

NDUL09N150C

Power MOSFET 1500V, 3.0Ω, 9A, N-Channel



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Features

- Low On-Resistance
- Ultra High Voltage
- Pb-Free and RoHS Compliance
- High Speed Switching
- 100% Avalanche Tested

Specifications

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

Parameter	Symbol	Value	Unit
Drain to Source Voltage	V_{DS}	1500	V
Gate to Source Voltage	V_{GS}	± 30	V
Drain Current (DC)	I_D	9	A
Drain Current (DC) Limited by Package	I_{DL}	6	A
Drain Current (Pulse) $PW \leq 10\mu\text{s}$, duty cycle $\leq 1\%$	I_{DP}	18	A
Power Dissipation	P_D	3.0	W
$T_c = 25^\circ\text{C}$		78	
Junction Temperature	T_j	150	$^\circ\text{C}$
Storage Temperature	T_{stg}	-55 to +150	$^\circ\text{C}$
Source Current (Body Diode)	I_S	6	A
Avalanche Energy (Single Pulse) * ¹	E_{AS}	197	mJ
Lead Temperature for Soldering Purposes, 3 mm from case for 10 seconds	T_L	260	$^\circ\text{C}$

Thermal Resistance Ratings

Parameter	Symbol	Value	Unit
Junction to Case Steady State	$R_{\theta JC}$	1.60	$^\circ\text{C/W}$
Junction to Ambient * ²	$R_{\theta JA}$	41.7	

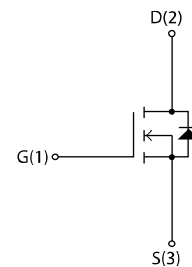
Note : *¹ $V_{DD} = 50\text{V}$, $L = 10\text{mH}$, $I_{AV} = 6\text{A}$ (Fig.1)

*² Insertion mounted

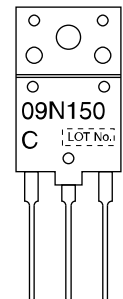
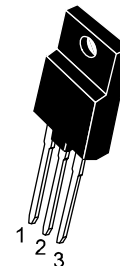
Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

Electrical Connection

N-Channel



Marking



**TO-3PF-3L
CASE 340AH**

ORDERING INFORMATION

See detailed ordering and shipping information on page 5 of this data sheet.

NDUL09N150C

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

Parameter	Symbol	Conditions	Value			Unit
			min	typ	max	
Drain to Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D=10\text{mA}$, $V_{GS}=0\text{V}$	1500			V
Zero-Gate Voltage Drain Current	I_{DSS}	$V_{DS}=1200\text{V}$, $V_{GS}=0\text{V}$			1	mA
Gate to Source Leakage Current	I_{GSS}	$V_{GS}=\pm 30\text{V}$, $V_{DS}=0\text{V}$			± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=10\text{V}$, $I_D=1\text{mA}$	2		4	V
Forward Transconductance	g_{FS}	$V_{DS}=20\text{V}$, $I_D=3\text{A}$		5.2		S
Static Drain to Source On-State Resistance	$R_{DS(on)}$	$I_D=3\text{A}$, $V_{GS}=10\text{V}$		2.2	3.0	Ω
Input Capacitance	C_{iss}	$V_{DS}=30\text{V}$, $f=1\text{MHz}$		2025		pF
Output Capacitance	C_{oss}			222		pF
Reverse Transfer Capacitance	C_{rss}			66		pF
Turn-ON Delay Time	$t_{d(on)}$	See Fig.2		33		ns
Rise Time	t_r			75		ns
Turn-OFF Delay Time	$t_{d(off)}$			500		ns
Fall Time	t_f			111		ns
Total Gate Charge	Q_g	$V_{DS}=200\text{V}$, $V_{GS}=10\text{V}$, $I_D=6\text{A}$		114		nC
Gate to Source Charge	Q_{gs}			12		nC
Gate to Drain "Miller" Charge	Q_{gd}			57		nC
Forward Diode Voltage	V_{SD}	$I_S=6\text{A}$, $V_{GS}=0\text{V}$		0.8	1.5	V
Reverse Recovery Time	t_{rr}	See Fig.3 $I_S=6\text{A}$, $V_{GS}=0\text{V}$, $di/dt=100\text{A}/\mu\text{s}$		1050		ns
Reverse Recovery Charge	Q_{rr}			9010		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

