

PDFN5X6-8L Plastic-Encapsulate MOSFET

60V N-Channel MOSFET

Product Summary

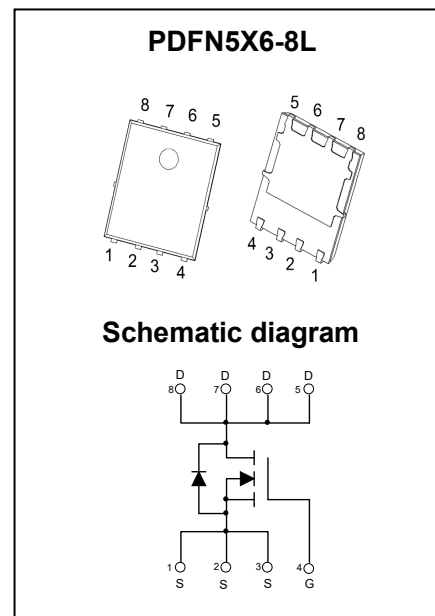
$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
60V	5.2m Ω @10V	60A
	6.6m Ω @4.5V	

Feature

- Split Gate Trench Technology
- Low $R_{DS(ON)}$
- Low Gate Charge
- Low Gate Resistance
- 100% UIS Tested

Application

- Power Switching Application
- DC/DC Converter



Package Marking and Ordering Information

Part Number	Package	Marking	Packing	Reel Size	Tape Width	Qty
HDT052N06LNC	PDFN5X6-8L	T052N06L	Reel & Tape	330mm	12mm	5000pcs

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	60	V
Gate-Source Voltage		V_{GS}	± 20	V
Continuous Drain Current ¹	$T_C = 25^\circ\text{C}$	I_D	60	A
	$T_C = 100^\circ\text{C}$		37	
Pulsed Drain Current ²		I_{DM}	240	A
Single Pulsed Avalanche Current ³		I_{AS}	18	A
Single Pulsed Avalanche Energy ³		E_{AS}	81	mJ
Power Dissipation ⁵		P_D	70	W
$T_C = 25^\circ\text{C}$				
Thermal Resistance from Junction to Ambient ⁶		$R_{\theta JA}$	55	$^\circ\text{C/W}$
Thermal Resistance from Junction to Case		$R_{\theta JC}$	1.78	$^\circ\text{C/W}$
Junction Temperature		T_J	150	$^\circ\text{C}$
Storage Temperature		T_{STG}	-55~+150	$^\circ\text{C}$

