MHz}$		2,010		$\text{pF}$
Output Capacitance	$C_{\text{oss}}$			840		$\text{pF}$
Reverse Transfer Capacitance	$C_{\text{rss}}$			21		$\text{pF}$
Turn-ON Delay Time	$t_{\text{Q(on)}}$	See Fig.2		30		ns
Rise Time	$t_r$			180		ns
Turn-OFF Delay Time	$t_{\text{Q(off)}}$			55		ns
Fall Time	$t_f$			40		ns
Total Gate Charge	$Q_g$	$V_{DS}=48\text{V}, V_{GS}=10\text{V}, I_D=70\text{A}$		26		nC
Gate to Source Charge	$Q_{gs}$			9		nC
Gate to Drain "Miller" Charge	$Q_{gd}$			8		nC
Forward Diode Voltage	$V_{SD}$	$I_S=70\text{A}, V_{GS}=0\text{V}$		1.1	1.5	V
Reverse Recovery Time	$t_{\text{rr}}$	See Fig.3		95		ns
Reverse Recovery Charge	$Q_{rr}$		$I_S=70\text{A}, V_{GS}=0\text{V}, di/dt=100\text{A}/\mu\text{s}$	240		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.

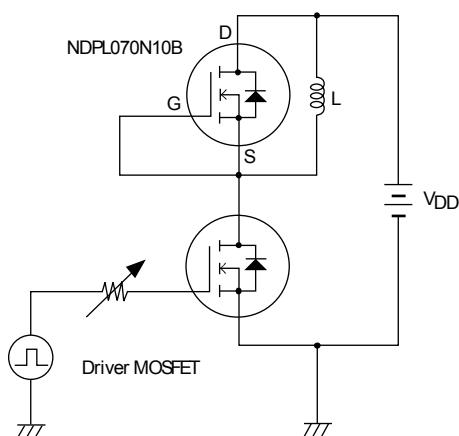
**Fig.1 Unclamped Inductive Switching Test Circuit**