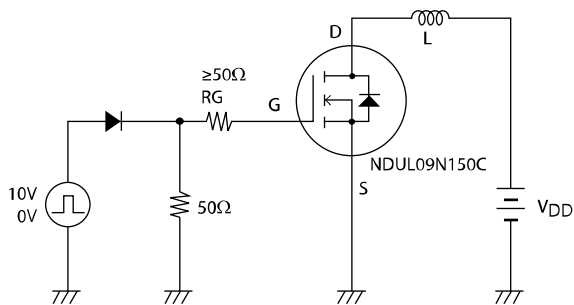


Fig.2 : Switching Time Test Circuit

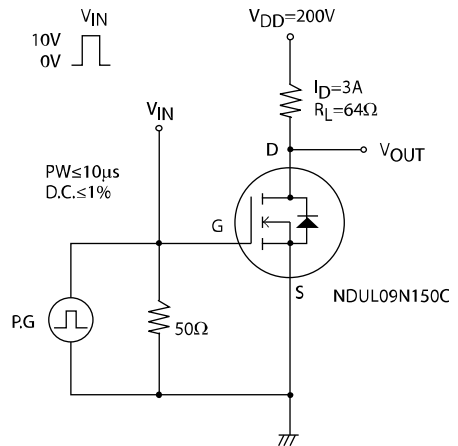
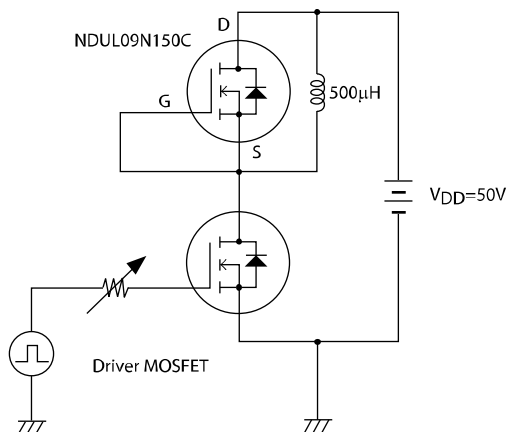