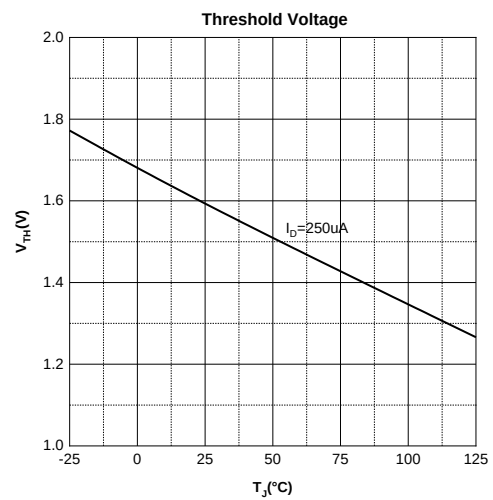
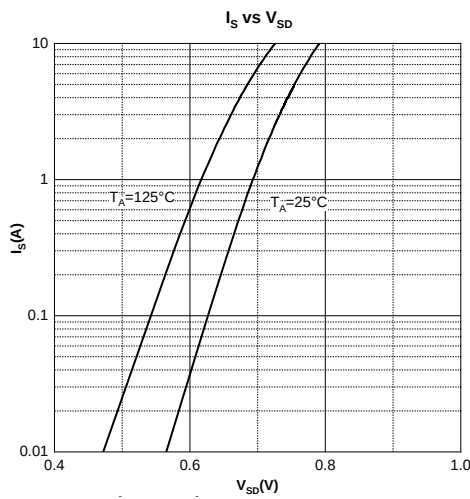
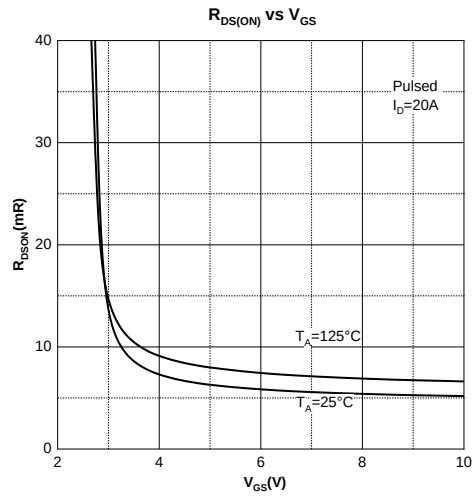
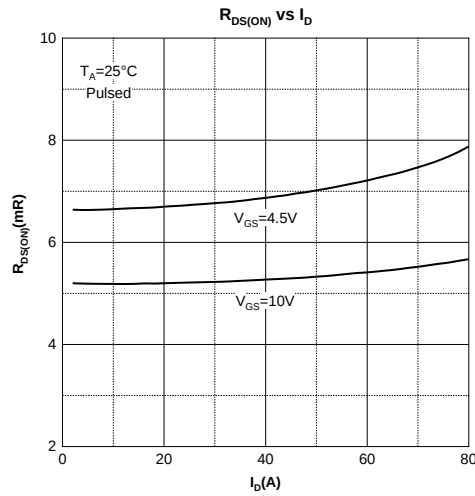
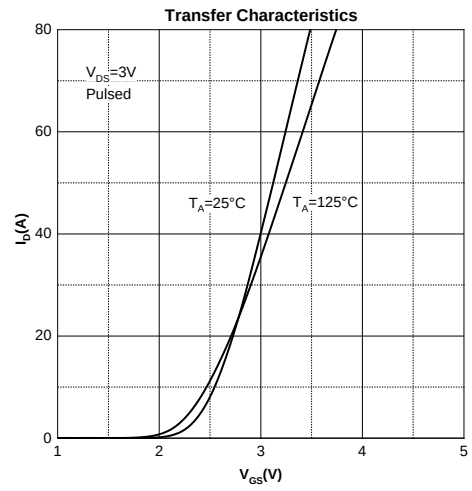
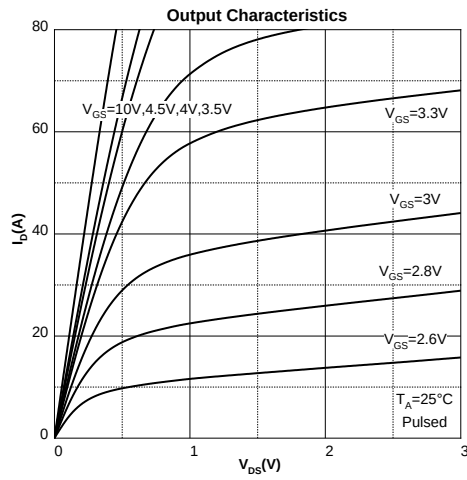
Electrical Characteristics (T_A=25°C unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D = 250μA	60			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 60V, V _{GS} = 0V			1	μA
Gate-Body Leakage Current	I _{GSS}	V _{GS} = ±20V, V _{DS} = 0V			±100	nA
On Characteristics ⁴						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250μA	1.0	1.6	2.0	V
Drain-Source On-Resistance	R _{DS(on)}	V _{GS} = 10V, I _D = 20A		5.2	6.5	mΩ
		V _{GS} = 4.5V, I _D = 15A		6.6	8.6	
Dynamic Characteristics						
Input Capacitance	C _{iSS}	V _{DS} = 30V, V _{GS} = 0V, f = 1MHz		1820		pF
Output Capacitance	C _{oSS}			424		
Reverse Transfer Capacitance	C _{rSS}			23		
Gate Resistance	R _g	V _{DS} = 0V, V _{GS} = 0V, f = 1MHz		2.1		Ω
Switching Characteristics						
Total Gate Charge	Q _g	V _{DS} = 30V, V _{GS} = 10V, I _D = 10A		37		nC
Gate-Source Charge	Q _{gs}			5.1		
Gate-Drain Charge	Q _{gd}			8.2		
Turn-On Delay Time	t _{d(on)}	V _{DD} = 30V, V _{GS} = 10V, R _G = 4.7Ω, I _D = 20A		12		ns
Turn-On Rise Time	t _r			5		
Turn-Off Delay Time	t _{d(off)}			32		
Turn-Off Fall Time	t _f			7		
Source-Drain Diode Characteristics						
Diode Forward Voltage ⁴	V _{SD}	V _{GS} = 0V, I _S = 20A			1.2	V

