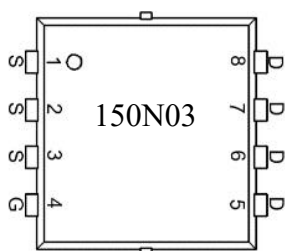


**Features**

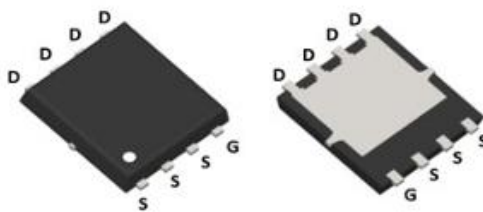
- 100% EAS Guaranteed
- Green Device Available
- Super Low Gate Charge
- Excellent CdV/dt effect decline
- Advanced high cell density Trench technology

Bvdss**30V*****Rdson*****1.5mΩ*****ID*****150A****Application**

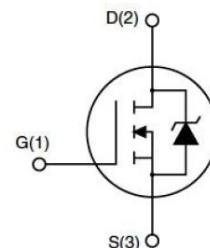
- PWM applications
- Power management functions
- Synchronous-rectification applications

RoHS**Package**

Marking and pin assignment



PDFN5x6-8L top view



Schematic diagram

Package Marking and Ordering Information

Device Marking	Device	Device Package	Quantity
150N03	HL150N03F	PDFN5x6-8L	5000

Absolute Maximum Ratings ($T_c=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current, $V_{GS}@10V^{1,6}$	I_D	150	A
		80	A
Pulsed Drain Current ²	I_{DM}	450	A
Single Pulsed Avalanche Energy ³	EAS	580	mJ
Avalanche Current	I_{AS}	60	A
Power Dissipation ⁴	P_d	87	W
Junction Temperature	T_J	$-55 \sim 150$	$^\circ\text{C}$
Storage Temperature	T_{STG}	$-55 \sim 150$	$^\circ\text{C}$

Thermal Resistance Ratings

Parameter	Symbol	Typ.	Max.	Unit
Thermal Resistance, Junction-to-Case ¹	$R_{\theta JC}$	--	2.1	$^\circ\text{C/W}$
Thermal Resistance, Junction-to-Ambient ¹	$R_{\theta JA}$	--	62	$^\circ\text{C/W}$



Ordering Information

Ordering Number	Package	Pin Assignment			Packing
Halogen Free		G	D	S	
HL150N03F	PDFN5x6-8L	4	5,6,7,8	1,2,3	Tape Reel

Electrical Characteristics ($T_J=25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	30	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=30V, V_{GS}=0V$	-	-	1	μA
Gate to Body Leakage Current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 20V$	-	-	± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.2	-	2.4	V
Static Drain-Source on-Resistance ²	$R_{DS(on)}$	$V_{GS}=10V, I_D=30A$	-	1.5	1.8	m Ω
		$V_{GS}=4.5V, I_D=30A$	-	2.2	2.65	m Ω
Forward Transconductance	g_{fs}	$V_{DS}=5V, I_D=30A$	-	73	-	S
Gate Resistance	R_g	$V_{DS}=0V, V_{GS}=0V, f=1MHz$	-	-	-	Ω
Input Capacitance	C_{iss}	$V_{DS}=15V, V_{GS}=0V, f=1.0MHz$	-	6272	-	pF
Output Capacitance	C_{oss}		-	1022	-	
Reverse Transfer Capacitance	C_{rss}		-	718	-	
Total Gate Charge	Q_g	$V_{DS}=24V, I_D=30A, V_{GS}=10V$	-	143	-	nC
Gate-Source Charge	Q_{gs}		-	17	-	
Gate-Drain("Miller") Charge	Q_{gd}		-	43	-	
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=15V, I_D=30A, R_G=4.7\Omega, V_{GS}=10V$	-	20	-	nS
Turn-on Rise Time	t_r		-	58	-	
Turn-Off Delay Time	$t_{d(off)}$		-	158	-	
Turn-Off Fall Time	t_f		-	77	-	
Continuous Source Current ^{1,4}	I_S	$V_G=V_D=0V, \text{Force Current}$	-	-	150	A
Diode Forward Voltage ²	V_{SD}	$V_{GS}=0V, I_S=1A$	-	-	1.4	V
Reverse Recovery Time	t_{rr}	$I_F=30A, di/dt=100A/\mu s$	-	26	-	nS
Reverse Recovery Charge	Q_{rr}		-	10	-	nC

Notes:

1. Repetitive rating : pulse width limited by junction temperature.
2. $L=0.5mH, I_{AS}=48A, V_{DD}=30V, R_G=25\Omega$, Starting $T_J=25^{\circ}\text{C}$
3. $I_{SD} \leq 30A, di/dt = 100A/\mu s, V_{DD} \leq BV_{DSS}$, Starting $T_J=25^{\circ}\text{C}$
4. Pulse Test : Pulse Width $\leq 300\mu s$, duty cycle $\leq 2\%$.



