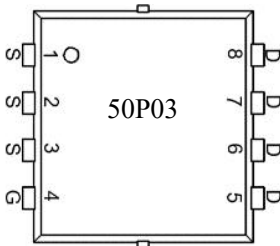
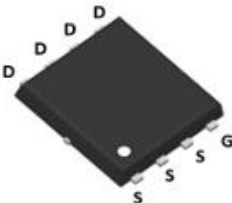
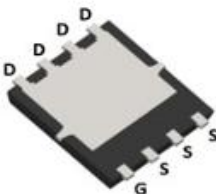
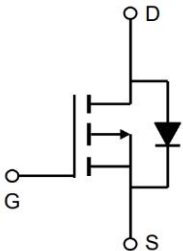


Features ➤ 100% EAS Guaranteed ➤ Green Device Available ➤ Super Low Gate Charge ➤ Excellent CdV/dt effect decline ➤ Advanced high cell density Trench technology	Bvdss	Rdson	ID
	-30V	8.7mΩ	-50A
	Application ➤ Battery protection ➤ Load switch ➤ Uninterruptible power supply		
RoHS			

Package			
			
Marking and pin assignment	PDFN5*6-8L top view		Schematic diagram

Package Marking and Ordering Information

Device Marking	Device	Device Package	Quantity
50P03	50P03F	PDFN5x6-8L	5000

Absolute Maximum Ratings (T_C=25°C unless otherwise specified)

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V _{DS}	-30	V
Gate-Source Voltage		V _{GS}	±25	V
Continuous Drain Current@-10V ¹	T _C = 25°C	I _D	-50	A
	T _C = 100°C	I _D	-32	A
Pulsed Drain Current ²		I _{DM}	-150	A
Single Pulse Avalanche Energy ³		EAS	125	mJ
Avalanche Current		I _{AS}	-50	A
Total Power Dissipation ⁴	T _C = 25°C	P _D	25	W
Operating Junction Temperature Range		T _J	-55 ~ +150	°C
Storage Temperature Range		T _{STG}	-55 ~ +150	°C

Thermal Resistance Ratings

Parameter	Symbol	Value	Unit
Thermal Resistance from Junction-to-Ambient ¹	R _{θJA}	62	°C/W
Thermal Resistance from Junction-to-Case	R _{θJC}	-	°C/W



Ordering Information

Ordering Number	Package	Pin Assignment			Packing
Halogen Free		G	D	S	
HL50P03F	PDFN5x6-8L	4	5,6,7,8	1,2,3	Tape Reel

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-30	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-30V, V_{GS}=0V$	-	-	-1	μA
Gate-body Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=-250\mu A$	-1	-1.6	-2.5	V
Static Drain-Source On-Resistance ³	$R_{DS(on)}$	$V_{GS} = -10V, I_D = -10A$	-	8.7	14	m Ω
		$V_{GS} = -4.5V, I_D = -5A$	-	17	24	
Input Capacitance	C_{iss}	$V_{DS}=-15V, V_{GS}=0V, f=1.0MHz$	-	1770	-	pF
Output Capacitance	C_{oss}		-	233	-	
Reverse Transfer Capacitance	C_{rss}		-	206	-	
Total Gate Charge	Q_g	$V_{DS}=-15V, I_D=-5A,$ $V_{GS}=-10V$	-	22	-	nC
Gate Source Charge	Q_{gs}		-	1	-	
Gate Drain("Miller")Charge	Q_{gd}		-	1.8	-	
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=-15V, I_D=-10A,$ $R_G=2.5\Omega, V_{GS}=-10V$	-	9	-	ns
Turn-On Rise Time	t_r		-	13	-	
Turn-Off Delay Time	$t_{d(off)}$		-	48	-	
Turn-Off Fall Time	t_f		-	20	-	
Drain to Source Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=-15A$	-	-0.8	-1.2	V
Maximum Continuous Drain to Source Diode Forward Current	I_S	-	-	-	-15	A
Maximum Pulsed Drain to Source Diode Forward Current	I_{SM}	-	-	-	-60	A
Reverse Recovery Time	t_{rr}	$V_{DD}=-24V, I_F=-2.8A,$ $dI/dt=100A/\mu s, T_J=25^{\circ}\text{C}$	-	64	-	ns
Reverse Recovery Charge	Q_{rr}		-	25	-	nC

Note :

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.
2. EAS condition: $T_J=25^{\circ}\text{C}$, $V_{GS}=10V$, $R_G=25\Omega$, $L=0.5mH$, $I_{AS}=-12.7A$.
3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 0.5\%$.