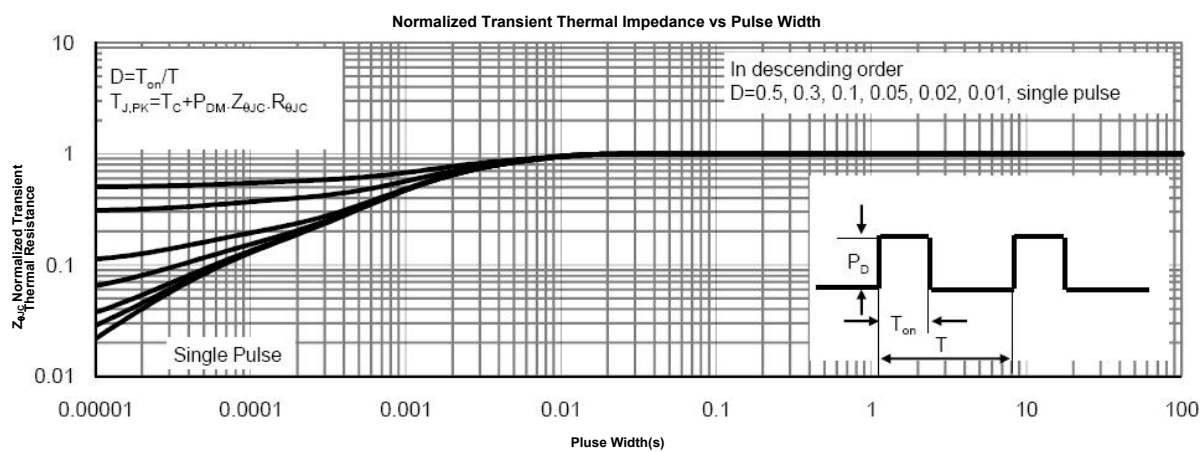
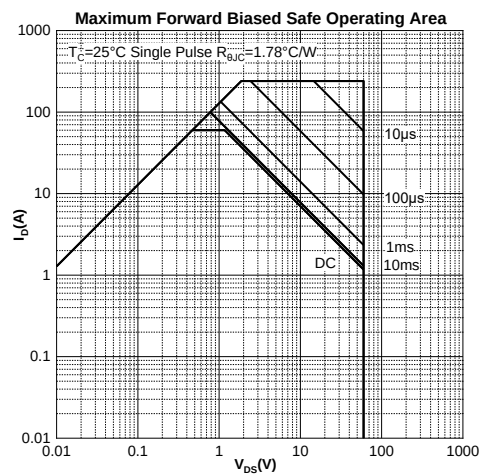
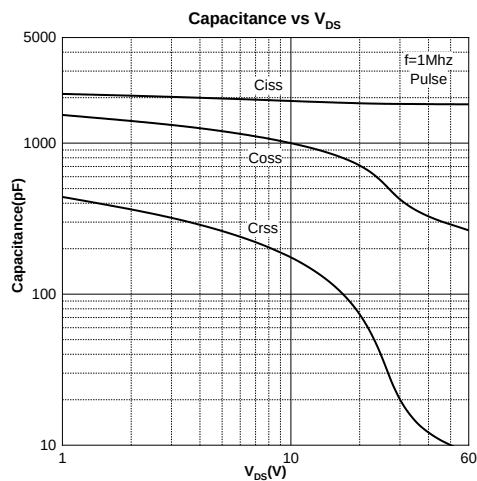
Notes :