Typical Performance Characteristics

Fig. 1. On-state characteristics

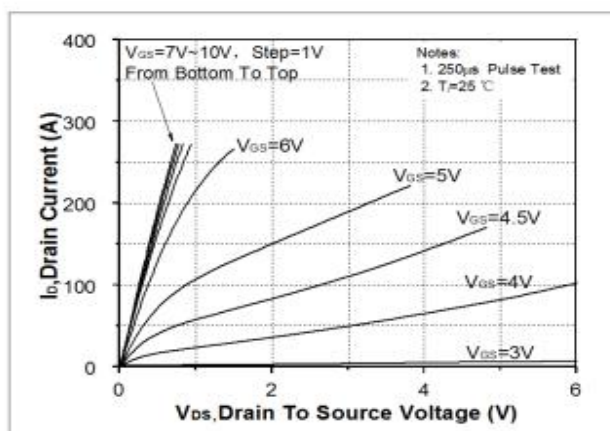


Fig. 2. Transfer Characteristics

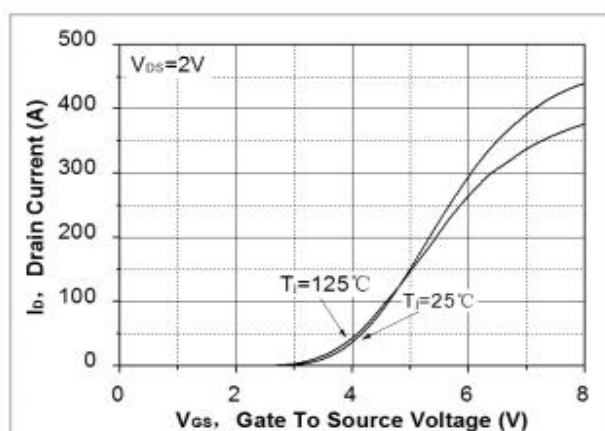


Fig. 3. On-resistance variation vs. drain current and gate voltage

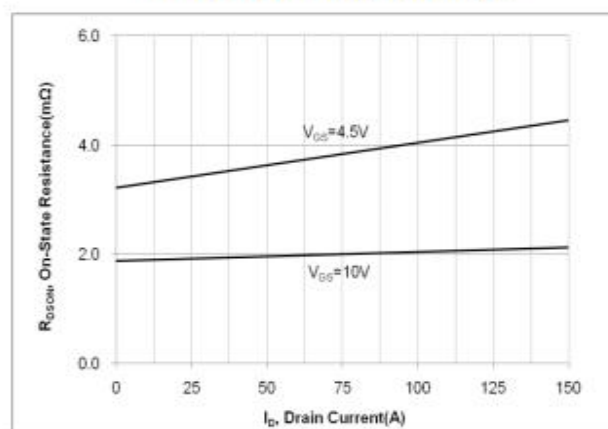


Fig. 4. On-state current vs. diode forward voltage

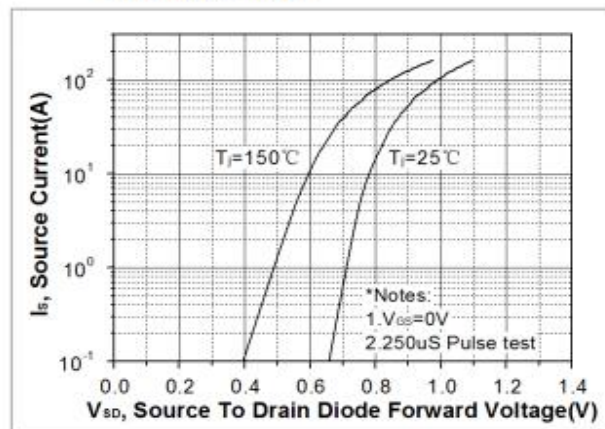


Fig 5. Breakdown voltage variation vs. junction temperature

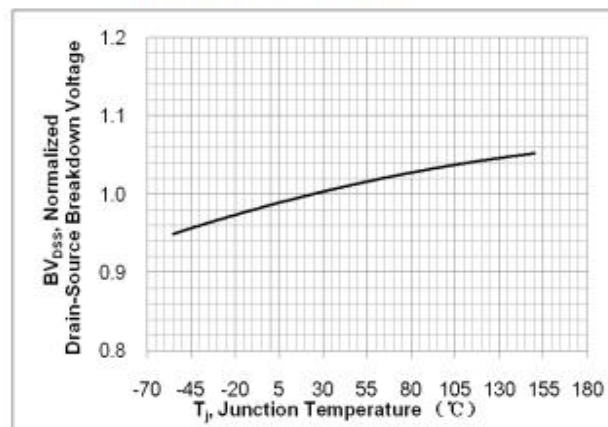