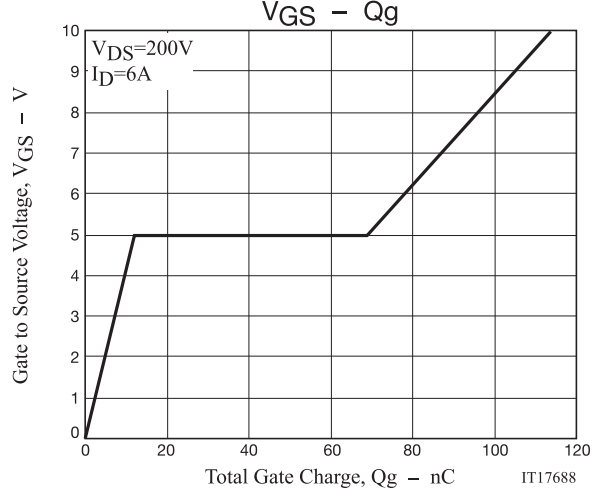
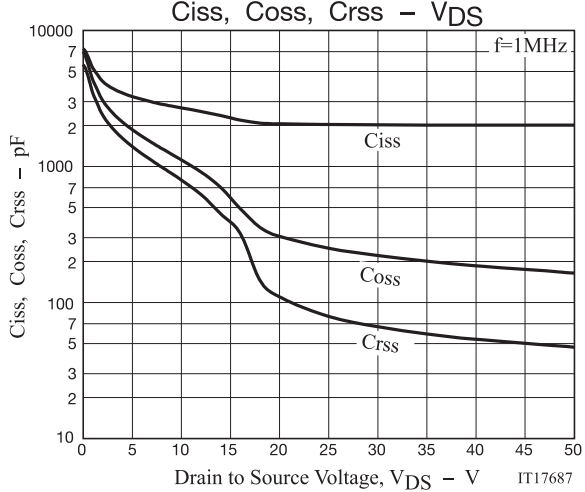
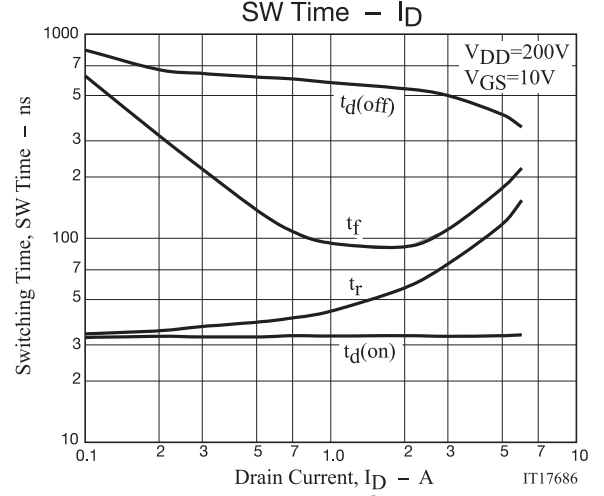
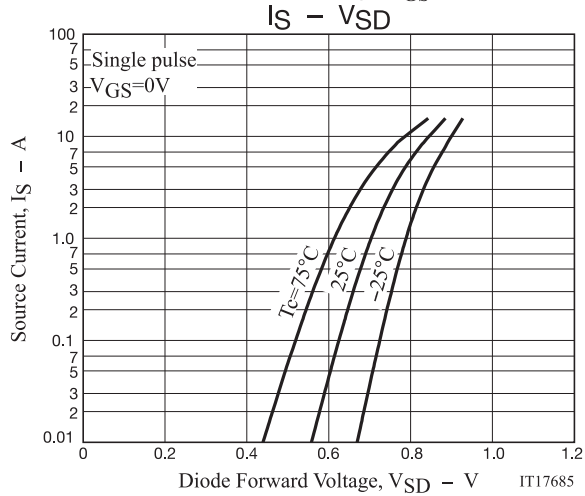
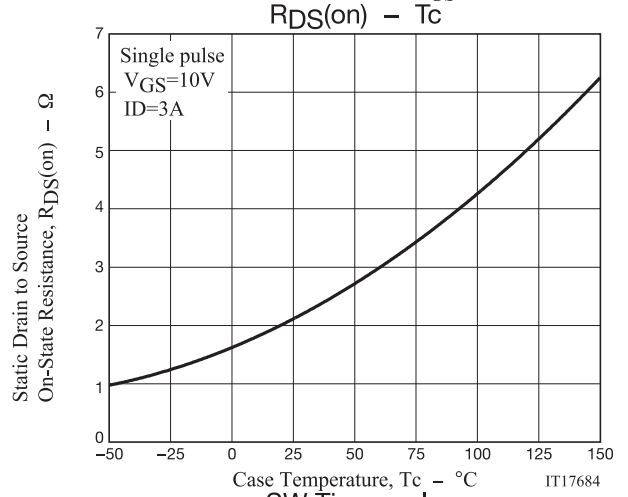