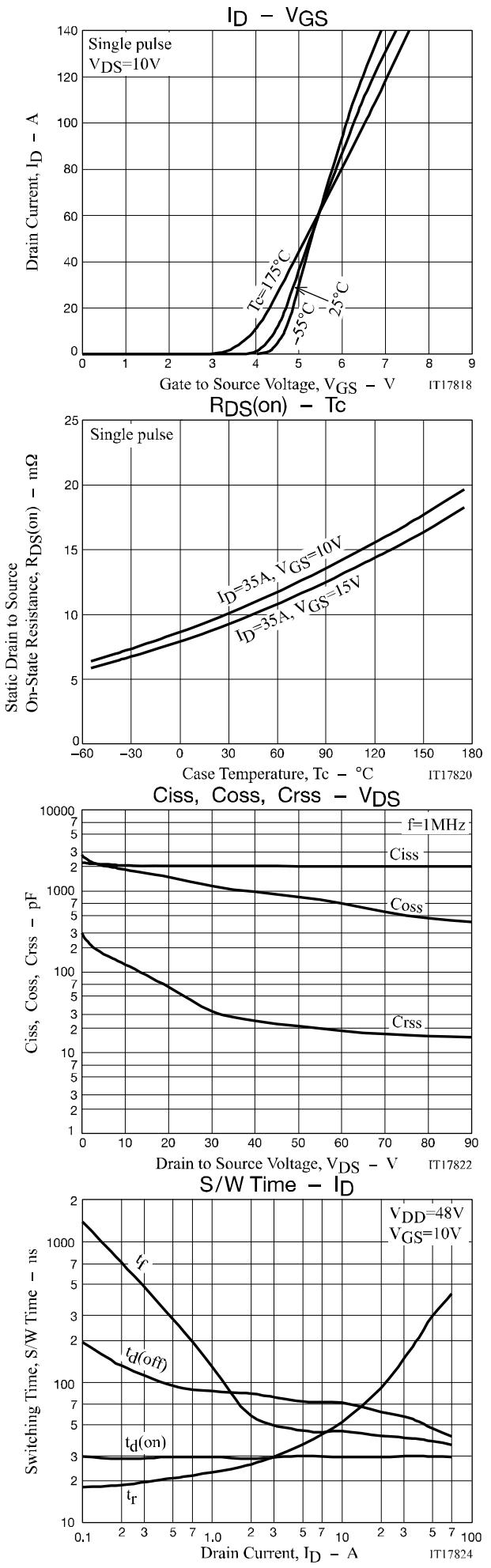
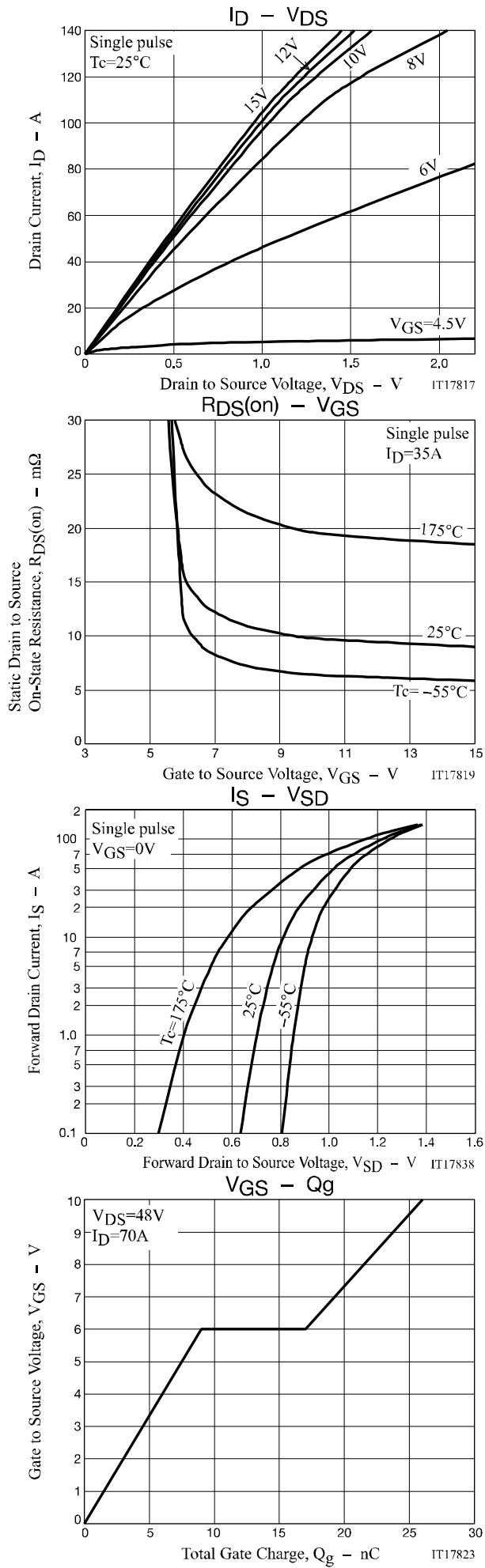
**Fig.2 Switching Time Test Circuit**