Fig. 6. On-resistance variation vs. junction temperature

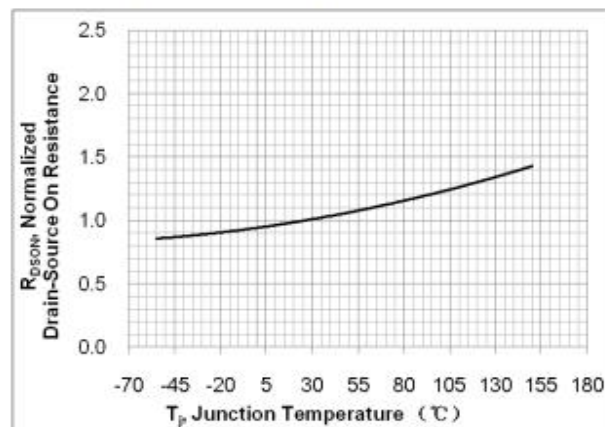




Fig. 7. Gate charge characteristics

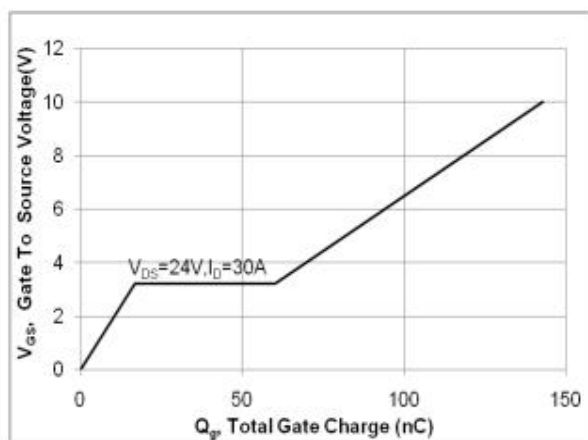


Fig. 8. Capacitance Characteristics

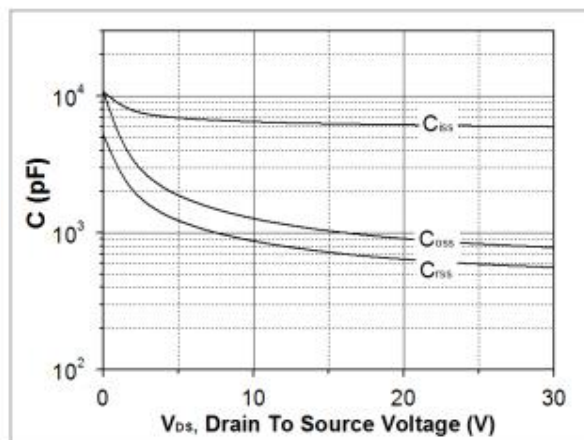


Fig. 9. Maximum safe operating area

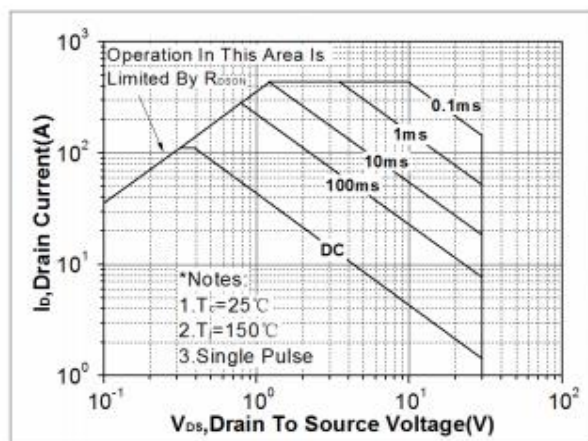


Fig. 10. Maximum drain current vs. case temperature

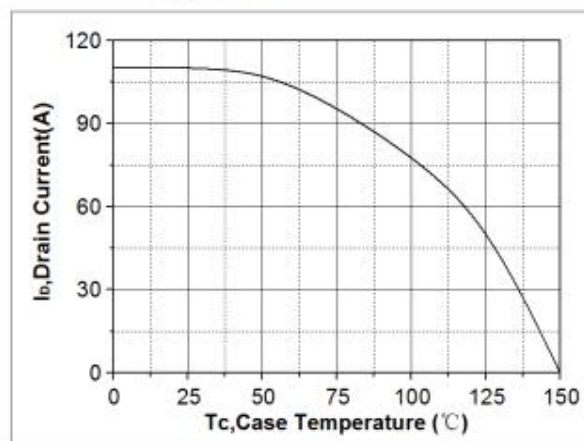
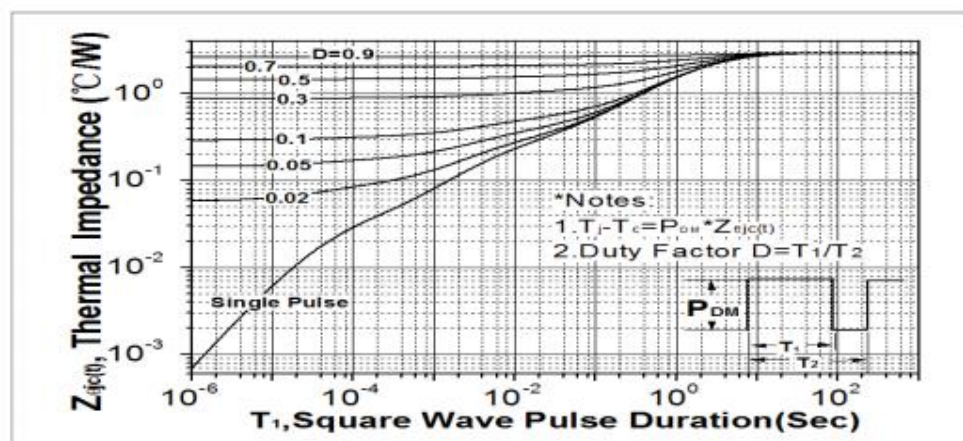