Typical Performance Characteristics

Figure 1: Output Characteristics

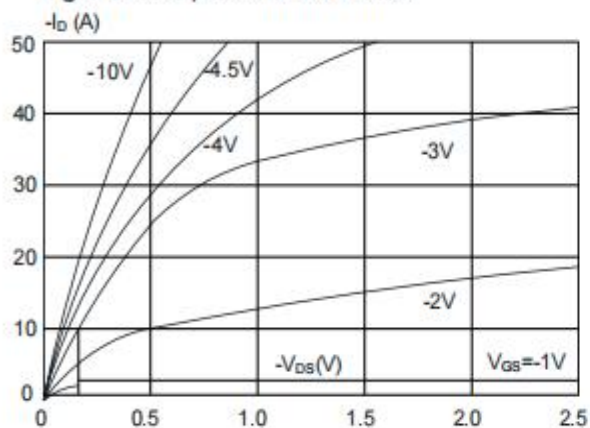


Figure 2: Typical Transfer Characteristics

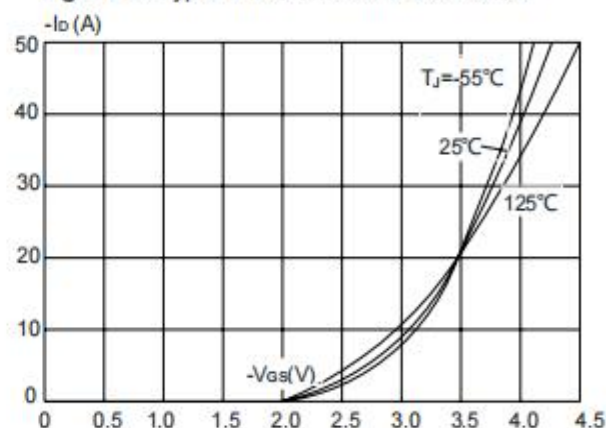


Figure 3: On-resistance vs. Drain Current

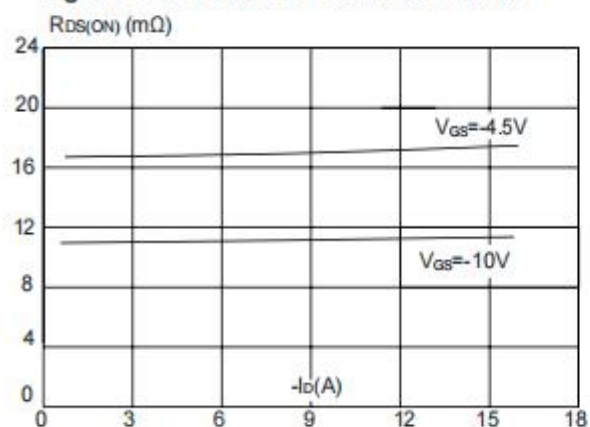


Figure 4: Body Diode Characteristics