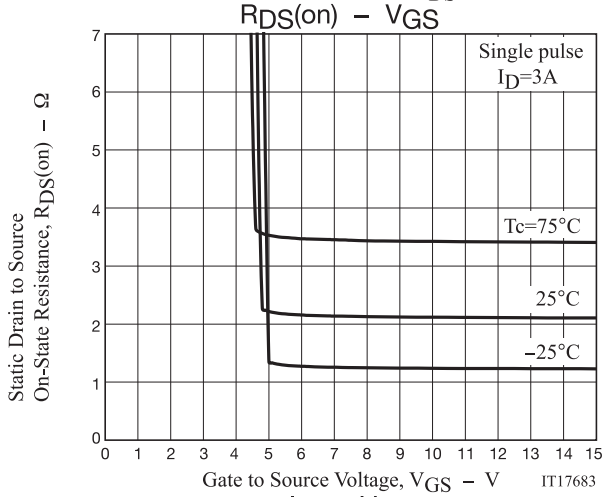
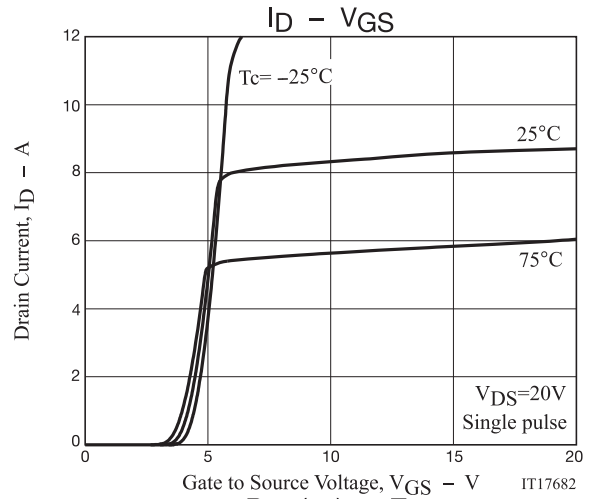
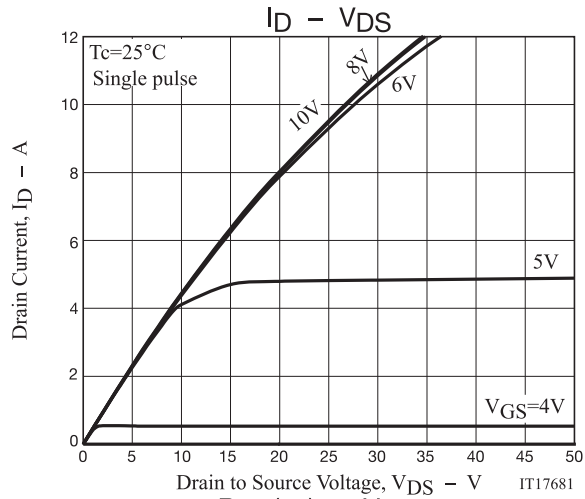
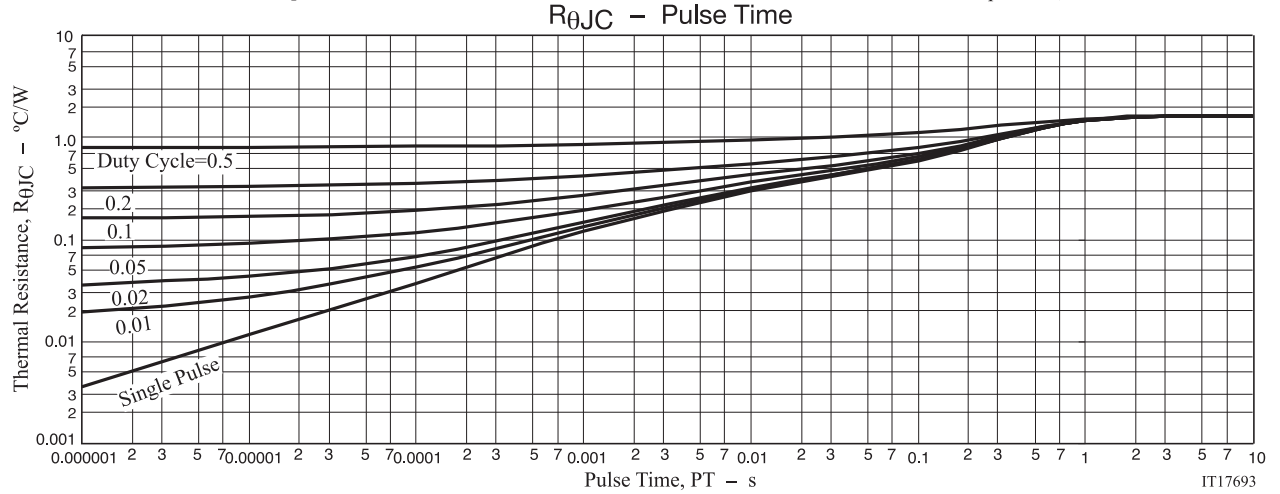