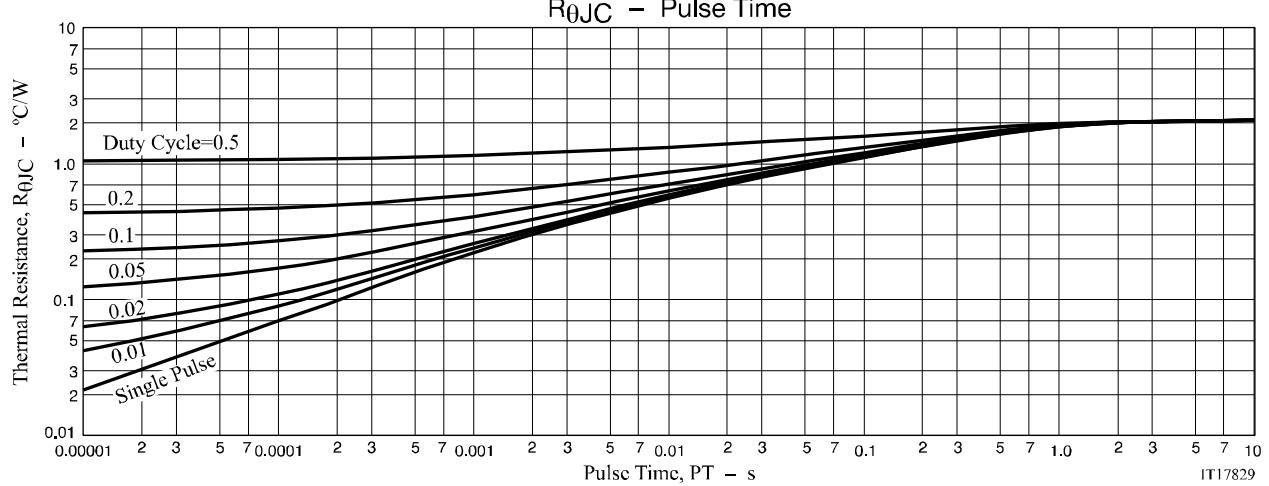
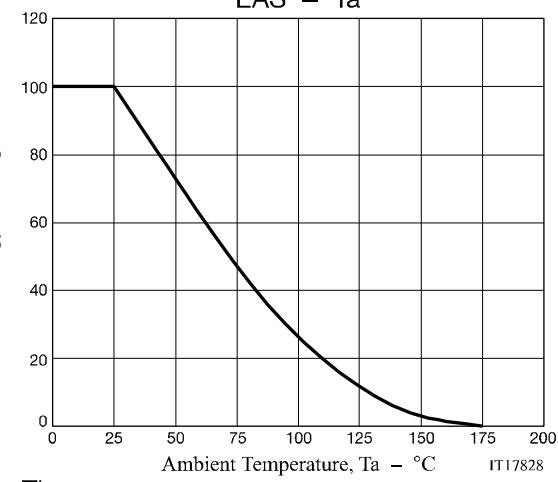
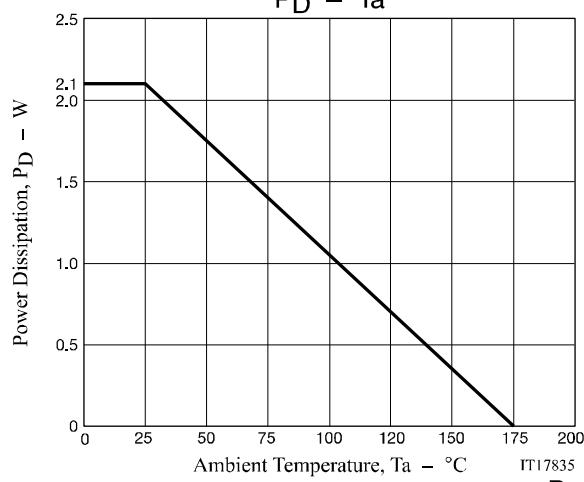
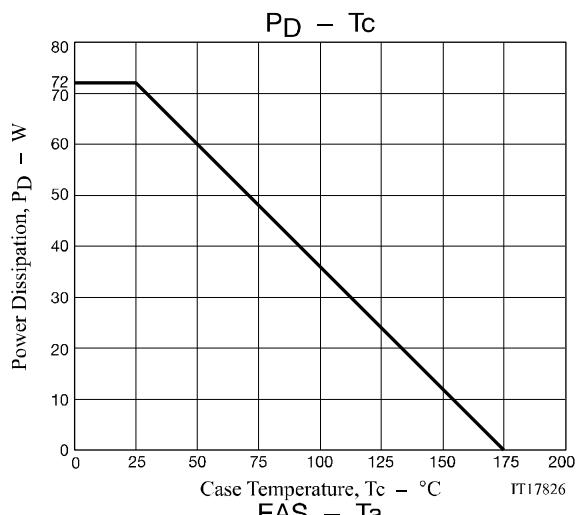
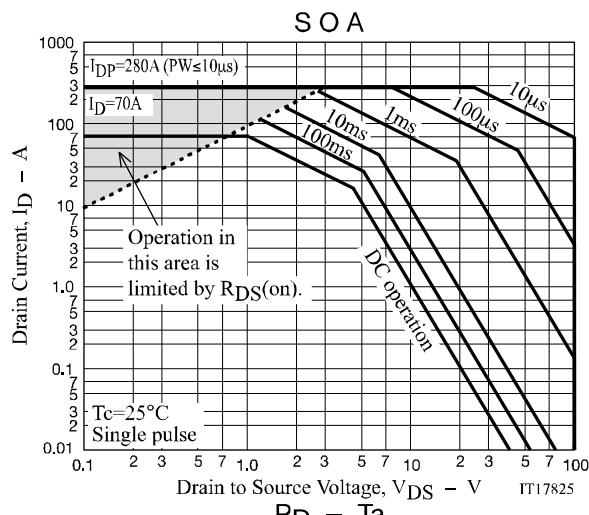
**Fig.3 Reverse Recovery Time Test Circuit**