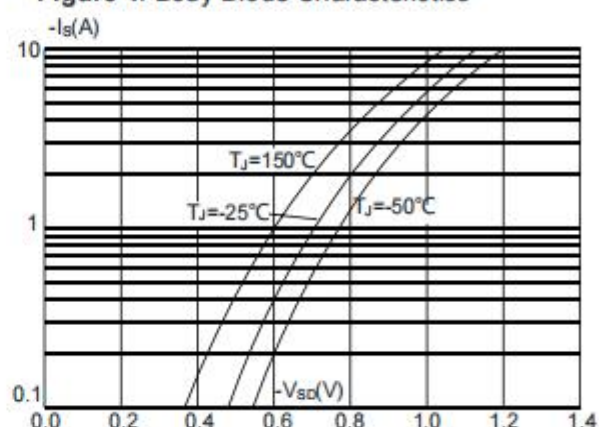


Figure 5: Gate Charge Characteristics

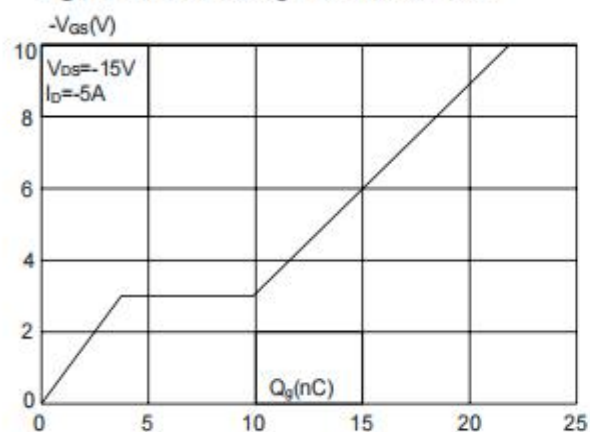


Figure 6: Capacitance Characteristics

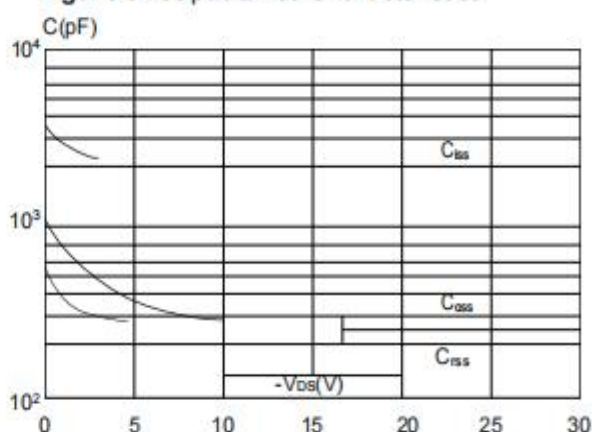


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

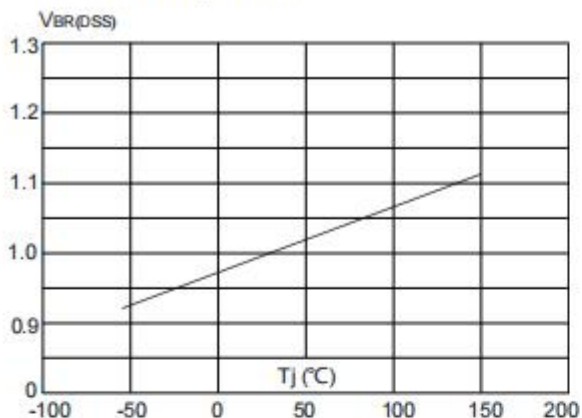


Figure 8: Normalized on Resistance vs. Junction Temperature