Fig. 11. Transient thermal response curve





Test Circuit

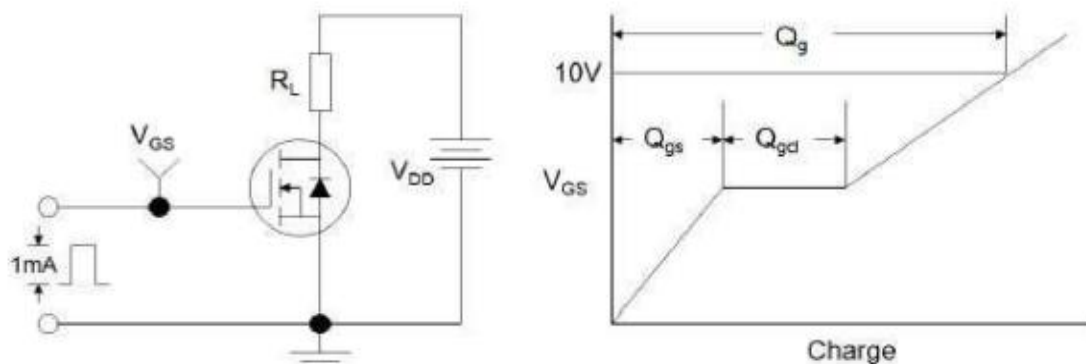


Figure1:Gate Charge Test Circuit & Waveform

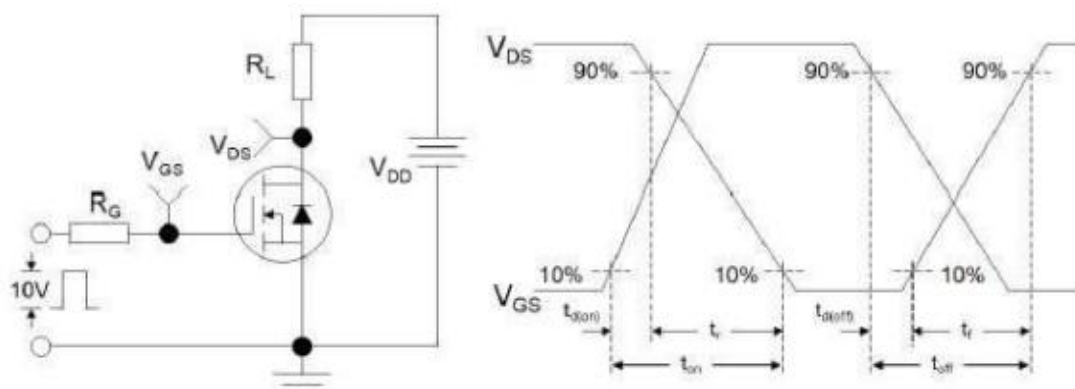


Figure 2: Resistive Switching Test Circuit & Waveforms

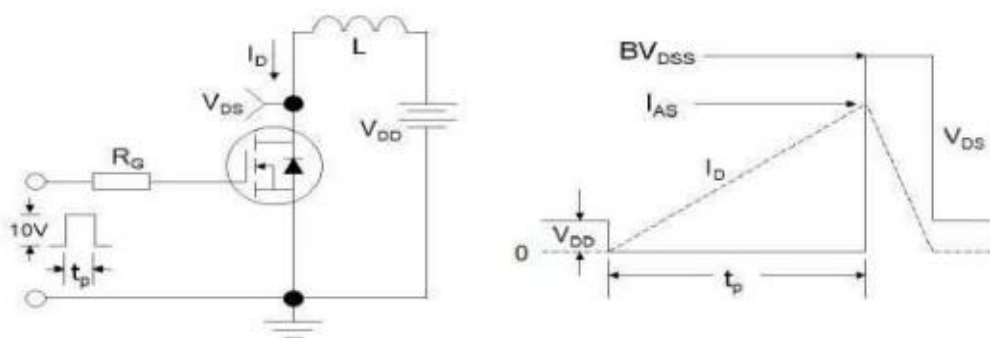
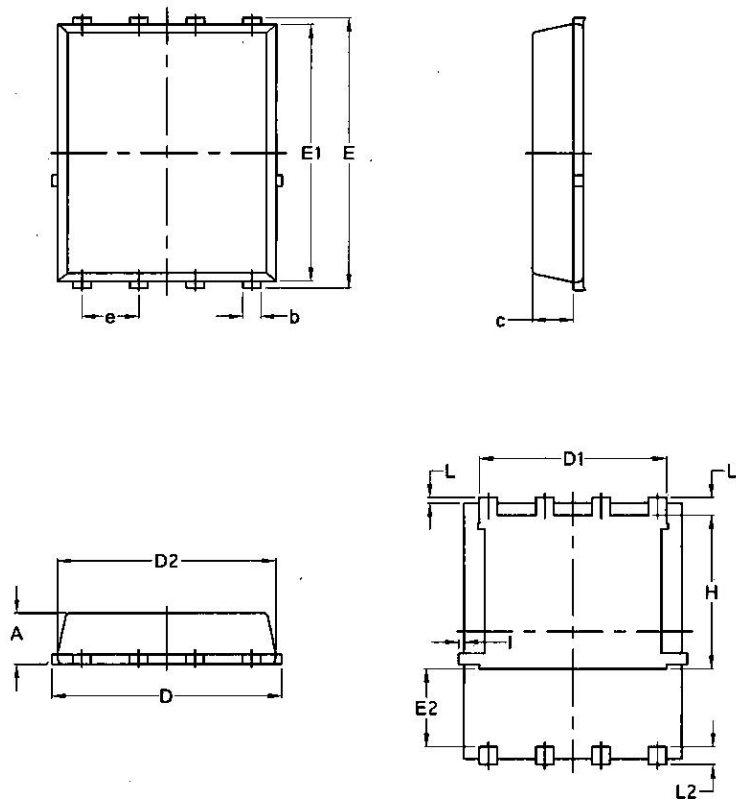


Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms



Package Dimensions PDFN5x6-8L



Symbol	Common			
	mm		Inch	
	Mim	Max	Min	Max
A	1.03	1.17	0.0406	0.0461
b	0.34	0.48	0.0134	0.0189
c	0.824	0.0970	0.0324	0.082
D	4.80	5.40	0.1890	0.2126
D1	4.11	4.31	0.1618	0.1697
D2	4.80	5.00	0.1890	0.1969
E	5.95	6.15	0.2343	0.2421
E1	5.65	5.85	0.2224	0.2303
E2	1.60	/	0.0630	/
e	1.27 BSC		0.05 BSC	
L	0.05	0.25	0.0020	0.0098
L1	0.38	0.50	0.0150	0.0197
L2	0.38	0.50	0.0150	0.0197
H	3.30	3.50	0.1299	0.1378
I	/	0.18	/	0.0070



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