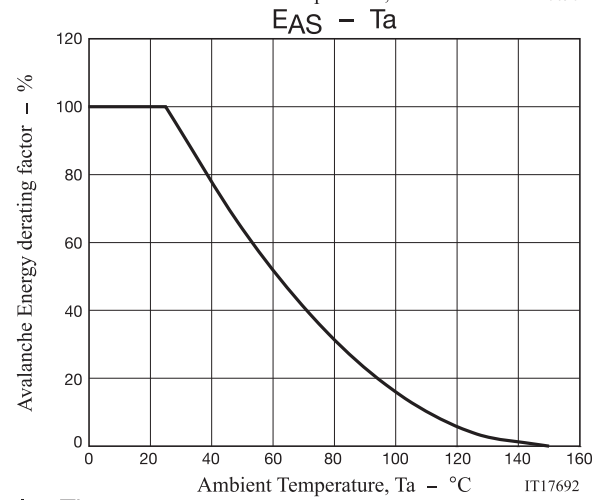
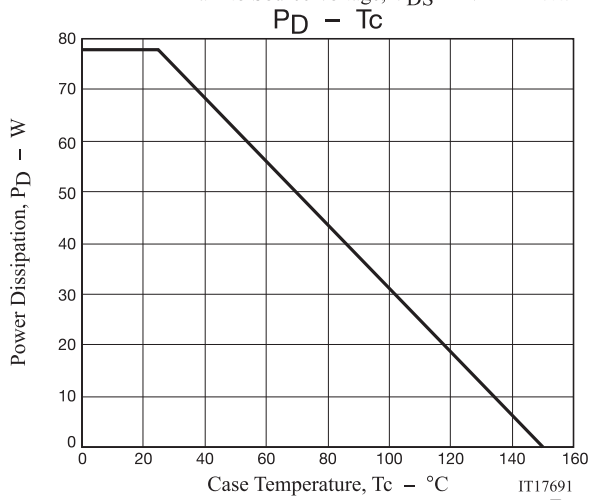
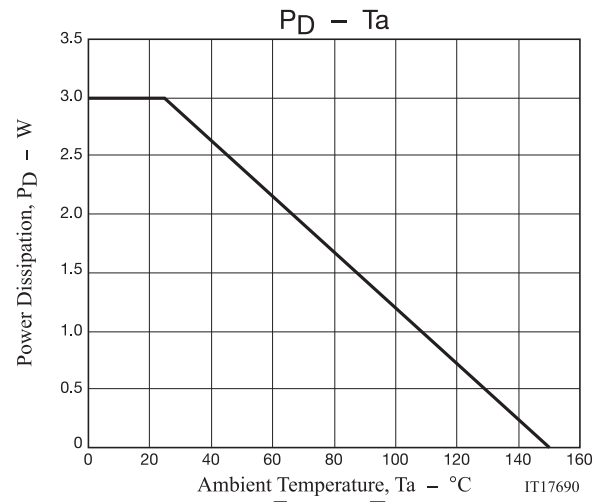
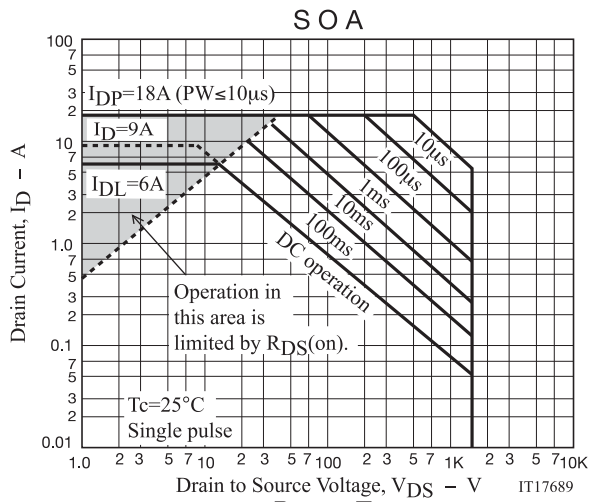