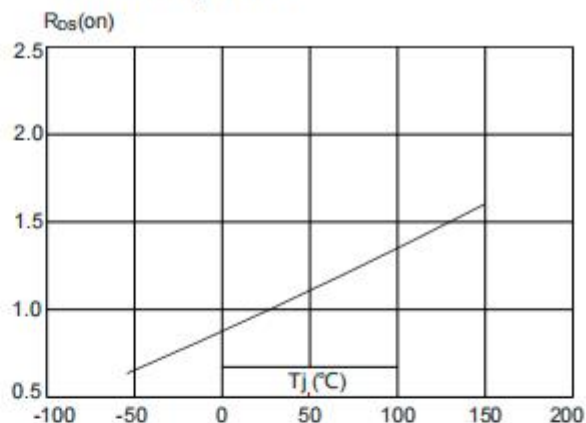


Figure 9: Maximum Safe Operating Area

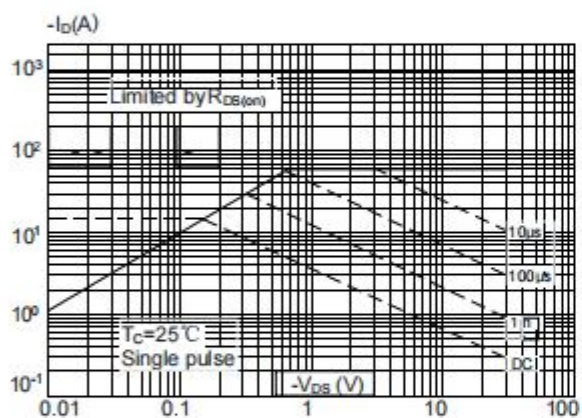


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

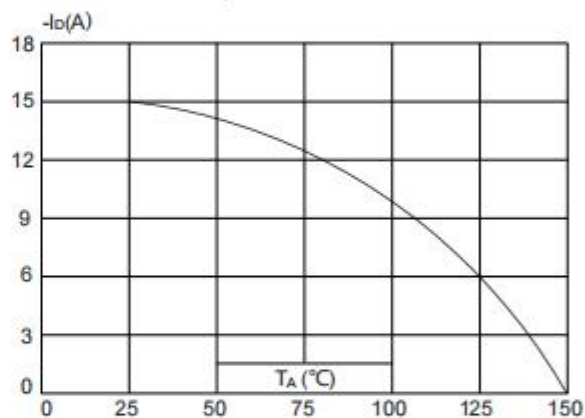
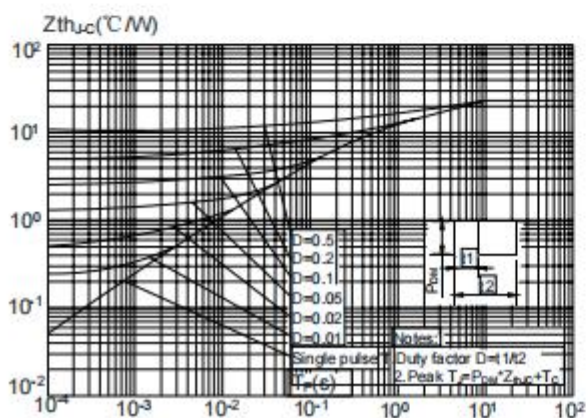
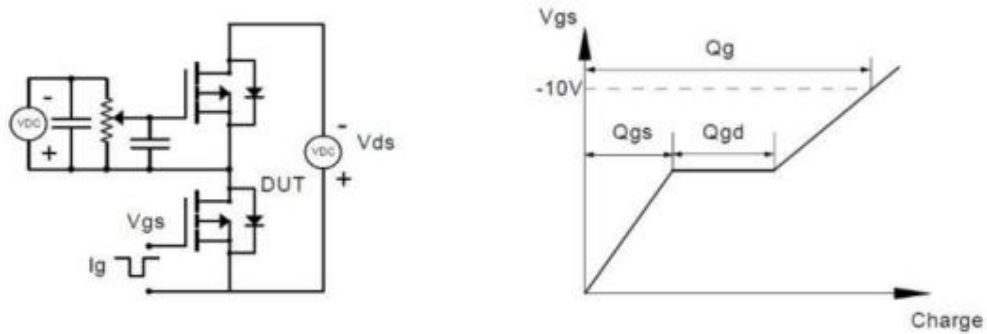