- 1.The maximum current rating is limited by package. And device mounted on a large heatsink.
- 2.Pulse Test : Pulse Width ≤ 10μs, duty cycle ≤ 1%.
- 3.EAS condition: V_{DD} = 30V, V_{GS} = 10V, L = 0.5mH, R_G = 25Ω Starting T_J = 25°C.
- 4.Pulse Test : Pulse Width ≤ 300μs, duty cycle ≤ 2%.
- 5.The power dissipation P_D is limited by T_{J(MAX)} = 150°C.And device mounted on a large heatsink
- 6.Device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with T_A =25°C.

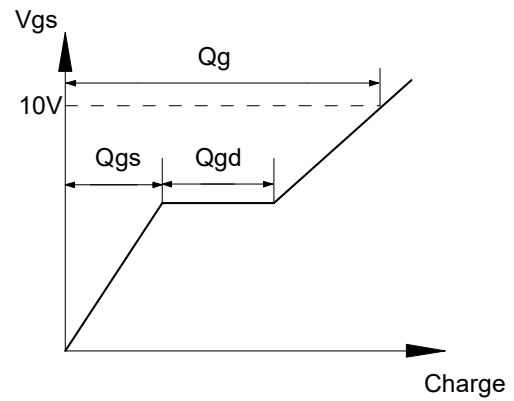
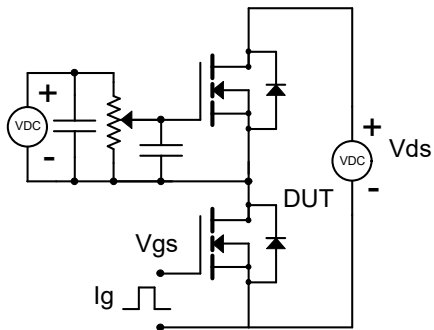
Typical Characteristics



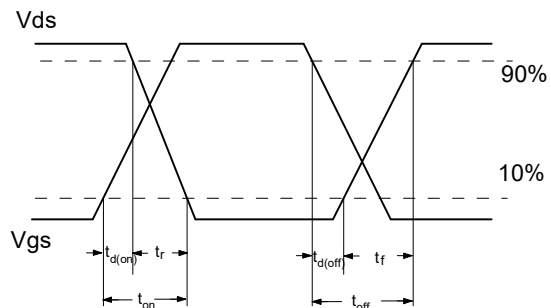
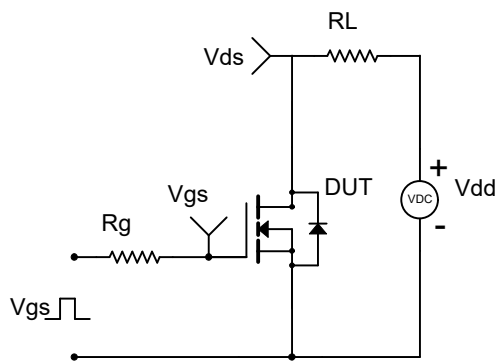
Typical Characteristics