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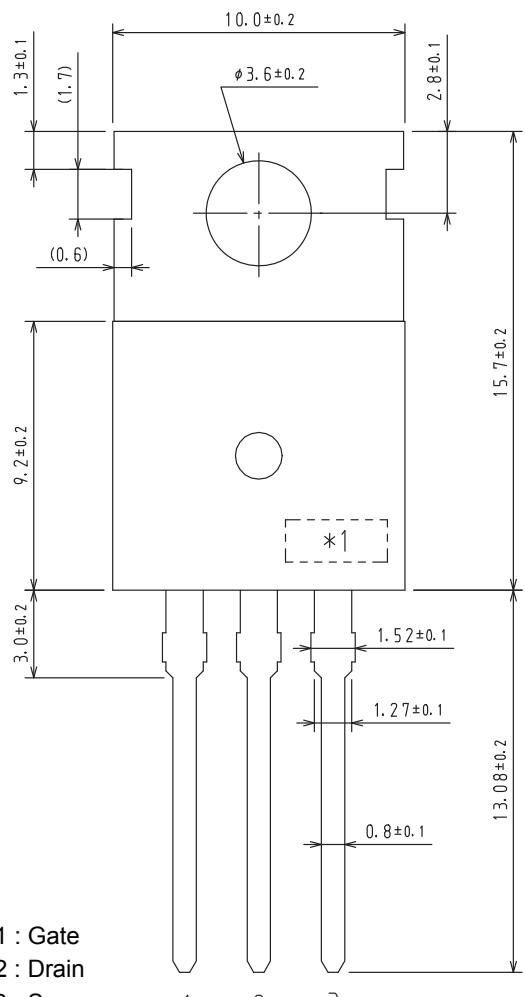
## PACKAGE DIMENSIONS

unit : mm

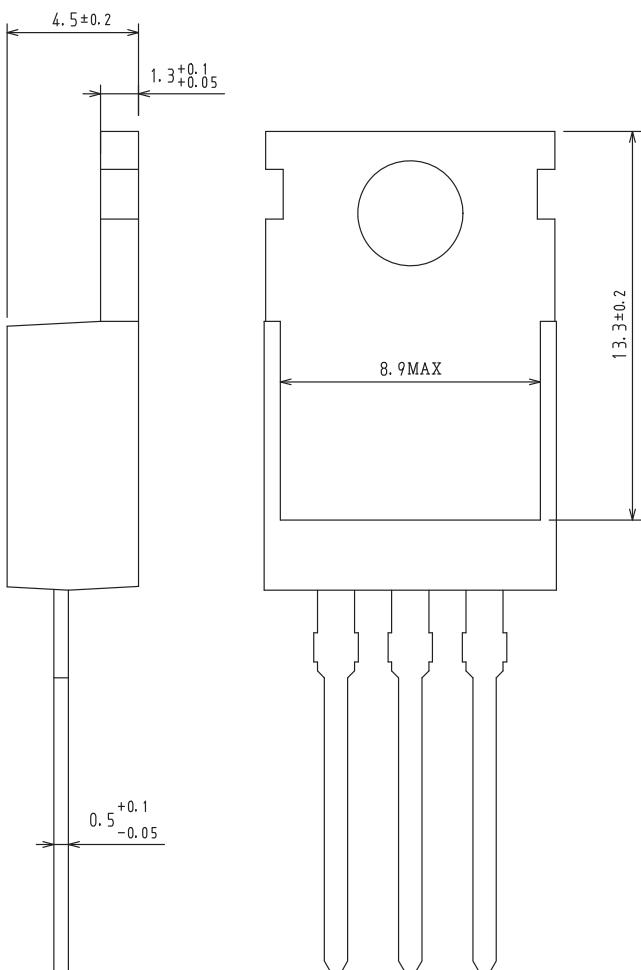
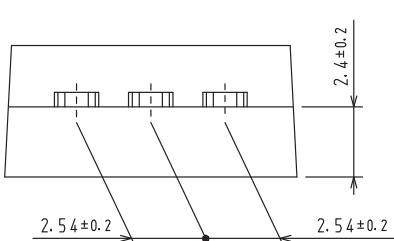
### TO-220, 3-Lead / TO-220-3L

CASE 221AU

ISSUE O



1 : Gate  
2 : Drain  
3 : Source



These dimension do not include  
mold protrusion

\*1 : Lot indication

## NDPL070N10B

### ORDERING INFORMATION

Device	Marking	Package	Shipping (Qty / Packing)
NDPL070N10BG	070N10	TO-220, 3-Lead / TO-220-3L (Pb-Free)	50 / Tube

Note on usage : Since the NDPL070N10B is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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