Fig.3 : Reverse Recovery Time Test Circuit



NDUL09N150C



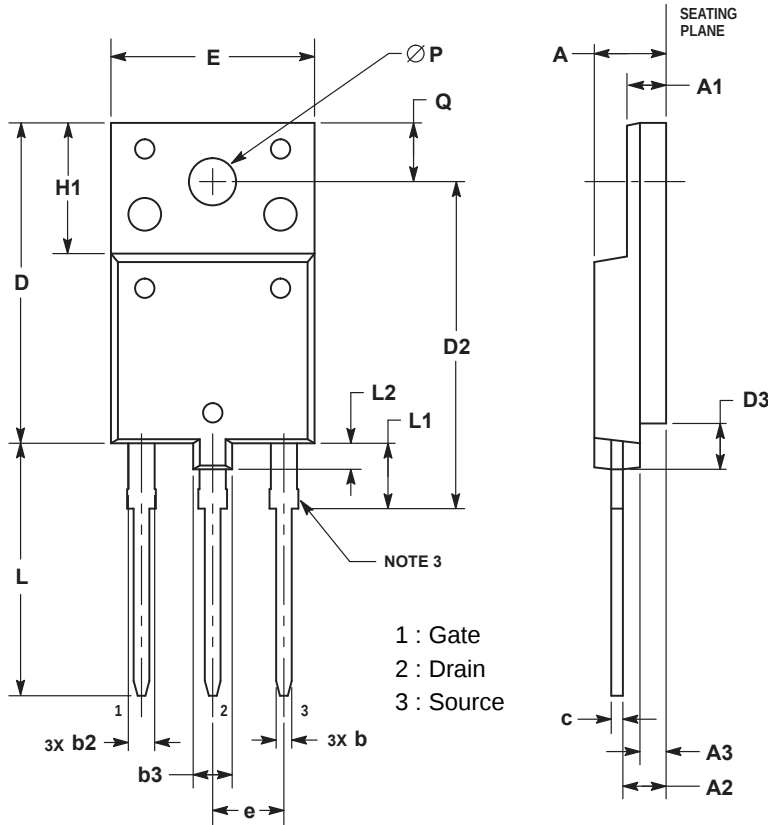


Package Dimensions

NDUL09N150CG

unit : mm

TO-3PF-3L
CASE 340AH
ISSUE A



NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 2009.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. CONTOUR UNCONTROLLED IN THIS AREA (6 PLACES).
4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH OR GATE PROTRUSIONS. MOLD FLASH AND GATE PROTRUSIONS NOT TO EXCEED 0.13 PER SIDE. THESE DIMENSIONS ARE TO BE MEASURED AT THE OUTERMOST EXTREME OF THE PLASTIC BODY.
5. DIMENSION b2 DOES NOT INCLUDE DAMBAR PROTRUSION. LEAD WIDTH INCLUDING PROTRUSION SHALL NOT EXCEED 2.20.

DIM	MILLIMETERS	
	MIN	MAX
A	5.30	5.70
A1	2.80	3.20
A2	3.10	3.50
A3	1.80	2.20
b	0.65	0.95
b2	1.90	2.15
b3	3.80	4.20
c	0.80	1.10
D	24.30	24.70
D2	24.70	25.30
D3	3.30	3.70
E	15.30	15.70
e	5.35	5.55
H1	9.80	10.20
L	19.10	19.50
L1	4.80	5.20
L2	1.90	2.20
P	3.40	3.80
Q	4.30	4.70

ORDERING INFORMATION

Device	Package	Shipping	Note
NDUL09N150CG	TO-3PF-3L SC-94	30pcs. / Tube	Pb-Free

Note on usage : Since the NDUL09N150C is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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