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case

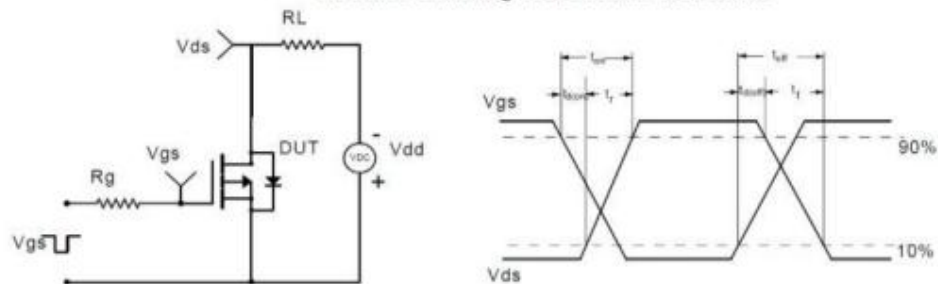


Test Circuit

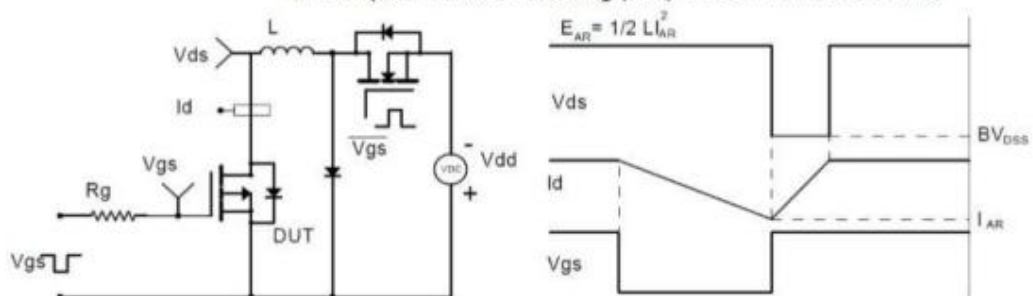
Gate Charge Test Circuit & Waveform



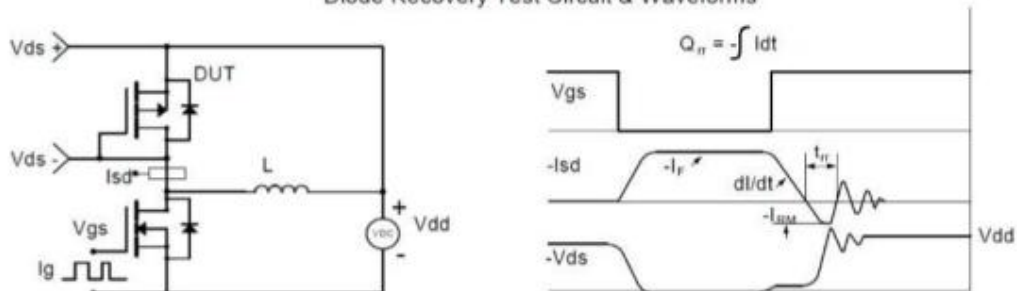
Resistive Switching Test Circuit & Waveforms

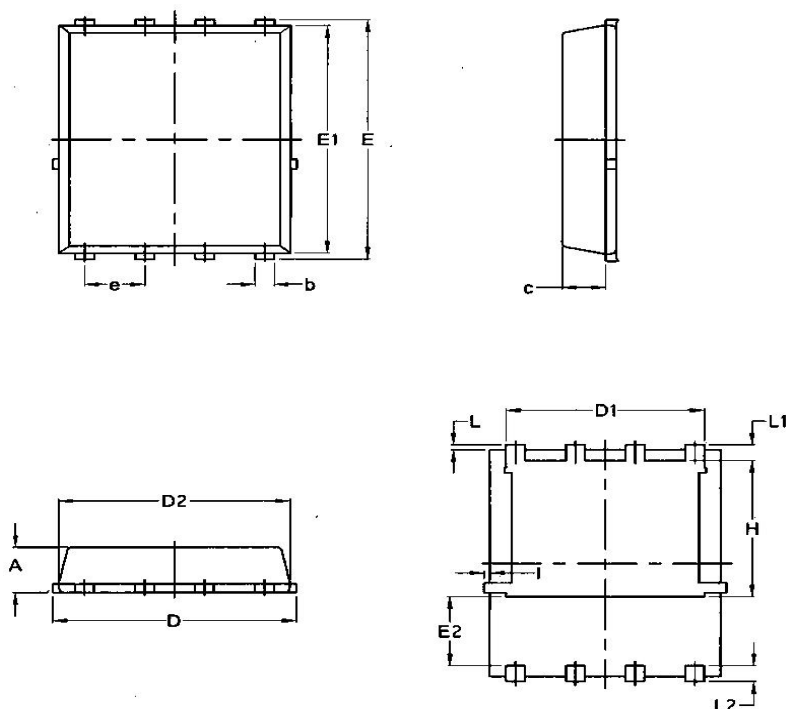


Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



Package Dimensions PDFN5x6-8L


Symbol	Common			
	mm		Inch	
	Min	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
l	/	0.18	/	0.0070



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