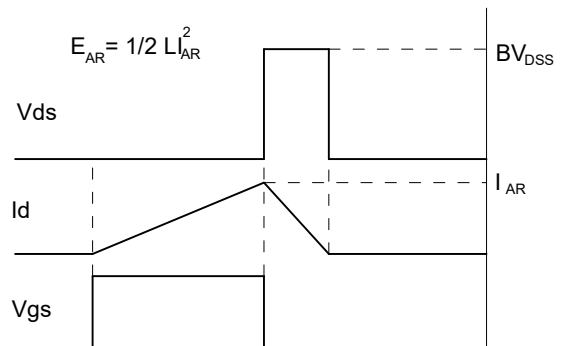
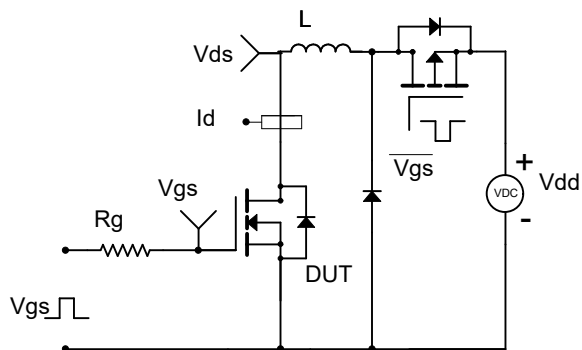
Gate Charge Test Circuit & Waveform

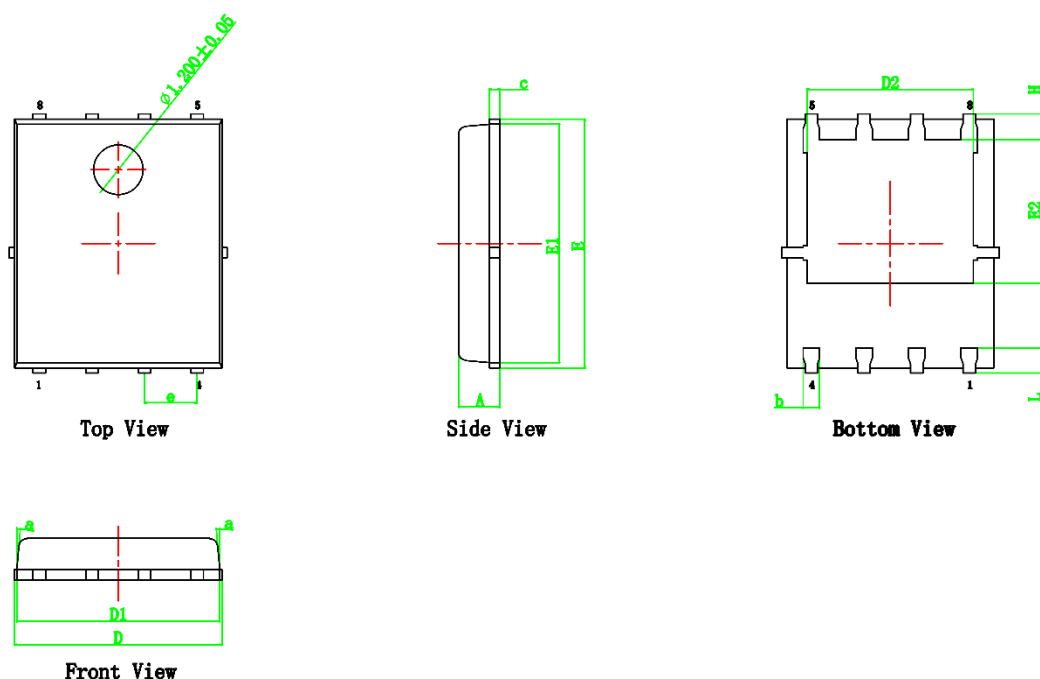


Resistive Switching Test Circuit & Waveform



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms





Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.100	0.035	0.043
b	0.330	0.510	0.013	0.020
c	0.200	0.300	0.008	0.012
D	4.820	5.220	0.190	0.206
D2	3.910	4.110	0.154	0.162
E	5.900	6.100	0.232	0.240
E1	5.700	5.800	0.224	0.228
E2	3.370	3.570	0.133	0.141
e	1.270REF		0.050REF	
H	0.520	0.720	0.020	0.028
D1	4.800	5.000	0.189	0.197
L	0.510	0.710	0.020	0.028
a	0°	10°	0°	10°

NOTICE

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